Hearings Examiner Meeting Agenda
Thursday, February 16, 2023, 5:00 PM
Council Chambers, 616 NE 4th AVE

NOTE: The City welcomes public meeting citizen participation. TTY Relay Service: 711. In compliance with the ADA, if you need special assistance to participate in a meeting, contact the City Clerk's office at (360) 834-6864, 72 hours prior to the meeting so reasonable accommodations can be made (28 CFR 35.102-35.104 ADA Title 1)

To Participate Remotely:

OPTION 1 -

1. Go to www.zoom.us and download the app or click "Join A Meeting" and use Meeting ID – 813 0747 9050
2. Or, from any device click https://us06web.zoom.us/j/81307479050

OPTION 2 - Join by phone (audio only):
Dial 877-853-5257 and enter meeting ID# 813 0747 9050

For Public Comment:
Click the raise hand icon in the app or by phone, hit *9 to "raise your hand", or email to communitydevelopment@cityofcamas.us

These will be entered into the meeting record. Emails received up until one hour before the start of the meeting will be emailed to the Meeting Body prior to the meeting start time.

CALL TO ORDER

INTRODUCTIONS AND INSTRUCTIONS

HEARING ITEM

1. McIntosh Subdivision (SUB22-04)

   Presenter: Yvette Sennewald, Senior Planner

2. Monte Verde Subdivision (SUB22-05)

   Presenter: Yvette Sennewald, Senior Planner

CLOSE OF MEETING

LAND USE DECISION

STAFF REPORT

McIntosh Subdivision

File No. SUB22-04

(Consolidated files: ARCH22-10, CA22-11, MAJVAR22-05, SEPA22-15)

Report Date: February 13th, 2023

TO	Hearings Examiner	**HEARING DATE**	February 16, 2023
PROPOSAL	To subdivide approximately 10.40 acres into 28 single-family lots.		
LOCATION	The site is located at 3210 NW McIntosh Road in the SE ¼ of Section 09, Township 1 North, Range 3, East of the Willamette Meridian; and described as Parcel Number 127449000.		
APPLICANT/ OWNER	METT RI, LLC: Sam Madison 3511 NW McMaster Drive Camas, WA 98606	**CONTACT**	SGA Engineering, PLLC Attn: Scott Taylor 2005 Broadway Street Vancouver, WA 98663
APPLICATION SUBMITTED	June 24, 2022	**APPLICATION COMPLETE**	November 7, 2022
SEPA	The City issued a SEPA Determination of Non-significance (DNS) on December 15, 2022, with a comment period that ended on December 29, 2022. The SEPA DNS was mailed to property owners on December 14, 2022 and published in the Post Record on December 15, 2022. Legal publication #762840.		
PUBLIC NOTICES	A Notice of Application was mailed to property owners within 300 feet of the site and published in the Post Record on January 5, 2023. Legal publication #768340. A Notice of Public Hearing was mailed to property owners within 300 feet of the site and published in the Post Record on February 2, 2023. Legal publication #774360.		

APPLICABLE LAW: The application was submitted on June 24, 2022, and the applicable codes are those codes that were in effect at the date of the application's first submittal. Camas Municipal Code (CMC) Title 16 Environment, Title 17 Land Development, and Title 18 Zoning, specifically (but not limited to): Chapter 17.11 Subdivision, Chapter 18.11 - Parking, Chapter 18.13 - Landscaping, and Chapter 18.55 Administrative Procedures. [Note: Citations from Camas Municipal Code (CMC) are indicated in *italic* type.]

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SUMMARY

An application has been made to the City of Camas for preliminary plat approval to subdivide approximately 10.40 acres situated in the R-10 - Single-Family Residential Zone. The proposed preliminary plat would subdivide this subject property into 28 lots, ranging in size from approximately 8,000 square-feet to 14,074 square-feet. The site contains steep slopes. The proposal includes critical areas, open space, access, utility, and stormwater facility tracts.

The subject property is bordered to the east, west, and south by single-family residential subdivisions zoned Single-Family Residential R-10 and R-15. To the north, across NW McIntosh Road, is an existing Neighborhood Park (Klickitat Park) in the NP-Neighborhood Park Zone. The project site is currently developed with a shop building. The site also consists of grass and some trees in the southeast section as well as one evergreen tree located near NW McIntosh Road.

The proposed preliminary plat does or can comply with the applicable standards of the Camas Municipal Code (CMC) and Revised Code of Washington (RCW).

FINDINGS

Chapter 16.07 State Environmental Policy Act

A SEPA checklist was submitted, and a Determination of Non-Significance (DNS) was issued on December 15, 2022, as the proposed development includes more than nine residential dwelling units per CMC 16.07.020.A.1. and contains critical areas. The comment period ended December 29, 2022, and two comments were received. One comment was from the Department of Ecology regarding solid waste management and water quality (Exhibit 23) and a comment from the Cowlitz Tribe regarding requirements if potential artifacts were found was received (Exhibit 22).

> **FINDING:** Staff finds the comments provided by the Department of Ecology should be complied with.

Chapter 16.31 Archaeological Preservation

An archaeological predetermination report dated May 19, 2022, was prepared by Archeological Services LLC, and was sent to the Department of Archaeology and Historic Preservation and the tribes. Based on the report, no further archaeological work is recommended at this time. The report and findings are not subject to the open public records act and as such, the City cannot disclose the results.

> **FINDING:** Staff finds a condition of approval is warranted that if potential artifacts are discovered during construction, work must immediately cease, and both the State Department of Archaeological and Historic Preservation and the City shall be notified.

Chapter 16.51 Critical Areas

CMC Chapter 16.61 – Geological Hazardous Areas

City mapping identified the subject property within an area of geologically hazardous areas (i.e., steep slopes). As such, the applicant submitted a geotechnical report prepared by Earth Engineering Inc., dated March 1, 2022. The slopes are located in the northwestern portion of the parcel where it exceed 15 percent grade, and at the southern end of the site where slopes range from 15-40%. Information contained in the geotechnical report indicates that the slopes were analyzed for stability with the proposed road, lots, and stormwater infrastructure. The geotechnical report provided did contain an older plat layout which is slightly different from the current proposal. As such staff does recommend that a condition be placed to have an addendum be provided to the geotechnical report addressing any notable changes for the current proposed layout. A preliminary grading plan has been provided which demonstrates compliance with the recommendations from Earth Engineers, Inc. Staff finds the site to be developable if the recommendations in the geotechnical report are followed.

> **FINDING:** Staff finds the proposal, as conditioned, can or will comply with the applicable provisions of CMC Title 16 Environment as discussed above.

Chapter 17.11 Subdivisions

CMC Chapter 17.11.030(D) Criteria for Preliminary Plat Approval:

The hearings examiner's decision on application for preliminary plat approval shall be based on the following criteria:

1. The proposed subdivision is in conformance with the Camas Comprehensive Plan, Parks and Open Space Comprehensive Plan, Neighborhood Traffic Management Plan, and any other City adopted plans.

Comprehensive Plan

The subject property is designated as Single-Family Medium in the City's Comprehensive Plan, which includes the R-10 - Single-Family Residential Zone designation.

Overall, the 2035 City of Camas Comprehensive Plan supports the subdivision through a number of land use policies such as the following:

- LU Policy 1.3: Maintain compatible use and design with the surrounding built and natural environments when considering new development or redevelopment.
- LU-1.5: Where compatible with surrounding uses, encourage redevelopment or infill development to support the efficient use of urban land.
- LU-3.3: Encourage connectivity between neighborhoods (vehicular and pedestrian) to support citywide connectivity and pedestrian access.
- H-1: Maintain the strength, vitality, and stability of all neighborhoods and promote the development of a variety of housing choices that meet the needs of all members of the community.
- H-1.6: Encourage in-fill development on vacant or underutilized sites, subject to design review guidelines, that have adequate urban services, and ensure that the development is compatible with the surrounding neighborhood.

The proposed subdivision will help accommodate the projected growth through the utilization of existing land. The proposed residential development, when built, will provide housing opportunities to meet the needs of the community in accordance with the Housing Element of the Comprehensive Plan.

Parks and Open Space Plan
The Parks and Recreation Open Space Plan does not identify any trails or open spaces on or near the site.

Neighborhood Traffic Management Plan
The City has a Neighborhood Traffic Management Plan (NTM). The NTM plan identifies the need for installation of acceptable traffic calming features when a proposed development will create 700 Average Daily Trips (ADT) or more.

A Transportation Impact Study (TIS) dated April 27, 2022, was prepared by Kelly Engineering (Exhibit 7). Per the TIS, the proposed 28 Lot development will generate 264 average daily trips (ADTs), a total of 20 AM Peak Hour trips (5 in, 15 out) and a total of 26 PM Peak Hour trips (17 in, 9 out). Therefore, the proposed development will not be required to install traffic calming features.

> **FINDING:** Staff finds that the proposed project can and will meet the requirements as noted in the City's NTM plan.

2. Provisions have been made for water, storm drainage, erosion control, and sanitary sewage disposal for the subdivision that are consistent with current standards and plans as adopted in the Camas Design Standard Manual.

Water:
In accordance with CMC 17.19.040.C.4 Water System, each lot within a development shall be served by a water distribution system designed and installed in accordance with the city's *Design Standards Manual* (CDSM).

There is an existing 8-inch water main located in NW McIntosh Road and an existing 6-inch water main in NW 5th Avenue. The existing 6-inch water main dead-ends at a blowoff at the current westernmost end of NW 5th Avenue.

Preliminary utility plans were submitted with the application (Exhibit 8). Revised preliminary utility plans were submitted in February 2023 (Exhibit 15). The revised utility plans show a new 8-inch water main tapped from the main in NW McIntosh Road and extended through the site in future public roads NW Halifax Street and NW 5th Avenue, and to the end of the cul-de-sac in future private road NW Garden Court, with individual water services provided to each lot. An access and utility easement is to be granted to the city over and under both the water and sewer mains located within the future private road and is to be recorded with the final plat.

> Staff recommends a condition of approval that prior to final plat approval the following note should be added to the final plat stating that:
>
> - Tract _, a private road, consists of a utility access and maintenance easement, conveyed to the city, over and under the water main located in the private street.

Per the Camas Design Standard Manual (CDSM), individual water services are to be a minimum 1-inch service to each lot with meter boxes located in planter strips or at back of sidewalk in areas where the sidewalk is curb tight. Locations behind the sidewalk are to be within the right-of-way on public roads and within the private road tract. The revised preliminary utility plans show several locations where the water services and meter boxes are located within curb tight sidewalks.

> Staff recommends a condition of approval that prior to final engineering plan approval, the applicant should submit revised water utility plans with all the future services and meter boxes located in planter strips or behind curb tight sidewalks.

Per CMC 17.19.040.C.4.a Locations of fire hydrants and flow rates shall be in accordance with city standards and the International Fire Code. The distance between fire hydrants, as indicated in the fire code, is allowed to be doubled when automatic fire sprinklers are installed throughout the development. The revised preliminary plans show one new fire hydrant located on the future extension of NW 5th Avenue and no new hydrants on the future private road. Potential requirement for additional fire hydrants will be determined during final engineering plan review.

Per the CDSM a water sampling station for the development is required. The preliminary plans did not propose a water sampling station to be installed.

Staff recommends a condition of approval that prior to final engineering plan approval, the applicant should submit revised the water utility plans to include the location for installation of the water sampling station onsite.

Per CMC 17.19.040.C.4.d landscaping in Open Space tracts must have a separate irrigation service and meter. Irrigation services are to be a minimum 1-inch service. The size of the irrigation meter is to be determined in advance and shown on the water and landscape plans. The owner of the open space tract is responsible for installation of the meter and the water usage. Landscaping water services and meters are to be privately owned and maintained by the Owner and/or Homeowners Association (HOA).

Staff recommends a condition of approval that prior to final engineering plan approval, the applicant should submit revised water utility plans showing the locations of all proposed irrigation services and the size of each irrigation meter.

FINDINGS: Staff finds that, as conditioned, adequate provisions for water can or will be made in accordance with CDSM and CMC 17.19.040.

Storm Drainage:

In accordance with CMC 17.19.040.C.3 the storm drainage collection system shall meet the requirements of the city's stormwater standards, the *Camas Design Standards Manual* (CDSM), and CMC 14.02 Stormwater Control.

Per Clark GIS Property Information, the site for the proposed development is approximately 10.43 acres (454,331 SF) in size. Per the preliminary TIR the site is approximately 9.94 acres (432,790 SF) in size. Per Figure 1-3.2: Flow Chart for Determining Requirements for Redevelopment of Ecology's Stormwater Management Manual for Western Washington (SWMMWW), if the land-disturbing activities are greater than 7,000-square feet, minimum requirements #1-#9 will apply. The proposed development will have land-disturbing activities greater than 7,000-square feet, therefore Minimum Requirements (MR) #1-#9 apply.

A preliminary stormwater Technical Information Report (TIR) (Exhibit 9), dated June 24, 2022, was prepared by SGA Engineering & Design, LLC. The site contains an existing gravel driveway and an existing 1,440 SF building that will be demolished with the proposed improvements. There is a high point on the eastern side of the parcel and slopes predominantly to the north, west, and south, with existing steep slopes at the lower southeast portion of the property. Existing slopes range from approximately 5 to 8%, except for the steep slopes in the southeast portion which consist of slopes up to approximately 26%.

MR #1 – Preparation of Stormwater Site Plans: The preliminary stormwater utility plan was incomplete, as the plans did not include sizing for the conveyance piping or manholes; design plans for the stormwater facilities or treatment structures; nor profiles of said conveyance system.

Staff recommends a condition of approval that prior to final engineering plan approval the applicant should submit a complete set of stormwater plans for review and approval, per MR #1 of the TIR.

MR #2 – Construction Stormwater Pollution Prevention Plan (SWPPP): The SWPPP was not included in the preliminary TIR.

Staff recommends a condition of approval that prior to any land-disturbing activities the applicant should submit the required SWPPP, per MR #2 of the preliminary TIR.

MR #3 – Source Control of Pollution: The preliminary TIR addresses the various BMPs required for source control, which are included in Section D of the preliminary TIR.

MR #4 – Preservation of Natural Drainage Systems and Outfalls: The preliminary TIR states that the proposed development will maintain existing drainage patterns and discharge locations to the maximum extent possible.

MR #5 – On-Site Stormwater Management: The preliminary TIR addresses this requirement in Section E of the preliminary TIR. Per the preliminary TIR, the intent of the onsite stormwater management is to implement inexpensive practices on individual properties in order to reduce the amount of disruption of the natural hydrology.

Per CMC 14.02 and CMC 17.19.040, stormwater is not to negatively affect adjacent property owners. This requirement encompasses both roof drain downspouts and overland surface flow as noted below:

- CMC 14.02 Stormwater Control:
  14.02.010.B.2 Minimize damage to property from increased runoff rates and volumes.
- CMC 17.19 Design and Improvement Standards:
  17.19.040.C.3 Storm Drainage - The storm drainage collection system shall meet the requirements of the city's officially adopted storm water standards.
- 17.19.040.C.3.e - All lots shall provide drainage for stormwater runoff from roof and footing drains to an approved drainage system. Rear yard low point area drains and/or storm drain lateral stubs connected to an approved drainage system shall be provided to each lot as necessary to prevent stormwater runoff impacts to adjoining parcels as determined by the city.

The revised preliminary plans (Exhibit 15) show a rear yard infiltration trench with roof drain laterals for Lots 3 thru 26. The preliminary plans don't appear to provide for stormwater surface runoff impacts to Lots 1 and 2 or Lots 27 and 28. These lots are subject to the same requirement to prevent stormwater surface runoff and roof drain impacts to adjacent parcels as Lots 3 thru 26.

Staff recommends a condition of approval that, prior to final engineering plan approval, the applicant should submit a revised stormwater plan that includes limiting impacts from roof drain and surface water runoff from Lots 1 & 2, and Lots 27 & 28, in addition to the measures proposed for Lots 3 thru 26. Said plan should ensure that adjacent parcels and downstream drainageways and/or adjacent properties are not negatively affected by roof drain downspouts and surface water runoff, per Camas Municipal Code (CMC) 14.02 and 17.19.040.C.

Staff recommends a condition of approval that prior to building permit approval, single-family building permit applications are to include information regarding connection of roof drain downspouts to the rear yard stormwater laterals that discharge to the rear yard infiltration trenches.

MR #6 – Runoff Treatment: The preliminary TIR addresses this requirement in Section F. Treatment is proposed via Filterra treatment vaults located on future Tracts A and B. Per the preliminary utility plans the future Filterra treatment vault and the storm drainage facility on Tract A are public.

Per CMC 17.19.040.C.a Storm drainage facilities shall be placed on their own tract or within an open space tract and are to be maintained by the homeowners within the development in accordance with city standards. Treatment structures are not permitted within the public right-of-way.

Staff recommends a condition of approval that prior to final engineering plan approval the stormwater plans are to be revised with the proposed Filterra treatment structure at future Tract A is located outside of the public right-of-way and on future Tract A. Additionally, private rear or side yard drainage systems are to be placed within an easement across the applicable lots.

MR #7 – Flow Control: The preliminary stormwater report (TIR), addresses this requirement in Section G with the utilization of detention ponds and rear yard roof infiltration trenches in order to meet the predeveloped conditions as required by Ecology's current Stormwater Management Manual for Western Washington (SWMMWW).

Staff recommends a condition of approval that prior to final engineering plan approval, the stormwater utility plans are to be submitted with design information for proposed detention ponds and rear or side yard roof drain infiltration trenches.

MR #8 – Wetlands Protection: Section H of the preliminary TIR states that there are not any wetlands on-site, therefore wetland protections are not applicable.

MR #9 – Operation and Maintenance (O&M): The preliminary TIR did not provide an O&M manual for either the stormwater detention facilities or the Filterra treatment vaults. However, the referenced O&M Manual is Book 4 of the *2015 Clark County Stormwater Facility Operations and Maintenance Manual*. The proposed development is located in the City of Camas and Camas has a stormwater operation and maintenance manual included in the Camas Design Standards Manual.

Staff recommends a condition of approval that prior to final engineering plan approval the final stormwater TIR is to be submitted with both the City of Camas June 2022 *Stormwater Sewer System Operations & Maintenance Manual* and the maintenance requirements for the treatment vaults.

Per CMC 14.02.090.1 Stormwater facilities, located within residential subdivisions and short plats, shall be the maintenance responsibility of the applicant for two-years after date of final acceptance. This maintenance period shall run concurrent with the city's required two-year warranty period that begins at final acceptance.

Prior to end of the two-year warranty period, and upon inspection by the city, the applicant shall ensure that a fully functional facility is turned over to the new owners (e.g., homeowners' associations (HOAs)/homeowners). At completion of the 2-year warranty period, the stormwater facilities in Tract A and Tract B will be owned and maintained by the Homeowner's Association/homeowners.

Staff recommends a condition of approval that prior to final plat approval the following notes should be added to the final plat stating that:

- The stormwater facilities located on Tract A and Tract B are to be owned and maintained by the homeowners / Homeowner Association (HOA) at the end of the 2-year warranty period, which expires 2-years after final acceptance.
- Right-of-entry is to be granted to the city for inspection purposes of the stormwater facilities located on Tract A and Tract B.

- Private rear or side yard drainage systems are to be owned and maintained by the HOA or the applicable Lot owners upon which the private stormwater systems/easements are located.

Proposed Plat Notes:

- Tract A and Tract B stormwater facilities are to be owned and maintained by the homeowners / Homeowner Association (HOA) at the end of the 2-year warranty period, which expires 2-years after final acceptance.
- Right-of-entry is to be granted to the city for inspection purposes of the stormwater facilities located on Tract A and Tract B.
- Private rear and/or side yard stormwater drainage systems are to be placed in private stormwater easements and are owned and maintained by the HOA or the applicable Lot owners upon which the private stormwater systems easements are located.

FINDINGS: Staff finds that, as conditioned, the applicant can and will make adequate provisions for stormwater control, conveyance, and water quality treatment.

Erosion Control:

In accordance with CMC 14.06 Erosion Control, adequate erosion control measures are to be provided during the site improvements for the proposed development in accordance with the *Camas Design Standards Manual* (CDSM) and Ecology's *Stormwater Management Manual for Western Washington* (SWMMWW).

Per CMC 17.21.030.A installation of erosion prevention / sediment control measures are required per an approved erosion and sediment control plan. The preliminary plans did not include the erosion and sediment control plans.

Staff recommends a condition of approval that prior to final engineering approval, the applicant should be required to submit a complete set of Erosion Sediment Control (ESC) plans, as a part of the site improvement plans for review and approval.

Per CMC 17.21.030.C construction of storm drainage facilities required to detain and dispose of stormwater is to commence prior to work on other portions of the project. The city may require the construction of a temporary storm drainage facility that would bypass and protect the permanent facility until such time as the rest of the project is complete and ready for the permanent facility to be brought online.

Per CMC 14.06.200 and CMC 17.21.030.B financial security for erosion control, in the amount of 200% of the estimated erosion control items is required prior to land-disturbing activities of one acre or more. The erosion control financial security is to be submitted to the city prior to start of any land-disturbing activities. Additionally, the applicant will be required to provide a copy of both their *NPDES General Construction Stormwater Permit* (GCSWP) and their *Stormwater Pollution Prevention Plan* (SWPPP), which is a requirement of the NPDES GCSWP permit. The NPDES GCSWP permit is issued by the Washington State Department of Ecology for land-disturbing activities of an acre or more.

Staff recommends a condition of approval that prior to any land-disturbing activities, an electronic copy of Ecology's NPDES GCSWP permit, an electronic copy of the SWPPP, and the financial security for erosion and sediment control are to be submitted to the city.

Staff recommends a condition of approval that prior to any land-disturbing activities, which includes tree cutting, clearing and grading, an approved set of final engineering plans, including the erosion prevention and sediment control measures is required.

FINDINGS: Staff finds that, as conditioned, adequate provisions for erosion control can or will be made.

Sanitary Sewage Disposal:

In accordance with CMC 17.19.040.C.2, sanitary sewers shall be provided and designed in accordance with the city's *Design Standards Manual* (CDSM). New gravity sewer mains are to be a minimum 8-inch main, including providing 6-inch laterals to each lot.

There is not an existing sanitary sewer main in NW McIntosh Road, however there is an existing 8-inch gravity sanitary sewer main and dead-end sanitary sewer manhole located at the southeast corner of the undeveloped parcel. The existing 8-inch gravity sanitary sewer main extends to the south along the eastern property line of future Lot 1. The existing sanitary sewer main continues south and east towards the sewage treatment plant.

The revised preliminary plans (Exhibit 15, sheet 3.0) show two new, but separate, 8-inch gravity sanitary sewer mains that begin at the northern end of future public roads "NW Halifax Street" and NW 5th Avenue extension; and in future private street "NW Garden Court", with sanitary laterals stubbed to each of the proposed lots (1 thru 28).

"NW Halifax Street / NW 5th Avenue" – Public Road

The new 8-inch sanitary sewer main, located in the future public road, starts at the north end of the development and continues south and then east connecting to an existing sanitary sewer main located along the eastern property line of future Lot 1. The existing sewer main is located approximately 8-feet west of the westernmost property lines of Lots 8 and 9 of The Ridge subdivision. Additionally, the preliminary plat shows Tract C, south of Lots 1 and 2, as a utility tract. Staff did not find a recorded access and maintenance easement over said existing sanitary sewer main. As the new sanitary sewer system for the proposed development will connect to an existing city owned sanitary sewer main, access for future maintenance activities is to be maintained along the eastern side of the proposed development.

Staff recommends a condition of approval that prior to final engineering plan approval, the preliminary utility plans should be revised with the existing sanitary sewer main, sanitary sewer manholes, and water main placed in a 20-foot-wide easement along the eastern property line of future Lot 1. The 20-foot-wide access and utility easement is to consist of a minimum 12-foot-wide hard surfacing to allow for access to the sewer main and manholes, the water main, and future Tract C – Utility Tract.

Staff recommends a condition of approval that prior to final plat approval, the final plat should be revised with the existing sanitary sewer main, sanitary sewer manholes, and water place in a 20-foot-wide easement along the eastern property line of future Lot 1. The 20-foot-wide easement is to an access and utility easement over and under the existing water and sanitary sewer, with right-of-entry granted to the city.

Proposed Plat Note: The 20-foot-wide easement along the eastern property line of future Lot 1 is an access and utility easement over and under the existing water and sanitary sewer, with right-of-entry granted to the city.

"NW Garden Court" – Private Road

The preliminary plans show the new 8-inch sanitary sewer main in the future private road beginning at Lot 28 and proceeding south thru the cul-de-sac and continuing south between future Lots 21 thru 24 to tie into the new sewer main in NW 5th Avenue.

Staff recommends a condition of approval that prior to final plat approval, a note is to be added to the plat that a blanket utility access and maintenance easement is provided to the city over and under the sanitary sewer main located in the future private road "NW Garden Court".

Proposed Plat Note: Tract _, a private road "NW Garden Court" is covered by a blanket access and maintenance easement over and under the sanitary sewer main.

Neither the revised preliminary plans nor the preliminary plat provides for a utility access and maintenance easement over the segment of the sanitary sewer main and sewer manholes located south of the cul-de-sac, between future Lots 21 thru 24, and continuing south to tie into a new sanitary sewer manhole in NW 5th Avenue.

Staff recommends a condition of approval that prior to final engineering plan approval the engineering plans should be revised to include a minimum 15-foot-wide utility access and maintenance easement from the end of future "NW Garden Court", between future Lots 21 thru 24, south to future NW 5th Avenue, with right-of-entry granted to the city.

Staff recommends a condition of approval that prior to final plat approval, the final plat should be revised with a 15-foot-wide utility access and maintenance easement over the new sanitary sewer main and sewer manhole from the end of future "NW Garden Court", between Lots 21 thru 24, south to future NW 5th Avenue, with right-of-entry granted to the city.

Proposed Plat Note: The 15-foot-wide access and utility easement, from the end of future "NW Garden Court", between Lots 21 thru 24, and south to NW 5th Avenue is provided over and under the sanitary sewer main and sanitary manhole, with a right-of-entry granted to the city.

FINDINGS: Staff finds that, as conditioned, adequate provisions for sanitary sewage disposal can or will be made.

[Existing wells, septic tanks, and septic drain fields]:
Per CMC 17.19.020.A.3 requires abandonment of existing wells, septic tanks, and septic drain fields. Any existing wells, septic tanks, and drain fields should be properly decommissioned in accordance with State and County guidelines prior to final plat approval. If applicable, any water rights associated with the decommissioned well(s) shall be transferred to the City.

Staff recommends a condition of approval that prior to final engineering plan approval, the applicant should provide documentation to the city that any existing wells, or septic systems have been properly decommissioned in accordance with State and County guidelines. Additionally, any water rights associated with a decommissioned well shall be transferred to the City.

3. Provisions have been made for road, utilities, street lighting, street trees, and other improvements that are consistent with the Six-Year Street Plan, the Camas Design Standards Manual and other State adopted standards and plans;

<u>Roads:</u>
Streets for the proposed development shall be designed in accordance with CMC 17.19.040.B Streets and the Camas Design Standards Manual (CDSM).

Street naming is the responsibility of the Building Official. The future (street names), as shown on the preliminary plans and plat (Exhibit 8) and on the revised preliminary plans (Exhibit 15) and discussed

throughout the staff report, are street names that were provided by the developer. The preliminary street names on the preliminary plans and the preliminary plat are referred to as future (…) and are subject to change during the final engineering plan approval process.

NW McIntosh Road, located along the north frontage of the proposed development, is an existing 2-lane arterial per the city's 2016 Transportation Comp Plan. Existing frontage improvements on NW McIntosh Road are limited to the south side of the road west of the proposed development, and both sides of the road east of the proposed development. Existing frontage improvements consist of curb & gutter, sidewalks, and planter strips.

NW 5th Avenue, is an existing fully improved 2-lane local road, located at the southeast corner of the proposed development, which includes curb & gutter, sidewalks, and planter strips. NW 5th Avenue will be extended to the west with the proposed development.

Per 17.19.040.B.1 half-width street improvements along an existing roadway is required when determined appropriate by the city engineer, shall include utility easements, pedestrian pathway, storm water drainage, street lighting and signage, bike lanes, and improvements to the centerline of the right-of-way as necessary to provide the minimum structural street section per CDSM.

[Public Road]:
Per CDSM *Table 2 – General Guidelines for Geometry of a Roadway*, 3-lane collectors and/or arterials are to consist of a 74-foot right-of-way width, a 46-foot-wide paved street width, 6-foot-wide sidewalk, 5.5 to 7.5-foot-wide planter strip, and no on-street parking permitted on either side.

<u>NW McIntosh Road</u>
The revised preliminary plans (Exhibit 15) show the half-width street improvements along the frontage of the proposed development on NW McIntosh Road to include the 37-feet of right-of-way width as measured from the centerline of the road, a minimum 23-feet of full-depth paved surface, a 6-foot-wide sidewalk, and an 8-foot-wide planter strip. The improvements will result in approximately 59-feet of right-of-way width and 36-feet of total paved surface.

There is an existing sidewalk on the west side of the proposed development that was constructed with the frontage improvements for Ilwaco Estates. The preliminary plans show the new sidewalk connecting to the existing sidewalk.

On the eastside of the proposed development is The Ridge subdivision. The frontage improvements along 741 NW Fremont Street include curb and gutter and an existing curb ramp. These improvements were constructed with the development improvements for The Ridge. The sidewalk improvements stopped at the end of the curb return. Per the approved plat for The Ridge subdivision, sufficient right-of-way appears to have been dedicated that will allow for the sidewalk connection behind the curb, from the end of the existing curb ramp to the new sidewalk, along the frontage of the proposed development. The area behind the curb currently consists of packed soil and shrubs.

As there is a school bus stop located at the corner of NW McIntosh Road and NW Fremont Street, staff recommends that the applicant provide approximately 60-feet of sidewalk from the applicant's east property line to the existing curb return on the pedestrian pathway on NW McIntosh Road to the southwest corner of Fremont Street.

> Staff recommends a condition of approval that prior to final engineering plan approval, the engineering plans should provide for a continuous sidewalk connection from the east end of the sidewalk installed with the adjacent Ilwaco subdivision, along the frontage of the proposed development, and ending at the west end of the curb ramp installed with The Ridge subdivision at NW Fremont Street.

Exhibit 25, is in regard to providing additional signed and marked crosswalks on NW McIntosh. There is an existing signed and marked crosswalk on the westside of NW Ilwaco Street that provides pedestrian access to Klickitat Park. The recommended sidewalk improvements along NW McIntosh Road will provide a continuous pedestrian connection on the southside of NW McIntosh Road from NW Fremont Street west to the existing signed crosswalk on NW McIntosh Road. Based on limited sight distance staff does not recommend an additional marked crosswalk along NW McIntosh Road.

Per CMC 17.19.040.B.5 dedication of additional right-of-way may be required for a development when it is necessary to meet the minimum street width standards or when lack of such dedication would cause or contribute to an unsafe road or intersection.

NW McIntosh is classified as a future 3-lane arterial with a right-of-way width of 74-feet. The existing right-of-way width along the frontage of the proposed development is approximately 42-feet-wide. In order to construct the required 37-feet of frontage improvements, the proposed development is required to dedicate approximately 17-feet of additional right-of-way width.

> Staff recommends a condition of approval that prior to final engineering plan approval, the engineering plans should be submitted with the required 17-foot right-of-way dedication on NW McIntosh Road to allow for the 37-foot full depth half-width street improvement, including a minimum of 23-feet of paved surface, curb & gutter, 8-foot planter strip, and 6-foot detached sidewalk in accordance with CDSM Street Detail ST5 3 Lane Collector/Arterial.

Per CDSM, Access Spacing Standards Table 3: The Access Spacing Standards for a roadway classified as an arterial is a minimum of 600-feet and a maximum of 1,000-feet.

Per the revised preliminary plans (Exhibit 15) the proposed intersection of NW McIntosh Road and the future public road (NW Halifax Street), is approximately 380-feet east of NW Ilwaco Street and approximately 338-feet west of NW Fremont Street. The location as shown does not meet the minimum access spacing standards.

> Staff finds that as the proposed development is located between two existing developments, to the east and west, a deviation from the minimum access spacing standards is supported by the city engineer.

In addition to the intersection spacing standard, a project is required to evaluate the 'Design Intersection Sight Distance' requirements, per *A Policy on Geometric Design of Highway and Streets per the American Association of State Highway and Transportation Officials (AASHTO).* Per the Traffic Impact Study (Exhibit 7), which is discussed in further detail under Criteria 7, the intersection sight distance looking west is over 400-feet (approximately 980-feet) and the intersection sight distance looking east is approximately 350-feet due to the existing vertical curve on NW McIntosh Road. Based on AASHTO and the 35 MPH posted speed limit on NW McIntosh Road, the recommended intersection sight distance should be 390-feet.

> Staff finds that as there is over 400-feet (approximately 980-feet) of sight distance looking west, staff would support shifting the proposed future public access road intersection (NW Halifax Street) further to the west to increase the intersection sight distance looking east. Shifting the proposed public access road intersection further to the west would also allow the applicant to potentially preserve the existing significant fir tree that will be impacted with the currently proposed location of the future public access road (NW Halifax Street).

Per CDSM, Table 2 General Guidelines for Geometry of a Roadway classified as a collector or arterial, the minimum curb radii on a public street with a 74-foot right-of-way width and 28-feet of paved surface is

35-feet. The revised preliminary plans do not include any curb radius dimensions at the intersection of NW McIntosh Road and future public road (NW Halifax Street).

Staff recommends a condition of approval that prior to final engineering plan approval, the engineering plans should be submitted with the minimum curb radius of 35-feet on both sides of the intersection at NW McIntosh Road and the future public access road (NW Halifax Street).

[Interior Public Roads]:
(NW Halifax Street)
Per CDSM Table 2 – General Guidelines for Geometry of a Roadway, a 2-lane local neighborhood road with a 52-foot-wide right-of-way width, a 28-foot paved surface, 5-foot-wide detached sidewalks and 7-foot planter strips on both sides, and on-street parking permitted on one side only; requires approval from the city engineer.

The revised preliminary plans (Exhibit 15) propose to construct the future public road (NW Halifax Steet) in accordance with CDSM Table 2 – General Guidelines for Geometry of a Roadway, 2-lane local neighborhood road with 52-foot right-of-way width.

Staff finds that as shown on the revised preliminary plans, future local public road (NW Halifax Street) as shown, meets the minimum public road standard for a 52-foot right-of-way width and is approved by the city engineer.

Future NW 5th Avenue Extension:
The revised preliminary plans (Exhibit 15) propose to construct the future public road extension of NW 5th Avenue as a 2-lane local road with a 52-foot right-of-way width. However, per CMC 17.19.040.B.6, proposed street systems shall extend existing streets at the same or greater width, unless otherwise approved. The existing eastern end of NW 5th Avenue was constructed with a 60-foot right-of-way width, 36-foot-wide paved surface, sidewalks, and planter strips. During the initial review staff advised the applicant that the future extension of NW 5th Avenue was to be constructed to tie into the existing NW 5th Avenue with a 60-foot right-of-way and tying into the existing sidewalk and planter strips to the east. This will also eliminate the 'spite strip' that would have been located between the back of sidewalk and the property lines along future Lots 1 and 2.

Staff recommends a condition of approval that prior to final engineering plan approval, the applicant should work with staff to provide an acceptable transition between the future extension of NW 5th Avenue to tie into the existing NW 5th Avenue to the east.

The revised preliminary plans show a triangular shaped unidentified parcel of land on the southeast side of future Lot 3 that is shown to provide access to the existing single-family residence at 3210 NW McIntosh Road (Parcel ID Number 217455000). This parcel is approximately 1.1 acres (47,916 SF) in size and has the potential to be further developed in the future. Per *CMC 17.19.040.B.10, street layout shall provide for the most advantageous development of land development, adjoining area, and the entire neighborhood.* Therefore, the unidentified triangular shaped parcel is to be public tract to reserve sufficient roadway and right-of way widths for future improvements.

Staff recommends a condition of approval that prior to final engineering plan approval, the engineering plans should be submitted with the unidentified triangular shaped parcel on the east side of future Lot 3 shown as a public tract to allow for future access improvements to the southern parcel (PIN 217455000).

Staff recommends a condition of approval that prior to final plat approval, the final plat should provide for the dedication of Tract _, the unidentified triangular shaped parcel located on the east

side of future Lot 3. Tract _ is to be dedicated as a public tract set aside for reservation of future access improvements to parcel number 217455000.

Proposed Plat Note: Tract _ is a public tract set aside for future access improvements to Parcel Number 217455000. Ownership and maintenance of said tract will be the responsibility of the city.

Per CMC 17.19.040.B.10.b.i Block lengths shall not exceed the maximum access spacing for the roadway class per the city's design standard manual. The maximum block length for a local roadway classification is 600-feet. The proposed interior local block length on the future public road (NW Halifax Street) is approximately 625-feet in length.

Staff finds that while the length slightly exceeds the maximum block length standard, a deviation from the maximum block length standard for a local roadway is supported by the city engineer as the roadway is looped.

[Private Roads]:
Per the CDSM Table 1 – Guidelines for Geometry of a Private Roadway – Private Street D, a private road in excess of 300-feet with access to five of more dwelling units is to consist of a 48-foot-wide tract, with a 28-foot paved surface, 5-foot-wide sidewalks and 4.5-foot-wide planter strips on both sides, on-street parking permitted on one side only, and cul-de-sacs are to be a minimum 35-foot radius.

The revised preliminary plans (Exhibit 15), show the future private road (NW Garden Street) with a 48-foot-wide tract, 28-foot paved surface, sidewalks and planter strips on both sides, and a cul-de-sac with a minimum 40-foot radius.

Staff finds that the revised preliminary plans, as shown, meets or exceed the minimum private road standard D and is supported by staff.

Private Road Standard D prohibits on-street parking on one side of the road. Installation of 'No Parking and Towing' signage is required as the city does not provide towing on private roads, nor does the city enforce no parking on private roads.

Staff recommends a condition of approval that prior to final engineering plan approval, the applicant should be required to provide a design for a 'No Parking and Towing' sign for review and approval.

a. Said sign is to include contact information for a towing company.
b. The applicant shall be required to install the 'No Parking and Towing' signs prior to final acceptance.

Per CMC 17.19.040.B.10.b.ii Cul-de-sacs and permanent dead-end streets over 300-feet in length may be denied unless topographic or other physical constraints prohibit achieving this standard. When cul-de-sacs or dead-end streets are permitted, a direct pedestrian or bicycle connection shall be provided to the nearest available street for pedestrian oriented use.

Per the revised preliminary plans, the permanent dead-end cul-de-sac is approximately 365-feet from the proposed gate, which exceeds the maximum 300-foot length. A direct pedestrian or bicycle connection is not provided to the nearest available street, which would be the future public road (NW Halifax Street).

Staff finds that a deviation from the dead-end standard requiring a pedestrian or bicycle connection is supported by the city engineer as a pedestrian connection to the future public road (NW Halifax Street) does to provide a substantial benefit to the residents on the future private road (NW Garden Court).

Per the CDSM Table 1 – Guidelines for Geometry of a Private Roadway – Private Street A, a private with access to four or less dwelling units is to consist of a 20-foot-wide tract, with a minimum 12-foot paved surface, no on-street parking permitted on either side.

Private Road Standard A prohibits parking on both sides of the road. Installation of 'No Parking and Towing' signage is required as the city does not provide towing on private roads, nor does the city enforce no parking on private roads.

Staff recommends a condition of approval that prior to final engineering plan approval, the applicant should be required to provide a design for a 'No Parking and Towing' sign for review and approval.

a. Said sign is to include contact information for a towing company.
b. The applicant shall be required to install the 'No Parking and Towing' signs prior to final acceptance on the private road access to future Lots 22 and 23.

Per Note 3, Dead-end roads in excess of 150-feet as measured from the centerline of the adjacent road require a dead-end turnaround.

The revised preliminary plans show the private road access to future Lots 22 and 23 to is approximately 190-feet in length as measured from the centerline of the dead-end cul-de-sac.

Staff recommends a condition of approval that prior to final engineering plan approval the applicant is to work with the engineering staff and the Fire Marshal to provide an acceptable dead-end turnaround on this private road. Additionally, the private road access to Lots 22 and 23 is to be placed in a Tract to be owned and maintained by the adjacent homeowners and/or the homeowners association (HOA).

Staff recommends a condition of approval that prior to final plat approval the private road access to Lots 22 and 23 is to be placed in a Tract to be owned and maintained by the adjacent homeowners and/or the homeowners association (HOA).

Proposed Plat Note: Tract _ is a private road access to Lots 23 and 24 and is to be owned and maintained by the adjacent homeowners and/or the homeowners association (HOA).

<u>Utilities, Street Lighting, Street Trees, and Other Improvements</u>:

[Street lighting]:
LED Street lighting is to be designed and installed along all street frontages in accordance with the Camas Design Standards Manual (CDSM) – Standards for Street Lighting.

The locations for streetlights are to be coordinated with the locations of other site features, such as street trees, driveways, and other utilities. Per CDSM, private streets in excess of 100-feet in length and serving more than five dwelling units are required to have streetlights. Any streetlights proposed for private streets are required to be metered separately and are to be owned and maintained by the HOA.

Staff recommends a condition of approval that prior to final engineering plan approval all street light locations are to be shown on the engineering and landscape plans. Additionally:

- Any streetlights provided for private streets are required to be metered separately and are to be owned and maintained by the HOA / homeowners.
- Prior to submittal of electrical plans to Clark Public Utilities, the preliminary electrical plans for streetlights, transformers, J-boxes, etc., which are prepared by others, are to be submitted to the city for review and approval.

[Street trees and Landscaping]:

CMC 17.19.030 (F 1) states: "Each dwelling unit within a new development shall be landscaped with at least one tree in the planting strip of the right-of-way, or similar location in the front yard of each dwelling unit, with the exception of flag lots and lots accessed by tracts." Street trees shall be a minimum of 2" caliper. The preliminary landscape plan indicates that each proposed lot, with the exception of lots 22 and 23, has been provided with at least one street tree. As proposed, lots 22 and 23 are accessed via a shared driveway access and do not have direct access off the private road, so the street tree requirement does not apply.

Staff recommends a condition of approval that prior to final acceptance all landscaping be installed or bonded for and all proposed street trees must be in compliance with the city's approved street tree list. Additionally, prior to final engineering approval, the applicant is required to show proposed driveway locations for each lot to ensure that street trees are not impacted.

The street tree plantings and other landscaping as discussed throughout this report, should be included on the landscaping plans with final engineering plan submittal for the site improvements.

Staff recommends a condition of approval that requires the applicant to submit a final landscape plan for review and approval that is consistent with the landscaping standards in CMC Chapter 18.13, in addition to CMC Chapter 17.19.030.F.6, and include plantings from the City's approved plant list, prior to final engineering plan approval.

Landscaping adjacent to or within tracts should be installed prior to final acceptance per CMC 17.19.030.F.3. Street trees adjacent to lots should be installed prior to final occupancy or bonded for per CMC 17.19.030.F.4.

[Storm Facility Landscaping]:
CMC 17.19.030.F.6 requires that storm drainage facilities within 30-feet from any street or accessory structure to be landscaped with a 10-foot L2 buffer. The proposed storm facilities located in Tracts A and B should be landscaped with a L2 buffer at its lot lines and the landscaping should be shown on the final landscape plans.

Per the CDSM, the storm facilities are to be fenced with a maximum height 6-foot fence with top rail and a minimum 10-foot-wide double gate for access. The preliminary stormwater plans do not provide for fencing or gated access to the future stormwater facilities located on Tracts A and B.

Staff recommends a condition of approval that prior to final engineering plan approval the applicant should submit revised stormwater facility plans that provide for a minimum 6-foot-high black vinyl coated chain link fence with top rail installed along the property lines of Tracts A and B where the tracts abuts the future Lot 11 and Lots 26 and 27. Additionally, the plans are to provide for a minimum 16-foot-wide double gate at the access road to the facility and a minimum 4-foot-wide man gate.

FINDING: Staff finds that, as conditioned, the applicant can or will make adequate provisions as conditioned for roads, utilities, street lighting, street trees, and other improvements that are consistent with the six-year street plan, the Camas Design Standard Manual and other state adopted standards and plans.

4. Provisions have been made for dedications, easements, and reservations;

The applicant is conditioned to dedicate the minimum 17-foot right-of-way width on NW McIntosh Road required for the frontage improvements and the 52-foot right-of-way width for the internal public roads required to serve the proposed development, as shown on the preliminary plats, with the exception of sufficient right-of-way width required to match the western end of the existing NW 5th Avenue that was

constructed with The Ridge subdivision. NW 5th Avenue, through The Ridge, consists of a 60-foot right-of-way width.

Future private road "NW Garden Court" Tract _ is identified as private road on the preliminary plat. A public sanitary sewer main and public water main will be located within the private road 'Tract _', therefore future private road "NW Garden Court" is conditioned to provide a blanket utility access and maintenance easement to the city for the water and sanitary sewer mains.

The 20-foot-wide easement along the eastern property line of future Lot 1 is a blanket access and utility easement over and under the existing water and sanitary sewer, with right-of-entry granted to the city at time of final platting.

The 15-foot-wide easement from the end of future "NW Garden Court" to NW 5th Avenue is an access and utility easement over and under the sanitary sewer main located between Lots 21 through 24, with a right-of-entry granted to the city, at the time of final platting.

Additionally, the private road Tract provides access to the stormwater facility located in 'Tract B'; as such the applicant is required to provide the blanket access easement is to be included for the stormwater facility on Tract B. Right-of-entry for inspection purposes is to be provide for the stormwater facilities located on Tract A and Tract B at the time of final platting.

A homeowner's association (HOA) will be required and a copy of the CC&Rs for the development will need to be submitted to the City for review and approval. Specifically, the applicant will need to make provisions in the CC&Rs for ownership and maintenance of the storm drainage facilities located on Tracts A and B; private rear yard storm drainage facilities; fencing; walls; landscaping and irrigation; private road 'Tract' and street lighting; the private gate and controller; and tracts or easements outside of the City's right-of-way. Further, all necessary easements and dedications should be noted on the final plat.

> **FINDING:** Staff finds that, as conditioned, adequate provisions for dedications, easements and reservations can or will be made by the applicant at the time of final platting.

5. The design, shape, and orientation of the proposed lots are appropriate to the proposed use.

<u>CMC 18.09.040 Table 1 Lot Dimensional Standards</u>

The subject property is situated in the R-10 - Single-Family Residential Zone, permitting a minimum lot size of 8,000 square-feet, maximum lot size of 14,000 square-feet, and an average lot size of 10,000 square-feet. As per Table 1, the proposed lots are required to have a minimum lot width of 80-feet, and lot depth of 100-feet. The maximum density for the R-10 zone is 4.3 dwelling units per acre.

The subject property shares its easterly side and a portion of the westerly side property line with property situated in the R-15 zone. Per CMC 18.09.080.B, *"When creating new lots via short plats or subdivisions that are adjacent to a different residential zone designation, the new lots along that common boundary shall be the maximum lot size allowed for the zone designation of the new development (if a lower density adjacent zone), or the minimum lot size allowed for the zone designation of the new development (if a greater density adjacent zone), as based on CMC 18.09.040 Table 2, Section A."* As such, proposed Lots 23-27 situated along the westerly side property line are required to be a minimum of 14,000 square feet in size and are slightly larger than 14,000 square-feet, meeting that requirement. The applicant is proposing a 10-foot-wide landscape tract "Landscape Tract 2" along the westerly side property line adjacent to proposed Lots 3-7. This design is consistent with other current land use decisions that abut adjacent properties with a higher zoning designation and beveling does not directly apply.

<u>CMC 18.09.040 Table 2 Setbacks</u>

As proposed, the lots within the subdivision range in size from 8,000 - 14,074 square-feet. Setbacks are based on lot size; therefore, the lots must comply with the setbacks as shown in in CMC 18.09.040 Table 2 and as noted below:

Lot Area	**5,000-11,999 sq. ft.**	**12,000-14,999 sq. ft.**
Minimum front yard	20	25
Minimum side yard	5	10
Minimum side yard flanking a street corner lot rear yard	10	15
Minimum rear yard	25	30
Minimum lot frontage on a cul-de-sac or curve	30	35

All proposed lots meet the dimensional standards with the exception of lots 25, 26, and 28. Variances have been requested for reduced front and rear yard setbacks for lots 25 and 26, as well as a reduced rear yard setback for lot 28. The applicant is also requesting a major variance to increase the lot coverage from 35% to up to 50% for the proposed subdivision. The applicant's narrative indicates that the larger lot requirement has created some challenges and a reduced front and rear yard setback is requested for the lots along the easterly side of the project.

> **FINDING:** Aside from lots requesting a variance, staff finds the proposed lot sizes can conform to the requirements of the R-10 zone as conditioned.

6. The subdivision complies with the relevant requirements of the Camas land development and zoning codes, and all other relevant local regulations;

<u>CMC 18.13.045 and CMC 18.13.051 Tree Density/Tree Survey:</u>
A minimum of 20 tree units (TU) per net developable acre is required for residential developments per *CMC 18.13.051(A) Table 1 – Required Tree Density* and should be incorporated into the overall landscape plan. The entire site is approximately 10.40 acres in size. Per CMC 18.03.040 *"developed/net acreage means the total acreage of a land use development exclusive of open space and critical areas."* The open space and critical area tracts account for approximately 2.81 acres; therefore, the net developable acreage is 7.48 acres, requiring 150 TUs.

An arborist report dated February 6, 2023, was submitted for the proposed project, and indicates that there are 8 trees and 10 clumps of Hazelnut trees on the project site. Six of the existing trees are proposed to be removed to facilitate the subdivision. One of the trees to be removed is a large evergreen that is situated at the front of the property, near NW McIntosh Road and directly in the proposed access road for the subdivision. The arborist report indicates that this tree is approximately 90-feet tall and while the tree appears to be in good condition, it exhibits some past breakage about 15-feet from the top. The breakage resulted in several branches growing upward to become new tops which creates a weak are subject to future breakage. The report notes that the grading required for the proposed project would have sever impacts to the tree and states that there does not appear to be a viable option for moving the road location while providing the safety, sight distance, and slope requirements for the project. The applicant has indicated that the proposed access for the subdivision is required to be where located to ensure enough spacing of the intersection. Staff notes that the access point requires an exception for spacing as proposed and encourages the applicant to redesign the access point to avoid the removal of the tree, if possible.

Based on 7.48 acres of net developable area, a total of 149.6 tree units are required for the proposed project. The tree plan indicates that the exiting trees provide 10 TU's, and an additional 140 trees will be planted for a total of 150 TU's. The 150 TUs are made up of proposed street trees and site trees. The applicant has indicated that the project would provide more mature trees and shrubs to create an entry statement into the development to offset the removal of the large evergreen tree. A final landscape, tree, and vegetation plan consistent with the landscaping standards in CMC Chapter 18.13 should be submitted to the City for review and approval prior to engineering plan approval. The final landscape plan shall specify what larger tree or shrubs can be installed at the north entrance of the subdivision to create an entry statement. Plants utilized will need to be per the approved City's Tree list and per the Camas Design Manual planting specifications and landscape notes. For plants not on the approved City list, a characteristic card should be submitted to the City for review and approval. Irrigation and landscaping should be installed or bonded for prior to final acceptance.

CMC Section 18.17.060 Retaining Walls:

CMC 18.17.060 allows for retaining walls up to 6 feet, unless approved by the Director. As proposed, the Preliminary Grading Plan indicates that Storm Tract "A" will utilize a retaining wall approximately 8-feet in height while Storm Tract "B" is proposed with a 6-foot-high retaining wall. Exterior retaining walls facing the public right-of-way will be required to be "set back a distance of one foot for every foot in height of a fence in excess of allowed height" per CMC 18.17.060.D. and provide additional landscaping consisting of groundcover, shrubs, and trees. A condition is warranted.

7. Appropriate provisions are made to address all impacts identified by the transportation impact study;

[Traffic Impact Analysis]:
Per CMC 18.18.040.E a Transportation Impact Analysis (TIS/TIA) may be required when a development will generate 200 or greater average daily trips (ADTs).

Based on the transportation impact analysis (TIA), dated April 2022 and prepared by Kelly Engineering, the proposed development will generate approximately 264 ADTs, which triggered the requirement for a TIA.

[Trip Generation and Distribution]:
Per the TIA, Table 1 – Site Traffic Generation. Using the 11th Edition ITE Trip Generation Manual and the land-use code (210 – single-family detached housing), the proposed development will generate an average of 264 trips per day, with a total of 28 AM Peak Hour Trips (20 In / 15 out) and a total of 36 PM Peak Hour Trips (17 In / 9 out). Based on existing traffic volumes 65% of the traffic will travel to and from SR-14 via NW Brady Road and the remaining 35% will west and east on NW McIntosh Road and NW Brady Road.

[Level of Service]:
The level of service (LOS) study area intersections were analyzed to determine existing year (2022), and year 2025 with and without the proposed development. The 2010 Highway Capacity Manual procedures were used for the intersection operation analysis based on LOS. The LOS criterial range from 'A', which indicates little, if any delay, to 'F', which indicates significant vehicle delays. The range of criteria, based on an average delay of seconds per vehicle, are shown on Table 2 – LOS Criteria in the TIA.

[Capacity Analysis]:
Based on the LOS criteria range, noted in Table 2, the intersections to be evaluated at Year 2025 without Project and Year 2025 with Project will operate at a LOS ranging from LOS A to LOS C, depending on the noted intersection.

The following intersections were analyzed:

- Proposed site access at NW McIntosh Road
- NW Fremont Street at NW McIntosh Road
- NW McIntosh Road at NW Brady Road
- NW Grand Ridge Drive at NW Brady Road

Per Table 3 – Capacity Analysis Summary, the intersections noted above, which are located within the study area will operate at acceptable levels with the Year 2025 build-out of the proposed development. ***Staff Concurs.***

[Pedestrian, Bicycle & Transit Considerations]
Per the TIA, "low pedestrian and no bicycle activities were observed within the vicinity of the site. The site is not served by public transit service."

[Collision Data]:
Per the TIA, "collision data was obtained from the Washington State Department of Transportation (WSDOT) for the three-year time period between December 23, 2018, and December 23, 2021. This is the most recent three years of available data. Based on the available data the calculated accident rates do not exceed 1.0 accidents per million entering vehicles (MEV) that usually identifies an intersection with a high accident rate."

[Turn Lanes and Conflicts with Adjacent Intersections/Driveways]:
Per the TIA, dedicated "turn lanes are not warranted. Additionally, "based on field observations, including the existing traffic volumes no turning movement conflicts will occur with any adjacent intersections or driveways."

[Sight Distance Analysis]:
Per the TIA, "Sight distance was measured at the site access onto NW Mcintosh Road. The measured intersection sight distance was over 400-feet when looking towards the west and 350-feet when looking towards the east. The sight distance when looking towards the east was slightly restricted by the vertical curve on NW Mcintosh Road. Based on the criteria in AASHTO, *A Policy on Geometric Design of Highways and Streets,* and the posted speed limit of 35 mph on NW Mcintosh Road, the recommended intersection site distance is 390-feet.

Staff finds that as there is over 400-feet (approximately 980-feet) of sight distance looking west. Staff would support shifting the proposed future public access road (NW Halifax Street) intersection at NW McIntosh Road, further to the west to increase the intersection sight distance looking east. Shifting the proposed public access road intersection further to the west would also allow the applicant to potentially preserve the existing significant fir tree that will be impacted with the currently proposed location of the future public access road (NW Halifax Street).

[Transportation Improvements]:
Per the TIA, "bike and pedestrian improvements on NW Brady Road west from NW McIntosh Road to the city limits are identified in the City's "6-Year Transportation Improvement Bike and Pedestrian Improvements on Brady Road from McIntosh west to the city limits are identified in the City of Camas 6-year Transportation Improvement Program. The project has a priority number of 23, with preliminary engineering scheduled for January 2025." However, there is not currently any funding for the proposed project.

[School Considerations]:

Per the TIA, "elementary and middle school students will attend Prune Hill Elementary and Skyridge Middle School. High school students will attend Camas High School. School bus service will be provided for all students. The school bus routes change on a yearly basis depending on where new developments occur. Currently there are school bus stops on NW Ilwaco Street at NW McIntosh Road to the west and on NW Fremont Street to the east."

[City of Vancouver Concurrency Review]:
The City of Vancouver has identified a list of proportionate share intersections that require the number of PM Peak Hour Trip distributions to be identified. Per Table 5 - Concurrency Corridors of the TIA, the applicant's traffic engineer, Kelly Engineering, identified 17 PM Pear Hour Trips distributed to the proportionate share intersection of NE 192nd Avenue at the westbound (WB) on ramps onto SR-14 from the proposed development. Per the City of Vancouver, "the proportionate share fee amount at the following intersection is $2,000.00 per PM Peak Hour Trip and that the developer is required to pay the proportionate share fees associated with this intersection."

Based on the TIA, the proportionate share amount for intersection improvement projects in the City of Vancouver are as follows:

Proportionate Share Project Name	Fee Rate	Number of Trips	Proportionate Share Cost
SE 192nd Ave & WB SR-14 ramps	$2,000 per PM peak hour trip	17	34,000.00
Total Proportionate Share Cost			**$34,000.00**

Staff recommends a condition of approval that prior to final acceptance the applicant is required to pay the proportionate share amount of $34,000.00 to the City of Vancouver. The applicant is to provide Camas staff with documentation of payment of said proportionate share amount.

TIA Conclusions and Recommendations:

- Based on the findings of this transportation impact study the surrounding roadway system can adequately accommodate traffic from the Mcintosh Subdivision. The study area intersections will operate at level of service "C" or better with build out of the development.
- The sight distance when looking towards the east from the future site access is slightly restricted by a crest vertical curve on NW Mcintosh Road. Tue measured intersection sight distance was 350 feet and 390 feet would be desirable as based on the criteria in AASHTO, A Policy on Geometric Design of Highways and Streets. Consideration should be given to install a "Limited Sight Distance" sign similar to the one on Mcintosh Road for eastbound traffic. The sign could be installed to the west of NW Fremont Street for westbound traffic. No additional off-site traffic control devices or roadway improvements were identified to accommodate the development. ***Staff concurs. The 'limited sight-distance' sign will be addressed during engineering plan review.***

- 17 trips from the Mcintosh Subdivision are projected to enter the 192nd Avenue and SR-14 WB ramps during the PM peak hour. This intersection location is under the jurisdiction of the City of Vancouver. The City of Vancouver is collecting proportionate share fees with a unit cost per trip of $2,000. ***A condition is warranted***.
- Adequate sight distance should be maintained at the site access onto Mcintosh Road. Obstructions by signs, vegetation or other objects should not be allowed. ***Staff concurs.***

FINDING: Staff finds that this development, as conditioned, can or will meet any impacts identified by the transportation impact study.

8. Appropriate provisions for maintenance of commonly owned private facilities have been made;

Per CMC 14.02.090.A.1 Stormwater facilities, located within residential subdivisions and short plats, shall be the maintenance responsibility of the applicant for two-years after the date of final acceptance. This maintenance period shall run concurrent with the city's required two-year warranty period that begins at final acceptance.

Per CMC 14.02090.C, the City shall have the right-of-entry and authority to inspect the stormwater facilities for compliance with this chapter. A note is to be added to the final plat granted the city right-of-entry for inspection purposes. A condition of approval is warranted.

Per CMC 17.19.040.A.2 the HOA and/or homeowners are responsible for the ownership and maintenance of the private streets. A note is to be added to the final plat stating that private Tract C is to be owned and maintained by the individual property owners and/or homeowners association (HOA). A condition of approval is warranted.

FINDING: Staff finds that, as conditioned, this development can or will meet the appropriate provisions for maintenance of private facilities.

9. Appropriate provisions in accordance with RCW 58.17.110, are made for (a) the public health, safety, and general welfare, and (b)The public use and interest will be served by the platting of such subdivision and dedication;

FINDING: As discussed throughout this report, staff finds that the subdivision can be conditioned to provide the appropriate provisions for public health, safety, general welfare, and assure the public interest is served.

10. The application and plans shall be consistent with the applicable regulations of the adopted comprehensive plans, shoreline master plan, state, and local environmental acts, and ordinances in accordance with RCW36.70B.030.

FINDINGS: Staff concurs that the proposed subdivision can or will meet the requirements of RCW 58.17 and other applicable state and local laws that are in at the time of final platting. The final plat will be processed in accordance with the requirements of CMC 17.21.060.

Chapter 18.45 Variance

As proposed, the applicant is requesting a major variance to allow a lot coverage of up to 50% for all lots where the zoning code permits a lot coverage of 35% in the R-10 zone. The applicant is also requesting setback variances for proposed lots 25, 26, and 28 as follows:

- To allow a front setback for lots 25 and 26 to be 20-feet where CMC permits a minimum front setback of 25-feet.

- To allow a rear yard setback for lots 25 and 26 to be 25-feet where CMC permits a minimum rear yard setback of 25-feet.
- To allow a rear yard setback for lot 28 to be 20-feet where CMC permits a minimum rear yard setback of 25-feet.

A. CMC 18.45.040.B - Approval of a major variance must demonstrate with findings of compliance with the following criteria:

1. The variance shall not constitute a grant of special privilege inconsistent with the limitation upon uses of other properties in the vicinity and zone in which the subject property is located;

DISCUSSION: Per CMC 18.09.040, Table 1, the maximum lot coverage for new lots in the R-10 single-family residential zone is 35%. As per Table 2, front and rear building setbacks for single-family residential zones are as follows:

Lot Area	**5,000-11,999 sq. ft.**	**12,000-14,999 sq. ft.**
Minimum front yard	20	25
Minimum rear yard	25	30

The applicant is requesting to allow a maximum lot coverage of up to 50% for all proposed lots and to allow a reduced front and rear yard setback for proposed lots 25 and 26 as well as a reduced rear yard setback for proposed lot 28. The applicant's narrative indicates that they are requesting to use the same provisions that have been provided to adjacent developments and cited Dawson's Ridge. However, the Dawson Ridge lot coverage requirement was accomplished via a post decision review after the Camas Municipal Code was modified by council action. No special lot coverage was granted at the Dawson Ridge final order. The subject site is situated in the R-10 zone and because of the beveling requirements with adjacent R-15 zoned property, some of the lots are required to be larger in size. This request will not increase the number of lots within the proposed development and does not affect other dimensional standards of the R-10 zone. According to the applicant, the majority of the lots within the proposed subdivision will only be able to achieve a 42-45% lot coverage, based on the setback requirements. Due to the topographic constraints, the existing lot dimensions, and the required infrastructure, the variances are necessary. Given all of the design constraints and the applicant's effort to comply with all other dimensional standards for lots and infrastructure, staff could support a variance as proposed.

FINDING: Due to the topography of the site, adjacent R-15 zoning, and project design, staff can support this request.

2. That such variance is necessary, because of special circumstances or conditions relating to the size, shape, topography, location, or surroundings of the subject property, to provide it with use, rights, and privileges permitted to other properties in the vicinity and in the zone in which the subject property is located;

DISCUSSION: The requested variances are necessary due to the special circumstances explained in the applicant's narrative. Due to topographic constraints, the exiting property dimensions, the required site access and street circulation standards, the project requires large, wide lots along the eastern side property line. Utilizing a reduced setback standard for 3 of the 28 lots would not be a special privilege or inconsistent with other adjacent properties. This request does not increase the number of lots and does not affect other dimensional standards of the R-10 zone which this project meets, such as lot width, and average lot size. Given all of the design constraints and the applicant's effort to comply with all other dimensional standards for lots and infrastructure, staff could support a variance as proposed.

FINDING: The site topography, location adjacent to surrounding R-15 zoned property, and the proposed infrastructure constitute special circumstances that necessitate the major variance requests for the lot coverage for all proposed lots as well as reduced front and rear yard setbacks for lots 25, 26, and 28.

3. The granting of such variance will not be materially detrimental to the public welfare or injurious to the property or improvements in the vicinity and in the zone in which the subject property is located.

DISCUSSION: The granting of the requested variances will not be materially detrimental to the public welfare. No injury to the property or improvements in the vicinity or in this zone will occur with the approval of the variances. The proposed project seeks to utilize the setbacks typically provided for R-10 zoned projects and seeks to use the same lot coverage standards provided by the Dawson Ridge Subdivision. The up to 50% lot coverage variance is a blanket request for the entire development to allow for all lots to maximize the required building setbacks. Garages will be setback 5 feet from the minimum 20-foot front setback.

FINDING: Staff finds the granting of the requested variances will not be detrimental to the public welfare.

PUBLIC COMMENTS

As of the writing of this staff report, staff received the following written comments:

- Cowlitz Tribe (exhibit 23)
- Dept. Ecology (exhibit 24)
- Garsztka Comment (exhibit 26)
- Lyne Comment (exhibit 29)

CONCLUSION

Based on the above findings and discussion provided in this staff report, staff concludes that McIntosh Subdivision (SUB22-04) should be approved because it does comply with the applicable standards if all the conditions of approval are met.

RECOMMENDATION

Staff recommends APPROVAL of the preliminary plat of McIntosh Subdivision (SUB22-04) subject to the following conditions of approval:

CONDITIONS OF APPROVAL

Standard Conditions:

1. Engineering site improvement plans shall be prepared in accordance with the City of Camas Design Standards Manual (CDSM) and CMC 17.19.040.
2. The engineering site plans shall be prepared by a licensed civil engineer in Washington State and submitted to the City's Community Development (CDEV) Engineering Department for review and approval. Submittal requirements for first review are as follows:
    a. Submit four (4) full size sets and one (1) half size set of plans.
    b. Submit one (1) electronic version of the final (TIR) stormwater report. Do not submit any hard copies of the Final TIR.
    c. Submit a stamped preliminary engineer's estimate.

3. Community Development (CDEV) Engineering shall collect a total 3% plan review and construction inspection (PR&CI) fee for the proposed development.
    a. A preliminary construction estimate shall be submitted to the CDEV Engineering Dept prior to or with submittal of plans for first review.
    b. Payment of the 1% plan review (PR) fee shall be due prior to the start of the plan review process. The PR fees will be provided by the engineering staff.
    c. Payment of the 2% construction inspection (CI) fee shall be due prior to construction plan approval and release of approved plans to the applicant's consultant. The CI fees due will be provided by the engineering staff.
    d. Under no circumstances will the applicant be allowed to begin construction prior to construction plan approval.
4. Installation of public improvements shall be in accordance with CMC 17.21 Procedures for Public Improvements.
5. If applicable, existing wells, septic tank, and septic drain fields shall be decommissioned in accordance with state and county guidelines, per CMC 17.19.020.
6. Any entrance structures or signs proposed or required for this project will be reviewed and approved by the city.
    a. All designs will be in accordance with applicable City codes.
    b. The maintenance of the entrance structure will be the responsibility of the homeowners.
7. The applicant will be responsible for ensuring that private utilities; underground power, telephone, gas, CATV, streetlights, and associated appurtenances are installed.
8. A 6-foot private utility easement (PUE) shall be located outside of the right-of-way on public streets and outside of the tracts on private streets.
9. A draft street lighting plan shall be submitted to development engineering for review prior to final plan submittal to Clark Public Utility.
10. The applicant will be required to purchase all permanent traffic control signs, street name signs, street lighting, traffic control markings, and gate and controller for the improved subdivision.
11. Prior to any land-disturbing activities of an acre or more, the applicant shall have approved final engineering plans and shall submit a copy of the *NPDES General Construction Stormwater Permit* (GCSWP), which is issued by the Washington State Dept. of Ecology, and the *Stormwater Pollution Prevention Plan* (SWPPP), which is required as a component of the NPDES GCSWP permit.
12. Prior to commencing any land-disturbing activities of an acre or more, the applicant shall submit an Erosion Control Bond (ESC) in the amount of 200% of the cost for erosion control measures, per CMC 17.21.030.B and CMC 14.06.200.
13. In the event any item of archaeological interest is uncovered during a permitted ground disturbing action or activity, all ground disturbing activities shall immediately cease, and the applicant shall notify the City and the Department of Archaeology and Historic Preservation (DAHP).
14. Prior to final acceptance, the applicant shall remove all temporary erosion prevention and sediment control measures from the site at completion of all site improvements, which includes stabilization of all disturbed soil, prior to issuance of Final Acceptance from CDEV Engineering.
15. Prior to final acceptance, final as-built construction drawing submittals shall meet the requirements of the Camas Design Standards Manual (CDSM).

a. As-builts are to be submitted as PDFs and in either AutoCad or Carlson formats. The cover sheet for the as-builts is to include the originally approved and signed cover sheet.

16. Prior to final acceptance the 2-year warranty maintenance bond is to be submitted in accordance with CMC 17.21.070.A Upon final acceptance of the development improvements a two-year (2) warranty bond commences.
17. Per CMC 17.21.070.E A letter of final acceptance will be issued once all items listed in 17.21.070.B-C.
18. Final plat submittals shall meet the requirements of the CMC 17.11.060, CMC 17.01.050, and the Camas Design Standards Manual.
19. A homeowner's association (HOA) will be required and a copy of the CC&Rs for the development will need to be submitted to the City for review and approval. Specifically, the applicant will need to make provisions in the CC&Rs for ownership and maintenance of the private storm drainage systems, open spaces, retaining walls, fencing, walls, landscaping, irrigation, private roads, and tracts or easements outside of the City's right-of-way if applicable. Further, all necessary easements and dedications should be noted on the final plat.
20. Accessory dwelling units shall not be precluded from in the CC&R's.
21. The applicant shall take appropriate measures to ensure landscaping success for a minimum of three years after issuance of Certificate of Occupancy. If plantings fail to survive, the property owner shall promptly replace them.
22. Automatic fire sprinklers installed per NFPA 13D or 13R shall be required in all new residential structures.
23. Provisions for parking enforcement on private Tracts/access driveways, acceptable to the Fire Marshal, shall be included in the CC&Rs at the time of final platting.
24. Per CMC 17.21.060.H Permits for one sales office and/or one model home per plat or phase may be issued after the final plat is recorded, and prior to final acceptance. Building permit applications, for any other residential buildings, will not be accepted until after final acceptance is issued.

Special Conditions of Approval:

Planning:

25. The recommendations provided by the Department of Ecology shall be complied with.
26. The recommendations in the Geotechnical Report by Earth Engineering, Inc. dated March 1, 2022, shall be followed.
27. The recommendations in the Arborists Report by Jerry Hofer, dated February 6, 2023, shall be followed.
28. If potential artifacts are discovered during construction, work must immediately cease, and both the State Department of Archaeological and Historic Preservation and the City shall be notified.

Prior to Final Engineering Plan Approval:

Planning:

29. Retaining walls shall comply with CMC 18.17.060.

30. A final landscape, tree, and vegetation plan consistent with the landscaping standards in CMC Chapter 18.13 shall be submitted to the City for review and approval prior to engineering plan approval. The final landscape plan shall specify what larger tree or shrubs can be installed at the north entrance of the subdivision to create an entry statement. Plants utilized will need to be per the approved City's Tree list and per the Camas Design Manual planting specifications and landscape notes.
31. Provide an addendum to the geotechnical report to include analysis of the updated plat layout.

Engineering:

Water

32. The applicant shall submit revised water utility plans with all the future services and meter boxes located in planter strips or behind curb tight sidewalks.
33. The applicant shall submit revised the water utility plans to include the location for installation of the water sampling station onsite.
34. The applicant shall submit revised water utility plans showing the locations of all proposed irrigation services and the size of each irrigation meter.

Storm Drainage:

35. The applicant shall submit a complete set of stormwater plans for review and approval, per MR #1 of the TIR.
36. The applicant shall submit a revised stormwater plan that includes limiting impacts from roof drain and surface water runoff from Lots 1 & 2, and Lots 27 & 28, in addition to the measures proposed for Lots 3 thru 26. Said plan should ensure that adjacent parcels and downstream drainageways and/or adjacent properties are not negatively affected by roof drain downspouts and surface water runoff, per Camas Municipal Code (CMC) 14.02 and 17.19.040.C.
37. The stormwater plans are to be revised with the proposed Filterra treatment structure at future Tract A is located outside of the public right-of-way and on future Tract A. Additionally, private rear or side yard drainage systems are to be placed within an easement across the applicable lots.
38. The stormwater utility plans are to be submitted with design information for proposed detention ponds and rear or side yard roof drain infiltration trenches.
39. The final stormwater TIR is to be submitted with both the City of Camas June 2022 *Stormwater Sewer System Operations & Maintenance Manual* and the maintenance requirements for the treatment vaults.
40. A final stormwater report (TIR) is to be submitted to the City for review and approval.

Erosion Control:

41. The applicant shall submit a complete set of Erosion Sediment Control (ESC) plans, as a part of the site improvement plans for review and approval.

Sanitary Sewer Disposal:

42. The engineering plans shall be revised with the existing sanitary sewer main and sewer manholes, and water main placed in a 20-foot-wide utility Tract that is to be dedicated to the city, along the eastern property line of future Lot 1.
    a. The 20-foot-wide access and utility easement is to consist of a minimum 12-foot-wide hard surfacing to allow for access to the sewer main and manholes, the water main, and future Tract C, Utility Tract.

43. The engineering plans shall be revised to include a minimum 15-foot-wide utility access and maintenance easement from the end of future "NW Garden Court", between future Lots 21 thru 24, and south to future NW 5th Avenue, with right-of-entry granted to the city.

[Existing wells, septic tanks, and septic drain fields]:

44. The applicant shall provide documentation to the city that any existing wells, or septic systems have been properly decommissioned in accordance with State and County guidelines. Additionally, any water rights associated with a decommissioned well shall be transferred to the City.

Roads:

[Public Roads]

45. The engineering plans shall provide for a continuous sidewalk connection from the east end of the sidewalk installed with the adjacent Ilwaco subdivision, along the frontage of the proposed development, and ending at the west end of the curb ramp installed with The Ridge subdivision at NW Fremont Street.

46. The engineering plans shall be submitted with the required 17-foot right-of-way dedication on NW McIntosh Road to allow for the 37-foot full depth half-width street improvement, including a minimum of 23-feet of paved surface, curb & gutter, 8-foot planter strip, and 6-foot detached sidewalk in accordance with CDSM Street Detail ST5 3 Lane Collector/Arterial.

47. The engineering plans shall be submitted with the minimum curb radius of 35-feet on both sides of the intersection at NW McIntosh Road and the future public access road (NW Halifax Street).

48. Prior to final engineering plan approval, the applicant shall work with staff to provide an acceptable transition between the future extension of NW 5th Avenue to tie into the existing NW 5th Avenue to the east.

49. The engineering plans shall be submitted with the unidentified triangular shaped parcel on the east side of future Lot 3 shown as a public tract to allow for future access improvements to the southern parcel (PIN 217455000).

[Private Roads]

50. The applicant shall be required to provide a design for a 'No Parking and Towing' sign for review and approval.
    a. Said sign is to include contact information for a towing company.
    b. The applicant shall be required to install the 'No Parking and Towing' signs prior to final acceptance on future private road (NW Garden Court) and on the private road access to Lots 22 and 23.

51. The applicant is to work with the engineering staff and the Fire Marshal to provide an acceptable dead-end turnaround on this private road. Additionally, the private road access to Lots 22 and 23 is to be placed in a Tract to be owned and maintained by the adjacent homeowners and/or the homeowners association (HOA).

[Street lighting]:

52. All street light locations are to be shown on the engineering and landscape plans.

53. Streetlights on private streets are required to be metered separately and are to be owned and maintained by the HOA / homeowners.

54. Prior to submittal of electrical plans to Clark Public Utilities, the preliminary electrical plans for streetlights, transformers, J-boxes, etc., which are prepared by others, are to be submitted to the city for review and approval.

[Street trees and Landscaping]:

55. The applicant is to show proposed driveway locations for each lot to ensure that street trees are not impacted.

56. The applicant shall submit a final landscape plan consistent with the landscaping standards in CMC Chapter 18.13 to the City for review and approval, in addition to CMC Chapter 17.19.030.F.6, and include plantings from the City's approved plant list.

[Storm Facility Landscaping]:

57. The applicant shall submit revised stormwater facility plans that provide for a minimum 6-foot-high black vinyl coated chain link fence with top rail installed along the property lines of Tracts A and B where the tracts abuts the future Lot 11 and Lots 26 and 27. Additionally, the plans are to provide for a minimum 16-foot-wide double gate at the access road to the facility and a minimum 4-foot-wide man gate.

Traffic Impact Analysis:

58. The engineering plans are to be submitted with the site vision clearance/site distance triangles shown on the final engineering plans at the intersection of future public road (NW Halifax Street) and NW McIntosh Road.

<u>Prior to Land-Disturbing Activities:</u>

59. Prior to any land-disturbing activities the applicant shall submit the required SWPPP, per MR #2 of the preliminary TIR.

60. Prior to any land-disturbing activities, an electronic copy of Ecology's NPDES GCSWP permit, an electronic copy of the SWPPP, and the financial security for erosion and sediment control are to be submitted to the city.

61. Prior to any land-disturbing activities, which includes tree cutting, clearing and grading, an approved set of final engineering plans, including the erosion prevention and sediment control measures is required.

<u>Prior to Final Plat Approval:</u>

Planning:

62. Setbacks per CMC 18.09.040 Table 2 shall be followed.

63. Lots 5 and 6 are not considered irregular lots and shall follow current setbacks per CMC 18.09.040 Table 2.

Engineering:

64. Prior to final plat approval the following note is to be added to the final plat.
    a. Tract _, a private road consists of a blanket utility access and maintenance easement conveyed to the city, over and under the water main located in the private street.

65. The following notes shall be added to the final plat stating that:

a. The stormwater facilities located on Tract A and Tract B are to be owned and maintained by the homeowners/Homeowner Association (HOA) at the end of the 2-year warranty period, which expires 2-years after final acceptance.

b. Right-of-entry is to be granted to the city for inspection purposes of the stormwater facilities located on Tract A and Tract B.

c. Private rear or side yard drainage systems are to be owned and maintained by the HOA or the applicable Lot owners upon which the private stormwater systems/easements are located.

66. The final plat shall be revised with the existing sanitary sewer main, sanitary sewer manholes, and water place in a 20-foot-wide easement along the eastern property line of future Lot 1. The 20-foot-wide easement is to an access and utility easement over and under the existing water and sanitary sewer, with right-of-entry granted to the city.

67. A note is to be added to the plat that a blanket utility access and maintenance easement is provided to the city over and under the sanitary sewer main located in the future private road "NW Garden Court".

68. The final plat shall be revised with a 15-foot-wide utility access and maintenance easement over the new sanitary sewer main and sewer manhole from the end of future "NW Garden Court", between Lots 21 thru 24, and south to future NW 5th Avenue, with right-of-entry granted to the city.

69. The final plat shall provide for the dedication of Tract _, the unidentified triangular shaped parcel, located on the east side of future Lot 3. Tract _ is to be dedicated as a public tract set aside for future access improvements to parcel number 217455000.

70. The private road access to Lots 22 and 23 is to be placed in a Tract to be owned and maintained by the adjacent homeowners and/or the homeowners association (HOA).

Prior to Final Acceptance:

Planning:

71. Irrigation and landscaping should be installed or bonded for prior to final acceptance.

Engineering:

72. The applicant is required to provide a design for a 'No Parking and Towing' sign for review and approval.
    a. Said sign is to include contact information for a towing company, as the city does not provide towing on private roads, nor does the city enforce no parking on private roads.
    b. The applicant shall be required to install the 'No Parking and Towing' signs prior to final acceptance.

73. The applicant shall remove all temporary erosion prevention and sediment control measures from the site at completion of all site improvements, which includes stabilization of all disturbed soil, prior to issuance of Final Acceptance from CDEV Engineering.

74. Final as-built construction drawing submittals shall meet the requirements of the Camas Design Standards Manual (CDSM).
    a. As-builts are to be submitted as PDFs and in either AutoCad or Carlson formats. The cover sheet for the as-builts is to include the originally approved and signed cover sheet.

75. The 2-year warranty maintenance bond is to be submitted in accordance with CMC 17.21.070.A Upon final acceptance of the development improvements a two-year (2) warranty bond commences.
76. The applicant is required to pay the proportionate share amount of $34,000.00 to the City of Vancouver. The applicant is to provide Camas staff with documentation of payment of said proportionate share amount.

Prior to Building Permit Approval:

77. Single-family building permit applications are to include information regarding connection of roof drain downspouts to the rear yard stormwater laterals that discharge to the rear yard infiltration trenches.

Prior to Final Occupancy:

Planning:

78. Street trees adjacent to lots should be installed prior to final occupancy or bonded for per CMC 17.19.030.F.4.

Proposed Plat Notes

1. A homeowner's association (HOA) will be required for this development. Copies of the CC&Rs shall be submitted and on file with the City of Camas.
2. Building permits will not be issued by the Building Department until all subdivision improvements are completed and Final Acceptance has been issued by the City.
3. Maximum building lot coverage for this subdivision is 40%.
4. The lots in this subdivision are subject to traffic impact fees, school impact fees, fire impact fees and park/open space impact fees. Each new dwelling will be subject to the payment of appropriate impact fees at the time of building permit issuance.
5. Wetlands, critical areas, and associated buffers shall be maintained in their natural state as described in the Final Wetland Mitigation Plan (Note: add date after approval) that is recorded with this plat by the HOA. Any modifications to critical areas and buffers must be approved in writing by the city after submittal of a revised critical area report.
6. Tree topping is not permitted within this development, nor removal of more than 20 percent of a tree's canopy. Trees that are determined to be hazardous by a licensed arborist may be removed after approval by the City. Required street trees shall be promptly replaced with an approved species.
7. In the event any item of archaeological interest is uncovered during the course of a permitted ground disturbing action or activity, all ground disturbing activities shall immediately cease, and the applicant shall notify the City and the Department of Archaeology and Historic Preservation (DAHP).
8. Tract _, a private road consists of a utility access and maintenance easement conveyed to the city, over and under the water main located in the private street.

9. Tract A and Tract B stormwater facilities are to be owned and maintained by the homeowners / Homeowner Association (HOA) at the end of the 2-year warranty period, which expires 2-years after final acceptance.
10. Right-of-entry is to be granted to the city for inspection purposes of the stormwater facilities located on Tract A and Tract B.
11. Private rear and/or side yard stormwater drainage systems are to be placed in private stormwater easements and are owned and maintained by the HOA or the applicable Lot owners upon which the private stormwater systems easements are located.
12. The 20-foot-wide easement along the eastern property line of future Lot 1 is an access and utility easement over and under the existing water and sanitary sewer, with right-of-entry granted to the city.
13. Tract _, a private road "NW Garden Court" is covered by a blanket access and maintenance easement over and under the sanitary sewer main.
14. The 15-foot-wide access and utility easement, from the end of future "NW Garden Court", between Lots 21 thru 24, and south to NW 5th Avenue is provided over and under the sanitary sewer main and sanitary manhole, with a right-of-entry granted to the city.
15. Tract _ contains a 20-foot-wide access and maintenance easement over and under the existing water, sanitary sewer main, and sanitary sewer manholes, with right-of entry granted to the city.
16. Tract _ is a public tract set aside for future access improvements to Parcel Number 217455000. Ownership and maintenance of said tract will be the responsibility of the city.
17. Tract _ is a private road access to Lots 23 and 24 and is to be owned and maintained by the adjacent homeowners and/or the homeowners association (HOA).

City of Camas WASHINGTON

Community Development Department | Planning
616 NE Fourth Avenue | Camas, WA 98607
(360) 817-1568
communitydevelopment@cityofcamas.us

General Application Form McIntosh Subdivision **Case Number:** SUB22-04

Applicant Information

Applicant/Contact:: Scott Taylor- SGA Engineering *Phone:* (360) 993-0911

Address: 2005 Braodway Street *Street Address* staylor@sgaengineering.com *E-mail Address*

Vancouver *City* WA *State* 98663 *ZIP Code*

Property Information

Property Address: 3210 NW McIntosh Rd. *Street Address* 127449000 *County Assessor # / Parcel #*

Camas *City* WA *State* 98607 *ZIP Code*

Zoning District Residential-10,000 (R-10) Site Size **7.113 Net Acres/ 309,862 SF**

Description of Project

Brief description:
28 lot, single family residential subdivision.

Are you requesting a consolidated review per CMC 18.55.020(B)? YES ☒ NO ☐

Permits Requested: ☐ Type I ☐ Type II ☒ Type III ☐ Type IV, BOA, Other

Property Owner or Contract Purchaser

Owner's Name: Madison Sam *Last* *First* *Phone:* 1-503-318-2578

3511 NW McMaster Dr. *Street Address* N/A *Apartment/Unit #*

E mail Address: scamalama72@gmail.com Camas *City* WA *State* 98606 *Zip*

Signature

I authorize the applicant to make this application. Further, I grant permission for city staff to conduct site inspections of the property.

Signature: Date: 6-15-22

Note: If multiple property owners are party to the application, an additional application form must be signed by each owner. If it is impractical to obtain a property owner signature, then a letter of authorization from the owner is required.

Date Submitted: 6/24/22 Pre-Application Date:

Yvette Sennewald
Staff: Related Cases #

☐ Electronic Copy Submitted

$17,496 6/24/22
Receipt# 694135

$50 6/28/22
Receipt#694278
Validation of Fees

Revised: 01/22/2019

Application Checklist and Fees [updated on January 1, 2022]

◊ Annexation	$863 - 10% petition; $3,669 - 60% petition	001-00-345-890-00		$
◊ Appeal Fee		001-00-345-810-00	$399.00	$
◊ Archaeological Review		001-00-345-810-00	$137.00	$ 137.00 ARCH22-10
◊ Binding Site Plan	$1,879 + $24 per unit	001-00-345-810-00		$
◊ Boundary Line Adjustment		001-00-345-810-00	$103.00	$
◊ Comprehensive Plan Amendment		001-00-345-810-00	$5,826.00	$
◊ Conditional Use Permit				
Residential	$3,417 + $105 per unit	001-00-345-810-00		$
Non-Residential		001-00-345-810-00	$4,328.00	$
◊ Continuance of Public Hearing		001-00-345-810-00	$524.00	$
◊ Critical or Sensitive Areas (fee per type)		001-00-345-810-00	$775.00	$ 775.00 CA 22-11
(wetlands, steep slopes or potentially unstable soils, streams and watercourses, vegetation removal, wildlife habitat)				
◊ Design Review				
Minor		001-00-345-810-00	$433.00	$
Committee		001-00-345-810-00	$2,375.00	$
◊ Development Agreement	$877 first hearing; $530 ea. add'l hearing/continuance	001-00-345-810-00		$
◊ Engineering Department Review - *Fees Collected at Time of Engineering Plan Approval*				
Construction Plan Review & Inspection	*(3% of approved estimated construction costs)*			
Modification to Approved Construction Plan Review	*(Fee shown for information only)*		$420.00	
Single Family Residence (SFR) - Stormwater Plan Review	*(Fee shown for information only)*		$208.00	
Gates/Barrier on Private Street Plan Review	*(Fee shown for information only)*		$1,041.00	
◊ Fire Department Review				
Short Plat or other Development Construction Plan Review & Insp.		115-09-345-830-10	$284.00	$
Subdivision or PRD Construction Plan Review & Inspection		115-09-345-830-10	$354.00	$ 354.00
Commercial Construction Plan Review & Inspection		115-09-345-830-10	$424.00	$
◊ Home Occupation				
Minor - Notification (No fee)			$0.00	
Major		001-00-321-900-00	$69.00	$
◊ LI/BP Development	$4,328 + $41.00 per 1000 sf of GFA	001-00-345-810-00		$
◊ Minor Modifications to approved development		001-00-345-810-00	$346.00	$
◊ Planned Residential Development	$35 per unit + subdivision fees	001-00-345-810-00		$
◊ Plat, Preliminary				
Short Plat	4 lots or less: $1,936 per lot	001-00-345-810-00		$ SUB 22-04
Short Plat	5 lots or more: $7,175 + $250 per lot	001-00-345-810-00		$ 14,175. = 14,125
Subdivision	$7,175 + $250 per lot	001-00-345-810-00		$
◊ Plat, Final:	250 x 28 = 7,000			
Short Plat		001-00-345-810-00	$200.00	$
Subdivision		001-00-345-810-00	$2,375.00	$
◊ Plat Modification/Alteration		001-00-345-810-00	$1,196.00	$
◊ Pre-Application (Type III or IV Permits)				
No fee for Type I or II				
General		001-00-345-810-00	$354.00	$
Subdivision (Type III or IV)		001-00-345-810-00	$911.00	$
◊ SEPA		001-00-345-890-00	$810.00	$ 810.00 SEPA-22-15
◊ Shoreline Permit		001-00-345-890-00	$1,196.00	$
◊ Sign Permit				
General Sign Permit	(Exempt if building permit is required)	001.00.322.400.00	$41.00	$
Master Sign Permit		001.00.322.400.00	$126.00	$
◊ Site Plan Review				
Residential	$1,151 + $34 per unit	001-00-345-810-00		$
Non-Residential	$2,876 + $68 per 1000 sf of GFA	001-00-345-810-00		$
Mixed Residential/Non Residential	(see below)	001-00-345-810-00		$
	$4,055 + $34 per res unit + $68 per 1000 sf of GFA			
◊ Temporary Use Permit		001-00-321-990-00	$80.00	$
◊ Variance (Minor)		001-00-345-810-00	$695.00	$
◊ Variance (Major)		001-00-345-810-00	$1,295.00	$ 1,295.00 ~~VAR22-02~~ MAJVAR22-05
◊ Zone Change (single tract)		001-00-345-810-00	$3,345.00	$

Adopted by RES 1023 AUG 2005; Revised by RES 1113 SEPT 2007; Revised by RES 1163 OCT 2009; Revised by RES 1204 NOV 2010; Revised by RES 15-001 JAN 2015; Revised by RES 15-007 MAY 2015; Revised by RES 15-018 DEC 2015; Revised by RES 16-019 NOV 2016; Revised by RES 17-015 NOV 2017; Revised by RES 18-003 APRIL 2018; Revised by RES 18-013 NOV 2018; Revised by RES 19-018 DEC 2019 Revised by RES20-014 DEC 2020

Fees reviewed & approved by Planner: MS 6/24/22
Initial *Date*

For office use only

Total Fees Due: $ ~~17,596~~ 17,496.00 ✓ pd. 6/24/22

C:\Users\abaldwin\Desktop\DAILY PERMITS\Planning Fee Schedule 2022

City of Camas
616 NE 4th Avenue
Camas, WA 98607
360-834-2462

Finance Office Hours:
Monday-Friday 9:00 - 5:00 p.m.

Date/Time 06/28/2022 08:30 AM
Receipt No. 00694278
Receipt Date 06/28/2022
CR plan 50.00
plat
plat fees - plan
ning 50.00

Cash: 0.00
Other: 50.00
Check: 50.00

Total: 50.00
Change: 0.00

Check No: #2118 SUB22-04

SGA ENGINEERING PLLC
Customer #: 000000
2005 BROADWAY ST

VANCOUVER WA 98663-
Cashier: kmurphy
Station: IS02594

cation Checklist and Fees [updated on January 1, 2022]

63 - 10% petition; $3,669 - 60% petition	001-00-345-890-00		$
	001-00-345-810-00	$399.00	$
	001-00-345-810-00	$137.00	$ 137.00 ARCH22-10
879 + $24 per unit	001-00-345-810-00		$
	001-00-345-810-00	$103.00	$
	001-00-345-810-00	$5,826.00	$
417 + $105 per unit	001-00-345-810-00		$
	001-00-345-810-00	$4,328.00	$
	001-00-345-810-00	$524.00	$
/pe)	001-00-345-810-00	$775.00	$ 775.00 CA 22-11
y unstable soils, streams and watercourses, vegetation removal, wildlife habitat)			
	001-00-345-810-00	$433.00	$
	001-00-345-810-00	$2,375.00	$
first hearing: $530 ea. add'l hearing/continuance	001-00-345-810-00		$
ees Collected at Time of Engineering Plan Approval			
pection	*(3% of approved estimated construction costs)*		
struction Plan Review	*(Fee shown for information only)*	$420.00	
Stormwater Plan Review	*(Fee shown for information only)*	$208.00	
Plan Review	*(Fee shown for information only)*	$1,041.00	
t Construction Plan Review & Insp.	115-09-345-830-10	$284.00	$
Plan Review & Inspection	115-09-345-830-10	$354.00	$ 354.00
Review & Inspection	115-09-345-830-10	$424.00	$
		$0.00	
	001-00-321-900-00	$69.00	$
28 + $41.00 per 1000 sf of GFA	001-00-345-810-00		$
velopment	001-00-345-810-00	$346.00	$
$35 per unit + subdivision fees	001-00-345-810-00		$
s or less: $1,936 per lot	001-00-345-810-00		$
s or more: $7,1755 + $250 per lot	001-00-345-810-00		$ 14,175 = 14,125 SUB22-04
75 + $250 per lot	001-00-345-810-00		$
250 x 28 = 7,000			s/b 14,175
	001-00-345-810-00	$200.00	$
	001-00-345-810-00	$2,375.00	$
	001-00-345-810-00	$1,196.00	$ Short $50
	001-00-345-810-00	$354.00	$
	001-00-345-810-00	$911.00	$
	001-00-345-890-00	$810.00	$ 810.00 SEPA-22-15
	001-00-345-890-00	$1,196.00	$
npt if building permit is required)	001.00.322.400.00	$41.00	$
	001.00.322.400.00	$126.00	$
1 + $34 per unit	001-00-345-810-00		$
6 + $68 per 1000 sf of GFA	001-00-345-810-00		$
al (see below)	001-00-345-810-00		$
5 + $34 per res unit + $68 per 1000 sf of GFA			
	001-00-321-990-00	$80.00	$
	001-00-345-810-00	$695.00	$
	001-00-345-810-00	$1,295.00	$ 1,295.00 VAR22-02
	001-00-345-810-00	$3,345.00	$

113 SEPT 2007; Revised by RES 1163 OCT 2009; Revised by RES 1204 NOV 2010;
5-007 MAY 2015; Revised by RES 15-018 DEC 2015; Revised by RES 16-019 NOV 2016;
18-003 APRIL 2018; Revised by RES 18-013 NOV 2018; Revised by RES 19-018 DEC 2019

eviewed & approved by Planner: MS 6/24/22
Initial *Date*

Total Fees Due: $ 17,496 = $17,496 ✓ pd. 6/24/22

SGA ENGINEERING & DESIGN

Phone (360)993-0911
Fax (360)993-0912

2005 Broadway
Vancouver, WA 98663

Macintosh Subdivision

Preliminary Narrative

Project summary - uses proposed for the site

This site contains one parent parcel: #127449000. The site is approximately 10.40 acres or 453,074 square feet in size. The site is currently occupied by one shop building with the address 3210 NW McIntosh Road, Camas 98607. The project proposes to develop 28 single-family lots and necessary infrastructure within the R-10 zone. The R-10 low density residential zone allows for a minimum average lot size of 9,500-10,500 square feet and a maximum density of 4.3 dwellings per acre. Lots can be no smaller than 8,000 square feet. The average lot size in the development will be approximately 10,340 square feet. The minimum lot width allowed is 80 feet and the minimum depth allowed is 100'.

Access will come from the existing NW McIntosh Road at the north edge of the property. Right-of-way widths and any necessary dedications have been confirmed by boundary survey following the pre-app. Street improvements would be completed on NW McIntosh Road as necessary. All new lots will take individual driveway access onto the proposed public and private internal roadways. One shared driveway is proposed with the project. The shared driveway tract will serve lots 22-23 near the southeast corner of the project. Two existing homes (located just south of the site) will be served by new driveways off of NW 5th Avenue.

Homes on the lots are expected to have occupancy in 2023-2024. The project site work would take place summer/fall of 2023.

Hours of operation

The development will function 24 hours a day. Site construction will be short term and will likely take place Monday-Saturday 7am to 7pm.

Development Standards (18.09.040)

Standard	Requirement	Proposed
Minimum Lot Size	8,000 sf	8,141 sf
Maximum Lot Size	14,000 sf	14,000 sf +
Average Lot Size	9,500-10,500 sf	10,319 sf
Maximum Lot Coverage	35%	50% with major variance
Minimum Lot Width	80'	80'
Minimum Lot Depth	100'	100'
Maximum Building Height	35 feet	< 35 feet
Minimum Landscaped Area	10%	>10% of the site

Lot Area	Up to 4,999 sq. ft.	5,000 to 11,999 sq. ft.	12,000 to 14,999 sq. ft.	15,000 or more sq. ft.
Minimum front yard (feet) [2]	20	20	25	30
Minimum side yard (feet)	5	5	10	15
Minimum side yard flanking a street and corner lot rear yard (feet)	10	10	15	15
Minimum rear yard (feet)	20	25	30	35
Minimum lot frontage on a cul-de-sac or curve (feet)	25	30	35	40

Double Frontage Lots (CMC 17.19.030.D.6)
There are no double frontage lots in this development. Landscape tracts have been utilized for what would have been a double frontage lot to meet city code.

Archaeological Resource Protection (CMC 16.31.070.A)
An archaeological predetermination is required. Archaeological Services of Clark County has performed an Archaeological Predetermination Report and it is being submitted with this application. No further archaeological work is necessary at this time. The report was sent to DAHP and the required Tribes.

SEPA (CMC 16.07.020.A.1))
A SEPA checklist is required and is being submitted with this application.

Critical Areas, Wetlands and Geological Hazard Areas (CMC 16.51.130, 16.53.030, CMC 16.59.060 and 16.59.070)
There are no wetlands or riparian habitat on this property. There are no Oregon White Oaks on this site.

The south end of the property has slopes over 15% which trigger the Geological Hazard code.

A geotechnical report was completed by Earth Engineering, Inc. and is included with this application. Earth Engineering, Inc. reviewed the existing conditions of the site and the proposed development. They analyzed the slopes for stability with the proposed road, lots and stormwater infrastructure. A preliminary grading plan has been provided with the preliminary application packet which demonstrates compliance with the recommendations from Earth Engineering, Inc. The southern portion of the project, Tract 'C', has been retained and will remain largely undisturbed. The slopes are stable as determined by the Geotech and no slope setbacks are necessary. The existing sanitary sewer line along the south edge of Tract 'C' will remain along with the orchard of Hazelnut Trees.

Traffic
A traffic study was prepared by Kelly Engineering and is included with this application. Daily traffic to and from the site will be approximately 264 vehicles per day. 20 AM peak hour trips (in-5, out-15) and 26 PM peak hour trips (in-17, out-9).

Transportation (CMC 17.19.040)

NW McIntosh Road.

NW McIntosh Road is designated as a 2 lane collector/arterial which requires a minimum 60 foot full width right of way and 36 foot full paved width. NW McIntosh will have a 59 foot full width right of way due to the 22 foot half width right of way dedicated across the street to the north. The road will be 36 feet wide and have the detached sidewalk as required per drawing ST4 and ST5. See the preliminary street, utility and landscape plans for all the street improvement details.

On site road ways will be constructed to the City of Camas Local Access Standards. NW 5th Avenue will be built to meet the Local Access roadways standards with 52 feet of right of way and 28 feet of pavement along with 5 foot detached sidewalks. See the plans for additional information.

Private Roads

Lots 19-28 will be in a gated community with private road. Appropriate provisions, such as Knox Boxes, will be implemented to ensure adequate emergency access to the site. The private road is designed to meet city of Camas standards. A 28 foot wide paved section is located in a 50 foot wide private road tract with detached 5 foot sidewalks. The private road is right at 300 feet long and provides a 40 foot radius for turnaround in a 51 foot radius tract. A public turnaround easement and paved cul-de-sac has been provided outside of the gate. A permit for the gate will be obtained from the fire department.

Sight Distance

Sight distance will be demonstrated on the engineering plans and final plat for the on-site roads. All sight distance on-site can be met for traffic entering NW McIntosh Road. A 350 foot sight distance was confirmed by the Traffic Engineer at the future entrance/intersection along NW McIntosh Road.

Street Lighting

Street lights are proposed. Exact locations will be determined during civil plan review per the direction of Camas Engineering staff.

Fire Protection (CMC 17.19.040 & IFC)

Fire Apparatus Access

The proposed access has been designed to provide adequate room to accommodate the required fire apparatus and emergency vehicles. Access has been provided to within 150 feet of any point of the exterior wall of the first story of the exterior of the future buildings.

Fire Hydrants

A fire hydrants exists on NW McIntosh Road. east and west of the site. New fire hydrants are proposed with this project and are shown on the utility plan.

Fire Sprinklers

Fire sprinklers will be installed in the future homes in accordance with NFPA 13D or 13R.

Water and Sewer Service

There is an existing 8 inch ductile iron water main in NW McIntosh Road. An 8" water main will be extended through the site to proposed east end of NW 5th Avenue. Separate water services will connect to the proposed 8" water main. The water meters will be located in the planter strip for water services.

There is an existing 8" gravity sewer located at the southeast corner of the site. The project will use a gravity 8" sewer main to serve the site. A gravity lateral is proposed to serve each of the proposed lots.

Erosion Prevention and Sediment Control (CMC 14.06)

Erosion control measures are addressed in the civil plans. Please refer to the civil submittal for additional information. Silt fencing will be placed on the majority of this project's perimeter.

Stormwater Control (CMC 17.19.030 (F6) & CMC 17.19.040 (C3a))

The proposed stormwater plan includes filterra basins or other approved B.M.P.s for treatment and detention/infiltration which will release at or below pre-developed rates. Please refer to the preliminary stormwater report and the preliminary utility plan for additional information and design details. A final stormwater plan and report will be prepared for the project following the preliminary subdivision approval. Maintenance of the stormwater facilities will be the responsibility of the Homeowners Association per CMC 17.19.040 (C3).

Street Tree Planting and Landscaping (CMC 17.19.030 (F))

Street tree planting is required. Street trees will be provided with the project. See the preliminary landscape plan for additional information.

Signs (CMC 18.15)

No signs are proposed at this time.

Tree Retention (CMC 18.31.080)

Ten Hazelnut trees south of lots 1 and 2 in Tract 'C' will be retained. Retained trees are shown on the preliminary landscape plan and should be protected during construction. Any trees deemed unhealthy or deemed a safety hazard will be removed. Based on the tree survey by MGS and SGA the proposed trees to be retained are healthy and do not pose any safety concerns. An Arborist Report was also completed for this project and submitted to the City. This project meets the required 20 tree units per acre. Based on 7.48 acres of net developable area there are 149.6 tree units required. The project proposes to retain 10 trees on-site worth 10 tree units. The project is also planting 140 trees. A total of 150 tree units are provided on the site.

CMC17.11.030 D. – Preliminary Subdivision Plat Approval

Criteria for Preliminary Plat Approval. The hearings examiner decision on an application for preliminary plat approval shall be based on the following criteria: (Camas code in *italics* and applicant's response in **bold** text.)

1. The proposed subdivision is in conformance with the Camas comprehensive plan, parks and open space comprehensive plan, neighborhood traffic management plan, and any other city adopted plans;

The proposed subdivision is in conformance with all the city adopted plans. Provisions have been made for open space, trails, traffic management and more. This project will satisfy a number of comprehensive plan goals for Camas and its residence.

2. Provisions have been made for water, storm drainage, erosion control and sanitary sewage disposal for the subdivision that are consistent with current standards and plans as adopted in the Camas Design Standard Manual;

Provisions have been made for all the required utilities in this project. The preliminary utility plans and project narrative demonstrate this compliance. Design standards and final engineering plan review will ensure all construction and development codes are met. Public water, sewer and stormwater will serve this project.

3. Provisions have been made for road, utilities, street lighting, street trees and other improvements that are consistent with the six-year street plan, the Camas Design Standard Manual and other state adopted standards and plans;

Provisions have been made for all the required road/street and utilities in this project. The six-year street plan, the Camas design standards and the parks and open space comprehensive plans have guided the design of this project.

4. Provisions have been made for dedications, easements and reservations;

The required dedications, easements and reservations have been provided on the preliminary plans and discussed in this narrative. Dedications will be provided for the public roads and other public infrastructure as conditioned by Camas staff. Tracts and reservations have been proposed on-site to cover the stormwater facilities and other

private infrastructure.

5. The design, shape and orientation of the proposed lots are appropriate to the proposed use;

The preliminary plat has been carefully crafted using a number of professional studies, site specific constraints and site specific opportunities. The design, shape and orientation of the lots follow the general topography of this site. Territorial view lots will be provided throughout this project.

6. The subdivision complies with the relevant requirements of the Camas land development and zoning codes, and all other relevant local regulations;

This project has taken into account all the relevant land development and zoning codes. The code sections have been broken out into separate sections and discussed above in this narrative. It is the goal of the applicant to meet or exceed all relevant local regulations and city regulations.

7. Appropriate provisions are made to address all impacts identified by the transportation impact study;

A transportation impact study was not required for this project. Only 28 new homes are proposed with the project. NW McIntoch Road will provide adequate transportation for this project and any future adjacent development.

8. Appropriate provisions for maintenance of commonly owned private facilities have been made;

Tracts and reservations have been proposed on-site to cover the stormwater facility and other private infrastructure. Stormwater and other possible maintenance agreements or covenants will be drafted, reviewed, approved and recorded for this project. These maintenance agreements typically begin during the final engineering process and are completed/recorded prior to final plat or in conjunction with the final plat. The conditions of approval for this project will spell out the specifics required on the different maintenance agreements.

9. Appropriate provisions, in accordance with RCW 58.17.110, are made for:
a. The public health, safety, and general welfare and for such open spaces, drainage ways, streets, or roads, alleys or other public ways, transit stops, potable water supplies, sanitary wastes, parks and recreation, playgrounds, schools and school grounds and all other relevant facts, including sidewalks and other planning features that assure safe conditions at schools bus shelter/stops, and for students who walk to and from school, and
b. The public use and interest will be served by the platting of such subdivision and dedication;

The public use and interest will be served by the platting of this subdivision. Public roads, sidewalks and utilities will be provided. A connection from the existing sidewalks and subdivision east and west of the project will provide adequate and safe walking for students to bus stops. Additional information has been provided above in this narrative discussing all the items mentioned in 9.a.

10. The application and plans shall be consistent with the applicable regulations of the adopted comprehensive plans, shoreline master plan, state and local environmental acts and ordinances in accordance with RCW 36.70B.030.

The application and plans are consistent with all the applicable RCW, state and local codes. The state and local environmental acts and ordinances have been adhered to and demonstrated in the plans, narratives and reports. This project does not trigger the shoreline master plan or other shoreline permits or reviews. This project will satisfy a number of comprehensive plan goals for Camas and its residence. This project is consistent with the applicable regulations of the comprehensive plan(s).

18.45.040 - Major variance.

A. The board of adjustment (or hearing examiner, or planning commission, in accordance with Section 18.45.020(B)) shall consider all requests for major variances from the zoning code.

The Project proposes a major variance to increase the lot coverage from 35% up to 50% for all of the lots. The project also proposes reduced front and rear setbacks on lots 25 & 26. Lot 28 is only proposing a reduced rear yard setback. The 5 foot setback reductions are necessary due to city requirements forcing the lot size to be larger than 11,999 sf to match the 14,000 sf + lots to the east. This larger lot requirement has created numerous challenges for the project and a reduced front and rear yard setback is requested for these lots mentioned above along the north and east side of the project for this reason.

B. Approval of a major variance must demonstrate with findings of compliance with all of the following criteria:

1. The variance shall not constitute a grant of special privilege inconsistent with the limitation upon uses of other properties in the vicinity and zone in which the subject property is located;

The Project is asking to use the same provisions provided to adjacent developments. The parcel is zone R-10 and would like to use the setbacks for lots sizes 5,000 to 11,999 sf. Because of beveling requirements with the R-15 zone to the east new lots proposed in this development must be 14,000 sf to match the lot sizes to the east. This required max lot size for the R-10 zone forces the project to scramble to meet minimum density and maximum average lot area of 10,500 sf. We have achieved it with numerous 8,000+ sf lots and 28 lots. Due to the topographic constraints, the existing lot dimensions, the required lot access and street circulation standards we are forced to have large, wide lots along the east side of the project. Using the 20 foot front setbacks and 25 foot rear yard setbacks is not a special privilege or inconsistent with the other adjacent properties. The 5 foot requested reduction in front and rear yard setbacks will simply allow the shallower lots to use the same setbacks as those lots less than 11,999 sf. Garages must still be set back 5 feet from the front of the building. The 50% lot coverage was granted for Dawsons Ridge Subdivision just to the west in April of 2019. That project was zoned R-15 with even larger lots. This request does not increase the number of lots in the development. This request does not affect other dimensional standards of the R-10 zone which this project meets. Not all of the lots will increase their coverage to 50%. The majority of the lots in this development will only be able to achieve a 42-45% lot coverage based upon the setbacks. Three example plot plans from Dawson's Ridge have been provided for staff and the hearings examiner which range in lot coverage from 40-47% lot coverage.

2. That such variance is necessary, because of special circumstances or conditions relating to the size, shape, topography, location, or surroundings of the subject property, to provide it with use, rights, and privileges permitted to other properties in the vicinity and in the zone in which the subject property is located;

The Project variances requested are necessary due to special circumstances explained in this narrative. Due to the topographic constraints, the existing property dimensions, the required site access and street circulation standards we are forced to have large, wide lots along the east side of the project. Using the 20 foot front setbacks and 25 foot rear yard setbacks is not a special privilege or inconsistent with the other adjacent properties. The 50% lot coverage was granted for Dawsons Ridge Subdivision just to the west in April of 2019. That project was zoned R-15 with even larger lots. This request does not increase the number of lots in the development. This request does not affect other dimensional standards of the R-10 zone which this project meets like lot depth, lot width and average max lot area of 10,500 sf.

3. The granting of such variance will not be materially detrimental to the public welfare or injurious to the property or improvements in the vicinity and in the zone in which the subject property is located.

Granting these variances will not be materially detrimental to the public welfare. No injury to

the property or improvements in the vicinity or in this zone will occur with the approval of this variance. This project only seeks to use the setbacks typically provided for R-10 projects and seeks to use the same lot coverage standards provided to Dawson Ridge Subdivision. The existing homes to the north, south and west use the same setbacks we are proposing. An up to 50% lot coverage is necessary to meet the home demands of new buyers in this market. Adequate open space and landscaping for this project have offset any increase seen in the 50% lot coverage request. Most homes if they maximize their building envelope will be around 45% lot coverage or less. The up to 50% request is a blanket request for the entire development to allow for all lots to maximize their proposed building setbacks. Garages will still be setback 5 feet from the minimum 20 foot front setback.

(Ord. No. 2691, § I(Exh. A), 1-21-2014)

Thank you for your time and assistance with this application review. Please contact Scott Taylor at SGA Engineering for any additional information or with any questions. 360-993-0911 staylor@sgaengineering.com

PRE-APPLICATION MEETING NOTES
McIntosh Subdivision
PA21-51

Meeting scheduled via Zoom Thursday, November 4, 2021, at 1:30 p.m.
Notes issued November 15, 2021.

Applicant:	SGA Engineering Attn: Scott Taylor
City of Camas:	Madeline Sutherland, Planner Anita Ashton, Engineering Ahmed Yanks, Engineering Brian Smith, Building Official Ron Schumacher, Fire Marshal
Location:	3210 NW McIntosh Rd. Parcel No. 127449000
Zoning:	Single-Family Residential (R-10)
Description:	The applicant is proposing a 28 lot subdivision.

NOTICE: Notwithstanding any representation by City staff at a pre-application conference, staff is not authorized to waive any requirement of the City Code. Any omission or failure by staff to recite to an applicant all relevant applicable code requirements shall not constitute a waiver by the City of any standard or requirement. [CMC 18.55.060 (C)] This pre-application conference shall be valid for a period of 180 days from the date it is held. If no application is filed within 180 days of the conference or meeting, the applicant must schedule and attend another conference before the City will accept a permit application. [CMC 18.55.060 (D)] Any changes to the code or other applicable laws, which take effect between the pre-application conference and submittal of an application, shall be applicable. [CMC 18.55.060 (D)]. A link to the Camas Municipal Code (CMC) can be found on the City of Camas website, http://www.cityofcamas.us/ on the main page under “Business and Development”.

PLANNING DIVISION **Madeline Sutherland | (360) 817-1568 |msutherland@cityofcamas.us**

An application for a Subdivision Preliminary Plat review is considered a Type III permit. Applicable codes for development include Title 16 Environment, Title 17 Land Development and Title 18 Zoning of the Camas Municipal Code (CMC) which can be found on the city website. Please note it remains the **applicant’s responsibility** to review the CMC and address all applicable provisions. The following pre-application notes are based on application materials and site plan submitted to the City on September 30, 2021:

Application Requirements
Your proposal will need to comply with the general application requirements per **CMC Section 18.55.110** in addition to the specific application requirements outlined in the **CMC 17.11 - Subdivisions**. The following is an excerpt from the requirements (see code section for full text)

Fees will be based on the adopted fees at the time of land use application submittal. The current 2021 fees include the following:	
1. Preliminary Plat	$7,175 + $250 per lot
2. Critical Area Review	$775
3. SEPA Review	$810
4. Archaeological Review	$137
5. Fire Department Review	$354

- A copy of a completed city application form(s) and required fee(s),
- A completed and signed SEPA checklist;
- Complete applications for other required land use proposals applicable to the proposal;
- A vicinity map showing location of the site;
- A survey of existing significant trees as required under CMC Section 18.13.045;
- All existing conditions shall be delineated on the site plan per CMC Section 17.11.030.B.6(a-p);
- A preliminary grading plan;
- Preliminary stormwater plan and report;
- A geotechnical report consistent with CMC Chapter 16.59 as development is proposed on slopes greater than ten percent,
- A copy of the Clark County assessor's map which show the location of each property within 300 feet of the subdivision;
- One set of mailing labels for all property owners as provided in CMC Section 18.55.110;
- A traffic study,
- A narrative addressing ownership and maintenance of open spaces, stormwater facilities, public trails and critical areas, and the applicable approval criteria (CMC Section 17.11.030.D) and standards of the Camas Municipal Code. It should also address any proposed building conditions or restrictions.
- A development sign must be posted on site per CMC Section 18.55.110.H (1-5).
- Necessary drawings- three sets and an electronic copy (send as a PDF by email or on a disc). All documents and reports must be submitted as separate pdf copies.

Preliminary Plat
The following comments are based on the site plan materials submitted with this Pre-Application:

1. The preliminary plat drawings must meet the density and dimensional standards for lots in a Single-Family Residential (R-10) zone, and infrastructure improvements (i.e. roads, easements, etc.).
2. Setbacks are based on lotsize per CMC 18.09.040 Table 2. Lots 12,000sf to 14,999sf are: 25' front, 10' side, 30' rear.
3. Per CMC 18.09.080.B, the lots adjacent to east and south are zoned R-15 properties and must be the maximum lot size allowed for the proposed development, which is 14,000 square feet.

4. Lots 19 and 20 are considered double frontage lot and must comply with CMC 17.19.030.D.6.
5. Density calculation is based on development/net acreage which is defined as the total land use development exclusive of open space and critical areas. Developed/net acreage includes infrastructure, storm drainage facilities and lots and access easements.
6. Building setback requirements are found at CMC 18.09.040-Table 2, which includes the requirement for setbacks to be drawn on the plat. Per Note 2, *"Garage setback is five feet behind the front of the dwelling."*
7. Building envelopes (setbacks) shall be shown on the preliminary and final plats. Per CMC Section 17.19.030.D.3.a, a 40ft. by 40ft. square dwelling should be able to fit within the building envelope.
8. Each dwelling unit within a new development shall be landscaped with at least one tree per CMC 17.19.030.F.
9. Per CMC 17.19.040.B.10.a, a Circulation plan is required at application that includes the subject site and properties within six hundred feet showing topography, critical areas and existing and proposed streets, trails, etc. Streets shall extend to and connect with neighboring properties per CMC 17.19.040.B.6.a.
10. A direct pedestrian or bicycle connection shall be provided to the neatest street or pedestrian use from a cul-de-sac or dead-end street per CMC 17.19.040.B.10.b.ii.
11. The storm drainage facility shall include a 10-foot L2 landscape buffer per CMC 17.19.030.F.6.
12. The location and height of any retaining walls shall be shown on the grading plan. Retaining wall height requirements are found in CMC 18.17.060.
13. The square footage of the easement across lot 13 must be included in the total square footage of the lot.
14. Lots 22 and 23 must take access off the private street, not the proposed tract. The lots must also meet the minimum lot depth and width.
15. The maximum lot coverage in the Single-Family Residential R-10 zone is 35%.

Critical Area Review

The initial environmental studies that must be submitted in support of the SEPA checklist include the following (and location in CMC):

1. General Critical Area report CMC 16.51.140
   If wetlands or streams are found, then a critical area report specific to those areas should be included.
2. Geotechnical report per CMC 16.59.060. The report must analyze the geological hazards regarding proposed tree removal as well as the single-family residential construction. The geotechnical report submitted for the pre-application meeting does not include this parcel. The report includes the abutting parcel.

Landscaping Regulations and Tree Retention

Landscaping standards shall apply to all new land divisions per CMC 18.13.020.B.1. A Landscape, Tree and Vegetation plan must be submitted pursuant to CMC 18.13.040.A. A Tree Survey is required per CMC 18.13.040.B and must be prepared by a certified arborist or professional forester pursuant to the

requirements outlined in CMC 18.13.045. A minimum 20-unit tree density per net acre is required and needs to be incorporated in the overall landscape plan per CMC 18.13.051.A.

SEPA
The residential development is not exempt from the State Environmental Policy Act (SEPA) as the project is within an environmentally sensitive area. The applicant must submit a SEPA checklist.

Archaeological Review
The site is located in an area of high probability for the presence of archaeological objects, as such an archaeological predetermination will be required per CMC Section 16.31.070.B. Submit proof of mailing or emailing the tribes per CMC 16.31.160.

ENGINEERING DIVISION **ANITA ASHTON | 360.817.7231 | aashton@cityofcamas.us**

General Requirements:

- Civil site construction plans shall be prepared by a licensed Washington State Engineer in accordance with the *Camas Design Standards Manual (CDSM)* and CMC 17.19.040.
- The Community Development Engineering Dept. is responsible for plan review (PR) and construction inspection (CI).
- A 3% PR&CI fee is collected by engineering for all infrastructure improvements.
  - A stamped preliminary engineer's estimate shall be submitted to the CDEV Engineering Dept prior to or with submittal of plans for first review.
    - The first review submittal shall consist of three (3) full size sets and one (1) half size set of the engineering plans, and one (1) hard copy of the revised TIR.
  - Payment of the 1% plan review (PR) fee shall be due prior to start of first review.
  - Payment of the 2% construction inspection (CI) fee shall be due prior to construction plan approval and release of approved plans to the applicant's consultant.
  - Under no circumstances will the applicant be allowed to begin construction prior to construction plan approval.
- *Engineering site improvements plans are not to be submitted until after land-use decision is issued.*
- *Building applications will not be accepted until after Final Acceptance of all infrastructure improvements have been completed.*
- *Final acceptance is issued by the Community Development Engineering Dept.*
- Any existing wells, septic tanks, and septic drain fields shall be decommissioned in accordance with State and County guidelines per CMC 17.19.020 (A3).
- The applicant will be required to purchase all permanent traffic control signs, street name signs, street lighting, and traffic control markings for the proposed development.
- Regulations for installation of public improvements, improvement agreements, bonding, final platting, and final acceptance can be found at CMC 17.21.
- The applicant will be responsible for ensuring that private utilities; underground power, telephone, gas, CATV, interior street/parking lighting, and associated appurtenances are installed.

Traffic/Transportation:

- A transportation impact study (TIA) is required if the proposed development results in 200 vehicle trips per day (VPD) or more. Per the pre-app narrative, the proposed development will result in 276 ADTs.
- The transportation impact analysis (TIA) shall be prepared in accordance with the City's adopted *Traffic Impact Study Guidelines* as outlined in the CDSM and the latest edition of the ITE Manual (11th Edition).
- The applicant will be required to have a traffic engineer analyze the following:
  - Site distance access (es) at the intersection with NW McIntosh Road.
  - A traffic circulation plan showing ingress and egress, per CMC 17.19.040 (B.10.a).
    - Address movement conflicts with nearby intersections, left-turn pocket analysis on NW McIntosh Road at the proposed access location, and applicable private driveways.
    - Provide trip AM and PM Peak distribution to and from the site.
  - Intersection analysis will be based on trip distribution.

Streets:

- The proposed development is located along the south side of NW McIntosh Road.
- NW McIntosh Road is classified as an existing 2 lane arterial per the City's 2016 Transportation Comp Plan.
- Per CMC 17.19.040.B.1, the applicant will be required to construct full half-width street improvements along the frontage of the proposed development on NW McIntosh Road.
- Per CMC 17.19.040.B.5, the applicant will be required to dedicate sufficient right-of-way for full half-width street improvement along the proposed frontage on NW McIntosh Road.
  - The existing right-of-way (ROW) width along the frontage of the proposed development is 40-feet wide. The applicant will be required to dedicate sufficient ROW to provide for 37-foot wide ROW width from the centerline of NW McIntosh Road.
- Per CDSM, Access Spacing Standards: The minimum access spacing standard on an arterial is 660-feet with a maximum of 1,000-feet.
  - The proposed access location off NW McIntosh Road is approximately 330-feet west of the intersection of NW Freemont Street and NW McIntosh Road and approximately 400-feet east of the intersection of NW Ilwaco Street. The proposed location does not meet the minimum access spacing requirements of 660-feet on an arterial.
  - Due to the site constraints on either side of the proposed development, i.e. there are developed parcels to the east and west of the proposed development, a deviation request from the minimum access spacing standards would be supported by the City Engineer.
- Per CMC 17.19.040.B.6.Extension. Proposed street systems shall extend existing streets at the same or greater width. A vehicular connection is required from the proposed development to the existing dead-end on NW 5th Avenue.
  - B.6.a. Streets and pedestrian/bicycle paths shall be extended to the boundaries of the plat to ensure access to neighboring properties unless the presence of critical areas or existing development render such extension infeasible. The design shall contribute to an integrated system of vehicular and pedestrian circulation.
  - B.6.b. Grading of steep topography may be necessary to achieve this objective.
  - The applicant is proposing a private street therefore the applicant is to provide a narrative with ample reasoning for why the vehicular connection is not practicable and why a deviation from the design standards should be supported by the city engineer.

- Per CMC 17.19.040.B.10.b.ii Cul-de-sacs and permanent dead-end streets over three hundred feet in length may be denied unless topographic or other physical constraints prohibit achieving this standard. When cul-de-sacs or dead-end streets are permitted, a direct pedestrian or bicycle connection shall be provided to the nearest available street or pedestrian oriented use.
- Private access driveways to one or more lots that are in excess of 150-feet, as measured from the centerline of the adjacent road, will require a dead-end turnaround.
- The proposed access driveway to the existing SFR to the south of the proposed development is to be placed in a Tract.

If a deviation is supported, the following private street standards would apply.

- Per CMC 17.19.040.B Streets, private streets shall meet the requirements of Table 17.19.040-1 Private Street Standards:
  - (A) Access to 5 or more dwelling units greater than 300 feet in length: Tract width 48-feet, paved surface 28-feet, five-foot detach sidewalks required on both sides of the street, with planter strip. No parking on one side.
  - The applicant has proposed to construct a private road as follows: 52-foot wide right-of-way, 28-foot paved surface, 5-foot wide sidewalks and planter strips on both sides. This meets the street standards.
- The proposed gated entrance and turnaround area are to meet CDSM and be approved by both Fire Marshal's Office (FMO) and Engineering Staff.
  - An application for a private gate is to be submitted to the FMO.
- LED street lighting is to be installed along all street frontages within and adjacent to the proposed development, in accordance with CDSM.
- Private streets, with street lighting, are to have separate meters and the maintenance of all lights and power will be the responsibility of the Owner/Homeowner's Association.

<u>Stormwater:</u>

- The site of proposed development is approximately 10.43 acres.
- The applicant shall provide a preliminary stormwater report (TIR), using the most current edition of Ecology's *Stormwater Management Manual for Western Washington (latest edition 2019 SWMMWW*).
- Per CMC 14.02 Stormwater Control, stormwater treatment and detention shall be designed in accordance with the latest edition of Ecology's *SWMMWW (2019 edition)*.
- Refer to Ecology's *Figure I-3.2 Flow Chart for Determining Requirements for Re- Development (Vol. I, Chapter 3)*.
  - All development projects shall comply with Minimum Requirement (MR) #2 – Submittal of a Stormwater Pollution Prevent Plan (SWPPP).
  - As the project results in 5,000 sf, or greater, of new plus replaced hard surface area; than Minimum Requirements (MR) #1- #9 will apply.
- Stormwater facilities are to be placed in a Tract, with right-of-entry to the City for inspection purposes.
- Ownership and maintenance of onsite stormwater facilities will be the responsibility of the Owner/HOA, per CMC 17.19.040 (C3).
- Public and private storm easements, if required, are to be shown on the construction drawings.

- Provisions are to be provided for roof downspout controls. Stormwater from downspouts is not to be directed onto adjoining parcels. Reference Ecology's latest edition of the SWMMWW (2019) for roof downspout controls and CMC 14.02 and 17.19.040.C.
- A designated concrete washout area (BMP C154, Vol. II, Chap. 3, pgs. 320-326) is to be shown on the site plans. The washout area is to be removed prior to issuance of final occupancy.

Erosion Control

- The site of proposed development is approximately 10.43 acres.
- As the land-disturbing activities are greater than one acre, the applicant will be required to obtain an *NPDES Construction Stormwater General Permit* from Ecology, which includes the *Stormwater Pollution Prevention Plan (SWPPP)*. Copies of both are to be submitted to Engineering prior to any land-disturbing activities.
- The applicant will be responsible for all erosion and sediment control measures to ensure that sediment laden water does not leave the site or impact adjacent parcels.
- Per CMC 17.21.030.B an erosion and sediment control (ESC) bond, in the amount 200% of the engineer's estimate for ESC measures, is to be submitted prior to any land-disturbing activities.
- Mud tracking onto the road surface is discouraged and any mud tracking is to be cleaned up immediately.

Water:

- There is an existing 8-inch ductile iron water main located in NW McIntosh Road.
- The applicant will be required to design and construct a minimum 8-inch ductile iron water main from NW McIntosh Road to serve the proposed development.
  - The new waterline is to be looped through and tied into the existing 6-inch waterline located at a dead-end blowoff on NW 5th Avenue.
- Per staff and as-builts, there is an existing 4-inch steel waterline that transects the proposed development from the north to the south.
  - Upon completion of the new 8-inch waterline applicant will be required to remove and/or abandon the existing 4-inch waterline.
- The applicant shall provide a separate 1-inch water service and install water meter boxes to each of the lots located within this development.
- Trenching, backfill, and surface restoration on NW McIntosh Road will be required, per CDSM Detail G2 and G2A.
- An onsite water sampling station will be required.
- Applicant shall demonstrate that there are adequate fire flows available for the development.
- A 10-foot separation shall be maintained between water and sanitary sewer lines.

Sanitary Sewer:

- There is an existing 8-inch gravity sanitary sewer line that is located at the southeast corner of the site that runs south from an existing dead-end manhole that located at the southern corner of the dead-end of NW 5th Avenue.
- The Applicant will be required to design and construct a new 8-inch gravity sanitary sewer main to serve the development, with 6-inch laterals provided to each lot.
- A 10-foot separation shall be maintained between water and sanitary sewer lines.

City Approved Tapping Contractors:

- A&A Drilling Services, Inc (water & pressure sewer):
  16734 SE Kens Ct. #B, Milwaukie, OR 97267, 800-548-3827,
  http://www.aadrilling.com

Parks/Trails:

- There are no trail requirements per the 2014 Parks, Recreation, and Open Space (PROS) Comprehensive plan.

Garbage & Recycling:

- Garbage and recycling receptacles are to be placed along the sidewalks of the proposed access roadway for pickup.
- If a private gated road is supported, the garbage and recycling providers are to be given access to enter via the private gate.

Impact Fees & System Development Charges (SDCs):

- The proposed development is in the South District.
- Impact Fees and SDCs are collected at time of building permit issuance.
- Impact fees and SDCs are adjusted on January 1st of each year.

Impact Fees for 2021:

- Single Family Detached:
  - Traffic Impact Fees - $3,555.00
  - School Impact Fees (SIF) (Camas) – $5,371.00
  - Park/Open Space Impact Fees (PIF) – $4,782.00
  - Fire Impact Fees (FIF) - $0.20 sf

System Development Charges (SDCs) for 2021:

- Water
  - 3/4" meter - $7,398.00 + $401.00 connection fee
- Sewer
  - Residential - $2,493.00

BUILDING DIVISION **BRIAN SMITH | 360.817.7243 | bsmith@cityofcamas.us**

1. Existing structures to be removed will need an asbestos survey and demolition permit.
2. Decommissioning of septic tanks and drain fields through Clark County Department of Health
3. Property corners shall be established by a licensed surveyor.
4. The structures will be reviewed under the most current building codes as adopted by The State of Washington.
5. The structural drawings and calculations shall be prepared and stamped by a Professional Engineer licensed by the State of Washington.
6. The placement of buildings and structures on or adjacent to slopes steeper than one unit vertical in three units horizontal shall conform to Sections R403.1.7.1 through R403.1.7.4. A geotechnical report may be required
7. The required fire distance between buildings and property line shall be in accordance with the International Residential Code.

8. The required fire suppression system shall be in accordance with IBC and other applicable codes standards and shall be reviewed by the Camas Fire Marshal's office.
9. Storm water from adjacent properties and existing developments should be taken into consideration.
10. Storm sewer disposal and connections shall be identified on the approved plans.
11. All lots shall be provided a storm drain lateral at the lowest practical location.
12. Developer shall provide a designated concrete wash out area.
13. An approved monument sign for posting addresses shall be provided at all Flag lots, the monument sign, location and design a shall be noted on the Plat.
14. Impact fees and System Development charges shall be applicable
15. Estimated review for building plan review is currently 4 – 6 weeks

FIRE DEPARTMENT **RON SCHUMACHER | 360.834.6191 | FMO@cityofcamas.us**

The following are requirements for the aforementioned project. The review is based on information presented or plans submitted. Changes in the submitted plans must be in writing and authorized by the Camas/Washougal Fire Marshal Office (AHJ).

Fire Hydrants

- Two fire hydrants required. One between lot 29 and 21 the other between 25 and 24
- Witnessed Hydrant Flushing and fire flow testing required contact the FMO to schedule.

Fire Sprinklers

- All homes shall have a NFPA 13D fire sprinkler system installed
- All fire sprinkler work is to be performed by individuals, which hold the appropriate "Washington State Certificate of Competency for Fire Sprinkler Work" as per WAC 212-80 and RCW 18.160. If the underground is installed by another contractor, proof of a "Washington State Certificate of Competency for Fire Sprinkler Work" is required. This requirement shall include design, installation and Testing.
- Protection to all areas shall be provided. All areas should be verified for proper coverage in accordance with NFPA 13D, including garages if attached to residential dwellings. Due to the difficulties in determining head placement in relation to ceilings, walls and other obstructions. Sprinkler head placement shall be verified during inspections.
- Water line size installation from the meter into the house shall be determined with the fire sprinkler contractor and not the underground or plumbing contractor. If the Fire Sprinkler Contractor is not consulted then a minimum 2 inch supply line is required.
- Inspection and testing of the sprinkler system or alarm systems shall be scheduled with the Camas/Washougal Fire Marshal Office with no less than 24 hours notice.

Fire Department Access

All roads must have an all weather surface prior to combustible construction. All approved turnarounds must meet current Camas Engineering Standards. All roads must meet current Engineering Standards for width and slope.

Approved fire apparatus access roads shall be provided for every facility, building or portion of a building hereafter constructed or moved into or within the jurisdiction. The fire apparatus access road shall comply with the requirements of this section and shall extend to within 150 feet of all portions of the facility and all portions of the exterior walls of the first story of the building as measured by an approved route around the exterior of the building or facility.

Other requirements when applicable

- If existing or discovered, Underground oil tank removal requires a permit with the fire marshal's office following IFC (International Fire Code) 3404.2.14
- An approved address sign, in accordance with the Camas Municipal Code, must be posted for each residence where the access road or flag lot leaves the public road or access tract. This sign shall be of permanence in its design/installation and shall be approved prior to installation. Contact the FMO for approval. CMC 17.19.030.D.5.d
- If addresses cannot be viewed from the street, monument signs are required.
- If the landowner is interested in having any existing buildings donated for practice fire training please contact the FMO for further details
- Fire Sprinkler and fire alarm Permits will be issued by the Camas/ Washougal Fire Marshal Office 605 NE 3rd Camas, WA.
- Private Streets require a plan for access obstruction per CMC, 17.19.040.A.9
- All road closures must be reported to the Washougal Police and the Camas Washougal Fire Department per WMC 12.30.

GEOTECHNICAL ENGINEERING STUDY

McIntosh Residential Subdivision
3210 NW McIntosh Road
Camas, Washington 98607

Tax Lot No. (127449000)

Prepared for:

Sam Madison c/o John Colgate
3511 NW McMaster Drive
Camas, Washington 98606

Prepared By:

State of Washington
Engineering Geologist
2177
Licensed Geologist
DONALD J. BRUNO
3-4-22

Donald J. Bruno, CEG
Engineering Geologist

Van W. Olin, PE
Project Engineer

3/4/22
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REGISTERED
PROFESSIONAL ENGINEER
ES 4/27/23

Project No. G12-0122

{March 1st 2022}

Earth Engineering Inc.
PO Box 1512, Ridgefield, Washington 98642
(360) 600-6518

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{G12-0122}

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Earth Engineering, Inc.
Geotechnical & Environmental Consultants

Sam Madison c/o John Holgate
3511 NW McMaster Drive
Camas, Washington 98606

March 4th 2022
G12-0122

Subject: **Geotechnical Engineering Study**
McIntosh Property Subdivision
3210 NW McIntosh Road
Camas, Clark County, Washington

Hello Sam,

We are pleased to submit our engineering report for the subject property located in Camas, Washington. This report presents the results of our field exploration, selective laboratory tests, field testing and engineering analyses.

Based on the results of this study, it is our opinion that construction of the proposed residential subdivision is feasible from a geotechnical standpoint, provided recommendations presented in this report are included in the project design.

We appreciate the opportunity to have been of service to you and look forward to working with you in the future. Should you have any questions about the content of this report, or if we can be of further assistance, please call.

Respectfully Submitted,
Earth Engineering Inc.,

Donald J. Bruno, CEG
Engineering Geologist

Exhibit 4 SUB22-04

INTRODUCTION

General

This report presents the results of the geotechnical engineering study completed by Earth Engineering, Inc. (EEI) for the proposed residential subdivision located in Camas, Washington. The general location of the site is shown on the *Vicinity Map, Figure 1.* At the time our study was performed, the site and our exploratory locations were approximately as shown on the *Site Plan, Figure 2.*

The purpose of this study was to explore subsurface conditions at the site and based on the conditions encountered, provide geotechnical recommendations for the proposed construction. In addition, we have provided infiltration testing to determine the feasibility for stormwater infiltration design as well as an assessment of the condition of onsite slopes.

Project Description

Based on the information that was provided to us by the project civil engineer (SGA) it is our understanding the proposed subdivision will consist of twenty-seven (27) single-family lots that will range in size from approximately 6,054 to 22,925 square feet in size. Site development will also include construction of a storm water system, subsurface utilities and an asphalt-paved roadway.

Preliminary grading plans indicate cuts as deep as ten feet and fill up to five feet will be required to achieve the desired design grade for building pads and the roadway. The residential buildings will most likely be constructed with wood frames, suspended floors and slab-on-grade garage floors.

Structural design loads were not available at the time this report was written. However, based on our experience with similar projects, we anticipate that wall and column loads will be approximately seven hundred and fifty (750) to one thousand five hundred (1500) pounds per lineal foot (maximum dead plus live loads). Slab-on-grade garage floor loads will most likely range from one hundred (100) to one hundred fifty (150) pounds per square foot (psf).

If any of the above information is incorrect or changes, we should be consulted to review the recommendations contained in this report. In any case, it is recommended that Earth Engineering, Inc. perform a general review of the final design for the proposed construction at each lot.

SITE CONDITIONS

Surface

The irregular shaped parcel encompasses approximately ten acres. In general, the property slopes gently downward from the central area of the site to the north and south with gradients ranging from about five to eight percent (5-8%), exclusive of the southeast section (~ 0.7 acres) which slopes moderately downward to the south with an approximate gradient of twenty-six percent (26%).

During the time of our study a gravel driveway extended from McIntosh Road to an existing shop at the central east area of the property. The driveway also extended past the shop to several off site single family homes located adjacent to the southwest area of the property. The property was covered predominately with pasture grass with some deciduous trees at the southeast section.

Subsurface & Soil Classification

For this study the site was explored by excavating two infiltration test pits and six additional test pits. The approximate locations of the test pits are shown on the Site Plan, Figure 2. All soil was classified following the Unified Soil Classification System (USCS). A USCS Legend is included as Plate A1. A description of the field exploration methods is included in Appendix A.

In general, in our test pits we encountered approximately four to twelve inches of topsoil underlain by firm to hard native Silt (ML) and elastic Silt (MH) to the maximum exploration depth of thirteen (13) feet below the existing ground surface. It should be noted that soft silt was encountered at test pits TP-5 and TP-6 to a depth of about two feet below the surface. Please refer to the test pit logs, Plates A2 thru A9, for a more detailed description of the conditions encountered.

Groundwater

During the time of our field exploration (February 2022) no groundwater or groundwater seepage was encountered in any of our test pits. Clark County "Generalized Water Altitude Maps" indicate that groundwater is greater than two hundred (200) feet below the surface.

Groundwater conditions are not static; fluctuations may be expected in the level and seepage flow depending on the season, amount of rainfall, surface water runoff, and other factors. Generally, groundwater levels and seepage rates are greater in the wetter winter months (typically October through May).

General Regional Geology

General information about geologic conditions and soil in the vicinity of the site was obtained by reviewing the Geologic Map of Washington-Southwest Quadrant, Washington Division of Geology and Earth Resources, (Geologic Map GM-34, 1987). This map provides general information about geologic units in the Camas, Clark County, Washington area.

Our review of existing geological information indicates that soils in the vicinity of the subject site were formed from alluvial deposits during the Quaternary Period. Outburst flood deposits from glacial Lake Missoula deposited these sedimentary soils. The material encountered in our test pits consists predominantly of Silt.

LABORATORY TESTING

Laboratory tests were conducted on representative soil samples to verify or modify the field soil classification of the units encountered, and to evaluate the general physical properties as well as the engineering characteristics of the soils encountered. The following provides information about the testing procedures performed on representative soil samples and the general condition of subsurface soil conditions encountered:

- Moisture Content (ASTM-D2216-92) tests were performed on representative samples. The native Silt and Elastic Silt has a moisture content that ranges from twenty-two to thirty percent (22% - 30%).

Exhibit 4 SUB22-04

- Atterberg Limits *(ASTM-D4318-95)* were performed on representative samples to determine the "water-plasticity" ratio of in-situ soil. This test also provides an indication of relative soil strength as well as the potential for soil volume changes with variation in moisture content. The sub-grade soils encountered have an average liquid limit of forty-six (46) and a plasticity index of seventeen (17).

- In-Situ Soil Density (ASTM-D4564-93) utilizing the sleeve method was performed on representative samples to determine the wet and dry density of native soil. The in-situ density provides a relative indication of soil support characteristics. The wet density of the native silt is one hundred and sixteen (116) pounds per cubic foot (pcf). The dry density of this soil is ninety two (92) pcf. The wet density of the native elastic silt is one hundred and ten (110) pounds per cubic foot (pcf). The dry density of this soil is eighty-six (86) pcf.

Laboratory testing confirms that subsurface soil consists predominantly of Silt. Soils encountered at the subject site are sensitive to changes in moisture content. Moisture sensitive soils are discussed in more detail in the *Site Preparation and Grading* section of this report.

The results of laboratory tests performed on specific samples are provided at the appropriate sample depth on the individual test pit logs. However, it is important to note that some variation of subsurface conditions may exist. Our geotechnical recommendations are based on our interpretation of these test results.

SEISMIC HAZARD EVALUATION

The following provides a seismic hazard evaluation for the subject site. Our evaluation is based on subsurface conditions encountered at the site during the time of our geotechnical study and a review of applicable geologic maps (Washington Department of Natural Resources, Geologic Map of Washington-Southwest Quadrant, 1987) and the International Building Code (IBC-2015) guidelines.

In general, supportive soil at the subject site consists predominately of stiff to hard Silt. Geologic maps indicates that no known active faults are located within one-mile of the subject site. Soil encountered at the site are classified as a type "D" soil in accordance with "Seismic Design Categories" (IBC 2015, Section 1805.5.12). For more detail regarding soil conditions refer to the test pit logs in Appendix A of this report.

Liquefaction:

Structures are subject to damage from earthquakes due to direct and indirect action. Shaking represents direct action. Indirect action is represented by foundation failures and is typified by liquefaction. Liquefaction occurs when soil loses all shear strength for short periods of time during an earthquake. Ground shaking of sufficient duration results in the loss of grain to grain contact as well as a rapid increase in pore water pressure. This causes the soil to assume physical properties of a fluid.

Exhibit 4 SUB22-04

To have potential for liquefaction a soil must be loose, cohesion-less (generally sands and silts), below the groundwater table, and must be subjected to sufficient magnitude and duration of ground shaking. The effects of liquefaction may be large total settlement and/or large differential settlement for structures with foundations in or above the liquefied soil. Based on the predominance of stiff to hard soil conditions, and the absence of a near surface groundwater table, it is not likely that soil liquefaction would occur at the subject site during a seismic event.

DISCUSSION AND RECOMMENDATIONS

General

Based on the results of our study, it is our opinion the residential subdivision can be developed as planned provided the geotechnical recommendations contained in this report are incorporated into the final design. The proposed buildings can be supported on conventional shallow spread footings bearing either entirely on competent native soil or compacted structural fill. Supporting the proposed buildings on homogeneous material will significantly decrease the potential for differential settlement across the foundation area.

As previously discussed, several feet of soft material was encountered in our test pits at the southeast area of the site (proposed lots 1&2). This material will not provide adequate support for foundations, floor slabs or driveways. To improve support conditions it will be necessary to remove the unsuitable material to competent native soil and replace it with compacted structural fill. Recommendations for the placement and compaction of fill is described in the *Site Preparation & Grading* section of this report.

This report has been prepared for specific application to this project only and in a manner consistent with that level of care and skill ordinarily exercised by other members of the profession currently practicing under similar conditions in this area for the exclusive use of Sam Madison and his representatives. This report, in its entirety, should be included in the project documents for information to the contractor. No warranty, expressed or implied, is made.

Infiltration Testing

On February 10th 2022, infiltration testing was performed at two locations at a depth of four and five feet below the existing ground surface. The approximate location of the infiltration tests, I-1 and I-2 (also used for exploration test pits) is shown on the Site Plan, Figure 2.

Infiltration testing was conducted in general accordance with the Southwest Washington Storm Water Manual. The Encased Falling Head Test consists of driving a fifteen (15) inch long, six-inch diameter pipe six inches into the exposed ground surface at the bottom of the test pit.

The pipe is filled with water as the soil around the bottom and below the pipe is saturated for several hours. The pipe is filled again and the amount of time required for the water to fall, per inch, for six inches, is recorded. This step is performed a minimum of three times. The test results are averaged and calculated in inches per hour.

Exhibit 4 SUB22-04

The following table provides the infiltration test results, soil classification and a summary of laboratory test results for soils encountered at the infiltration test areas:

LOCATION	*USCS SOIL TYPE	AASHTO SOIL TYPE	DEPTH (FT.)	MOISTURE CONTENT %	% PASSING # 200 SIEVE	FIELD INFILTRATION RATE (inches per hr.)	COEFFICIENT OF PERMEABILITY
I-1	MH	A-7	4.0	27	100	1.0 iph	0.5
I-2	ML	A-7	5.0	30	100	42.0 iph	21.0

Slope Conditions

The subject site is designated as being located in a geologically sensitive area under City of Camas code due to the moderate slopes on the property (>15% gradient). In addition to having moderate to steep slopes, to be considered as having a geologic landslide hazard, the site must also posses the following: relatively permeable sediments overlying relatively impermeable sediments or bedrock; and have the presence of groundwater seepage or springs.

A surface reconnaissance was performed at the site on January 26th and February 10 (2022) to look for the potential presence of slide activity at the southeast area of the site. During the time of our reconnaissance we did not observe any erosion, tension cracks, slide scarps, down set blocks, hillside seepage or other indications of an unstable slope.

Based on the soil and groundwater conditions encountered in our test pits as well as our review of geologic maps, the characteristics described above do not exist at the proposed building areas. Therefore, it is not likely that the building sites would be impacted by hazards associated with an unstable slope.

Primary factors that will adversely affect slope stability include: the placement of un-retained fill on or at the top of slopes, excavation of steep un-retained cuts at the toe of slopes and uncontrolled top of slope surface water runoff. At this time and to the best of our knowledge, none of these are planned for the development of this property.

Site Preparation and Grading

The site shall be stripped and cleared of all vegetation, organic matter and any other deleterious material. Stripped material should not be mixed with any soils to be used as fill. Stripped soil could potentially be used for topsoil at landscape areas after removing vegetation and screening out organic matter.

Building & Roadway Areas:

After clearing and grading, the building and pavement areas should be compacted to a dense non-yielding condition with suitable vibratory compaction equipment. This phase of earthwork compaction shall be performed prior to the placement of any structural fill, at the bottom of all foundation excavations, floor slabs, roadway and driveways, before the placement of base rock.

Structural Fill:

Structural fill is defined as any soil placed under buildings or any other load bearing-areas. Structural fill placed under footings and slab on grade should be placed in thin horizontal lifts not exceeding eight inches and compacted to a minimum ninety-five percent (95%) of its maximum dry density (Standard Proctor ASTM D698). The fill material should be placed within two to three percent of the optimum moisture content.

Fill under pavements should also be placed in lifts approximately eight inches in thickness, and compacted to a minimum of ninety two percent (92%) of its maximum dry density (Standard Proctor ASTM D698), except for the top twelve (12) inches which should be compacted to ninety-five percent (95%) of the maximum dry density.

On site material can be used as structural fill provided the soil is compacted at or near the optimum moisture content and in accordance with the compaction density parameters described above. It is possible that some soils will be too wet for compaction and will require improvement and/or replacement to achieve the desired density.

Preliminary plans indicate that exclusive of utility trench backfill (clean sand & gravel) imported structural fill will not be required to achieve the desired design grades. However, if imported structural fill is planned for onsite use, we recommend the material be submitted to our laboratory for testing and approval prior to import.

The placement and compaction of structural fill should be observed by a representative from our office to verify that fill has been placed and compacted in accordance with the approved project plans and specifications.

It should be noted that the depth of excavation to competent soil at foundation footings and floor slab areas could be greater or less than anticipated depending on conditions encountered. Our test pits provide general information about subsurface soil and groundwater conditions.

Wet Weather Construction & Moisture Sensitive Soils:

Field observations and laboratory testing indicates that soil encountered at the site consists of moisture sensitive Silt and elastic Silt. As such in an exposed condition moisture sensitive soil can become disturbed during normal construction activity, especially when in a wet or saturated condition. Once disturbed, in a wet condition, these soils will be unsuitable for support of foundations, floor slabs and pavements.

Therefore, where soil is exposed and will support new construction, care must be taken not to disturb their condition. If disturbed soil conditions develop, the affected soil must be removed and replaced with structural fill. The depth of removal will be dependent on the depth of disturbance developed during construction. Covering the excavated area with plastic and refraining from excavation activities during rainfall will minimize the disturbance and decrease the potential degradation of supportive soils.

Exhibit 4 SUB22-04

Earthwork grading and foundation construction will be difficult during the wet winter and spring seasons. Based on this condition we suggest that grading and foundation construction be completed during the drier summer and fall seasons.

Foundations

Based on the encountered subsurface soil conditions, preliminary building design criteria, and assuming compliance with the preceding *Site Preparation and Grading* section, the proposed residential buildings may be supported on conventional shallow spread footings bearing either on competent native soil or compacted structural fill.

Individual spread footings or continuous wall footings providing support for the proposed buildings may be designed for a maximum allowable bearing value of one thousand five hundred (1500) pounds per square foot (psf).

Footings for a one level structure should be at least twelve (12) inches in width. Footings for a two-level structure should be a minimum of fifteen (15) inches in width. In either case, all footings should extend to a depth of at least eighteen (18) inches below the lowest adjacent finished sub grade.

These basic allowable bearing values are for dead plus live loads and may be increased one-third for combined dead, live, wind, and seismic forces. It is estimated that total and differential footing settlements for the relatively light building will be approximately one-half and one-quarter inches, respectively.

We recommend that all footing excavations be observed by a representative of EEI prior to placing forms or rebar, to verify that sub grade support conditions are as anticipated in this report, and/or provide modifications in the design as required.

Lateral loads can be resisted by friction between the foundation and the supporting sub grade or by passive earth pressure acting on the buried portions of the foundation. For the latter, the foundations must be poured "neat" against the existing soil or backfilled with a compacted fill meeting the requirements of structural fill.

- Passive Pressure = 300 pcf equivalent fluid weight
- Coefficient of Friction = 0.40

The above values include a safety factor of 1.5. In order to mobilize full passive resistance, the ground surface adjacent to the foundation elements must be level for a minimum distance of eight feet.

Slab on Grade

The sub-grade for all concrete floor slab areas should be compacted to a dense non-yielding condition prior to the placement of base rock. It is important to note that the existing sub-grade soil may become too wet to re-compact due to weather conditions. If supportive soils become saturated it may be necessary to remove the unsuitable material and replace it with imported granular structural fill.

Interior floor slabs should be provided with a minimum of eight inches of compacted granular structural fill after compacting the sub-grade. In areas where moisture is undesirable, a vapor barrier such as an 8-mil plastic membrane should be placed beneath the slab.

Temporary Excavations

The following information is provided solely as a service to our client. Under no circumstances should this information be interpreted to mean that Earth Engineering, Inc. is assuming responsibility for construction site safety or the contractor's activities; such responsibility is not being implied and should not be inferred. In no case should excavation slopes be greater than the limits specified in local, state and federal safety regulations.

Based on the information obtained from our field exploration and laboratory testing, the site soils expected to be encountered in excavations, stiff to hard Silt would be classified as a Type "B" soil by OSHA guidelines.

Therefore, temporary excavations and cuts greater than four feet in height, should be sloped at an inclination no steeper than 1:1V (horizontal:vertical) for type "B" soils. If slopes of this inclination, or flatter, cannot be constructed or if excavations greater than ten feet in depth are required, temporary shoring will be necessary.

Site Drainage

The site should be graded so that surface water is directed off the site. Water should not be allowed to stand in any area where buildings or slabs are to be constructed. Loose surfaces should be sealed at the end of each workday by compacting the surface to reduce the potential for moisture infiltration into the soils. Final site grades should allow for drainage away from the building foundation.

The ground should be sloped at a gradient of three percent for a distance of at least ten feet away from the buildings. We recommend that a footing drain be installed around the perimeter of the buildings just below the invert of the footing with a gradient sufficient to initiate flow.

Under no circumstances should the roof down spouts be connected to the footing drain system. We suggest that clean outs be installed at several accessible locations to allow for the periodic maintenance of the footing drain system. Details for the footing drain have been included on *Figure 3, Typical Footing Drain Detail.*

Interceptor Drains:

In addition to the foundation footing drains we recommend that an interceptor drain be installed along the up-gradient side of the proposed residences that are constructed on moderate sloping parcels (northeast, southeast and central east). The installation of these drains will divert stormwater away from the buildings. The drain should consist of a four-inch diameter perforated pipe with holes facing down and installed in an envelope of clean drain rock or pea gravel wrapped with free draining filter fabric. The drain should be a minimum of one foot wide and two feet deep with sufficient gradient to initiate flow.

The drain should be routed to a suitable discharge area and rock spalls placed at the outlet to dissipate flow from the system. A representative from our office can determine the location of the drains during construction for the applicable lots. A *Typical Interceptor Drain Detail, Figure 4,* has been included with this report.

Utility Support and Back Fill

Based on the conditions encountered, the soil to be exposed by utility trenches should provide adequate support for utilities. Utility trench backfill is a concern in reducing the potential for settlement along utility alignments, particularly in pavement areas. It is also important that each section of utility line be adequately supported in the bedding material. The back fill material should be hand tamped to ensure support is provided around the pipe haunches.

Fill should be carefully placed and hand tamped to about twelve inches above the crown of the pipe before any compaction equipment is used. The remainder of the trench back fill should be placed in lifts having a loose thickness of eight inches.

A typical trench backfill section and compaction requirements for load supporting and non-load supporting areas is presented on *Figure 5, Utility Trench Backfill Detail.* Trench back fill may consist of imported granular fill provided the material is approved, placed and compacted near the optimum moisture content.

Imported granular material or on-site soil to be used as backfill should be submitted to our laboratory at least one week prior to construction so that we can provide a laboratory proctor for field density testing. If native soil is planned for use as backfill, additional testing will be required to determine the suitability of the material.

Pavements

The durability of pavements is related in part to the condition of the underlying sub grade. To provide a properly prepared sub grade for pavements, we recommend the sub grade be treated and prepared as described in the *Site Preparation and Grading* section of this report.

It is possible that some localized areas of soft, wet or unstable sub grade may still exist after this process. Before placement of any base rock, the sub grade should be compacted with suitable compaction equipment. Yielding areas that are identified should be excavated to firm material and replaced with compacted one and one quarter inch-minus clean-crushed rock.

The following pavement sections are recommended for the proposed pavement areas:

- Three inches of Asphalt Concrete (AC) over nine inches of compacted Crushed Rock Base (CRB) material or,
- Three inches of Asphalt Concrete (AC) over seven inches of compacted Crushed Rock Base (CRB) material, over a geo-grid consisting of Tensar Triax or equivalent.

The geo-grid should be placed directly on the sub grade surface of the roadway prior to placement of base rock. Appropriate geo-textiles have been designed to increase the strength of the sub grade and extend pavement life.

Asphaltic Cement (AC) and Crushed Rock Base (CRB) materials should conform to WSDOT specifications. All base rock should be compacted to at least ninety five percent (95%) of the ASTM (D698) laboratory test standard.

We recommend that a minimum of eight inches of compacted CRB be placed below all exterior slabs. Exterior concrete slabs that are subject to vehicle traffic loads should be at least four inches in thickness. It is also suggested that nominal reinforcement such as "6x6-10/10" welded wire mesh be installed, near midpoint, in new exterior concrete slabs and paving. Fiber mesh concrete may be used in lieu of welded wire mesh.

Additional Services & Earthwork Monitoring

Earth Engineering, Inc. will be available to provide consultation services related to review of the final design to verify that the recommendations within our purview have been properly interpreted and implemented in the approved construction plans and specifications. A representative from our office will be available to attend a pre-construction meeting to discuss and/or clarify all geotechnical issues related to the proposed project.

In addition, it is suggested that our office be retained to provide geotechnical services during construction to observe compliance with the design concepts and project specifications and to allow design changes in the event subsurface conditions differ from those anticipated.

Our construction services would include monitoring and documenting the following:

- Provide erosion control monitoring and documentation.
- Observe and document the removal of site stripping & organic materials
- If required, provide infiltration system testing to verify the design infiltration rates.
- Laboratory proctor tests on structural fill and roadway area materials.
- Observe compaction and provide testing of structural fill at buildings and roadway.
- Observe compaction and provide testing of utility trench backfill.
- Observe excavations and condition of exposed bearing soils at the building areas.
- Provide footing inspection at buildings to verify soil bearing capacity.
- Verify the installation of all building and site drainage elements.

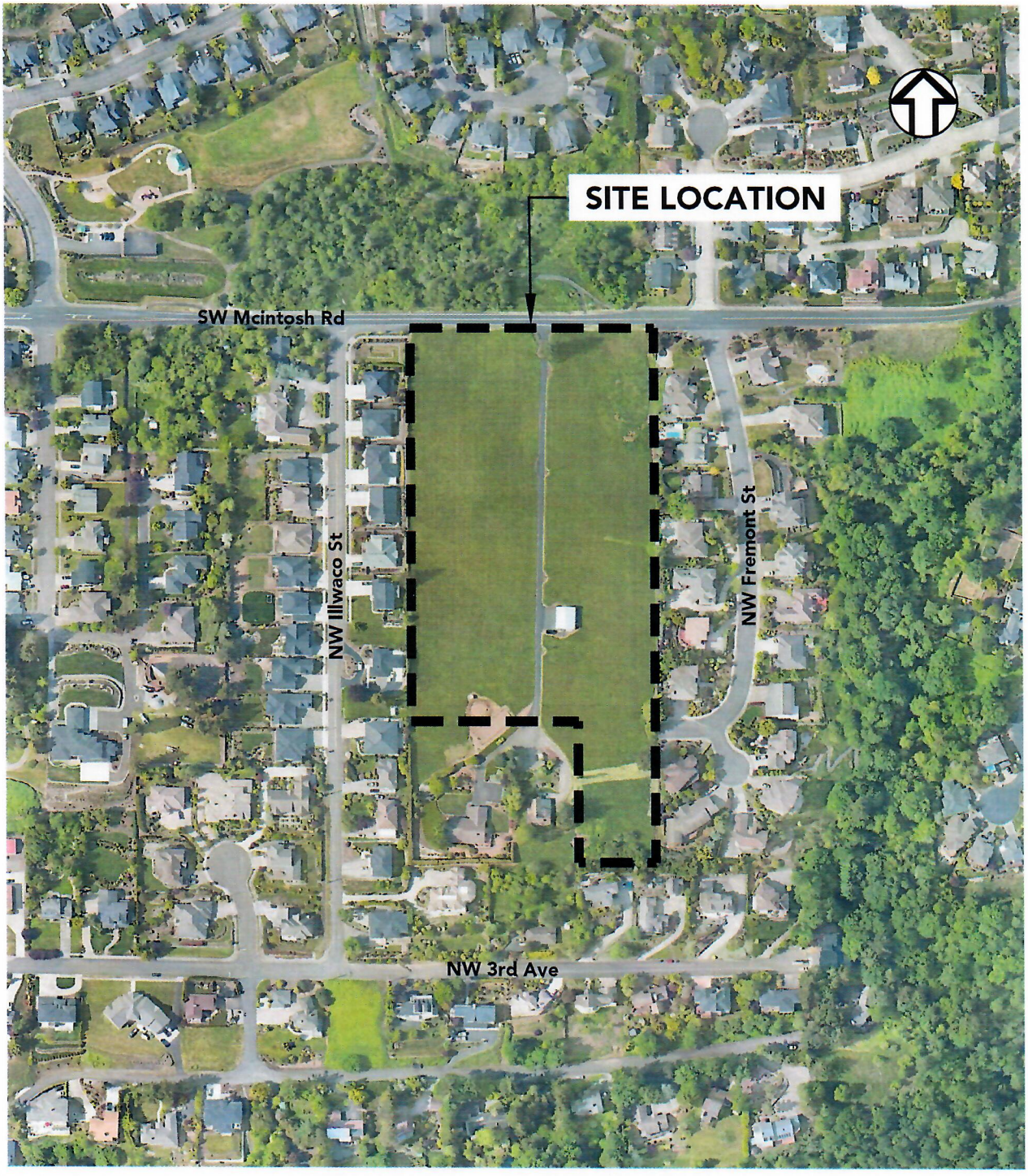
LIMITATIONS

Our recommendations and conclusions are based on the site materials observed, selective laboratory testing, engineering analyses, the design information provided to Earth Engineering, Inc. and our experience as well as engineering judgment. The conclusions and recommendations are professional opinions derived in a manner consistent with that level of care and skill ordinarily exercised by other members of the profession currently practicing under similar conditions in this area. No warranty is expressed or implied.

The recommendations submitted in this report are based upon the data obtained from the test pit excavations. Soil and groundwater conditions may vary from those encountered. The nature and extent of variations may not become evident until construction. If variations do appear, Earth Engineering, Inc. should be requested to reevaluate the recommendations contained in this report and to modify or verify them in writing prior to proceeding with the proposed construction.

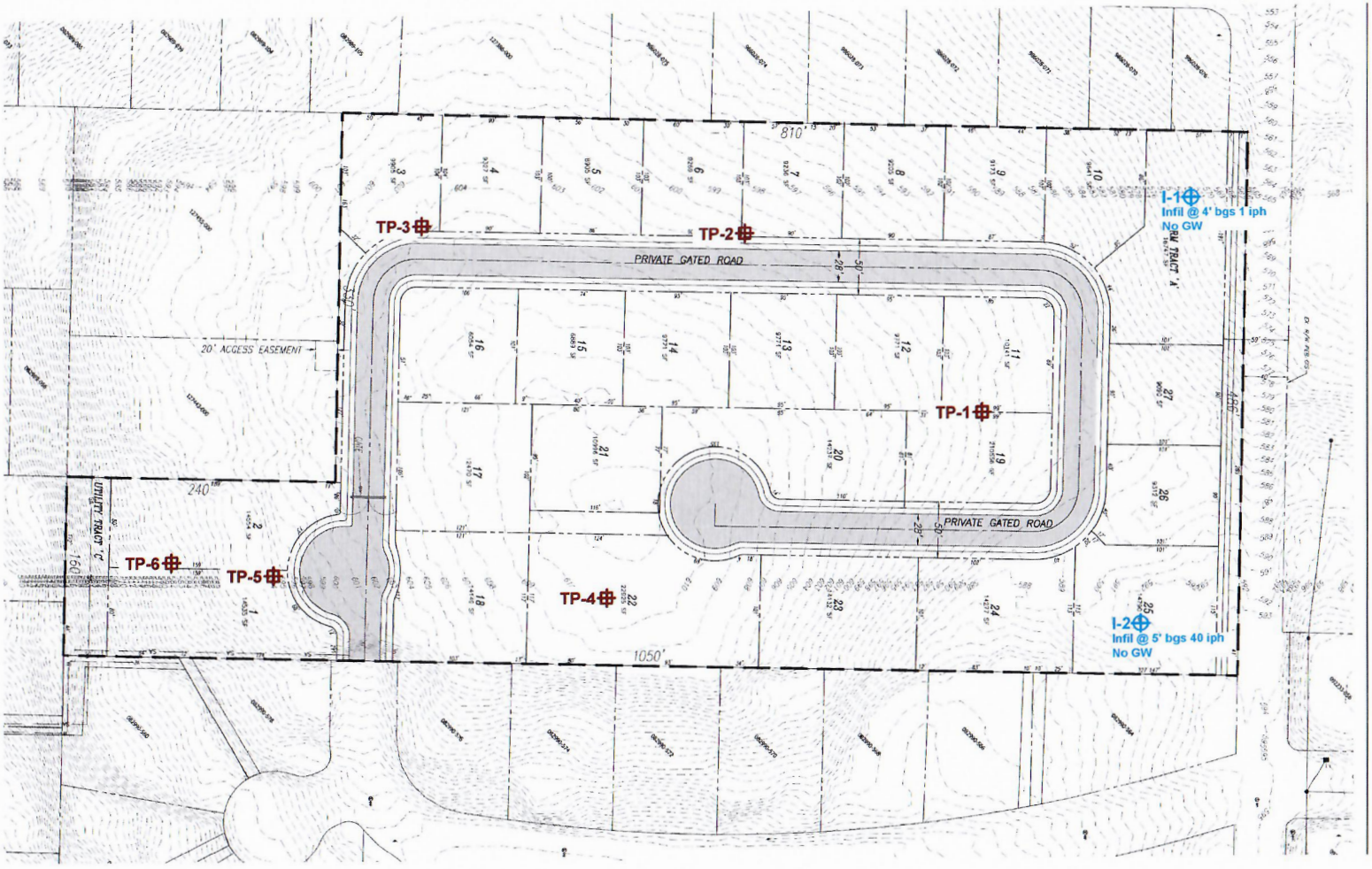
It is important to note that part of our study has included an assessment of the condition of the exiting on site slopes and not a slope stability analyses. Our opinion about the stability of the site slopes is limited to our field reconnaissance, review of geologic maps and knowledge of soils in the area. A slope stability analyses would require deep borings, extensive laboratory testing and rigorous calculations that are beyond the scope of our services.

VICINITY MAP



Earth Engineering GEOTECHNICAL & ENVIRONMENTAL SERVICES	CLIENT: MADISON	DRAWN: CCK
	PROJECT: MCINTOSH PROPERTY SUBDIVISION 3210 NW MCINTOSH ROAD CAMAS, WA	DATE: 3/2022 FIGURE: 1 PRO. #: G12-0122

SITE PLAN



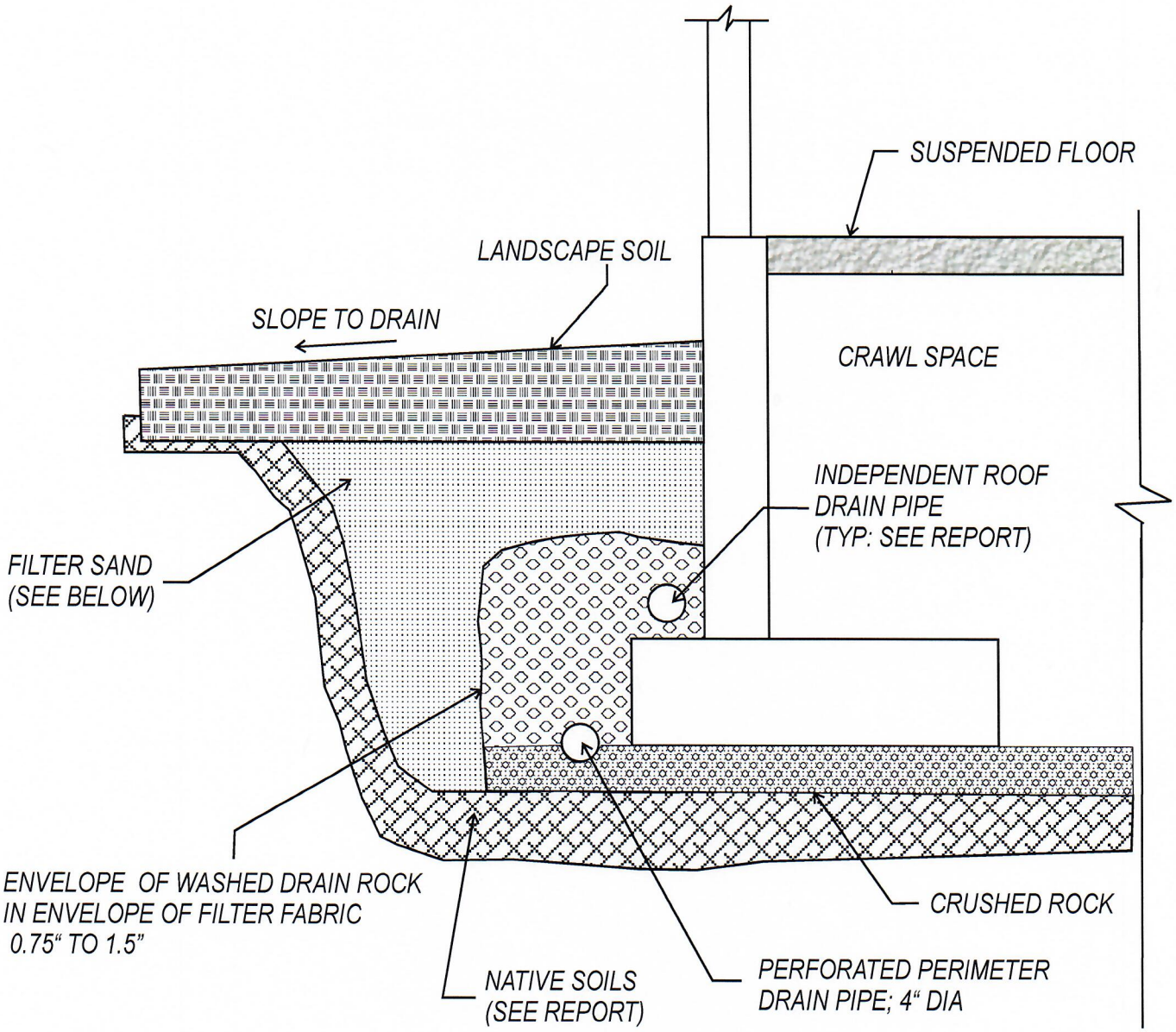
LEGEND

TP-1 Approximate Location of Test Pits

I-1 Approximate Location of Infiltration Test Pits

Earth Engineering
GEOTECHNICAL & ENVIRONMENTAL SERVICES

CLIENT: MADISON		DRAWN: CCK
PROJECT: MCINTOSH PROPERTY SUBDIVISION 3210 NW MCINTOSH ROAD CAMAS, WA		DATE: 3/2022 FIGURE: 2 PRO. #: G12-0122



NOTES:

1. FILTER SAND - FINE AGGREGATE FOR PORTLAND CEMENT; SECTION 9=03.1(2)
2. PERFORATED OR SLOTTED RIGID PVC PIPE WITH A POSITIVE DRAINAGE GRADIENT
3. FILTER FABRIC OPTIONAL IF FILTER SAND USED

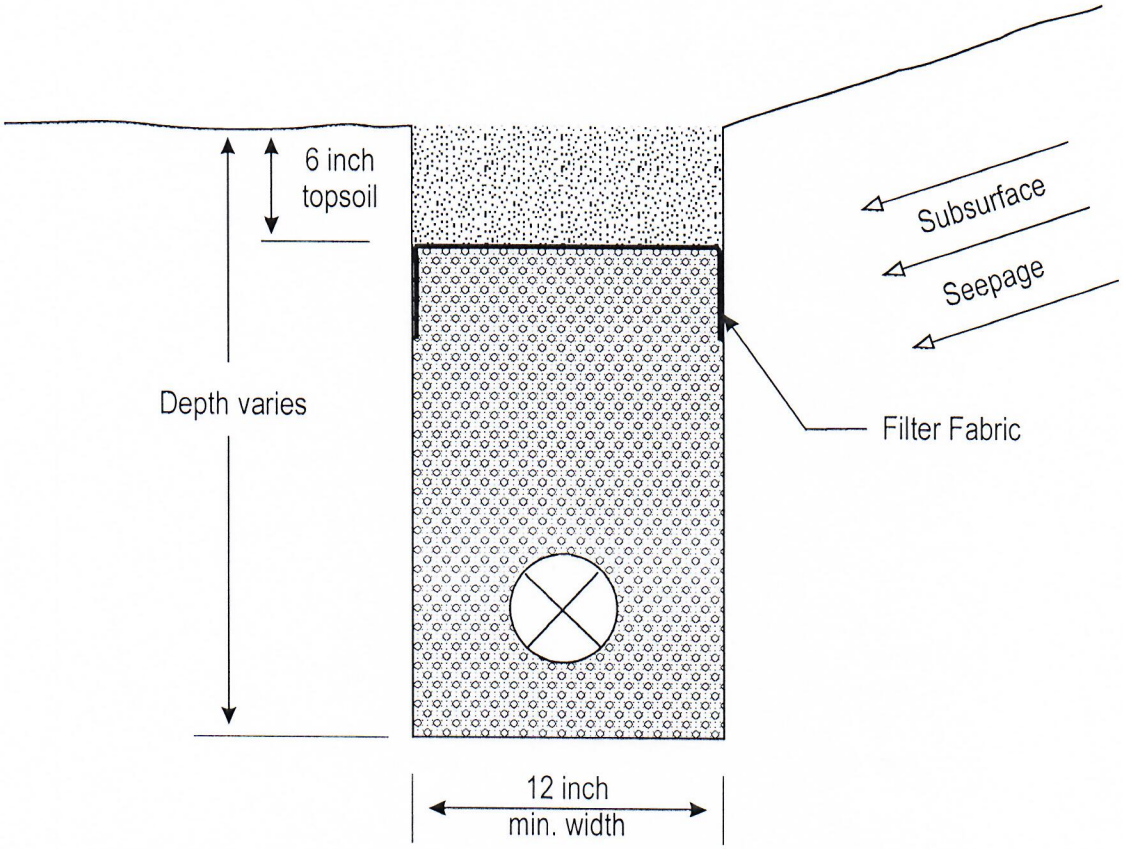
TYPICAL FOOTING DRAIN DETAIL

Not to Scale

Earth Engineering, Inc. GEOTECHNICAL & ENVIRONMENTAL SERVICES	CLIENT: MADISON	DRAWN: DB
	PROJECT: MCINTOSH PROPERTY SUBDIVSION 3210 NW MCINTOSH ROAD CAMAS, WA	DATE: 03/2022
		FIGURE: 3
		PRO. #: G12-0122

TYPICAL INTERCEPTOR DRAIN DETAIL

Not to Scale



Legend

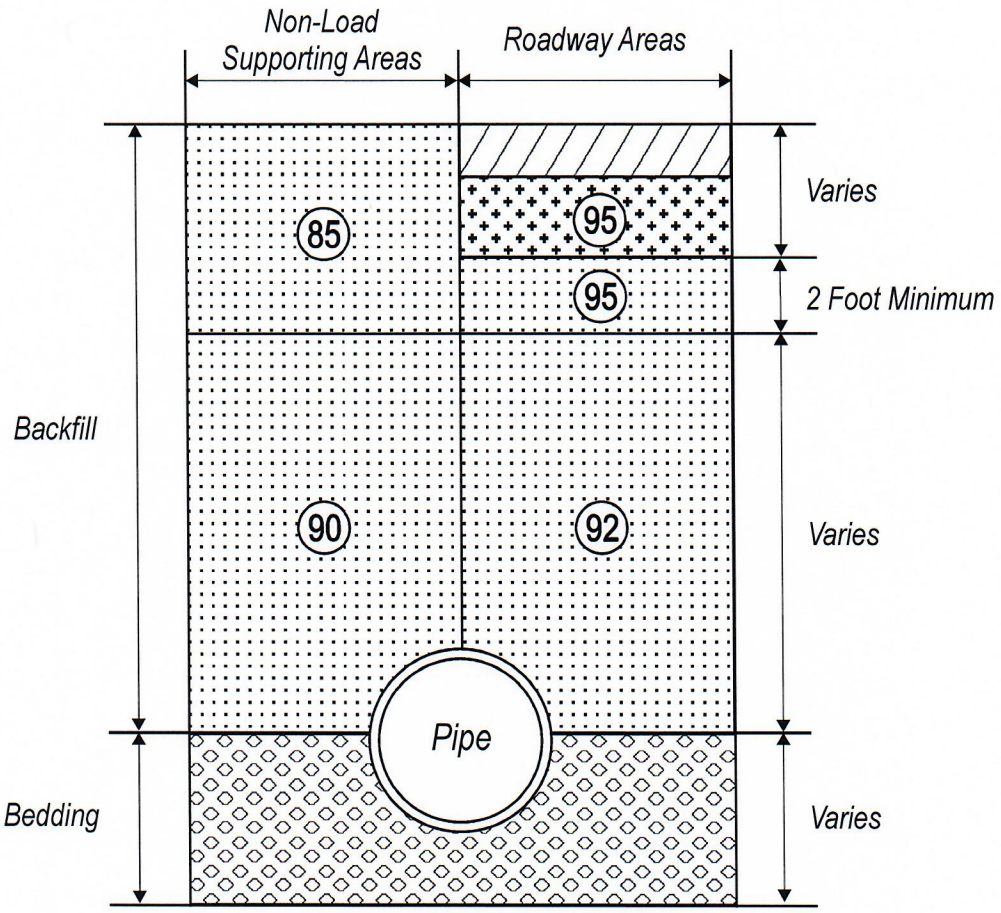
Native soil backfill.

Free-draining material composed of clean round gravel, pea gravel, etc.

Minimum 4 inch perforated pipe wrapped with free draining filter fabric or equivalent placed at a positive gradient to a suitable permanent discharge area.

Note: A field representative from this office should be present to establish the depth and lateral extent of the interceptor trench during construction.

Earth Engineering, Inc. GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS	CLIENT: MADISON	DRAWN: DB
	PROJECT: MCINTOSH PROPERTY SUBDIVISION, 3210 NW MCINTOSH ROAD CAMAS,WA	DATE: 03/2022
		FIGURE: 4
		PRO. #: G12-0122



LEGEND

Asphalt or Concrete Pavement

Roadway Base Material or Base Rock

Backfill: Compacted on-site soil or imported select fill material as described in the site preparation of the general Earthwork Section of the attached report text.

92 — Minimum percentage of maximum Laboratory Dry Density as determined by ASTM Test method D698 (Standard Proctor),unless otherwise specified in the attached report text.

Bedding Material: Material type depends on type of pipe and laying conditions. Bedding should conform to the manufacturer's recommendations for the type of pipe selected.

UTILITY TRENCH BACKFILL DETAIL

Not to Scale

Earth Engineering, Inc. GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS	CLIENT: MADISON	DRAWN: DB
	PROJECT: MCINTOSH SUBDIVISION 3210 NW MCINTOSH ROAD CAMAS, WA	DATE: 03/2022
		FIGURE: 5
		PRO. #: G12-0122

APPENDIX A

(FIELD EXPLORATION)

FIELD EXPLORATION

Our field exploration was performed on February 10th 2022. Subsurface conditions at the site were explored by excavating eight test pits. The test pits were excavated with a track-hoe to a maximum depth of thirteen (13) feet below the existing ground surface.

The test pits were located by pacing from property features. The locations are shown on the Site Plan, Figure 2. Field exploration was monitored by an Earth Engineering, Inc. representative, who classified the soils that we encountered and maintained a log of each test pit, obtained representative samples, and observed pertinent site features. Representative soil samples were placed in closed containers and returned to the laboratory for further examination and testing.

All samples were identified using the Standard Classification of Soils for Engineering Purposes (ASTM D2487-93) in accordance with the Unified Soil Classification System (USCS), which is presented on Plate A-1. The test pit logs are presented in Appendix A. The final log represents our interpretations of the field logs and the results of the laboratory tests on field samples.

UNIFIED SOIL CLASSIFICATION SYSTEM
LEGEND

MAJOR DIVISIONS			GRAPH SYMBOL	LETTER SYMBOL	TYPICAL DESCRIPTION
Coarse Grained Soils	Gravel and Gravelly Soils More Than 50% Coarse Fraction Retained on No 4 Sieve	Clean Gravels (little or no fines)		GW gw	Well-Graded Gravels, Gravel-Sand Mixtures Little or no Fines
				GP gp	Poorly-Graded Gravels, Gravel-Sand Mixtures, Little or no Fines
		Gravels with Fines (appreciable amount of fines)		GM gm	Silty Gravels, Gravel-Sand-Silt Mixtures
				GC gc	Clayey Gravels, Gravel-Sand-Clay Mixtures
More Than 50% Material Larger Than No 200 Sieve Size	Sand and Sandy Soils More Than 50% Coarse Fraction Passing No 4 Sieve	Clean Sand (little or no fines)		SW sw	Well-graded Sands, Gravelly Sands Little or no Fines
				SP sp	Poorly-Graded Sands, Gravelly Sands Little or no Fines
		Sands with Fines (appreciable amount of fines)		SM sm	Silty Sands, Sand-Silt Mixtures
				SC sc	Clayey Sands, Sand-Clay Mixtures
Fine Grained Soils	Silts and Clays	Liquid Limit Less than 50		ML ml	Inorganic Silts and Very Fine Sands, Rock Flour, Silty-Clayey Fine Sands; Clayey Silts w/ slight Plasticity
				CL cl	Inorganic Clays of Low to Medium Plasticity, Gravelly Clays, Sandy Clays, Silty Clays, Lean
				OL ol	Organic Silts and Organic Silty Clays of Low Plasticity
More Than 50% Material Smaller Than No 200 Sieve Size	Silts and Clays	Liquid Limit Greater than 50		MH mh	Inorganic Silts, Micaceous or Diatomaceous Fine Sand or Silty Soils
				CH ch	Inorganic Clays of High Plasticity, Fat Clays
				OH oh	Organic Clays of Medium to High Plasticity, Organic Silts
Highly Organic Soils				PT pt	Peat, Humus, Swamp Soils with High Organic Contents

Topsoil		Humus and Duff Layer
Fill		Highly Variable Constituents

Earth Engineering Inc.
GEOTECHNICAL & ENVIRONMENTAL SERVICES

CLIENT: MADISON	DRAWN: DB
PROJECT: MCINTOSH PROPERTY SUBDIVISION. 3210 NW MCINTOSH ROAD CAMAS,WA	DATE: 03/2022
	PLATE: A1
	PRO. #: G12-0122

LOG OF TEST PIT I-1

(Northwest)

ELEVATION: +/- 570 feet
EXPLORATORY EQUIPMENT: TRACK HOE
DATE: 02/10/2022

DEPTH IN FEET	SAMPLES	SOILS CLASSIFICATION	LITHOLOGY (USGS)	COLOR	MOISTURE	CONSISTENCY	MOISTURE CONTENT % OF DRY WEIGHT	PERCENT PASS NUMBER 200
1		8" Topsoil						
2	X	Wet γ ~110 pcf Dry γ ~86 pcf					28	-
3		**elastic Silt (MH)**		Brown Grey		Stiff to Very Stiff		
4	•	- Field infiltration rate @ 1 inch per hour					27	-
5					Moist			
6		(Native)						
7								
8		**sandy Silt (ML)**		Light Brown		Firm	22	-
9								
10	•							

Bottom of test pit at 10.0 feet below existing ground surface.
No groundwater encountered.

Earth Engineering, Inc.
GEOTECHNICAL & ENVIRONMENTAL SERVICES

CLIENT:	MADISON	DRAWN:	EG
PROJECT:	MCINTOSH PROPERTY SUBDIVISION 3210 NW MCINTOSH ROAD CAMAS, WA	DATE:	02/2022
		PLATE:	A2
		PRO. #:	G12-0122

LOG OF TEST PIT I-2

(Northeast)

ELEVATION: **+/- 592 feet**

EXPLORATORY EQUIPMENT: **TRACK HOE**

DATE: **02/10/2022**

DEPTH IN FEET	SAMPLES	SOILS CLASSIFICATION	LITHOLOGY (USGS)	COLOR	MOISTURE	CONSISTENCY	MOISTURE CONTENT % OF DRY WEIGHT	PERCENT PASS NUMBER 200
1		6" Topsoil						
2								
3	•	**Silt (ML)**		Brown	Moist	Stiff to Very Stiff	27	-
4								
5	•	- Field infiltration rate @ 40 inches per hour					30	-
6								
7		(Native)						
8								
9		**elastic Silt (MH)**		Orange Grey		Very Stiff to Hard	28	-
10	•							
11								

Bottom of test pit at 11.0 feet below existing ground surface.
No groundwater encountered.

Earth Engineering, Inc.
GEOTECHNICAL & ENVIRONMENTAL SERVICES

CLIENT:	MADISON	DRAWN:	EG
PROJECT:	MCINTOSH PROPERTY SUBDIVISION 3210 NW MCINTOSH ROAD CAMAS, WA	DATE:	02/2022
		PLATE:	A3
		PRO. #:	G12-0122

LOG OF TEST PIT — TP-1

(North Central)

ELEVATION: **+/- 596 feet**

EXPLORATORY EQUIPMENT: **TRACK HOE**

DATE: **02/10/2022**

DEPTH IN FEET	SAMPLES	SOILS CLASSIFICATION	LITHOLOGY (USGS)	COLOR	MOISTURE	CONSISTENCY	MOISTURE CONTENT % OF DRY WEIGHT	PERCENT PASS NUMBER 200
1		6" Topsoil **Silt (ML)** (Native)		Dark Brown	Moist	Firm	-	-
2								
3		**elastic Silt (MH)**		Orange Grey		Stiff to Very Stiff	27	-
4	●							
5								

Bottom of test pit at 5.0 feet below existing ground surface.
No groundwater encountered.

Earth Engineering, Inc.
GEOTECHNICAL & ENVIRONMENTAL SERVICES

CLIENT:	MADISON	DRAWN:	EG
PROJECT:	MCINTOSH PROPERTY SUBDIVISION 3210 NW MCINTOSH ROAD CAMAS, WA	DATE:	02/2022
		PLATE:	A4
		PRO. #:	G12-0122

LOG OF TEST PIT — TP-2

(West Central)

ELEVATION: **+/- 601 feet**

EXPLORATORY EQUIPMENT: **TRACK HOE**

DATE: **02/10/2022**

DEPTH IN FEET	SAMPLES	SOILS CLASSIFICATION	LITHOLOGY (USGS)	COLOR	MOISTURE	CONSISTENCY	MOISTURE CONTENT % OF DRY WEIGHT	PERCENT PASS NUMBER 200
1–2		4" Topsoil **Silt (ML)** (Native)		Dark Brown	Moist	Stiff	-	-
3–4	•	**elastic Silt (MH)**		Orange Grey		Stiff to Very Stiff	29	-

Bottom of test pit at 4.0 feet below existing ground surface.
No groundwater encountered.

Earth Engineering, Inc.
GEOTECHNICAL & ENVIRONMENTAL SERVICES

CLIENT:	MADISON	DRAWN:	EG
PROJECT:	MCINTOSH PROPERTY SUBDIVISION 3210 NW MCINTOSH ROAD CAMAS, WA	DATE:	02/2022
		PLATE:	A5
		PRO. #:	G12-0122

LOG OF TEST PIT (Southwest) — TP-3

ELEVATION: **+/- 604 feet**
EXPLORATORY EQUIPMENT: **TRACK HOE**
DATE: **02/10/2022**

DEPTH IN FEET	SAMPLES	SOILS CLASSIFICATION	LITHOLOGY (USGS)	COLOR	MOISTURE	CONSISTENCY	MOISTURE CONTENT % OF DRY WEIGHT	PERCENT PASS NUMBER 200
1–2		6" Topsoil **Silt (ML)** (Native)		Dark Brown	Moist	Firm	-	-
3–5	•	**elastic Silt (MH)**		Orange Grey		Stiff	24	-

Bottom of test pit at 5.0 feet below existing ground surface.
No groundwater encountered.

Earth Engineering, Inc.
GEOTECHNICAL & ENVIRONMENTAL SERVICES

CLIENT:	MADISON	DRAWN:	EG
PROJECT:	MCINTOSH PROPERTY SUBDIVISION 3210 NW MCINTOSH ROAD CAMAS, WA	DATE:	02/2022
		PLATE:	A6
		PRO. #:	G12-0122

LOG OF TEST PIT — TP-4

(East Central)

ELEVATION: **+/- 610 feet**

EXPLORATORY EQUIPMENT: **TRACK HOE**

DATE: **02/10/2022**

DEPTH IN FEET	SAMPLES	SOILS CLASSIFICATION	LITHOLOGY (USGS)	COLOR	MOISTURE	CONSISTENCY	MOISTURE CONTENT % OF DRY WEIGHT	PERCENT PASS NUMBER 200
1		4" Topsoil						
2	X	**Silt (ML)** Wet γ ~116 pcf Dry γ ~92 pcf (Native)		Dark Brown	Moist	Firm to Stiff	26	-
3								
4	•	**elastic Silt (MH)**		Orange Grey		Very Stiff	24	-
5								

Bottom of test pit at 5.0 feet below existing ground surface.
No groundwater encountered.

Earth Engineering, Inc.
GEOTECHNICAL & ENVIRONMENTAL SERVICES

CLIENT:	MADISON	DRAWN:	EG
PROJECT:	MCINTOSH PROPERTY SUBDIVISION 3210 NW MCINTOSH ROAD CAMAS, WA	DATE:	02/2022
		PLATE:	A7
		PRO. #:	G12-0122

LOG OF TEST PIT — TP-5

(Southeast)

ELEVATION: **+/- 594 feet**

EXPLORATORY EQUIPMENT: **TRACK HOE**

DATE: **02/10/2022**

DEPTH IN FEET	SAMPLES	SOILS CLASSIFICATION	LITHOLOGY (USGS)	COLOR	MOISTURE	CONSISTENCY	MOISTURE CONTENT % OF DRY WEIGHT	PERCENT PASS NUMBER 200
1–2	•	4" Topsoil **Silt (ML)**		Brown	Moist	Soft to Firm	26	-
3		**lean Clay (CL)**		Orange Grey		Stiff	-	-
4–12	•	**Silt (ML)** (Native)		Brown		Very Stiff to Hard	25 30	- -

Bottom of test pit at 12.0 feet below existing ground surface.
No groundwater encountered.

Earth Engineering, Inc.
GEOTECHNICAL & ENVIRONMENTAL SERVICES

CLIENT:	MADISON	DRAWN:	EG
PROJECT:	MCINTOSH PROPERTY SUBDIVISION 3210 NW MCINTOSH ROAD CAMAS, WA	DATE:	02/2022
		PLATE:	A8
		PRO. #:	G12-0122

LOG OF TEST PIT — TP-6

(Southeast)

ELEVATION: **+/- 583 feet**

EXPLORATORY EQUIPMENT: **TRACK HOE**

DATE: **02/10/2022**

DEPTH IN FEET	SAMPLES	SOILS CLASSIFICATION	LITHOLOGY (USGS)	COLOR	MOISTURE	CONSISTENCY	MOISTURE CONTENT % OF DRY WEIGHT	PERCENT PASS NUMBER 200
1		12" Topsoil						
2	☒	Wet γ ~116 pcf Dry γ ~93 pcf					24	-
3						Soft to Firm		
4								
5								
6		**Silt (ML)**		Dark Brown to Brown	Moist			
7								
8								
9	●						26	-
10						Very Stiff to Hard		
11								
12		(Native)						
13								

Bottom of test pit at 13.0 feet below existing ground surface.
No groundwater encountered.

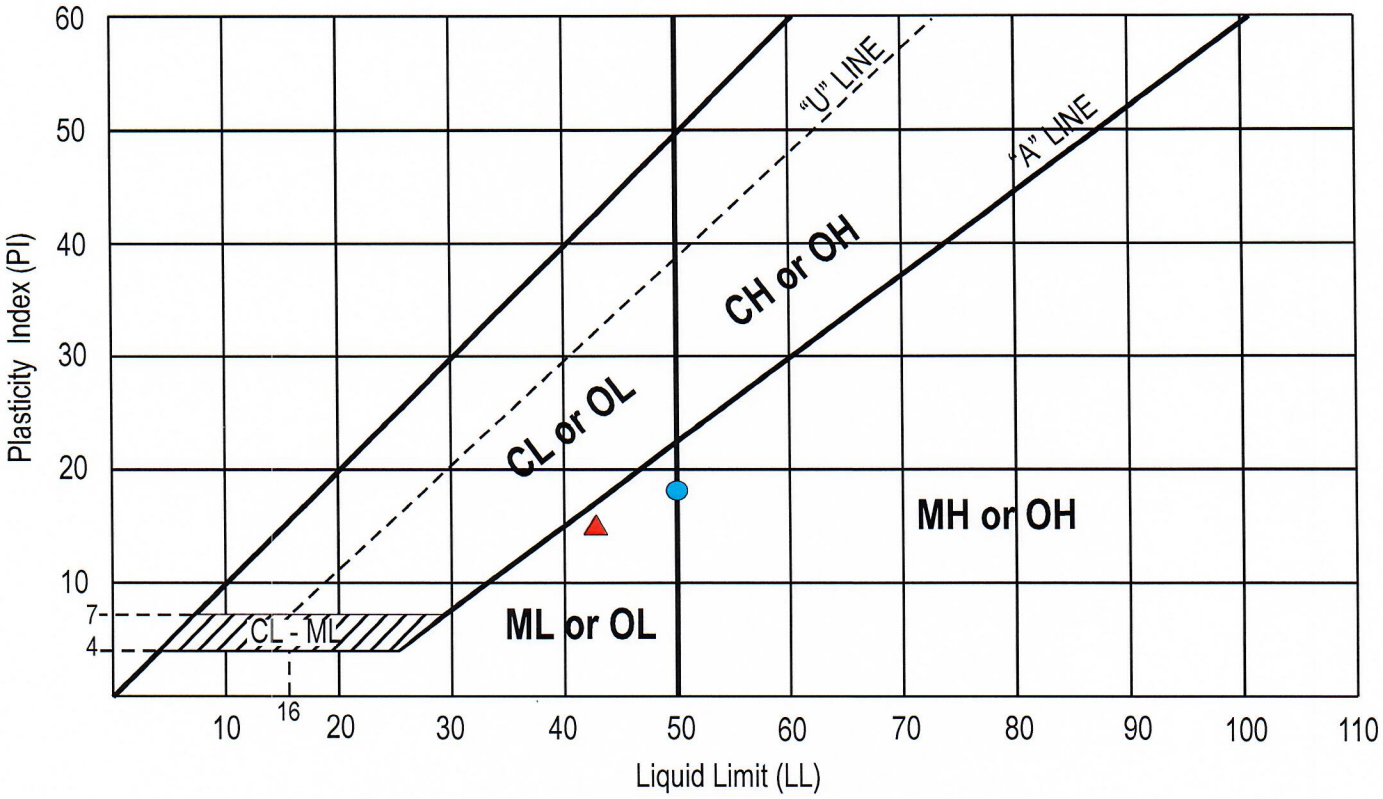
Earth Engineering, Inc.
GEOTECHNICAL & ENVIRONMENTAL SERVICES

CLIENT:	MADISON	DRAWN:	EG
PROJECT:	MCINTOSH PROPERTY SUBDIVISION 3210 NW MCINTOSH ROAD CAMAS, WA	DATE:	02/2022
		PLATE:	A9
		PRO. #:	G12-0122

APPENDIX B

(LABORATORY TESTING)

ATTERBERG LIMITS
ASTM D4318-95



● I-1 @ 4.0 feet bgs - Elastic Silt (MH)
Liquid Limit = 50 Plasticity Index = 19

▲ TP-6 @ 9.0 feet bgs - Silt (ML)
Liquid Limit = 42 Plasticity Index = 15

Earth Engineering, Inc. GEOTECHNICAL & ENVIRONMENTAL SERVICES	CLIENT: MADISON	DRAWN: DB
	PROJECT: MCINTOSH SUBDIVISION 3210 NW MCINTOSH ROAD CAMAS, WA	DATE: 03/2022
		PLATE: B1
		PRO. #: G12-0122

DISTRIBUTION

{G12-0122}

1 Copy

Sam Madison
3511 NW McMaster Drive
Camas, Washington 98606

1 Copy

SGA Engineering, PLLC
2005 Broadway Street
Vancouver, Washington 98663

Attention: Scott Taylor

Community Development
616 NE Fourth Avenue • Camas, WA 98607
(360) 817-1568
http://www.cityofcamas.us

SEPA ENVIRONMENTAL CHECKLIST

Purpose of checklist:

Governmental agencies use this checklist to help determine whether the environmental impacts of your proposal are significant. This information is also helpful to determine if available avoidance, minimization or compensatory mitigation measures will address the probable significant impacts or if an environmental impact statement will be prepared to further analyze the proposal.

Instructions for applicants:

This environmental checklist asks you to describe some basic information about your proposal. Please answer each question accurately and carefully, to the best of your knowledge. You may need to consult with an agency specialist or private consultant for some questions. You may use "not applicable" or "does not apply" only when you can explain why it does not apply and not when the answer is unknown. You may also attach or incorporate by reference additional studies reports. Complete and accurate answers to these questions often avoid delays with the SEPA process as well as later in the decision-making process.

The checklist questions apply to all parts of your proposal, even if you plan to do them over a period of time or on different parcels of land. Attach any additional information that will help describe your proposal or its environmental effects. The agency to which you submit this checklist may ask you to explain your answers or provide additional information reasonably related to determining if there may be significant adverse impact.

Instructions for Lead Agencies:

Please adjust the format of this template as needed. Additional information may be necessary to evaluate the existing environment, all interrelated aspects of the proposal and an analysis of adverse impacts. The checklist is considered the first but not necessarily the only source of information needed to make an adequate threshold determination. Once a threshold determination is made, the lead agency is responsible for the completeness and accuracy of the checklist and other supporting documents.

Use of checklist for nonproject proposals: [help]

For nonproject proposals (such as ordinances, regulations, plans and programs), complete the applicable parts of sections A and B plus the SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS (part D). Please completely answer all questions that apply and note that the words "project," "applicant," and "property or site" should be read as "proposal," "proponent," and "affected geographic area," respectively. The lead agency may exclude (for non-projects) questions in Part B - Environmental Elements –that do not contribute meaningfully to the analysis of the proposal.

A. Background [help]

1. Name of proposed project, if applicable: [help]
   McIntosh Subdivision
2. Name of applicant: [help]
   METT RI, LLC. Attn: Sam Madison

3. Address and phone number of applicant and contact person: [help] Contact Person: 2005 Broadway Street, Vancouver WA 98663
360-993-0911

4. Date checklist prepared: [help]
June 14, 2022

5. Agency requesting checklist: [help]
City of Camas

6. Proposed timing or schedule (including phasing, if applicable): [help]
Build project in 2022 and 2023.

7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain. [help]
No.

8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal. [help]
Tree Survey, Geotechnical Report and Slope stability analysis have been prepared.

9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain. [help]
NPDES permit for stormwater with Ecology and DAHP review of the Archaeological pre-determination report.

10. List any government approvals or permits that will be needed for your proposal, if known. [help] Clark County will approve any septic and well removals. City of Camas will approve Planning and Engineering.

11. Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.) [help] 28 Lot Subdivision on 9.94 Acre site.
28 new Single-family residential homes will be built on-site.

12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist. [help] Access will come from the existing NW McIntosh Road at the north edge of the property. The site address is 3210 NW McIntosh Road in Camas, WA.
Section 09, T1N R3E WM Parcel #127449-000

B. ENVIRONMENTAL ELEMENTS [help]

1. Earth [help]

a. General description of the site: [help]

(circle one): Flat, rolling, hilly, steep slopes, mountainous, other Moderate slope from south to north.

b. What is the steepest slope on the site (approximate percent slope)? [help]
Approx. 20%

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any agricultural land of long-term commercial significance and whether the proposal results in removing any of these soils. [help]
Powell Silt Loams, PoB & PoD

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe. [help]
No surface indications of unstable soils.

e. Describe the purpose, type, total area, and approximate quantities and total affected area of any filling, excavation, and grading proposed. Indicate source of fill. [help]
Site grading will occur for new streets, utility infrastructure and homes. Approx. 50,000 cubic yards of grading will occur.

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe. [help]
Yes, so erosion control methods are used like, straw, seeding, sediment ponds, waddles and silt fence.

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)? [help]
Approx. 50%

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any: [help]
Erosion control methods such as: straw, seeding, sediment ponds, waddles and silt fence may be used.
Site watering may occur if the site becomes too dry or dusty.

2. Air [help]

a. What types of emissions to the air would result from the proposal during construction, operation, and maintenance when the project is completed? If any, generally describe and give approximate quantities if known. [help]
Construction equipment will emit exhaust and air may get dusty during construction. This is a short term issue on-site.

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe. [help]
No.

c. Proposed measures to reduce or control emissions or other impacts to air, if any: [help]
Erosion control measures will help control the dust.

3. **Water** [help]

a. Surface Water:

1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into. [help]
No.

2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans. [help]
No.

3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material. [help]
N/A

4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known. [help]

No.

5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan. [help]

No.

6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge. [help]

No.

b. Ground Water:

1) Will groundwater be withdrawn from a well for drinking water or other purposes? If so, give a general description of the well, proposed uses and approximate quantities withdrawn from the well. Will water be discharged to groundwater? Give general description, purpose, and approximate quantities if known. [help]

No. Public water will be provided by Camas. Any existing wells on-site will be decommissioned.

2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals. . . ; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve. [help]

None. Any existing septic systems and drainfields will be removed with this project.

c. Water runoff (including stormwater):

1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe. [help]

Treated stormwater, from rainfall, will be detained on-site and released at below pre-developed rates. This treated water will flow into adjacent stormwater systems along the natural drainage paths.

2) Could waste materials enter ground or surface waters? If so, generally describe. [help]

No.

3) Does the proposal alter or otherwise affect drainage patterns in the vicinity of the site? If so, describe. [help]

No. existing drainage patterns will remain the same across this site and on adjacent sites.

d. Proposed measures to reduce or control surface, ground, and runoff water, and drainage pattern impacts, if any: [help]

The stormwater system will be designed to collect, convey, treat, detain and release runoff from the site in a controlled manor.

4. **Plants** [help]

a. Check the types of vegetation found on the site: [help]

_x_ deciduous tree: alder, maple, aspen, other
_x_ evergreen tree: fir, cedar, pine, other
_x_ shrubs
_x_ grass
_x_ pasture
____ crop or grain
____ Orchards, vineyards or other permanent crops.
____ wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other
____ water plants: water lily, eelgrass, milfoil, other
____ other types of vegetation

b. What kind and amount of vegetation will be removed or altered? [help]

Approx. 9 acres of the site will have the vegetation removed and soils graded. Existing trees and shrubs will be removed.

c. List threatened and endangered species known to be on or near the site. [help]

None Known. There are no Oregon White Oak trees on the site.

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any: [help]

Native plants will be used on-site wherever possible. Existing smaller deciduous and evergreen trees will be retained around the perimeter of the project where feasible.

e. List all noxious weeds and invasive species known to be on or near the site. [help]

Himalayan Black Berry is the primary noxious weed on-site. There may be some english ivy too which will be removed with site construction.

5. **Animals** [help]

a. List any birds and other animals which have been observed on or near the site or are known to be on or near the site. [help]

Examples include:

birds: hawk, heron, eagle, songbirds, other: All of these birds could use the site.
mammals: deer, bear, elk, beaver, other: No large mammals have been seen on-site.
fish: bass, salmon, trout, herring, shellfish, other _____ No fish on this site.

b. List any threatened and endangered species known to be on or near the site. [help]

c. Is the site part of a migration route? If so, explain.

[help] This site is located in what is referred to as the Pacific Flyway. The flyway stretches from Alaska to Mexico and from the Pacific Ocean to the Rocky Mountains.

d. Proposed measures to preserve or enhance wildlife, if any: [help]

Landscape plantings and some tree retention on the perimeter of the project will provide food and cover for small birds, insects, small mammals and soil organisms.

e. List any invasive animal species known to be on or near the site. [help]

None known.

6. **Energy and Natural Resources** [help]

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc. [help]

Electricity or natural gas will be used to heat the homes and electricity will be used for lighting.

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe. [help]

No.

c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any: [help]

Comply with state building codes. Utilize efficient building designs to maximize building materials and minimize waste.

7. **Environmental Health** [help]

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal? If so, describe. [help]

No.

1) Describe any known or possible contamination at the site from present or past uses. [help]

None Known.

2) Describe existing hazardous chemicals/conditions that might affect project development and design. This includes underground hazardous liquid and gas transmission pipelines located within the project area and in the vicinity. [help]

None known.

3) Describe any toxic or hazardous chemicals that might be stored, used, or produced during the project's development or construction, or at any time during the operating life of the project. [help]

None known. Contractors may fuel up equipment on-site with truck mounted fuel tanks. Any spillage would be small and cleaned up immediately by the contractor.

4) Describe special emergency services that might be required. [help]

Fire, Police or Ambulance.

5) Proposed measures to reduce or control environmental health hazards, if any: [help]

None are necessary.

b. Noise [help]

1) What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)? [help]
Mild vehicular traffic can be heard on-site.

2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site. [help]
7 am - 7pm construction noise may come from the site.

3) Proposed measures to reduce or control noise impacts, if any: [help]
Contractors will abide by city noise rules and future home owners as well.

8. **Land and Shoreline Use** [help]

a. What is the current use of the site and adjacent properties? Will the proposal affect current land uses on nearby or adjacent properties? If so, describe. [help]
The site currently has one shop on the site. Adjacent lots to the N,S,E & W have existing homes. The project will not affect land uses on adjacent properties.

b. Has the project site been used as working farmlands or working forest lands? If so, describe. How much agricultural or forest land of long-term commercial significance will be converted to other uses as a result of the proposal, if any? If resource lands have not been designated, how many acres in farmland or forest land tax status will be converted to nonfarm or nonforest use? [help]
No.

1) Will the proposal affect or be affected by surrounding working farm or forest land normal business operations, such as oversize equipment access, the application of pesticides, tilling, and harvesting? If so, how: [help]
No.

c. Describe any structures on the site. [help]
Existing shop on-site.

d. Will any structures be demolished? If so, what? [help]
Yes, the existing shop will be removed from the site.

e. What is the current zoning classification of the site? [help]
R-10 Residential

f. What is the current comprehensive plan designation of the site? [help]
Single-Family_Low Density

g. If applicable, what is the current shoreline master program designation of the site? [help]
N/A

h. Has any part of the site been classified as a critical area by the city or county? If so, specify. [help]
Steep slopes, > 15% are classified as critical area by City of Camas. This has been reviewed by Geotech.

i. Approximately how many people would reside or work in the completed project? [help]
Approx. 70 people may live in the project on the 28 lots.

j. Approximately how many people would the completed project displace? [help]
None.

k. Proposed measures to avoid or reduce displacement impacts, if any: [help]
None.

L. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any: [help]
Design of the project to meet city codes and standards for the R-10 zone.

m. Proposed measures to reduce or control impacts to agricultural and forest lands of long-term commercial significance, if any: [help]
None.

9. **Housing** [help]

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing. [help]
28 total units would be provided. Homes will likely be middle to high income given adjacent development patterns.

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing. [help]
None.

c. Proposed measures to reduce or control housing impacts, if any: [help]
None.

10. **Aesthetics** [help]

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed? [help]
Camas allows a maximum building height of 35 feet. It is anticipated that two story homes will be built on-site approx. 25-30 feet tall.

b. What views in the immediate vicinity would be altered or obstructed? [help]
Only adjacent homes/neighbors will have a view of this project. New homes are being constructed or have recently been constructed on three sides of this property.

b. Proposed measures to reduce or control aesthetic impacts, if any: [help]
Construction of visually appealing homes. Retention of perimeter trees to screen site from neighboring homes.

11. **Light and Glare** [help]

a. What type of light or glare will the proposal produce? What time of day would it mainly occur? [help]
Only residential lighting will occur in the front and back yards of the 28 lots. Street lights will be used per city standards and will be on at night over the public roadway.

b. Could light or glare from the finished project be a safety hazard or interfere with views? [help]

No. Proper shielding and orientation should eliminate any glare or safety hazards.

c. What existing off-site sources of light or glare may affect your proposal? [help]

None. Only adjacent homes and street lights will be visible from this project.

d. Proposed measures to reduce or control light and glare impacts, if any: [help]

Proper shielding and orientation of the lights will reduce glare and off-site issues.

12. **Recreation** [help]

a. What designated and informal recreational opportunities are in the immediate vicinity? [help]

Klickitat Park is north of the site.

b. Would the proposed project displace any existing recreational uses? If so, describe. [help]

No.

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any: [help]

None. Public sidewalks on-site will connect to other public sidewalks and trail systems.

13. **Historic and cultural preservation** [help]

a. Are there any buildings, structures, or sites, located on or near the site that are over 45 years old listed in or eligible for listing in national, state, or local preservation registers ? If so, specifically describe. [help]

None known.

b. Are there any landmarks, features, or other evidence of Indian or historic use or occupation? This may include human burials or old cemeteries. Are there any material evidence, artifacts, or areas of cultural importance on or near the site? Please list any professional studies conducted at the site to identify such resources. [help]

No.

c. Describe the methods used to assess the potential impacts to cultural and historic resources on or near the project site. Examples include consultation with tribes and the department of archeology and historic preservation, archaeological surveys, historic maps, GIS data, etc. [help]

A site pre-determination survey was completed by ASCC and sent to the state Archaeological group, DAHP. No artifacts or historic items were found on the site surface or in the test pits they dug.

d. Proposed measures to avoid, minimize, or compensate for loss, changes to, and disturbance to resources. Please include plans for the above and any permits that may be required. [help]

An inadvertent discovery plan and language is placed on the construction plans in the event the contractor finds any historic artifacts or remains.

14. **Transportation** [help]

a. Identify public streets and highways serving the site or affected geographic area and describe proposed access to the existing street system. Show on site plans, if any. [help]

NW McIntosh Road is a public road on the north side of the project which will provide access to the site.

b. Is the site or affected geographic area currently served by public transit? If so, generally describe. If not, what is the approximate distance to the nearest transit stop? [help]

Public transportation is provided by C-Trans and operates approx. 1/2 mile south of the site.

c. How many additional parking spaces would the completed project or non-project proposal have? How many would the project or proposal eliminate? [help]

The project will not eliminate any parking spaces. The total parking spaces on-site will exceed 112. Each home will have a two car driveway and two car garage minimum.

d. Will the proposal require any new or improvements to existing roads, streets, pedestrian, bicycle or state transportation facilities, not including driveways? If so, generally describe (indicate whether public or private). [help]

Yes, NW McIntosh will be built to City standards. Internal roads will be constructed to serve the proposed lots.

e. Will the project or proposal use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe. [help]

No.

f. How many vehicular trips per day would be generated by the completed project or proposal? If known, indicate when peak volumes would occur and what percentage of the volume would be trucks (such as commercial and nonpassenger vehicles). What data or transportation models were used to make these estimates? [help]

Approx. 264 average daily trips would occur to and from this site. Very few trips would be commercial or non passenger vehicles. The ITE 11th Edition was used for the 9.52 ADT/Unit rate. AM peak is usually around 20 and PM around 25.

g. Will the proposal interfere with, affect or be affected by the movement of agricultural and forest products on roads or streets in the area? If so, generally describe. [help]

No.

h. Proposed measures to reduce or control transportation impacts, if any: [help]

Build NW McIntosh Road and internal roadways to city standards for new homes and the public to use.

15. **Public Services** [help]

a. Would the project result in an increased need for public services (for example: fire protection, police protection, public transit, health care, schools, other)? If so, generally describe. [help]

Yes, the project will require all public services. Emergency services like fire, police and ambulance, other services include trash & recycling, delivery services, public schooling and utilities.

b. Proposed measures to reduce or control direct impacts on public services, if any. [help]

Build project per city standards. 28 of the lots will pay impact fees for schools, traffic and parks. Future residents will pay taxes to the city and county for use in public services.

16. **Utilities** [help]

a. Circle utilities currently available at the site: [help]

electricity, natural gas, water, refuse service, telephone, sanitary sewer, septic system,

other _____

Electricity, Natural Gas, Water, Telephone, Sanitary Sewer and Refuse services.

b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed. [help] Water & Sewer: City of Camas, Telephone: Comcast or Qwest
Electricity: Clark Public Utilities, Gas: NW Natural Gas

C. Signature [help]

Under the penalty of perjury, the above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

Signature: _____

Name of signee Scott Taylor

Position and Agency/Organization Land Use Planner

Date Submitted: 4-06-2021

EXISTING CONDITIONS SURVEY

LOCATED IN A PORTION OF THE NW 1/4 OF THE SE 1/4 OF SECTION 9 T. 1 N., R. 3 E., W.M. CITY OF CAMAS CLARK COUNTY, WASHINGTON

HORIZONTAL DATUM:
NAD 83(2011)(EPOCH 2010.0000), WASHINGTON STATE PLANE COORDINATE SYSTEM, SOUTH ZONE, US SURVEY FEET.

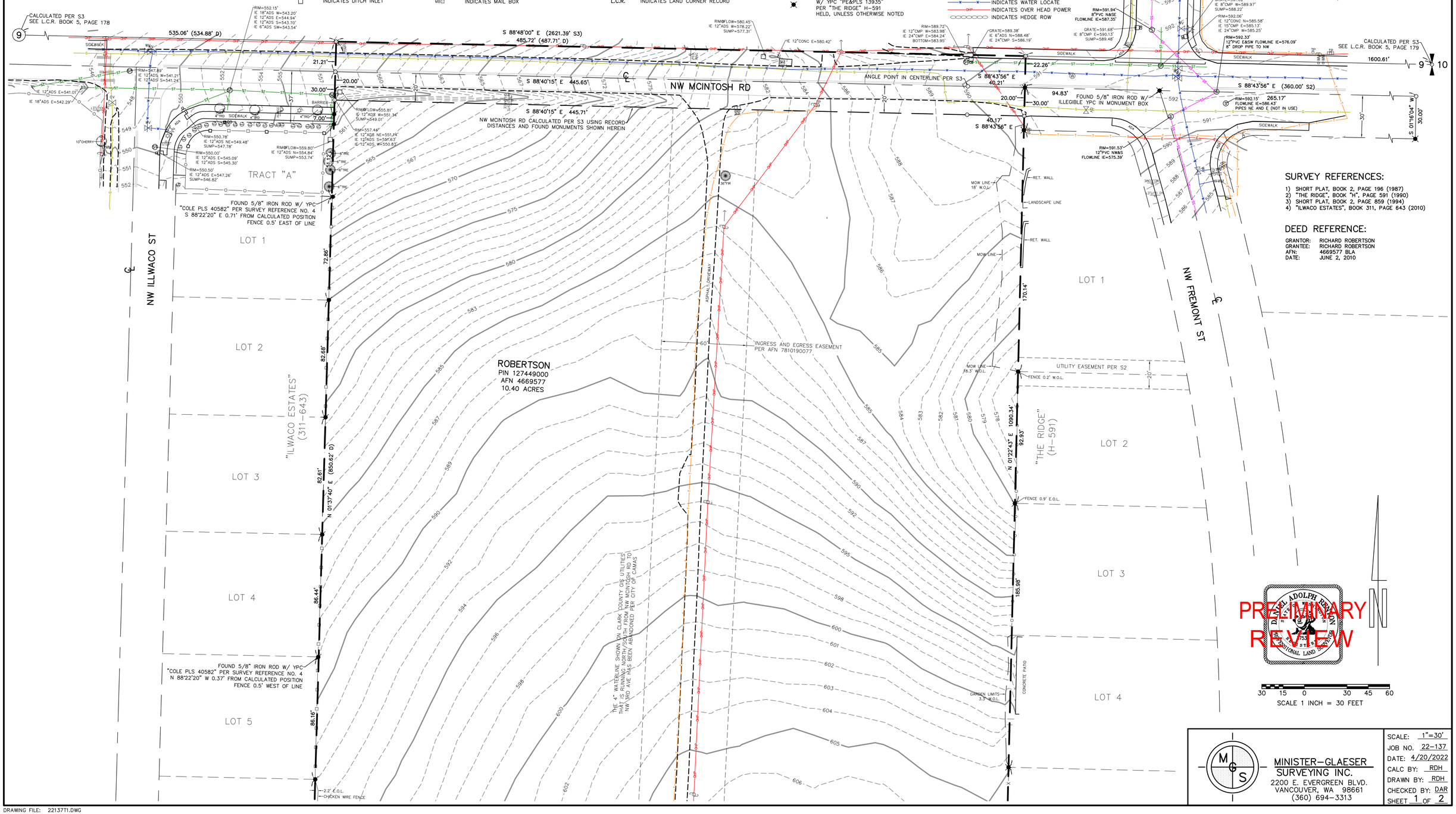
VERTICAL DATUM:
CITY OF CAMAS

STATEMENT OF PURPOSE:
THIS EXISTING CONDITIONS SURVEY IS INTENDED TO FULFILL THE CLARK COUNTY REQUIREMENT FOR A PRELIMINARY BOUNDARY SURVEY OF THE SUBJECT PARCEL, PER ITEM 21 OF THE CLARK COUNTY "TYPE II, II-A AND III SUBMITTAL REQUIREMENTS" HANDOUT.

LEGEND:

- INDICATES WATER VALVE
- INDICATES FIRE HYDRANT
- INDICATES WATER METER
- INDICATES CONTROL VALVE
- INDICATES WATER VAULT
- INDICATES WATER MANHOLE
- INDICATES TELEPHONE SERVICE BOX
- INDICATES TELEPHONE MARKER
- INDICATES STORM SEWER MANHOLE
- INDICATES STORM CLEANOUT
- INDICATES DITCH INLET
- INDICATES CURB INLET
- INDICATES CATCH BASIN
- INDICATES SANITARY SEWER MANHOLE
- INDICATES SEPTIC SYSTEM LID
- INDICATES POWER POLE
- INDICATES GUY ANCHOR
- INDICATES LIGHT POLE
- INDICATES ELECTRIC SERVICE BOX
- INDICATES GAS VALVE
- INDICATES GAS MARKER
- INDICATES SIGN
- INDICATES MAIL BOX
- INDICATES SHRUB
- INDICATES EVERGREEN TREE WITH TRUNK DIAMETER AND TYPE
- INDICATES DECIDUOUS TREE WITH TRUNK DIAMETER AND TYPE
- (S#) INDICATES RECORD DATA PER SURVEY REFERENCE NUMBER
- (D) INDICATES RECORD DATA PER DEED REFERENCE
- AFN INDICATES AUDITOR'S FILE NUMBER
- PIN INDICATES PARCEL IDENTIFICATION NUMBER
- E.O.L. INDICATES EAST OF LINE
- W.O.L. INDICATES WEST OF LINE
- L.C.R. INDICATES LAND CORNER RECORD
- ADA INDICATES ADA RAMP
- ASPH INDICATES ASPHALT
- CONC INDICATES CONCRETE
- GRVL INDICATES GRAVEL
- TRE INDICATES UNIDENTIFIED EVERGREEN TREE
- TRD INDICATES UNIDENTIFIED DECIDUOUS TREE
- INDICATES MONUMENT FOUND AS NOTED
- INDICATES CALCULATED POSITION
- INDICATES FOUND 5/8" IRON ROD W/ YPC "COLE PLS 40582" PER "ILWACO ESTATES" 311-643 HELD, UNLESS OTHERWISE NOTED
- INDICATES FOUND 5/8" IRON ROD W/ YPC "PE&PLS 13935" PER "THE RIDGE" H-591 HELD, UNLESS OTHERWISE NOTED
- INDICATES BOUNDARY
- INDICATES EDGE OF ASPHALT
- INDICATES EDGE OF CONCRETE
- INDICATES EDGE OF GRAVEL
- INDICATES 5 FOOT INTERVAL CONTOUR
- INDICATES 1 FOOT INTERVAL CONTOUR
- INDICATES FENCE LINE
- INDICATES CHAINLINK FENCE LINE
- INDICATES WOOD FENCE LINE
- INDICATES PAINT STRIPE
- INDICATES ELECTRIC LOCATE
- INDICATES GAS LOCATE
- INDICATES SANITARY LOCATE
- INDICATES STORM LOCATE
- INDICATES TELEPHONE LOCATE
- INDICATES TELEVISION LOCATE
- INDICATES WATER LOCATE
- INDICATES OVER HEAD POWER
- INDICATES HEDGE ROW

TIN, R3E, W.M.



SURVEY REFERENCES:

1) SHORT PLAT, BOOK 2, PAGE 196 (1987)
2) "THE RIDGE", BOOK "H", PAGE 591 (1990)
3) SHORT PLAT, BOOK 2, PAGE 859 (1994)
4) "ILWACO ESTATES", BOOK 311, PAGE 643 (2010)

DEED REFERENCE:

GRANTOR: RICHARD ROBERTSON
GRANTEE: RICHARD ROBERTSON
AFN: 4669577 BLA
DATE: JUNE 2, 2010

PRELIMINARY REVIEW

DANIEL ADOLPH REDMON — 75348 — REGISTERED PROFESSIONAL LAND SURVEYOR

30 15 0 30 45 60
SCALE 1 INCH = 30 FEET

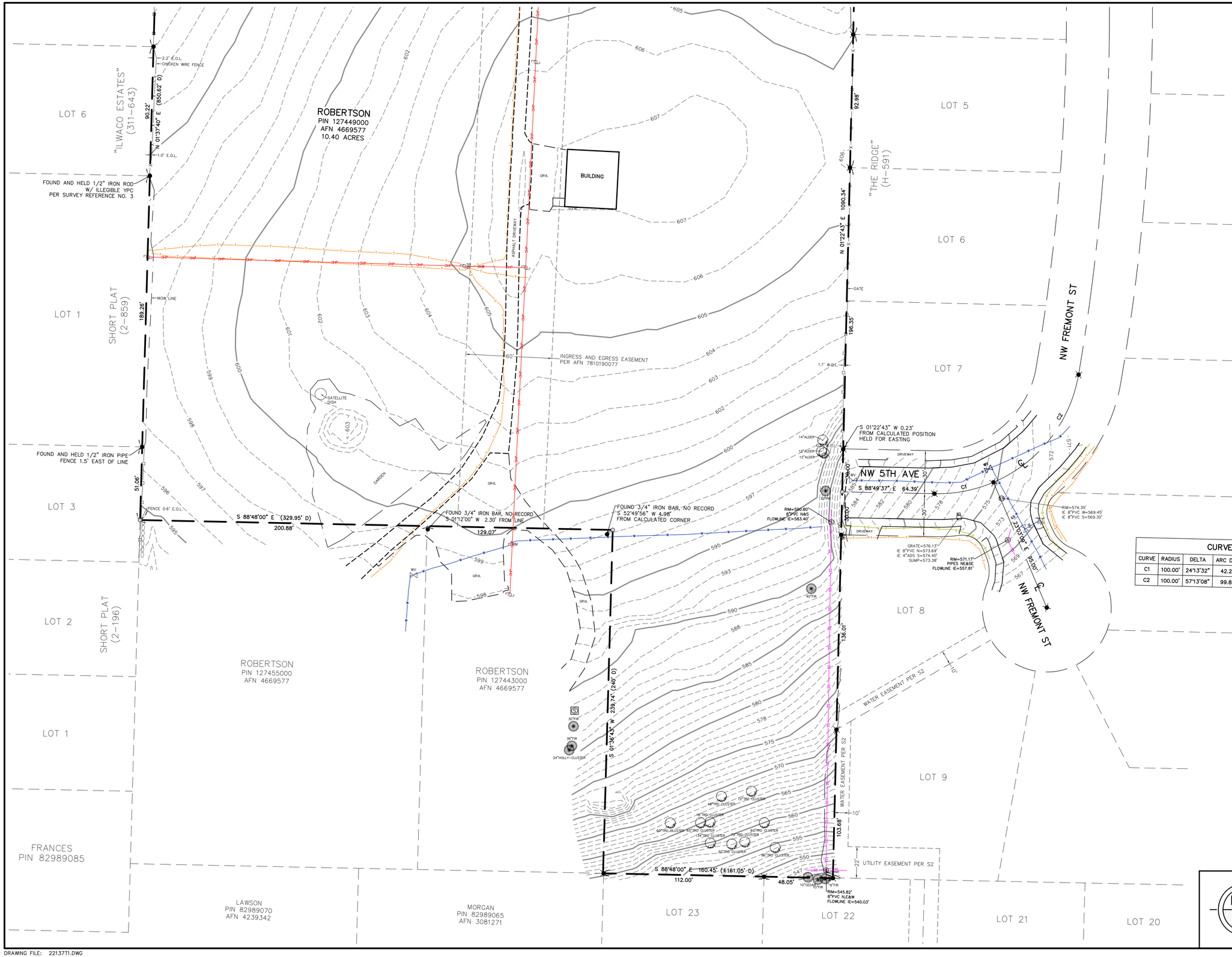
MINISTER-GLAESER SURVEYING INC.
2200 E. EVERGREEN BLVD.
VANCOUVER, WA 98661
(360) 694-3313

SCALE: 1"=30'
JOB NO. 22-137
DATE: 4/20/2022
CALC BY: RDH
DRAWN BY: RDH
CHECKED BY: DAR
SHEET 1 OF 2

DRAWING FILE: 22137T1.DWG

EXISTING CONDITIONS SURVEY

LOCATED IN A PORTION OF
THE NW 1/4 OF THE SE 1/4
OF SECTION 9
T. 1 N., R. 3 E., W.M.
CITY OF CAMAS
CLARK COUNTY, WASHINGTON



CURVE TABLE					
CURVE	RADIUS	DELTA	ARC DIST.	CHORD BEARING	CHORD DIST.
C1	100.00'	24°13'32"	42.28'	N 79°03'37" E	41.97'
C2	100.00'	57°13'08"	99.87'	N 38°20'17" E	95.77'

PRELIMINARY REVIEW

30 15 0 30 45 60
SCALE 1 INCH = 30 FEET

MINISTER-GLAESER SURVEYING INC.
2200 E. EVERGREEN BLVD.
VANCOUVER, WA 98661
(360) 694-3313

SCALE:	1"=30'
JOB NO.	22-137
DATE:	4/20/2022
CALC BY:	RDH
DRAWN BY:	RDH
CHECKED BY:	DAR
SHEET	2 OF 2

DRAWING FILE: 22137T1.DWG

TRANSPORTATION IMPACT STUDY

FOR

MCINTOSH SUBDIVISION

3210 NW MCINTOSH ROAD

CITY OF CAMAS, WASHINGTON

4/27/2022

PREPARED BY

KELLY ENGINEERING

April 2022

TRANSPORTATION IMPACT STUDY

McIntosh Subdivision

City of Camas, Washington

April 27, 2022

Prepared for:

Sam Madison
3511 NW McMaster Drive
Camas, WA 98606

Prepared by:
Kelly Engineering
1805 NE 94th St. No. 19
Vancouver, WA 98665
Phone: 360-433-7530
e-mail: Kellyengineer@comcast.net

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Figure 1c - Preliminary Plat
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Figure 5 - Site Traffic Distribution/Assignment
Figure 6 - Year 2025 Traffic Volumes with Project
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Appendix C - Level of Service Computer Printouts
Appendix D - References

TRANSPORTATION IMPACT STUDY

MCINTOSH SUBDIVISION

April 27, 2022

INTRODUCTION

A transportation impact study (TIS) for the McIntosh Subdivision was conducted to determine the potential traffic related impacts of the development to the surrounding roadway system. The development will consist of 28 single family detached homes. The site is vacant with outbuildings. The McIntosh Subdivision TIS was based on guidelines as adopted by the City of Camas, correspondence with city staff and the Pre-Application meeting notes for the project.

The 9.94 acre site is located at 3210 NW McIntosh Road (Parcel 127449000) in the City of Camas. Land uses in the vicinity of the site consist of single family homes and undeveloped land. A vicinity map, aerial photograph and preliminary plat are shown in Figures 1a, 1b and 1c.

Roadway Characteristics

NW McIntosh Road is a 20 foot wide 2-lane paved roadway with no shoulders along the site frontage. Double yellow striping is along the centerline of the roadway indicating that passing is prohibited. The posted speed limit is 35 mph. A "Limited Sight Distance" sign is along the site frontage for eastbound traffic. The warning sign is due to the limited sight distance for vehicles entering McIntosh Road from NW Fremont Street and looking towards the west. NW McIntosh Road is classified as a 2 lane arterial and the average daily traffic is approximately 1,000 vehicles per day (VPD).

In addition to a direct access onto NW McIntosh Road the assumption was made that a connection will be made to NW Fremont Street to the east through The Ridge Subdivision. NW Fremont Street is a 36 foot wide dead end curb to curb roadway with sidewalks.

The study area intersections in the TIA are controlled by stop signs on the minor street approaches. The lane configurations for the intersections are shown in Figure 2.

Traffic Volumes

The traffic counts in this report were conducted from 7:00 to 9:00 am and 4:00 to 6:00 pm during April 2022 along the site frontage and at the NW Brady Road/NW Grand Ridge Drive, NW Brady Road/NW Mcintosh Road and NW Fremont Street/NW McIntosh Road intersections. The traffic counts were conducted to determine the peak hours. The peak hour at an intersection is the one hour time period when traffic volumes are the highest and congestion is most likely to occur. The existing traffic volumes are included in Figure 3. The raw traffic count data is included in Appendix A.

Trip Generation/Distribution

The McIntosh Subdivision will generate approximately 264 trips per day, ITE Trip Generation Manual, 11th edition. A trip is a one-directional vehicle movement. 20 trips will occur during the AM peak hour and 25 trips will occur during the PM peak hour. The trip generation rates are shown in Table 1.

Table 1
Site Traffic Generation

Land Use	ITE code	Dwelling Units	Daily Trips	AM Peak Hour Trips	PM Peak Hour Trips
Single-Family Detached Housing	210	28	264	20 (in-5, out-15)	26 (in-17, out-9)

The directional distribution of traffic generated by the development was assigned to the study area intersections. The distribution was based on the existing traffic volumes. Based on the volumes 65% of the site traffic will travel to and from SR-14 via NW Brady Road. The remaining 35% will travel to and from the east on NW Brady Road and NW McIntosh Road. The site traffic distribution and assignment diagrams are shown in Figure 5.

Year 2025 Traffic Volumes

The year 2025 traffic volumes at the study area intersections included a two percent per year compounded growth factor over the existing traffic volumes and in-process traffic. In-process traffic is traffic from developments that have been approved, but are not fully occupied. The only in-process traffic in the area is from Phase II of the Dawson Ridge Subdivision to the west. At the present time 10 homes are not occupied. The growth factor and in-process traffic was included to provide an analysis of the study area intersections for build-out of the McIntosh Subdivision, forecast year 2025 traffic conditions.

Peak Hour Traffic Operations

Based on discussions with representatives from the City of Camas an analysis was conducted at the following intersections during the weekday AM and PM peak hours of the adjacent street traffic:

(1) NW Brady Road & NW Grand Ridge Drive
(2) NW Brady Road & NW McIntosh Road
(3) NW Fremont Street & NW McIntosh Road
(4) Site Access & NW McIntosh Road

The study area intersections were analyzed to determine existing, year 2025 without project and year 2025 with project conditions. The direct site access onto NW McIntosh Road was analyzed for the year 2025 with project conditions. The year 2025 traffic volumes without and with the project are shown in Figures 4 and 6.

The intersection operational analysis was conducted using the procedures in the 2010 Highway Capacity Manual. These procedures describe the operation of an intersection in terms of its level of service (LOS). The LOS criteria ranges from "A", which indicates little, if any, delay to "F", which indicates that vehicles experience very long delays. The LOS criteria with the corresponding delay in seconds per vehicle is shown in Table 2. The capacity analysis summary is shown in Table 3 on page 4.

Table 2
Level of Service Criteria

Level of Service (LOS)	A	B	C	D	E	F
Unsignalized intersections Average Delay (seconds per vehicle)	≤10	>10 - 15	>15 - 25	>25 - 35	>35 - 50	>50

Table 3
Capacity Analysis Summary

	AM Peak Hour		PM Peak Hour	
	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
NW Brady Road & NW Grand Ridge Drive				
Existing	B	12.2	B	10.7
Year 2025 w/o Project	B	12.7	B	10.9
Year 2025 with Project	B	12.8	B	11.0
NW Brady Road & NW McIntosh Road				
Existing	C	16.0	B	14.4
Year 2025 w/o Project	C	17.3	C	15.3
Year 2025 with Project	C	17.9	C	15.8
NW Fremont Street & NW McIntosh Road				
Existing	A	9.1	A	9.5
Year 2025 w/o Project	A	9.8	A	9.6
Year 2025 with Project	A	9.4	A	9.4
Site access & NW McIntosh Road				
Year 2025 with Project	A	9.4	A	9.5

Based on the findings of the TIS the study area intersections will operate at acceptable levels with build-out of the McIntosh Subdivision. The LOS computer printouts are included in Appendix C.

Pedestrian, Bicycle & Transit Considerations

Low pedestrian and no bicycle activities were observed within the vicinity of the site. The site is not served by public transit service.

Collision Data

Collision data was obtained from the Washington State Department of Transportation (WSDOT) for the three year time period between December 23, 2018 and December 23, 2021. This is the most recent three years of available data. Based on the available data the calculated accident rates do not exceed 1.0 accidents per million entering vehicles (MEV) that usually identifies an intersection with a high accident rate. The collision data for the study area intersections is shown in Table 4 and Appendix B.

Table 4
Collision Data

Intersection	Number of Collisions	Collision Type		Rate MEV *
		Angle	Fixed Object	
NW Brady Road/ NW Grand Ridge Dr.	1	1		0.12
NW Brady Road/ NW McIntosh Road	2	1	1	0.27
NW Fremont Street/ NW McIntosh Road	0			

* Accident rate per million entering vehicles

Turn Lanes

The requirement for additional turn lanes was evaluated at the study area intersections and site access as based on guidelines in the Washington State Design Manual. Based on the findings additional turn lanes are not required.

Movement Conflicts with Adjacent Intersections/Driveways

Based on field observations including the existing traffic volumes no turning movement conflicts will occur with any adjacent intersections or driveways. The NW Ilwaco Street/NW McIntosh Road intersection to the west and NW Fremont Street/NW McIntosh Road intersection to the east both have very little traffic.

Sight Distance

Sight distance was measured at the site access onto NW McIntosh Road. The measured intersection sight distance was over 400 feet when looking towards the west and 350 feet when looking towards the east. The sight distance when looking towards the east was slightly restricted by the vertical curve on NW McIntosh Road. Based on the criteria in AASHTO, A Policy on Geometric Design of Highways and Streets and the posted speed limit of 35 mph on NW McIntosh Road the recommended intersection sight distance is 390 feet.

Transportation Improvements

Bike and pedestrian improvements on Brady Road from McIntosh to the west city limits are identified in the City of Camas 6-year Transportation Improvement Program. The project has a priority number of 23 with preliminary engineering scheduled for January 2025.

School Considerations

Elementary and middle school students will attend Prune Hill Elementary and Skyridge Middle School. High School Students will attend Camas High School. School bus service will be provided for all students. The school bus routes change on a yearly basis depending on where new developments occur. Currently there are school bus stops on Ilwaco Street to the west and NW Fremont Street to the east.

City of Vancouver Concurrency

Approximately 65% of the traffic from the McIntosh Subdivision will enter the City of Vancouver. The City of Vancouver maintains a list of concurrency corridors that are modeled according to their level of service standard and PM peak hour speed. 17 PM peak hour trips from the development are projected to enter the 192nd Avenue Concurrency Corridor. The concurrency corridors are shown in Table 5.

Table 5
Concurrency Corridors

Arterial Concurrency Corridor	Limits of Corridor	PM Peak hour trips entering corridors from the McIntosh Subdivision
Mill Plain Blvd.	Fourth Plain to I-5	0
	I-5 to Andresen	0
	Andresen to I-205	0
	I-205 to 136th Ave.	0
	136th Ave. to 164th Ave.	0
	164th Ave. to 192nd Ave.	0
St. Johns/Ft. Van Way	Mill Plain to 63rd St.	0
Fourth Plain Blvd.	Mill Plain to I-5	0
	I-5 to Andresen	0
	Andresen to I-205	0
	I-205 to 162nd Ave.	0
Andresen Road	Mill Plain to SR 500	0
	SR 500 to 78th St.	0
112th Avenue	Mill Plain to 28th St.	0
	28th St. to 51st St.	0
164th/162nd Avenue	SR 14 to SE 1st St.	0
	SE 1st St. to Fourth Plain	0
Burton Road/28th Street	18th St. to 112th Ave.	0
	112th Ave. to 138th Ave.	0
	138th Ave. to 162nd Ave.	0
18th Street	112th Ave. to 138th Ave.	0
	138th Ave. to 164th Ave.	0
136th/137th Avenue	Mill Plain to 28th St.	0
	28th St. to Fourth Plain	0
192nd Avenue	SR 14 to NE 18th St.	17

Proportionate Share Fees for COV Projects

The COV is collecting proportionate share fees for the following projects that are shown in Table 6.

Table 6
COV Projects

Project Location	Unit Cost per Trip
137th Ave. - 49th St. to Fourth Plain Blvd.	$3,000 per PM peak hour trip
192nd Ave. & SR-14 ramps	$2,000 per PM peak hour trip
Fourth Plain Blvd. & 152nd Ave. Signal	$333 per PM peak hour trip
Leiser/St. Helens/McArthur	$2,000 per PM peak hour trip
192nd Ave. & NE 13th St.	$400 per PM peak hour trip
192nd Ave. & NE 34th St.	$150 per PM peak hour trip
176th Ave. & NE 20th St.	$400 per PM peak hour trip
Grove St./Columbia House Blvd./SR-14 WB off-ramp	$600 per AM peak hour trip

17 PM peak hour trips from the McIntosh Subdivision are projected to enter the 192nd Ave. & SR-14 ramps. The unit cost per trip would be $2,000.

CONCLUSIONS AND RECOMMENDATIONS

Based on the findings of this transportation impact study the surrounding roadway system can adequately accommodate traffic from the McIntosh Subdivision. The study area intersections will operate at level of service "C" or better with build out of the development.

The sight distance when looking towards the east from the future site access is slightly restricted by a crest vertical curve on NW Mcintosh Road. The measured intersection sight distance was 350 feet and 390 feet would be desirable as based on the criteria in AASHTO, A Policy on Geometric Design of Highways and Streets. Consideration should be given to install a "Limited Sight Distance" sign similar to the one on McIntosh Road for eastbound traffic. The sign could be installed to the west of NW Fremont Street for westbound traffic. No additional off-site traffic control devices or roadway improvements were identified to accommodate the development.

17 trips from the McIntosh Subdivision are projected to enter the 192nd Ave. & SR-14 ramps during the PM peak hour. This project location is under the jurisdiction of the City of Vancouver. The City of Vancouver is collecting proportionate share fees with a unit cost per trip of $2,000.

Adequate sight distance should be maintained at the site access onto McIntosh Road. Obstructions by signs, vegetation or other objects should not be allowed.

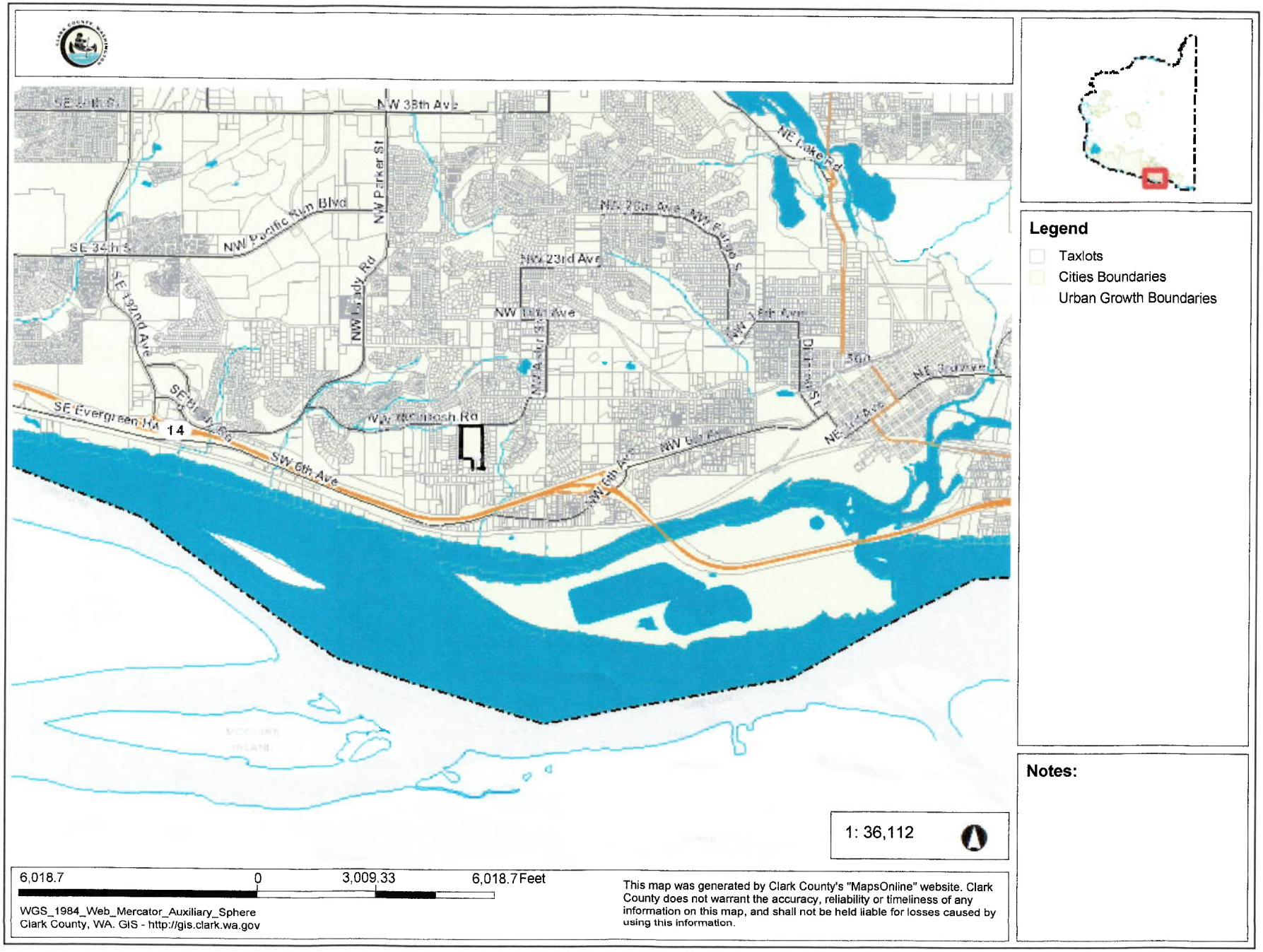

NW 38th Ave
NW Parker St
NW Pacific Rim Blvd
SE 34th St
NW Lindy Rd
NW 23rd Ave
NW 21st Ave
NE Lake Rd
SE 192nd Ave
SE Evergreen Hwy
14
SW 6th Ave
NW 6th Ave
NE 3rd Ave
Legend
Taxlots
Cities Boundaries
Urban Growth Boundaries
Notes:
1: 36,112
6,018.7
0
3,009.33
6,018.7 Feet
WGS_1984_Web_Mercator_Auxiliary_Sphere
Clark County, WA. GIS - http://gis.clark.wa.gov
This map was generated by Clark County's "MapsOnline" website. Clark County does not warrant the accuracy, reliability or timeliness of any information on this map, and shall not be held liable for losses caused by using this information.

FIGURE 1a

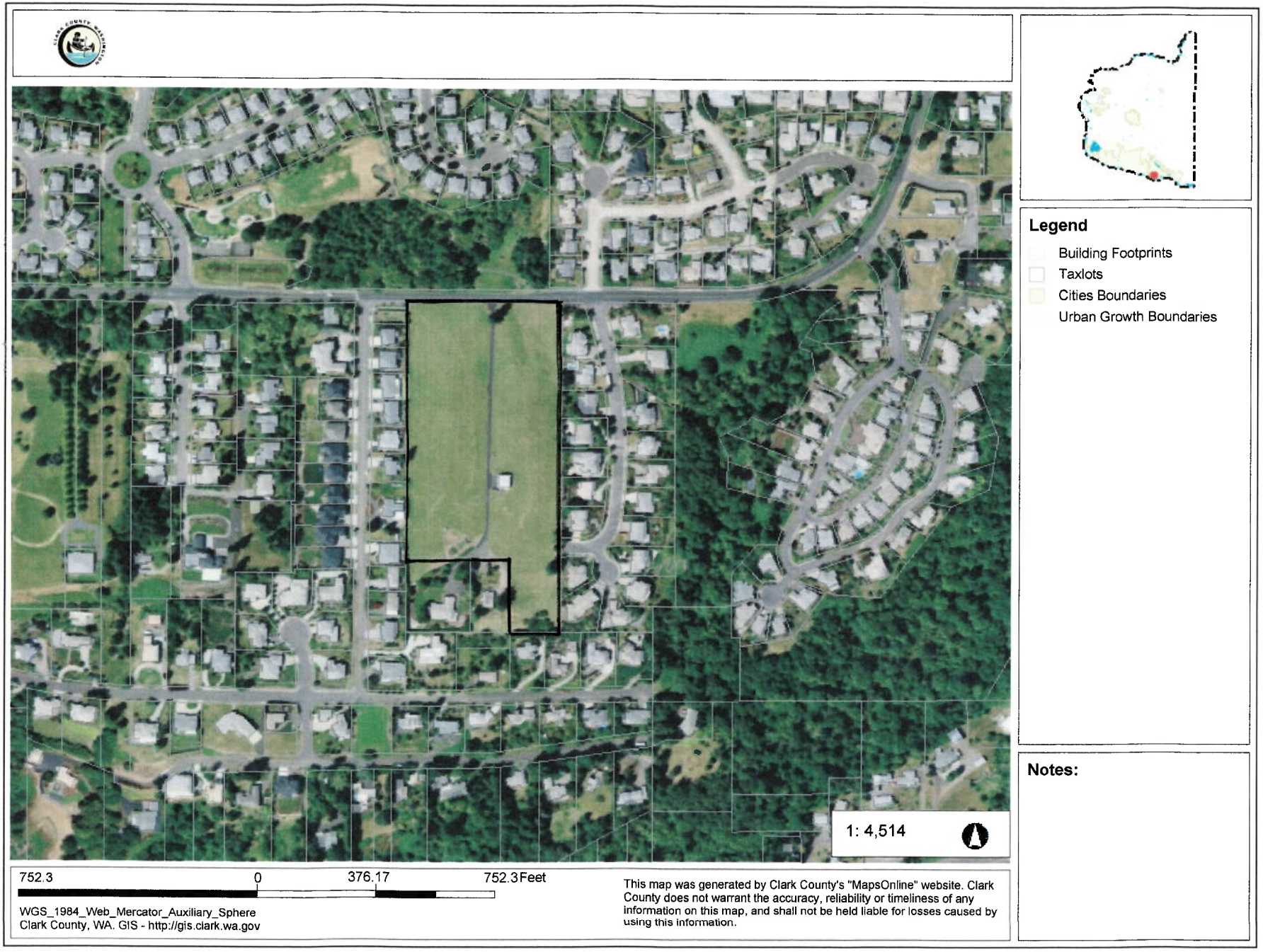

Legend
Building Footprints
Taxlots
Cities Boundaries
Urban Growth Boundaries
Notes:
1: 4,514
752.3
0
376.17
752.3 Feet
WGS_1984_Web_Mercator_Auxiliary_Sphere
Clark County, WA. GIS - http://gis.clark.wa.gov
This map was generated by Clark County's "MapsOnline" website. Clark County does not warrant the accuracy, reliability or timeliness of any information on this map, and shall not be held liable for losses caused by using this information.

FIGURE 1b

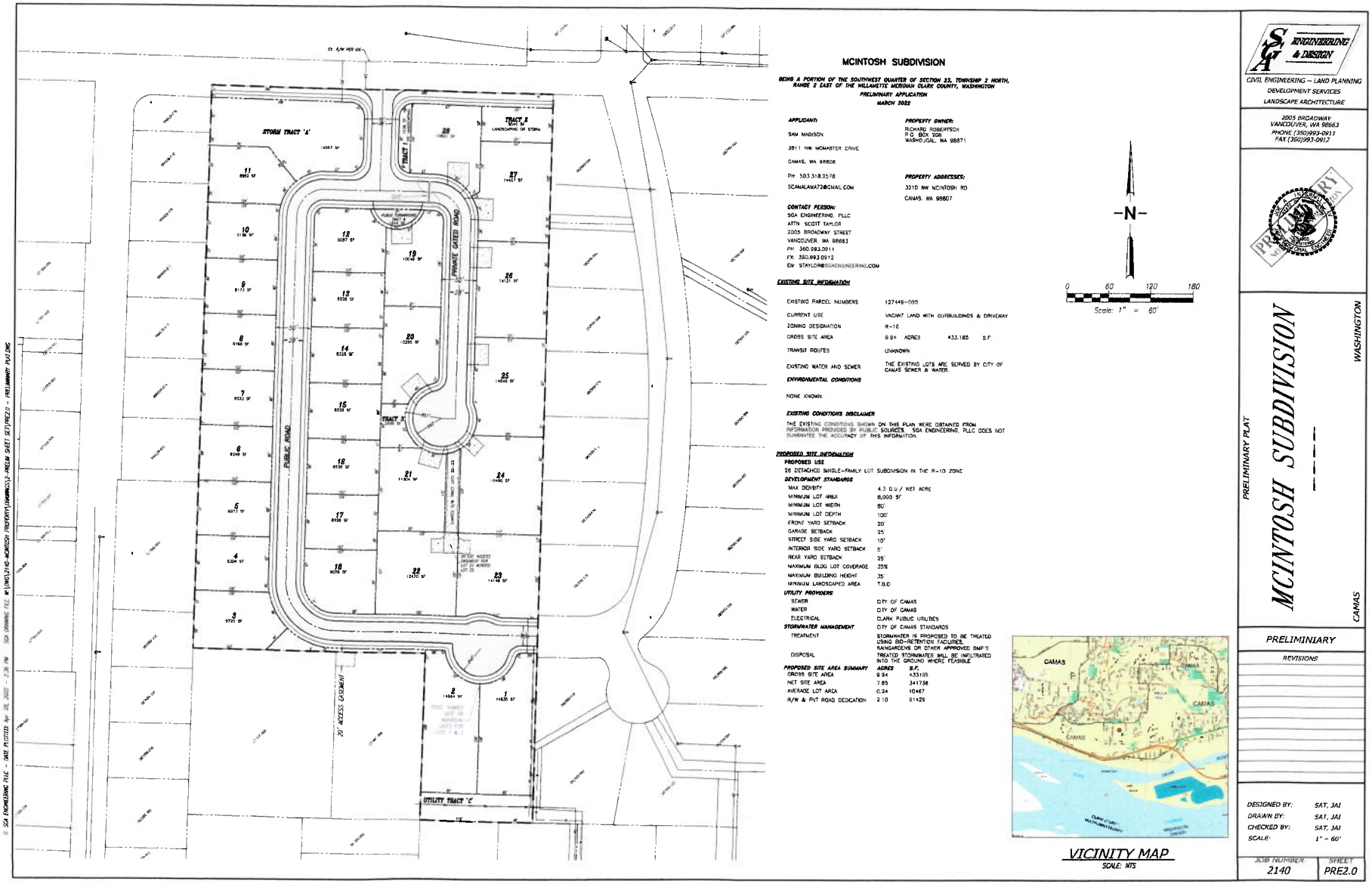

MCINTOSH SUBDIVISION
BEING A PORTION OF THE SOUTHWEST QUARTER OF SECTION 33, TOWNSHIP 2 NORTH, RANGE 2 EAST OF THE WILLAMETTE MERIDIAN CLARK COUNTY, WASHINGTON
PRELIMINARY APPLICATION
MARCH 2022
APPLICANT:
SAM MADISON
3811 NW MCMASTER DRIVE
CAMAS, WA 98606
PH 503.318.2578
SCAMALAMA72@GMAIL.COM
PROPERTY OWNER:
RICHARD ROBERTSON
P.O. BOX 308
WASHOUGAL, WA 98671
PROPERTY ADDRESSES:
321D NW MCINTOSH RD
CAMAS, WA 98607
CONTACT PERSON:
SGA ENGINEERING, PLLC
ATTN SCOTT TAYLOR
2005 BROADWAY STREET
VANCOUVER, WA 98663
PH 360.993.0911
FX 360.993.0912
EM STAYLOR@SGAENGINEERING.COM
EXISTING SITE INFORMATION
EXISTING PARCEL NUMBERS 127449-000
CURRENT USE VACANT LAND WITH OUTBUILDINGS & DRIVEWAY
ZONING DESIGNATION R-10
GROSS SITE AREA 9.94 ACRES 433,185 S.F.
TRANSIT ROUTES UNKNOWN
EXISTING WATER AND SEWER THE EXISTING LOTS ARE SERVED BY CITY OF CAMAS SEWER & WATER.
ENVIRONMENTAL CONDITIONS
NONE KNOWN.
EXISTING CONDITIONS DISCLAIMER
THE EXISTING CONDITIONS SHOWN ON THIS PLAN WERE OBTAINED FROM INFORMATION PROVIDED BY PUBLIC SOURCES. SGA ENGINEERING, PLLC DOES NOT GUARANTEE THE ACCURACY OF THIS INFORMATION.
PROPOSED SITE INFORMATION
PROPOSED USE
28 DETACHED SINGLE-FAMILY LOT SUBDIVISION IN THE R-10 ZONE
DEVELOPMENT STANDARDS
MAX DENSITY 4.3 D.U. / NET ACRE
MINIMUM LOT AREA 6,000 SF
MINIMUM LOT WIDTH 60'
MINIMUM LOT DEPTH 100'
FRONT YARD SETBACK 20'
GARAGE SETBACK 25'
STREET SIDE YARD SETBACK 10'
INTERIOR SIDE YARD SETBACK 5'
REAR YARD SETBACK 25'
MAXIMUM BLDG LOT COVERAGE 35%
MAXIMUM BUILDING HEIGHT 35'
MINIMUM LANDSCAPED AREA TBD
UTILITY PROVIDERS
SEWER CITY OF CAMAS
WATER CITY OF CAMAS
ELECTRICAL CLARK PUBLIC UTILITIES
STORMWATER MANAGEMENT CITY OF CAMAS STANDARDS
TREATMENT STORMWATER IS PROPOSED TO BE TREATED USING BIO-RETENTION FACILITIES, RAINGARDENS OR OTHER APPROVED BMP'S
DISPOSAL TREATED STORMWATER WILL BE INFILTRATED INTO THE GROUND WHERE FEASIBLE.
PROPOSED SITE AREA SUMMARY ACRES S.F.
GROSS SITE AREA 9.94 433185
NET SITE AREA 7.85 341738
AVERAGE LOT AREA 0.24 10467
R/W & PVT ROAD DEDICATION 2.10 91429
STORM TRACT 'A'
TRACT 'B'
TRACT 'C'
PRIVATE GATED ROAD
PUBLIC ROAD
20' ACCESS EASEMENT
UTILITY TRACT 'C'
N
0 60 120 180
Scale: 1" = 60'
VICINITY MAP
SCALE: NTS
SGA ENGINEERING
CIVIL ENGINEERING – LAND PLANNING
DEVELOPMENT SERVICES
LANDSCAPE ARCHITECTURE
2005 BROADWAY
VANCOUVER, WA 98663
PHONE (360)993-0911
FAX (360)993-0912
PRELIMINARY PLAT
MCINTOSH SUBDIVISION
CAMAS WASHINGTON
PRELIMINARY
REVISIONS
DESIGNED BY: SAT, JAI
DRAWN BY: SAT, JAI
CHECKED BY: SAT, JAI
SCALE: 1" = 60'
JOB NUMBER 2140
SHEET PRE2.0

FIGURE 1c

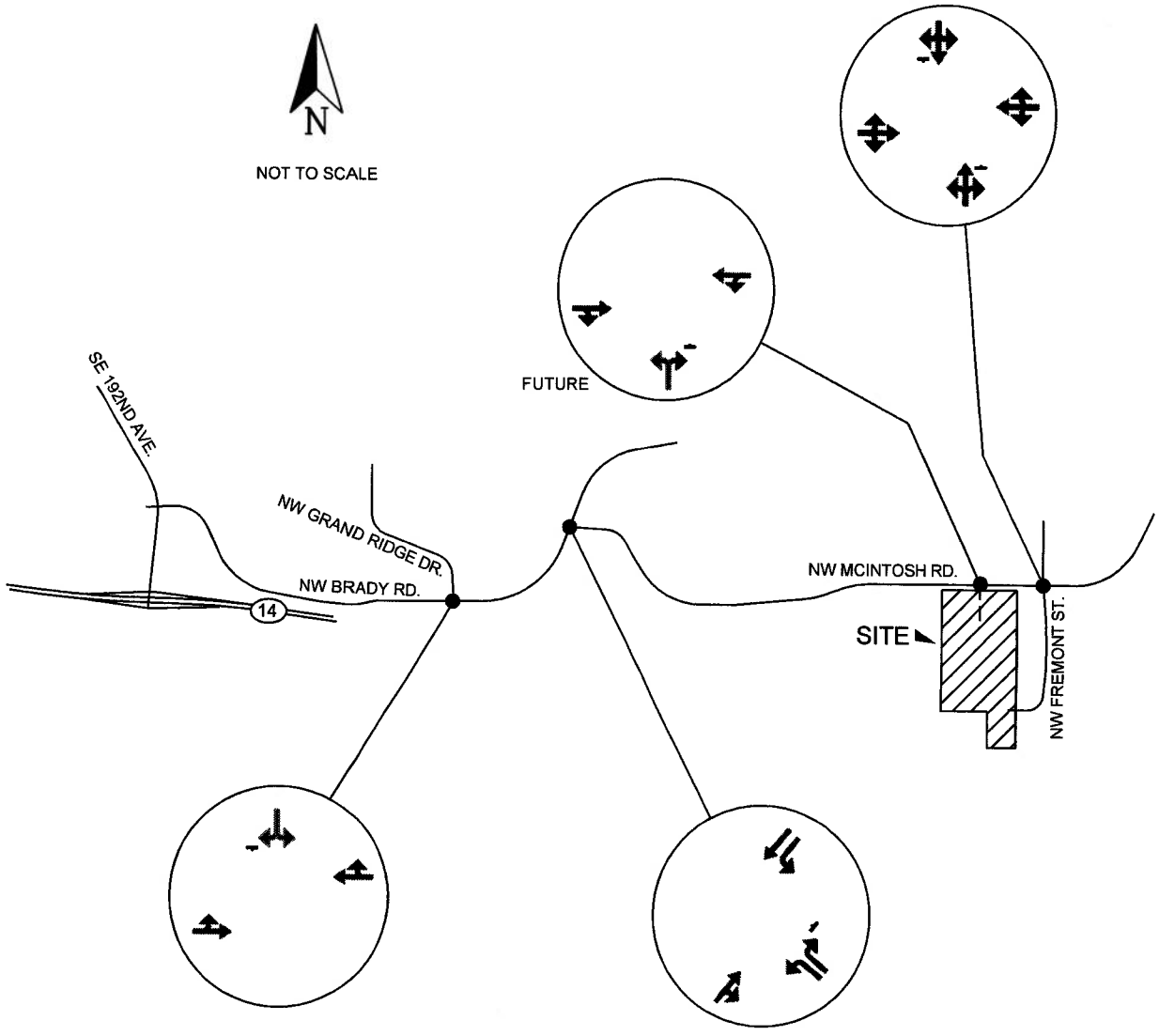


FIGURE 2
LANE CONFIGURATIONS

KELLY ENGINEERING
1805 NE 94th St. No. 19, Vancouver, WA 98665
Phone: 360-433-7530

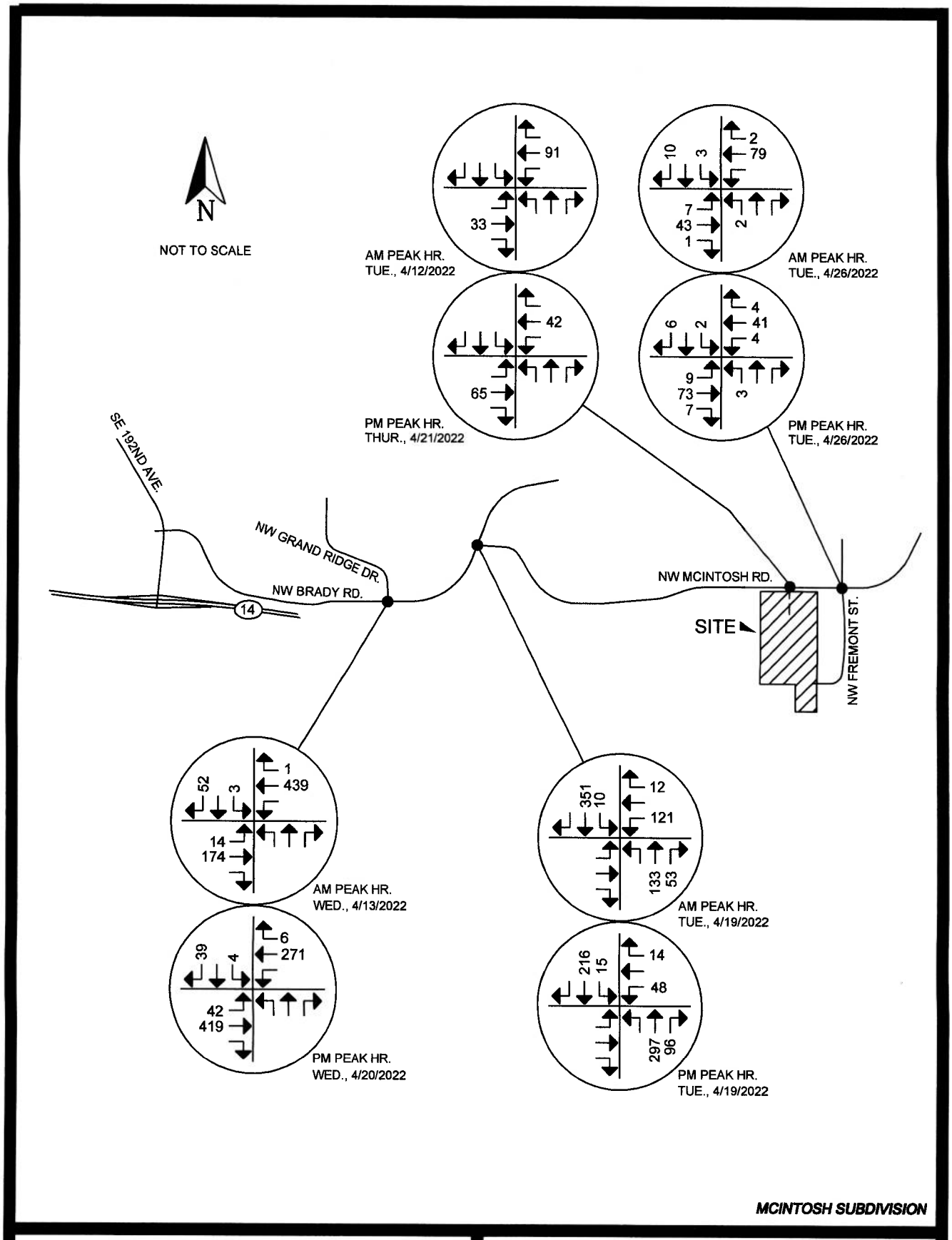
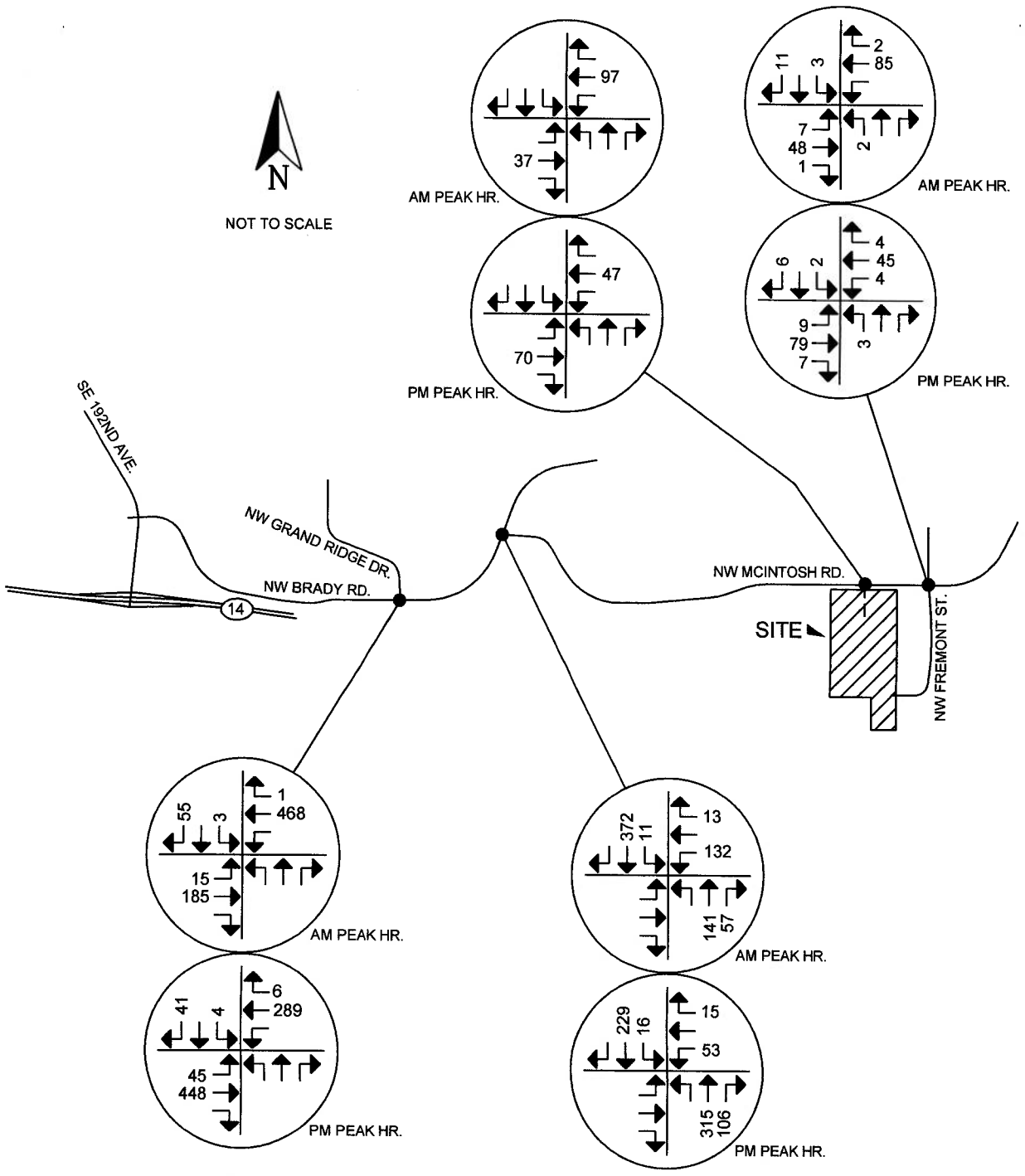


FIGURE 3
EXISTING TRAFFIC VOLUMES

KELLY ENGINEERING
1805 NE 94th St. No. 19, Vancouver, WA 98665
Phone: 360-433-7530

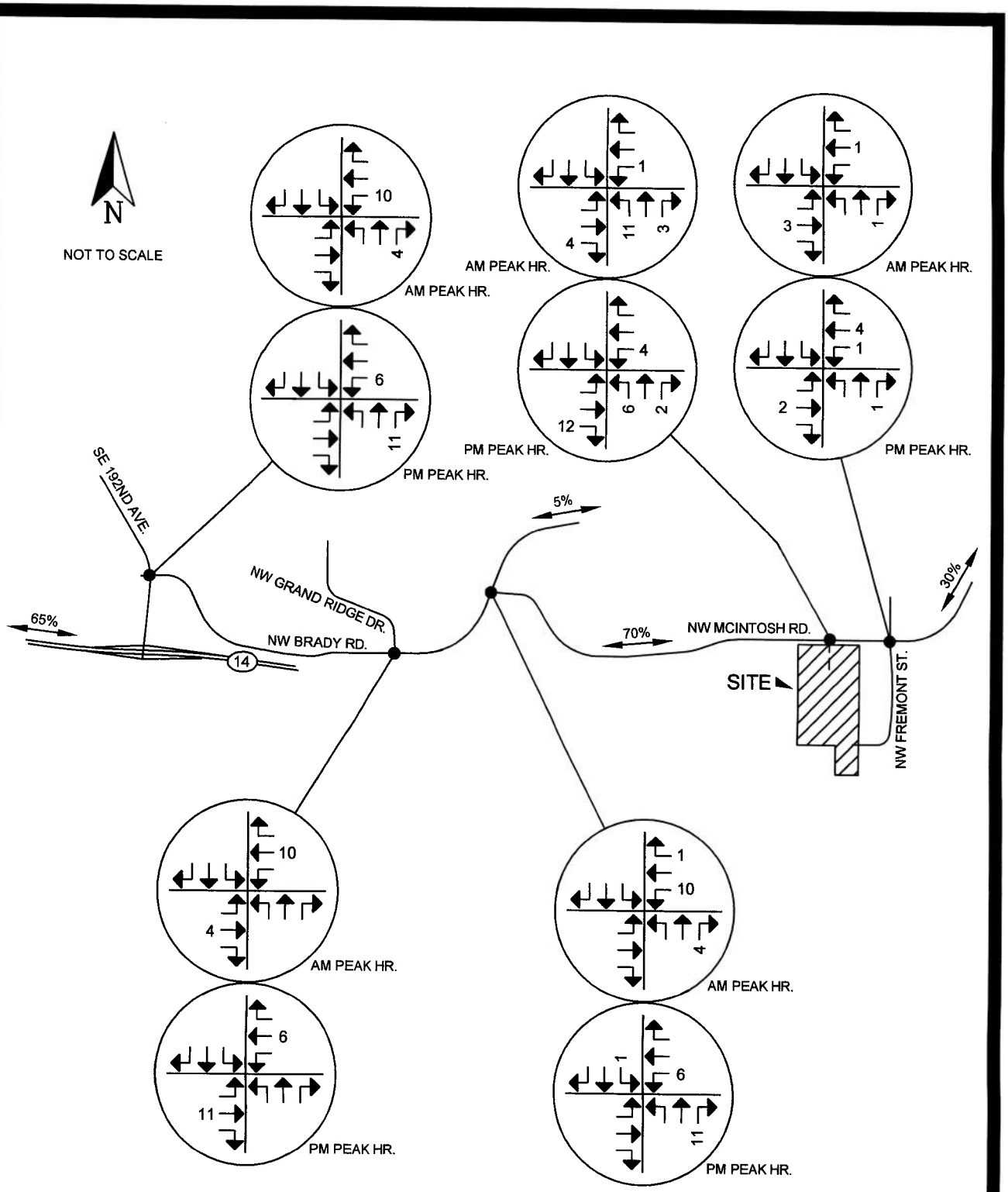


YEAR 2025 TRAFFIC VOLUMES INCLUDED
6% GROWTH FACTOR OVER EXISTING
TRAFFIC VOLUMES AND IN-PROCESS TRAFFIC
FROM DAWSON RIDGE PHASE II DEVELOPMENT

MCINTOSH SUBDIVISION

FIGURE 4
YEAR 2025 TRAFFIC VOLUMES
W/O PROJECT

KELLY ENGINEERING
1805 NE 94th St. No. 19, Vancouver, WA 98665
Phone: 360-433-7530



SITE TRIPS
AM PEAK HOUR: IN-5, OUT-15
PM PEAK HOUR: IN-17, OUT-9

MCINTOSH SUBDIVISION

FIGURE 5
SITE TRAFFIC DISTRIBUTION/ ASSIGNMENT

KELLY ENGINEERING
1805 NE 94th St. No. 19, Vancouver, WA 98665
Phone: 360-433-7530

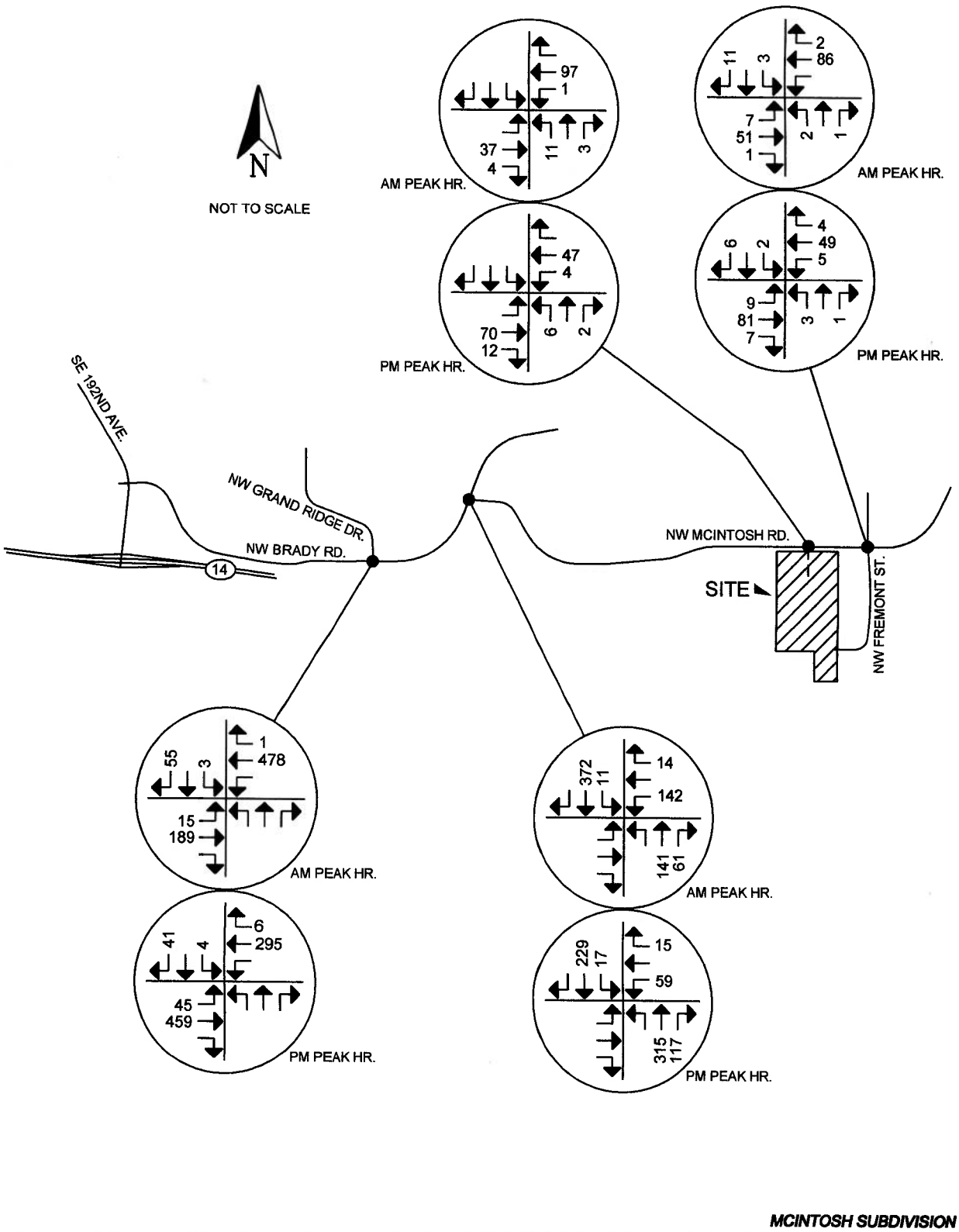


FIGURE 6
YEAR 2025 TRAFFIC VOLUMES
WITH PROJECT

KELLY ENGINEERING
1805 NE 94th St. No. 19, Vancouver, WA 98665
Phone: 360-433-7530

APPENDIX A
RAW TRAFFIC COUNT DATA

INTERSECTION TURN MOVEMENT SURVEY
NW BRADY ROAD & NW GRAND RIDGE DRIVE

DATE OF COUNT: 4/13/2022, 07:00-09:00
DAY OF WEEK: WED.
WEATHER: CLOUDY
COUNTER: KAK

Time Period From – To	FROM NORTH			FROM EAST			FROM SOUTH			FROM WEST			TOTAL
	L	T	R	L	T	R	L	T	R	L	T	R	
07:00-07:05	0	0	4	0	26	0	0	0	0	2	6	0	38
07:05-07:10	0	0	2	0	26	0	0	0	0	2	10	0	40
07:10-07:15	0	0	2	0	27	0	0	0	0	0	8	0	37
07:15-07:20	**0**	**0**	**3**	**0**	**38**	**0**	**0**	**0**	**0**	**2**	**9**	**0**	**52**
07:20-07:25	**0**	**0**	**4**	**0**	**23**	**0**	**0**	**0**	**0**	**1**	**19**	**0**	**47**
07:25-07:30	**0**	**0**	**4**	**0**	**40**	**0**	**0**	**0**	**0**	**1**	**15**	**0**	**60**
07:30-07:35	**0**	**0**	**5**	**0**	**39**	**0**	**0**	**0**	**0**	**0**	**6**	**0**	**50**
07:35-07:40	**0**	**0**	**6**	**0**	**43**	**0**	**0**	**0**	**0**	**0**	**7**	**0**	**56**
07:40-07:45	**0**	**0**	**3**	**0**	**48**	**0**	**0**	**0**	**0**	**3**	**15**	**0**	**69**
07:45-07:50	**1**	**0**	**8**	**0**	**46**	**0**	**0**	**0**	**0**	**1**	**13**	**0**	**69**
07:50-07:55	**0**	**0**	**3**	**0**	**35**	**1**	**0**	**0**	**0**	**0**	**16**	**0**	**55**
07:55-08:00	**1**	**0**	**2**	**0**	**42**	**0**	**0**	**0**	**0**	**4**	**24**	**0**	**73**
08:00-08:05	**0**	**0**	**4**	**0**	**26**	**0**	**0**	**0**	**0**	**2**	**20**	**0**	**52**
08:05-08:10	**1**	**0**	**4**	**0**	**30**	**0**	**0**	**0**	**0**	**0**	**12**	**0**	**47**
08:10-08:15	**0**	**0**	**6**	**0**	**29**	**0**	**0**	**0**	**0**	**0**	**18**	**0**	**53**
08:15-08:20	0	0	1	0	26	0	0	0	0	1	9	0	37
08:20-08:25	0	0	2	0	25	0	0	0	0	1	19	0	47
08:25-08:30	0	0	3	0	28	0	0	0	0	2	17	0	50
08:30-08:35	0	0	5	0	25	0	0	0	0	0	20	0	50
08:35-08:40	0	0	4	0	28	0	0	0	0	1	22	0	55
08:40-08:45	0	0	1	0	27	0	0	0	0	0	12	0	40
08:45-08:50	0	0	2	0	25	0	0	0	0	1	9	0	37
08:50-08:55	0	0	3	0	27	0	0	0	0	0	9	0	39
08:55-09:00	0	0	3	0	26	0	0	0	0	0	10	0	39
Peak Hour Total	**3**	**0**	**52**	**0**	**439**	**1**	**0**	**0**	**0**	**14**	**174**	**0**	**683**
% Trucks	0	0	0	0	0	0	0	0	0	7	0	0	
Peds	0	0	0	0	0	0	0	0	0	0	0	0	
Bikes	0	0	0	0	0	0	0	0	0	0	0	0	

PEAK HOUR: 07:15-08:15

PHF Intersection: 0.87

KELLY ENGINEERING

INTERSECTION TURN MOVEMENT SURVEY
NW BRADY ROAD & NW GRAND RIDGE DRIVE

DATE OF COUNT: 4/20/2022, 16:00-18:00
DAY OF WEEK: WED.
WEATHER: CLOUDY
COUNTER: DSK

Time Period From – To	FROM NORTH			FROM EAST			FROM SOUTH			FROM WEST			TOTAL
	L	T	R	L	T	R	L	T	R	L	T	R	
16:00-16:05	0	0	2	0	26	1	0	0	0	5	32	0	66
16:05-16:10	0	0	1	0	26	2	0	0	0	1	27	0	57
16:10-16:15	1	0	2	0	25	0	0	0	0	7	37	0	72
16:15-16:20	0	0	3	0	24	1	0	0	0	4	40	0	72
16:20-16:25	0	0	6	0	22	0	0	0	0	4	29	0	61
16:25-16:30	0	0	3	0	20	0	0	0	0	6	23	0	52
16:30-16:35	0	0	0	0	23	0	0	0	0	5	18	0	46
16:35-16:40	**0**	**0**	**3**	**0**	**29**	**0**	**0**	**0**	**0**	**6**	**38**	**0**	**76**
16:40-16:45	**0**	**0**	**2**	**0**	**24**	**1**	**0**	**0**	**0**	**4**	**33**	**0**	**64**
16:45-16:50	**0**	**0**	**2**	**0**	**21**	**0**	**0**	**0**	**0**	**3**	**41**	**0**	**67**
16:50-16:55	**1**	**0**	**4**	**0**	**23**	**0**	**0**	**0**	**0**	**4**	**42**	**0**	**74**
16:55-17:00	**1**	**0**	**5**	**0**	**23**	**1**	**0**	**0**	**0**	**0**	**27**	**0**	**57**
17:00-17:05	**0**	**0**	**3**	**0**	**23**	**0**	**0**	**0**	**0**	**1**	**35**	**0**	**62**
17:05-17:10	**0**	**0**	**2**	**0**	**19**	**0**	**0**	**0**	**0**	**4**	**27**	**0**	**52**
17:10-17:15	**0**	**0**	**3**	**0**	**25**	**1**	**0**	**0**	**0**	**4**	**37**	**0**	**70**
17:15-17:20	**2**	**0**	**4**	**0**	**23**	**0**	**0**	**0**	**0**	**4**	**31**	**0**	**64**
17:20-17:25	**0**	**0**	**3**	**0**	**22**	**1**	**0**	**0**	**0**	**5**	**36**	**0**	**67**
17:25-17:30	**0**	**0**	**4**	**0**	**19**	**1**	**0**	**0**	**0**	**3**	**34**	**0**	**61**
17:30-17:35	**0**	**0**	**4**	**0**	**20**	**1**	**0**	**0**	**0**	**4**	**38**	**0**	**67**
17:35-17:40	0	0	1	0	22	0	0	0	0	7	26	0	56
17:40-17:45	0	0	1	0	18	0	0	0	0	4	36	0	59
17:45-17:50	1	0	1	0	20	1	0	0	0	5	31	0	59
17:50-17:55	0	0	0	0	19	0	0	0	0	4	20	0	43
17:55-18:00	0	0	2	0	21	0	0	0	0	2	24	0	49
Peak Hour Total	**4**	**0**	**39**	**0**	**271**	**6**	**0**	**0**	**0**	**42**	**419**	**0**	**781**
% Trucks	0	0	0	0	0	17	0	0	0	0	0	0	
Peds	0	0	0	0	0	0	0	0	0	0	0	0	
Bikes	0	0	0	0	0	0	0	0	0	0	0	0	

PEAK HOUR: 16:35-17:35

PHF Intersection: 0.94

KELLY ENGINEERING

INTERSECTION TURN MOVEMENT SURVEY
NW BRADY ROAD & NW MCINTOSH ROAD

DATE OF COUNT: 4/19/2022, 07:00-09:00
DAY OF WEEK: TUE.
WEATHER: CLOUDY
COUNTER: KAK

Time Period From – To	FROM NORTH			FROM EAST			FROM SOUTH			FROM WEST			TOTAL
	L	T	R	L	T	R	L	T	R	L	T	R	
07:00-07:05	0	0	0	0	18	0	6	0	1	0	3	4	32
07:05-07:10	0	0	0	0	17	0	8	0	0	0	7	3	35
07:10-07:15	0	0	0	0	25	0	3	0	1	0	8	0	37
07:15-07:20	0	0	0	0	22	0	5	0	0	0	8	1	36
07:20-07:25	0	0	0	0	19	0	7	0	0	0	9	2	37
07:25-07:30	**0**	**0**	**0**	**1**	**40**	**0**	**8**	**0**	**1**	**0**	**9**	**3**	**62**
07:30-07:35	**0**	**0**	**0**	**1**	**44**	**0**	**7**	**0**	**3**	**0**	**16**	**2**	**73**
07:35-07:40	**0**	**0**	**0**	**0**	**45**	**0**	**9**	**0**	**0**	**0**	**9**	**1**	**64**
07:40-07:45	**0**	**0**	**0**	**2**	**37**	**0**	**13**	**0**	**1**	**0**	**7**	**1**	**61**
07:45-07:50	**0**	**0**	**0**	**1**	**27**	**0**	**16**	**0**	**1**	**0**	**13**	**6**	**64**
07:50-07:55	**0**	**0**	**0**	**1**	**29**	**0**	**17**	**0**	**1**	**0**	**14**	**7**	**69**
07:55-08:00	**0**	**0**	**0**	**0**	**22**	**0**	**11**	**0**	**1**	**0**	**10**	**7**	**51**
08:00-08:05	**0**	**0**	**0**	**0**	**27**	**0**	**9**	**0**	**0**	**0**	**9**	**5**	**50**
08:05-08:10	**0**	**0**	**0**	**1**	**23**	**0**	**9**	**0**	**0**	**0**	**9**	**4**	**46**
08:10-08:15	**0**	**0**	**0**	**2**	**20**	**0**	**10**	**0**	**4**	**0**	**8**	**2**	**46**
08:15-08:20	**0**	**0**	**0**	**0**	**19**	**0**	**6**	**0**	**0**	**0**	**16**	**8**	**49**
08:20-08:25	**0**	**0**	**0**	**1**	**18**	**0**	**6**	**0**	**0**	**0**	**13**	**7**	**45**
08:25-08:30	0	0	0	0	13	0	7	0	2	0	15	3	40
08:30-08:35	0	0	0	0	23	0	4	0	2	0	12	4	45
08:35-08:40	0	0	0	0	19	0	14	0	0	0	8	4	45
08:40-08:45	0	0	0	1	13	0	9	0	1	0	10	5	39
08:45-08:50	0	0	0	0	14	0	8	0	0	0	9	4	35
08:50-08:55	0	0	0	0	20	0	7	0	0	0	9	3	39
08:55-09:00	0	0	0	0	19	0	10	0	2	0	11	3	45
Peak Hour Total	**0**	**0**	**0**	**10**	**351**	**0**	**121**	**0**	**12**	**0**	**133**	**53**	**680**
% Trucks	0	0	0	0	0	0	0	0	0	0	2	0	
Peds	0	0	0	0	0	0	0	0	0	0	0	0	
Bikes	0	0	0	0	0	0	0	0	0	0	0	0	

PEAK HOUR: 07:25-08:25

PHF Intersection: 0.85

KELLY ENGINEERING

INTERSECTION TURN MOVEMENT SURVEY
NW BRADY ROAD & NW MCINTOSH ROAD

DATE OF COUNT: 4/19/2022, 16:00-18:00
DAY OF WEEK: TUE.
WEATHER: CLOUDY
COUNTER: KAK

Time Period From – To	FROM NORTH			FROM EAST			FROM SOUTH			FROM WEST			TOTAL
	L	T	R	L	T	R	L	T	R	L	T	R	
16:00-16:05	0	0	0	2	17	0	7	0	1	0	24	8	59
16:05-16:10	0	0	0	0	15	0	9	0	1	0	14	2	41
16:10-16:15	0	0	0	1	14	0	7	0	1	0	14	4	41
16:15-16:20	0	0	0	0	16	0	4	0	0	0	17	8	45
16:20-16:25	0	0	0	0	8	0	12	0	2	0	20	7	49
16:25-16:30	0	0	0	1	15	0	8	0	0	0	21	5	50
16:30-16:35	0	0	0	1	12	0	5	0	0	0	13	3	34
16:35-16:40	0	0	0	0	21	0	3	0	0	0	20	5	49
16:40-16:45	0	0	0	1	18	0	6	0	1	0	16	8	50
16:45-16:50	**0**	**0**	**0**	**1**	**15**	**0**	**3**	**0**	**0**	**0**	**29**	**6**	**54**
16:50-16:55	**0**	**0**	**0**	**0**	**15**	**0**	**6**	**0**	**2**	**0**	**18**	**8**	**49**
16:55-17:00	**0**	**0**	**0**	**0**	**17**	**0**	**6**	**0**	**0**	**0**	**18**	**5**	**46**
17:00-17:05	**0**	**0**	**0**	**1**	**21**	**0**	**9**	**0**	**1**	**0**	**26**	**4**	**62**
17:05-17:10	**0**	**0**	**0**	**2**	**23**	**0**	**3**	**0**	**1**	**0**	**22**	**7**	**58**
17:10-17:15	**0**	**0**	**0**	**0**	**16**	**0**	**4**	**0**	**2**	**0**	**19**	**7**	**48**
17:15-17:20	**0**	**0**	**0**	**5**	**23**	**0**	**2**	**0**	**2**	**0**	**19**	**13**	**64**
17:20-17:25	**0**	**0**	**0**	**1**	**25**	**0**	**4**	**0**	**1**	**0**	**24**	**8**	**63**
17:25-17:30	**0**	**0**	**0**	**0**	**15**	**0**	**5**	**0**	**3**	**0**	**32**	**11**	**66**
17:30-17:35	**0**	**0**	**0**	**1**	**13**	**0**	**2**	**0**	**0**	**0**	**32**	**10**	**58**
17:35-17:40	**0**	**0**	**0**	**2**	**15**	**0**	**2**	**0**	**1**	**0**	**29**	**10**	**59**
17:40-17:45	**0**	**0**	**0**	**2**	**18**	**0**	**2**	**0**	**1**	**0**	**29**	**7**	**59**
17:45-17:50	0	0	0	0	14	0	3	0	0	0	21	9	47
17:50-17:55	0	0	0	1	17	0	4	0	0	0	17	10	49
17:55-18:00	0	0	0	0	15	0	2	0	1	0	18	8	44
Peak Hour Total	**0**	**0**	**0**	**15**	**216**	**0**	**48**	**0**	**14**	**0**	**297**	**96**	**686**
% Trucks	0	0	0	20	0	0	0	0	0	0	0	1	
Peds	0	0	0	0	0	0	0	0	0	0	0	0	
Bikes	0	0	0	0	0	0	0	0	0	0	0	0	

PEAK HOUR: 16:45-17:45

PHF Intersection: 0.89

KELLY ENGINEERING

ROADWAY SURVEY
NW MCINTOSH ROAD & FUTURE SITE ACCESS

DATE OF COUNT: 4/12/2022, 07:00-09:00
DAY OF WEEK: TUE.
WEATHER: CLOUDY
COUNTER: KAK

Time Period From – To	FROM NORTH			FROM EAST			FROM SOUTH			FROM WEST			TOTAL
	L	T	R	L	T	R	L	T	R	L	T	R	
07:00-07:05	0	0	0	0	8	0	0	0	0	0	1	0	9
07:05-07:10	0	0	0	0	2	0	0	0	0	0	2	0	4
07:10-07:15	0	0	0	0	6	0	0	0	0	0	2	0	8
07:15-07:20	0	0	0	0	0	0	0	0	0	0	0	0	0
07:20-07:25	0	0	0	0	3	0	0	0	0	0	1	0	4
07:25-07:30	0	0	0	0	7	0	0	0	0	0	1	0	8
07:30-07:35	0	0	0	0	6	0	0	0	0	0	4	0	10
07:35-07:40	**0**	**0**	**0**	**0**	**8**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**10**
07:40-07:45	**0**	**0**	**0**	**0**	**15**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**18**
07:45-07:50	**0**	**0**	**0**	**0**	**6**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**7**
07:50-07:55	**0**	**0**	**0**	**0**	**15**	**0**	**0**	**0**	**0**	**0**	**5**	**0**	**20**
07:55-08:00	**0**	**0**	**0**	**0**	**4**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**6**
08:00-08:05	**0**	**0**	**0**	**0**	**7**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**10**
08:05-08:10	**0**	**0**	**0**	**0**	**7**	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**11**
08:10-08:15	**0**	**0**	**0**	**0**	**7**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**9**
08:15-08:20	**0**	**0**	**0**	**0**	**5**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**8**
08:20-08:25	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**4**
08:25-08:30	**0**	**0**	**0**	**0**	**6**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**9**
08:30-08:35	**0**	**0**	**0**	**0**	**8**	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**12**
08:35-08:40	0	0	0	0	7	0	0	0	0	0	2	0	9
08:40-08:45	0	0	0	0	5	0	0	0	0	0	1	0	6
08:45-08:50	0	0	0	0	4	0	0	0	0	0	0	0	4
08:50-08:55	0	0	0	0	7	0	0	0	0	0	2	0	9
08:55-09:00	0	0	0	0	3	0	0	0	0	0	1	0	4
Peak Hour Total	**0**	**0**	**0**	**0**	**91**	**0**	**0**	**0**	**0**	**0**	**33**	**0**	**124**
% Trucks	0	0	0	0	1	0	0	0	0	0	6	0	
Peds	0	0	0	0	0	0	0	0	0	0	0	0	
Bikes	0	0	0	0	0	0	0	0	0	0	0	0	

PEAK HOUR: 07:35-08:35
PHF Roadway: 0.69

KELLY ENGINEERING

ROADWAY SURVEY
NW MCINTOSH ROAD & FUTURE SITE ACCESS

DATE OF COUNT: 4/21/2022, 16:00-18:00
DAY OF WEEK: THUR.
WEATHER: CLOUDY
COUNTER: KAK

Time Period From – To	FROM NORTH			FROM EAST			FROM SOUTH			FROM WEST			TOTAL
	L	T	R	L	T	R	L	T	R	L	T	R	
16:00-16:05	**0**	**0**	**0**	**0**	**6**	**0**	**0**	**0**	**0**	**0**	**6**	**0**	**12**
16:05-16:10	**0**	**0**	**0**	**0**	**5**	**0**	**0**	**0**	**0**	**0**	**6**	**0**	**11**
16:10-16:15	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**6**
16:15-16:20	**0**	**0**	**0**	**0**	**4**	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**8**
16:20-16:25	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**10**	**0**	**13**
16:25-16:30	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**7**	**0**	**10**
16:30-16:35	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**5**	**0**	**7**
16:35-16:40	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**5**	**0**	**8**
16:40-16:45	**0**	**0**	**0**	**0**	**5**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**8**
16:45-16:50	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**4**
16:50-16:55	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**5**	**0**	**7**
16:55-17:00	**0**	**0**	**0**	**0**	**5**	**0**	**0**	**0**	**0**	**0**	**8**	**0**	**13**
17:00-17:05	0	0	0	0	4	0	0	0	0	0	7	0	11
17:05-17:10	0	0	0	0	3	0	0	0	0	0	2	0	5
17:10-17:15	0	0	0	0	2	0	0	0	0	0	3	0	5
17:15-17:20	0	0	0	0	4	0	0	0	0	0	4	0	8
17:20-17:25	0	0	0	0	1	0	0	0	0	0	1	0	2
17:25-17:30	0	0	0	0	5	0	0	0	0	0	5	0	10
17:30-17:35	0	0	0	0	2	0	0	0	0	0	2	0	4
17:35-17:40	0	0	0	0	3	0	0	0	0	0	3	0	6
17:40-17:45	0	0	0	0	2	0	0	0	0	0	2	0	4
17:45-17:50	0	0	0	0	4	0	0	0	0	0	1	0	5
17:50-17:55	0	0	0	0	3	0	0	0	0	0	3	0	6
17:55-18:00	0	0	0	0	1	0	0	0	0	0	4	0	5
Peak Hour Total	**0**	**0**	**0**	**0**	**42**	**0**	**0**	**0**	**0**	**0**	**65**	**0**	**107**
% Trucks	0	0	0	0	0	0	0	0	0	0	0	0	
Peds	0	1	0	0	0	0	0	0	0	0	0	0	
Bikes	0	0	0	0	0	0	0	0	0	0	0	0	

PEAK HOUR: 16:00-17:00

PHF Roadway: 0.63

KELLY ENGINEERING

INTERSECTION TURN MOVEMENT SURVEY
NW MCINTOSH ROAD & NW FREMONT STREET

DATE OF COUNT: 4/26/2022, 07:00-09:00
DAY OF WEEK: TUE.
WEATHER: CLOUDY
COUNTER: DSK

Time Period From – To	FROM NORTH			FROM EAST			FROM SOUTH			FROM WEST			TOTAL
	L	T	R	L	T	R	L	T	R	L	T	R	
07:00-07:05	0	0	1	0	1	0	0	0	0	0	0	0	2
07:05-07:10	1	0	2	0	1	0	0	0	0	0	0	0	4
07:10-07:15	0	0	0	0	2	0	1	0	0	1	3	0	7
07:15-07:20	0	0	1	0	1	0	0	0	0	1	1	0	4
07:20-07:25	0	0	1	0	3	0	0	0	0	0	1	0	5
07:25-07:30	0	0	1	0	4	0	0	0	0	0	1	0	6
07:30-07:35	0	0	1	0	4	0	2	0	0	0	2	0	9
07:35-07:40	1	0	0	0	4	0	0	0	0	1	2	0	8
07:40-07:45	**1**	**0**	**1**	**0**	**9**	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**13**
07:45-07:50	**1**	**0**	**4**	**0**	**8**	**0**	**0**	**0**	**0**	**0**	**6**	**0**	**19**
07:50-07:55	**0**	**0**	**1**	**0**	**8**	**0**	**0**	**0**	**0**	**2**	**4**	**0**	**15**
07:55-08:00	**1**	**0**	**1**	**0**	**7**	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**13**
08:00-08:05	**0**	**0**	**0**	**0**	**6**	**0**	**0**	**0**	**0**	**2**	**6**	**0**	**14**
08:05-08:10	**0**	**0**	**0**	**0**	**9**	**1**	**0**	**0**	**0**	**0**	**4**	**0**	**14**
08:10-08:15	**0**	**0**	**0**	**0**	**6**	**0**	**0**	**0**	**0**	**1**	**3**	**0**	**10**
08:15-08:20	**0**	**0**	**0**	**0**	**2**	**0**	**1**	**0**	**0**	**0**	**2**	**1**	**6**
08:20-08:25	**0**	**0**	**0**	**0**	**6**	**0**	**1**	**0**	**0**	**0**	**4**	**0**	**11**
08:25-08:30	**0**	**0**	**1**	**0**	**5**	**0**	**0**	**0**	**0**	**1**	**3**	**0**	**10**
08:30-08:35	**0**	**0**	**2**	**0**	**8**	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**14**
08:35-08:40	**0**	**0**	**0**	**0**	**5**	**0**	**0**	**0**	**0**	**1**	**2**	**0**	**8**
08:40-08:45	0	0	0	0	4	0	0	0	0	0	3	0	7
08:45-08:50	0	0	0	0	3	0	0	0	0	1	2	0	6
08:50-08:55	1	0	1	0	2	0	0	0	0	0	3	0	6
08:55-09:00	0	0	0	0	5	0	0	0	0	0	2	0	7
Peak Hour Total	**3**	**0**	**10**	**0**	**79**	**2**	**2**	**0**	**0**	**7**	**43**	**1**	**147**
% Trucks	33	0	0	0	1	0	0	0	0	0	5	0	
Peds	0	0	0	0	1	0	0	1	0	0	0	0	
Bikes	0	0	0	0	0	0	0	0	0	0	0	0	

PEAK HOUR: 07:40-08:40

PHF Intersection: 0.78

KELLY ENGINEERING

INTERSECTION TURN MOVEMENT SURVEY
NW MCINTOSH ROAD & NW FREMONT STREET

DATE OF COUNT: 4/26/2022, 16:00-18:00
DAY OF WEEK: TUE.
WEATHER: CLOUDY
COUNTER: KAK

Time Period From – To	FROM NORTH			FROM EAST			FROM SOUTH			FROM WEST			TOTAL
	L	T	R	L	T	R	L	T	R	L	T	R	
16:00-16:05	**0**	**0**	**0**	**0**	**5**	**0**	**0**	**0**	**0**	**0**	**7**	**0**	**12**
16:05-16:10	**0**	**0**	**1**	**0**	**4**	**0**	**0**	**0**	**0**	**1**	**7**	**0**	**13**
16:10-16:15	**0**	**0**	**1**	**0**	**4**	**0**	**1**	**0**	**0**	**2**	**5**	**2**	**15**
16:15-16:20	**0**	**0**	**0**	**1**	**4**	**1**	**0**	**0**	**0**	**0**	**3**	**0**	**9**
16:20-16:25	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**1**	**9**	**0**	**13**
16:25-16:30	**0**	**0**	**0**	**0**	**2**	**1**	**1**	**0**	**0**	**1**	**7**	**2**	**14**
16:30-16:35	**0**	**0**	**1**	**1**	**3**	**0**	**0**	**0**	**0**	**0**	**6**	**0**	**11**
16:35-16:40	**0**	**0**	**2**	**0**	**2**	**1**	**0**	**0**	**0**	**3**	**5**	**1**	**14**
16:40-16:45	**1**	**0**	**0**	**1**	**5**	**0**	**1**	**0**	**0**	**0**	**3**	**0**	**11**
16:45-16:50	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**7**	**1**	**11**
16:50-16:55	**0**	**0**	**0**	**1**	**3**	**0**	**0**	**0**	**0**	**1**	**6**	**1**	**12**
16:55-17:00	**1**	**0**	**1**	**0**	**3**	**1**	**0**	**0**	**0**	**0**	**8**	**0**	**14**
17:00-17:05	0	0	0	0	4	0	1	0	0	1	2	0	8
17:05-17:10	0	0	0	0	1	0	0	0	0	2	3	2	8
17:10-17:15	0	0	0	0	2	1	0	0	0	0	4	1	8
17:15-17:20	0	0	0	0	2	0	0	0	0	0	3	0	5
17:20-17:25	0	0	0	0	3	0	0	0	0	2	4	0	9
17:25-17:30	0	0	1	1	4	0	2	0	0	0	5	0	13
17:30-17:35	0	0	0	0	2	1	0	0	0	0	2	0	5
17:35-17:40	0	0	1	0	2	0	0	0	1	1	5	0	10
17:40-17:45	0	0	0	1	3	0	0	0	0	2	3	1	10
17:45-17:50	1	0	0	0	3	1	1	0	0	0	3	0	9
17:50-17:55	0	0	0	0	2	0	0	0	0	0	4	0	6
17:55-18:00	0	0	1	0	3	0	0	0	0	1	3	0	8
Peak Hour Total	**2**	**0**	**6**	**4**	**41**	**4**	**3**	**0**	**0**	**9**	**73**	**7**	**149**
% Trucks	0	0	0	0	0	0	0	0	0	0	0	0	
Peds	0	0	0	0	0	0	0	0	0	0	0	0	
Bikes	0	0	0	0	0	0	0	0	0	0	0	0	

PEAK HOUR: 16:00-17:00

PHF Intersection: 0.93

KELLY ENGINEERING

APPENDIX B
COLLISION DATA

OFFICER REPORTED CRASHES THAT OCCURRED *at* OR *in the vicinity of* THE FOLLOWING INTERSECTIONS IN THE CITY OF CAMAS

Brady Rd @ McIntosh Rd

Brady Rd @ Grand Ridge Dr

12/23/2018 - 12/23/2021

Under 23 U.S. Code § 148 and 23 U.S. Code § 407, safety data, reports, surveys, schedules, lists compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential crash sites, hazardous roadway conditions, or railway-highway crossings are not subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

JURISDICTION	COUNTY	CITY	PRIMARY TRAFFICWAY	BLOCK NUMBER	INTERSECTING TRAFFICWAY	DIST FROM REF POINT	MI or FT	COMP DIR FROM REF POINT	REFERENCE POINT NAME	MILEPOST	A / B	SR ONLY HISTORY / SUSPENSE IND
City Street	Clark	Camas	NW BRADY RD	4600	NW MCINTOSH RD							No
City Street	Clark	Camas	NW BRADY RD	0	NW MCINTOSH RD							No
City Street	Clark	Camas	NW BRADY RD	20800		195	F	SW	NW MCINTOSH RD			No
City Street	Clark	Camas	SE BRADY RD	0	NW GRAND RIDGE DR							No
City Street	Clark	Camas	SE BRADY RD	20300		129	F	W	SE GRAND RIDGE DR			No

REPORT NUMBER	DATE	TIME	MOST SEVERE INJURY TYPE	# INJ	# FAT	# VEH	# PEDS	# BIKES	VEHICLE 1 TYPE	VEHICLE 2 TYPE
E966063	09/08/2019	11:36	No Apparent Injury	0	0	1	0	0	Pickup,Panel Truck or Vanette under 10,000 lb	
E900545	03/06/2019	07:39	Possible Injury	1	0	2	0	0	Passenger Car	Passenger Car
EB22271	04/12/2021	19:13	Suspected Minor Injury	1	0	1	0	0	Motorcycle	
E941259	07/09/2019	17:00	No Apparent Injury	0	0	2	0	0	Pickup,Panel Truck or Vanette under 10,000 lb	Passenger Car
EA13950	02/11/2020	14:40	No Apparent Injury	0	0	2	0	0	Pickup,Panel Truck or Vanette under 10,000 lb	Passenger Car

JUNCTION RELATIONSHIP	WEATHER	ROADWAY SURFACE CONDITION	LIGHTING CONDITION
At Intersection and Related	Overcast	Wet	Daylight
At Intersection and Related	Sleet or Hail or Freezing Rain	Wet	Daylight
Not at Intersection and Not Related	Clear	Dry	Daylight
At Intersection and Related	Raining	Wet	Daylight
Intersection Related but Not at Intersection	Clear or Partly Cloudy	Dry	Daylight

FIRST COLLISION TYPE / OBJECT STRUCK	VEHICLE 1 ACTION	VEHICLE 2 ACTION	VEHICLE 1 COMPASS DIRECTION FROM	VEHICLE 1 COMPASS DIRECTION TO
Linear Curb	Making Right Turn		Southeast	East
Entering at angle	Making Left Turn	Going Straight Ahead	East	South
Vehicle Strikes Deer	Going Straight Ahead		Southwest	Northeast
Entering at angle	Making Left Turn	Going Straight Ahead	North	East
From same direction - both going straight - one stopped - rear-end	Going Straight Ahead	Stopped for Traffic	West	East

VEHICLE 2 COMPASS DIRECTION FROM	VEHICLE 2 COMPASS DIRECTION TO	MV DRIVER CONTRIBUTING CIRCUMSTANCE 1 (UNIT 1)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 1 (UNIT 2)	FIRST IMPACT LOCATION (City, County & Misc Trafficways - 2010 forward)	WA STATE PLANE SOUTH - X 2010 - FORWARD	WA STATE PLANE SOUTH - Y 2010 - FORWARD
		Under Influence of Alcohol		Intersecting Trafficway	1139024.47	98463.24
South	North	Did Not Grant RW to Vehicle	None	Lane of Primary Trafficway	1139002.96	98479.44
		Other Contributing Circ Not Listed		Lane of Primary Trafficway	1138915.87	98304.51
East	West	Did Not Grant RW to Vehicle	None	Lane of Primary Trafficway	1137956.11	97818.21
Vehicle Stopped	Vehicle Stopped	Follow Too Closely	None	Lane of Primary Trafficway	1137828.12	97823.28

APPENDIX C
LEVEL OF SERVICE COMPUTER PRINTOUTS

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*DSK*	Intersection	*Brady Road & Grand Ridge Dr.*
Agency/Co.	*Kelly Engineering*	Jurisdiction	*City of Camas*
Date Performed	*4/27/2022*	Analysis Year	*2022*
Analysis Time Period	*AM Peak Hour*		

Project Description *Existing*

East/West Street: *Brady Road* | North/South Street: *Grand Ridge Dr.*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*14*	*174*			*439*	*1*
Peak-Hour Factor, PHF	*0.87*	*0.87*	*1.00*	*1.00*	*0.87*	*0.87*
Hourly Flow Rate, HFR (veh/h)	*16*	*199*	*0*	*0*	*504*	*1*
Percent Heavy Vehicles	*7*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LT*					*TR*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				*3*		*52*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*0.87*	*1.00*	*0.87*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*3*	*0*	*59*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*						*LR*	
v (veh/h)	*16*						*62*	
C (m) (veh/h)	*1034*						*559*	
v/c	*0.02*						*0.11*	
95% queue length	*0.05*						*0.37*	
Control Delay (s/veh)	*8.5*						*12.2*	
LOS	*A*						*B*	
Approach Delay (s/veh)	--	--					*12.2*	
Approach LOS	--	--					*B*	

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*DSK*	Intersection	*Brady Road & Grand Ridge Dr.*
Agency/Co.	*Kelly Engineering*	Jurisdiction	*City of Camas*
Date Performed	*4/27/2022*	Analysis Year	*2025*
Analysis Time Period	*AM Peak Hour*		

Project Description *Year 2025 w/o Project*

East/West Street: *Brady Road* | North/South Street: *Grand Ridge Dr.*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*15*	*185*			*468*	*1*
Peak-Hour Factor, PHF	*0.87*	*0.87*	*1.00*	*1.00*	*0.87*	*0.87*
Hourly Flow Rate, HFR (veh/h)	*17*	*212*	*0*	*0*	*537*	*1*
Percent Heavy Vehicles	*7*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LT*					*TR*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				*3*		*55*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*0.87*	*1.00*	*0.87*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*3*	*0*	*63*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*						*LR*	
v (veh/h)	*17*						*66*	
C (m) (veh/h)	*1005*						*534*	
v/c	*0.02*						*0.12*	
95% queue length	*0.05*						*0.42*	
Control Delay (s/veh)	*8.6*						*12.7*	
LOS	*A*						*B*	
Approach Delay (s/veh)	--	--					*12.7*	
Approach LOS	--	--					*B*	

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*DSK*	Intersection	*Brady Road & Grand Ridge Dr.*
Agency/Co.	*Kelly Engineering*	Jurisdiction	*City of Camas*
Date Performed	*4/27/2022*	Analysis Year	*2025*
Analysis Time Period	*AM Peak Hour*		

Project Description	*Year 2025 with Project*
East/West Street: *Brady Road*	North/South Street: *Grand Ridge Dr.*
Intersection Orientation: *East-West*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*15*	*189*			*478*	*1*
Peak-Hour Factor, PHF	*0.87*	*0.87*	*1.00*	*1.00*	*0.87*	*0.87*
Hourly Flow Rate, HFR (veh/h)	*17*	*217*	*0*	*0*	*549*	*1*
Percent Heavy Vehicles	*7*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LT*					*TR*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				*3*		*55*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*0.87*	*1.00*	*0.87*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*3*	*0*	*63*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*						*LR*	
v (veh/h)	*17*						*66*	
C (m) (veh/h)	*995*						*526*	
v/c	*0.02*						*0.13*	
95% queue length	*0.05*						*0.43*	
Control Delay (s/veh)	*8.7*						*12.8*	
LOS	*A*						*B*	
Approach Delay (s/veh)	--	--					*12.8*	
Approach LOS	--	--					*B*	

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*DSK*	Intersection	*Brady Road & Grand Ridge Dr.*
Agency/Co.	*Kelly Engineering*	Jurisdiction	*City of Camas*
Date Performed	*4/27/2022*	Analysis Year	*2022*
Analysis Time Period	*PM Peak Hour*		

Project Description *Existing*

East/West Street: *Brady Road* | North/South Street: *Grand Ridge Dr.*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*42*	*419*			*271*	*6*
Peak-Hour Factor, PHF	*0.94*	*0.94*	*1.00*	*1.00*	*0.94*	*0.94*
Hourly Flow Rate, HFR (veh/h)	*44*	*445*	*0*	*0*	*288*	*6*
Percent Heavy Vehicles	*7*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LT*					*TR*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				*4*		*39*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*0.94*	*1.00*	*0.94*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*4*	*0*	*41*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*						*LR*	
v (veh/h)	*44*						*45*	
C (m) (veh/h)	*1239*						*677*	
v/c	*0.04*						*0.07*	
95% queue length	*0.11*						*0.21*	
Control Delay (s/veh)	*8.0*						*10.7*	
LOS	*A*						*B*	
Approach Delay (s/veh)	--	--					*10.7*	
Approach LOS	--	--					*B*	

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*DSK*	Intersection	*Brady Road & Grand Ridge Dr.*
Agency/Co.	*Kelly Engineering*	Jurisdiction	*City of Camas*
Date Performed	*4/27/2022*	Analysis Year	*2025*
Analysis Time Period	*PM Peak Hour*		

Project Description	*Year 2025 w/o Project*
East/West Street: *Brady Road*	North/South Street: *Grand Ridge Dr.*
Intersection Orientation: *East-West*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*45*	*448*			*289*	*6*
Peak-Hour Factor, PHF	*0.94*	*0.94*	*1.00*	*1.00*	*0.94*	*0.94*
Hourly Flow Rate, HFR (veh/h)	*47*	*476*	*0*	*0*	*307*	*6*
Percent Heavy Vehicles	*7*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LT*					*TR*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				*4*		*41*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*0.94*	*1.00*	*0.94*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*4*	*0*	*43*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*						*LR*	
v (veh/h)	*47*						*47*	
C (m) (veh/h)	*1220*						*657*	
v/c	*0.04*						*0.07*	
95% queue length	*0.12*						*0.23*	
Control Delay (s/veh)	*8.1*						*10.9*	
LOS	*A*						*B*	
Approach Delay (s/veh)	--	--					*10.9*	
Approach LOS	--	--					*B*	

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*DSK*	Intersection	*Brady Road & Grand Ridge Dr.*
Agency/Co.	*Kelly Engineering*	Jurisdiction	*City of Camas*
Date Performed	*4/27/2022*	Analysis Year	*2025*
Analysis Time Period	*PM Peak Hour*		

Project Description	*Year 2025 with Project*
East/West Street: *Brady Road*	North/South Street: *Grand Ridge Dr.*
Intersection Orientation: *East-West*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*45*	*459*			*295*	*6*
Peak-Hour Factor, PHF	*0.94*	*0.94*	*1.00*	*1.00*	*0.94*	*0.94*
Hourly Flow Rate, HFR (veh/h)	*47*	*488*	*0*	*0*	*313*	*6*
Percent Heavy Vehicles	*7*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LT*					*TR*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				*4*		*41*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*0.94*	*1.00*	*0.94*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*4*	*0*	*43*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*						*LR*	
v (veh/h)	*47*						*47*	
C (m) (veh/h)	*1213*						*650*	
v/c	*0.04*						*0.07*	
95% queue length	*0.12*						*0.23*	
Control Delay (s/veh)	*8.1*						*11.0*	
LOS	*A*						*B*	
Approach Delay (s/veh)	--	--					*11.0*	
Approach LOS	--	--					*B*	

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*DSK*	Intersection	*Brady Road & McIntosh Road*
Agency/Co.	*Kelly Engineering*	Jurisdiction	*City of Camas*
Date Performed	*4/27/2022*	Analysis Year	*2022*
Analysis Time Period	*AM Peak Hour*		

Project Description *Existing*

East/West Street: *McIntosh Road* | North/South Street: *Brady Road*

Intersection Orientation: *North-South* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*133*	*53*	*10*	*351*	
Peak-Hour Factor, PHF	*1.00*	*0.85*	*0.85*	*0.85*	*0.85*	*0.94*
Hourly Flow Rate, HFR (veh/h)	*0*	*156*	*62*	*11*	*412*	*0*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*1*	*1*	*0*
Configuration			*TR*	*L*	*T*	
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				*121*		*12*
Peak-Hour Factor, PHF	*0.94*	*0.94*	*1.00*	*0.85*	*0.94*	*0.85*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*142*	*0*	*14*
Percent Heavy Vehicles	*7*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*1*	*0*	*1*
Configuration				*L*		*R*

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*L*	*L*		*R*			
v (veh/h)		*11*	*142*		*14*			
C (m) (veh/h)		*1364*	*450*		*860*			
v/c		*0.01*	*0.32*		*0.02*			
95% queue length		*0.02*	*1.34*		*0.05*			
Control Delay (s/veh)		*7.7*	*16.6*		*9.3*			
LOS		*A*	*C*		*A*			
Approach Delay (s/veh)	--	--	*16.0*					
Approach LOS	--	--	*C*					

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*DSK*	Intersection	*Brady Road & McIntosh Road*
Agency/Co.	*Kelly Engineering*	Jurisdiction	*City of Camas*
Date Performed	*4/27/2022*	Analysis Year	*2025*
Analysis Time Period	*AM Peak Hour*		
Project Description	*Year 2025 w/o Project*		
East/West Street:	*McIntosh Road*	North/South Street:	*Brady Road*
Intersection Orientation:	*North-South*	Study Period (hrs):	*0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*141*	*57*	*11*	*372*	
Peak-Hour Factor, PHF	*1.00*	*0.85*	*0.85*	*0.85*	*0.85*	*0.94*
Hourly Flow Rate, HFR (veh/h)	*0*	*165*	*67*	*12*	*437*	*0*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*1*	*1*	*0*
Configuration			*TR*	*L*	*T*	
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				*132*		*13*
Peak-Hour Factor, PHF	*0.94*	*0.94*	*1.00*	*0.85*	*0.94*	*0.85*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*155*	*0*	*15*
Percent Heavy Vehicles	*7*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*1*	*0*	*1*
Configuration				*L*		*R*

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*L*	*L*		*R*			
v (veh/h)		*12*	*155*		*15*			
C (m) (veh/h)		*1348*	*428*		*848*			
v/c		*0.01*	*0.36*		*0.02*			
95% queue length		*0.03*	*1.63*		*0.05*			
Control Delay (s/veh)		*7.7*	*18.1*		*9.3*			
LOS		*A*	*C*		*A*			
Approach Delay (s/veh)	--	--	*17.3*					
Approach LOS	--	--	*C*					

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*DSK*	Intersection	*Brady Road & McIntosh Road*
Agency/Co.	*Kelly Engineering*	Jurisdiction	*City of Camas*
Date Performed	*4/27/2022*	Analysis Year	*2025*
Analysis Time Period	*AM Peak Hour*		

Project Description	*Year 2025 with Project*
East/West Street: *McIntosh Road*	North/South Street: *Brady Road*
Intersection Orientation: *North-South*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*141*	*61*	*11*	*372*	
Peak-Hour Factor, PHF	*1.00*	*0.85*	*0.85*	*0.85*	*0.85*	*0.94*
Hourly Flow Rate, HFR (veh/h)	*0*	*165*	*71*	*12*	*437*	*0*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*1*	*1*	*0*
Configuration			*TR*	*L*	*T*	
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				*142*		*14*
Peak-Hour Factor, PHF	*0.94*	*0.94*	*1.00*	*0.85*	*0.94*	*0.85*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*167*	*0*	*16*
Percent Heavy Vehicles	*7*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*1*	*0*	*1*
Configuration				*L*		*R*

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*L*	*L*		*R*			
v (veh/h)		*12*	*167*		*16*			
C (m) (veh/h)		*1343*	*427*		*846*			
v/c		*0.01*	*0.39*		*0.02*			
95% queue length		*0.03*	*1.82*		*0.06*			
Control Delay (s/veh)		*7.7*	*18.7*		*9.3*			
LOS		*A*	*C*		*A*			
Approach Delay (s/veh)	--	--	*17.9*					
Approach LOS	--	--	*C*					

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*DSK*	Intersection	*Brady Road & McIntosh Road*
Agency/Co.	*Kelly Engineering*	Jurisdiction	*City of Camas*
Date Performed	*4/27/2022*	Analysis Year	*2022*
Analysis Time Period	*PM Peak Hour*		

Project Description *Existing*

East/West Street: *McIntosh Road*	North/South Street: *Brady Road*
Intersection Orientation: *North-South*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*297*	*96*	*15*	*216*	
Peak-Hour Factor, PHF	*1.00*	*0.89*	*0.89*	*0.89*	*0.89*	*0.94*
Hourly Flow Rate, HFR (veh/h)	*0*	*333*	*107*	*16*	*242*	*0*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*1*	*1*	*0*
Configuration			*TR*	*L*	*T*	
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				*48*		*14*
Peak-Hour Factor, PHF	*0.94*	*0.94*	*1.00*	*0.89*	*0.94*	*0.89*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*53*	*0*	*15*
Percent Heavy Vehicles	*7*	*0*	*0*	*20*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*1*	*0*	*1*
Configuration				*L*		*R*

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*L*	*L*		*R*			
v (veh/h)		*16*	*53*		*15*			
C (m) (veh/h)		*1131*	*395*		*666*			
v/c		*0.01*	*0.13*		*0.02*			
95% queue length		*0.04*	*0.46*		*0.07*			
Control Delay (s/veh)		*8.2*	*15.5*		*10.5*			
LOS		*A*	*C*		*B*			
Approach Delay (s/veh)	--	--	*14.4*					
Approach LOS	--	--	*B*					

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*DSK*	Intersection	*Brady Road & McIntosh Road*
Agency/Co.	*Kelly Engineering*	Jurisdiction	*City of Camas*
Date Performed	*4/27/2022*	Analysis Year	*2025*
Analysis Time Period	*PM Peak Hour*		

Project Description *Year 2025 w/o Project*

East/West Street: *McIntosh Road* | North/South Street: *Brady Road*

Intersection Orientation: *North-South* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*315*	*106*	*16*	*229*	
Peak-Hour Factor, PHF	*1.00*	*0.89*	*0.89*	*0.89*	*0.89*	*0.94*
Hourly Flow Rate, HFR (veh/h)	*0*	*353*	*119*	*17*	*257*	*0*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*1*	*1*	*0*
Configuration			*TR*	*L*	*T*	
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				*53*		*15*
Peak-Hour Factor, PHF	*0.94*	*0.94*	*1.00*	*0.89*	*0.94*	*0.89*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*59*	*0*	*16*
Percent Heavy Vehicles	*7*	*0*	*0*	*20*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*1*	*0*	*1*
Configuration				*L*		*R*

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*L*	*L*		*R*			
v (veh/h)		*17*	*59*		*16*			
C (m) (veh/h)		*1100*	*372*		*644*			
v/c		*0.02*	*0.16*		*0.02*			
95% queue length		*0.05*	*0.56*		*0.08*			
Control Delay (s/veh)		*8.3*	*16.5*		*10.7*			
LOS		*A*	*C*		*B*			
Approach Delay (s/veh)	--	--	*15.3*					
Approach LOS	--	--	*C*					

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*DSK*	Intersection	*Brady Road & McIntosh Road*
Agency/Co.	*Kelly Engineering*	Jurisdiction	*City of Camas*
Date Performed	*4/27/2022*	Analysis Year	*2025*
Analysis Time Period	*PM Peak Hour*		

Project Description	*Year 2025 with Project*
East/West Street:	*McIntosh Road*
Intersection Orientation:	*North-South*
North/South Street:	*Brady Road*
Study Period (hrs):	*0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*315*	*117*	*17*	*229*	
Peak-Hour Factor, PHF	*1.00*	*0.89*	*0.89*	*0.89*	*0.89*	*0.94*
Hourly Flow Rate, HFR (veh/h)	*0*	*353*	*131*	*19*	*257*	*0*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*1*	*1*	*0*
Configuration			*TR*	*L*	*T*	
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				*59*		*15*
Peak-Hour Factor, PHF	*0.94*	*0.94*	*1.00*	*0.89*	*0.94*	*0.89*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*66*	*0*	*16*
Percent Heavy Vehicles	*7*	*0*	*0*	*20*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*1*	*0*	*1*
Configuration				*L*		*R*

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*L*	*L*		*R*			
v (veh/h)		*19*	*66*		*16*			
C (m) (veh/h)		*1089*	*366*		*639*			
v/c		*0.02*	*0.18*		*0.03*			
95% queue length		*0.05*	*0.65*		*0.08*			
Control Delay (s/veh)		*8.4*	*17.0*		*10.8*			
LOS		*A*	*C*		*B*			
Approach Delay (s/veh)	--	--	*15.8*					
Approach LOS	--	--	*C*					

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*DSK*	Intersection	*Fremont St. & McIntosh Rd.*
Agency/Co.	*Kelly Engineering*	Jurisdiction	*City of Camas*
Date Performed	*4/27/2022*	Analysis Year	*2022*
Analysis Time Period	*AM Peak Hour*		
Project Description	*Existing*		
East/West Street:	*McIntosh Road*	North/South Street:	*Fremont St.*
Intersection Orientation:	*East-West*	Study Period (hrs):	*0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*7*	*43*	*1*	*0*	*79*	*2*
Peak-Hour Factor, PHF	*0.78*	*0.78*	*0.78*	*0.78*	*0.78*	*0.78*
Hourly Flow Rate, HFR (veh/h)	*8*	*55*	*1*	*0*	*101*	*2*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LTR*			*LTR*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*2*	*0*	*0*	*3*	*0*	*10*
Peak-Hour Factor, PHF	*0.78*	*0.78*	*0.78*	*0.78*	*0.78*	*0.78*
Hourly Flow Rate, HFR (veh/h)	*2*	*0*	*0*	*3*	*0*	*12*
Percent Heavy Vehicles	*0*	*0*	*0*	*33*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*	*LTR*		*LTR*			*LTR*	
v (veh/h)	*8*	*0*		*2*			*15*	
C (m) (veh/h)	*1502*	*1562*		*773*			*900*	
v/c	*0.01*	*0.00*		*0.00*			*0.02*	
95% queue length	*0.02*	*0.00*		*0.01*			*0.05*	
Control Delay (s/veh)	*7.4*	*7.3*		*9.7*			*9.1*	
LOS	*A*	*A*		*A*			*A*	
Approach Delay (s/veh)	--	--	*9.7*			*9.1*		
Approach LOS	--	--	*A*			*A*		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*DSK*	Intersection	*Fremont St. & McIntosh Rd.*
Agency/Co.	*Kelly Engineering*	Jurisdiction	*City of Camas*
Date Performed	*4/27/2022*	Analysis Year	*2025*
Analysis Time Period	*AM Peak Hour*		

Project Description *Year 2025 w/o Project*

East/West Street: *McIntosh Road* | North/South Street: *Fremont St.*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*7*	*48*	*1*	*0*	*85*	*2*
Peak-Hour Factor, PHF	*0.78*	*0.78*	*0.78*	*0.78*	*0.78*	*0.78*
Hourly Flow Rate, HFR (veh/h)	*8*	*61*	*1*	*0*	*108*	*2*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LTR*			*LTR*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*2*	*0*	*0*	*3*	*0*	*11*
Peak-Hour Factor, PHF	*0.78*	*0.78*	*0.78*	*0.78*	*0.78*	*0.78*
Hourly Flow Rate, HFR (veh/h)	*2*	*0*	*0*	*3*	*0*	*14*
Percent Heavy Vehicles	*0*	*0*	*0*	*33*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*	*LTR*		*LTR*			*LTR*	
v (veh/h)	*8*	*0*		*2*			*17*	
C (m) (veh/h)	*1493*	*1554*		*755*			*896*	
v/c	*0.01*	*0.00*		*0.00*			*0.02*	
95% queue length	*0.02*	*0.00*		*0.01*			*0.06*	
Control Delay (s/veh)	*7.4*	*7.3*		*9.8*			*9.1*	
LOS	*A*	*A*		*A*			*A*	
Approach Delay (s/veh)	--	--	*9.8*			*9.1*		
Approach LOS	--	--	*A*			*A*		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*DSK*	Intersection	*Fremont St. & McIntosh Rd.*
Agency/Co.	*Kelly Engineering*	Jurisdiction	*City of Camas*
Date Performed	*4/27/2022*	Analysis Year	*2025*
Analysis Time Period	*AM Peak Hour*		
Project Description	*Year 2025 with Project*		
East/West Street:	*McIntosh Road*	North/South Street:	*Fremont St.*
Intersection Orientation:	*East-West*	Study Period (hrs):	*0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*7*	*51*	*1*	*0*	*86*	*2*
Peak-Hour Factor, PHF	*0.78*	*0.78*	*0.78*	*0.78*	*0.78*	*0.78*
Hourly Flow Rate, HFR (veh/h)	*8*	*65*	*1*	*0*	*110*	*2*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LTR*			*LTR*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*2*	*0*	*1*	*3*	*0*	*11*
Peak-Hour Factor, PHF	*0.78*	*0.78*	*0.78*	*0.78*	*0.78*	*0.78*
Hourly Flow Rate, HFR (veh/h)	*2*	*0*	*1*	*3*	*0*	*14*
Percent Heavy Vehicles	*0*	*0*	*0*	*33*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*	*LTR*		*LTR*			*LTR*	
v (veh/h)	*8*	*0*		*3*			*17*	
C (m) (veh/h)	*1490*	*1549*		*818*			*892*	
v/c	*0.01*	*0.00*		*0.00*			*0.02*	
95% queue length	*0.02*	*0.00*		*0.01*			*0.06*	
Control Delay (s/veh)	*7.4*	*7.3*		*9.4*			*9.1*	
LOS	*A*	*A*		*A*			*A*	
Approach Delay (s/veh)	--	--		*9.4*			*9.1*	
Approach LOS	--	--		*A*			*A*	

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*DSK*	Intersection	*Fremont St. & McIntosh Rd.*
Agency/Co.	*Kelly Engineering*	Jurisdiction	*City of Camas*
Date Performed	*4/27/2022*	Analysis Year	*2022*
Analysis Time Period	*PM Peak Hour*		
Project Description	*Existing*		
East/West Street:	*McIntosh Road*	North/South Street:	*Fremont St.*
Intersection Orientation:	*East-West*	Study Period (hrs):	*0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*9*	*73*	*7*	*4*	*41*	*4*
Peak-Hour Factor, PHF	*0.93*	*0.93*	*0.93*	*0.93*	*0.93*	*0.93*
Hourly Flow Rate, HFR (veh/h)	*9*	*78*	*7*	*4*	*44*	*4*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LTR*			*LTR*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*3*	*0*	*0*	*2*	*0*	*6*
Peak-Hour Factor, PHF	*0.93*	*0.93*	*0.93*	*0.93*	*0.93*	*0.93*
Hourly Flow Rate, HFR (veh/h)	*3*	*0*	*0*	*2*	*0*	*6*
Percent Heavy Vehicles	*0*	*0*	*0*	*33*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*	*LTR*		*LTR*			*LTR*	
v (veh/h)	*9*	*4*		*3*			*8*	
C (m) (veh/h)	*1572*	*1524*		*804*			*939*	
v/c	*0.01*	*0.00*		*0.00*			*0.01*	
95% queue length	*0.02*	*0.01*		*0.01*			*0.03*	
Control Delay (s/veh)	*7.3*	*7.4*		*9.5*			*8.9*	
LOS	*A*	*A*		*A*			*A*	
Approach Delay (s/veh)	--	--	*9.5*			*8.9*		
Approach LOS	--	--	*A*			*A*		

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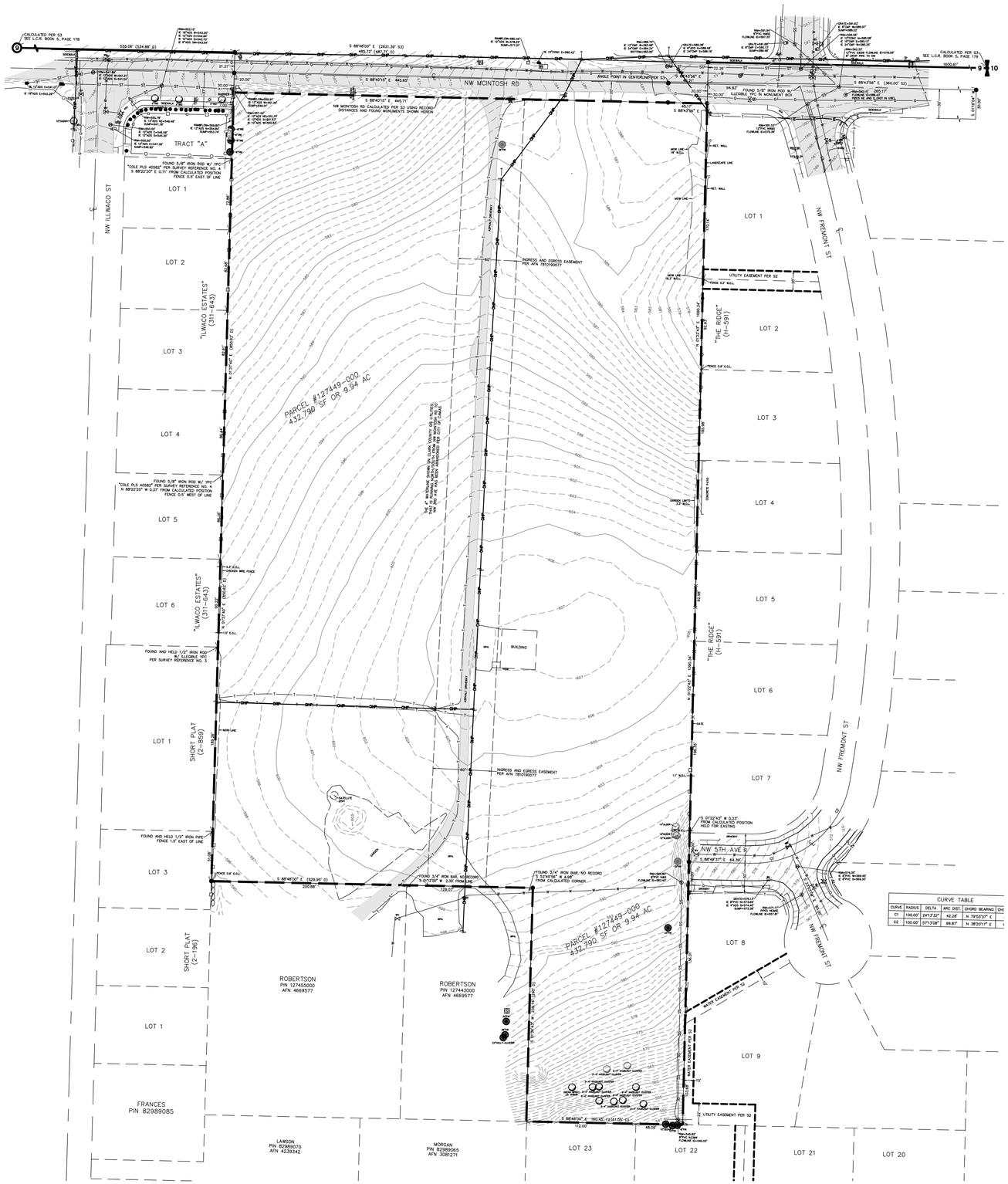
APPENDIX D
REFERENCES

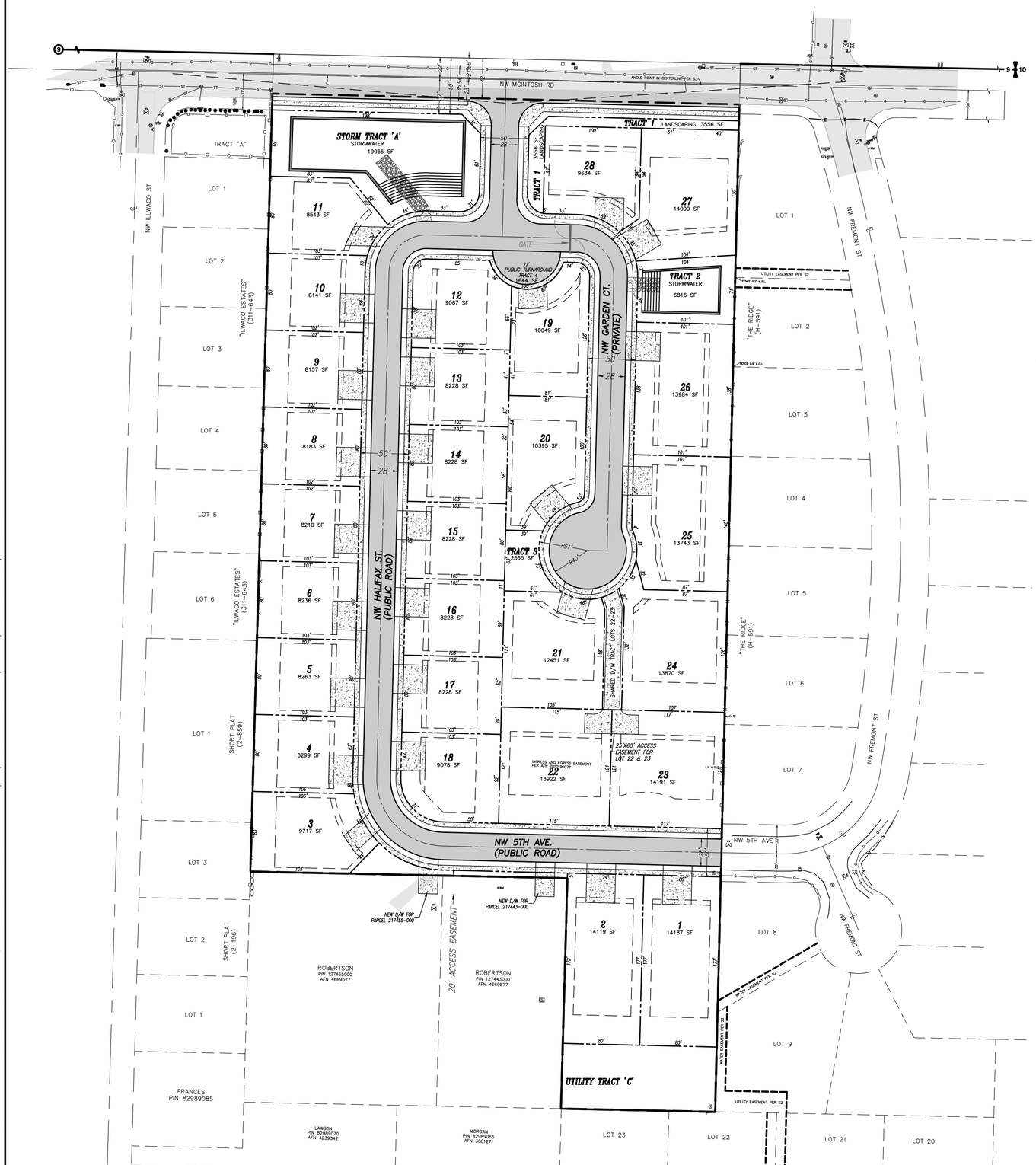
References

1. Trip Generation Manual, 11th Edition, 2021, Institute of Transportation Engineers.

2. Highway Capacity Manual, 2000 and 2010, Transportation Research Board, National Research Council.

3. McIntosh Subdivision, Pre-Application Meeting Notes, City of Camas Case Number PA21-51.


NW MCINTOSH RD
NW ILLWACO ST
NW FREMONT ST
NW 5TH AVE
TRACT "A"
LOT 1
LOT 2
LOT 3
LOT 4
LOT 5
LOT 6
LOT 7
LOT 8
LOT 9
LOT 20
LOT 21
LOT 22
LOT 23
"ILWACO ESTATES" (311-643)
"THE RIDGE" (H-591)
SHORT PLAT (2-859)
SHORT PLAT (2-196)
PARCEL #127449-000
432,790 SF OR 9.94 AC
ROBERTSON
PIN 127445000
AFN 4669577
ROBERTSON
PIN 127443000
AFN 4669577
FRANCES
PIN 82989085
LAWSON
PIN 82988070
AFN 4239342
MORGAN
PIN 82989065
AFN 3081271
INGRESS AND EGRESS EASEMENT PER AFN 7810180077
UTILITY EASEMENT PER 52
WATER EASEMENT PER 52
BUILDING
CALCULATED PER 53
SEE L/C/R BOOK 5, PAGE 178
CALCULATED PER 52
SEE L/C/R BOOK 5, PAGE 179
FOUND 5/8" IRON ROD W/ YPC "COLE PLS 40582" PER SURVEY REFERENCE NO. 4
FOUND HELD 1/2" IRON ROD W/ ILLEGIBLE YPC PER SURVEY REFERENCE NO. 3
FOUND HELD 1/2" IRON PIPE
FOUND 3/4" IRON BAR, NO RECORD
FOUND 5/8" IRON ROD W/ YPC "COLE PLS 40582" PER SURVEY REFERENCE NO. 4
FOUND 5/8" IRON ROD W/ YPC "COLE PLS 40582" PER SURVEY REFERENCE NO. 4
FOUND 5/8" IRON ROD W/ ILLEGIBLE YPC IN MONUMENT BOX
ANGLE POINT IN CENTERLINE PER 53
S 88°40'15" E 445.91'
S 88°40'00" E (2621.39' 53)
485.72' (487.31' 52)
535.06' (534.88' 2)
S 88°43'56" E (360.00' 52)
94.83'
60.13'
S 88°43'56" E
S 88°40'37" E 64.39'
S 88°44'00" E (329.95' 2)
200.89'
S 88°44'00" E (660.00' 2)
S 88°44'00" E (660.00' 2)
S 88°40'00" E (660.00' 2)
S 88°40'00" E (660.00' 2)
S 88°40



MCINTOSH SUBDIVISION

BEING A PORTION OF THE SOUTHEAST QUARTER OF SECTION 9, TOWNSHIP 1 NORTH, RANGE 3 EAST OF THE WILLAMETTE MERIDIAN CLARK COUNTY, WASHINGTON

PRELIMINARY APPLICATION

JUNE 2022

APPLICANT & PROPERTY OWNER:

METT RI, LLC. ATTN: SAM MADISON

3511 NW MCMASTER DRIVE

CAMAS, WA 98606

PH: 503.318.2578

SCAMALAMA72@GMAIL.COM

PROPERTY ADDRESSES:

3210 NW MCINTOSH RD.

CAMAS, WA 98607

CONTACT PERSON:

SGA ENGINEERING, PLLC
ATTN: SCOTT TAYLOR
2005 BROADWAY STREET
VANCOUVER, WA 98663
PH: 360.993.0911
FX: 360.993.0912
EM: STAYLOR@SGAENGINEERING.COM

EXISTING SITE INFORMATION

EXISTING PARCEL NUMBERS	127449-000
CURRENT USE	VACANT LAND WITH OUTBUILDINGS & DRIVEWAY
ZONING DESIGNATION	R-10
GROSS SITE AREA	9.94 ACRES 432,790 S.F.
TRANSIT ROUTES	UNKNOWN.
EXISTING WATER AND SEWER	THE EXISTING LOT IS SERVED BY CITY OF CAMAS SEWER & WATER.

ENVIRONMENTAL CONDITIONS

NONE KNOWN.

EXISTING CONDITIONS DISCLAIMER

THE EXISTING CONDITIONS SHOWN ON THIS PLAN WERE OBTAINED FROM INFORMATION PROVIDED BY PUBLIC SOURCES. SGA ENGINEERING, PLLC DOES NOT GUARANTEE THE ACCURACY OF THIS INFORMATION.

PROPOSED SITE INFORMATION

PROPOSED USE

28 DETACHED SINGLE-FAMILY LOT SUBDIVISION IN THE R-10 ZONE

DEVELOPMENT STANDARDS

MAX DENSITY	4.3 D.U./ NET ACRE
MINIMUM LOT AREA	8,000 SF
MINIMUM LOT WIDTH	80'
MINIMUM LOT DEPTH	100'
FRONT YARD SETBACK	20'
GARAGE SETBACK	25'
STREET SIDE YARD SETBACK	10'
INTERIOR SIDE YARD SETBACK	5'
REAR YARD SETBACK	25'
MAXIMUM BLDG LOT COVERAGE	35%, 50% REQUESTED WITH MODIFICATION
MAXIMUM BUILDING HEIGHT	35'
MINIMUM LANDSCAPED AREA	T.B.D.

UTILITY PROVIDERS

SEWER	CITY OF CAMAS
WATER	CITY OF CAMAS
ELECTRICAL	CLARK PUBLIC UTILITIES

STORMWATER MANAGEMENT CITY OF CAMAS STANDARDS

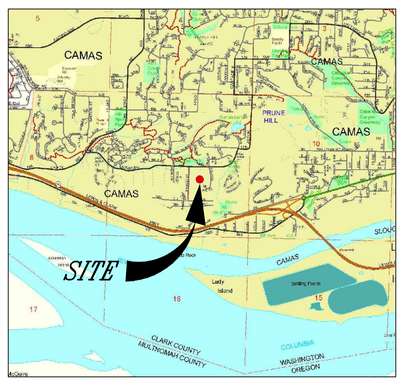
TREATMENT	STORMWATER IS PROPOSED TO BE TREATED USING BIO-RETENTION FACILITIES, RAINGARDENS OR OTHER APPROVED BMP'S
DISPOSAL	TREATED STORMWATER WILL BE INFILTRATED INTO THE GROUND WHERE FEASIBLE.

PROPOSED SITE AREA SUMMARY	***ACRES***	***S.F.***
GROSS SITE AREA	9.94	433165
NET SITE AREA	7.85	341736
AVERAGE LOT AREA	0.24	10319
R/W & PVT ROAD DEDICATION	2.10	91429

N

0 60 120 180

Scale: 1" = 60'



VICINITY MAP

SCALE: NTS

SGA ENGINEERING & DESIGN
CIVIL ENGINEERING ~ LAND PLANNING
DEVELOPMENT SERVICES
LANDSCAPE ARCHITECTURE

2005 BROADWAY
VANCOUVER, WA 98663
PHONE (360)993-0911
FAX (360)993-0912

PRELIMINARY NOT A CONSTRUCTION DOCUMENT — SCOTT A. TAYLOR — 19005 — REGISTERED PROFESSIONAL ENGINEER

PRELIMINARY PLAT

MCINTOSH SUBDIVISION

CITY OF CAMAS WASHINGTON

PRELIMINARY

REVISIONS

DESIGNED BY:	SAT, JAI
DRAWN BY:	SAT, JAI
CHECKED BY:	SAT, JAI
SCALE:	1" = 60'

JOB NUMBER	SHEET
2140	PRE2.0

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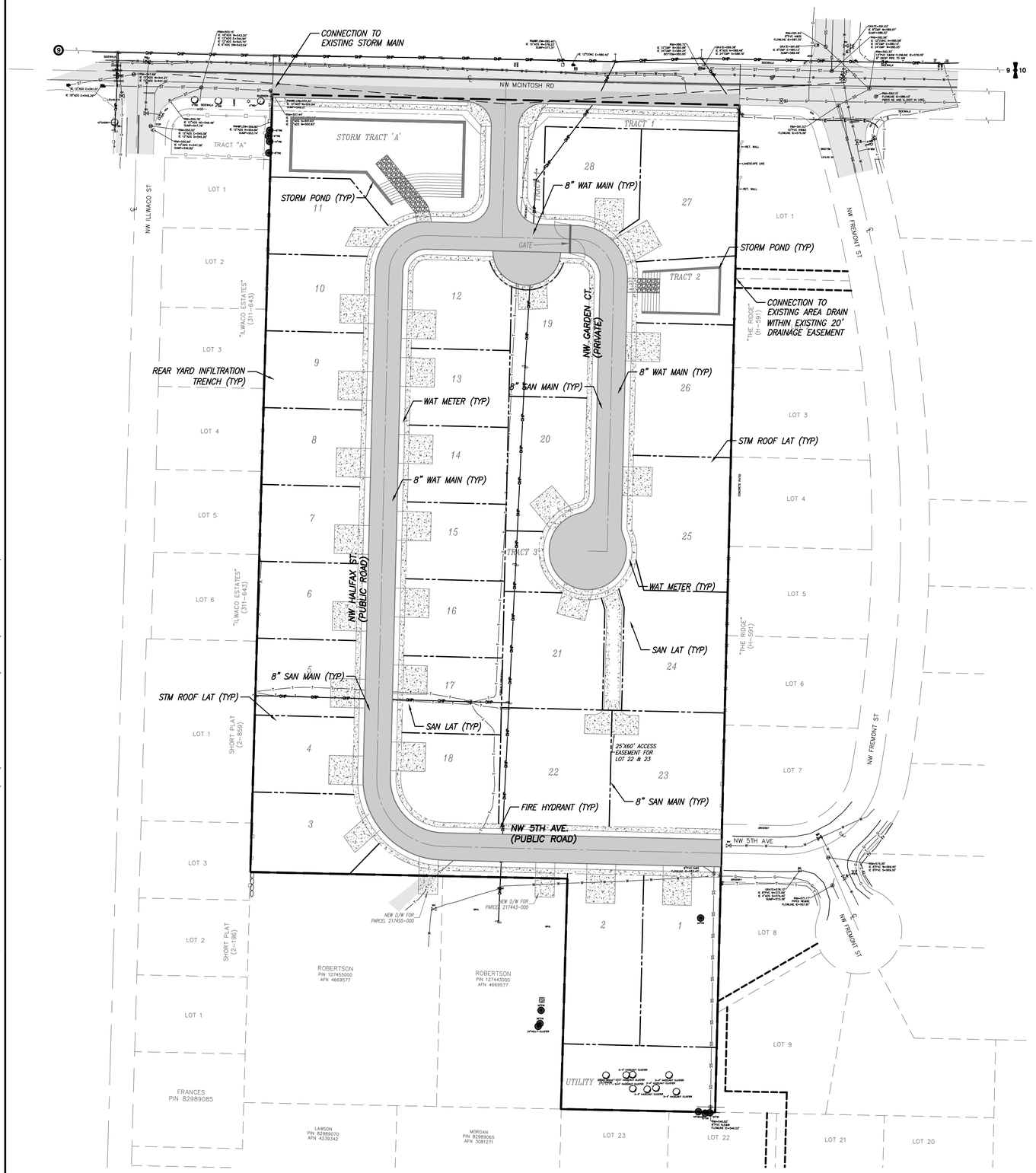

LEGEND:

WV	INDICATES WATER VALVE
	INDICATES FIRE HYDRANT
WM	INDICATES WATER METER
	INDICATES CONTROL VALVE
WV	INDICATES WATER VAULT
W	INDICATES WATER MANHOLE
	INDICATES TELEPHONE SERVICE BOX
	INDICATES TELEPHONE MARKER
ST	INDICATES STORM SEWER MANHOLE
CO	INDICATES STORM CLEANOUT
	INDICATES DITCH INLET
	INDICATES CURB INLET
	INDICATES CATCH BASIN
S	INDICATES SANITARY SEWER MANHOLE
S	INDICATES SEPTIC SYSTEM LID
	INDICATES POWER POLE
	INDICATES GUY ANCHOR
	INDICATES LIGHT POLE
E	INDICATES ELECTRIC SERVICE BOX
GV	INDICATES GAS VALVE
	INDICATES GAS MARKER
	INDICATES SIGN
	INDICATES MAIL BOX

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FAX (360)993-0912

PRELIMINARY UTILITY PLAN

MCINTOSH SUBDIVISION

WASHINGTON

CITY OF CAMAS

PRELIMINARY

REVISIONS

DESIGNED BY:	SAT, JAI
DRAWN BY:	SAT, JAI
CHECKED BY:	SAT, JAI
SCALE:	1" = 60'

JOB NUMBER	SHEET
2140	PRE3.0

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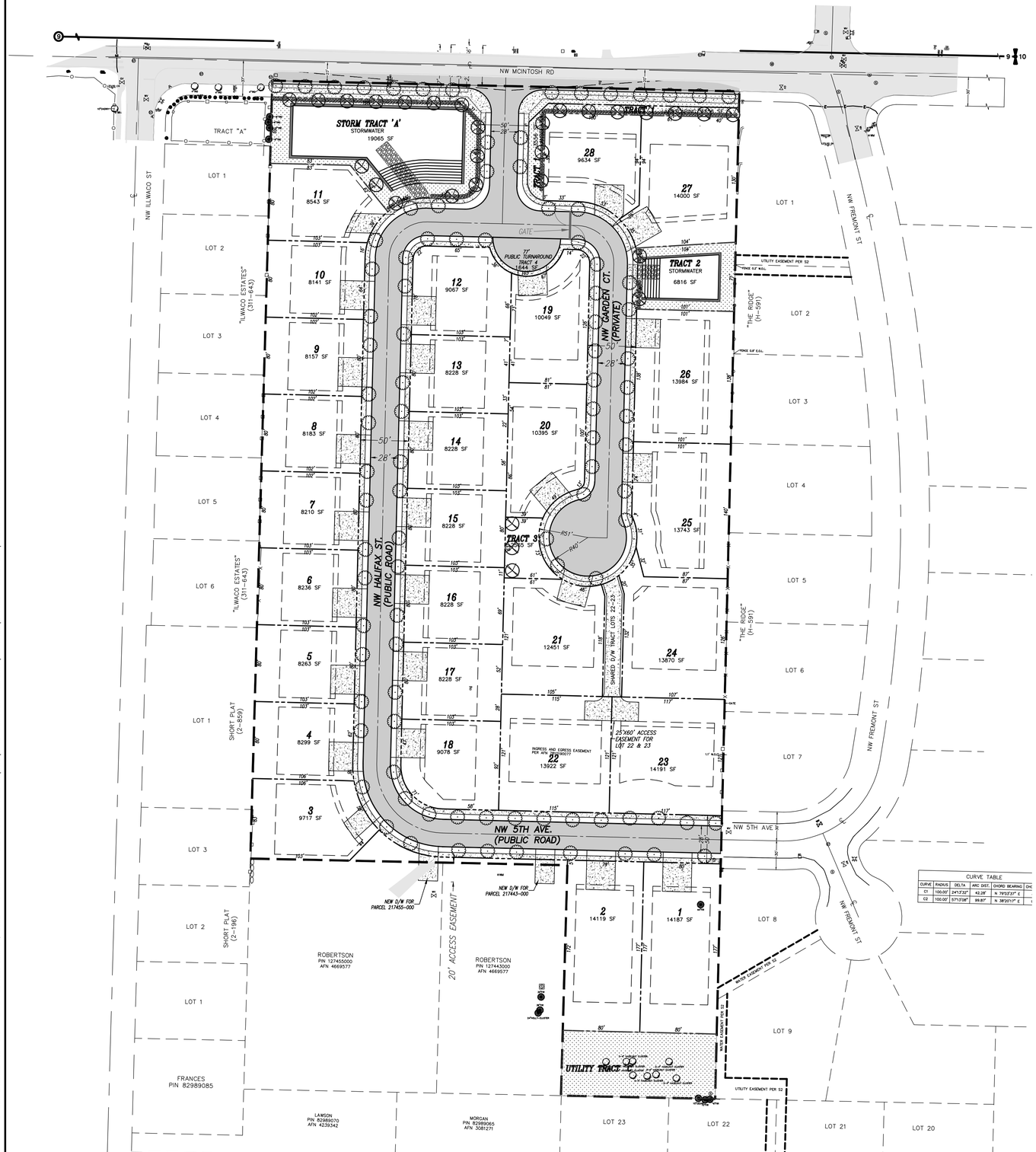

CURVE TABLE					
CURVE	RADIUS	DELTA	ARC DIST.	CHORD BEARING	CHO
C1	100.00'	241°37'35"	42.28'	N 79°57'37" E	
C2	100.00'	57°13'08"	99.87'	N 38°20'17" E	

PLANTING LEGEND

	SIZE	SPACING	QUANTITY
ACER GINNALA 'FLAME' FLAME MAPLE or approved equal.	2" CAL.	30' O.C. OR AS SHOWN	96
CORNUS KOUSA x FLORIDA 'PINK DOGWOOD' or approved equal.	2" CAL.	30' O.C. OR AS SHOWN	29
PRUNUS LAUROCERASUS 'OTTO LUYKEN' OTTO LUYKEN LAUREL or approved equal.	2-5 GALLON	4' O.C.	209
TURF GRASS or approved equal	N/A	AS SHOWN	27063 SF

N

0 60 120 180

Scale: 1" = 60'

Diameter at Breast Height "dbh"	Tree Units	Diameter at Breast Height "dbh"	Tree Units
1" to 5" (7: 2-4" HAZELNUTS)	1 (X 7 = 7 UNITS)	31" to 32"	12
6" to 12"	2	33" to 34"	13
13" to 14"	3	35" to 36"	14
15" to 16"	4	37" to 38"	15
17" to 18"	5	39" to 40"	16
19" to 20"	6	41" to 42"	17
21" to 22"	7	43" to 44" (44" FIR)	18 (X 1 = 18 UNITS)
23" to 24"	8	45" to 46"	19
25" to 26"	9	47" to 48"	20
27" to 28"	10	49" to 50"	21
29" to 30"	11	For larger trees, allow a ½ tree unit for every additional inch of dbh.	

8 TREES RETAINED TOTAL

25 TREE UNITS RETAINED

7.5 NET ACRES X 20= 150 TREE UNITS REQUIRED

125 TREE UNITS REMAINING

125 TREES PLANTED

150 TREE UNITS PROVIDED

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LANDSCAPE ARCHITECTURE

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PRELIMINARY NOT FOR CONSTRUCTION

STATE OF WASHINGTON
LICENSED LANDSCAPE ARCHITECT

SCOTT A. TAYLOR

LICENSE NO. 1247

EXPIRES ON _____

PRELIMINARY LANDSCAPE & TREE PLAN

MCINTOSH SUBDIVISION

CITY OF CAMAS WASHINGTON

PRELIMINARY

REVISIONS

DESIGNED BY:	SAT, JAI
DRAWN BY:	SAT, JAI
CHECKED BY:	SAT, JAI
SCALE:	1" = 60'

JOB NUMBER	SHEET
2140	PRE4.0

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LANDSCAPING GENERAL NOTES:

1. DEVELOPER SHALL SUBMIT A LANDSCAPE PLAN SHOWING PLANT TYPE, LOCATION, AND QUANTITY OF PLANTS, THAT IS DESIGNED BY A QUALIFIED LANDSCAPE DESIGNER.
2. SHOW THE LOCATION OF SIDEWALK, LIGHT POLES, MAIL BOXES, DRIVEWAYS, FIRE HYDRANTS, INTERSECTIONS, AND ANY OTHER APPURTENANCE THAT MAY INFLUENCE THE PLACEMENT OF PLANTS.
3. LANDSCAPING SHALL BE SELECTED AND LOCATED TO DETER SOUND, FILTER AIR CONTAMINANTS, CURTAIL EROSION, MINIMIZE STORM WATER RUN-OFF, CONTRIBUTE TO LIVING PRIVACY, REDUCE THE VISUAL IMPACTS OF BUILDINGS/EQUIPMENT AND PAVED AREAS, SCREEN, REDUCE GLARE, AND EMPHASIZE OR SEPARATE OUTDOOR SPACES OF DIFFERENT USES OR CHARACTER.
4. LANDSCAPING SHALL BE DESIGNED TO BE HARMONIOUS WITH THE LOCAL SETTING AND WITH NEIGHBORING DEVELOPMENTS.
5. PLANTS AND TREES SHALL COMPLEMENT OR SUPPLEMENT SURROUNDING NATURAL VEGETATION.
6. PLANTS AND TREES CHOSEN SHALL BE IN SCALE WITH THE STRUCTURES AND EQUIPMENT DEVELOPMENT, KEEPING IN MIND THE MATURE SIZE OF PLANTINGS.
7. MINIMUM LANDSCAPING AS A PERCENT OF GROSS SITE AREA SHALL BE 15%.
8. DEVELOPER SHALL PROVIDE AN IRRIGATION PLAN.
   - 8.1 APPROPRIATE IRRIGATION SYSTEMS SHALL BE INSTALLED WHERE NEEDED TO ASSURE LANDSCAPING SUCCESS.
   - 8.2 DESIGN OF LANDSCAPING THAT INCLUDES XERISCAPE PRINCIPLES IS ENCOURAGED TO REDUCE LONG-TERM MAINTENANCE DEMANDS AND TO CONSERVE WATER.
   - 8.3 XERISCAPE IS DEFINED AS LANDSCAPE DESIGN, WHICH WOULD INCORPORATE PLANT MATERIALS THAT REQUIRE LITTLE OR NO IRRIGATION AND RELY ON NATURAL MOISTURE AND RAINFALL FOR SURVIVAL ONCE ESTABLISHED.
9. LANDSCAPE SHALL BE DESIGNED WITH MAINTENANCE IN MIND:
   - 9.1 DEVELOPER SHALL PROVIDE A MAINTENANCE PLAN DESCRIBING FUNDING, RESPONSIBILITY, AND FREQUENCY OF MAINTENANCE.
   - 9.2 PLANTS AND TREES THAT MINIMIZE UPKEEP AND MAINTENANCE SHALL BE SELECTED.
   - 9.3 TREES, AS THEY GROW, SHALL BE PRUNED TO THEIR NATURAL FORM TO PROVIDE AT LEAST 10 FEET OF CLEARANCE ABOVE SIDEWALKS AND 12 FEET ABOVE STREET ROADWAY SURFACES.
   - 9.4 SHRUBS SHALL BE MAINTAINED TO A MAXIMUM HEIGHT OF 42 INCHES FROM TOP OF CURB TO TOP OF PLANT. ENSURE THAT SHRUBS ARE TRIMMED BACK FROM FACE OF CURB.
10. WHERE THERE ARE OVERHEAD UTILITY LINES, TREE SPECIES THAT WILL NOT INTERFERE WITH THOSE LINES SHALL BE CHOSEN. DEVELOPER IS TO VERIFY WITH UTILITY ON SPECIES SELECTION.
11. TREES SHALL NOT BE PLANTED WITHIN 2 FEET OF ANY PERMANENT HARD SURFACE PAVING OR WALKWAY.
12. PARKING AND LOADING AREAS SHALL BE SCREENED FROM HORIZONTAL VIEW WITH THE USE OF DENSE LANDSCAPING, MOUNDS OR BERMS.
13. PERIMETER AND SECURITY FENCING SHALL BE CONSTRUCTED TO MINIMIZE VISUAL IMPACT. WALLS OR FENCES SEPARATING ADJOINING PARCELS MAY BE LOCATED AT THE PROPERTY LINE. SECURITY FENCING SHALL BLEND INTO AND BE COMPATIBLE WITH LANDSCAPING AND SURROUNDING ENVIRONMENT. FENCING SHALL HAVE EARTH TONE COLORS OF BROWN, TAN GRAY, OR GREEN, WALLS SHALL BE CONSTRUCTED OF MATERIALS COMPATIBLE WITH THE BUILDING ACRHITECTURE, LANDSCAPING, AND SURROUNDING ENVIRONMENT.
14. SITE AND BUILDING LIGHTING SHALL BE DESIGNED TO MINIMIZE GLARE OR OBJECTIONABLE EFFECTS TO THE ADJACENT PROPERTIES. SITE LIGHTING POLES SHALL NOT EXCEED 20 FEET IN HEIGHT AND SHALL DIRECT THE LIGHT DOWNWARD. LIGHTING SOURCES VIEWED FROM ABOVE OR BELOW ON ADJACENT PROPERTY SHALL BE SHIELDED. BUILDING LIGHTING IS TO BE CONCEALED AND INDIRECT. SITE LIGHTING IS TO BE DESIGNED TO PROVIDE UNIFORM DISTRIBUTION AND THE LIGHT LEVELS SHALL BE ADEQUATE FOR REASONABLE SECURITY AND SAFETY ON THE PREMISES.
15. EARTH BERMS MAY BE USED TO PROVIDE VARIATION IN THE GROUND PLANE AND FOR SCREENING INTERIOR PROTIONS OF THE SITE. CARE MUST BE TAKEN IN THEIR DESIGN TO AVOID CREATING AN ARTIFICIAL APPEARING LANDSCAPE. THE BERMED AREAS SHALL BE AS LONG, AS GRADUAL, AND AS GRACEFUL AS SPACE WILL ALLOW, AND SHOULD HAVE A MINIMUM HEIGHT ABOVE SURROUNDING GRADE OF THREE FEET. MAXIMUM SLOPES FOR BERMED AREAS SHALL BE 3:1 FOR TURF AREAS AND 2:1 FOR GROUNDCOVER AREAS.

LANDSCAPING W/IN R.O.W. NOTES:

1. TREES SHALL NOT BE PLANTED CLOSER THAN 25 FEET FROM THE CURB LINE OF THE INTERSECTIONS OF STREETS OR ALLEYS, AND NOT CLOSER THAN 10 FEET FROM DRIVEWAYS, FIRE HYDRANTS, OR UTILITY POLES.
2. STREET TREES SHALL NOT BE PLANTED CLOSER THAN 20 FEET TO LIGHT STANDARDS. EXCEPT FOR PUBLIC SAFETY, NO NEW LIGHT STANDARD SHOULD BE POSITIONED CLOSER THAN 10 FEET TO ANY EXISTING STREET TREE, AND PREFERABLY SUCH LOCATIONS WILL BE AT LEAST 20 FEED DISTANCE.
3. TREES SHALL NOT BE PLANTED CLOSER THAN 2-1/2 FEET FROM THE FACE OF THE CURB EXCEPT AT INTERSECTIONS, WHERE IT SHOULD BE 25 FEET FROM THE CURB IN A CURB RETURN AREA..
4. EXISTING TREES MAY BE USED AS STREET TREES IF THERE WILL BE NO DAMAGE FROM THE DEVELOPMENT WHICH WILL KILL OR WEAKEN THE TREE.
5. VISION CLEARANCE HAZARDS SHALL BE AVOIDED AND VISION CLEARANCE STANDARDS SHALL BE ADHERED TO.

City of Camas WASHINGTON — LANDSCAPE DETAIL: LANDSCAPING NOTES — NOT TO SCALE — DETAIL NO. LS1
DETAIL APPROVED BY — DATE 5-17-19 — REVISION: 3 — DATE: 5/17/2019
ST-PLANTING.DWG

PLANTING NOTES:

1. ALL PLANTING TO BE OF NURSERY STOCK GRADE NO. 1 OR BETTER AND MUST BE APPROVED PRIOR TO PLANTING.
2. ALL PLANTING HOLES SHALL BE EXCAVATED THREE TIMES THE DIAMETER OF THE TREE ROOT BALL OR ROOT SYSTEM.
3. DECIDUOUS TREES SHALL HAVE STRAIGHT TRUNKS, BE FULL BRANCHED, HAVE A MINIMUM CALIPER OF 2 INCHES AND BE ADEQUATELY STAKED FOR PLANTING. CALIPER OF TREES SHALL BE LARGER WHEN REQUIRED BY OTHER CITY STANDARDS OR PLANS.
4. EVERGREEN TREES SHALL BE A MINIMUM OF THREE FEET IN HEIGHT, FULLY BRANCHED AND ADEQUATELY STAKED FOR PLANTING.
5. DECIDUOUS TREES SHALL BE A MINIMUM 2" CALIPER UNLESS APPROVED BY THE CITY.
6. POTTED OR B&B PLANTS SHALL BE A MINIMUM SIZE OF 3 GALLONS UNLESS APPROVED BY THE CITY.
7. SHRUBS SHALL BE PLANTED ACCORDING TO RECOGONIZED LANDSCAPE STANDARD PRACTICE FOR MAINTENANCE, APPEARANCE, HEALTH OF THE PLANTS, AND OVERALL AESTHETICS.
8. PLANT UPRIGHT AND FACE TO GIVE BEST APPEARANCE OR RELATIONSHIP TO OTHER PLANTS AND STRUCTURES.
   - 8.1. LOOSEN AND REMOVE TWINE BINDING AND BURLAP FROM AROUND THE TOP OF EACH ROOT BALL.
   - 8.2. SET TREES AN INCH ABOVE FINISH GRADE.
   - 8.3. STAKE OR GUY TREES IMMEDIATELY AFTER PLANTING (SEE DETAIL PL3, PL4, & PL5)
   - 8.4. REMOVE STAKES OR GUY WIRES ONE YEAR AFTER INSTALLATION.
9. PLACE AND COMPACT BACKFILL SOIL MIXTURE CAREFULLY TO AVOID INJURY TO ROOTS, AND TO FILL ALL VOIDS. BACKFILL MIX SHALL CONSIST OF 1/4 APPROVED HUMUS MATERIAL TO 3/4 TOPSOIL, PLUS SOIL AMENDMENTS/FERTILIZERS AS PER SOIL ANALYSIS (TO BE PERFORMED PRIOR TO PLANTING TREES).
10. WHEN HOLE IS NEARLY FILLED, COMPLETELY SOAK AND ALLOW WATER TO DRAIN AWAY. FILL HOLE TO FINISH GRADE. PROVIDE 2 INCH HIGH BERM WATER RING AT THE BASE OF EACH TREE. REMOVE BERM AT THE END OF CONTRACT MAINTENANCE PERIOD.
11. GROUND COVER, SHALL BE PLANTED ACCORDING TO RECOGNIZED LANDSCAPE STANDARD PRACTICE FOR MAINTENANCE, APPEARANCE, OVERALL AESTHETICS, AND HEALTH OF THE PLANTS.
12. TREES, AS THEY GROW, SHALL BE PRUNED TO THEIR NATURAL FORM TO PROVIDE AT LEAST 10 FEET OF CLEARANCE ABOVE SIDEWALKS AND 14 FEET ABOVE STREET ROADWAY SURFACES.
13. TREE MAINTENANCE – IN ORDER TO INSURE ESTABLISHMENT, SURVIVAL AND GROWTH, TREES SHALL BE MULCHED WITH 4" DEEP COMPOST AND WATERED AS NECESSARY DURING THE FIRST TWO GROWING SEASONS. PRUNING TO BE AS FOLLOWS:
   - 13.1. YEAR 1 – ONLY DEAD, BROKEN, OR CROSSING BRANCHES SHALL BE PRUNED.
   - 13.2. YEAR 2 – A CLASS 1 PRUNE, PURSUANT TO NATIONAL ARBORIST ASSOCIATION STANDARDS, SHALL BE PERFORMED. THE PURPOSE OF THIS PRUNING IS TO ESTABLISH PROPER SCAFFOLD BRANCHING, RAISE THE CROWN FOR ROAD/SIDEWALK CLEARANCE, AND REMOVE ANY DEAD, DYING OR CROSSING BRANCHES.
   - 13.3. YEAR 3 – A CLASS 1 PRUNE, PURSUANT TO NATIONAL ARBORIST ASSOCIATION STANDARDS, SHALL BE PERFORMED. THE PURPOSE OF THIS PRUNING IS TO CONTINUE TO ESTABLISH THE PROPER SCAFFOLD BRANCHING, CONTINUE TO RAISE THE CROSSING FOR ROAD/SIDEWALK CLEARANCE, AND TO REMOVE ANY DEAD, DYING, OR CROSSING BRANCHES.
14. DEFINITIONS:
   - 14.1. BALLED AND BURLAPPED (B&B) – TREES AND SHRUBS WITH A LARGE BALL OF SOIL AROUND THE ROOTS WRAPPED IN BURLAP.
   - 14.2. BARE-ROOT – OFFERED BY NURSERIES IN WINTER AND EARLY SPRING WITH ALL THE SOIL REMOVED FROM THEIR ROOTS.
   - 14.3. CALIPER – THE DIAMETER OF THE TRUNK MEASURED AT 4-FEET FROM THE GROUND.
   - 14.4. GROUND COVER – LIVING MATERIAL THAT DOES NOT INCLUDE BARK CHIPS OR OTHER MULCH.

City of Camas WASHINGTON — LANDSCAPE DETAIL: PLANTING NOTES — NOT TO SCALE — DETAIL NO. LS2
DETAIL APPROVED BY — DATE 5-17-19 — REVISION: 3 — DATE: 5/17/2019
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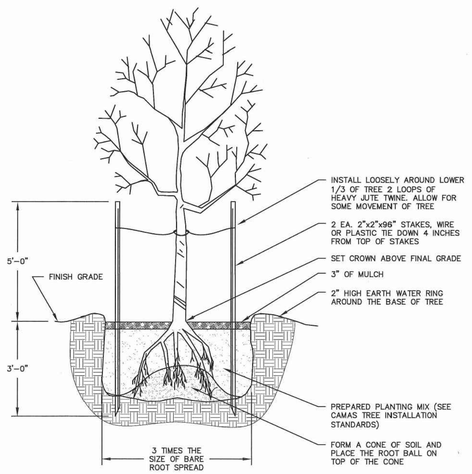

NOTES:
1. A ROOT BARRIER SHOULD BE INSTALLED AT THE EDGE OF PAVEMENT OR 4 FEET WIDE AND 6 FEET LONG RECTANGLE AROUND THE TREE. SEE DETAILS PL7, PL8 & PL9
2. BACKFILL MIX SHALL CONSIST OF THE FOLLOWING: 0.75 PART TOPSOIL, 0.25 PART APPROVED HUMUS MATERIAL, SOIL AMENDMENTS/FERTILIZERS AS PER SOIL ANALYSIS (TO BE PERFORMED BEFORE PLANTING TREES).

City of Camas WASHINGTON — LANDSCAPE DETAIL: BARE ROOT PLANTING — NOT TO SCALE — DETAIL NO. LS3
DETAIL APPROVED BY — DATE 5-17-19 — REVISION: 2 — DATE: 5/17/2019
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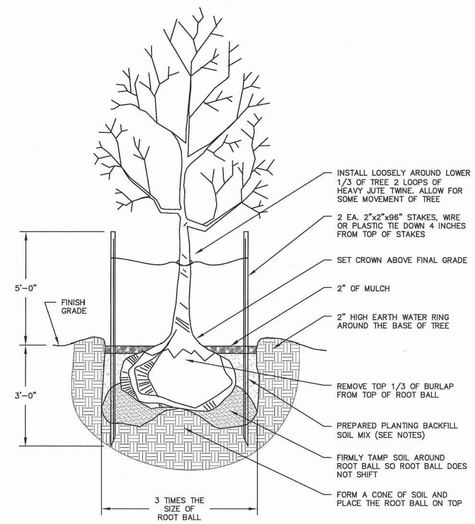

NOTES:
1. A ROOT BARRIER SHOULD BE INSTALLED AT THE EDGE OF PAVEMENT OR 4 FEET WIDE AND 6 FEET WIDE RECTANGLE AROUND THE TREE. SEE DETAILS PL7, PL8 & PL9
2. BACKFILL MIX SHALL CONSIST OF THE FOLLOWING: 0.75 PART TOPSOIL, 0.25 PART APPROVED HUMUS MATERIAL, SOIL AMENDMENTS/FERTILIZERS AS PER SOIL ANALYSIS (TO BE PERFORMED BEFORE PLANTING TREES).

City of Camas WASHINGTON — LANDSCAPE DETAIL: DECIDUOUS BALLED/BURLAP TREE PLANTING — NOT TO SCALE — DETAIL NO. LS4
DETAIL APPROVED BY — DATE 5-17-19 — REVISION: 2 — DATE: 5/17/2019
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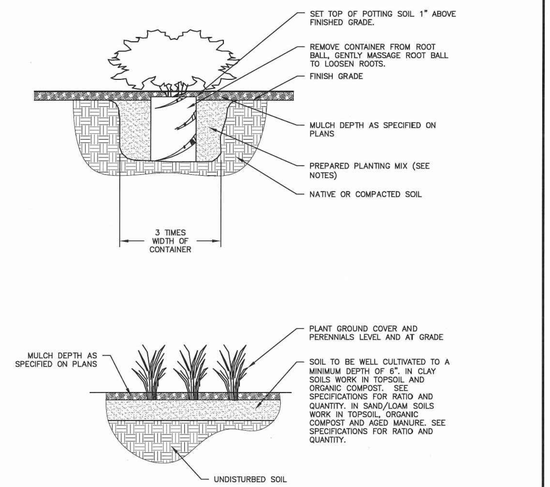

NOTES:
1. SCARIFY BOTTOM AND SIDES OF HOLE PRIOR TO PLANTING.
2. KEEP PLANTS MOIST AND SHADED UNTIL PLANTING.
3. BACKFILL MIX SHALL CONSIST OF THE FOLLOWING: 0.75 PART TOPSOIL, 0.25 PART APPROVED HUMUS MATERIAL, SOIL AMENDMENTS/FERTILIZERS AS PER SOIL ANALYSIS (TO BE PERFORMED BEFORE PLANTING).

City of Camas WASHINGTON — LANDSCAPE DETAIL: SHRUB CONTAINER PLANTING — NOT TO SCALE — DETAIL NO. LS5
DETAIL APPROVED BY — DATE 5-17-19 — REVISION: 2 — DATE: 5/17/2019
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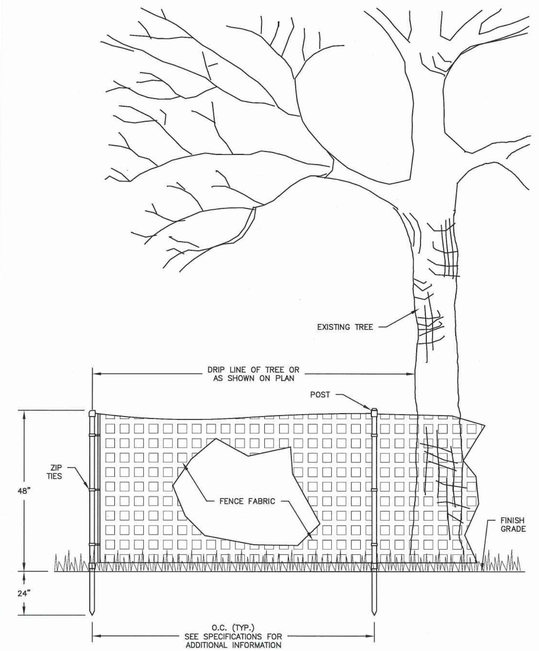

City of Camas WASHINGTON — LANDSCAPE DETAIL: TREE PROTECTION FENCE DETAIL — NOT TO SCALE — DETAIL NO. LS6
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PRELIMINARY LANDSCAPE DETAILS

MCINTOSH SUBDIVISION

CITY OF CAMAS WASHINGTON

PRELIMINARY

REVISIONS

DESIGNED BY:	SAT, JAI
DRAWN BY:	SAT, JAI
CHECKED BY:	SAT, JAI
SCALE:	########

JOB NUMBER 2140 — SHEET PRE4.1

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MCINTOSH SUBDIVISION

PRELIMINARY TECHNICAL INFORMATION REPORT

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06/24/2022

DATE: 06/24/22
JOB #: 2140

Exhibit 9 SUB22-04

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SECTION B – Minimum Requirements *3*
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Technical Appendix

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Hydraulic Calculations *Appendix C*
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Neighboring Subdivision *Appendix E*

SECTION A - Project Overview

The McIntosh Subdivision proposes to develop parcel 127449000 approximately 9.93 acres total, Into a 28-lot subdivision. The site is located at 3210 NW McIntosh Road, Camas, WA 98607. There is an existing driveway along the center of the site and one small building to be demolished.

The existing vegetation on site consists of flat field. An existing house to remain is located just to the south of site and will have access from the south of site to a 20' access easement. Typical slopes are between 5-8% on the majority of the site except for the southeast corner where there is a slope of approximately 26%. A large portion of the existing runoff from the site flows to the northwest corner of the site. Runoff is collected on NW McIntosh Road by an existing ditch inlet and routed to an unnamed creek to the west, and eventually discharged to the Columbia River. The eastern portion of the site is collected by an existing catch basin on the eastern border of the site. Runoff is routed from this catch basin to an unnamed stream to the east. This stream also discharges to the Columbia River. A small basin at the southern tip of the site discharges to the existing single-family residences to the south of the property. An additional minor basin discharges to the stubbed NW 5th Court.

Storm design for this site will consist of Contech Filterra treatment systems, rear yard roof infiltration systems, and two detention ponds that will treat, infiltrate, detain and release flows below predeveloped conditions. All facilities will release to the existing drainage points on site to the maximum extent feasible.

This project will consist of site grading, constructing roads, and utilities necessary to develop the site. Stormwater control will conform to the requirements of the City of Camas Design Standards Manual and the 2019 Stormwater Management Manual for Western Washington. Stormwater will be managed on the site using Contech Filterra and two detention pond systems. The proposed systems will be privately owned and maintained by the HOA> There are currently no stormwater facilities on site.

SECTION B – Minimum Requirements

According to Table A below and Figure 1.2 from Chapter 1 of the Camas Stormwater Design Standards Manual, all Minimum Requirements (1-9) apply.

Table A. – Surface Area Breakdown Onsite

Existing Impervious Surface	**0.20 Acres**
New Impervious Surface	**4.08 Acres**
Replaced Impervious Surface	**0.00 Acres**
Native Vegetation Converted to Lawn or Landscaping	**5.90 Acres**
Native Vegetation Converted to Pasture	**0.00 Acres**
Total Land-disturbing Activity	**9.98 Acres**

Since Minimum Requirements #1-9 apply to this project, the following requirements must be met by each
TDA listed:

- All TDA's will not increase the 100-year flood frequency.
- All TDA's must meet the runoff treatment requirements listed in Minimum Requirement #6.
- All TDA's must meet flow control requirements listed in Minimum Requirement #7.
- No wetlands exist on site. Minimum Requirement #8 does not apply.

Minimum Requirement 1. – Preparation of Stormwater Site Plans*:*
This report is part of the Preliminary Stormwater Plan. Reference the preliminary engineering plans for preliminary drawings detailing the stormwater design.

Minimum Requirement 2. – Construction Stormwater Pollution Prevention*:*
A Construction Stormwater Pollution Prevention Plan (SWPPP) is required and will be prepared with final engineering. The contractor will comply with construction SWPPP requirements including elements 1-13.

Minimum Requirement 3. – Source Control of Pollution*:*
All development activities shall consult Camas Design Standard Manual. The BMPs that may apply to land disturbance could be **BMPs for Dust Control at Disturbed Land Areas and Unpaved Roadways and Parking Lots, BMPs for Landscaping and Lawn/Vegetation Management, BMPs for Maintenance of Stormwater Drainage and Treatment Systems, BMPs for Urban Streets.** Refer to Section D of this report.

Minimum Requirement 4. – Preservation of Natural Drainage Systems and Outfalls*:*
Existing drainage patterns shall be maintained, and discharges from the project site shall occur as is, to the maximum extent practicable. The site currently has four releases, as described in Section A. The preliminary stormwater plan proposes to release runoff to all four discharge locations as close to predeveloped flow rates as feasible.

Minimum Requirement 5. – Onsite Stormwater Management*:*
The BMPs that may apply to Onsite Stormwater Management for this project could include T5.13 - Post-Construction Soil Quality and Depth and T5.21 - Better Site Design. Onsite Stormwater Management is a means to implement inexpensive practices on individual properties to reduce the amount of disruption of the natural hydrology. Refer to Section E of this Report.

Minimum Requirement #6. – Runoff Treatment:
Since the thresholds for impervious area added exceeds the limits, basic runoff treatment is required. The stormwater system discharges to multiple unnamed, non-fish bearing streams, and ultimately discharges to the Columbia River, which requires basic treatment. Basic treatment is proposed in the form of Contech Filterra technologies that will meet or exceed the required treatment parameters. An approved equivalent treatment system like Contech Stormfilter catch basins or bioretention areas may be proposed during final engineering. Refer to Section F of this

report.

Minimum Requirement #7. – Runoff Flow Control:
This project's storm plan consists of a combination of facilities including trenches and storm ponds for the main source of flow control. The trenches and ponds will utilize low-level infiltration while also detaining and releasing runoff below predeveloped rates. Rear yard runoff and roof water will be piped to infiltration trenches to the detention ponds. See Appendix B of this report for additional soil information.

Minimum Requirement #8. – Wetlands Protection:
No wetlands exist onsite or around the site.

Minimum Requirement #9. – Operation and Maintenance:
The storm systems will be privately owned and maintained by a Homeowners Association. See Contech's website for maintenance on Filtera Bioretention Systems.

SECTION C – Soils Evaluation

Refer to the Final Geotechnical Report by Earth Engineering, Inc. dated March 4, 2022. for the full soils evaluation in Appendix D. Infiltration tests onsite yielded rates of 1 inch per hour (iph). Infiltration will be utilized to the maximum extent feasible onsite in combination with detention facilities.

The Soil Survey of Clark County, Washington, November 1972 identifies the onsite soils as, Powell (PoB, PoD). The hydrologic soil group for these soils is "C" and WWHM3 Soil Groups (SG) 3.

SECTION D – Source Control

All development activities shall consult City of Camas Design Standard Manual and Camas Stormwater Design Standards Manual. The BMPs that may apply to land disturbance could be 'BMPs for Dust Control at Disturbed Land Areas and Unpaved Roadways and Parking Lots,' 'BMPs for Landscaping and Lawn/Vegetation Management,' 'BMPs for Maintenance of Stormwater Drainage and Treatment Systems' and 'BMPs for Urban Streets'.

SECTION E - Onsite Stormwater Management BMPs

1. The following are a list of onsite stormwater management BMPs:

   T5.13 – Post-Construction Soil Quality and Depth

2. Refer to Section C above for geotechnical information

3./4. **T5.13 – Post-Construction Soil Quality and Depth (Volume V, SMMWW)**

Exhibit 9 SUB22-04

Since the majority of the site has been or will be stripped of topsoil and/or organic material for grading purposes, the remaining open spaces, yards, and landscaping areas shall be restored with the appropriate soil quality and depths.

T5.21 – Better Site Design (Volume V, SMMWW)

An attempt to provide better site design has been considered to the extent practical. Sensitive areas with wetlands and significant trees have been left out of the development.

5./6./7. Contech Filterras are proposed on this project. See Appendix C for the water quality analysis.

8. N/A; no pervious pavement is proposed.

9. N/A; no reversed slope sidewalks are proposed.

SECTION F - Runoff Treatment Analysis and Design

1. Based on the proposed site conditions and use, basic treatment is proposed.

2. Since the thresholds for impervious area added exceeds the limits, basic runoff treatment is required. The stormwater system will meet or exceed the required treatment parameters as described in the Washington State Department of Ecology Stormwater Management Manual for Western Washington (SWMM), Appendix III-C.

3. See Section C for Geotechnical information.

4. The following are the BMPs used in the design.

   Contech Filterra – See Appendix C for Contech Filterra design

5. In accordance with the Camas Stormwater Design Standards Manual and Volume V of the SMMWW, the water quality treatment system designs comply with these sections and provide basic treatment (see plans and details).

6. See Water Quality Basin Map in Appendix C for pollution generating areas summary.

SECTION G - Flow Control Analysis and Design

As previously mentioned in Sections A and B of this report, the proposed detention facilites are designed to detain and release flows below predeveloped conditions. The detention ponds will also utilize the low-level infiltration rates measured onsite. Rear yard roof infiltration trenches will overflow to the detention ponds onsite. See Appendix C for Flow Control modeling details.

The site was evaluated using the continuous model using the WWHM2012 software. Electronic copies of the WWHM files will be submitted upon request.

SECTION H – Wetlands Protection

There are no wetlands in or around the site.

SECTION I - Other Permits

NPDES Construction Stormwater General Permit Required.

SECTION J - Conveyance Systems Analysis and Design

See maps, exhibits, and calculations in Appendices A-C for design parameters, methodology and computations.

Surface runoff will be collected from the street via catch basins and directed through a Contech Filterra treatment system to the on-site Chamber detention system. "Worst Case" scenario conveyance modeling for a 12" will be completed with final engineering.

SECTION K – Offsite Analysis

Offsite analysis was performed during multiple trips throughout 2022 to evaluate the downstream systems. The current proposed detention facility will release to existing systems that discharge to the Northwest and East of the site to unnamed creeks that eventually flow to the Columbia River. The downstream systems for both the East and West basins appear to be functioning as designed without any maintenance or erosions issues.

SECTION L - Approval Conditions Summary

To be completed with Final Engineering

SECTION M - Special Reports and Studies

See Geotechnical Report (Appendix D)

SECTION N - Maintenance and Operations Manual

The storm systems will be privately owned and maintained by a Homeowners Association. See ADS and Contech websites for latest Maintenance and Operations Manuals.

Exhibit 9 SUB22-04

References

United States Department of Agriculture, Soil Conservation Service. "Soil Survey of Clark County Washington," Washington, D.C., 1972.

United States Department of Agriculture, Soil Conservation Service, Engineering Division, "Technical Release 55: Urban Hydrology for Small Watersheds, 2nd Ed.," Washington, D.C., 1986.

United States Department of Transportation, Federal Highway Administration, "Hydraulic Engineering Circular No. 12: Drainage of Highway Pavements," Springfield, VA, 1984.

United States Department of Transportation, Federal Highway Administration, "Hydraulic Engineering Circular No. 15: Design of Roadside Channels with Flexible Linings," Springfield, VA, 1984.

Washington State Department of Ecology, "Stormwater Management Manual for Western Washington, Volume I-V," Olympia, WA, February 2005.

Washington State Department of Transportation, "Hydraulic Manual," Olympia, WA, 1989.

City of Camas, "Camas Stormwater Design Standards Manual," Camas, WA, 2016

Clark County Department of Assessment and GIS, "2000 Clark County Road Atlas," Vancouver, WA, 2000.

A p p e n d i x A

General Location Map **A1**

Elevation Contours Map **A2**

Soil Types Map **A3**

Pre-Developed Basin Map **A4**

Mitigated Basin Map **A5**

General Location

Account: 127449000
Owner: ROBERTSON RICHARD T
Address: PO BOX 208
C/S/Z: WASHOUGAL, WA 98671

Location of Subject Property(s)

Printed on: August 09, 2021

Geographic Information System

0 1,000 2,000 Feet

Information shown on this map was collected from several sources. Clark County accepts no responsibility for any inaccuracies that may be present.

Elevation Contours

Account: 127449000
Owner: ROBERTSON RICHARD T
Address: PO BOX 208
C/S/Z: WASHOUGAL, WA 98671

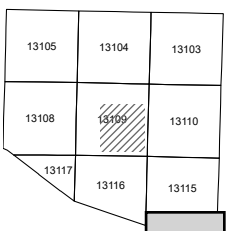
Printed on: August 09, 2021

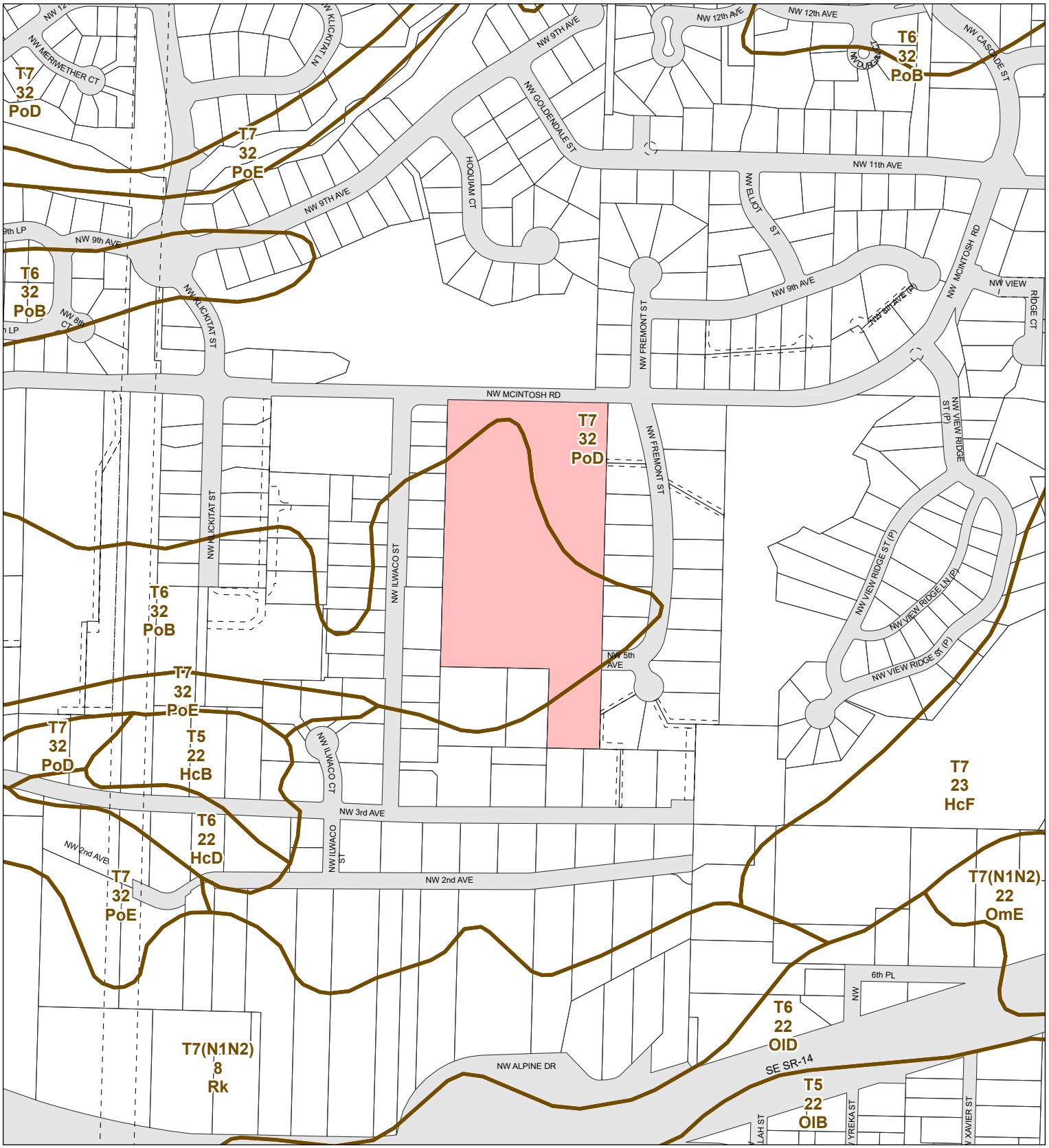
Subject Property(s)
Public Road
Transportation or Major Utility Easement
10' Elevation Contours
2' Elevation Contours

Geographic Information System

0 200 400 Feet

Information shown on this map was collected from several sources. Clark County accepts no responsibility for any inaccuracies that may be present.





CLARK COUNTY, WASHINGTON

Geographic Information System

0 200 400 Feet

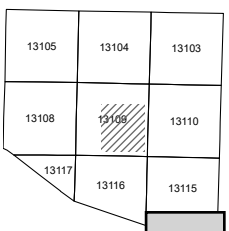
Information shown on this map was collected from several sources. Clark County accepts no responsibility for any inaccuracies that may be present.

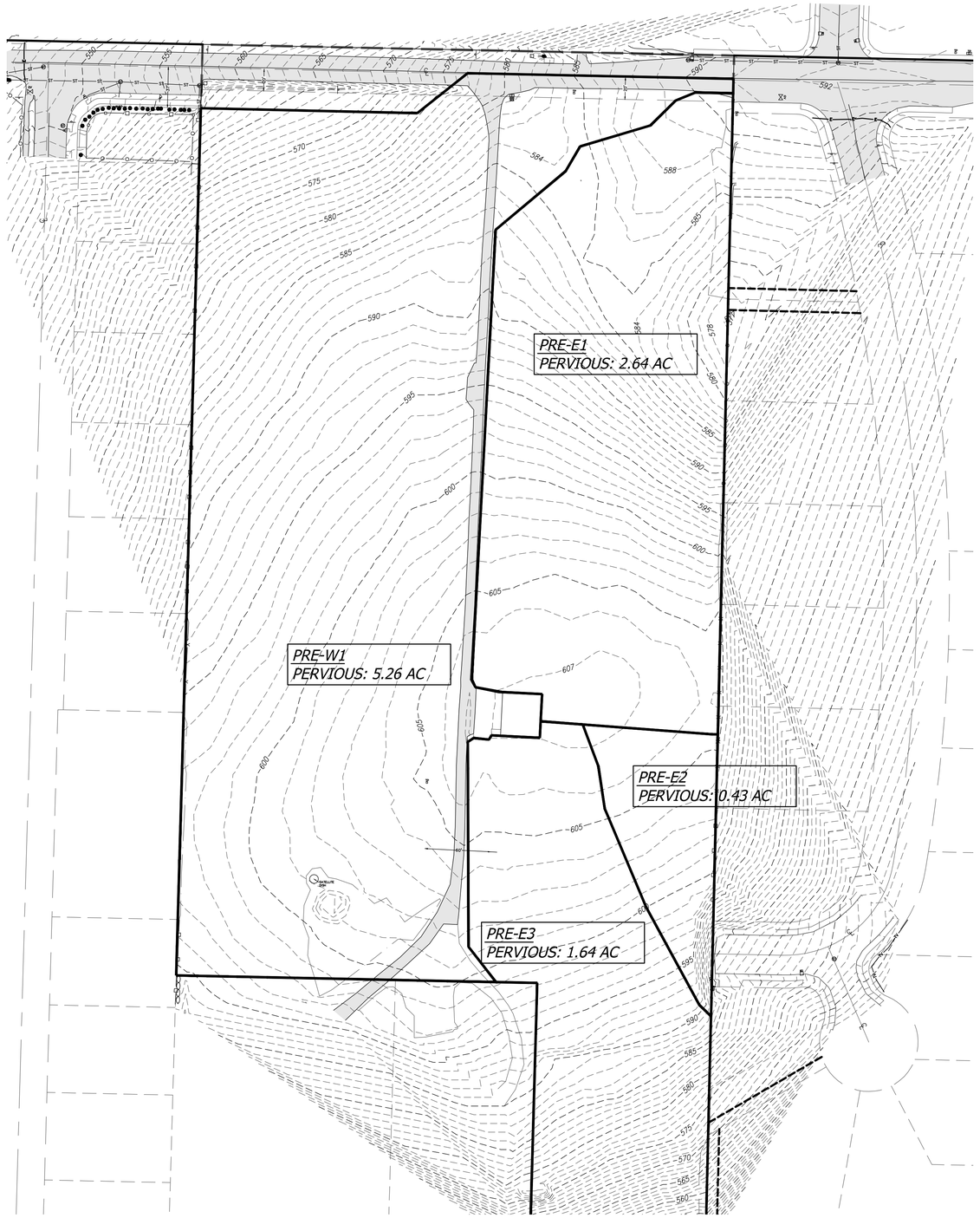
Soil Types

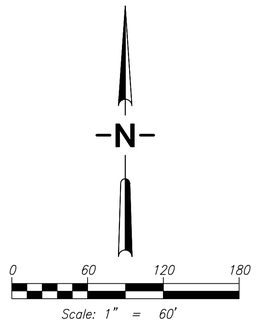
Account: 127449000
Owner: ROBERTSON RICHARD T
Address: PO BOX 208
C/S/Z: WASHOUGAL, WA 98671

- Subject Property(s)
- Public Road
- Transportation or Major Utility Easement
- Soil Type Boundary

Printed on: August 09, 2021







SCA ENGINEERING & DESIGN
CIVIL ENGINEERING ~ LAND PLANNING
DEVELOPMENT SERVICES
LANDSCAPE ARCHITECTURE

2005 BROADWAY
VANCOUVER, WA 98663
PHONE (360)993-0911
FAX (360)993-0912

PRELIMINARY NOT FOR CONSTRUCTION
JOHN A. IVERSON
STATE OF WASHINGTON
21605
REGISTERED
PROFESSIONAL ENGINEER

PREDEVELOPED BASIN MAP

MCINTOSH SUBDIVISION

CITY OF CAMAS WA

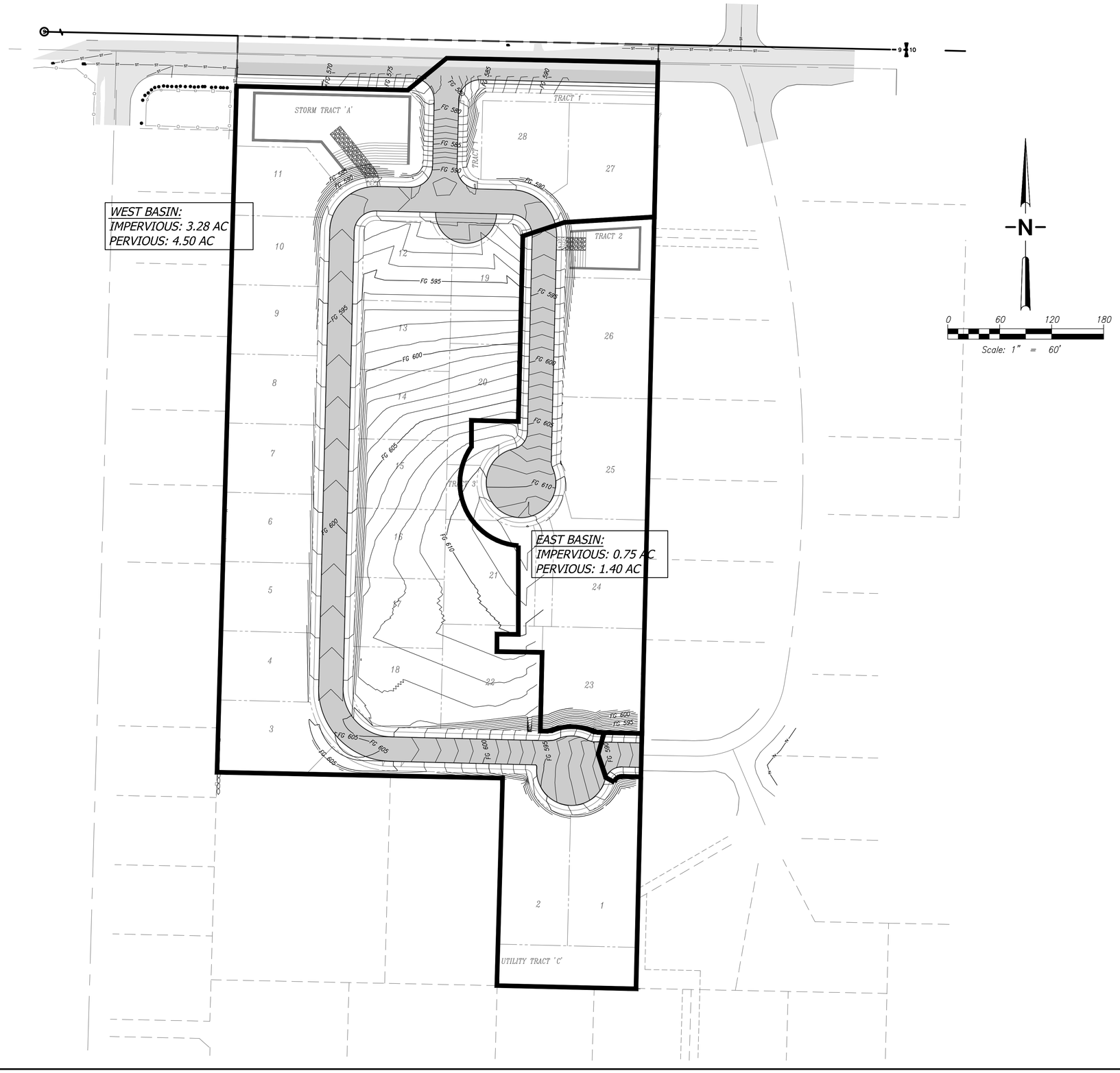
PRELIMINARY

REVISIONS

DESIGNED BY:	JAI
DRAWN BY:	JAI
CHECKED BY:	JTM
SCALE:	1" = 60'

JOB NUMBER	SHEET
2140	PRE

© SCA ENGINEERING PLLC - DATE PLOTTED: Jun 23, 2022 - 8:56 AM SCA DRAWING FILE: W:\DWG\2140-MCINTOSH PROPERTY\STORMWATER\PRELIMINARY\PREDEVELOPED BASIN MAP.DWG



0 60 120 180

Scale: 1" = 60'

SGA ENGINEERING & DESIGN
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DEVELOPMENT SERVICES
LANDSCAPE ARCHITECTURE

2005 BROADWAY
VANCOUVER, WA 98663
PHONE (360)993-0911
FAX (360)993-0912

MCINTOSH SUBDIVISION

CITY OF CAMAS WA

DEVELOPED BASIN MAP

PRELIMINARY

REVISIONS

DESIGNED BY:	JAI
DRAWN BY:	JAI
CHECKED BY:	JTM
SCALE:	1" = 60'

JOB NUMBER	SHEET
2140	DEV

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Design Criteria Appendix B

WWHM Soil Groups

Memorandum

otak

700 Washington Street
Suite 401.
Vancouver, WA 98660
Phone (360) 737-9613
Fax (360) 737-9651

To: Rod Swanson, Clark County Environmental Services

From: Tim Kraft

Copies: File

Date: December 21, 2010

Subject: Clark County WWHM Soil Groupings

The Clark County version of the Western Washington Hydrology Model (WWHM) includes five soils groups to represent the many soil types found within the county limits. Although there are over 110 different soil types throughout Clark County, similarities between the soils allows them to be grouped into categories for modeling purposes.

Clark County soils are grouped into five categories largely based on their permeability and runoff potential. These categories include:

- Soil Group (SG) 1 – Excessively drained soils (hydrologic soil groups A & B)
- Soil Group (SG) 2 – Well drained soils (mostly hydrologic soil group B)
- Soil Group (SG) 3 – Moderately drained soils (hydrologic soil groups B & C)
- Soil Group (SG) 4 – Poorly drained soils (slowly infiltrating C soils, as well as D soils)
- Soil Group (SG) 5 – Wetland soils (mucks).

Soil Groups 1 and 2 are those most suitable for traditional infiltration facilities such as trenches and drywells, while Soil Group 3 may only be suitable for slower infiltrating facilities such as rain gardens and other Low Impact Development (LID) measures. Soil Groups 4 and 5 are those which are typically not suitable for infiltration.

For additional information on the classification of soils for use in the Clark County WWHM model, please see the report titled "Development of the Clark County Version of the Western Washington Hydrology Model", which can be found on the county's community development web site.

The following table lists the WWHM soil group for each NCRS soil type in Clark County.

Map Symbol	Soil Name	HSG
HoB	HILLSBORO	B
	Soils Group (SG) 3 (continued)	
HoC	HILLSBORO	B
HoD	HILLSBORO	B
HoE	HILLSBORO	B
HoG	HILLSBORO	B
HsB	HILLSBORO	B
McB	McBEE	C
MeA	McBEE	C
MIA	McBEE	C
OeD	OLEQUA	B
OeE	OLEQUA	B
OeF	OLEQUA	B
OlB	OLYMPIC	B
OID	OLYMPIC	B
OlE	OLYMPIC	B
OIF	OLYMPIC	B
OmE	OLYMPIC	B
OmF	OLYMPIC	B
OpC	OLYMPIC VARIANT	C
OpE	OLYMPIC VARIANT	C
OpG	OLYMPIC VARIANT	C
OrC	OLYMPIC VARIANT	C
PoB	POWELL	C
PoD	POWELL	C
PoE	POWELL	C
SmA	SAUVIE	B
SmB	SAUVIE	B
SnA	SAUVIE	D
SpB	SAUVIE	B

Soils Group (SG) 4

CvA	COVE	D
CwA	COVE	D
GeB	GEE	C

Hydraulic Calculations Appendix C

Water Quality Schematic

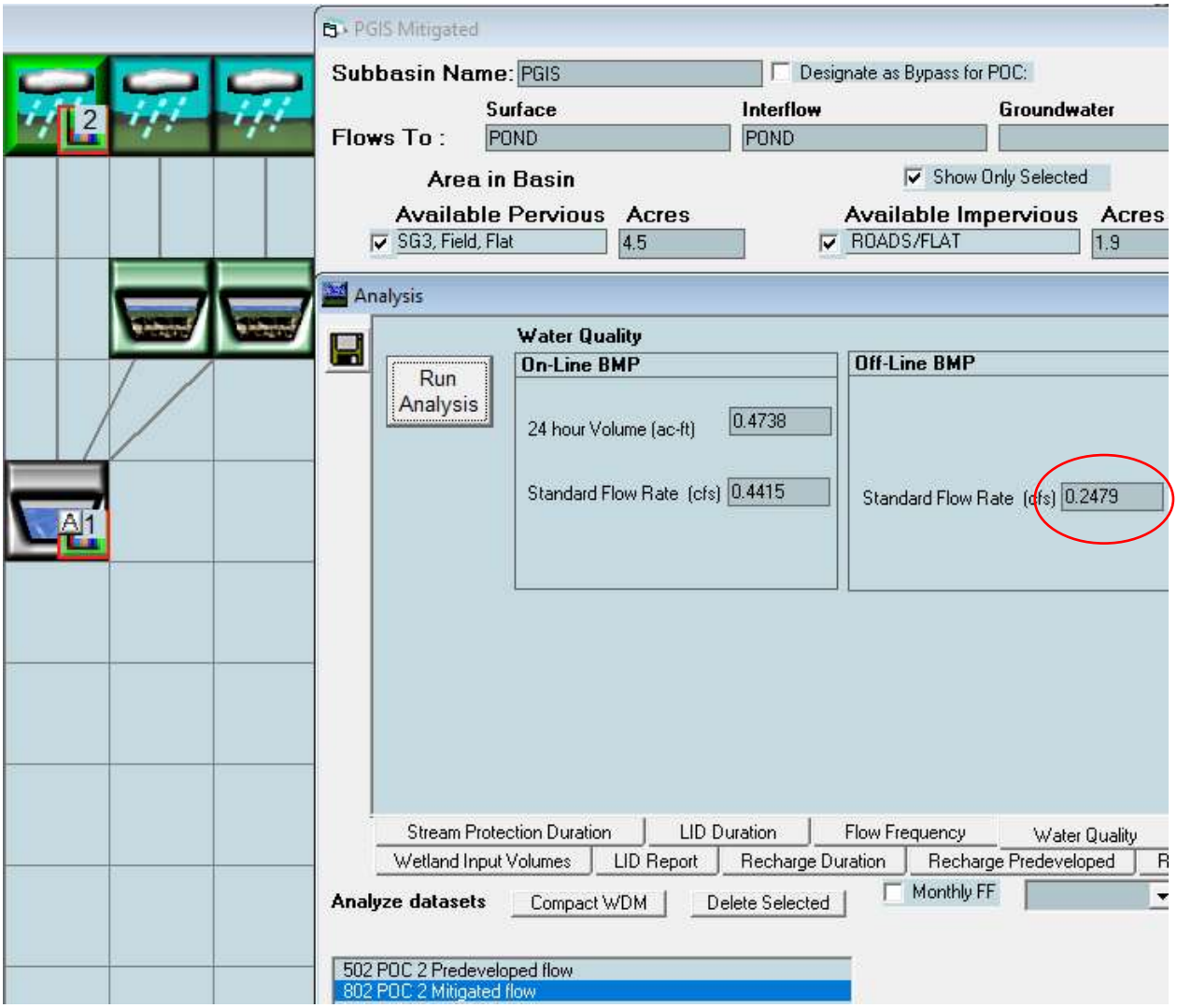
Filterra Sizing Calculations

Flow Control

WWHM Report

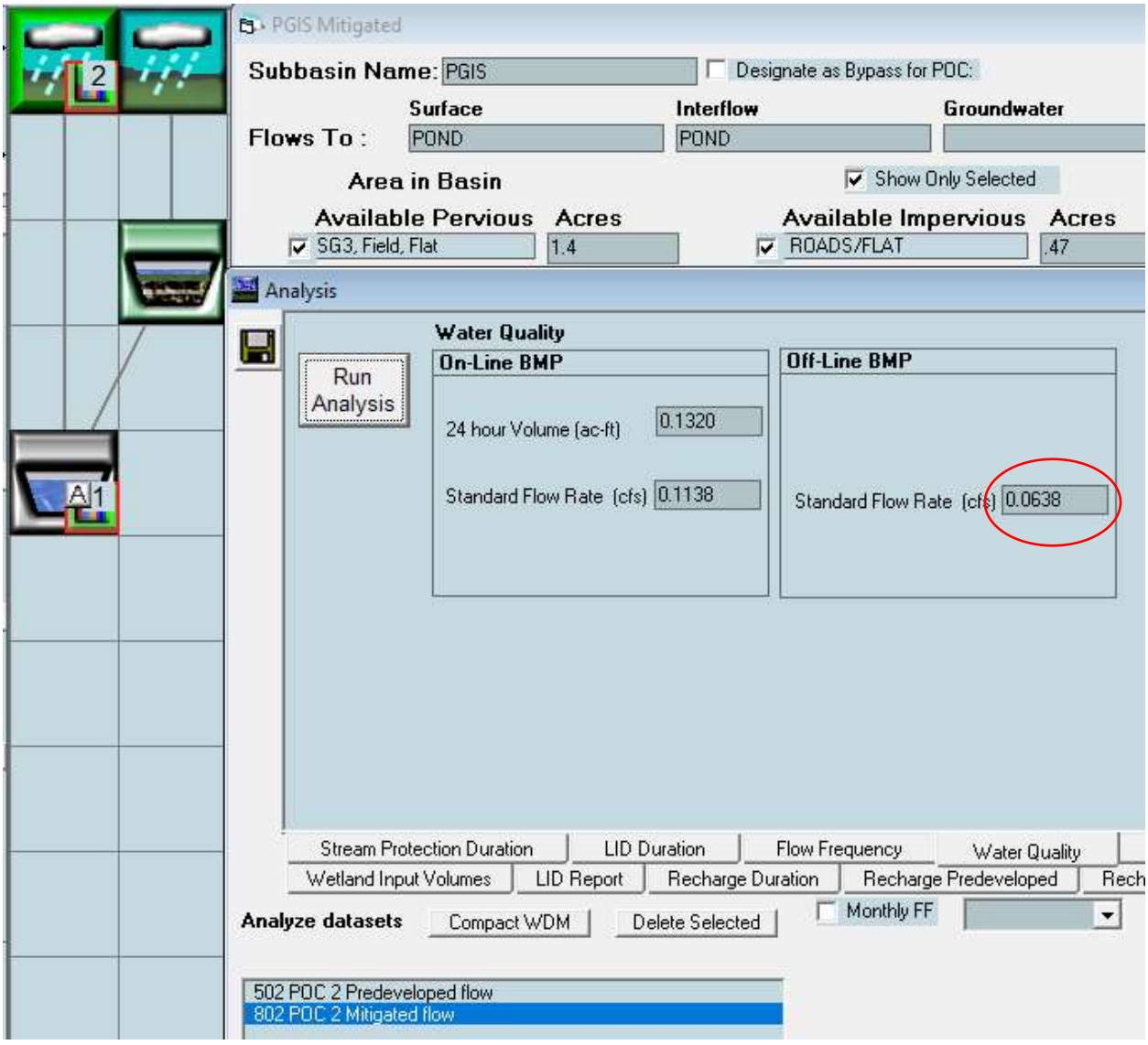
WWHM – WEST WATER QUALITY

WEST BASIN – WATER QUALITY = 0.2479 CFS 6' X 12' FILTERRA FLOW TREATED = 0.292 CFS



WWHM – EAST WATER QUALITY

EAST BASIN – WATER QUALITY = 0.0638 CFS 4' X 4' FILTERRA FLOW TREATED = 0.065 CFS



filterra®

Washington Sizing Table

Infiltration Rate:	Enhanced/Basic	Phosphorus	Oil/Grease
	[1] 175 in/hr (0.00405 ft/sec)	[1] 100 in/hr (0.00231 ft/sec)	[1] 50 in/hr (0.00116 ft/sec)

WADOE Sizing Table	Size	Flow Treated (cfs)	Flow Treated (cfs)	Flow Treated (cfs)
EAST →	4x4	0.065	0.037	0.019
Based on 2019 GULD	4x6 & 6x4	0.097	0.055	0.028
	4x8 & 8x4	0.130	0.074	0.037
Calculated by:	6x6	0.146	0.083	0.042
$Flow\ Treated = Footprint * Infiltration\ Rate$	6x8 & 8x6	0.194	0.111	0.056
	6x10 & 10x6	0.243	0.139	0.070
WEST →	6x12 & 12x6	0.292	0.166	0.084
	7x13 or 13x7	0.369	0.210	0.106

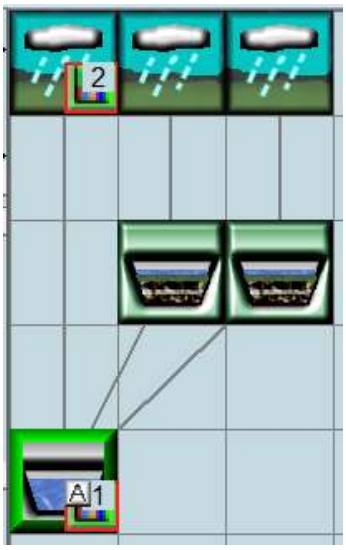
Shallow Filterra Table	Standard Size	Equivalent Shallow Size
	4x4	4x6 or 6x4
Found in 2019 GULD	4x6 or 6x4	6x6
	4x8 or 8x4	6x8 or 8x6
Standard Media Depth: 21"	6x6	6x10 or 10x6
Shallow Media Depth: 15"	6x8 or 8x6	6x12 or 12x6
	6x10 or 10x6	13x7

1. Only residential and commercial land types considered in sizing table. For roadway or regional treatment sizing contact your local Stormwater Consultant
2. For sizing in other areas, contact your local Contech Engineered Solutions representative

CONTECH® ENGINEERED SOLUTIONS

WWHM – WEST FLOW CONTROL

WEST SYSTEM:



POND Mitigated

Facility Name	POND	**Facility Type**	
	Outlet 1	**Outlet 2**	**Outlet 3**
Downstream Connections	0	0	0

☐ Precipitation Applied to Facility
☐ Evaporation Applied to Facility

Auto Pond | Quick Pond

Facility Dimension Diagram

Facility Dimensions

Facility Bottom Elevation (ft)	0
Bottom Length (ft)	177
Bottom Width (ft)	60
Effective Depth (ft)	8.5
Left Side Slope (H/V)	0
Bottom Side Slope (H/V)	0
Right Side Slope (H/V)	0
Top Side Slope (H/V)	0

Outlet Structure Data

Riser Height (ft)	7.5
Riser Diameter (in)	18
Riser Type	Flat
Notch Type	

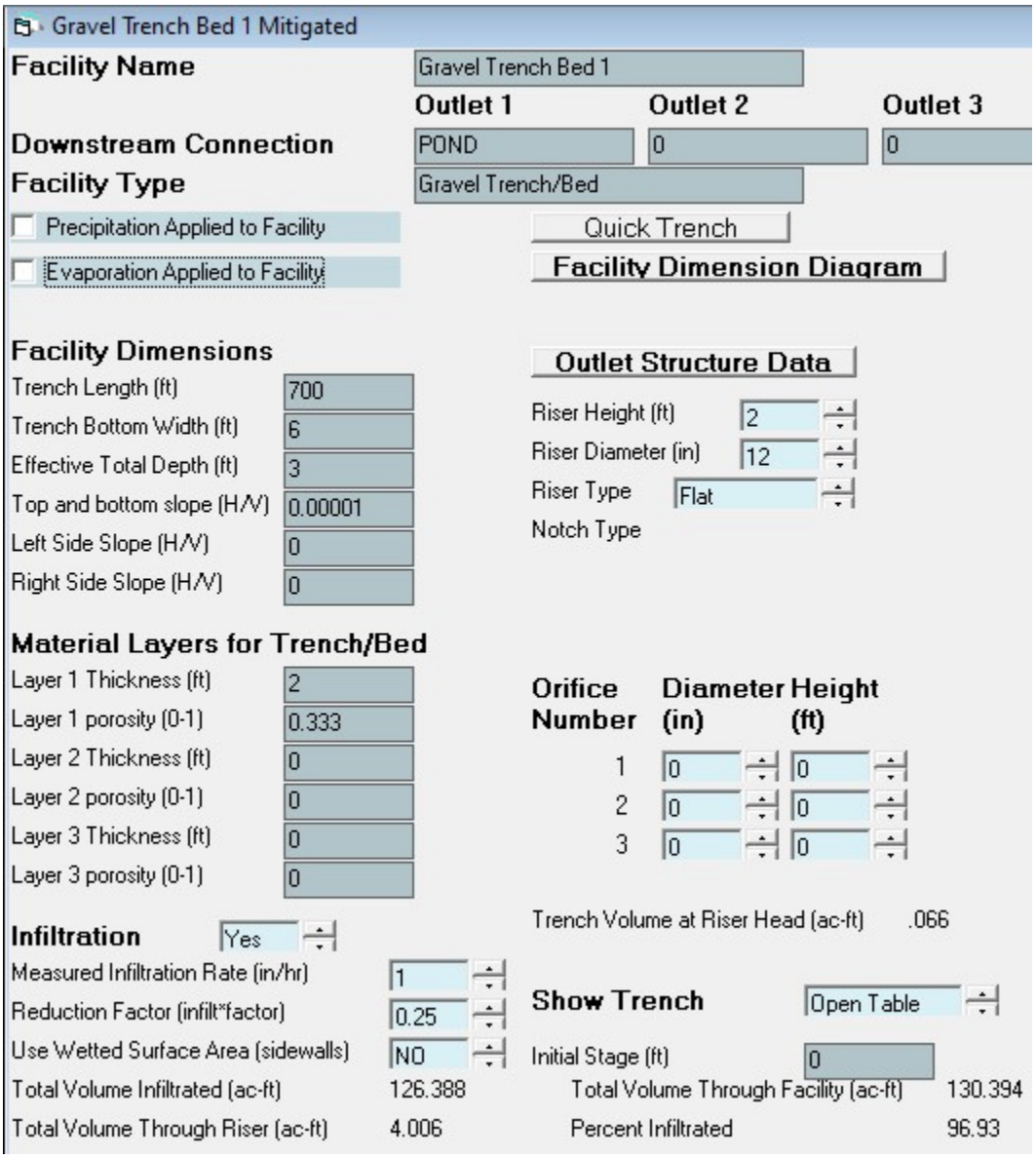
Infiltration	Yes	**Orifice Number**	**Diameter (in)** / **Height (ft)**
Measured Infiltration Rate (in/hr)	1	1	1.125 / 0
Reduction Factor(infilt*factor)	0.25	2	2 / 2.75
Use Wetted Surface Area (sidewalls)	NO	3	0 / 0
Total Volume Infiltrated (ac-ft)	486.53		
Total Volume Through Riser (ac-ft)	196.637		
Total Volume Through Facility (ac-ft)	683.17		
Percent Infiltrated	71.22		

Pond Volume at Riser Head (ac-ft) 1.842

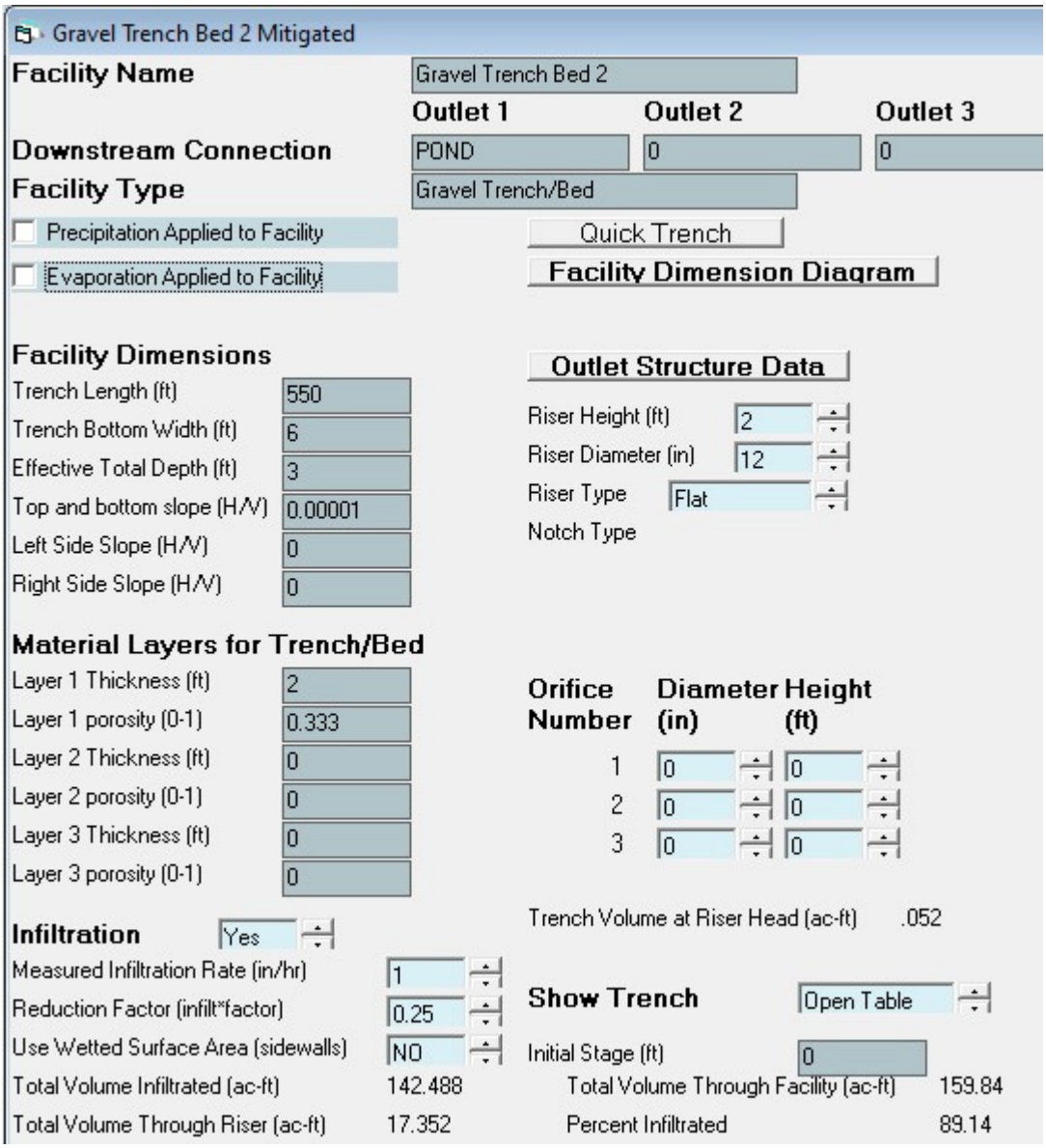
Show Pond Table Open Table

Initial 0

WWHM – WEST FLOW CONTROL

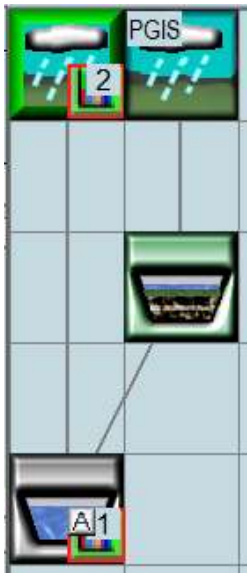


WWHM – WEST FLOW CONTROL



WWHM – EAST FLOW CONTROL

EAST SYSTEM:



POND Mitigated

Facility Name	POND	**Facility Type**	
	Outlet 1	**Outlet 2**	**Outlet 3**
Downstream Connections	0	0	0

☐ Precipitation Applied to Facility
☐ Evaporation Applied to Facility

Auto Pond | Quick Pond | **Facility Dimension Diagram**

Facility Dimensions

Facility Bottom Elevation (ft)	0
Bottom Length (ft)	70
Bottom Width (ft)	44
Effective Depth (ft)	6
Left Side Slope (H/V)	0
Bottom Side Slope (H/V)	0
Right Side Slope (H/V)	0
Top Side Slope (H/V)	0

Outlet Structure Data

Riser Height (ft)	5
Riser Diameter (in)	18
Riser Type	Flat
Notch Type	

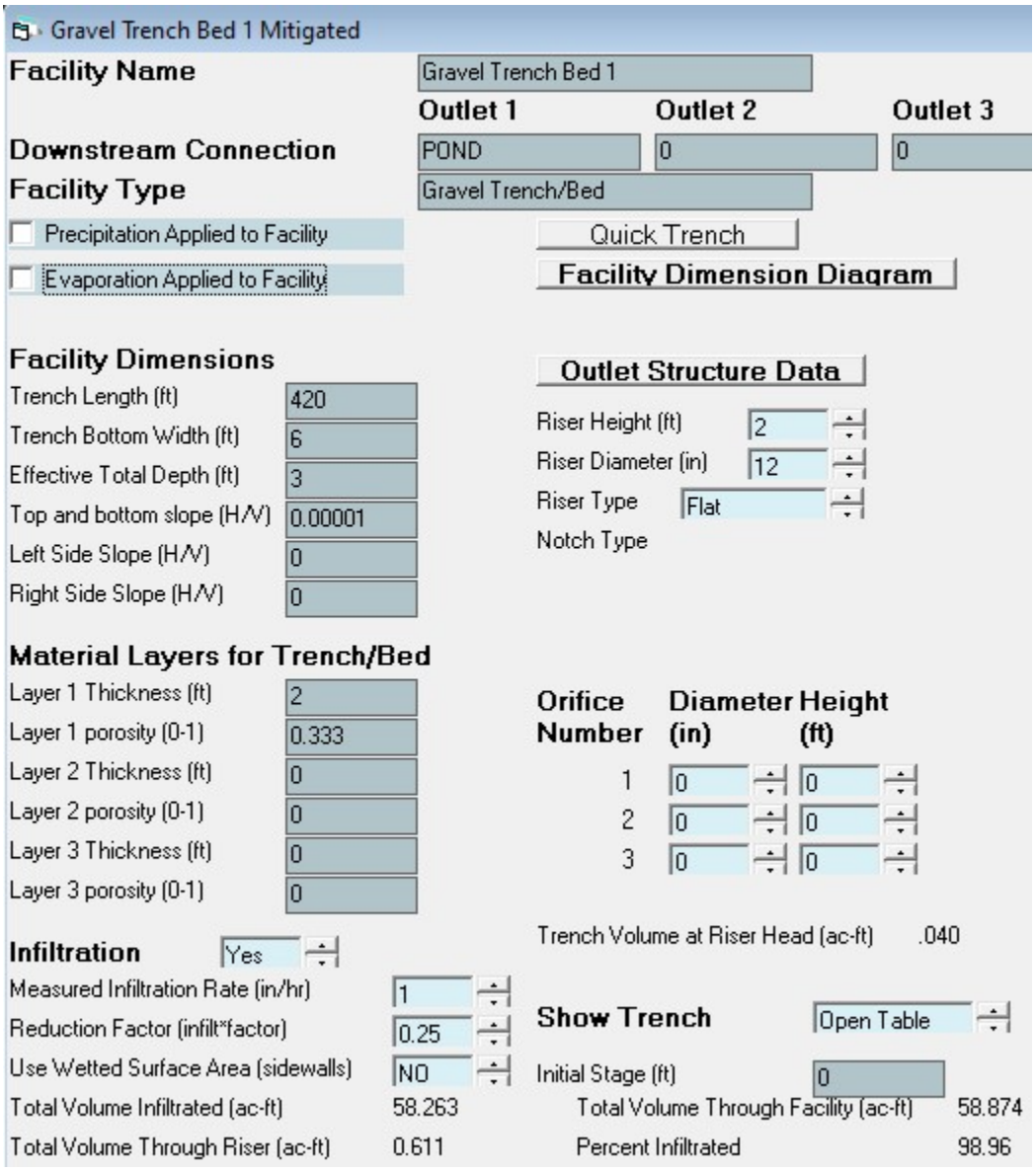
Infiltration	Yes	**Orifice Number**	**Diameter (in)** / **Height (ft)**
Measured Infiltration Rate (in/hr)	1	1	1.125 / 0
Reduction Factor(infilt*factor)	0.25	2	2 / 2.75
Use Wetted Surface Area (sidewalls)	NO	3	0 / 0
Total Volume Infiltrated (ac-ft)	99.955		
Total Volume Through Riser (ac-ft)	81.096		
Total Volume Through Facility (ac-ft)	181.05		
Percent Infiltrated	55.21		

Pond Volume at Riser Head (ac-ft) .354

Show Pond Table Open Table

Initial 0

WWHM – EAST FLOW CONTROL



WWHM2012

PROJECT REPORT

General Model Information

Project Name:	2140 PRE_V2
Site Name:	MCINTOSH
Site Address:	
City:	CAMAS
Report Date:	6/22/2022
Gage:	Troutdale
Data Start:	1948/10/01
Data End:	2008/09/30
Timestep:	15 Minute
Precip Scale:	1.370
Version Date:	2021/08/18
Version:	4.2.18

POC Thresholds

Low Flow Threshold for POC1:	50 Percent of the 2 Year
High Flow Threshold for POC1:	50 Year
Low Flow Threshold for POC2:	50 Percent of the 2 Year
High Flow Threshold for POC2:	50 Year

Landuse Basin Data

Predeveloped Land Use

PRE-NORTH

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
SG3, Forest, Mod	5.26
Pervious Total	5.26

Impervious Land Use	acre
Impervious Total	0
Basin Total	5.26

Element Flows To:

Surface	Interflow	Groundwater

WQ-Placebo

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
SG3, Field, Flat	4.5
Pervious Total	4.5

Impervious Land Use	acre
ROADS FLAT	1.9
Impervious Total	1.9
Basin Total	6.4

Element Flows To:

Surface	Interflow	Groundwater

Mitigated Land Use

PGIS

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
SG3, Field, Flat	4.5
Pervious Total	4.5

Impervious Land Use	acre
ROADS FLAT	1.9
Impervious Total	1.9
Basin Total	6.4

Element Flows To:

Surface	Interflow	Groundwater
POND	POND	

W1-ROOFS

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
Pervious Total	0
Impervious Land Use	acre
ROOF TOPS FLAT	0.62
Impervious Total	0.62
Basin Total	0.62

Element Flows To:

Surface	Interflow	Groundwater
Gravel Trench Bed 1	Gravel Trench Bed 1	

W2-ROOFS

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
Pervious Total	0
Impervious Land Use	acre
ROOF TOPS FLAT	0.76
Impervious Total	0.76
Basin Total	0.76

Element Flows To:

Surface	Interflow	Groundwater
Gravel Trench Bed 2	Gravel Trench Bed 2	

Routing Elements
Predeveloped Routing

Mitigated Routing

POND

Bottom Length:	177.00 ft.		
Bottom Width:	60.00 ft.		
Depth:	8.5 ft.		
Volume at riser head:	1.8421 acre-feet.		
Infiltration On			
Infiltration rate:	1		
Infiltration safety factor:	0.25		
Total Volume Infiltrated (ac-ft.):		486.53	
Total Volume Through Riser (ac-ft.):		196.637	
Total Volume Through Facility (ac-ft.):		683.168	
Percent Infiltrated:		71.22	
Total Precip Applied to Facility:		0	
Total Evap From Facility:		0	
Side slope 1:	0 To 1		
Side slope 2:	0 To 1		
Side slope 3:	0 To 1		
Side slope 4:	0 To 1		
Discharge Structure			
Riser Height:	7.5 ft.		
Riser Diameter:	18 in.		
Orifice 1 Diameter:	1.125 in.	Elevation:0 ft.	
Orifice 2 Diameter:	2 in.	Elevation:2.75 ft.	
Element Flows To:			
Outlet 1	Outlet 2		

Pond Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.243	0.000	0.000	0.000
0.0944	0.243	0.023	0.010	0.061
0.1889	0.243	0.046	0.014	0.061
0.2833	0.243	0.069	0.018	0.061
0.3778	0.243	0.092	0.021	0.061
0.4722	0.243	0.115	0.023	0.061
0.5667	0.243	0.138	0.025	0.061
0.6611	0.243	0.161	0.027	0.061
0.7556	0.243	0.184	0.029	0.061
0.8500	0.243	0.207	0.031	0.061
0.9444	0.243	0.230	0.033	0.061
1.0389	0.243	0.253	0.035	0.061
1.1333	0.243	0.276	0.036	0.061
1.2278	0.243	0.299	0.038	0.061
1.3222	0.243	0.322	0.039	0.061
1.4167	0.243	0.345	0.040	0.061
1.5111	0.243	0.368	0.042	0.061
1.6056	0.243	0.391	0.043	0.061
1.7000	0.243	0.414	0.044	0.061
1.7944	0.243	0.437	0.046	0.061
1.8889	0.243	0.460	0.047	0.061
1.9833	0.243	0.483	0.048	0.061
2.0778	0.243	0.506	0.049	0.061
2.1722	0.243	0.529	0.050	0.061
2.2667	0.243	0.552	0.051	0.061

2.3611	0.243	0.575	0.052	0.061
2.4556	0.243	0.598	0.053	0.061
2.5500	0.243	0.621	0.054	0.061
2.6444	0.243	0.644	0.055	0.061
2.7389	0.243	0.667	0.056	0.061
2.8333	0.243	0.690	0.089	0.061
2.9278	0.243	0.713	0.104	0.061
3.0222	0.243	0.736	0.116	0.061
3.1167	0.243	0.759	0.126	0.061
3.2111	0.243	0.782	0.135	0.061
3.3056	0.243	0.805	0.143	0.061
3.4000	0.243	0.828	0.150	0.061
3.4944	0.243	0.852	0.157	0.061
3.5889	0.243	0.875	0.164	0.061
3.6833	0.243	0.898	0.170	0.061
3.7778	0.243	0.921	0.176	0.061
3.8722	0.243	0.944	0.182	0.061
3.9667	0.243	0.967	0.188	0.061
4.0611	0.243	0.990	0.193	0.061
4.1556	0.243	1.013	0.198	0.061
4.2500	0.243	1.036	0.203	0.061
4.3444	0.243	1.059	0.208	0.061
4.4389	0.243	1.082	0.213	0.061
4.5333	0.243	1.105	0.218	0.061
4.6278	0.243	1.128	0.222	0.061
4.7222	0.243	1.151	0.227	0.061
4.8167	0.243	1.174	0.231	0.061
4.9111	0.243	1.197	0.235	0.061
5.0056	0.243	1.220	0.239	0.061
5.1000	0.243	1.243	0.244	0.061
5.1944	0.243	1.266	0.248	0.061
5.2889	0.243	1.289	0.251	0.061
5.3833	0.243	1.312	0.255	0.061
5.4778	0.243	1.335	0.259	0.061
5.5722	0.243	1.358	0.263	0.061
5.6667	0.243	1.381	0.267	0.061
5.7611	0.243	1.404	0.270	0.061
5.8556	0.243	1.427	0.274	0.061
5.9500	0.243	1.450	0.278	0.061
6.0444	0.243	1.473	0.281	0.061
6.1389	0.243	1.496	0.284	0.061
6.2333	0.243	1.519	0.288	0.061
6.3278	0.243	1.542	0.291	0.061
6.4222	0.243	1.565	0.295	0.061
6.5167	0.243	1.588	0.298	0.061
6.6111	0.243	1.611	0.301	0.061
6.7056	0.243	1.634	0.304	0.061
6.8000	0.243	1.657	0.308	0.061
6.8944	0.243	1.680	0.311	0.061
6.9889	0.243	1.703	0.314	0.061
7.0833	0.243	1.726	0.317	0.061
7.1778	0.243	1.750	0.320	0.061
7.2722	0.243	1.773	0.323	0.061
7.3667	0.243	1.796	0.326	0.061
7.4611	0.243	1.819	0.329	0.061
7.5556	0.243	1.842	0.540	0.061
7.6500	0.243	1.865	1.254	0.061
7.7444	0.243	1.888	2.215	0.061

7.8389	0.243	1.911	3.287	0.061
7.9333	0.243	1.934	4.332	0.061
8.0278	0.243	1.957	5.225	0.061
8.1222	0.243	1.980	5.881	0.061
8.2167	0.243	2.003	6.307	0.061
8.3111	0.243	2.026	6.737	0.061
8.4056	0.243	2.049	7.101	0.061
8.5000	0.243	2.072	7.447	0.061
8.5944	0.243	2.095	7.776	0.061

Gravel Trench Bed 1

Bottom Length:	700.00 ft.
Bottom Width:	6.00 ft.
Trench bottom slope 1:	0.00001 To 1
Trench Left side slope 0:	0 To 1
Trench right side slope 2:	0 To 1
Material thickness of first layer:	2
Pour Space of material for first layer:	0.333
Material thickness of second layer:	0
Pour Space of material for second layer:	0
Material thickness of third layer:	0
Pour Space of material for third layer:	0
Infiltration On	
Infiltration rate:	1
Infiltration safety factor:	0.25
Total Volume Infiltrated (ac-ft.):	126.388
Total Volume Through Riser (ac-ft.):	4.006
Total Volume Through Facility (ac-ft.):	130.394
Percent Infiltrated:	96.93
Total Precip Applied to Facility:	0
Total Evap From Facility:	0
Discharge Structure	
Riser Height:	2 ft.
Riser Diameter:	12 in.
Element Flows To:	
Outlet 1	Outlet 2
POND	

Gravel Trench Bed Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.096	0.000	0.000	0.000
0.0333	0.096	0.001	0.000	0.024
0.0667	0.096	0.002	0.000	0.024
0.1000	0.096	0.003	0.000	0.024
0.1333	0.096	0.004	0.000	0.024
0.1667	0.096	0.005	0.000	0.024
0.2000	0.096	0.006	0.000	0.024
0.2333	0.096	0.007	0.000	0.024
0.2667	0.096	0.008	0.000	0.024
0.3000	0.096	0.009	0.000	0.024
0.3333	0.096	0.010	0.000	0.024
0.3667	0.096	0.011	0.000	0.024
0.4000	0.096	0.012	0.000	0.024
0.4333	0.096	0.013	0.000	0.024
0.4667	0.096	0.015	0.000	0.024
0.5000	0.096	0.016	0.000	0.024
0.5333	0.096	0.017	0.000	0.024
0.5667	0.096	0.018	0.000	0.024
0.6000	0.096	0.019	0.000	0.024
0.6333	0.096	0.020	0.000	0.024
0.6667	0.096	0.021	0.000	0.024
0.7000	0.096	0.022	0.000	0.024
0.7333	0.096	0.023	0.000	0.024
0.7667	0.096	0.024	0.000	0.024
0.8000	0.096	0.025	0.000	0.024
0.8333	0.096	0.026	0.000	0.024

0.8667	0.096	0.027	0.000	0.024
0.9000	0.096	0.028	0.000	0.024
0.9333	0.096	0.030	0.000	0.024
0.9667	0.096	0.031	0.000	0.024
1.0000	0.096	0.032	0.000	0.024
1.0333	0.096	0.033	0.000	0.024
1.0667	0.096	0.034	0.000	0.024
1.1000	0.096	0.035	0.000	0.024
1.1333	0.096	0.036	0.000	0.024
1.1667	0.096	0.037	0.000	0.024
1.2000	0.096	0.038	0.000	0.024
1.2333	0.096	0.039	0.000	0.024
1.2667	0.096	0.040	0.000	0.024
1.3000	0.096	0.041	0.000	0.024
1.3333	0.096	0.042	0.000	0.024
1.3667	0.096	0.043	0.000	0.024
1.4000	0.096	0.045	0.000	0.024
1.4333	0.096	0.046	0.000	0.024
1.4667	0.096	0.047	0.000	0.024
1.5000	0.096	0.048	0.000	0.024
1.5333	0.096	0.049	0.000	0.024
1.5667	0.096	0.050	0.000	0.024
1.6000	0.096	0.051	0.000	0.024
1.6333	0.096	0.052	0.000	0.024
1.6667	0.096	0.053	0.000	0.024
1.7000	0.096	0.054	0.000	0.024
1.7333	0.096	0.055	0.000	0.024
1.7667	0.096	0.056	0.000	0.024
1.8000	0.096	0.057	0.000	0.024
1.8333	0.096	0.058	0.000	0.024
1.8667	0.096	0.059	0.000	0.024
1.9000	0.096	0.061	0.000	0.024
1.9333	0.096	0.062	0.000	0.024
1.9667	0.096	0.063	0.000	0.024
2.0000	0.096	0.066	0.000	0.024
2.0333	0.096	0.069	0.064	0.024
2.0667	0.096	0.072	0.182	0.024
2.1000	0.096	0.076	0.333	0.024
2.1333	0.096	0.079	0.509	0.024
2.1667	0.096	0.082	0.703	0.024
2.2000	0.096	0.085	0.907	0.024
2.2333	0.096	0.088	1.115	0.024
2.2667	0.096	0.092	1.318	0.024
2.3000	0.096	0.095	1.509	0.024
2.3333	0.096	0.098	1.683	0.024
2.3667	0.096	0.101	1.834	0.024
2.4000	0.096	0.104	1.960	0.024
2.4333	0.096	0.108	2.060	0.024
2.4667	0.096	0.111	2.138	0.024
2.5000	0.096	0.114	2.227	0.024
2.5333	0.096	0.117	2.300	0.024
2.5667	0.096	0.121	2.371	0.024
2.6000	0.096	0.124	2.439	0.024
2.6333	0.096	0.127	2.506	0.024
2.6667	0.096	0.130	2.571	0.024
2.7000	0.096	0.133	2.635	0.024
2.7333	0.096	0.137	2.697	0.024
2.7667	0.096	0.140	2.757	0.024

2.8000	0.096	0.143	2.817	0.024
2.8333	0.096	0.146	2.875	0.024
2.8667	0.096	0.149	2.932	0.024
2.9000	0.096	0.153	2.988	0.024
2.9333	0.096	0.156	3.042	0.024
2.9667	0.096	0.159	3.096	0.024
3.0000	0.096	0.162	3.149	0.024

Gravel Trench Bed 2

Bottom Length:	550.00 ft.
Bottom Width:	6.00 ft.
Trench bottom slope 1:	0.00001 To 1
Trench Left side slope 0:	0 To 1
Trench right side slope 2:	0 To 1
Material thickness of first layer:	2
Pour Space of material for first layer:	0.333
Material thickness of second layer:	0
Pour Space of material for second layer:	0
Material thickness of third layer:	0
Pour Space of material for third layer:	0
Infiltration On	
Infiltration rate:	1
Infiltration safety factor:	0.25
Total Volume Infiltrated (ac-ft.):	142.488
Total Volume Through Riser (ac-ft.):	17.352
Total Volume Through Facility (ac-ft.):	159.84
Percent Infiltrated:	89.14
Total Precip Applied to Facility:	0
Total Evap From Facility:	0
Discharge Structure	
Riser Height:	2 ft.
Riser Diameter:	12 in.
Element Flows To:	
Outlet 1	Outlet 2
POND	

Gravel Trench Bed Hydraulic Table

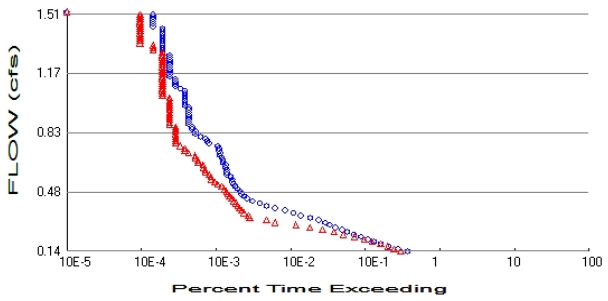
Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.075	0.000	0.000	0.000
0.0333	0.075	0.000	0.000	0.019
0.0667	0.075	0.001	0.000	0.019
0.1000	0.075	0.002	0.000	0.019
0.1333	0.075	0.003	0.000	0.019
0.1667	0.075	0.004	0.000	0.019
0.2000	0.075	0.005	0.000	0.019
0.2333	0.075	0.005	0.000	0.019
0.2667	0.075	0.006	0.000	0.019
0.3000	0.075	0.007	0.000	0.019
0.3333	0.075	0.008	0.000	0.019
0.3667	0.075	0.009	0.000	0.019
0.4000	0.075	0.010	0.000	0.019
0.4333	0.075	0.010	0.000	0.019
0.4667	0.075	0.011	0.000	0.019
0.5000	0.075	0.012	0.000	0.019
0.5333	0.075	0.013	0.000	0.019
0.5667	0.075	0.014	0.000	0.019
0.6000	0.075	0.015	0.000	0.019
0.6333	0.075	0.016	0.000	0.019
0.6667	0.075	0.016	0.000	0.019
0.7000	0.075	0.017	0.000	0.019
0.7333	0.075	0.018	0.000	0.019
0.7667	0.075	0.019	0.000	0.019
0.8000	0.075	0.020	0.000	0.019
0.8333	0.075	0.021	0.000	0.019

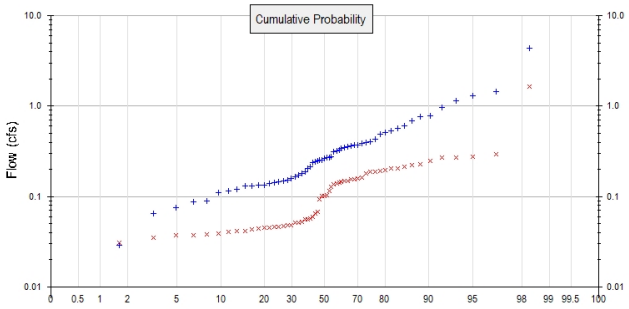
0.8667	0.075	0.021	0.000	0.019
0.9000	0.075	0.022	0.000	0.019
0.9333	0.075	0.023	0.000	0.019
0.9667	0.075	0.024	0.000	0.019
1.0000	0.075	0.025	0.000	0.019
1.0333	0.075	0.026	0.000	0.019
1.0667	0.075	0.026	0.000	0.019
1.1000	0.075	0.027	0.000	0.019
1.1333	0.075	0.028	0.000	0.019
1.1667	0.075	0.029	0.000	0.019
1.2000	0.075	0.030	0.000	0.019
1.2333	0.075	0.031	0.000	0.019
1.2667	0.075	0.032	0.000	0.019
1.3000	0.075	0.032	0.000	0.019
1.3333	0.075	0.033	0.000	0.019
1.3667	0.075	0.034	0.000	0.019
1.4000	0.075	0.035	0.000	0.019
1.4333	0.075	0.036	0.000	0.019
1.4667	0.075	0.037	0.000	0.019
1.5000	0.075	0.037	0.000	0.019
1.5333	0.075	0.038	0.000	0.019
1.5667	0.075	0.039	0.000	0.019
1.6000	0.075	0.040	0.000	0.019
1.6333	0.075	0.041	0.000	0.019
1.6667	0.075	0.042	0.000	0.019
1.7000	0.075	0.042	0.000	0.019
1.7333	0.075	0.043	0.000	0.019
1.7667	0.075	0.044	0.000	0.019
1.8000	0.075	0.045	0.000	0.019
1.8333	0.075	0.046	0.000	0.019
1.8667	0.075	0.047	0.000	0.019
1.9000	0.075	0.047	0.000	0.019
1.9333	0.075	0.048	0.000	0.019
1.9667	0.075	0.049	0.000	0.019
2.0000	0.075	0.052	0.000	0.019
2.0333	0.075	0.054	0.064	0.019
2.0667	0.075	0.057	0.182	0.019
2.1000	0.075	0.059	0.333	0.019
2.1333	0.075	0.062	0.509	0.019
2.1667	0.075	0.064	0.703	0.019
2.2000	0.075	0.067	0.907	0.019
2.2333	0.075	0.069	1.115	0.019
2.2667	0.075	0.072	1.318	0.019
2.3000	0.075	0.074	1.509	0.019
2.3333	0.075	0.077	1.683	0.019
2.3667	0.075	0.079	1.834	0.019
2.4000	0.075	0.082	1.960	0.019
2.4333	0.075	0.085	2.060	0.019
2.4667	0.075	0.087	2.138	0.019
2.5000	0.075	0.090	2.227	0.019
2.5333	0.075	0.092	2.300	0.019
2.5667	0.075	0.095	2.371	0.019
2.6000	0.075	0.097	2.439	0.019
2.6333	0.075	0.100	2.506	0.019
2.6667	0.075	0.102	2.571	0.019
2.7000	0.075	0.105	2.635	0.019
2.7333	0.075	0.107	2.697	0.019
2.7667	0.075	0.110	2.757	0.019

2.8000	0.075	0.112	2.817	0.019
2.8333	0.075	0.115	2.875	0.019
2.8667	0.075	0.117	2.932	0.019
2.9000	0.075	0.120	2.988	0.019
2.9333	0.075	0.122	3.042	0.019
2.9667	0.075	0.125	3.096	0.019
3.0000	0.075	0.127	3.149	0.019

Analysis Results

POC 1





\+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #1
Total Pervious Area: 5.26
Total Impervious Area: 0

Mitigated Landuse Totals for POC #1
Total Pervious Area: 4.5
Total Impervious Area: 3.28

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	**Flow(cfs)**
2 year	0.271377
5 year	0.584552
10 year	0.842843
25 year	1.213538
50 year	1.514787
100 year	1.832581

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	**Flow(cfs)**
2 year	0.088982
5 year	0.181767
10 year	0.274591
25 year	0.439576
50 year	0.605992
100 year	0.818354

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #1

Year	**Predeveloped**	**Mitigated**
1949	0.389	0.268
1950	0.268	0.149
1951	0.429	0.149
1952	0.320	0.065
1953	0.268	0.135
1954	0.253	0.068
1955	0.345	0.041
1956	0.975	0.245
1957	0.190	0.059
1958	0.111	0.045

1959	0.142	0.052
1960	0.150	0.043
1961	0.262	0.195
1962	0.133	0.048
1963	0.148	0.051
1964	0.314	0.154
1965	0.329	0.229
1966	0.371	0.156
1967	0.247	0.048
1968	0.402	0.142
1969	0.494	0.105
1970	4.382	0.269
1971	0.145	0.046
1972	0.273	0.102
1973	0.139	0.128
1974	0.784	0.278
1975	0.254	0.101
1976	1.290	0.051
1977	0.006	0.037
1978	0.371	0.194
1979	0.121	0.041
1980	0.364	0.205
1981	0.396	0.222
1982	0.687	0.163
1983	1.152	0.115
1984	0.568	0.046
1985	0.353	0.093
1986	0.134	0.037
1987	0.339	0.178
1988	0.116	0.056
1989	0.088	0.031
1990	0.131	0.055
1991	0.167	0.038
1992	0.178	0.045
1993	0.159	0.045
1994	0.244	0.141
1995	0.171	0.205
1996	1.437	1.644
1997	0.530	0.291
1998	0.213	0.039
1999	0.240	0.188
2000	0.089	0.035
2001	0.029	0.028
2002	0.761	0.057
2003	0.512	0.187
2004	0.065	0.041
2005	0.076	0.047
2006	0.610	0.146
2007	0.130	0.212
2008	0.205	0.157

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	4.3824	1.6435
2	1.4368	0.2910
3	1.2901	0.2781
4	1.1517	0.2687

5	0.9751	0.2685
6	0.7842	0.2454
7	0.7610	0.2287
8	0.6869	0.2225
9	0.6096	0.2122
10	0.5684	0.2050
11	0.5298	0.2046
12	0.5122	0.1955
13	0.4940	0.1939
14	0.4294	0.1877
15	0.4019	0.1869
16	0.3961	0.1781
17	0.3887	0.1627
18	0.3714	0.1572
19	0.3708	0.1563
20	0.3638	0.1541
21	0.3528	0.1486
22	0.3450	0.1486
23	0.3388	0.1462
24	0.3287	0.1424
25	0.3202	0.1406
26	0.3137	0.1353
27	0.2730	0.1283
28	0.2679	0.1152
29	0.2679	0.1045
30	0.2623	0.1020
31	0.2536	0.1013
32	0.2528	0.0926
33	0.2469	0.0680
34	0.2441	0.0645
35	0.2395	0.0589
36	0.2132	0.0566
37	0.2052	0.0558
38	0.1897	0.0554
39	0.1781	0.0521
40	0.1712	0.0512
41	0.1667	0.0509
42	0.1586	0.0478
43	0.1504	0.0477
44	0.1482	0.0469
45	0.1454	0.0463
46	0.1418	0.0459
47	0.1386	0.0451
48	0.1342	0.0447
49	0.1333	0.0446
50	0.1314	0.0434
51	0.1298	0.0414
52	0.1206	0.0412
53	0.1156	0.0406
54	0.1113	0.0393
55	0.0893	0.0384
56	0.0876	0.0373
57	0.0760	0.0372
58	0.0647	0.0351
59	0.0290	0.0311
60	0.0063	0.0282

Duration Flows

The Facility PASSED

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.1357	7687	6290	81	Pass
0.1496	5722	5079	88	Pass
0.1635	4277	4216	98	Pass
0.1775	3372	3381	100	Pass
0.1914	2733	2596	94	Pass
0.2053	2245	2042	90	Pass
0.2193	1839	1512	82	Pass
0.2332	1476	1070	72	Pass
0.2471	1202	803	66	Pass
0.2611	1015	560	55	Pass
0.2750	838	377	44	Pass
0.2889	702	248	35	Pass
0.3029	604	130	21	Pass
0.3168	501	99	19	Pass
0.3307	383	59	15	Pass
0.3446	284	57	20	Pass
0.3586	229	50	21	Pass
0.3725	175	46	26	Pass
0.3864	130	43	33	Pass
0.4004	99	41	41	Pass
0.4143	81	39	48	Pass
0.4282	64	36	56	Pass
0.4422	55	34	61	Pass
0.4561	50	32	64	Pass
0.4700	46	30	65	Pass
0.4839	44	29	65	Pass
0.4979	41	27	65	Pass
0.5118	38	25	65	Pass
0.5257	36	22	61	Pass
0.5397	35	20	57	Pass
0.5536	35	18	51	Pass
0.5675	33	18	54	Pass
0.5815	29	17	58	Pass
0.5954	29	15	51	Pass
0.6093	29	15	51	Pass
0.6232	28	14	50	Pass
0.6372	28	14	50	Pass
0.6511	26	12	46	Pass
0.6650	26	12	46	Pass
0.6790	25	11	44	Pass
0.6929	24	11	45	Pass
0.7068	24	9	37	Pass
0.7208	23	8	34	Pass
0.7347	23	8	34	Pass
0.7486	22	7	31	Pass
0.7626	17	6	35	Pass
0.7765	16	6	37	Pass
0.7904	15	6	40	Pass
0.8043	13	6	46	Pass
0.8183	11	6	54	Pass
0.8322	11	6	54	Pass
0.8461	10	6	60	Pass
0.8601	10	6	60	Pass

0.8740	9	5	55	Pass
0.8879	9	5	55	Pass
0.9019	9	5	55	Pass
0.9158	9	5	55	Pass
0.9297	9	5	55	Pass
0.9436	9	5	55	Pass
0.9576	9	5	55	Pass
0.9715	9	5	55	Pass
0.9854	8	5	62	Pass
0.9994	8	5	62	Pass
1.0133	8	5	62	Pass
1.0272	8	5	62	Pass
1.0412	8	4	50	Pass
1.0551	8	4	50	Pass
1.0690	8	4	50	Pass
1.0829	7	4	57	Pass
1.0969	6	4	66	Pass
1.1108	6	4	66	Pass
1.1247	6	4	66	Pass
1.1387	6	4	66	Pass
1.1526	5	4	80	Pass
1.1665	5	4	80	Pass
1.1805	5	4	80	Pass
1.1944	5	4	80	Pass
1.2083	5	4	80	Pass
1.2223	5	4	80	Pass
1.2362	5	4	80	Pass
1.2501	5	4	80	Pass
1.2640	5	4	80	Pass
1.2780	5	4	80	Pass
1.2919	4	4	100	Pass
1.3058	4	3	75	Pass
1.3198	4	3	75	Pass
1.3337	4	3	75	Pass
1.3476	4	2	50	Pass
1.3616	4	2	50	Pass
1.3755	4	2	50	Pass
1.3894	4	2	50	Pass
1.4033	4	2	50	Pass
1.4173	4	2	50	Pass
1.4312	4	2	50	Pass
1.4451	3	2	66	Pass
1.4591	3	2	66	Pass
1.4730	3	2	66	Pass
1.4869	3	2	66	Pass
1.5009	3	2	66	Pass
1.5148	3	2	66	Pass

Water Quality

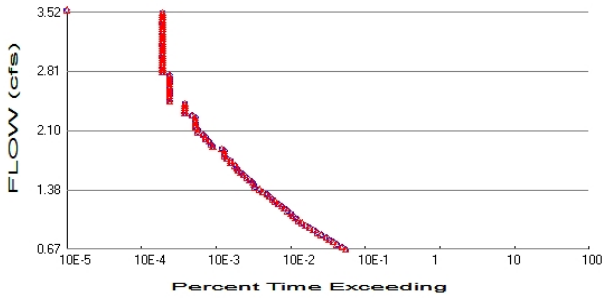
Water Quality BMP Flow and Volume for POC #1

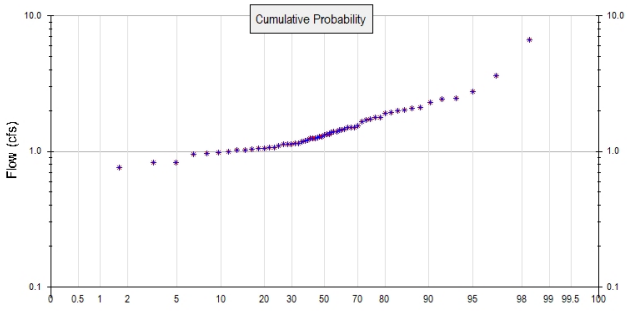
On-line facility volume:	0 acre-feet
On-line facility target flow:	0 cfs.
Adjusted for 15 min:	0 cfs.
Off-line facility target flow:	0 cfs.
Adjusted for 15 min:	0 cfs.

LID Report

LID Technique	Used for Treatment ?	Total Volume Needs Treatment (ac-ft)	Volume Through Facility (ac-ft)	Infiltration Volume (ac-ft)	Cumulative Volume Infiltration Credit	Percent Volume Infiltrated	Water Quality	Percent Water Quality Treated	Comment
POND POC	☐	621.68			☐	71.22			
Gravel Trench Bed 1	☐	118.66			☐	96.93			
Gravel Trench Bed 2	☐	145.45			☐	89.14			
Total Volume Infiltrated		885.80	0.00	0.00		77.60	0.00	0%	No Treat. Credit
Compliance with LID Standard 8% of 2-yr to 50% of 2-yr									Duration Analysis Result = Passed

POC 2





\+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #2
Total Pervious Area: 4.5
Total Impervious Area: 1.9

Mitigated Landuse Totals for POC #2
Total Pervious Area: 4.5
Total Impervious Area: 1.9

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #2

Return Period	**Flow(cfs)**
2 year	1.339874
5 year	1.895431
10 year	2.333465
25 year	2.974305
50 year	3.520293
100 year	4.129638

Flow Frequency Return Periods for Mitigated. POC #2

Return Period	**Flow(cfs)**
2 year	1.339874
5 year	1.895431
10 year	2.333465
25 year	2.974305
50 year	3.520293
100 year	4.129638

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #2

Year	**Predeveloped**	**Mitigated**
1949	1.696	1.696
1950	1.015	1.015
1951	1.384	1.384
1952	1.506	1.506
1953	1.195	1.195
1954	1.432	1.432
1955	1.042	1.042
1956	2.024	2.024
1957	1.071	1.071
1958	1.128	1.128
1959	0.823	0.823

1960	1.060	1.060
1961	1.099	1.099
1962	1.130	1.130
1963	1.285	1.285
1964	1.245	1.245
1965	1.324	1.324
1966	1.461	1.461
1967	1.048	1.048
1968	2.068	2.068
1969	1.789	1.789
1970	6.665	6.665
1971	1.401	1.401
1972	1.220	1.220
1973	1.286	1.286
1974	1.787	1.787
1975	1.240	1.240
1976	2.435	2.435
1977	0.762	0.762
1978	1.429	1.429
1979	1.342	1.342
1980	0.995	0.995
1981	1.498	1.498
1982	1.929	1.929
1983	2.452	2.452
1984	1.662	1.662
1985	1.151	1.151
1986	1.177	1.177
1987	1.122	1.122
1988	1.490	1.490
1989	1.148	1.148
1990	0.982	0.982
1991	1.399	1.399
1992	1.048	1.048
1993	2.294	2.294
1994	1.016	1.016
1995	1.253	1.253
1996	2.776	2.776
1997	1.984	1.984
1998	1.736	1.736
1999	0.972	0.972
2000	0.711	0.711
2001	0.826	0.826
2002	2.116	2.116
2003	1.535	1.535
2004	1.348	1.348
2005	1.263	1.263
2006	1.902	1.902
2007	0.959	0.959
2008	3.631	3.631

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #2

Rank	**Predeveloped**	**Mitigated**
1	6.6652	6.6652
2	3.6305	3.6305
3	2.7763	2.7763
4	2.4524	2.4524
5	2.4351	2.4351

6	2.2935	2.2935
7	2.1159	2.1159
8	2.0677	2.0677
9	2.0240	2.0240
10	1.9836	1.9836
11	1.9286	1.9286
12	1.9022	1.9022
13	1.7892	1.7892
14	1.7866	1.7866
15	1.7356	1.7356
16	1.6961	1.6961
17	1.6623	1.6623
18	1.5350	1.5350
19	1.5059	1.5059
20	1.4979	1.4979
21	1.4900	1.4900
22	1.4609	1.4609
23	1.4316	1.4316
24	1.4287	1.4287
25	1.4005	1.4005
26	1.3989	1.3989
27	1.3842	1.3842
28	1.3478	1.3478
29	1.3419	1.3419
30	1.3236	1.3236
31	1.2861	1.2861
32	1.2846	1.2846
33	1.2631	1.2631
34	1.2528	1.2528
35	1.2451	1.2451
36	1.2401	1.2401
37	1.2205	1.2205
38	1.1954	1.1954
39	1.1772	1.1772
40	1.1514	1.1514
41	1.1484	1.1484
42	1.1302	1.1302
43	1.1282	1.1282
44	1.1221	1.1221
45	1.0987	1.0987
46	1.0708	1.0708
47	1.0603	1.0603
48	1.0483	1.0483
49	1.0477	1.0477
50	1.0424	1.0424
51	1.0165	1.0165
52	1.0155	1.0155
53	0.9950	0.9950
54	0.9817	0.9817
55	0.9722	0.9722
56	0.9591	0.9591
57	0.8256	0.8256
58	0.8233	0.8233
59	0.7616	0.7616
60	0.7110	0.7110

Duration Flows

The Facility PASSED

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.6699	1147	1147	100	Pass
0.6987	1017	1017	100	Pass
0.7275	878	878	100	Pass
0.7563	776	776	100	Pass
0.7851	686	686	100	Pass
0.8139	625	625	100	Pass
0.8427	543	543	100	Pass
0.8715	477	477	100	Pass
0.9003	426	426	100	Pass
0.9291	376	376	100	Pass
0.9579	332	332	100	Pass
0.9866	297	297	100	Pass
1.0154	269	269	100	Pass
1.0442	244	244	100	Pass
1.0730	222	222	100	Pass
1.1018	213	213	100	Pass
1.1306	192	192	100	Pass
1.1594	173	173	100	Pass
1.1882	160	160	100	Pass
1.2170	143	143	100	Pass
1.2458	129	129	100	Pass
1.2746	120	120	100	Pass
1.3033	108	108	100	Pass
1.3321	101	101	100	Pass
1.3609	88	88	100	Pass
1.3897	80	80	100	Pass
1.4185	70	70	100	Pass
1.4473	67	67	100	Pass
1.4761	65	65	100	Pass
1.5049	59	59	100	Pass
1.5337	54	54	100	Pass
1.5625	49	49	100	Pass
1.5913	45	45	100	Pass
1.6201	41	41	100	Pass
1.6488	40	40	100	Pass
1.6776	38	38	100	Pass
1.7064	33	33	100	Pass
1.7352	33	33	100	Pass
1.7640	29	29	100	Pass
1.7928	27	27	100	Pass
1.8216	27	27	100	Pass
1.8504	27	27	100	Pass
1.8792	25	25	100	Pass
1.9080	19	19	100	Pass
1.9368	18	18	100	Pass
1.9656	17	17	100	Pass
1.9943	15	15	100	Pass
2.0231	15	15	100	Pass
2.0519	14	14	100	Pass
2.0807	12	12	100	Pass
2.1095	12	12	100	Pass
2.1383	11	11	100	Pass
2.1671	11	11	100	Pass

2.1959	11	11	100	Pass
2.2247	11	11	100	Pass
2.2535	11	11	100	Pass
2.2823	10	10	100	Pass
2.3111	8	8	100	Pass
2.3398	8	8	100	Pass
2.3686	8	8	100	Pass
2.3974	8	8	100	Pass
2.4262	8	8	100	Pass
2.4550	5	5	100	Pass
2.4838	5	5	100	Pass
2.5126	5	5	100	Pass
2.5414	5	5	100	Pass
2.5702	5	5	100	Pass
2.5990	5	5	100	Pass
2.6278	5	5	100	Pass
2.6565	5	5	100	Pass
2.6853	5	5	100	Pass
2.7141	5	5	100	Pass
2.7429	5	5	100	Pass
2.7717	5	5	100	Pass
2.8005	4	4	100	Pass
2.8293	4	4	100	Pass
2.8581	4	4	100	Pass
2.8869	4	4	100	Pass
2.9157	4	4	100	Pass
2.9445	4	4	100	Pass
2.9733	4	4	100	Pass
3.0020	4	4	100	Pass
3.0308	4	4	100	Pass
3.0596	4	4	100	Pass
3.0884	4	4	100	Pass
3.1172	4	4	100	Pass
3.1460	4	4	100	Pass
3.1748	4	4	100	Pass
3.2036	4	4	100	Pass
3.2324	4	4	100	Pass
3.2612	4	4	100	Pass
3.2900	4	4	100	Pass
3.3188	4	4	100	Pass
3.3475	4	4	100	Pass
3.3763	4	4	100	Pass
3.4051	4	4	100	Pass
3.4339	4	4	100	Pass
3.4627	4	4	100	Pass
3.4915	4	4	100	Pass
3.5203	4	4	100	Pass

Water Quality

Water Quality BMP Flow and Volume for POC #2

On-line facility volume:	0.4738 acre-feet
On-line facility target flow:	0.4415 cfs.
Adjusted for 15 min:	0.4415 cfs.
Off-line facility target flow:	0.2479 cfs.
Adjusted for 15 min:	0.2479 cfs.

LID Report

LID Technique	Used for Treatment ?	Total Volume Needs Treatment (ac-ft)	Volume Through Facility (ac-ft)	Infiltration Volume (ac-ft)	Cumulative Volume Infiltration Credit	Percent Volume Infiltrated	Water Quality	Percent Water Quality Treated	Comment
Total Volume Infiltrated		0.00	0.00	0.00		0.00	0.00	0%	No Treat. Credit
Compliance with LID Standard 8% of 2-yr to 50% of 2-yr									Duration Analysis Result = Passed

Model Default Modifications

Total of 0 changes have been made.

PERLND Changes

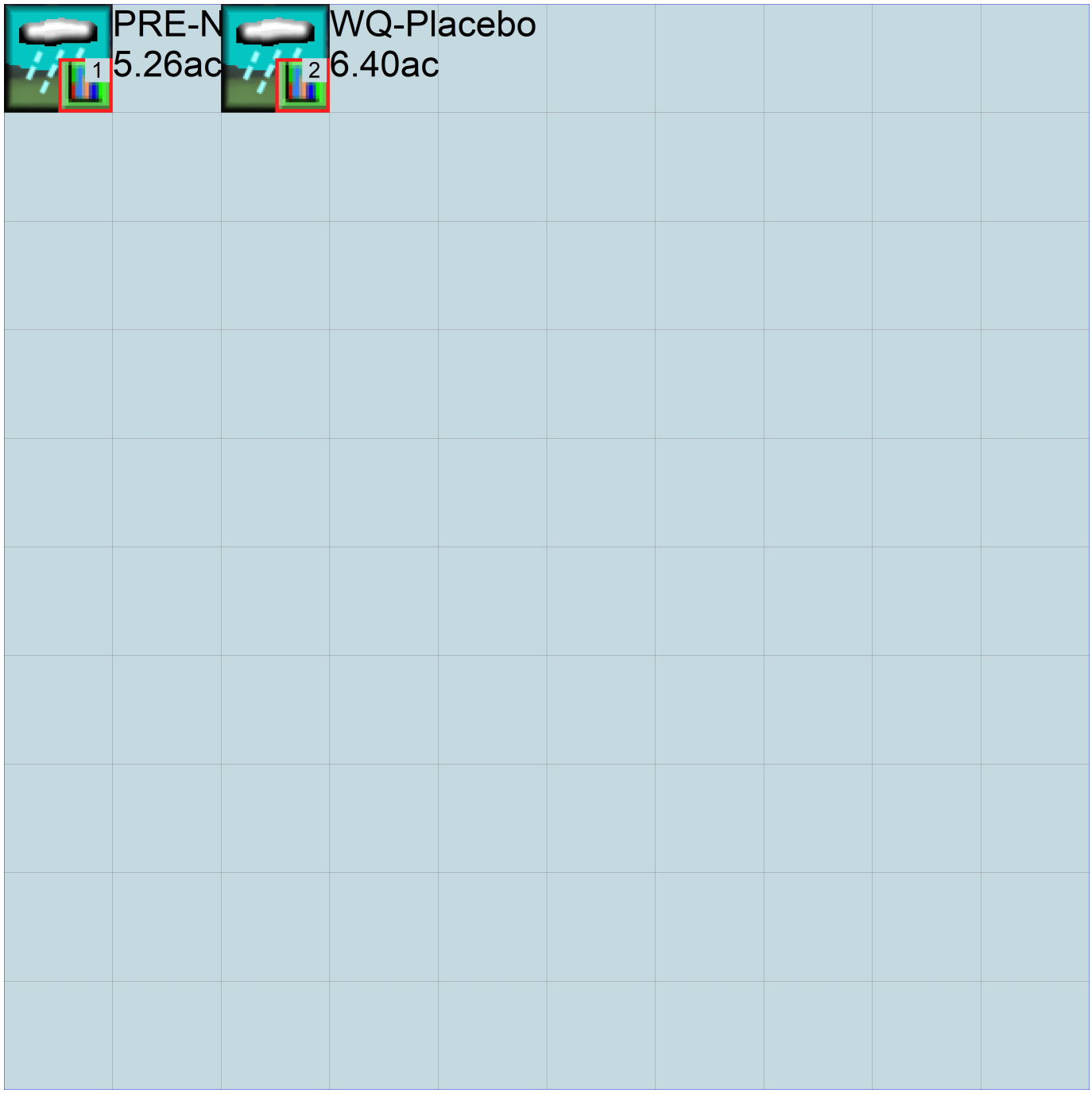
No PERLND changes have been made.

IMPLND Changes

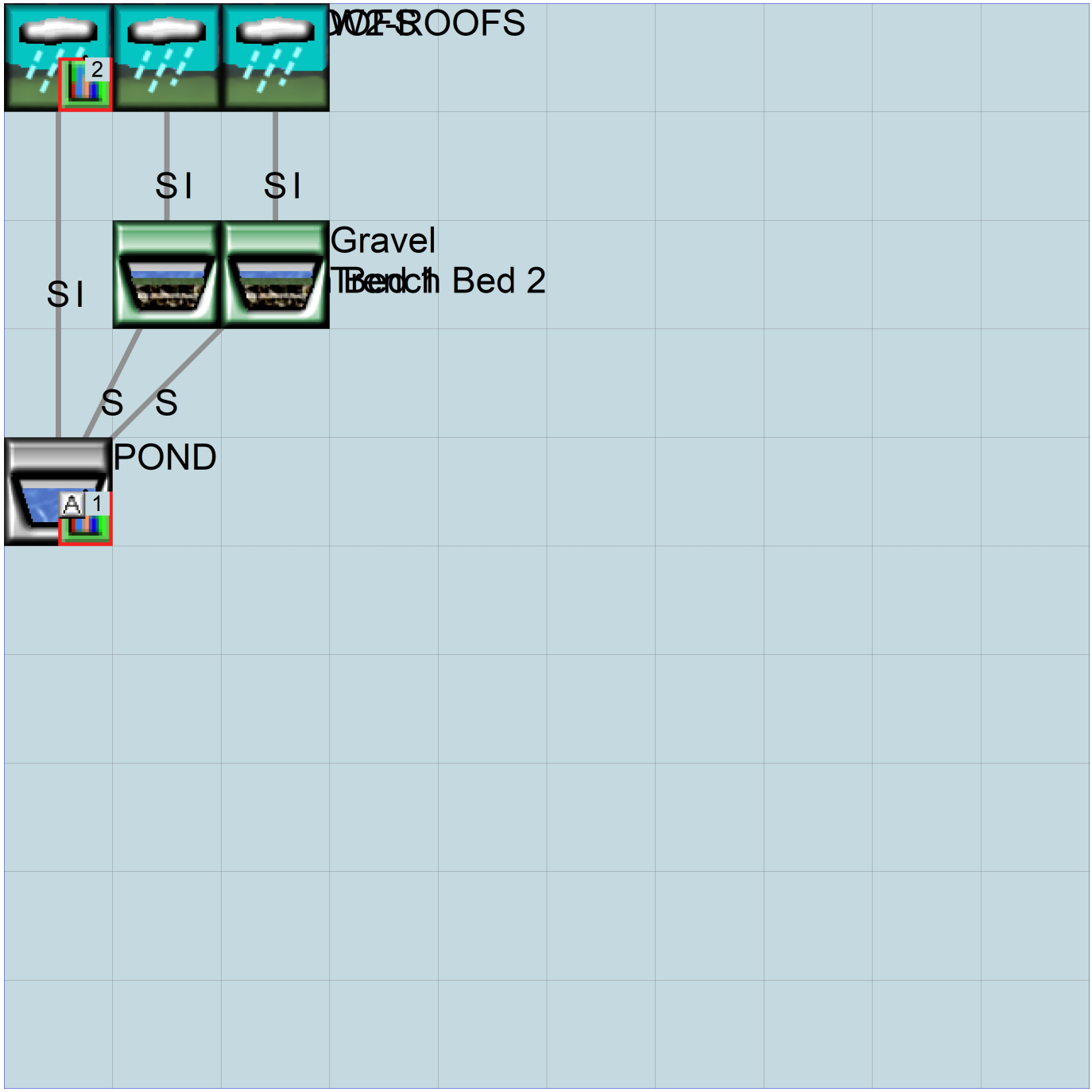
No IMPLND changes have been made.

Appendix

Predeveloped Schematic



Mitigated Schematic



Predeveloped UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1948 10 01        END    2008 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                    UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                              ***
WDM         26   2140 PRE_V2.wdm
MESSU       25   Pre2140 PRE_V2.MES
            27   Pre2140 PRE_V2.L61
            28   Pre2140 PRE_V2.L62
            30   POC2140 PRE_V21.dat
            31   POC2140 PRE_V22.dat
END FILES

OPN SEQUENCE
    INGRP               INDELT 00:15
      PERLND      20
      PERLND      22
      IMPLND       1
      COPY       501
      COPY       502
      DISPLY       1
      DISPLY       2
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        PRE-NORTH                  MAX                    1    2   30    9
    2        WQ-Placebo                 MAX                    1    2   31    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  502         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                          in  out            ***
   20     SG3, Forest, Mod        1    1    1    1   27    0
   22     SG3, Field, Flat        1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************ Active Sections ******************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
   20         0    0    1    0    0    0    0    0    0    0    0    0
```

```
   22         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ***************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
   20         0    0    4    0    0    0    0    0    0    0    0    0    1    9
   22         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
   20         0    0    0    0    0    0    0    0    0    0    0
   22         0    0    0    0    0    0    0    0    0    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
   20              0         9      0.08       400       0.1         0      0.96
   22              0         9      0.06       400      0.05         0      0.96
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
   20              0         0       2.5         2         0         0         0
   22              0         0       2.5         2         0         0         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                              ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
   20           0.2         1      0.35         4       0.4       0.7
   22          0.15         1       0.3         4       0.4       0.4
  END PWAT-PARM4

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
               ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS      GWVS
   20              0         0         0         0         3         1         0
   22              0         0         0         0         3         1         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                     in  out           ***
    1      ROADS/FLAT             1    1    1   27    0
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************* Active Sections ******************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
    1         0    0    1    0    0    0
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
    1         0    0    4    0    0    0    1    9
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
```

```
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
    1         0    0    0    0    0
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
    1            400      0.01       0.1       0.1
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
    1              0         0
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
    1              0         0
  END IWAT-STATE1

END IMPLND

SCHEMATIC
<-Source->                  <--Area-->     <-Target->   MBLK   ***
<Name>   #                  <-factor->     <Name>   #   Tbl#   ***
PRE-NORTH***
PERLND  20                       5.26     COPY   501     12
PERLND  20                       5.26     COPY   501     13
WQ-Placebo***
PERLND  22                        4.5     COPY   502     12
PERLND  22                        4.5     COPY   502     13
IMPLND   1                        1.9     COPY   502     15

******Routing******
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   48.4        DISPLY   1     INPUT  TIMSER 1
COPY   502 OUTPUT MEAN   1 1   48.4        DISPLY   2     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                ***
    # -  #<------------------><---> User T-series  Engl Metr LKFG           ***
                                       in  out                              ***
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************* Active Sections ****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ******************* PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                  ***
```

```
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
            FG FG FG FG  possible  exit  *** possible  exit      possible  exit
             *  *  *  *    *  *  *  *  *       *  *  *  *  *         ***
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><-------->       ***
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                          ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
          *** ac-ft     for each possible exit        for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><--->
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1.37           PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1.37           IMPLND   1 999 EXTNL  PREC
WDM      1 EVAP     ENGL    0.8            PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    0.8            IMPLND   1 999 EXTNL  PETINP

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    501 FLOW     ENGL      REPL
COPY   502 OUTPUT MEAN   1 1     48.4      WDM    502 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>            <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13

  MASS-LINK       15
IMPLND     IWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   15


END MASS-LINK

END RUN
```

Mitigated UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1948 10 01        END    2008 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                    UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                              ***
WDM         26   2140 PRE_V2.wdm
MESSU       25   Mit2140 PRE_V2.MES
            27   Mit2140 PRE_V2.L61
            28   Mit2140 PRE_V2.L62
            31   POC2140 PRE_V22.dat
            30   POC2140 PRE_V21.dat
END FILES

OPN SEQUENCE
    INGRP               INDELT 00:15
      PERLND      22
      IMPLND       1
      IMPLND       4
      RCHRES       1
      RCHRES       2
      RCHRES       3
      COPY       502
      COPY         1
      COPY       501
      DISPLY       2
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    2        PGIS                        MAX                   1    2   31    9
    1        POND                        MAX                   1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  502         1    1
  501         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                          in  out           ***
   22     SG3, Field, Flat        1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
```

```
    <PLS > ************ Active Sections ****************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
   22         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags **************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
   22         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
   22         0    0    0    0    0    0    0    0    0    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
   22              0         9      0.06       400      0.05         0      0.96
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
   22              0         0       2.5         2         0         0         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                          ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
   22           0.15         1       0.3         4       0.4       0.4
  END PWAT-PARM4

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
               ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS      GWVS
   22              0         0         0         0         3         1         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                     in  out           ***
    1      ROADS/FLAT             1    1    1   27    0
    4      ROOF TOPS/FLAT         1    1    1   27    0
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************ Active Sections ****************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
    1         0    0    1    0    0    0
    4         0    0    1    0    0    0
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
    1         0    0    4    0    0    0    1    9
    4         0    0    4    0    0    0    1    9
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
```

```
    1         0    0    0    0    0
    4         0    0    0    0    0
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
    1            400      0.01       0.1       0.1
    4            400      0.01       0.1       0.1
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
    1              0         0
    4              0         0
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
    1              0         0
    4              0         0
  END IWAT-STATE1

END IMPLND

SCHEMATIC
<-Source->                  <--Area-->     <-Target->   MBLK   ***
<Name>   #                  <-factor->     <Name>   #   Tbl#   ***
W1-ROOFS ***
IMPLND   4                        0.62     RCHRES   1      5
W2-ROOFS***
IMPLND   4                        0.76     RCHRES   2      5
PGIS***
PERLND  22                         4.5     RCHRES   3      2
PERLND  22                         4.5     RCHRES   3      3
IMPLND   1                         1.9     RCHRES   3      5
PGIS***
PERLND  22                         4.5     COPY   502     12
PERLND  22                         4.5     COPY   502     13
IMPLND   1                         1.9     COPY   502     15

******Routing******
PERLND  22                         4.5     COPY     1     12
IMPLND   1                         1.9     COPY     1     15
PERLND  22                         4.5     COPY     1     13
RCHRES   1                           1     RCHRES   3      7
RCHRES   1                                 COPY     1     17
RCHRES   2                           1     RCHRES   3      7
RCHRES   2                                 COPY     1     17
RCHRES   3                           1     COPY   501     17
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   502 OUTPUT MEAN   1 1   48.4        DISPLY   2     INPUT  TIMSER 1
COPY   501 OUTPUT MEAN   1 1   48.4        DISPLY   1     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                ***
    # -  #<----------------><---> User T-series  Engl Metr LKFG             ***
```

```
                                          in  out                                  ***
    1     Gravel Trench Be-007    2    1    1    1   28    0    1
    2     Gravel Trench Be-009    2    1    1    1   28    0    1
    3     POND                    2    1    1    1   28    0    1
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************ Active Sections ****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
    1         1    0    0    0    0    0    0    0    0    0
    2         1    0    0    0    0    0    0    0    0    0
    3         1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ****************** PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
    1         4    0    0    0    0    0    0    0    0    0    1    9
    2         4    0    0    0    0    0    0    0    0    0    1    9
    3         4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                    ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
           FG FG FG FG  possible  exit  *** possible  exit      possible  exit
            *  *  *  *    *  *  *  *  *       *  *  *  *  *         ***
    1        0  1  0  0    4  5  0  0  0       0  0  0  0  0       2  2  2  2  2
    2        0  1  0  0    4  5  0  0  0       0  0  0  0  0       2  2  2  2  2
    3        0  1  0  0    4  5  0  0  0       0  0  0  0  0       2  2  2  2  2
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><-------->       ***
    1             1      0.13       0.0       0.0       0.5       0.0
    2             2       0.1       0.0       0.0       0.5       0.0
    3             3      0.03       0.0       0.0       0.5       0.0
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                       ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
          *** ac-ft     for each possible exit        for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><--->
    1            0        4.0  5.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
    2            0        4.0  5.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
    3            0        4.0  5.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
  FTABLE      3
   91    5
     Depth      Area    Volume  Outflow1  Outflow2  Velocity  Travel Time***
      (ft)   (acres) (acre-ft)   (cfs)      (cfs)   (ft/sec)    (Minutes)***
  0.000000  0.243802  0.000000  0.000000  0.000000
  0.094444  0.243802  0.023026  0.010555  0.061458
  0.188889  0.243802  0.046051  0.014927  0.061458
  0.283333  0.243802  0.069077  0.018282  0.061458
  0.377778  0.243802  0.092103  0.021110  0.061458
  0.472222  0.243802  0.115129  0.023601  0.061458
  0.566667  0.243802  0.138154  0.025854  0.061458
  0.661111  0.243802  0.161180  0.027926  0.061458
  0.755556  0.243802  0.184206  0.029854  0.061458
  0.850000  0.243802  0.207231  0.031665  0.061458
  0.944444  0.243802  0.230257  0.033377  0.061458
  1.038889  0.243802  0.253283  0.035006  0.061458
```

1.133333	0.243802	0.276309	0.036563	0.061458
1.227778	0.243802	0.299334	0.038056	0.061458
1.322222	0.243802	0.322360	0.039493	0.061458
1.416667	0.243802	0.345386	0.040879	0.061458
1.511111	0.243802	0.368411	0.042219	0.061458
1.605556	0.243802	0.391437	0.043519	0.061458
1.700000	0.243802	0.414463	0.044780	0.061458
1.794444	0.243802	0.437489	0.046008	0.061458
1.888889	0.243802	0.460514	0.047203	0.061458
1.983333	0.243802	0.483540	0.048368	0.061458
2.077778	0.243802	0.506566	0.049507	0.061458
2.172222	0.243802	0.529591	0.050619	0.061458
2.266667	0.243802	0.552617	0.051708	0.061458
2.361111	0.243802	0.575643	0.052774	0.061458
2.455556	0.243802	0.598669	0.053819	0.061458
2.550000	0.243802	0.621694	0.054845	0.061458
2.644444	0.243802	0.644720	0.055851	0.061458
2.738889	0.243802	0.667746	0.056840	0.061458
2.833333	0.243802	0.690771	0.089146	0.061458
2.927778	0.243802	0.713797	0.104534	0.061458
3.022222	0.243802	0.736823	0.116342	0.061458
3.116667	0.243802	0.759848	0.126362	0.061458
3.211111	0.243802	0.782874	0.135254	0.061458
3.305556	0.243802	0.805900	0.143350	0.061458
3.400000	0.243802	0.828926	0.150843	0.061458
3.494444	0.243802	0.851951	0.157858	0.061458
3.588889	0.243802	0.874977	0.164484	0.061458
3.683333	0.243802	0.898003	0.170782	0.061458
3.777778	0.243802	0.921028	0.176799	0.061458
3.872222	0.243802	0.944054	0.182573	0.061458
3.966667	0.243802	0.967080	0.188134	0.061458
4.061111	0.243802	0.990106	0.193503	0.061458
4.155556	0.243802	1.013131	0.198702	0.061458
4.250000	0.243802	1.036157	0.203747	0.061458
4.344444	0.243802	1.059183	0.208650	0.061458
4.438889	0.243802	1.082208	0.213425	0.061458
4.533333	0.243802	1.105234	0.218082	0.061458
4.627778	0.243802	1.128260	0.222628	0.061458
4.722222	0.243802	1.151286	0.227073	0.061458
4.816667	0.243802	1.174311	0.231423	0.061458
4.911111	0.243802	1.197337	0.235684	0.061458
5.005556	0.243802	1.220363	0.239862	0.061458
5.100000	0.243802	1.243388	0.243962	0.061458
5.194444	0.243802	1.266414	0.247987	0.061458
5.288889	0.243802	1.289440	0.251943	0.061458
5.383333	0.243802	1.312466	0.255833	0.061458
5.477778	0.243802	1.335491	0.259660	0.061458
5.572222	0.243802	1.358517	0.263427	0.061458
5.666667	0.243802	1.381543	0.267137	0.061458
5.761111	0.243802	1.404568	0.270793	0.061458
5.855556	0.243802	1.427594	0.274397	0.061458
5.950000	0.243802	1.450620	0.277952	0.061458
6.044444	0.243802	1.473646	0.281459	0.061458
6.138889	0.243802	1.496671	0.284920	0.061458
6.233333	0.243802	1.519697	0.288337	0.061458
6.327778	0.243802	1.542723	0.291712	0.061458
6.422222	0.243802	1.565748	0.295047	0.061458
6.516667	0.243802	1.588774	0.298343	0.061458
6.611111	0.243802	1.611800	0.301600	0.061458
6.705556	0.243802	1.634826	0.304822	0.061458
6.800000	0.243802	1.657851	0.308008	0.061458
6.894444	0.243802	1.680877	0.311160	0.061458
6.988889	0.243802	1.703903	0.314279	0.061458
7.083333	0.243802	1.726928	0.317367	0.061458
7.177778	0.243802	1.749954	0.320423	0.061458
7.272222	0.243802	1.772980	0.323450	0.061458
7.366667	0.243802	1.796006	0.326447	0.061458
7.461111	0.243802	1.819031	0.329416	0.061458
7.555556	0.243802	1.842057	0.540630	0.061458
7.650000	0.243802	1.865083	1.254348	0.061458

```
7.744444  0.243802  1.888108  2.215472  0.061458
7.838889  0.243802  1.911134  3.287032  0.061458
7.933333  0.243802  1.934160  4.332692  0.061458
8.027778  0.243802  1.957185  5.225432  0.061458
8.122222  0.243802  1.980211  5.881490  0.061458
8.216667  0.243802  2.003237  6.306991  0.061458
8.311111  0.243802  2.026263  6.737363  0.061458
8.405556  0.243802  2.049288  7.101436  0.061458
8.500000  0.243802  2.072314  7.447087  0.061458
END FTABLE  3
FTABLE      1
 92    5
   Depth      Area    Volume  Outflow1  Outflow2  Velocity  Travel Time***
    (ft)   (acres) (acre-ft)   (cfs)      (cfs)   (ft/sec)    (Minutes)***
0.000000  0.096419  0.000000  0.000000  0.000000
0.033333  0.096419  0.001070  0.000000  0.024306
0.066667  0.096419  0.002140  0.000000  0.024306
0.100000  0.096419  0.003211  0.000000  0.024306
0.133333  0.096419  0.004281  0.000000  0.024306
0.166667  0.096419  0.005351  0.000000  0.024306
0.200000  0.096419  0.006421  0.000000  0.024306
0.233333  0.096419  0.007492  0.000000  0.024306
0.266667  0.096419  0.008562  0.000000  0.024306
0.300000  0.096419  0.009632  0.000000  0.024306
0.333333  0.096419  0.010702  0.000000  0.024306
0.366667  0.096419  0.011773  0.000000  0.024306
0.400000  0.096419  0.012843  0.000000  0.024306
0.433333  0.096419  0.013913  0.000000  0.024306
0.466667  0.096419  0.014983  0.000000  0.024306
0.500000  0.096419  0.016054  0.000000  0.024306
0.533333  0.096419  0.017124  0.000000  0.024306
0.566667  0.096419  0.018194  0.000000  0.024306
0.600000  0.096419  0.019264  0.000000  0.024306
0.633333  0.096419  0.020335  0.000000  0.024306
0.666667  0.096419  0.021405  0.000000  0.024306
0.700000  0.096419  0.022475  0.000000  0.024306
0.733333  0.096419  0.023545  0.000000  0.024306
0.766667  0.096419  0.024616  0.000000  0.024306
0.800000  0.096419  0.025686  0.000000  0.024306
0.833333  0.096419  0.026756  0.000000  0.024306
0.866667  0.096419  0.027826  0.000000  0.024306
0.900000  0.096419  0.028897  0.000000  0.024306
0.933333  0.096419  0.029967  0.000000  0.024306
0.966667  0.096419  0.031037  0.000000  0.024306
1.000000  0.096419  0.032107  0.000000  0.024306
1.033333  0.096419  0.033178  0.000000  0.024306
1.066667  0.096419  0.034248  0.000000  0.024306
1.100000  0.096419  0.035318  0.000000  0.024306
1.133333  0.096419  0.036388  0.000000  0.024306
1.166667  0.096419  0.037459  0.000000  0.024306
1.200000  0.096419  0.038529  0.000000  0.024306
1.233333  0.096419  0.039599  0.000000  0.024306
1.266667  0.096419  0.040669  0.000000  0.024306
1.300000  0.096419  0.041740  0.000000  0.024306
1.333333  0.096419  0.042810  0.000000  0.024306
1.366667  0.096419  0.043880  0.000000  0.024306
1.400000  0.096419  0.044950  0.000000  0.024306
1.433333  0.096419  0.046021  0.000000  0.024306
1.466667  0.096419  0.047091  0.000000  0.024306
1.500000  0.096419  0.048161  0.000000  0.024306
1.533333  0.096419  0.049231  0.000000  0.024306
1.566667  0.096419  0.050302  0.000000  0.024306
1.600000  0.096419  0.051372  0.000000  0.024306
1.633333  0.096419  0.052442  0.000000  0.024306
1.666667  0.096419  0.053512  0.000000  0.024306
1.700000  0.096419  0.054583  0.000000  0.024306
1.733333  0.096419  0.055653  0.000000  0.024306
1.766667  0.096419  0.056723  0.000000  0.024306
1.800000  0.096419  0.057793  0.000000  0.024306
1.833333  0.096419  0.058864  0.000000  0.024306
```

```
1.866667  0.096419  0.059934  0.000000  0.024306
1.900000  0.096419  0.061004  0.000000  0.024306
1.933333  0.096419  0.062074  0.000000  0.024306
1.966667  0.096419  0.063145  0.000000  0.024306
2.000000  0.096419  0.066359  0.000000  0.024306
2.033333  0.096419  0.069573  0.064540  0.024306
2.066667  0.096419  0.072787  0.182234  0.024306
2.100000  0.096419  0.076000  0.333520  0.024306
2.133333  0.096419  0.079214  0.509662  0.024306
2.166667  0.096419  0.082428  0.703432  0.024306
2.200000  0.096419  0.085642  0.907676  0.024306
2.233333  0.096419  0.088856  1.115035  0.024306
2.266667  0.096419  0.092070  1.318080  0.024306
2.300000  0.096419  0.095284  1.509672  0.024306
2.333333  0.096419  0.098498  1.683468  0.024306
2.366667  0.096419  0.101712  1.834531  0.024306
2.400000  0.096419  0.104926  1.960035  0.024306
2.433333  0.096419  0.108140  2.060036  0.024306
2.466667  0.096419  0.111354  2.138326  0.024306
2.500000  0.096419  0.114568  2.227125  0.024306
2.533333  0.096419  0.117782  2.300165  0.024306
2.566667  0.096419  0.120996  2.370955  0.024306
2.600000  0.096419  0.124210  2.439693  0.024306
2.633333  0.096419  0.127424  2.506546  0.024306
2.666667  0.096419  0.130638  2.571662  0.024306
2.700000  0.096419  0.133852  2.635170  0.024306
2.733333  0.096419  0.137066  2.697182  0.024306
2.766667  0.096419  0.140280  2.757800  0.024306
2.800000  0.096419  0.143494  2.817115  0.024306
2.833333  0.096419  0.146708  2.875206  0.024306
2.866667  0.096419  0.149921  2.932146  0.024306
2.900000  0.096419  0.153135  2.988001  0.024306
2.933333  0.096419  0.156349  3.042832  0.024306
2.966667  0.096419  0.159563  3.096691  0.024306
3.000000  0.096419  0.162777  3.149630  0.024306
3.033333  0.096419  0.165991  3.201694  0.024306
END FTABLE  1
FTABLE      2
 92    5
   Depth      Area    Volume  Outflow1  Outflow2  Velocity  Travel Time***
    (ft)   (acres) (acre-ft)   (cfs)      (cfs)   (ft/sec)    (Minutes)***
0.000000  0.075758  0.000000  0.000000  0.000000
0.033333  0.075758  0.000841  0.000000  0.019097
0.066667  0.075758  0.001682  0.000000  0.019097
0.100000  0.075758  0.002523  0.000000  0.019097
0.133333  0.075758  0.003364  0.000000  0.019097
0.166667  0.075758  0.004205  0.000000  0.019097
0.200000  0.075758  0.005045  0.000000  0.019097
0.233333  0.075758  0.005886  0.000000  0.019097
0.266667  0.075758  0.006727  0.000000  0.019097
0.300000  0.075758  0.007568  0.000000  0.019097
0.333333  0.075758  0.008409  0.000000  0.019097
0.366667  0.075758  0.009250  0.000000  0.019097
0.400000  0.075758  0.010091  0.000000  0.019097
0.433333  0.075758  0.010932  0.000000  0.019097
0.466667  0.075758  0.011773  0.000000  0.019097
0.500000  0.075758  0.012614  0.000000  0.019097
0.533333  0.075758  0.013455  0.000000  0.019097
0.566667  0.075758  0.014295  0.000000  0.019097
0.600000  0.075758  0.015136  0.000000  0.019097
0.633333  0.075758  0.015977  0.000000  0.019097
0.666667  0.075758  0.016818  0.000000  0.019097
0.700000  0.075758  0.017659  0.000000  0.019097
0.733333  0.075758  0.018500  0.000000  0.019097
0.766667  0.075758  0.019341  0.000000  0.019097
0.800000  0.075758  0.020182  0.000000  0.019097
0.833333  0.075758  0.021023  0.000000  0.019097
0.866667  0.075758  0.021864  0.000000  0.019097
0.900000  0.075758  0.022705  0.000000  0.019097
0.933333  0.075758  0.023545  0.000000  0.019097
```

```
  0.966667  0.075758  0.024386  0.000000  0.019097
  1.000000  0.075758  0.025227  0.000000  0.019097
  1.033333  0.075758  0.026068  0.000000  0.019097
  1.066667  0.075758  0.026909  0.000000  0.019097
  1.100000  0.075758  0.027750  0.000000  0.019097
  1.133333  0.075758  0.028591  0.000000  0.019097
  1.166667  0.075758  0.029432  0.000000  0.019097
  1.200000  0.075758  0.030273  0.000000  0.019097
  1.233333  0.075758  0.031114  0.000000  0.019097
  1.266667  0.075758  0.031955  0.000000  0.019097
  1.300000  0.075758  0.032795  0.000000  0.019097
  1.333333  0.075758  0.033636  0.000000  0.019097
  1.366667  0.075758  0.034477  0.000000  0.019097
  1.400000  0.075758  0.035318  0.000000  0.019097
  1.433333  0.075758  0.036159  0.000000  0.019097
  1.466667  0.075758  0.037000  0.000000  0.019097
  1.500000  0.075758  0.037841  0.000000  0.019097
  1.533333  0.075758  0.038682  0.000000  0.019097
  1.566667  0.075758  0.039523  0.000000  0.019097
  1.600000  0.075758  0.040364  0.000000  0.019097
  1.633333  0.075758  0.041205  0.000000  0.019097
  1.666667  0.075758  0.042045  0.000000  0.019097
  1.700000  0.075758  0.042886  0.000000  0.019097
  1.733333  0.075758  0.043727  0.000000  0.019097
  1.766667  0.075758  0.044568  0.000000  0.019097
  1.800000  0.075758  0.045409  0.000000  0.019097
  1.833333  0.075758  0.046250  0.000000  0.019097
  1.866667  0.075758  0.047091  0.000000  0.019097
  1.900000  0.075758  0.047932  0.000000  0.019097
  1.933333  0.075758  0.048773  0.000000  0.019097
  1.966667  0.075758  0.049614  0.000000  0.019097
  2.000000  0.075758  0.052139  0.000000  0.019097
  2.033333  0.075758  0.054664  0.064540  0.019097
  2.066667  0.075758  0.057189  0.182234  0.019097
  2.100000  0.075758  0.059715  0.333520  0.019097
  2.133333  0.075758  0.062240  0.509662  0.019097
  2.166667  0.075758  0.064765  0.703432  0.019097
  2.200000  0.075758  0.067290  0.907676  0.019097
  2.233333  0.075758  0.069816  1.115035  0.019097
  2.266667  0.075758  0.072341  1.318080  0.019097
  2.300000  0.075758  0.074866  1.509672  0.019097
  2.333333  0.075758  0.077391  1.683468  0.019097
  2.366667  0.075758  0.079917  1.834531  0.019097
  2.400000  0.075758  0.082442  1.960035  0.019097
  2.433333  0.075758  0.084967  2.060036  0.019097
  2.466667  0.075758  0.087492  2.138326  0.019097
  2.500000  0.075758  0.090018  2.227125  0.019097
  2.533333  0.075758  0.092543  2.300165  0.019097
  2.566667  0.075758  0.095068  2.370955  0.019097
  2.600000  0.075758  0.097593  2.439693  0.019097
  2.633333  0.075758  0.100119  2.506546  0.019097
  2.666667  0.075758  0.102644  2.571662  0.019097
  2.700000  0.075758  0.105169  2.635170  0.019097
  2.733333  0.075758  0.107694  2.697182  0.019097
  2.766667  0.075758  0.110220  2.757800  0.019097
  2.800000  0.075758  0.112745  2.817115  0.019097
  2.833333  0.075758  0.115270  2.875206  0.019097
  2.866667  0.075758  0.117795  2.932146  0.019097
  2.900000  0.075758  0.120321  2.988001  0.019097
  2.933333  0.075758  0.122846  3.042832  0.019097
  2.966667  0.075758  0.125371  3.096691  0.019097
  3.000000  0.075758  0.127896  3.149630  0.019097
  3.033333  0.075758  0.130422  3.201694  0.019097
  END FTABLE  2
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1.37           PERLND   1 999 EXTNL  PREC
```

```
WDM      2 PREC     ENGL    1.37           IMPLND   1 999 EXTNL  PREC
WDM      1 EVAP     ENGL    0.8            PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    0.8            IMPLND   1 999 EXTNL  PETINP

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
COPY     2 OUTPUT MEAN   1 1     48.4      WDM    702 FLOW     ENGL      REPL
COPY   502 OUTPUT MEAN   1 1     48.4      WDM    802 FLOW     ENGL      REPL
RCHRES   3 HYDR   RO     1 1        1      WDM   1000 FLOW     ENGL      REPL
RCHRES   3 HYDR   O      1 1        1      WDM   1001 FLOW     ENGL      REPL
RCHRES   3 HYDR   O      2 1        1      WDM   1002 FLOW     ENGL      REPL
RCHRES   3 HYDR   STAGE  1 1        1      WDM   1003 STAG     ENGL      REPL
COPY     1 OUTPUT MEAN   1 1     48.4      WDM    701 FLOW     ENGL      REPL
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    801 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>             <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK        2
PERLND     PWATER SURO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    2

  MASS-LINK        3
PERLND     PWATER IFWO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    3

  MASS-LINK        5
IMPLND     IWATER SURO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    5

  MASS-LINK        7
RCHRES     OFLOW  OVOL   1                 RCHRES         INFLOW IVOL
  END MASS-LINK    7

  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13

  MASS-LINK       15
IMPLND     IWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   15

  MASS-LINK       17
RCHRES     OFLOW  OVOL   1                 COPY           INPUT  MEAN
  END MASS-LINK   17


END MASS-LINK

END RUN
```

Predeveloped HSPF Message File

Mitigated HSPF Message File

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WWHM2012

PROJECT REPORT

General Model Information

Project Name:	2140 PRE_V2
Site Name:	MCINTOSH
Site Address:	
City:	CAMAS
Report Date:	6/22/2022
Gage:	Troutdale
Data Start:	1948/10/01
Data End:	2008/09/30
Timestep:	15 Minute
Precip Scale:	1.370
Version Date:	2021/08/18
Version:	4.2.18

POC Thresholds

Low Flow Threshold for POC1:	50 Percent of the 2 Year
High Flow Threshold for POC1:	50 Year
Low Flow Threshold for POC2:	50 Percent of the 2 Year
High Flow Threshold for POC2:	50 Year

Landuse Basin Data

Predeveloped Land Use

PRE-E1

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
SG3, Forest, Mod	2.64
Pervious Total	2.64

Impervious Land Use	acre
Impervious Total	0
Basin Total	2.64

Element Flows To:

Surface	Interflow	Groundwater

WQ-Placebo

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
SG3, Field, Flat	1.4
Pervious Total	1.4

Impervious Land Use	acre
ROADS FLAT	0.47
Impervious Total	0.47
Basin Total	1.87

Element Flows To:

Surface	Interflow	Groundwater

Mitigated Land Use

PGIS

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
SG3, Field, Flat	1.4
Pervious Total	1.4

Impervious Land Use	acre
ROADS FLAT	0.47
Impervious Total	0.47
Basin Total	1.87

Element Flows To:

Surface	Interflow	Groundwater
POND	POND	

W1-ROOFS

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
Pervious Total	0
Impervious Land Use	acre
ROOF TOPS FLAT	0.28
Impervious Total	0.28
Basin Total	0.28

Element Flows To:

Surface	Interflow	Groundwater
Gravel Trench Bed 1	Gravel Trench Bed 1	

Routing Elements
Predeveloped Routing

Mitigated Routing

POND

Bottom Length:	70.00 ft.	
Bottom Width:	44.00 ft.	
Depth:	6 ft.	
Volume at riser head:	0.3535 acre-feet.	
Infiltration On		
Infiltration rate:	1	
Infiltration safety factor:	0.25	
Total Volume Infiltrated (ac-ft.):		99.955
Total Volume Through Riser (ac-ft.):		81.096
Total Volume Through Facility (ac-ft.):		181.051
Percent Infiltrated:		55.21
Total Precip Applied to Facility:		0
Total Evap From Facility:		0
Side slope 1:	0 To 1	
Side slope 2:	0 To 1	
Side slope 3:	0 To 1	
Side slope 4:	0 To 1	
Discharge Structure		
Riser Height:	5 ft.	
Riser Diameter:	18 in.	
Orifice 1 Diameter:	1.125 in.	Elevation:0 ft.
Orifice 2 Diameter:	2 in.	Elevation:2.75 ft.
Element Flows To:		
Outlet 1	Outlet 2	

Pond Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.070	0.000	0.000	0.000
0.0667	0.070	0.004	0.008	0.017
0.1333	0.070	0.009	0.012	0.017
0.2000	0.070	0.014	0.015	0.017
0.2667	0.070	0.018	0.017	0.017
0.3333	0.070	0.023	0.019	0.017
0.4000	0.070	0.028	0.021	0.017
0.4667	0.070	0.033	0.023	0.017
0.5333	0.070	0.037	0.025	0.017
0.6000	0.070	0.042	0.026	0.017
0.6667	0.070	0.047	0.028	0.017
0.7333	0.070	0.051	0.029	0.017
0.8000	0.070	0.056	0.030	0.017
0.8667	0.070	0.061	0.032	0.017
0.9333	0.070	0.066	0.033	0.017
1.0000	0.070	0.070	0.034	0.017
1.0667	0.070	0.075	0.035	0.017
1.1333	0.070	0.080	0.036	0.017
1.2000	0.070	0.084	0.037	0.017
1.2667	0.070	0.089	0.038	0.017
1.3333	0.070	0.094	0.039	0.017
1.4000	0.070	0.099	0.040	0.017
1.4667	0.070	0.103	0.041	0.017
1.5333	0.070	0.108	0.042	0.017
1.6000	0.070	0.113	0.043	0.017

1.6667	0.070	0.117	0.044	0.017
1.7333	0.070	0.122	0.045	0.017
1.8000	0.070	0.127	0.046	0.017
1.8667	0.070	0.132	0.046	0.017
1.9333	0.070	0.136	0.047	0.017
2.0000	0.070	0.141	0.048	0.017
2.0667	0.070	0.146	0.049	0.017
2.1333	0.070	0.150	0.050	0.017
2.2000	0.070	0.155	0.050	0.017
2.2667	0.070	0.160	0.051	0.017
2.3333	0.070	0.165	0.052	0.017
2.4000	0.070	0.169	0.053	0.017
2.4667	0.070	0.174	0.053	0.017
2.5333	0.070	0.179	0.054	0.017
2.6000	0.070	0.183	0.055	0.017
2.6667	0.070	0.188	0.056	0.017
2.7333	0.070	0.193	0.056	0.017
2.8000	0.070	0.198	0.081	0.017
2.8667	0.070	0.202	0.095	0.017
2.9333	0.070	0.207	0.105	0.017
3.0000	0.070	0.212	0.113	0.017
3.0667	0.070	0.216	0.121	0.017
3.1333	0.070	0.221	0.128	0.017
3.2000	0.070	0.226	0.134	0.017
3.2667	0.070	0.231	0.140	0.017
3.3333	0.070	0.235	0.145	0.017
3.4000	0.070	0.240	0.150	0.017
3.4667	0.070	0.245	0.155	0.017
3.5333	0.070	0.249	0.160	0.017
3.6000	0.070	0.254	0.165	0.017
3.6667	0.070	0.259	0.169	0.017
3.7333	0.070	0.264	0.174	0.017
3.8000	0.070	0.268	0.178	0.017
3.8667	0.070	0.273	0.182	0.017
3.9333	0.070	0.278	0.186	0.017
4.0000	0.070	0.282	0.190	0.017
4.0667	0.070	0.287	0.193	0.017
4.1333	0.070	0.292	0.197	0.017
4.2000	0.070	0.297	0.201	0.017
4.2667	0.070	0.301	0.204	0.017
4.3333	0.070	0.306	0.208	0.017
4.4000	0.070	0.311	0.211	0.017
4.4667	0.070	0.315	0.214	0.017
4.5333	0.070	0.320	0.218	0.017
4.6000	0.070	0.325	0.221	0.017
4.6667	0.070	0.330	0.224	0.017
4.7333	0.070	0.334	0.227	0.017
4.8000	0.070	0.339	0.230	0.017
4.8667	0.070	0.344	0.233	0.017
4.9333	0.070	0.348	0.236	0.017
5.0000	0.070	0.353	0.239	0.017
5.0667	0.070	0.358	0.516	0.017
5.1333	0.070	0.363	1.016	0.017
5.2000	0.070	0.367	1.652	0.017
5.2667	0.070	0.372	2.374	0.017
5.3333	0.070	0.377	3.136	0.017
5.4000	0.070	0.381	3.888	0.017
5.4667	0.070	0.386	4.585	0.017

5.5333	0.070	0.391	5.186	0.017
5.6000	0.070	0.396	5.665	0.017
5.6667	0.070	0.400	6.021	0.017
5.7333	0.070	0.405	6.283	0.017
5.8000	0.070	0.410	6.610	0.017
5.8667	0.070	0.414	6.872	0.017
5.9333	0.070	0.419	7.123	0.017
6.0000	0.070	0.424	7.366	0.017
6.0667	0.070	0.429	7.601	0.017

Gravel Trench Bed 1

Bottom Length:	420.00 ft.
Bottom Width:	6.00 ft.
Trench bottom slope 1:	0.00001 To 1
Trench Left side slope 0:	0 To 1
Trench right side slope 2:	0 To 1
Material thickness of first layer:	2
Pour Space of material for first layer:	0.333
Material thickness of second layer:	0
Pour Space of material for second layer:	0
Material thickness of third layer:	0
Pour Space of material for third layer:	0
Infiltration On	
Infiltration rate:	1
Infiltration safety factor:	0.25
Total Volume Infiltrated (ac-ft.):	58.263
Total Volume Through Riser (ac-ft.):	0.611
Total Volume Through Facility (ac-ft.):	58.874
Percent Infiltrated:	98.96
Total Precip Applied to Facility:	0
Total Evap From Facility:	0
Discharge Structure	
Riser Height:	2 ft.
Riser Diameter:	12 in.
Element Flows To:	
Outlet 1	Outlet 2
POND	

Gravel Trench Bed Hydraulic Table

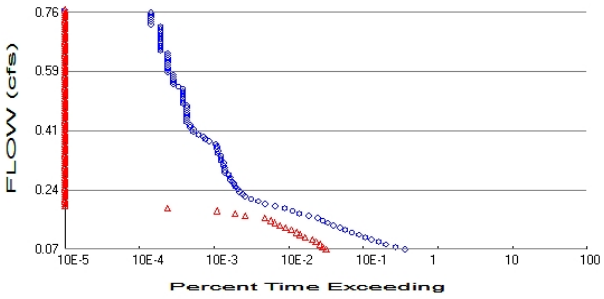
Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.057	0.000	0.000	0.000
0.0333	0.057	0.000	0.000	0.014
0.0667	0.057	0.001	0.000	0.014
0.1000	0.057	0.001	0.000	0.014
0.1333	0.057	0.002	0.000	0.014
0.1667	0.057	0.003	0.000	0.014
0.2000	0.057	0.003	0.000	0.014
0.2333	0.057	0.004	0.000	0.014
0.2667	0.057	0.005	0.000	0.014
0.3000	0.057	0.005	0.000	0.014
0.3333	0.057	0.006	0.000	0.014
0.3667	0.057	0.007	0.000	0.014
0.4000	0.057	0.007	0.000	0.014
0.4333	0.057	0.008	0.000	0.014
0.4667	0.057	0.009	0.000	0.014
0.5000	0.057	0.009	0.000	0.014
0.5333	0.057	0.010	0.000	0.014
0.5667	0.057	0.010	0.000	0.014
0.6000	0.057	0.011	0.000	0.014
0.6333	0.057	0.012	0.000	0.014
0.6667	0.057	0.012	0.000	0.014
0.7000	0.057	0.013	0.000	0.014
0.7333	0.057	0.014	0.000	0.014
0.7667	0.057	0.014	0.000	0.014
0.8000	0.057	0.015	0.000	0.014
0.8333	0.057	0.016	0.000	0.014

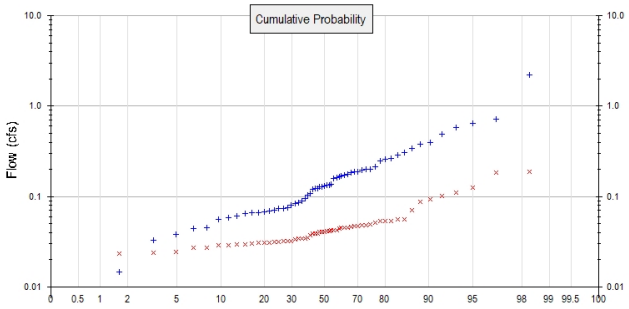
0.8667	0.057	0.016	0.000	0.014
0.9000	0.057	0.017	0.000	0.014
0.9333	0.057	0.018	0.000	0.014
0.9667	0.057	0.018	0.000	0.014
1.0000	0.057	0.019	0.000	0.014
1.0333	0.057	0.019	0.000	0.014
1.0667	0.057	0.020	0.000	0.014
1.1000	0.057	0.021	0.000	0.014
1.1333	0.057	0.021	0.000	0.014
1.1667	0.057	0.022	0.000	0.014
1.2000	0.057	0.023	0.000	0.014
1.2333	0.057	0.023	0.000	0.014
1.2667	0.057	0.024	0.000	0.014
1.3000	0.057	0.025	0.000	0.014
1.3333	0.057	0.025	0.000	0.014
1.3667	0.057	0.026	0.000	0.014
1.4000	0.057	0.027	0.000	0.014
1.4333	0.057	0.027	0.000	0.014
1.4667	0.057	0.028	0.000	0.014
1.5000	0.057	0.028	0.000	0.014
1.5333	0.057	0.029	0.000	0.014
1.5667	0.057	0.030	0.000	0.014
1.6000	0.057	0.030	0.000	0.014
1.6333	0.057	0.031	0.000	0.014
1.6667	0.057	0.032	0.000	0.014
1.7000	0.057	0.032	0.000	0.014
1.7333	0.057	0.033	0.000	0.014
1.7667	0.057	0.034	0.000	0.014
1.8000	0.057	0.034	0.000	0.014
1.8333	0.057	0.035	0.000	0.014
1.8667	0.057	0.036	0.000	0.014
1.9000	0.057	0.036	0.000	0.014
1.9333	0.057	0.037	0.000	0.014
1.9667	0.057	0.037	0.000	0.014
2.0000	0.057	0.039	0.000	0.014
2.0333	0.057	0.041	0.064	0.014
2.0667	0.057	0.043	0.182	0.014
2.1000	0.057	0.045	0.333	0.014
2.1333	0.057	0.047	0.509	0.014
2.1667	0.057	0.049	0.703	0.014
2.2000	0.057	0.051	0.907	0.014
2.2333	0.057	0.053	1.115	0.014
2.2667	0.057	0.055	1.318	0.014
2.3000	0.057	0.057	1.509	0.014
2.3333	0.057	0.059	1.683	0.014
2.3667	0.057	0.061	1.834	0.014
2.4000	0.057	0.063	1.960	0.014
2.4333	0.057	0.064	2.060	0.014
2.4667	0.057	0.066	2.138	0.014
2.5000	0.057	0.068	2.227	0.014
2.5333	0.057	0.070	2.300	0.014
2.5667	0.057	0.072	2.371	0.014
2.6000	0.057	0.074	2.439	0.014
2.6333	0.057	0.076	2.506	0.014
2.6667	0.057	0.078	2.571	0.014
2.7000	0.057	0.080	2.635	0.014
2.7333	0.057	0.082	2.697	0.014
2.7667	0.057	0.084	2.757	0.014

2.8000	0.057	0.086	2.817	0.014
2.8333	0.057	0.088	2.875	0.014
2.8667	0.057	0.090	2.932	0.014
2.9000	0.057	0.091	2.988	0.014
2.9333	0.057	0.093	3.042	0.014
2.9667	0.057	0.095	3.096	0.014
3.0000	0.057	0.097	3.149	0.014

Analysis Results

POC 1





\+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #1
Total Pervious Area: 2.64
Total Impervious Area: 0

Mitigated Landuse Totals for POC #1
Total Pervious Area: 1.4
Total Impervious Area: 0.75

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	**Flow(cfs)**
2 year	0.136204
5 year	0.293387
10 year	0.423024
25 year	0.609076
50 year	0.760273
100 year	0.919774

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	**Flow(cfs)**
2 year	0.040788
5 year	0.06205
10 year	0.079792
25 year	0.107012
50 year	0.131209
100 year	0.159158

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #1

Year	**Predeveloped**	**Mitigated**
1949	0.195	0.101
1950	0.134	0.048
1951	0.216	0.047
1952	0.161	0.039
1953	0.134	0.041
1954	0.127	0.039
1955	0.173	0.031
1956	0.489	0.109
1957	0.095	0.034
1958	0.056	0.033

1959	0.071	0.031
1960	0.076	0.029
1961	0.132	0.053
1962	0.067	0.032
1963	0.074	0.035
1964	0.157	0.045
1965	0.165	0.088
1966	0.186	0.045
1967	0.124	0.032
1968	0.202	0.045
1969	0.248	0.043
1970	2.200	0.093
1971	0.073	0.032
1972	0.137	0.042
1973	0.070	0.037
1974	0.394	0.125
1975	0.127	0.041
1976	0.648	0.039
1977	0.003	0.024
1978	0.186	0.056
1979	0.061	0.032
1980	0.183	0.046
1981	0.199	0.070
1982	0.345	0.049
1983	0.578	0.042
1984	0.285	0.034
1985	0.177	0.041
1986	0.067	0.027
1987	0.170	0.053
1988	0.058	0.032
1989	0.044	0.023
1990	0.066	0.031
1991	0.084	0.030
1992	0.089	0.027
1993	0.080	0.035
1994	0.123	0.048
1995	0.086	0.055
1996	0.721	0.187
1997	0.266	0.182
1998	0.107	0.029
1999	0.120	0.047
2000	0.045	0.024
2001	0.015	0.019
2002	0.382	0.040
2003	0.257	0.051
2004	0.032	0.029
2005	0.038	0.030
2006	0.306	0.042
2007	0.065	0.053
2008	0.103	0.045

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	2.1995	0.1870
2	0.7211	0.1819
3	0.6475	0.1252
4	0.5780	0.1092

5	0.4894	0.1011
6	0.3936	0.0931
7	0.3819	0.0882
8	0.3448	0.0701
9	0.3059	0.0557
10	0.2853	0.0553
11	0.2659	0.0533
12	0.2571	0.0533
13	0.2479	0.0530
14	0.2155	0.0509
15	0.2017	0.0488
16	0.1988	0.0482
17	0.1951	0.0479
18	0.1864	0.0467
19	0.1861	0.0466
20	0.1826	0.0465
21	0.1771	0.0449
22	0.1732	0.0447
23	0.1701	0.0447
24	0.1650	0.0446
25	0.1607	0.0427
26	0.1575	0.0423
27	0.1370	0.0420
28	0.1345	0.0416
29	0.1344	0.0412
30	0.1317	0.0407
31	0.1273	0.0407
32	0.1269	0.0404
33	0.1239	0.0392
34	0.1225	0.0392
35	0.1202	0.0389
36	0.1070	0.0370
37	0.1030	0.0347
38	0.0952	0.0346
39	0.0894	0.0343
40	0.0859	0.0343
41	0.0837	0.0335
42	0.0796	0.0321
43	0.0755	0.0320
44	0.0744	0.0319
45	0.0730	0.0317
46	0.0712	0.0315
47	0.0696	0.0311
48	0.0674	0.0309
49	0.0669	0.0306
50	0.0660	0.0304
51	0.0652	0.0297
52	0.0606	0.0293
53	0.0580	0.0289
54	0.0559	0.0288
55	0.0448	0.0272
56	0.0440	0.0268
57	0.0381	0.0244
58	0.0325	0.0240
59	0.0146	0.0235
60	0.0032	0.0189

Duration Flows

The Facility PASSED

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.0681	7616	663	8	Pass
0.0751	5672	601	10	Pass
0.0821	4248	552	12	Pass
0.0891	3358	490	14	Pass
0.0961	2722	434	15	Pass
0.1031	2232	348	15	Pass
0.1101	1835	297	16	Pass
0.1170	1474	271	18	Pass
0.1240	1201	229	19	Pass
0.1310	1014	189	18	Pass
0.1380	833	159	19	Pass
0.1450	693	138	19	Pass
0.1520	597	121	20	Pass
0.1590	514	101	19	Pass
0.1660	391	55	14	Pass
0.1730	290	40	13	Pass
0.1800	236	23	9	Pass
0.1870	185	5	2	Pass
0.1940	137	0	0	Pass
0.2009	101	0	0	Pass
0.2079	83	0	0	Pass
0.2149	66	0	0	Pass
0.2219	55	0	0	Pass
0.2289	51	0	0	Pass
0.2359	46	0	0	Pass
0.2429	44	0	0	Pass
0.2499	41	0	0	Pass
0.2569	39	0	0	Pass
0.2639	37	0	0	Pass
0.2709	35	0	0	Pass
0.2779	35	0	0	Pass
0.2848	33	0	0	Pass
0.2918	29	0	0	Pass
0.2988	29	0	0	Pass
0.3058	29	0	0	Pass
0.3128	28	0	0	Pass
0.3198	28	0	0	Pass
0.3268	26	0	0	Pass
0.3338	26	0	0	Pass
0.3408	26	0	0	Pass
0.3478	24	0	0	Pass
0.3548	24	0	0	Pass
0.3618	23	0	0	Pass
0.3687	23	0	0	Pass
0.3757	22	0	0	Pass
0.3827	18	0	0	Pass
0.3897	16	0	0	Pass
0.3967	15	0	0	Pass
0.4037	13	0	0	Pass
0.4107	11	0	0	Pass
0.4177	11	0	0	Pass
0.4247	10	0	0	Pass
0.4317	10	0	0	Pass

0.4387	9	0	0	Pass
0.4456	9	0	0	Pass
0.4526	9	0	0	Pass
0.4596	9	0	0	Pass
0.4666	9	0	0	Pass
0.4736	9	0	0	Pass
0.4806	9	0	0	Pass
0.4876	9	0	0	Pass
0.4946	8	0	0	Pass
0.5016	8	0	0	Pass
0.5086	8	0	0	Pass
0.5156	8	0	0	Pass
0.5226	8	0	0	Pass
0.5295	8	0	0	Pass
0.5365	8	0	0	Pass
0.5435	7	0	0	Pass
0.5505	6	0	0	Pass
0.5575	6	0	0	Pass
0.5645	6	0	0	Pass
0.5715	6	0	0	Pass
0.5785	6	0	0	Pass
0.5855	5	0	0	Pass
0.5925	5	0	0	Pass
0.5995	5	0	0	Pass
0.6065	5	0	0	Pass
0.6134	5	0	0	Pass
0.6204	5	0	0	Pass
0.6274	5	0	0	Pass
0.6344	5	0	0	Pass
0.6414	5	0	0	Pass
0.6484	4	0	0	Pass
0.6554	4	0	0	Pass
0.6624	4	0	0	Pass
0.6694	4	0	0	Pass
0.6764	4	0	0	Pass
0.6834	4	0	0	Pass
0.6904	4	0	0	Pass
0.6973	4	0	0	Pass
0.7043	4	0	0	Pass
0.7113	4	0	0	Pass
0.7183	4	0	0	Pass
0.7253	3	0	0	Pass
0.7323	3	0	0	Pass
0.7393	3	0	0	Pass
0.7463	3	0	0	Pass
0.7533	3	0	0	Pass
0.7603	3	0	0	Pass

Water Quality

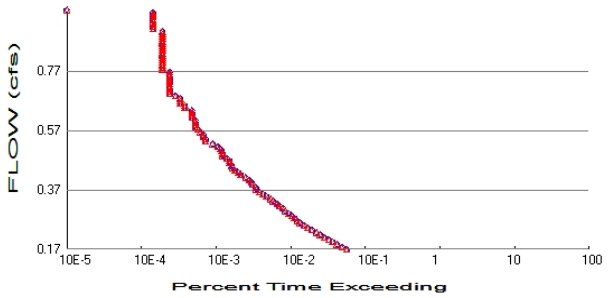
Water Quality BMP Flow and Volume for POC #1

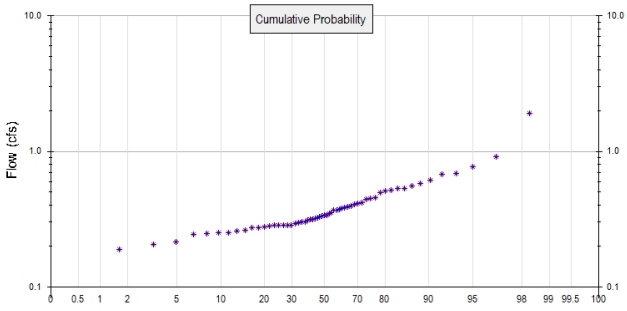
On-line facility volume:	0 acre-feet
On-line facility target flow:	0 cfs.
Adjusted for 15 min:	0 cfs.
Off-line facility target flow:	0 cfs.
Adjusted for 15 min:	0 cfs.

LID Report

LID Technique	Used for Treatment ?	Total Volume Needs Treatment (ac-ft)	Volume Through Facility (ac-ft)	Infiltration Volume (ac-ft)	Cumulative Volume Infiltration Credit	Percent Volume Infiltrated	Water Quality	Percent Water Quality Treated	Comment
POND POC	☐	164.76			☐	55.21			
Gravel Trench Bed 1	☐	53.58			☐	98.96			
Total Volume Infiltrated		218.33	0.00	0.00		65.94	0.00	0%	No Treat. Credit
Compliance with LID Standard 8% of 2-yr to 50% of 2-yr									Duration Analysis Result = Passed

POC 2





\+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #2
Total Pervious Area: 1.4
Total Impervious Area: 0.47

Mitigated Landuse Totals for POC #2
Total Pervious Area: 1.4
Total Impervious Area: 0.47

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #2

Return Period	**Flow(cfs)**
2 year	0.347843
5 year	0.502331
10 year	0.626117
25 year	0.809673
50 year	0.96796
100 year	1.146346

Flow Frequency Return Periods for Mitigated. POC #2

Return Period	**Flow(cfs)**
2 year	0.347843
5 year	0.502331
10 year	0.626117
25 year	0.809673
50 year	0.96796
100 year	1.146346

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #2

Year	**Predeveloped**	**Mitigated**
1949	0.420	0.420
1950	0.251	0.251
1951	0.379	0.379
1952	0.382	0.382
1953	0.314	0.314
1954	0.373	0.373
1955	0.281	0.281
1956	0.558	0.558
1957	0.284	0.284
1958	0.284	0.284
1959	0.214	0.214

1960	0.262	0.262
1961	0.286	0.286
1962	0.296	0.296
1963	0.339	0.339
1964	0.325	0.325
1965	0.355	0.355
1966	0.394	0.394
1967	0.276	0.276
1968	0.512	0.512
1969	0.443	0.443
1970	1.906	1.906
1971	0.347	0.347
1972	0.302	0.302
1973	0.318	0.318
1974	0.497	0.497
1975	0.329	0.329
1976	0.681	0.681
1977	0.189	0.189
1978	0.388	0.388
1979	0.340	0.340
1980	0.272	0.272
1981	0.404	0.404
1982	0.532	0.532
1983	0.689	0.689
1984	0.451	0.451
1985	0.285	0.285
1986	0.291	0.291
1987	0.303	0.303
1988	0.369	0.369
1989	0.286	0.286
1990	0.243	0.243
1991	0.366	0.366
1992	0.274	0.274
1993	0.609	0.609
1994	0.252	0.252
1995	0.310	0.310
1996	0.768	0.768
1997	0.532	0.532
1998	0.456	0.456
1999	0.258	0.258
2000	0.176	0.176
2001	0.204	0.204
2002	0.581	0.581
2003	0.413	0.413
2004	0.333	0.333
2005	0.313	0.313
2006	0.516	0.516
2007	0.246	0.246
2008	0.910	0.910

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #2

Rank	**Predeveloped**	**Mitigated**
1	1.9056	1.9056
2	0.9105	0.9105
3	0.7678	0.7678
4	0.6886	0.6886
5	0.6811	0.6811

6	0.6092	0.6092
7	0.5806	0.5806
8	0.5584	0.5584
9	0.5322	0.5322
10	0.5321	0.5321
11	0.5159	0.5159
12	0.5118	0.5118
13	0.4968	0.4968
14	0.4558	0.4558
15	0.4506	0.4506
16	0.4428	0.4428
17	0.4196	0.4196
18	0.4127	0.4127
19	0.4043	0.4043
20	0.3936	0.3936
21	0.3876	0.3876
22	0.3822	0.3822
23	0.3794	0.3794
24	0.3729	0.3729
25	0.3687	0.3687
26	0.3657	0.3657
27	0.3550	0.3550
28	0.3466	0.3466
29	0.3400	0.3400
30	0.3394	0.3394
31	0.3335	0.3335
32	0.3291	0.3291
33	0.3252	0.3252
34	0.3182	0.3182
35	0.3145	0.3145
36	0.3126	0.3126
37	0.3100	0.3100
38	0.3025	0.3025
39	0.3020	0.3020
40	0.2957	0.2957
41	0.2914	0.2914
42	0.2863	0.2863
43	0.2860	0.2860
44	0.2850	0.2850
45	0.2841	0.2841
46	0.2836	0.2836
47	0.2806	0.2806
48	0.2765	0.2765
49	0.2739	0.2739
50	0.2720	0.2720
51	0.2625	0.2625
52	0.2583	0.2583
53	0.2519	0.2519
54	0.2513	0.2513
55	0.2465	0.2465
56	0.2429	0.2429
57	0.2145	0.2145
58	0.2043	0.2043
59	0.1886	0.1886
60	0.1759	0.1759

Duration Flows

The Facility PASSED

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.1739	1188	1188	100	Pass
0.1819	1013	1013	100	Pass
0.1900	880	880	100	Pass
0.1980	763	763	100	Pass
0.2060	681	681	100	Pass
0.2140	593	593	100	Pass
0.2220	521	521	100	Pass
0.2301	464	464	100	Pass
0.2381	401	401	100	Pass
0.2461	353	353	100	Pass
0.2541	315	315	100	Pass
0.2621	279	279	100	Pass
0.2702	255	255	100	Pass
0.2782	236	236	100	Pass
0.2862	217	217	100	Pass
0.2942	199	199	100	Pass
0.3023	178	178	100	Pass
0.3103	164	164	100	Pass
0.3183	147	147	100	Pass
0.3263	137	137	100	Pass
0.3343	122	122	100	Pass
0.3424	113	113	100	Pass
0.3504	99	99	100	Pass
0.3584	90	90	100	Pass
0.3664	80	80	100	Pass
0.3744	73	73	100	Pass
0.3825	71	71	100	Pass
0.3905	64	64	100	Pass
0.3985	62	62	100	Pass
0.4065	58	58	100	Pass
0.4145	52	52	100	Pass
0.4226	45	45	100	Pass
0.4306	42	42	100	Pass
0.4386	38	38	100	Pass
0.4466	35	35	100	Pass
0.4546	34	34	100	Pass
0.4627	32	32	100	Pass
0.4707	32	32	100	Pass
0.4787	29	29	100	Pass
0.4867	26	26	100	Pass
0.4947	26	26	100	Pass
0.5028	25	25	100	Pass
0.5108	24	24	100	Pass
0.5188	22	22	100	Pass
0.5268	19	19	100	Pass
0.5348	15	15	100	Pass
0.5429	15	15	100	Pass
0.5509	14	14	100	Pass
0.5589	14	14	100	Pass
0.5669	13	13	100	Pass
0.5750	12	12	100	Pass
0.5830	11	11	100	Pass
0.5910	11	11	100	Pass

0.5990	11	11	100	Pass
0.6070	11	11	100	Pass
0.6151	10	10	100	Pass
0.6231	10	10	100	Pass
0.6311	10	10	100	Pass
0.6391	10	10	100	Pass
0.6471	8	8	100	Pass
0.6552	8	8	100	Pass
0.6632	7	7	100	Pass
0.6712	7	7	100	Pass
0.6792	7	7	100	Pass
0.6872	6	6	100	Pass
0.6953	5	5	100	Pass
0.7033	5	5	100	Pass
0.7113	5	5	100	Pass
0.7193	5	5	100	Pass
0.7273	5	5	100	Pass
0.7354	5	5	100	Pass
0.7434	5	5	100	Pass
0.7514	5	5	100	Pass
0.7594	5	5	100	Pass
0.7674	5	5	100	Pass
0.7755	4	4	100	Pass
0.7835	4	4	100	Pass
0.7915	4	4	100	Pass
0.7995	4	4	100	Pass
0.8075	4	4	100	Pass
0.8156	4	4	100	Pass
0.8236	4	4	100	Pass
0.8316	4	4	100	Pass
0.8396	4	4	100	Pass
0.8477	4	4	100	Pass
0.8557	4	4	100	Pass
0.8637	4	4	100	Pass
0.8717	4	4	100	Pass
0.8797	4	4	100	Pass
0.8878	4	4	100	Pass
0.8958	4	4	100	Pass
0.9038	4	4	100	Pass
0.9118	3	3	100	Pass
0.9198	3	3	100	Pass
0.9279	3	3	100	Pass
0.9359	3	3	100	Pass
0.9439	3	3	100	Pass
0.9519	3	3	100	Pass
0.9599	3	3	100	Pass
0.9680	3	3	100	Pass

Water Quality

Water Quality BMP Flow and Volume for POC #2

On-line facility volume:	0.132 acre-feet
On-line facility target flow:	0.1138 cfs.
Adjusted for 15 min:	0.1138 cfs.
Off-line facility target flow:	0.0638 cfs.
Adjusted for 15 min:	0.0638 cfs.

LID Report

LID Technique	Used for Treatment ?	Total Volume Needs Treatment (ac-ft)	Volume Through Facility (ac-ft)	Infiltration Volume (ac-ft)	Cumulative Volume Infiltration Credit	Percent Volume Infiltrated	Water Quality	Percent Water Quality Treated	Comment
Total Volume Infiltrated		0.00	0.00	0.00		0.00	0.00	0%	No Treat. Credit
Compliance with LID Standard 8% of 2-yr to 50% of 2-yr									Duration Analysis Result = Passed

Model Default Modifications

Total of 0 changes have been made.

PERLND Changes

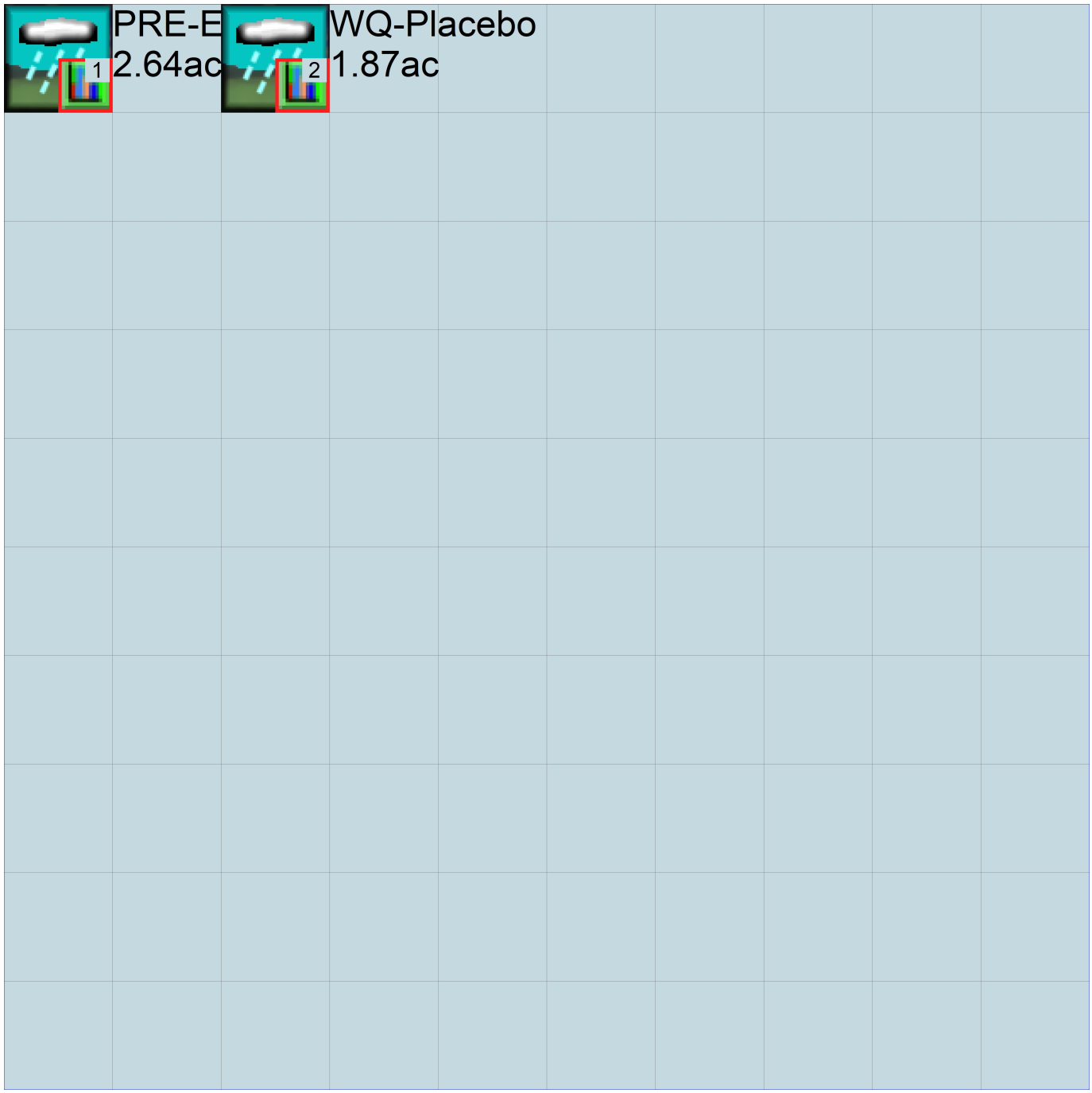
No PERLND changes have been made.

IMPLND Changes

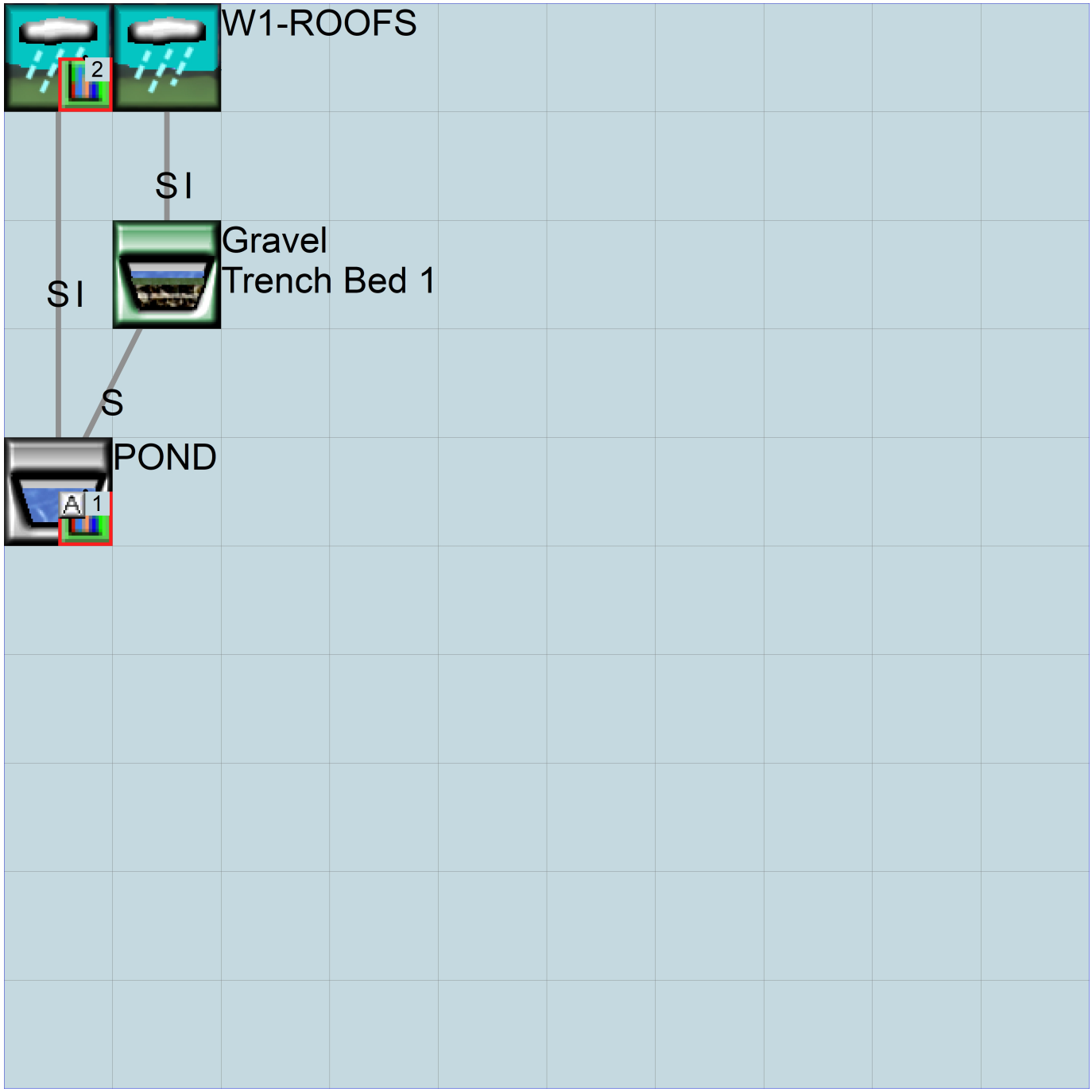
No IMPLND changes have been made.

Appendix

Predeveloped Schematic



Mitigated Schematic



Predeveloped UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1948 10 01        END    2008 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                    UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                              ***
WDM         26   2140 PRE_V2.wdm
MESSU       25   Pre2140 PRE_V2.MES
            27   Pre2140 PRE_V2.L61
            28   Pre2140 PRE_V2.L62
            30   POC2140 PRE_V21.dat
            31   POC2140 PRE_V22.dat
END FILES

OPN SEQUENCE
    INGRP               INDELT 00:15
      PERLND      20
      PERLND      22
      IMPLND       1
      COPY       501
      COPY       502
      DISPLY       1
      DISPLY       2
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        PRE-E1                    MAX                    1    2   30    9
    2        WQ-Placebo                MAX                    1    2   31    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  502         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                          in  out            ***
   20     SG3, Forest, Mod        1    1    1    1   27    0
   22     SG3, Field, Flat        1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************ Active Sections ******************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
   20         0    0    1    0    0    0    0    0    0    0    0    0
```

```
   22         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ***************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
   20         0    0    4    0    0    0    0    0    0    0    0    0    1    9
   22         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
   20         0    0    0    0    0    0    0    0    0    0    0
   22         0    0    0    0    0    0    0    0    0    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
   20              0         9      0.08       400       0.1         0      0.96
   22              0         9      0.06       400      0.05         0      0.96
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
   20              0         0       2.5         2         0         0         0
   22              0         0       2.5         2         0         0         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                              ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
   20           0.2         1      0.35         4       0.4       0.7
   22          0.15         1       0.3         4       0.4       0.4
  END PWAT-PARM4

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
               ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS      GWVS
   20              0         0         0         0         3         1         0
   22              0         0         0         0         3         1         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                     in  out           ***
    1      ROADS/FLAT             1    1    1   27    0
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************* Active Sections ******************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
    1         0    0    1    0    0    0
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
    1         0    0    4    0    0    0    1    9
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
```

```
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
    1         0    0    0    0    0
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
    1            400      0.01       0.1       0.1
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
    1              0         0
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
    1              0         0
  END IWAT-STATE1

END IMPLND

SCHEMATIC
<-Source->                  <--Area-->     <-Target->   MBLK   ***
<Name>   #                  <-factor->     <Name>   #   Tbl#   ***
PRE-E1***
PERLND  20                       2.64     COPY   501     12
PERLND  20                       2.64     COPY   501     13
WQ-Placebo***
PERLND  22                        1.4     COPY   502     12
PERLND  22                        1.4     COPY   502     13
IMPLND   1                       0.47     COPY   502     15

******Routing******
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   48.4        DISPLY   1     INPUT  TIMSER 1
COPY   502 OUTPUT MEAN   1 1   48.4        DISPLY   2     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                ***
    # -  #<------------------><---> User T-series  Engl Metr LKFG           ***
                                       in  out                              ***
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************* Active Sections ****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ******************* PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                  ***
```

```
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
            FG FG FG FG  possible  exit  *** possible  exit      possible  exit
             *  *  *  *    *  *  *  *  *       *  *  *  *  *         ***
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><-------->       ***
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                          ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
          *** ac-ft     for each possible exit        for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><--->
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1.37           PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1.37           IMPLND   1 999 EXTNL  PREC
WDM      1 EVAP     ENGL    0.8            PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    0.8            IMPLND   1 999 EXTNL  PETINP

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    501 FLOW     ENGL      REPL
COPY   502 OUTPUT MEAN   1 1     48.4      WDM    502 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>            <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13

  MASS-LINK       15
IMPLND     IWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   15


END MASS-LINK

END RUN
```

Mitigated UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1948 10 01        END    2008 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                    UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                              ***
WDM         26   2140 PRE_V2.wdm
MESSU       25   Mit2140 PRE_V2.MES
            27   Mit2140 PRE_V2.L61
            28   Mit2140 PRE_V2.L62
            31   POC2140 PRE_V22.dat
            30   POC2140 PRE_V21.dat
END FILES

OPN SEQUENCE
    INGRP               INDELT 00:15
      PERLND      22
      IMPLND       1
      IMPLND       4
      RCHRES       1
      RCHRES       2
      COPY       502
      COPY         1
      COPY       501
      DISPLY       2
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    2        PGIS                       MAX                   1    2   31    9
    1        POND                       MAX                   1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  502         1    1
  501         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                          in  out           ***
   22     SG3, Field, Flat        1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************ Active Sections ******************************
```

```
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
   22         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags **************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
   22         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
   22         0    0    0    0    0    0    0    0    0    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
   22              0         9      0.06       400      0.05         0      0.96
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
   22              0         0       2.5         2         0         0         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                              ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
   22          0.15         1       0.3         4       0.4       0.4
  END PWAT-PARM4

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
               ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS      GWVS
   22              0         0         0         0         3         1         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                     in  out           ***
    1      ROADS/FLAT             1    1    1   27    0
    4      ROOF TOPS/FLAT         1    1    1   27    0
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************ Active Sections ****************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
    1         0    0    1    0    0    0
    4         0    0    1    0    0    0
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
    1         0    0    4    0    0    0    1    9
    4         0    0    4    0    0    0    1    9
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
    1         0    0    0    0    0
```

```
    4         0    0    0    0    0
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
    1            400      0.01       0.1       0.1
    4            400      0.01       0.1       0.1
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
    1              0         0
    4              0         0
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
    1              0         0
    4              0         0
  END IWAT-STATE1

END IMPLND

SCHEMATIC
<-Source->                  <--Area-->     <-Target->   MBLK   ***
<Name>   #                  <-factor->     <Name>   #   Tbl#   ***
W1-ROOFS ***
IMPLND   4                        0.28     RCHRES   1      5
PGIS***
PERLND  22                         1.4     RCHRES   2      2
PERLND  22                         1.4     RCHRES   2      3
IMPLND   1                        0.47     RCHRES   2      5
PGIS***
PERLND  22                         1.4     COPY   502     12
PERLND  22                         1.4     COPY   502     13
IMPLND   1                        0.47     COPY   502     15

******Routing******
PERLND  22                         1.4     COPY     1     12
IMPLND   1                        0.47     COPY     1     15
PERLND  22                         1.4     COPY     1     13
RCHRES   1                           1     RCHRES   2      7
RCHRES   1                                 COPY     1     17
RCHRES   2                           1     COPY   501     17
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   502 OUTPUT MEAN   1 1   48.4        DISPLY   2     INPUT  TIMSER 1
COPY   501 OUTPUT MEAN   1 1   48.4        DISPLY   1     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                ***
    # -  #<------------------><---> User T-series  Engl Metr LKFG           ***
                                       in  out                              ***
    1     Gravel Trench Be-007    2    1    1    1   28    0    1
    2     POND                    2    1    1    1   28    0    1
  END GEN-INFO
  *** Section RCHRES***
```

```
  ACTIVITY
    <PLS > ************ Active Sections ******************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
    1         1    0    0    0    0    0    0    0    0    0
    2         1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ****************** PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
    1         4    0    0    0    0    0    0    0    0    0    1    9
    2         4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                    ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
           FG FG FG FG  possible  exit  *** possible  exit      possible  exit
            *  *  *  *    *  *  *  *  *       *  *  *  *  *         ***
    1        0  1  0  0    4  5  0  0  0       0  0  0  0  0       2  2  2  2  2
    2        0  1  0  0    4  5  0  0  0       0  0  0  0  0       2  2  2  2  2
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><--------><--------> ***
    1              1      0.08       0.0       0.0       0.5       0.0
    2              2      0.01       0.0       0.0       0.5       0.0
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                       ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
          *** ac-ft     for each possible exit        for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><--->
    1           0         4.0  5.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
    2           0         4.0  5.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
  FTABLE      2
   91    5
     Depth      Area    Volume  Outflow1  Outflow2  Velocity  Travel Time***
      (ft)   (acres) (acre-ft)   (cfs)     (cfs)   (ft/sec)    (Minutes)***
  0.000000  0.070707  0.000000  0.000000  0.000000
  0.066667  0.070707  0.004714  0.008868  0.017824
  0.133333  0.070707  0.009428  0.012541  0.017824
  0.200000  0.070707  0.014141  0.015360  0.017824
  0.266667  0.070707  0.018855  0.017736  0.017824
  0.333333  0.070707  0.023569  0.019829  0.017824
  0.400000  0.070707  0.028283  0.021722  0.017824
  0.466667  0.070707  0.032997  0.023462  0.017824
  0.533333  0.070707  0.037710  0.025082  0.017824
  0.600000  0.070707  0.042424  0.026604  0.017824
  0.666667  0.070707  0.047138  0.028043  0.017824
  0.733333  0.070707  0.051852  0.029411  0.017824
  0.800000  0.070707  0.056566  0.030719  0.017824
  0.866667  0.070707  0.061279  0.031973  0.017824
  0.933333  0.070707  0.065993  0.033180  0.017824
  1.000000  0.070707  0.070707  0.034345  0.017824
  1.066667  0.070707  0.075421  0.035471  0.017824
  1.133333  0.070707  0.080135  0.036563  0.017824
  1.200000  0.070707  0.084848  0.037623  0.017824
  1.266667  0.070707  0.089562  0.038654  0.017824
  1.333333  0.070707  0.094276  0.039658  0.017824
  1.400000  0.070707  0.098990  0.040638  0.017824
  1.466667  0.070707  0.103704  0.041594  0.017824
```

```
1.533333  0.070707  0.108418  0.042529  0.017824
1.600000  0.070707  0.113131  0.043443  0.017824
1.666667  0.070707  0.117845  0.044339  0.017824
1.733333  0.070707  0.122559  0.045217  0.017824
1.800000  0.070707  0.127273  0.046079  0.017824
1.866667  0.070707  0.131987  0.046924  0.017824
1.933333  0.070707  0.136700  0.047755  0.017824
2.000000  0.070707  0.141414  0.048571  0.017824
2.066667  0.070707  0.146128  0.049374  0.017824
2.133333  0.070707  0.150842  0.050164  0.017824
2.200000  0.070707  0.155556  0.050942  0.017824
2.266667  0.070707  0.160269  0.051708  0.017824
2.333333  0.070707  0.164983  0.052463  0.017824
2.400000  0.070707  0.169697  0.053207  0.017824
2.466667  0.070707  0.174411  0.053941  0.017824
2.533333  0.070707  0.179125  0.054665  0.017824
2.600000  0.070707  0.183838  0.055380  0.017824
2.666667  0.070707  0.188552  0.056085  0.017824
2.733333  0.070707  0.193266  0.056782  0.017824
2.800000  0.070707  0.197980  0.081742  0.017824
2.866667  0.070707  0.202694  0.095226  0.017824
2.933333  0.070707  0.207407  0.105300  0.017824
3.000000  0.070707  0.212121  0.113761  0.017824
3.066667  0.070707  0.216835  0.121228  0.017824
3.133333  0.070707  0.221549  0.128001  0.017824
3.200000  0.070707  0.226263  0.134254  0.017824
3.266667  0.070707  0.230976  0.140098  0.017824
3.333333  0.070707  0.235690  0.145609  0.017824
3.400000  0.070707  0.240404  0.150843  0.017824
3.466667  0.070707  0.245118  0.155839  0.017824
3.533333  0.070707  0.249832  0.160630  0.017824
3.600000  0.070707  0.254545  0.165241  0.017824
3.666667  0.070707  0.259259  0.169692  0.017824
3.733333  0.070707  0.263973  0.174000  0.017824
3.800000  0.070707  0.268687  0.178179  0.017824
3.866667  0.070707  0.273401  0.182240  0.017824
3.933333  0.070707  0.278114  0.186194  0.017824
4.000000  0.070707  0.282828  0.190050  0.017824
4.066667  0.070707  0.287542  0.193814  0.017824
4.133333  0.070707  0.292256  0.197494  0.017824
4.200000  0.070707  0.296970  0.201095  0.017824
4.266667  0.070707  0.301684  0.204622  0.017824
4.333333  0.070707  0.306397  0.208080  0.017824
4.400000  0.070707  0.311111  0.211474  0.017824
4.466667  0.070707  0.315825  0.214807  0.017824
4.533333  0.070707  0.320539  0.218082  0.017824
4.600000  0.070707  0.325253  0.221302  0.017824
4.666667  0.070707  0.329966  0.224471  0.017824
4.733333  0.070707  0.334680  0.227590  0.017824
4.800000  0.070707  0.339394  0.230662  0.017824
4.866667  0.070707  0.344108  0.233690  0.017824
4.933333  0.070707  0.348822  0.236675  0.017824
5.000000  0.070707  0.353535  0.239619  0.017824
5.066667  0.070707  0.358249  0.516219  0.017824
5.133333  0.070707  0.362963  1.016856  0.017824
5.200000  0.070707  0.367677  1.652686  0.017824
5.266667  0.070707  0.372391  2.374842  0.017824
5.333333  0.070707  0.377104  3.136301  0.017824
5.400000  0.070707  0.381818  3.888714  0.017824
5.466667  0.070707  0.386532  4.585239  0.017824
5.533333  0.070707  0.391246  5.186080  0.017824
5.600000  0.070707  0.395960  5.665744  0.017824
5.666667  0.070707  0.400673  6.021632  0.017824
5.733333  0.070707  0.405387  6.283713  0.017824
5.800000  0.070707  0.410101  6.610792  0.017824
5.866667  0.070707  0.414815  6.872146  0.017824
5.933333  0.070707  0.419529  7.123699  0.017824
6.000000  0.070707  0.424242  7.366482  0.017824
END FTABLE  2
FTABLE      1
```

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Depth (ft)	Area (acres)	Volume (acre-ft)	Outflow1 (cfs)	Outflow2 (cfs)	Velocity (ft/sec)	Travel Time*** (Minutes)***
0.000000	0.057851	0.000000	0.000000	0.000000		
0.033333	0.057851	0.000642	0.000000	0.014583		
0.066667	0.057851	0.001284	0.000000	0.014583		
0.100000	0.057851	0.001926	0.000000	0.014583		
0.133333	0.057851	0.002569	0.000000	0.014583		
0.166667	0.057851	0.003211	0.000000	0.014583		
0.200000	0.057851	0.003853	0.000000	0.014583		
0.233333	0.057851	0.004495	0.000000	0.014583		
0.266667	0.057851	0.005137	0.000000	0.014583		
0.300000	0.057851	0.005779	0.000000	0.014583		
0.333333	0.057851	0.006421	0.000000	0.014583		
0.366667	0.057851	0.007064	0.000000	0.014583		
0.400000	0.057851	0.007706	0.000000	0.014583		
0.433333	0.057851	0.008348	0.000000	0.014583		
0.466667	0.057851	0.008990	0.000000	0.014583		
0.500000	0.057851	0.009632	0.000000	0.014583		
0.533333	0.057851	0.010274	0.000000	0.014583		
0.566667	0.057851	0.010917	0.000000	0.014583		
0.600000	0.057851	0.011559	0.000000	0.014583		
0.633333	0.057851	0.012201	0.000000	0.014583		
0.666667	0.057851	0.012843	0.000000	0.014583		
0.700000	0.057851	0.013485	0.000000	0.014583		
0.733333	0.057851	0.014127	0.000000	0.014583		
0.766667	0.057851	0.014769	0.000000	0.014583		
0.800000	0.057851	0.015412	0.000000	0.014583		
0.833333	0.057851	0.016054	0.000000	0.014583		
0.866667	0.057851	0.016696	0.000000	0.014583		
0.900000	0.057851	0.017338	0.000000	0.014583		
0.933333	0.057851	0.017980	0.000000	0.014583		
0.966667	0.057851	0.018622	0.000000	0.014583		
1.000000	0.057851	0.019264	0.000000	0.014583		
1.033333	0.057851	0.019907	0.000000	0.014583		
1.066667	0.057851	0.020549	0.000000	0.014583		
1.100000	0.057851	0.021191	0.000000	0.014583		
1.133333	0.057851	0.021833	0.000000	0.014583		
1.166667	0.057851	0.022475	0.000000	0.014583		
1.200000	0.057851	0.023117	0.000000	0.014583		
1.233333	0.057851	0.023760	0.000000	0.014583		
1.266667	0.057851	0.024402	0.000000	0.014583		
1.300000	0.057851	0.025044	0.000000	0.014583		
1.333333	0.057851	0.025686	0.000000	0.014583		
1.366667	0.057851	0.026328	0.000000	0.014583		
1.400000	0.057851	0.026970	0.000000	0.014583		
1.433333	0.057851	0.027612	0.000000	0.014583		
1.466667	0.057851	0.028255	0.000000	0.014583		
1.500000	0.057851	0.028897	0.000000	0.014583		
1.533333	0.057851	0.029539	0.000000	0.014583		
1.566667	0.057851	0.030181	0.000000	0.014583		
1.600000	0.057851	0.030823	0.000000	0.014583		
1.633333	0.057851	0.031465	0.000000	0.014583		
1.666667	0.057851	0.032107	0.000000	0.014583		
1.700000	0.057851	0.032750	0.000000	0.014583		
1.733333	0.057851	0.033392	0.000000	0.014583		
1.766667	0.057851	0.034034	0.000000	0.014583		
1.800000	0.057851	0.034676	0.000000	0.014583		
1.833333	0.057851	0.035318	0.000000	0.014583		
1.866667	0.057851	0.035960	0.000000	0.014583		
1.900000	0.057851	0.036602	0.000000	0.014583		
1.933333	0.057851	0.037245	0.000000	0.014583		
1.966667	0.057851	0.037887	0.000000	0.014583		
2.000000	0.057851	0.039815	0.000000	0.014583		
2.033333	0.057851	0.041744	0.064540	0.014583		
2.066667	0.057851	0.043672	0.182234	0.014583		
2.100000	0.057851	0.045600	0.333520	0.014583		
2.133333	0.057851	0.047529	0.509662	0.014583		
2.166667	0.057851	0.049457	0.703432	0.014583		
2.200000	0.057851	0.051385	0.907676	0.014583		

```
  2.233333  0.057851  0.053314  1.115035  0.014583
  2.266667  0.057851  0.055242  1.318080  0.014583
  2.300000  0.057851  0.057171  1.509672  0.014583
  2.333333  0.057851  0.059099  1.683468  0.014583
  2.366667  0.057851  0.061027  1.834531  0.014583
  2.400000  0.057851  0.062956  1.960035  0.014583
  2.433333  0.057851  0.064884  2.060036  0.014583
  2.466667  0.057851  0.066812  2.138326  0.014583
  2.500000  0.057851  0.068741  2.227125  0.014583
  2.533333  0.057851  0.070669  2.300165  0.014583
  2.566667  0.057851  0.072598  2.370955  0.014583
  2.600000  0.057851  0.074526  2.439693  0.014583
  2.633333  0.057851  0.076454  2.506546  0.014583
  2.666667  0.057851  0.078383  2.571662  0.014583
  2.700000  0.057851  0.080311  2.635170  0.014583
  2.733333  0.057851  0.082239  2.697182  0.014583
  2.766667  0.057851  0.084168  2.757800  0.014583
  2.800000  0.057851  0.086096  2.817115  0.014583
  2.833333  0.057851  0.088025  2.875206  0.014583
  2.866667  0.057851  0.089953  2.932146  0.014583
  2.900000  0.057851  0.091881  2.988001  0.014583
  2.933333  0.057851  0.093810  3.042832  0.014583
  2.966667  0.057851  0.095738  3.096691  0.014583
  3.000000  0.057851  0.097666  3.149630  0.014583
  3.033333  0.057851  0.099595  3.201694  0.014583
  END FTABLE  1
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1.37           PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1.37           IMPLND   1 999 EXTNL  PREC
WDM      1 EVAP     ENGL    0.8            PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    0.8            IMPLND   1 999 EXTNL  PETINP

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
COPY     2 OUTPUT MEAN   1 1     48.4      WDM    702 FLOW     ENGL      REPL
COPY   502 OUTPUT MEAN   1 1     48.4      WDM    802 FLOW     ENGL      REPL
RCHRES   2 HYDR   RO     1 1        1      WDM   1000 FLOW     ENGL      REPL
RCHRES   2 HYDR   O      1 1        1      WDM   1001 FLOW     ENGL      REPL
RCHRES   2 HYDR   O      2 1        1      WDM   1002 FLOW     ENGL      REPL
RCHRES   2 HYDR   STAGE  1 1        1      WDM   1003 STAG     ENGL      REPL
COPY     1 OUTPUT MEAN   1 1     48.4      WDM    701 FLOW     ENGL      REPL
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    801 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>             <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK        2
PERLND     PWATER SURO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    2

  MASS-LINK        3
PERLND     PWATER IFWO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    3

  MASS-LINK        5
IMPLND     IWATER SURO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    5

  MASS-LINK        7
RCHRES     OFLOW  OVOL   1                 RCHRES         INFLOW IVOL
  END MASS-LINK    7
```

```
  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13

  MASS-LINK       15
IMPLND     IWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   15

  MASS-LINK       17
RCHRES     OFLOW  OVOL   1               COPY           INPUT  MEAN
  END MASS-LINK   17


END MASS-LINK

END RUN
```

Predeveloped HSPF Message File

Mitigated HSPF Message File

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Geotechnical Report Appendix D

Geotechnical Report by Earth Engineering, Inc. (March 1st, 2022)

Jerry Hofer

ISA Certified Arborist®

PN 7901A

Phone: 360-521-7944
E-mail: JerryHofer2@gmail.com

February 6, 2023

Tree Consultation Proposal For: McIntosh Property

Site Information: TaxParcel 127449000 3210 NW McIntosh Rd. Camas, WA 98607

Client:
Sam Madison: email: scamalama72@gmail.com
Mett RI
3511 NW McMaster Dr.
Camas, WA 98606

The attached tree Inventory table lists the trees on and immediately adjacent to this property.

TREE INVENTORY

	PROJECT: McIntosh Subdivision DATE:2/6/2023 2pm					PLANNED ACTION
TREE #	**SPECIES**	**DBH**	**HEIGHT**	**CONDITION**	**COMMENTS**	
1	DF	37"	90'	Good, but forked 10 & 15 yrs ago	Will need to remove for substantial cut for access road, and hazard from multiple tops, possible safety risk.	Remove
2	DF	24"	70'	Very Good	**Off property** Located 2' west of property line near NW corner of lot 7 Limbs hanging 18' over property	Retain
3	Alder	16"	35'	Good	Will need to be removed for connection to existing 5th Ave involving major cut for road and sidewalks	Remove
4	Alder	14"	40'	Good	Will need to be removed for connection to existing 5th Ave involving major cut for road and sidewalks	Remove

TREE #	SPECIES	DBH	HEIGHT	CONDITION	COMMENTS	
5	Alder	13"	35'	Good	Will need to be removed for connection to existing 5th Ave involving major cut for road and sidewalks	Remove
6	DF	17"	55'	Good	Will need to be removed for connection to existing 5th Ave involving major cut for road and sidewalks	Remove
7	DF	44"	80'	Good	Will need to be removed because of major cut to access property and building site.	Remove
8	DF	20"	55'	Good	3' east of property line, about lot #25. **Off property**. Limbs hanging 18' over property	Retain
9-18	10 Clumps Hazelnut	1" - 3"	8' - 12'	Fair -Good	10 Clumps from 2' - 8' in diameter, with 5-40 stems per Clump. Stems are 1" - 3" in diameter	Retain
					The following trees are just south and on the west end of the southern property line. The pines were planted and the DF and Cedars came in naturally. These trees are **off property.**	
9	WR Cedar	10"	40'	Good	Natural, **off property**	
10	WR Cedar	14"	40'	Good	Natural, **off property**	
11	7 DF	5" - 8"	20'-35	Good	Natural, **off property**	
12	17 Pines	8" -12"	30' - 40'	Good	Planted , **off property**	
					The following trees are just south and on the east end of the southern property line. I believe they are all natural trees. **Off property.**	
13	5 DF	9" - 14"	35' - 40'	Good	Natural, **off property**	
14	1 WR Cedar	8"	35'	Good	Natural, **off property**	

The most significant trees proposed for removal are trees #1 #6 and #7 (see subdivision plan)

Tree #1 is a 37” Douglas fir , 90’ tall and located about 40’ south of McIntosh Road where the entrance for this subdivision will be built. While the tree looks in good condition, it exhibits some past breakage about 15’ from the top. This breakage resulted in several branches growing upward to become new tops. This creates a weak area subject to future breakage, especially from a freezing rain, ice/snow event.

The main access road will go from McIntosh Rd. through this development and join with NW 5th Ave near the SE corner of this subdivision. Where this access road leaves McIntosh Rd, it will be necessary to make a cut and excavate to be able to match the grade of the existing road. The depth of the cut will be below the elevation of the existing road to provide the construction of the base required for the new road. The access road will be located adjacent to the stormwater pond on the west and lot #28 on the east.

The width of the clearing for the new access road starts on McIntosh Rd at about 70’ wide to allow for turning and visibility. It will be about 52’ wide through the subdivision. The depth of the cut at McIntosh Rd will be about 2’ and will increase to about 7’ as the road goes up the slope to the south adjacent to tree #1. The cut for the road will be immediately adjacent to tree #1 and remove or impact many of the roots on the west side of the tree. This will have a significant long term adverse impact on this tree. There does not appear to be a viable option for moving the road location while providing the safety, sight distance and slope requirements for construction.

Where the multiple stems start in near the top of tree #1, is a weak area that often times results in breakage occurring with strong winds, and heavy freezing rain or ice/snow events. Because this tree

would be hanging over the subdivision access road, it would be a potential hazardous situation for cars or pedestrians. Given both factors listed above, I recommend that tree #1 be removed. Additional trees will be planted along both sides of the access roads.

Trees #3, #4, #5, #6 and #7 are located where the new access road will join NW 5th Ave. Trees #6 and #7 are shown in the photo below. Trees #3, #4, and #5 are 14”-17” alder located behind tree #6. Because of the cut, 8’ - 10’ deep, that will be needed to match the elevation of NW 5th Avenue roadway and sidewalks, these trees will need to be removed. The existing sewer line will be removed and reconstructed to make it deeper next to tree #7. This will likely kill the tree making it a hazardous situation for existing houses on adjacent property as well as new houses. Trees #3, #4, & #5 located immediately behind tree #6 will also be removed for this work. There will be new trees planted in the street strip along NW 5th Ave.

There are 10 clumps of hazelnut trees/shrubs on the south side of the property, just north of the property boundary. The clumps range in size from 2’ - 8’ with 5-40 stems per clump. The height ranges from 8’ - 10’. They provide some vegetative and visual diversity, and are planned to be left. See photo below:

If you have any questions or need any clarifications, please give me a call.

/s/ Jerry L. Hofer
Certified Arborist Consultations
4414 NE 115th St
Vancouver, WA 98686

Current Resident
430 NW Ilwaco St
Camas WA 98607

Current Resident
330 NW Ilwaco St
Camas WA 98607

Current Resident
500 NW Ilwaco
Camas WA 98607

Current Resident
3046 NW 3rd Ave
Camas WA 98607

Current Resident
PO Box 484
Camas WA 98607

Current Resident
639 NW Fremont St
Camas WA 98607

Current Resident
545 NW Fremont St
Camas WA 98607

Current Resident
431 NW Fremont St
Camas WA 98607

Current Resident
460 NW Fremont St
Camas WA 98607

Current Resident
608 NW Fremont St
Camas WA 98607

Current Resident
3137 NW 3rd Ave
Camas WA 98607

Current Resident
410 NW Ilwaco
Camas WA 98607

Current Resident
3004 NW 3rd Ave
Camas WA 98607

Current Resident
3110 NW 3rd Ave
Camas WA 98607

Current Resident
741 NW Fremont St
Camas WA 98607

Current Resident
621 NW Fremont St
Camas WA 98607

Current Resident
517 NW Fremont St
Camas WA 98607

Current Resident
438 NW Fremont St
Camas WA 98607

Current Resident
526 NW Fremont St
Camas WA 98607

Current Resident
620 NW Fremont
Camas WA 98607

Current Resident
3137 NW 3rd Ave
Camas WA 98607

Current Resident
444 NW Ilwaco St
Camas WA 98607

Current Resident
3028 NW 3rd Ave
Camas WA 98607

Current Resident
3132 NW 3rd Ave
Camas WA 98607

Current Resident
705 NW Freemont St
Camas WA 98607

Current Resident
611 NW Fremont St
Camas WA 98607

Current Resident
455 NW Fremont St
Camas WA 98607

Current Resident
444 NW Fremont St
Camas WA 98607

Current Resident
542 NW Fremont St
Camas WA 98607

Current Resident
648 NW Freemont St
Camas WA 98607

Current Resident
728 NW Fremont St
Camas WA 98607

Current Resident
748 NW Fremont St
Camas WA 98607

Current Resident
3001 NW 3rd Ave
Camas WA 98607

Current Resident
3023 NW 3rd Ave
Camas WA 98607

Current Resident
3045 NW 3rd Ave
Camas WA 98607

Current Resident
3119 NW 3rd Ave
Camas WA 98607

Current Resident
1915 NW Sage St
Camas WA 98607

Current Resident
2928 NW 8th Way
Camas WA 98607

Current Resident
2944 NW 8th Way
Camas WA 98607

Current Resident
169 Erica Dr
Richland WA 99352

Current Resident
842 NW Fremont St
Camas WA 98607

Current Resident
2942 NW 9th Ave
Camas WA 98607

Current Resident
909 NW Fremont St
Camas WA 98607

Current Resident
849 NW Fremont St
Camas WA 98607

Current Resident
821 NW Fremont St
Camas WA 98607

Current Resident
675 NW Ilwaco St
Camas WA 98607

Current Resident
673 NW Ilwaco St
Camas WA 98607

Current Resident
661 NW Ilwaco St
Camas WA 98607

Current Resident
653 NW Ilwaco St
Camas WA 98607

Current Resident
651 NW Ilwaco St
Camas WA 98607

Current Resident
649 NW Ilwaco St
Camas WA 98607

Current Resident
645 NW Ilwaco St
Camas WA 98607

Current Resident
509 Ilwaco St
Camas WA 98607

Current Resident
501 NW Ilwaco St
Camas WA 98607

Current Resident
800 NE Tenney Rd #110-348
Vancouver WA 98685

Current Resident
943 NW Hoquiam Ct
Camas WA 98607

Current Resident
648 NW Ilwaco St
Camas WA 98607

Current Resident
310 NW Ilwaco Ct
Camas WA 98607

Current Resident
320 NW Ilwaco Ct
Camas WA 98607

Current Resident
340 NW Ilwaco Ct
Camas WA 98607

Current Resident
737 NW Ilwaco St
Camas WA 98607

Current Resident
PO Box 208
Washougal WA 98671

Current Resident
PO Box 208
Washougal WA 98676

Current Resident
616 NE 4th Ave
Camas WA 98607

Current Resident
736 NW Ilwaco St
Camas WA 98607

Current Resident
710 Ilwaco St
Camas WA 98607

Current Resident
676 NW Ilwaco St
Camas WA 98607

Current Resident
PO Box 470
Camas WA 98607

Current Resident
656 NW Ilwaco St
Camas WA 98607

Current Resident
652 NE Ilwaco St
Camas WA 98607

Current Resident
40220 SE Gibson Rd
Washougal WA 98671

COMMUNITY DEVELOPMENT DEPARTMENT
616 NE 4th Avenue
Camas, WA 98607
www.ci.camas.wa.us

July 15, 2022

SGA Engineering & Design
Attn: Scott Taylor
Sent via email staylor@sgaengineering.com

RE: Application Completeness Review for Planning Case SUB22-04: McIntosh Subdivision

Dear Scott Taylor,

Thank you for your application submittal for the McIntosh Subdivision (SUB22-04). I am the case planner assigned to this project. The purpose of this letter is to inform you that the application submitted on June 24, 2022, has been deemed incomplete in accordance with Camas Municipal Code (CMC) Section 18.55.130 and there are items that need to be addressed in order to move forward with the review process. Once the items below are submitted, staff will review the information to verify whether the application can be deemed complete. As a reminder, staff is not authorized to waive any requirement of the City Code. Any omission or failure by staff to recite applicable code requirements shall not constitute a waiver by the City of any standard or requirement.

Items necessary for completeness:

- 17.11.030.B.6: All existing conditions shall be delineated. Site development plans shall provide the following information:
  - e. Street lights are not shown on the preliminary plans.
  - j. Location, dimension and purpose of existing and proposed easements. Access and easement to Tract C is not shown. Provide recorded documents that identify the nature and extent of existing easements.
  - k. Location of any proposed dedications. Provide street cross-section detail for proposed right-of-way dedication.
  - l. Existing and proposed topography at two-foot intervals extending to five-feet beyond project boundaries. Proposed grading plan was not submitted.
  - n. Description, location, and size of existing and proposed utilities, storm drainage facilities, and road, to service the lots. Proposed utilities are called out but not shown on preliminary utility plan.
  - p. Show location and height of any proposed retaining walls.
- 17.11.030.B.7: For properties with slopes of ten percent or greater a preliminary grading plan is required to be submitted with the development application that shows:
  - Two-foot contours;
  - The proposed lots and existing topography;
  - The proposed lots with proposed topography; and
  - Total quantities of cut and fill.
- 17.11.030.B.8:
  - Preliminary TIR submitted states that stormwater utilities to be maintained by the HOA. This will apply only treatment and detention facilities, and to the collection and

conveyance system on the private road only.
    - Preliminary stormwater plans were not submitted.
- 17.01.050.B4: Preliminary and final plats shall include the following:
    - d. Total infrastructure acreage (includes proposed storm ponds)
    - f. Total acreage of critical areas
- Per CMC 18.55.110:
    - H. A development sign is required for a Type III subdivision application.
    - I. A copy of a full title report is required.

Comments related to Pre-Application Meeting Notes (PA21-51):

- Engineering:
    - Proposed public road does not meet Table 17.19.040-2 A (52-foot ROW width) with approval of city engineering;
    - Proposed private road does not meet minimum Table 17.19.040-1.D (48-foot Tract);
    - Proposed Lot 19 should take access from private street and not at the turnaround in front of the proposed gate;
    - Proposed utilities are called out, but not shown on the preliminary utility plan;
    - Easements for existing utilities, crossing the proposed development are not shown; and
    - Overhead power is shown. Overhead power to be placed underground.
- Preliminary Plat:
    - #3: Per CMC 18.09.080.B., the lots along the western, southern, and eastern boundaries of the proposed project are adjacent to R-15 zoned properties and must be the maximum lot size allowed (14,000 square-feet) for the proposed development. As proposed, Lots 3-7 and 24-26 do not comply with this requirement.
    - #8: Each dwelling unit within a new development shall be landscaped with at least one tree per CMC 17.19.030.F. As proposed, there is no tree designated for Lot 24.
    - #13: The location and height of any retaining walls shall be shown on the grading plan. Retaining wall height requirements are included in CMC 18.17.060.
- Archaeological Review:
    - The site is in an area of high probability for the presence of archaeological objects, as such an archaeological predetermination will be required per CMC Section 16.31.070.B. Please submit proof of mailing or emailing the tribes per CMC 16.31.160.

If you have any questions related to this project, please feel free to contact me by email: YSennewald@cityofcamas.us or by phone: (360) 817-7269.

Respectfully,

Yvette Sennewald
Senior Planner

COMMUNITY DEVELOPMENT DEPARTMENT
616 NE 4th Avenue
Camas, WA 98607
www.ci.camas.wa.us

July 15, 2022
SGA Responses in Green Text
SGA Engineering & Design
Attn: Scott Taylor
Sent via email staylor@sgaengineering.com

RE: Application Completeness Review for Planning Case SUB22-04: McIntosh Subdivision

Dear Scott Taylor,

Thank you for your application submittal for the McIntosh Subdivision (SUB22-04). I am the case planner assigned to this project. The purpose of this letter is to inform you that the application submitted on June 24, 2022, has been deemed incomplete in accordance with Camas Municipal Code (CMC) Section 18.55.130 and there are items that need to be addressed in order to move forward with the review process. Once the items below are submitted, staff will review the information to verify whether the application can be deemed complete. As a reminder, staff is not authorized to waive any requirement of the City Code. Any omission or failure by staff to recite applicable code requirements shall not constitute a waiver by the City of any standard or requirement.

Items necessary for completeness:

- 17.11.030.B.6: All existing conditions shall be delineated. Site development plans shall provide the following information:
  - e. Street lights are not shown on the preliminary plans.
  - j. Location, dimension and purpose of existing and proposed easements. Access and easement to Tract C is not shown. Provide recorded documents that identify the nature and extent of existing easements. Existing and proposed easements shown on plans.
  - k. Location of any proposed dedications. Provide street cross-section detail for proposed right-of-way dedication. Proposed streets now meet the city standard details.
  - l. Existing and proposed topography at two-foot intervals extending to five-feet beyond project boundaries. Proposed grading plan was not submitted. Grading Plan submitted.
  - n. Description, location, and size of existing and proposed utilities, storm drainage facilities, and road, to service the lots. Proposed utilities are called out but not shown on preliminary utility plan. Proposed Utilities shown on revised plans.
  - p. Show location and height of any proposed retaining walls. Walls shown on grading plan with heights.
- 17.11.030.B.7: For properties with slopes of ten percent or greater a preliminary grading plan is required to be submitted with the development application that shows: Plan has been submitted.
  - Two-foot contours;
  - The proposed lots and existing topography;
  - The proposed lots with proposed topography; and
  - Total quantities of cut and fill.
- 17.11.030.B.8:

- Preliminary TIR submitted states that stormwater utilities to be maintained by the HOA. This will apply only treatment and detention facilities, and to the collection and conveyance system on the private road only. TIR revised to match this.
- Preliminary stormwater plans were not submitted. Stormwater plans submitted.

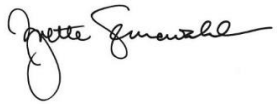
- 17.01.050.B4: Preliminary and final plats shall include the following:
  - d. Total infrastructure acreage (includes proposed storm ponds) 2.81 acres of infrastructure or 122,406 sf.
  - f. Total acreage of critical areas 0 Acres
- Per CMC 18.55.110:
  - H. A development sign is required for a Type III subdivision application. Sign posted on site and photos provided to staff.
  - I. A copy of a full title report is required. Title report provided to staff.
  -

Comments related to Pre-Application Meeting Notes (PA21-51):

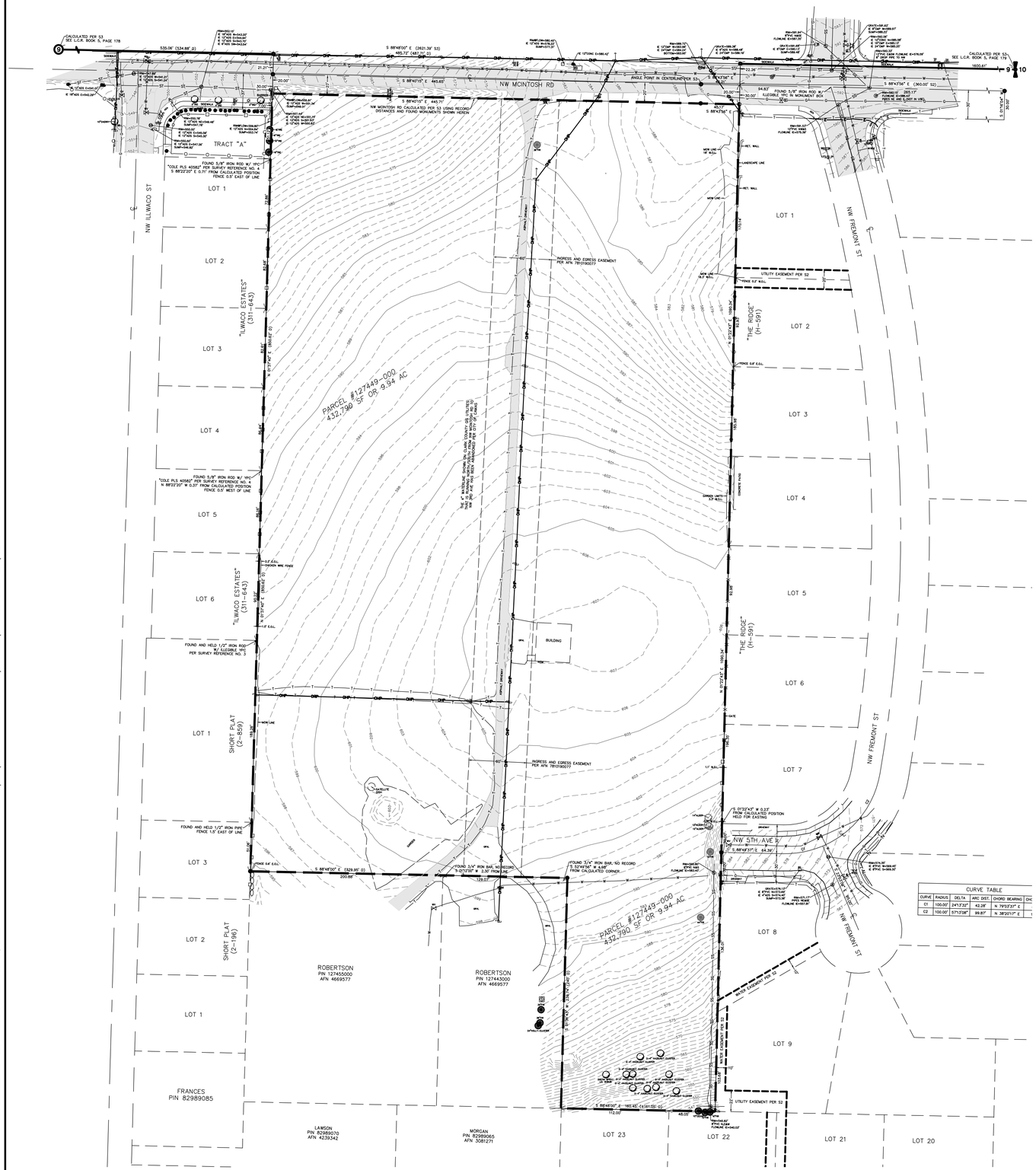
- Engineering:
  - Proposed public road does not meet Table 17.19.040-2 A (52-foot ROW width) with approval of city engineering; Plans adjusted to meet 52' r/w.
  - Proposed private road does not meet minimum Table 17.19.040-1.D (48-foot Tract); Plans adjusted to meet 48' tract.
  - Proposed Lot 19 should take access from private street and not at the turnaround in front of the proposed gate; Plans and r/w adjusted.
  - Proposed utilities are called out, but not shown on the preliminary utility plan; Shown on revised plans.
  - Easements for existing utilities, crossing the proposed development are not shown; and Shown on revised plans.
  - Overhead power is shown. Overhead power to be placed underground. This is understood by applicant and engineer. Shown for reference.
- Preliminary Plat:
  - #3: Per CMC 18.09.080.B., the lots along the western, southern, and eastern boundaries of the proposed project are adjacent to R-15 zoned properties and must be the maximum lot size allowed (14,000 square-feet) for the proposed development. As proposed, Lots 3-7 and 24-26 do not comply with this requirement. Plans adjusted per discussions with staff.
  - #8: Each dwelling unit within a new development shall be landscaped with at least one tree per CMC 17.19.030.F. As proposed, there is no tree designated for Lot 24. One tree added for lot 24.
  - #13: The location and height of any retaining walls shall be shown on the grading plan. Retaining wall height requirements are included in CMC 18.17.060. Retaining wall heights shown on grading plan.
- Archaeological Review:
  - The site is in an area of high probability for the presence of archaeological objects, as such an archaeological predetermination will be required per CMC Section 16.31.070.B. Please submit proof of mailing or emailing the tribes per CMC 16.31.160. Email proof PDF's submitted to staff.

If you have any questions related to this project, please feel free to contact me by email: YSennewald@cityofcamas.us or by phone: (360) 817-7269.

Respectfully,



Yvette Sennewald
Senior Planner



MCINTOSH SUBDIVISION

BEING A PORTION OF THE SOUTHEAST QUARTER OF SECTION 9, TOWNSHIP 1 NORTH, RANGE 3 EAST OF THE WILLAMETTE MERIDIAN CLARK COUNTY, WASHINGTON

PRELIMINARY APPLICATION

JUNE 2022

APPLICANT & PROPERTY OWNER:

METT RI, LLC. ATTN: SAM MADISON

3511 NW MCMASTER DRIVE

CAMAS, WA 98606

PH: 503.318.2578

SCAMALAMA72@GMAIL.COM

PROPERTY ADDRESSES:

3210 NW MCINTOSH RD.

CAMAS, WA 98607

CONTACT PERSON:

SGA ENGINEERING, PLLC
ATTN: SCOTT TAYLOR
2005 BROADWAY STREET
VANCOUVER, WA 98663
PH: 360.993.0911
FX: 360.993.0912
EM: STAYLOR@SGAENGINEERING.COM

EXISTING SITE INFORMATION

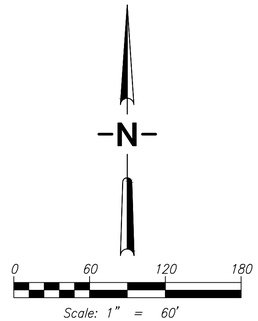
EXISTING PARCEL NUMBERS	127449-000	
CURRENT USE	VACANT LAND WITH OUTBUILDINGS & DRIVEWAY	
ZONING DESIGNATION	R-10	
GROSS SITE AREA	9.94 ACRES	432,790 S.F.
TRANSIT ROUTES	UNKNOWN.	
EXISTING WATER AND SEWER	THE EXISTING LOT IS SERVED BY CITY OF CAMAS SEWER & WATER.	

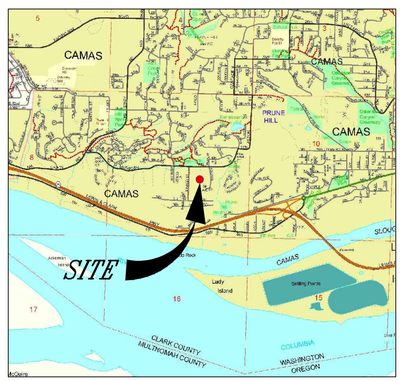
ENVIRONMENTAL CONDITIONS

NONE KNOWN.

EXISTING CONDITIONS DISCLAIMER

THE EXISTING CONDITIONS SHOWN ON THIS PLAN WERE OBTAINED FROM INFORMATION PROVIDED BY PUBLIC SOURCES. SGA ENGINEERING, PLLC DOES NOT GUARANTEE THE ACCURACY OF THIS INFORMATION.





VICINITY MAP

SCALE: NTS

SGA ENGINEERING & DESIGN
CIVIL ENGINEERING ~ LAND PLANNING
DEVELOPMENT SERVICES
LANDSCAPE ARCHITECTURE

2005 BROADWAY
VANCOUVER, WA 98663
PHONE (360)993-0911
FAX (360)993-0912

PRELIMINARY NOT FOR CONSTRUCTION

EXISTING CONDITIONS

MCINTOSH SUBDIVISION

CITY OF CAMAS WASHINGTON

PRELIMINARY

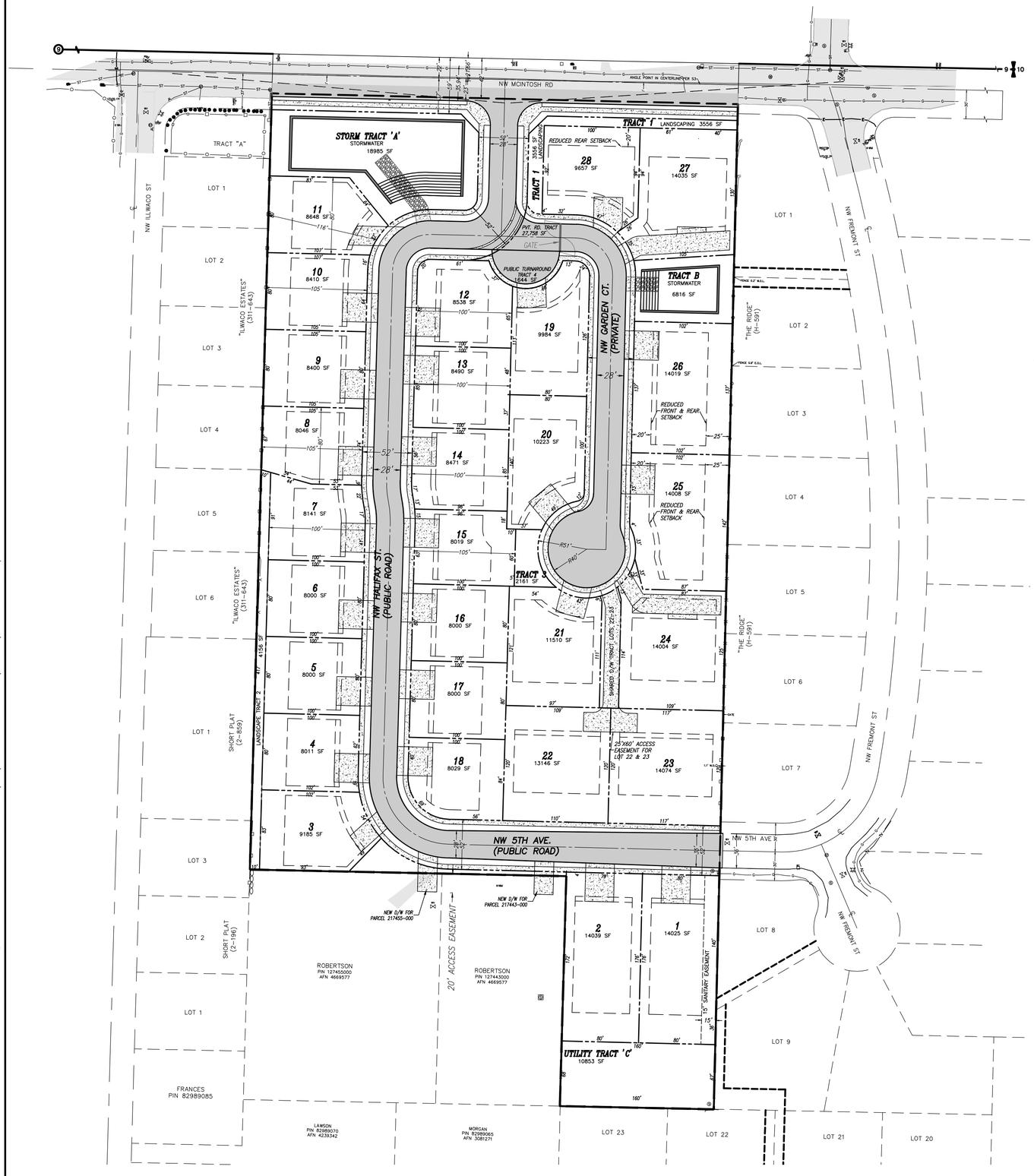
REVISIONS

DESIGNED BY:	SAT, JAI
DRAWN BY:	SAT, JAI
CHECKED BY:	SAT, JAI
SCALE:	1" = 60'

JOB NUMBER 2140

SHEET PRE1.0

© SGA ENGINEERING PLLC - DATE PLOTTED: Feb. 06, 2023 - 11:57 AM SGA DRAWING FILE: W:\DWG\2140-MCINTOSH PROPERTY\DRAWINGS\2-PRELIM SHEET SET\PRE1.0 - EXISTING CONDITIONS.DWG



MCINTOSH SUBDIVISION

BEING A PORTION OF THE SOUTHEAST QUARTER OF SECTION 9, TOWNSHIP 1 NORTH, RANGE 3 EAST OF THE WILLAMETTE MERIDIAN CLARK COUNTY, WASHINGTON

PRELIMINARY APPLICATION

JUNE 2022

APPLICANT & PROPERTY OWNER:

METT RI, LLC. ATTN: SAM MADISON

3511 NW MCMASTER DRIVE

CAMAS, WA 98606

PH: 503.318.2578

SCAMALAMA72@GMAIL.COM

PROPERTY ADDRESSES:

3210 NW MCINTOSH RD.

CAMAS, WA 98607

CONTACT PERSON:

SGA ENGINEERING, PLLC
ATTN: SCOTT TAYLOR
2005 BROADWAY STREET
VANCOUVER, WA 98663
PH: 360.993.0911
FX: 360.993.0912
EM: STAYLOR@SGAENGINEERING.COM

EXISTING SITE INFORMATION

EXISTING PARCEL NUMBERS	127449-000
CURRENT USE	VACANT LAND WITH OUTBUILDINGS & DRIVEWAY
ZONING DESIGNATION	R-10
GROSS SITE AREA	9.94 ACRES 432,790 S.F.
TRANSIT ROUTES	UNKNOWN.
EXISTING WATER AND SEWER	THE EXISTING LOT IS SERVED BY CITY OF CAMAS SEWER & WATER.

ENVIRONMENTAL CONDITIONS

NONE KNOWN.

EXISTING CONDITIONS DISCLAIMER

THE EXISTING CONDITIONS SHOWN ON THIS PLAN WERE OBTAINED FROM INFORMATION PROVIDED BY PUBLIC SOURCES. SGA ENGINEERING, PLLC DOES NOT GUARANTEE THE ACCURACY OF THIS INFORMATION.

PROPOSED SITE INFORMATION

PROPOSED USE

28 DETACHED SINGLE-FAMILY LOT SUBDIVISION IN THE R-10 ZONE

DEVELOPMENT STANDARDS

MAX DENSITY	4.3 D.U./ NET ACRE (3.63 U/A PROPOSED)
MINIMUM LOT AREA	8,000 SF
MINIMUM LOT WIDTH	80'
MINIMUM LOT DEPTH	100'
FRONT YARD SETBACK	20'-25'
GARAGE SETBACK	25'-30'
STREET SIDE YARD SETBACK	10'-15'
INTERIOR SIDE YARD SETBACK	5'-10'
REAR YARD SETBACK	25'-30'
MAXIMUM BLDG LOT COVERAGE	35%, 50% REQUESTED WITH MODIFICATION
MAXIMUM BUILDING HEIGHT	35'
MINIMUM LANDSCAPED AREA	~40-50% (REVIEWED WITH BLDG. PERMIT)

UTILITY PROVIDERS

SEWER	CITY OF CAMAS
WATER	CITY OF CAMAS
ELECTRICAL	CLARK PUBLIC UTILITIES

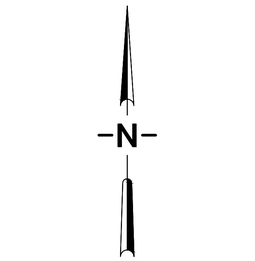
STORMWATER MANAGEMENT

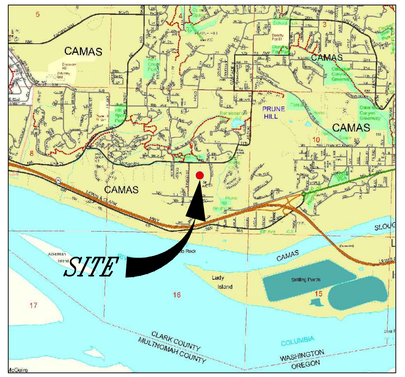
TREATMENT	STORMWATER IS PROPOSED TO BE TREATED USING STORM FILTER MAN HOLES, RAINGARDENS OR OTHER APPROVED BMP'S
DISPOSAL	TREATED STORMWATER WILL BE INFILTRATED INTO THE GROUND AND RELEASED AT BELOW PREDEVELOPED RATES.

PROPOSED SITE AREA SUMMARY	***ACRES***	***S.F.***
GROSS SITE AREA	9.94	432790
NET SITE AREA (GROSS-ROADS)	7.72	336185
AVERAGE LOT AREA	0.23	10198
R/W & PVT ROAD DEDICATION	2.20	96605

TOTAL INFRASTRUCTURE AREA:
122,406 SF OR 2.81 ACRES
(INCLUDING STORM PONDS)

0 SF OF CRITICAL AREAS





VICINITY MAP

SCALE: NTS

SGA ENGINEERING & DESIGN
CIVIL ENGINEERING ~ LAND PLANNING
DEVELOPMENT SERVICES
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2005 BROADWAY
VANCOUVER, WA 98663
PHONE (360)993-0911
FAX (360)993-0912

PRELIMINARY NOT FOR CONSTRUCTION — SCOTT A. TAYLOR — 22,000 — REGISTERED PROFESSIONAL ENGINEER

PRELIMINARY PLAT

MCINTOSH SUBDIVISION

CITY OF CAMAS *WASHINGTON*

PRELIMINARY

REVISIONS

REVISED 2-6-23 BY S.A.T.

DESIGNED BY:	*SAT, JAI*
DRAWN BY:	*SAT, JAI*
CHECKED BY:	*SAT, JAI*
SCALE:	*1" = 60'*

JOB NUMBER	*SHEET*
2140	*PRE2.0*

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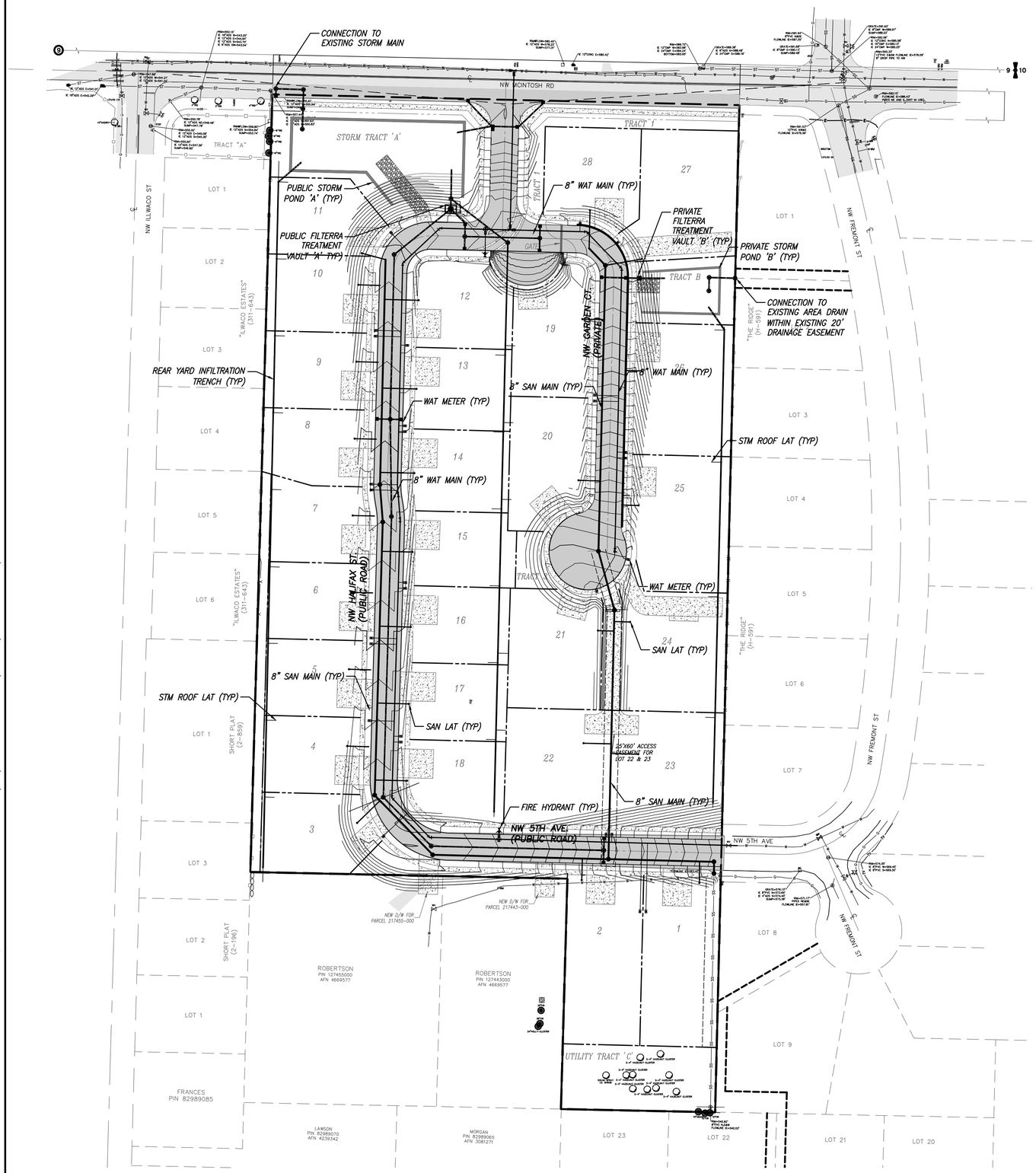

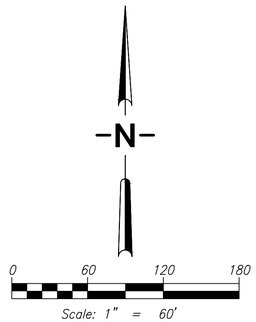

LEGEND:

WV	INDICATES WATER VALVE
	INDICATES FIRE HYDRANT
WM	INDICATES WATER METER
CV	INDICATES CONTROL VALVE
WV	INDICATES WATER VAULT
W	INDICATES WATER MANHOLE
	INDICATES TELEPHONE SERVICE BOX
	INDICATES TELEPHONE MARKER
ST	INDICATES STORM SEWER MANHOLE
CO	INDICATES STORM CLEANOUT
	INDICATES DITCH INLET
	INDICATES CURB INLET
	INDICATES CATCH BASIN
S	INDICATES SANITARY SEWER MANHOLE
	INDICATES SEPTIC SYSTEM LID
	INDICATES POWER POLE
	INDICATES GUY ANCHOR
	INDICATES LIGHT POLE
	INDICATES ELECTRIC SERVICE BOX
GV	INDICATES GAS VALVE
	INDICATES GAS MARKER
	INDICATES SIGN
	INDICATES MAIL BOX

SCA ENGINEERING & DESIGN
CIVIL ENGINEERING ~ LAND PLANNING
DEVELOPMENT SERVICES
LANDSCAPE ARCHITECTURE
2005 BROADWAY
VANCOUVER, WA 98663
PHONE (360)993-0911
FAX (360)993-0912

PRELIMINARY STORM & UTILITY PLAN

McINTOSH SUBDIVISION

CITY OF CAMAS WASHINGTON

PRELIMINARY

REVISIONS
REVISED 2-6-23 BY S.A.T.

DESIGNED BY:	SAT, JAI
DRAWN BY:	SAT, JAI
CHECKED BY:	SAT, JAI
SCALE:	1" = 60'

JOB NUMBER	SHEET
2140	PRE3.0

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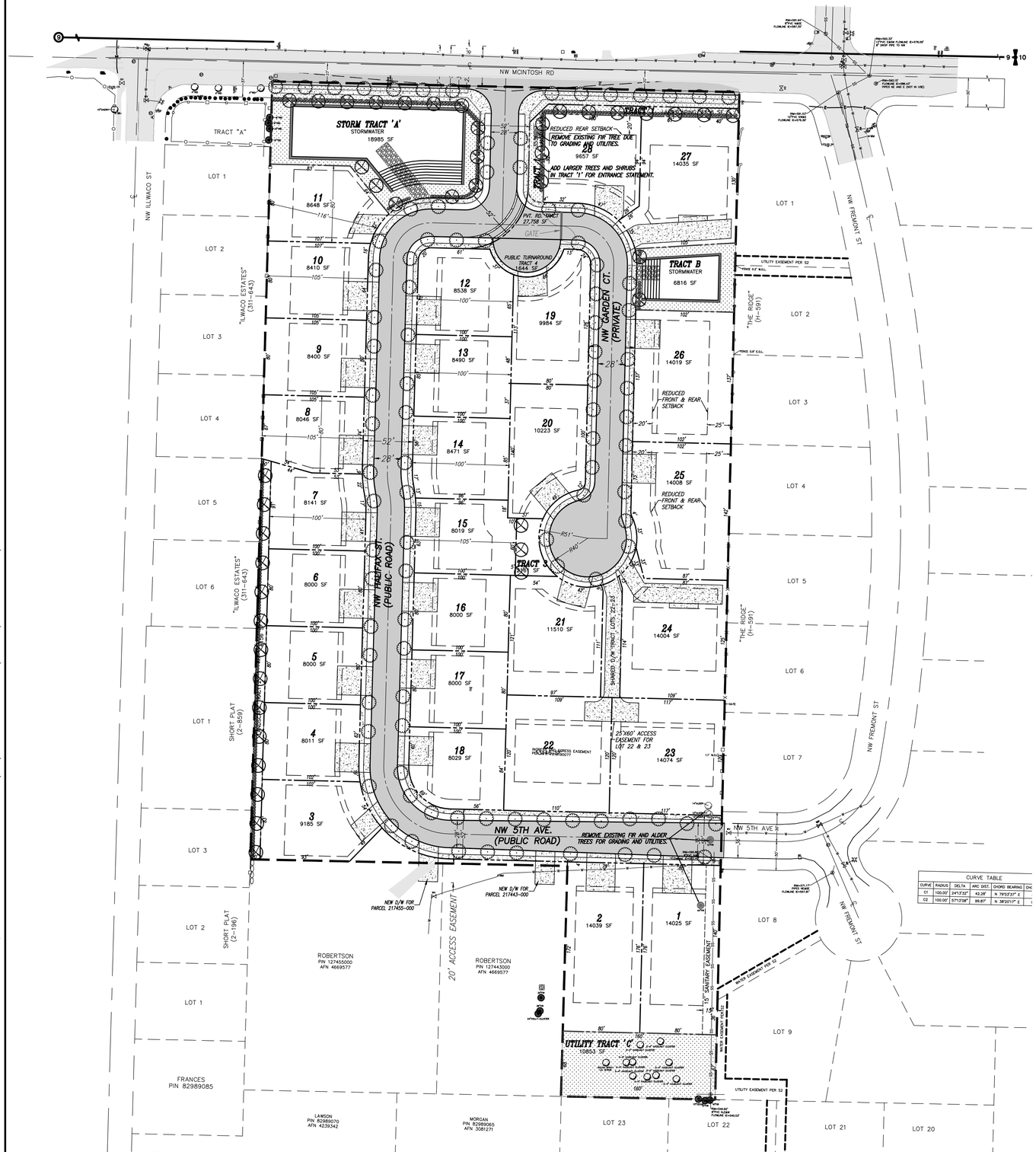

CURVE TABLE					
CURVE	RADIUS	DELTA	ARC DIST.	CHORD BEARING	CHO
C1	100.00'	241°37'33"	42.28'	N 79°03'31" E	
C2	100.00'	57°13'06"	99.87'	N 38°20'11" E	

PLANTING LEGEND

		SIZE	SPACING	QUANTITY
	ACER GINNALA 'FLAME' FLAME MAPLE or approved equal.	2" CAL.	30' O.C. OR AS SHOWN	97
	CORNUS KOUSA x FLORIDA 'PINK DOGWOOD' or approved equal.	2" CAL.	30' O.C. OR AS SHOWN	43
	PRUNUS LAUROCERASUS 'OTTO LUYKEN' OTTO LUYKEN LAUREL or approved equal.	2-5 GALLON	4' O.C.	348
	TURF GRASS or approved equal	N/A	AS SHOWN	27063 SF

Diameter at Breast Height "dbh"	Tree Units	Diameter at Breast Height "dbh"	Tree Units
1" to 5"	10- HAZELNUTS 1 = 10 TREE UNITS	31" to 32"	12
6" to 12"	2	33" to 34"	13
13" to 14"	3	35" to 36"	14
15" to 16"	4	37" to 38"	15
17" to 18"	5	39" to 40"	16
19" to 20"	6	41" to 42"	17
21" to 22"	7	43" to 44"	18
23" to 24"	8	45" to 46"	19
25" to 26"	9	47" to 48"	20
27" to 28"	10	49" to 50"	21
29" to 30"	11	For larger trees, allow a ½ tree unit for every additional inch of dbh.	

7.48 ACRES NET SITE AREA
X 20 TREE UNITS/ACRE REQUIRED
= 149.6 UNITS MINIMUM REQUIRED
10 TREE UNITS TO BE RETAINED.
+140 TREES PLANTED
= 150 TREE UNITS TOTAL FOR PROJECT

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LANDSCAPE ARCHITECTURE

2005 BROADWAY
VANCOUVER, WA 98663
PHONE (360)993-0911
FAX (360)993-0912

PRELIMINARY NOT FOR CONSTRUCTION

STATE OF WASHINGTON
LICENSED LANDSCAPE ARCHITECT

SCOTT A. TAYLOR
LICENSE NO. 1247
EXPIRES ON _____

PRELIMINARY LANDSCAPE & TREE PLAN

MCINTOSH SUBDIVISION

CITY OF CAMAS WASHINGTON

PRELIMINARY

REVISIONS
REVISED 2-6-23 BY S.A.T.

DESIGNED BY: SAT, JAI
DRAWN BY: SAT, JAI
CHECKED BY: SAT, JAI
SCALE: 1" = 60'

JOB NUMBER 2140
SHEET PRE4.0

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LANDSCAPING GENERAL NOTES:

1. DEVELOPER SHALL SUBMIT A LANDSCAPE PLAN SHOWING PLANT TYPE, LOCATION, AND QUANTITY OF PLANTS, THAT IS DESIGNED BY A QUALIFIED LANDSCAPE DESIGNER.
2. SHOW THE LOCATION OF SIDEWALK, LIGHT POLES, MAIL BOXES, DRIVEWAYS, FIRE HYDRANTS, INTERSECTIONS, AND ANY OTHER APPURTENANCE THAT MAY INFLUENCE THE PLACEMENT OF PLANTS.
3. LANDSCAPING SHALL BE SELECTED AND LOCATED TO DETER SOUND, FILTER AIR CONTAMINANTS, CURTAIL EROSION, MINIMIZE STORM WATER RUN-OFF, CONTRIBUTE TO LIVING PRIVACY, REDUCE THE VISUAL IMPACTS OF BUILDINGS/EQUIPMENT AND PAVED AREAS, SCREEN, REDUCE GLARE, AND EMPHASIZE OR SEPARATE OUTDOOR SPACES OF DIFFERENT USES OR CHARACTER.
4. LANDSCAPING SHALL BE DESIGNED TO BE HARMONIOUS WITH THE LOCAL SETTING AND WITH NEIGHBORING DEVELOPMENTS.
5. PLANTS AND TREES SHALL COMPLEMENT OR SUPPLEMENT SURROUNDING NATURAL VEGETATION.
6. PLANTS AND TREES CHOSEN SHALL BE IN SCALE WITH THE STRUCTURES AND EQUIPMENT DEVELOPMENT, KEEPING IN MIND THE MATURE SIZE OF PLANTINGS.
7. MINIMUM LANDSCAPING AS A PERCENT OF GROSS SITE AREA SHALL BE 15%.
8. DEVELOPER SHALL PROVIDE AN IRRIGATION PLAN.
   - 8.1 APPROPRIATE IRRIGATION SYSTEMS SHALL BE INSTALLED WHERE NEEDED TO ASSURE LANDSCAPING SUCCESS.
   - 8.2 DESIGN OF LANDSCAPING THAT INCLUDES XERISCAPE PRINCIPLES IS ENCOURAGED TO REDUCE LONG-TERM MAINTENANCE DEMANDS AND TO CONSERVE WATER.
   - 8.3 XERISCAPE IS DEFINED AS LANDSCAPE DESIGN, WHICH WOULD INCORPORATE PLANT MATERIALS THAT REQUIRE LITTLE OR NO IRRIGATION AND RELY ON NATURAL MOISTURE AND RAINFALL FOR SURVIVAL ONCE ESTABLISHED.
9. LANDSCAPE SHALL BE DESIGNED WITH MAINTENANCE IN MIND:
   - 9.1 DEVELOPER SHALL PROVIDE A MAINTENANCE PLAN DESCRIBING FUNDING, RESPONSIBILITY, AND FREQUENCY OF MAINTENANCE.
   - 9.2 PLANTS AND TREES THAT MINIMIZE UPKEEP AND MAINTENANCE SHALL BE SELECTED.
   - 9.3 TREES, AS THEY GROW, SHALL BE PRUNED TO THEIR NATURAL FORM TO PROVIDE AT LEAST 10 FEET OF CLEARANCE ABOVE SIDEWALKS AND 12 FEET ABOVE STREET ROADWAY SURFACES.
   - 9.4 SHRUBS SHALL BE MAINTAINED TO A MAXIMUM HEIGHT OF 42 INCHES FROM TOP OF CURB TO TOP OF PLANT. ENSURE THAT SHRUBS ARE TRIMMED BACK FROM FACE OF CURB.
10. WHERE THERE ARE OVERHEAD UTILITY LINES, TREE SPECIES THAT WILL NOT INTERFERE WITH THOSE LINES SHALL BE CHOSEN. DEVELOPER IS TO VERIFY WITH UTILITY ON SPECIES SELECTION.
11. TREES SHALL NOT BE PLANTED WITHIN 2 FEET OF ANY PERMANENT HARD SURFACE PAVING OR WALKWAY.
12. PARKING AND LOADING AREAS SHALL BE SCREENED FROM HORIZONTAL VIEW WITH THE USE OF DENSE LANDSCAPING, MOUNDS OR BERMS.
13. PERIMETER AND SECURITY FENCING SHALL BE CONSTRUCTED TO MINIMIZE VISUAL IMPACT. WALLS OR FENCES SEPARATING ADJOINING PARCELS MAY BE LOCATED AT THE PROPERTY LINE. SECURITY FENCING SHALL BLEND INTO AND BE COMPATIBLE WITH LANDSCAPING AND SURROUNDING ENVIRONMENT. FENCING SHALL HAVE EARTH TONE COLORS OF BROWN, TAN GRAY, OR GREEN, WALLS SHALL BE CONSTRUCTED OF MATERIALS COMPATIBLE WITH THE BUILDING ACHITECTURE, LANDSCAPING, AND SURROUNDING ENVIRONMENT.
14. SITE AND BUILDING LIGHTING SHALL BE DESIGNED TO MINIMIZE GLARE OR OBJECTIONABLE EFFECTS TO THE ADJACENT PROPERTIES. SITE LIGHTING POLES SHALL NOT EXCEED 20 FEET IN HEIGHT AND SHALL DIRECT THE LIGHT DOWNWARD. LIGHTING SOURCES VIEWED FROM ABOVE OR BELOW ON ADJACENT PROPERTY SHALL BE SHIELDED. BUILDING LIGHTING IS TO BE CONCEALED AND INDIRECT. SITE LIGHTING IS TO BE DESIGNED TO PROVIDE UNIFORM DISTRIBUTION AND THE LIGHT LEVELS SHALL BE ADEQUATE FOR REASONABLE SECURITY AND SAFETY ON THE PREMISES.
15. EARTH BERMS MAY BE USED TO PROVIDE VARIATION IN THE GROUND PLANE AND FOR SCREENING INTERIOR PROTIONS OF THE SITE. CARE MUST BE TAKEN IN THEIR DESIGN TO AVOID CREATING AN ARTIFICIAL APPEARING LANDSCAPE. THE BERMED AREAS SHALL BE AS LONG, AS GRADUAL, AND AS GRACEFUL AS SPACE WILL ALLOW, AND SHOULD HAVE A MINIMUM HEIGHT ABOVE SURROUNDING GRADE OF THREE FEET. MAXIMUM SLOPES FOR BERMED AREAS SHALL BE 3:1 FOR TURF AREAS AND 2:1 FOR GROUNDCOVER AREAS.

LANDSCAPING W/IN R.O.W. NOTES:

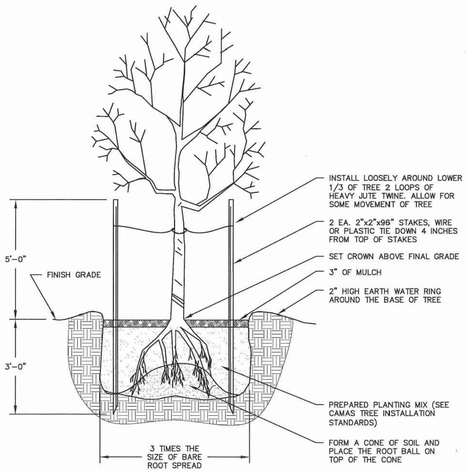
1. TREES SHALL NOT BE PLANTED CLOSER THAN 25 FEET FROM THE CURB LINE OF THE INTERSECTIONS OF STREETS OR ALLEYS, AND NOT CLOSER THAN 10 FEET FROM DRIVEWAYS, FIRE HYDRANTS, OR UTILITY POLES.
2. STREET TREES SHALL NOT BE PLANTED CLOSER THAN 20 FEET TO LIGHT STANDARDS. EXCEPT FOR PUBLIC SAFETY, NO NEW LIGHT STANDARD SHOULD BE POSITIONED CLOSER THAN 10 FEET TO ANY EXISTING STREET TREE, AND PREFERABLY SUCH LOCATIONS WILL BE AT LEAST 20 FEED DISTANCE.
3. TREES SHALL NOT BE PLANTED CLOSER THAN 2-1/2 FEET FROM THE FACE OF THE CURB EXCEPT AT INTERSECTIONS, WHERE IT SHOULD BE 25 FEET FROM THE CURB IN A CURB RETURN AREA..
4. EXISTING TREES MAY BE USED AS STREET TREES IF THERE WILL BE NO DAMAGE FROM THE DEVELOPMENT WHICH WILL KILL OR WEAKEN THE TREE.
5. VISION CLEARANCE HAZARDS SHALL BE AVOIDED AND VISION CLEARANCE STANDARDS SHALL BE ADHERED TO.

City of Camas WASHINGTON — LANDSCAPE DETAIL — LANDSCAPING NOTES — NOT TO SCALE — DETAIL NO. LS1
DETAIL APPROVED BY — DATE 5-17-19 — REVISION: 3 — DATE: 5/17/2019
ST-PI ANTING.DWG

PLANTING NOTES:

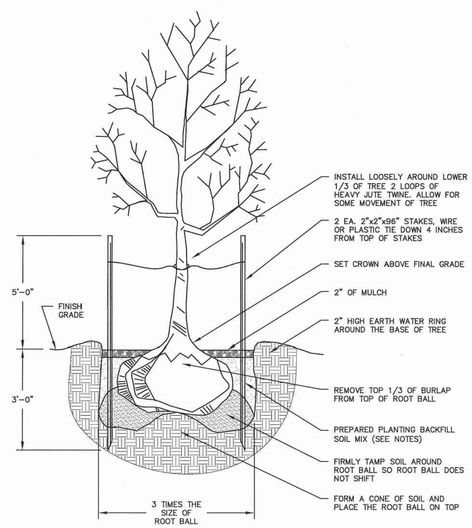
1. ALL PLANTING TO BE OF NURSERY STOCK GRADE NO. 1 OR BETTER AND MUST BE APPROVED PRIOR TO PLANTING.
2. ALL PLANTING HOLES SHALL BE EXCAVATED THREE TIMES THE DIAMETER OF THE TREE ROOT BALL OR ROOT SYSTEM.
3. DECIDUOUS TREES SHALL HAVE STRAIGHT TRUNKS, BE FULL BRANCHED, HAVE A MINIMUM CALIPER OF 2 INCHES AND BE ADEQUATELY STAKED FOR PLANTING. CALIPER OF TREES SHALL BE LARGER WHEN REQUIRED BY OTHER CITY STANDARDS OR PLANS.
4. EVERGREEN TREES SHALL BE A MINIMUM OF THREE FEET IN HEIGHT, FULLY BRANCHED AND ADEQUATELY STAKED FOR PLANTING.
5. DECIDUOUS TREES SHALL BE A MINIMUM 2" CALIPER UNLESS APPROVED BY THE CITY.
6. POTTED OR B&B PLANTS SHALL BE A MINIMUM SIZE OF 3 GALLONS UNLESS APPROVED BY THE CITY..
7. SHRUBS SHALL BE PLANTED ACCORDING TO RECOGNIZED LANDSCAPE STANDARD PRACTICE FOR MAINTENANCE, APPEARANCE, HEALTH OF THE PLANTS, AND OVERALL AESTHETICS.
8. PLANT UPRIGHT AND FACE TO GIVE BEST APPEARANCE OR RELATIONSHIP TO OTHER PLANTS AND STRUCTURES.
   - 8.1. LOOSEN AND REMOVE TWINE BINDING AND BURLAP FROM AROUND THE TOP OF EACH ROOT BALL.
   - 8.2. SET TREES AN INCH ABOVE FINISH GRADE.
   - 8.3. STAKE OR GUY TREES IMMEDIATELY AFTER PLANTING (SEE DETAIL PL3, PL4, & PL5)
   - 8.4. REMOVE STAKES OR GUY WIRES ONE YEAR AFTER INSTALLATION.
9. PLACE AND COMPACT BACKFILL SOIL MIXTURE CAREFULLY TO AVOID INJURY TO ROOTS, AND TO FILL ALL VOIDS. BACKFILL MIX SHALL CONSIST OF 1/4 APPROVED HUMUS MATERIAL TO 3/4 TOPSOIL, PLUS SOIL AMENDMENTS/FERTILIZERS AS PER SOIL ANALYSIS (TO BE PERFORMED PRIOR TO PLANTING TREES).
10. WHEN HOLE IS NEARLY FILLED, COMPLETELY SOAK AND ALLOW WATER TO DRAIN AWAY. FILL HOLE TO FINISH GRADE. PROVIDE 2 INCH HIGH BERM WATER RING AT THE BASE OF EACH TREE. REMOVE BERM AT THE END OF CONTRACT MAINTENANCE PERIOD.
11. GROUND COVER, SHALL BE PLANTED ACCORDING TO RECOGNIZED LANDSCAPE STANDARD PRACTICE FOR MAINTENANCE, APPEARANCE, OVERALL AESTHETICS, AND HEALTH OF THE PLANTS.
12. TREES, AS THEY GROW, SHALL BE PRUNED TO THEIR NATURAL FORM TO PROVIDE AT LEAST 10 FEET OF CLEARANCE ABOVE SIDEWALKS AND 14 FEET ABOVE STREET ROADWAY SURFACES.
13. TREE MAINTENANCE – IN ORDER TO INSURE ESTABLISHMENT, SURVIVAL AND GROWTH, TREES SHALL BE MULCHED WITH 4" DEEP COMPOST AND WATERED AS NECESSARY DURING THE FIRST TWO GROWING SEASONS. PRUNING TO BE AS FOLLOWS:
   - 13.1. YEAR 1 – ONLY DEAD, BROKEN, OR CROSSING BRANCHES SHALL BE PRUNED.
   - 13.2. YEAR 2 – A CLASS 1 PRUNE, PURSUANT TO NATIONAL ARBORIST ASSOCIATION STANDARDS, SHALL BE PERFORMED. THE PURPOSE OF THIS PRUNING IS TO ESTABLISH PROPER SCAFFOLD BRANCHING, RAISE THE CROWN FOR ROAD/SIDEWALK CLEARANCE, AND REMOVE ANY DEAD, DYING OR CROSSING BRANCHES.
   - 13.3. YEAR 3 – A CLASS 1 PRUNE, PURSUANT TO NATIONAL ARBORIST ASSOCIATION STANDARDS, SHALL BE PERFORMED. THE PURPOSE OF THIS PRUNING IS TO CONTINUE TO ESTABLISH THE PROPER SCAFFOLD BRANCHING, CONTINUE TO RAISE THE CROSSING FOR ROAD/SIDEWALK CLEARANCE, AND TO REMOVE ANY DEAD, DYING, OR CROSSING BRANCHES.
14. DEFINITIONS:
   - 14.1. BALLED AND BURLAPPED (B&B) – TREES AND SHRUBS WITH A LARGE BALL OF SOIL AROUND THE ROOTS WRAPPED IN BURLAP.
   - 14.2. BARE-ROOT – OFFERED BY NURSERIES IN WINTER AND EARLY SPRING WITH ALL THE SOIL REMOVED FROM THEIR ROOTS.
   - 14.3. CALIPER – THE DIAMETER OF THE TRUNK MEASURED AT 4-FEET FROM THE GROUND.
   - 14.4. GROUND COVER – LIVING MATERIAL THAT DOES NOT INCLUDE BARK CHIPS OR OTHER MULCH.

City of Camas WASHINGTON — LANDSCAPE DETAIL — PLANTING NOTES — NOT TO SCALE — DETAIL NO. LS2
DETAIL APPROVED BY — DATE 5-17-19 — REVISION: 3 — DATE: 5/17/2019
ST-PI ANTING.DWG



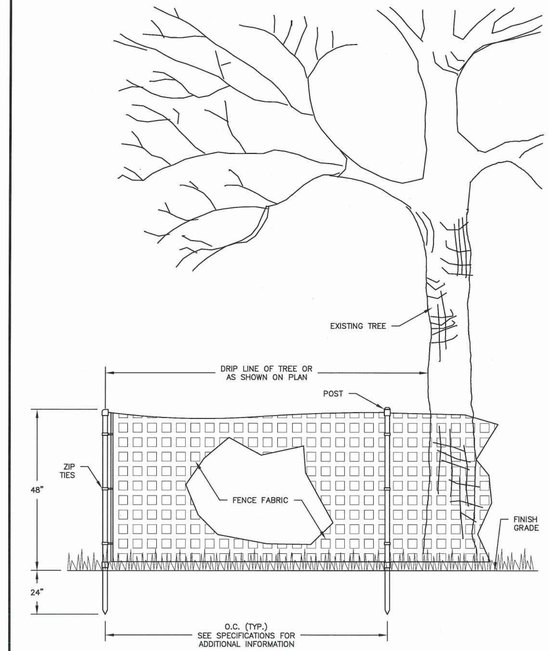
NOTES:
1. A ROOT BARRIER SHOULD BE INSTALLED AT THE EDGE OF PAVEMENT OR 4 FEET WIDE AND 6 FEET LONG RECTANGLE AROUND THE TREE. SEE DETAILS PL7, PL8 & PL9
2. BACKFILL MIX SHALL CONSIST OF THE FOLLOWING: 0.75 PART TOPSOIL, 0.25 PART APPROVED HUMUS MATERIAL, SOIL AMENDMENTS/FERTILIZERS AS PER SOIL ANALYSIS (TO BE PERFORMED BEFORE PLANTING TREES).

City of Camas WASHINGTON — LANDSCAPE DETAIL — BARE ROOT PLANTING — NOT TO SCALE — DETAIL NO. LS3
DETAIL APPROVED BY — DATE 5-17-19 — REVISION: 2 — DATE: 5/17/2019
ST-PI ANTING.DWG



NOTES:
1. A ROOT BARRIER SHOULD BE INSTALLED AT THE EDGE OF PAVEMENT OR 4 FEET WIDE AND 6 FEET WIDE RECTANGLE AROUND THE TREE. SEE DETAILS PL7, PL8 & PL9
2. BACKFILL MIX SHALL CONSIST OF THE FOLLOWING: 0.75 PART TOPSOIL, 0.25 PART APPROVED HUMUS MATERIAL, SOIL AMENDMENTS/FERTILIZERS AS PER SOIL ANALYSIS (TO BE PERFORMED BEFORE PLANTING TREES).

City of Camas WASHINGTON — LANDSCAPE DETAIL — DECIDUOUS BALLED/BURLAP TREE PLANTING — NOT TO SCALE — DETAIL NO. LS4
DETAIL APPROVED BY — DATE 5-17-19 — REVISION: 2 — DATE: 5/17/2019
ST-PLANTING.DWG



City of Camas WASHINGTON — LANDSCAPE DETAIL — TREE PROTECTION FENCE DETAIL — NOT TO SCALE — DETAIL NO. LS6
DETAIL APPROVED BY — DATE 5-17-19 — REVISION: 2 — DATE: 5/17/2019
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PRELIMINARY — JOHN A. TERMILLIA — 19005 — REGISTERED PROFESSIONAL ENGINEER

PRELIMINARY LANDSCAPE DETAILS

MCINTOSH SUBDIVISION

CITY OF CAMAS — WASHINGTON

PRELIMINARY

REVISIONS

DESIGNED BY:	SAT, JAI
DRAWN BY:	SAT, JAI
CHECKED BY:	SAT, JAI
SCALE:	########

JOB NUMBER 2140 — SHEET PRE4.1

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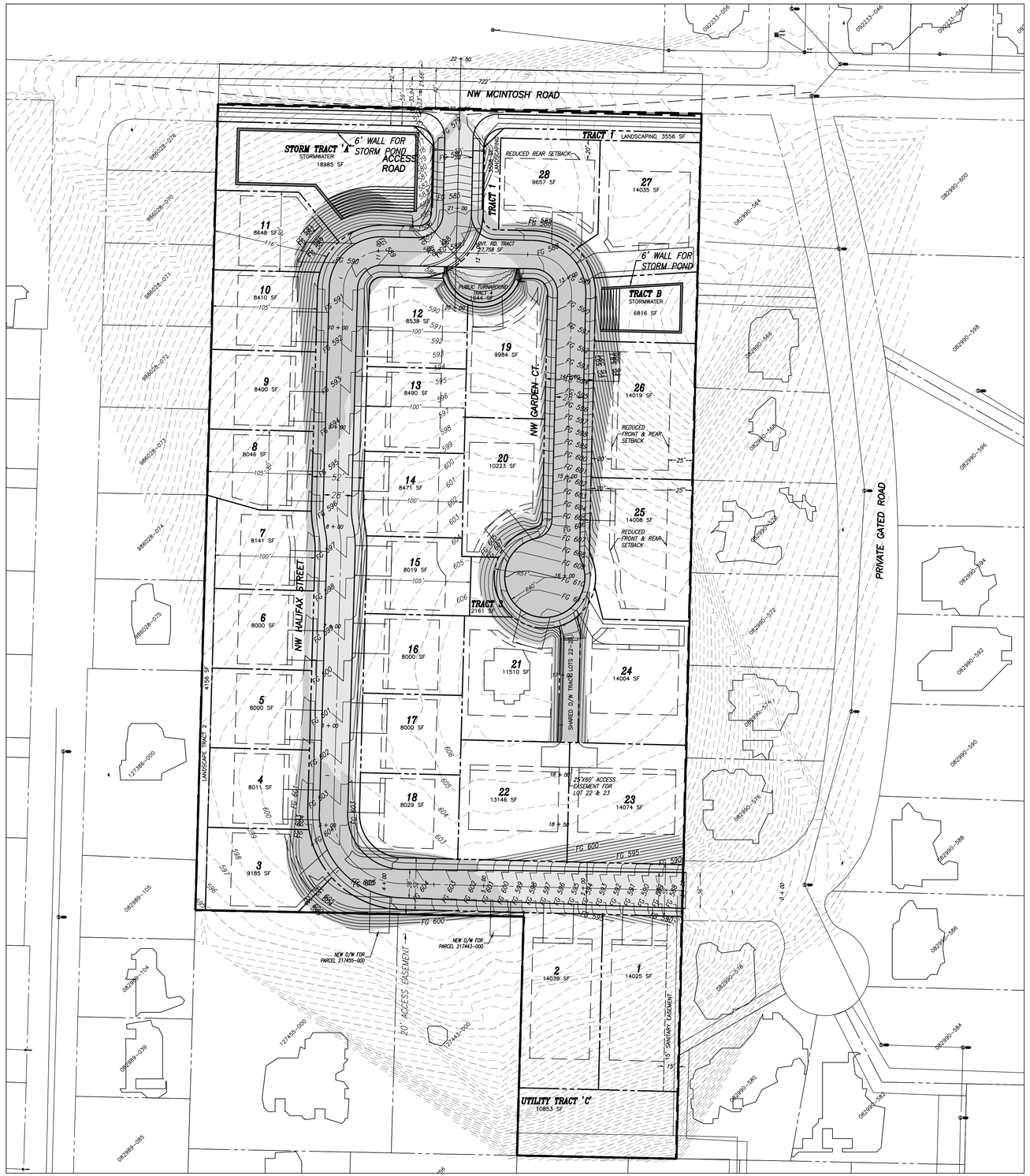

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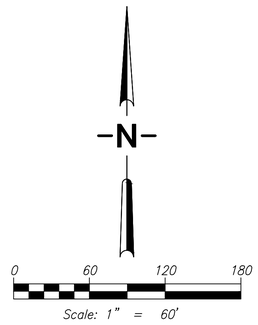
FILL 9000 CY



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PHONE (360)993-0911
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PRELIMINARY GRADING SHEET

MCINTOSH SUBDIVISION

CITY OF CAMAS WASHINGTON

PRELIMINARY

REVISIONS

REVISED 2-6-23 BY S.A.T.

DESIGNED BY:	SAT, JAI
DRAWN BY:	SAT, JAI
CHECKED BY:	SAT, JAI
SCALE:	1"=60'

JOB NUMBER	SHEET
2140	PRE5.0

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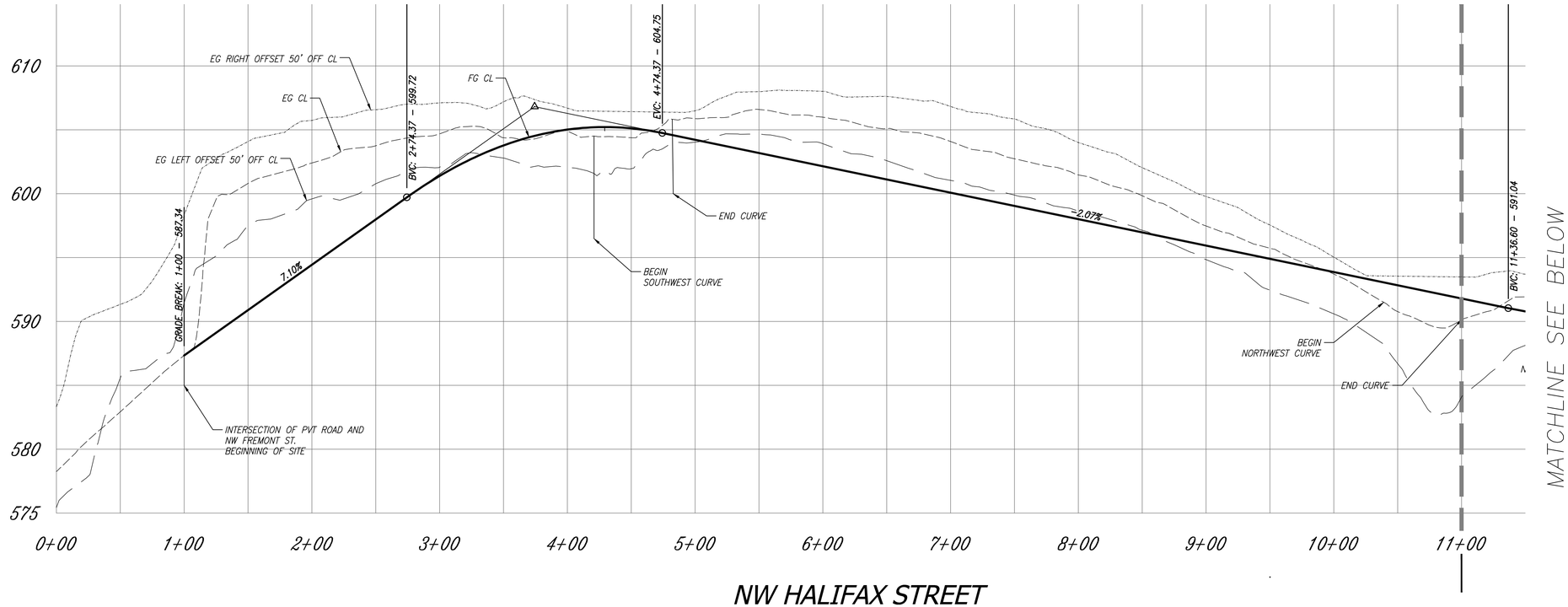

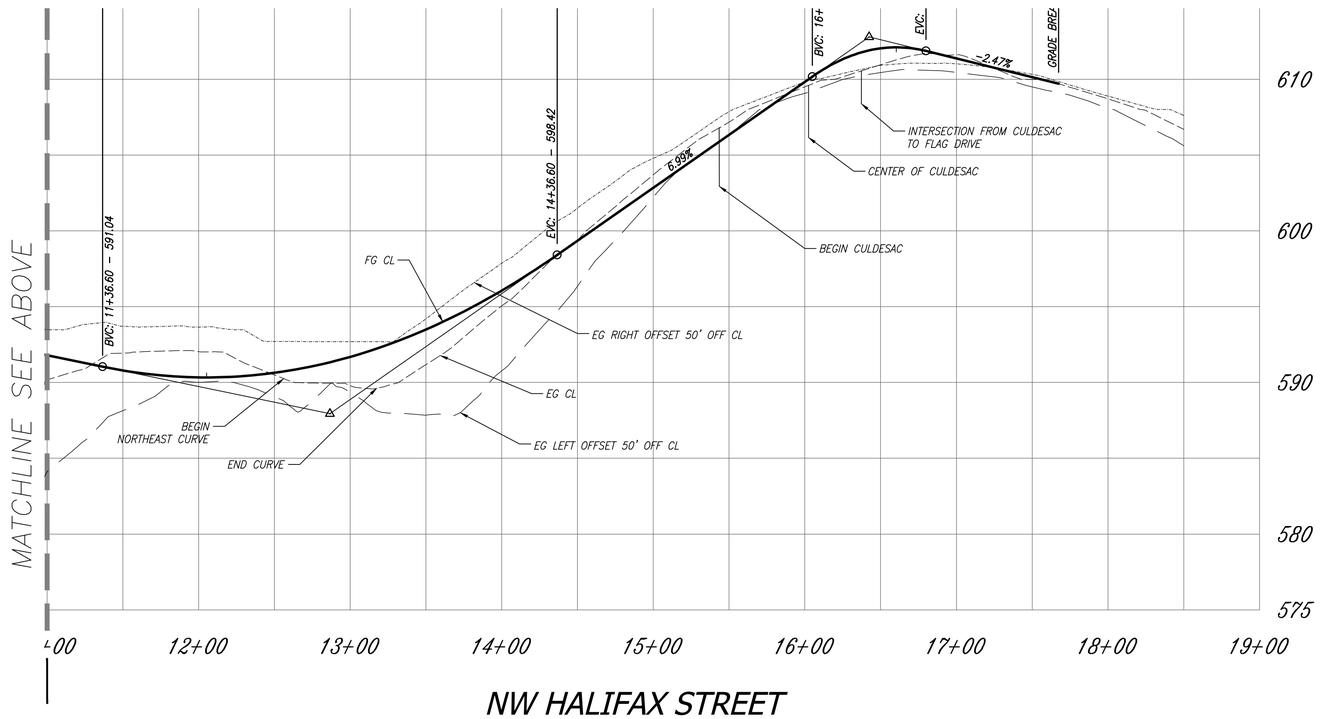

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PRELIMINARY NOT FOR CONSTRUCTION
JOHN A. INVERNIZZI
STATE OF WASHINGTON
21605
REGISTERED
PROFESSIONAL ENGINEER

PRELIMINARY PROFILE SHEET

MCINTOSH SUBDIVISION

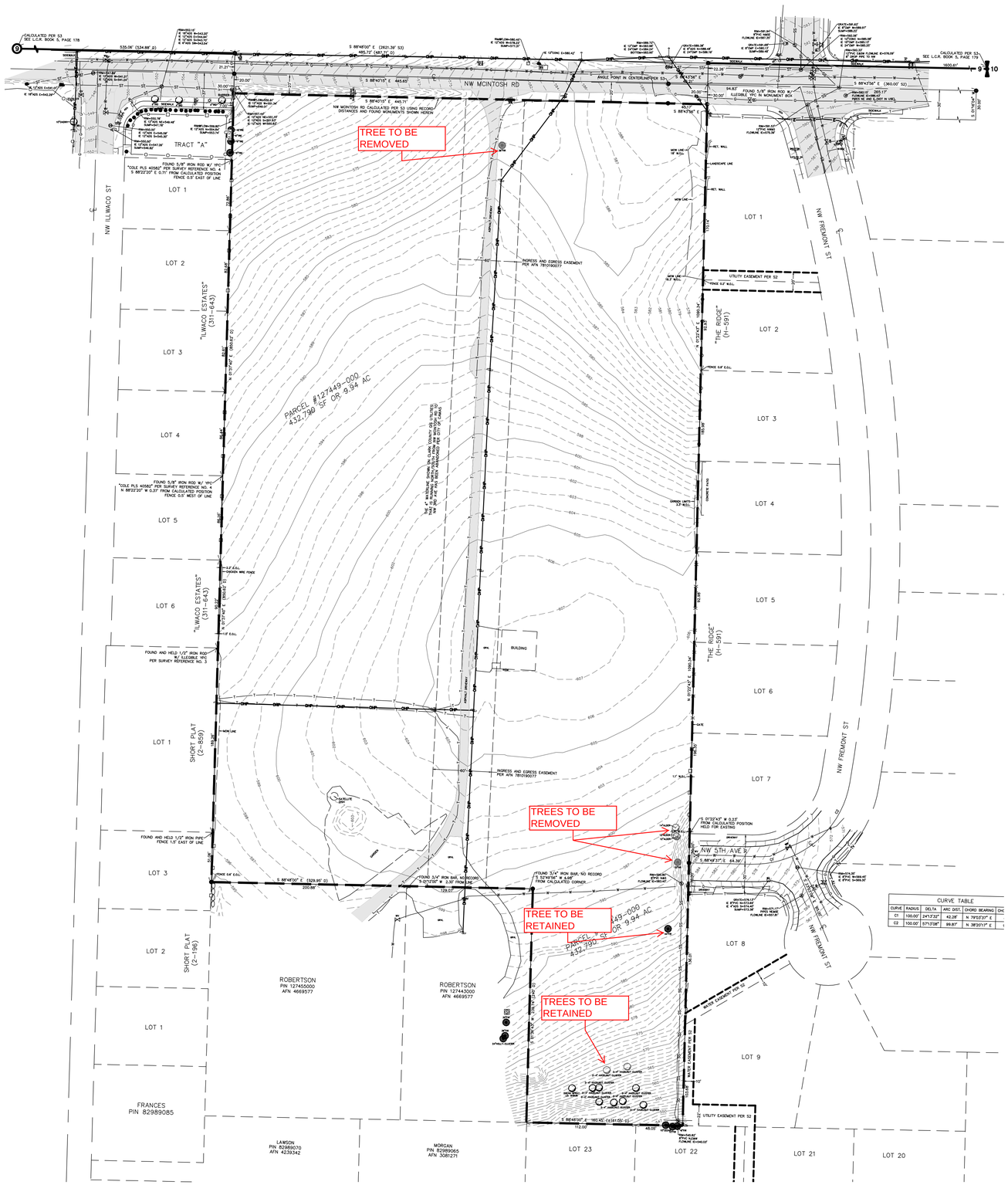
CITY OF CAMAS WASHINGTON

PRELIMINARY

REVISIONS

DESIGNED BY:	SAT, JAI
DRAWN BY:	SAT, JAI
CHECKED BY:	SAT, JAI
SCALE:	1"=60'

JOB NUMBER	SHEET
2140	PRE5.1


NW MCINTOSH RD
S 88°40'00" E (2621.39' SS)
455.72' (487.31' SS)
S 88°40'15" E 445.65'
S 88°40'15" E 445.71'
NW MCINTOSH RD. CALCULATED PER SS USING RECORD DISTANCES AND FOUND MONUMENTS SHOWN HEREIN
ANGLE POINT IN CENTERLINE PER SS
S 88°43'56" E (360.00' SS)
CALCULATED PER SS SEE L/C/R BOOK 5, PAGE 178
SEE L/C/R BOOK 5, PAGE 179
1600.61'
535.06' (534.88' SS)
TRACT "A"
NW ILLWACO ST
NW FREMONT ST
LOT 1
LOT 2
LOT 3
LOT 4
LOT 5
LOT 6
LOT 7
LOT 8
LOT 9
"ILWACO ESTATES" (311-643)
"THE RIDGE" (H-591)
SHORT PLAT (2-859)
SHORT PLAT (2-196)
PARCEL #127449-000
432,790 SF OR 9.94 AC
INGRESS AND EGRESS EASEMENT PER AFN 7810190077
UTILITY EASEMENT PER 52
TREE TO BE REMOVED
TREES TO BE REMOVED
TREE TO BE RETAINED
TREES TO BE RETAINED
FOUND 5/8" IRON ROD W/ YPC "COLE PLS 40582" PER SURVEY REFERENCE NO. 4 S 88°22'20" E 0.71' FROM CALCULATED POSITION FENCE 0.5' EAST OF LINE
FOUND 5/8" IRON ROD W/ YPC "COLE PLS 40582" PER SURVEY REFERENCE NO. 4 N 88°22'20" W 0.37' FROM CALCULATED POSITION FENCE 0.5' WEST OF LINE
FOUND AND HELD 1/2" IRON ROD W/ SUSSLE YPC PER SURVEY REFERENCE NO. 3
FOUND AND HELD 1/2" IRON PIPE FENCE 1.0' EAST OF LINE
FOUND 5/8" IRON ROD W/ YPC "COLE PLS 40582" PER SURVEY REFERENCE NO. 4 S 88°22'20" E 0.37' FROM CALCULATED POSITION FENCE 0.5' EAST OF LINE
FOUND 5/8" IRON ROD W/ YPC "COLE PLS 40582" PER SURVEY REFERENCE NO. 4 N 88°22'20" W 0.37' FROM CALCULATED POSITION FENCE 0.5' WEST OF LINE
FOUND 3/4" IRON BAR, NO RECORD S 52°40'56" W 0.08' FROM CALCULATED CORNER
FOUND 5/8" IRON ROD W/ YPC "COLE PLS 40582" PER SURVEY REFERENCE NO. 4 S 01°20'43" W 0.23' FROM CALCULATED POSITION HELD FOR EASTING
FOUND 5/8" IRON ROD W/ YPC "COLE PLS 40582" PER SURVEY REFERENCE NO. 4 S 01°07'00" W 0.30' FROM ANGLE

COMMUNITY DEVELOPMENT DEPARTMENT
616 NE 4th Avenue
Camas, WA 98607
www.ci.camas.wa.us

October 6, 2022

SGA Engineering & Design
Attn: Scott Taylor
Sent via email staylor@sgaengineering.com

RE: Application Completeness – Second Review - for Planning Case SUB22-04: McIntosh Subdivision

Dear Scott Taylor,

Thank you for your recent resubmittal. Upon review of the additional information, there are items that are still needed in order to move forward with the review process. Once the items below are submitted, staff will review the information to verify whether the application can be deemed complete.

Items necessary for completeness:

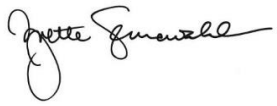
- Planning:
  - Upon further review, it appears we do not have an application/fee for the variances associated with this project. Please submit the Major Variance Fee in the amount of $1,295.00. The Variances required for this project include:
    A. A Minor Variance for 3 lots to allow a 95' lot width where the minimum lot width in the R-10 Zone requires 100-feet. (Which lots does this apply to?)
    B. A Major Variance to allow a lot coverage of 50% where the maximum lot coverage in the R-10 Zone is 35%. (Which lots does this apply to?)
  - Although the development sign has been installed, a photo of the sign has not been submitted for our files.
- Engineering:
  - Preliminary grading plan, sheet 5.0, and the retaining wall for the storm facility on Tract A:
    - The wall is not to exceed 8-feet without stepping the wall back 2-feet for that portion over 6-feet; or split the difference in height based on the 100-foot-high water elevation.
    - Please provide cross sections and profiles for both retaining walls.
    - The preliminary grading plans need to be revised to match the preliminary plat, as the proposed private road is labeled 'NW Fremont St.' and the public road is labeled as a 'private loop'.
  - Preliminary Plat:
    - NW Garden Ct. is approximately 420-feet in length. Per CMC 17.19.040.B.10.b.iii a ped/bicycle connection is required to the nearest public road, e.g. NW Halifax St.
  - Per the Pre-App Notes:
    - Per CMC 17.19.040.B.6: The proposed public road extension from the east is to be the same or greater width of the existing road:
      - The existing road to the east consists of 60-foot ROW, 36-feet of paved

surfacing, 5-foot sidewalks and planter strips on both sides, which meets public road standard B.

- The revised preliminary plat shows a proposed public road meeting public road standard A, which consists of a 52-foot ROW and 28-feet of paved surfacing. A deviation from public road standard B, has not been requested.
- If a deviation is requested and supported, the plan should provide a taper that matches the existing curb, pavement surface, sidewalks, and planter strips to the east.

If you have any questions related to this project, please feel free to contact me by email: YSennewald@cityofcamas.us or by phone: (360) 817-7269.

Respectfully,



Yvette Sennewald
Senior Planner

COMMUNITY DEVELOPMENT DEPARTMENT
616 NE 4th Avenue
Camas, WA 98607
www.ci.camas.wa.us

October 6, 2022

SGA Engineering & Design
Attn: Scott Taylor
Sent via email staylor@sgaengineering.com

RE: Application Completeness – Second Review - for Planning Case SUB22-04: McIntosh Subdivision

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Thank you for your recent resubmittal. Upon review of the additional information, there are items that are still needed in order to move forward with the review process. Once the items below are submitted, staff will review the information to verify whether the application can be deemed complete.

Items necessary for completeness:

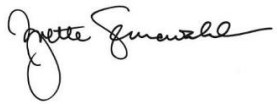
- Planning:
  - Upon further review, it appears we do not have an application/fee for the variances associated with this project. Please submit the Major Variance Fee in the amount of $1,295.00. The Variances required for this project include:
    A. A Minor Variance for 3 lots to allow a 95' lot width where the minimum lot width in the R-10 Zone requires 100-feet. (Which lots does this apply to?) None. The revised plat does not need a lot depth variance.
    B. A Major Variance to allow a lot coverage of 50% where the maximum lot coverage in the R-10 Zone is 35%. (Which lots does this apply to?) All of the lots.
  - Although the development sign has been installed, a photo of the sign has not been submitted for our files. Photo of sign was uploaded to the dropbox for this project.
- Engineering:
  - Preliminary grading plan, sheet 5.0, and the retaining wall for the storm facility on Tract A:
    - The wall is not to exceed 8-feet without stepping the wall back 2-feet for that portion over 6-feet; or split the difference in height based on the 100-foot-high water elevation. The wall height will be reduced to 6 feet tall or stepped with the final grading and stormwater design, This can be conditioned.
    - Please provide cross sections and profiles for both retaining walls. This level of engineering detail will be provided with construction plans.
    - The preliminary grading plans need to be revised to match the preliminary plat, as the proposed private road is labeled 'NW Fremont St.' and the public road is labeled as a 'private loop'. The grading plans have been updated to reflect the correct street names.
  - Preliminary Plat:
    - NW Garden Ct. is approximately 420-feet in length. Per CMC 17.19.040.B.10.b.iii a ped/bicycle connection is required to the nearest public road, e.g. NW Halifax St. A deviation request has been submitted for relief from this requirement. All of the justification and approval criteria has been satisfied.
  - Per the Pre-App Notes:
    - Per CMC 17.19.040.B.6: The proposed public road extension from the east is to be the same or greater width of the existing road:
      - The existing road to the east consists of 60-foot ROW, 36-feet of paved

surfacing, 5-foot sidewalks and planter strips on both sides, which meets public road standard B. The project is requesting a deviation to engineering standards for the reduced width right-of-way on-site and a taper to the existing road widths to the east.

- The revised preliminary plat shows a proposed public road meeting public road standard A, which consists of a 52-foot ROW and 28-feet of paved surfacing. A deviation from public road standard B, has not been requested. The project is requesting a deviation to engineering standards for public road B.
- If a deviation is requested and supported, the plan should provide a taper that matches the existing curb, pavement surface, sidewalks, and planter strips to the east. The project will provide a taper to the existing road widths to the east.

If you have any questions related to this project, please feel free to contact me by email: YSennewald@cityofcamas.us or by phone: (360) 817-7269.

Respectfully,



Yvette Sennewald
Senior Planner

MCINTOSH SUBDIVISION

DEVIATION TO ENGINEERING STANDARDS NARRATIVE

Request for:

-Relief from CMC 17.19.040.B.6 The proposed public road extension from the east is to be the same or greater width of the existing road. NW 5th Ave. to the east has 52 feet of right-of-way and 28 feet of paved surfacing. This project request a deviation from public road standard B.

- Relief from CMC 17.19.040.B.10.b.iii a ped/bicycle connection is required to the nearest public road. NW Garden Court (Private Road) is requesting to not connect to NW Halifax Street (Public Road).

- Relief from intersection spacing along NW McIntosh Road. CDSM, Access Spacing Standards: The minimum access spacing standard on an arterial is 660-feet with a maximum of 1,000-feet.

This request meets the following justification criteria:
City code listed below with applicant responses in ***Bold Italics.***

14.02.110 - Deviations.

The approval authority may authorize deviations from the minimum requirements of this chapter pursuant to a Type II decision or as part of a consolidated review process . Any decision to approve a deviation shall include affirmative findings addressing the following: ***This is part of a type III subdivision consolidated review process.***

A.The deviation provides for the use of low impact development practices for stormwater management; or ***These deviations are intended to reduce the amount of impervious surfaces in the project.***

B.The deviation shall be limited and shall provide equivalent environmental protection. ***The deviation reduces pollution generating road surfaces which provides increased environmental protection.***

1.The deviation shall be based on sound engineering practices, with the objectives of safety, function, environmental protection, and facility maintenance considered. ***The deviations support all of these criteria. -By reducing road widths for lower volume roadways the amount of stormwater runoff will be reduced. There is less need and volume of stormwater runoff/detention.***
-The removal of a mid-block ped/bicycle connection increases safety. The private road is proposed with a vehicle gate. The sidewalks entering Garden Court are open and can remain open for safe and convenient pedestrian and bicycle circulation. This gate can be monitored for safety. The applicant does not want to have a second sidewalk connection between the cul-de-sac and Halifax Street. This is unnecessary for the short private road. All pedestrian, vehicular and bicycle traffic from this development will go north to McIntosh Road. All of the traffic from the adjacent developments on NW Illwaco St. and NW Fremont St. drive directly north to McIntosh Road. Neither of the developments to the east, south or west have provided cross block pedestrian paths.
-The proposed deviations will function adequately for vehicle and pedestrian/bicycle circulation.
- The deviation reduces pollution generating road surfaces which provides increased environmental protection.

MCINTOSH SUBDIVISION

- Facility maintenance will be reduced for both of these deviations. Additional stormwater treatment and detention will not be needed for the reduced roadway section. That creates less maintenance for the city and HOA on the private and public portions of the stormwater systems. By removing the unnecessary mid-block sidewalk connection the HOA will not be encumbered by safety/access concerns into their gated street. They will not need to deal with additional fence installation and long term maintenance. The biggest concern would be graffiti maintenance and privacy for those neighbors.

2.The deviation requested does not necessitate the need for additional deviations, exceptions, or variances from the Camas Municipal Code. ***These deviations are the minimum necessary to provide this development with the same safe environment and high functioning neighborhood design as the adjacent subdivisions. No additional deviations, exceptions or variances are being requested related to these three deviations discussed in this narrative. The third deviation for reduced intersection spacing is the only location this project can connect to McIntosh Road which is a city circulation requirement, per the pre-application. Page 5 of the pre-application staff report says, "Due to the site constraints on either side of the proposed development, i.e. there are developed parcels to the east and west of the proposed development, a deviation request from the minimum access spacing standards would be supported by the City Engineer." This project has centrally located our public road, NW Halifax St. with the existing public roads to the east and west, NW Illwaco St. and NW Fremont St.***

Any authorization for deviation may prescribe conditions deemed necessary or desirable for the public interest. ***Conditions of approval will be warranted for the taper specifications from City staff on NW 5th Avenue. No additional conditions of approval should be warranted for the removal of a mid-block pedestrian connection between Garden Ct. and Halifax St. based on the justification above. Additional conditions of approval may be warranted for the reduced intersection spacing along NW McIntosh Road. Sight distance has been verified by the traffic engineer. Additional safety signage may be required by city staff.***

(Ord. No. 16-019 , § I(Exh. A), 11-21-2016)

Thank you for your consideration of this request. Please contact Scott Taylor or Joe Intermill of SGA Engineering with any questions or concerns at 360-993-0911.

Scott Taylor, Planner

Joe Intermill IV, P.E.

JOE A. INTERMILL IV
STATE OF WASHINGTON
54905
REGISTERED
PROFESSIONAL ENGINEER

10/31/2022

COMMUNITY DEVELOPMENT DEPARTMENT
616 NE 4th Avenue
Camas, WA 98607
www.cityofcamas.us

November 7, 2022

SGA Engineering & Design
Attn: Scott Taylor
Sent via email staylor@sgaengineering.com

RE: Application Completeness Review for Planning Case SUB22-04: McIntosh Subdivision

Dear Scott Taylor,

The purpose of this letter is to inform you that the above application submitted on June 24, 2022, and resubmitted on September 21, 2022, and again on November 1, 2022, has been deemed technically complete in accordance with Camas Municipal Code (CMC) Section 18.55.130.

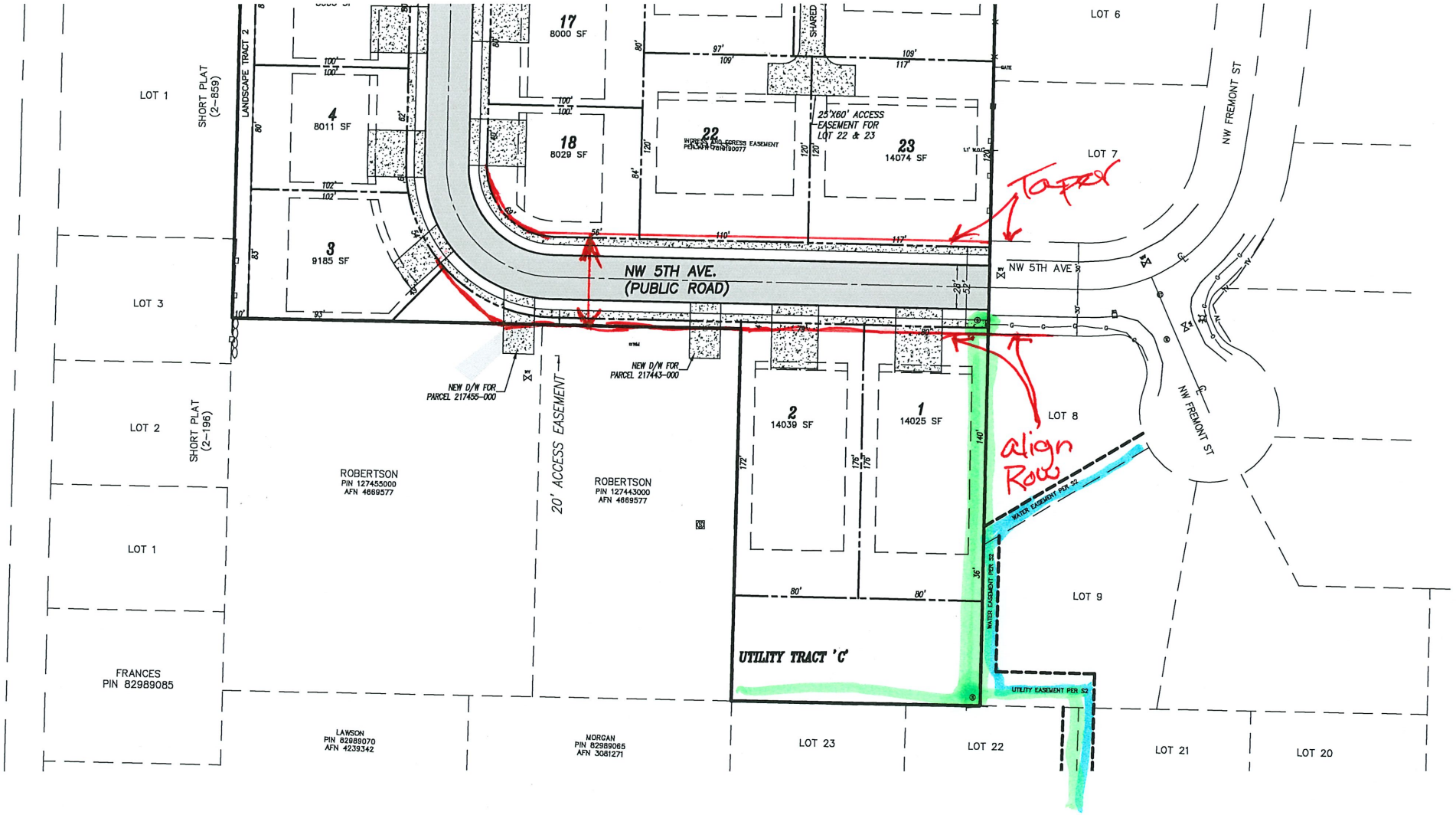
Below are other preliminary project issues noted by staff, which are to be addressed, but are not completeness review items:

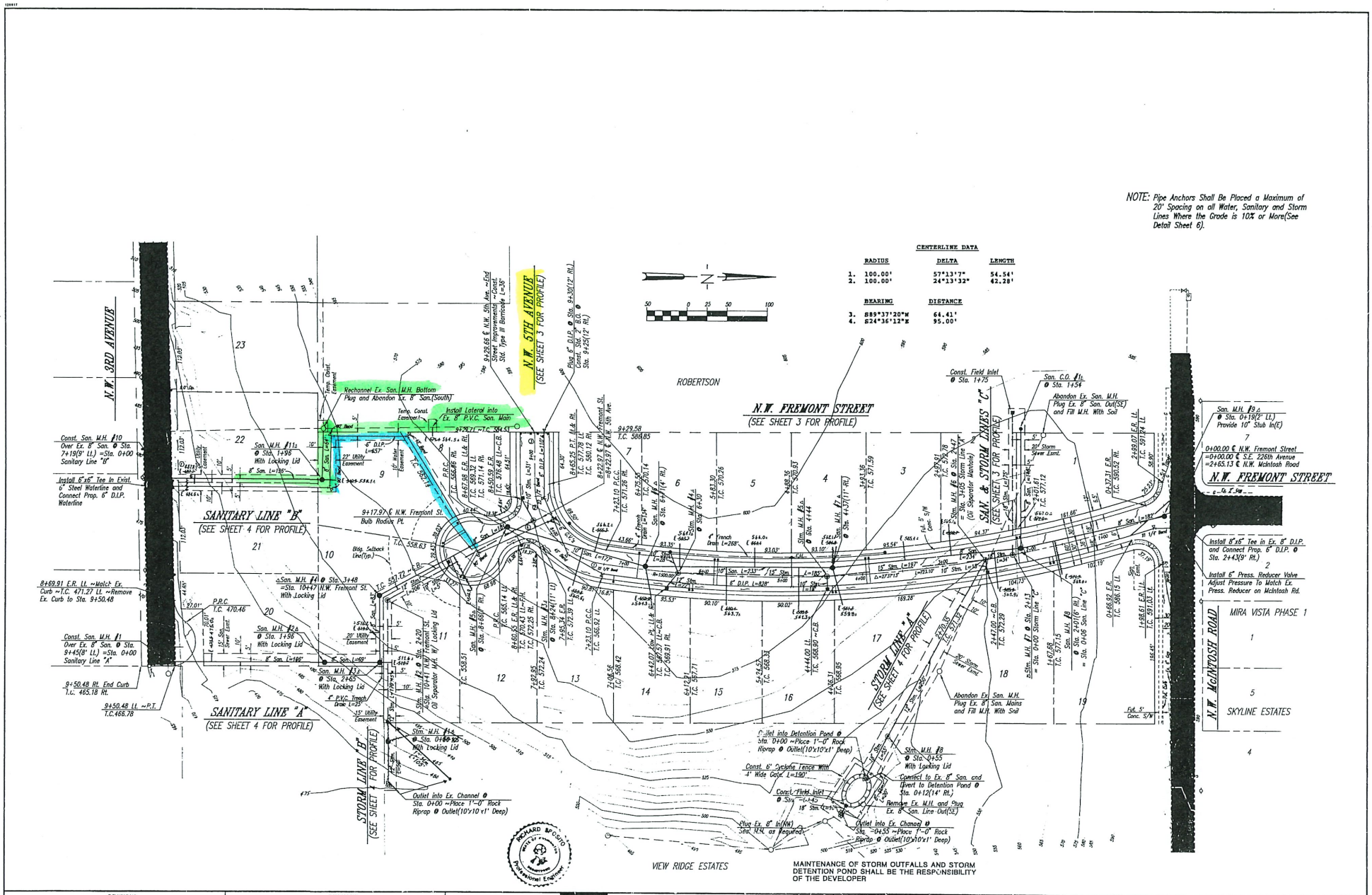
1. The submitted deviation requests, outlined in the consultant's 'Road Modification Narrative', is not supported as the referenced chapter, CMC 14.02 Stormwater Control, is not applicable to the requirements in CMC 17.19.040.
2. The right-of-way limits on the future extension of NW 5th Avenue, along future Lots 1 and 2, and existing parcels No. 127443000 and 127455000, is to be widened an additional 5-feet to the south to match the existing southern ROW alignment on NW 5th Avenue, see attachment.
    a. This will eliminate the 'spite strip' between existing parcels No. 127443000 and 127455000 and the proposed southern right-of-way on future NW 5th Avenue.
3. The proposed right-of-way width to the north is to be widened to allow for a taper that matches the existing right-of-way width to the east. Additionally, the sidewalk, planter strip, and paved surface, at the southern end of future Lots 22 and 23, are to be tapered to match the existing end of sidewalk, planter strip, and paved surface to the east on existing NW 5th Avenue, see attachment.
4. As shown on the attached as-builts for The Ridge subdivision, there is an existing sanitary sewer easement located on the east side of the proposed development's future Lot 1 and future Utility Tract 'C' that is not shown on the preliminary plans.
    a. A sanitary access and maintenance easement is to be shown on the revised plans.
    b. An access road to future Utility Tract 'C' is to be provided from future NW 5th Avenue to the Tract C for access and maintenance of both the sanitary sewer main and the water main.

Staff will begin reviewing the application and contact you should we have questions/comments. If you have any questions, please feel free to contact me by email: YSennewald@cityofcamas.us or by phone: (360) 817-7269.

Respectfully,

Yvette Sennewald, Senior Planner


LOT 1
SHORT PLAT (2-859)
LANDSCAPE TRACT 2
4
8011 SF
3
9185 SF
17
8000 SF
18
8029 SF
22
23
14074 SF
SHARED
25'X60' ACCESS EASEMENT FOR LOT 22 & 23
LOT 6
LOT 7
NW FREMONT ST
NW 5TH AVE.
(PUBLIC ROAD)
NW 5TH AVE
Taper
LOT 3
NEW D/W FOR PARCEL 217455-000
NEW D/W FOR PARCEL 217443-000
20' ACCESS EASEMENT
2
14039 SF
1
14025 SF
LOT 8
Align Row
LOT 2
SHORT PLAT (2-196)
ROBERTSON
PIN 127455000
AFN 4669577
ROBERTSON
PIN 127443000
AFN 4669577
WATER EASEMENT PER 52
LOT 1
LOT 9
UTILITY TRACT 'C'
UTILITY EASEMENT PER 52
FRANCES
PIN 82989085
LAWSON
PIN 82989070
AFN 4239342
MORGAN
PIN 82989065
AFN 3081271
LOT 23
LOT 22
LOT 21
LOT 20



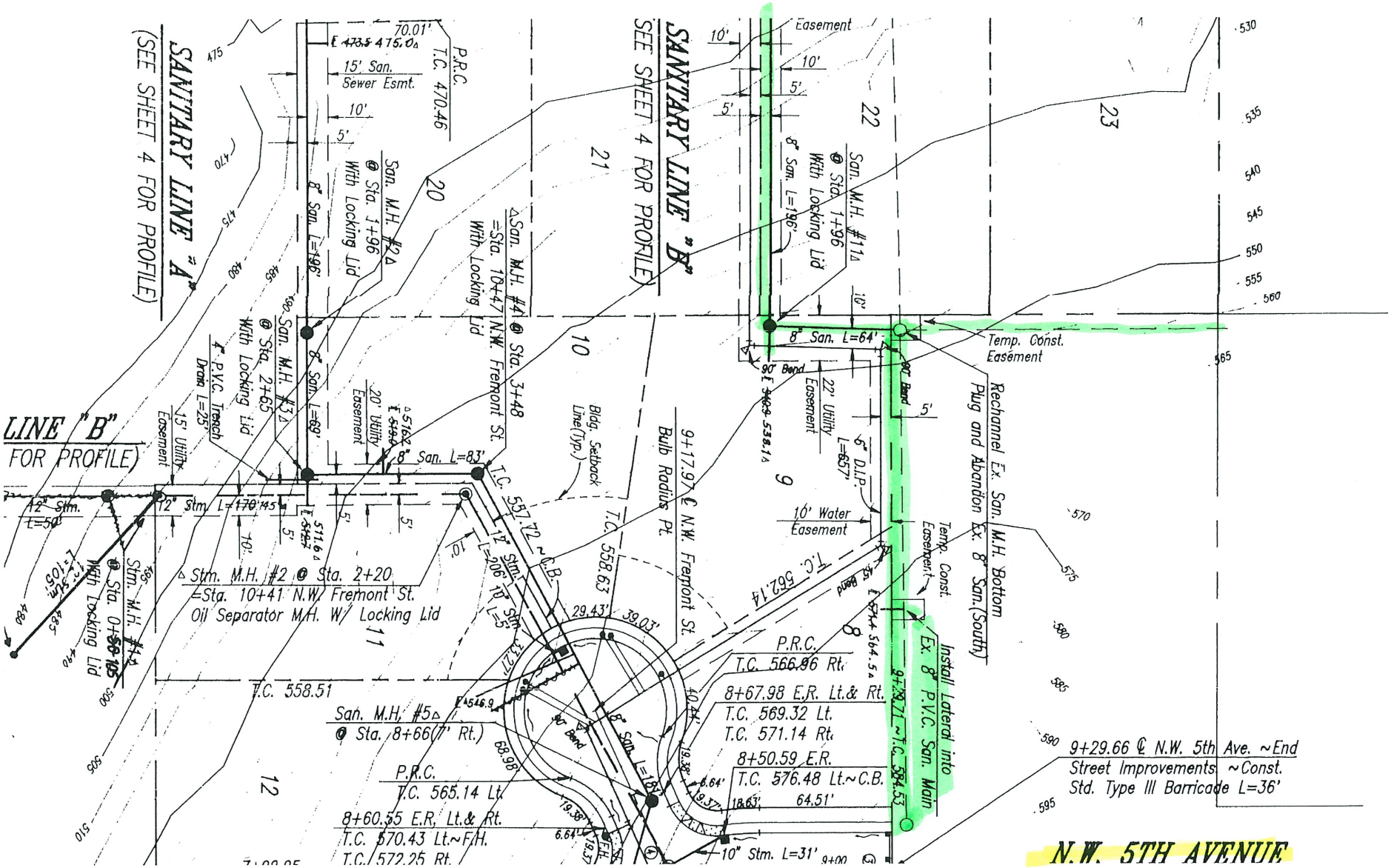
REVISIONS	REVISIONS				
1 - As Builts; Sanitary & Storm, J.M.Y., 6-4-92		Designed Under The Supervision Of RICHARD SPOSITO Registered Civil Engineer No. 13,935	Mac Kay & Sposito ENGINEERS SURVEYORS PLANNERS 110 E 17TH ST. VANCOUVER, WA (206)695-3411 (503)285-6726	Date: May, 1990 Scale: 1" = 50' Designed By: P.E.C. Drawn By: P.E.C. Checked By: D.J.W. A.S. & R.S.	IMPROVEMENT PLANS THE RIDGE CAMAS, WASHINGTON
2 - Revision of Storm Line "B", Storm MH # 1, J.M.Y., 6-5-92					

Job Number 11,199
Sheet 2 OF 7

700-96

700-9602

T.C.P.


SANITARY LINE "A"
(SEE SHEET 4 FOR PROFILE)
SANITARY LINE "B"
(SEE SHEET 4 FOR PROFILE)
LINE "B"
FOR PROFILE)
P.R.C.
T.C. 470.46
15' San. Sewer Esmt.
San. M.H. #2 @ Sta. 1+96 With Locking Lid
8" San. L=196'
San. M.H. #3 @ Sta. 2+65 With Locking Lid
8" San. L=69'
San. M.H. #1 @ Sta. 3+48 =Sta. 10+47 N.W. Fremont St. With Locking Lid
8" San. L=83'
P.V.C. Trench Drain L=25'
15' Utility Easement
20' Utility Easement
12" Stm. L=50'
12" Stm. L=170'
Stm. M.H. #2 @ Sta. 2+20 =Sta. 10+41 N.W. Fremont St. Oil Separator M.H. W/ Locking Lid
Stm. M.H. #4 @ Sta. 0+56 With Locking Lid
T.C. 558.51
San. M.H. #5 @ Sta. 8+66 (7' Rt.)
P.R.C.
T.C. 565.14 Lt.
8+60.55 E.R. Lt.& Rt.
T.C. 570.43 Lt.~F.H.
T.C. 572.25 Rt.
T.C. 557.72 ~ C.B.
12" Stm. L=206'
10" Stm. L=5'
Bldg. Setback Line(Typ.)
Bulb Radius Pt.
9+17.97 ℄ N.W. Fremont St.
T.C. 558.63
T.C. 562.14
P.R.C.
T.C. 566.96 Rt.
8+67.98 E.R. Lt.& Rt.
T.C. 569.32 Lt.
T.C. 571.14 Rt.
8+50.59 E.R.
T.C. 576.48 Lt.~C.B.
64.51'
8" San. L=183'
10" Stm. L=31'
Easement
8" San. L=64'
90° Bend
22' Utility Easement
6" D.I.P. L=657'
10' Water Easement
Temp. Const. Easement
Rechannel Ex. San. M.H. Bottom Plug and Abandon Ex. 8" San.(South)
Install Lateral into Ex. 8" P.V.C. San. Main
9+29.77 ~ T.C. 574.53
9+29.66 ℄ N.W. 5th Ave. ~End Street Improvements ~Const. Std. Type III Barricade L=36'
N.W. 5TH AVENUE
22
23
21
20
10
9
8
12
11

In re: McIntosh Subdivision

) NO. SEPA22-15
)
) AFFIDAVIT OF MAILING
)
)
)
)
)
Respondent.)

STATE OF WASHINGTON)
) ss.
CLARK COUNTY)

I, Carey Certo, on oath says:

I, Carey Certo, on December 14, 2022, I directed a true and correct copy of the SEPA Determination of Non-Significance, to be served upon the parties herein, in the above-entitled action, by depositing with the U.S. Post Office, Camas, Washington, a postage-prepaid envelope containing same addressed as follows: See attached list.

Carey Certo
SIGNATURE

SUBSCRIBED and SWORN to before me this 15th day of December, 2022.

AIREANNA BALDWIN NOTARY PUBLIC STATE OF WASHINGTON My Comm. Expires October 01, 2024 No. 183848

Aireanna Baldwin
Notary Public in and for the State of Washington, residing at Clark County
My appointment expires: 10/1/2024

Current Resident
430 NW Ilwaco St
Camas WA 98607

Current Resident
330 NW Ilwaco St
Camas WA 98607

Current Resident
500 NW Ilwaco
Camas WA 98607

Current Resident
3046 NW 3rd Ave
Camas WA 98607

Current Resident
PO Box 484
Camas WA 98607

Current Resident
639 NW Fremont St
Camas WA 98607

Current Resident
545 NW Fremont St
Camas WA 98607

Current Resident
431 NW Fremont St
Camas WA 98607

Current Resident
460 NW Fremont St
Camas WA 98607

Current Resident
608 NW Fremont St
Camas WA 98607

Current Resident
3137 NW 3rd Ave
Camas WA 98607

Current Resident
410 NW Ilwaco
Camas WA 98607

Current Resident
3004 NW 3rd Ave
Camas WA 98607

Current Resident
3110 NW 3rd Ave
Camas WA 98607

Current Resident
741 NW Fremont St
Camas WA 98607

Current Resident
621 NW Fremont St
Camas WA 98607

Current Resident
517 NW Fremont St
Camas WA 98607

Current Resident
438 NW Fremont St
Camas WA 98607

Current Resident
526 NW Fremont St
Camas WA 98607

Current Resident
620 NW Fremont
Camas WA 98607

Current Resident
3137 NW 3rd Ave
Camas WA 98607

Current Resident
444 NW Ilwaco St
Camas WA 98607

Current Resident
3028 NW 3rd Ave
Camas WA 98607

Current Resident
3132 NW 3rd Ave
Camas WA 98607

Current Resident
705 NW Freemont St
Camas WA 98607

Current Resident
611 NW Fremont St
Camas WA 98607

Current Resident
455 NW Fremont St
Camas WA 98607

Current Resident
444 NW Fremont St
Camas WA 98607

Current Resident
542 NW Fremont St
Camas WA 98607

Current Resident
648 NW Freemont St
Camas WA 98607

Current Resident
728 NW Fremont St
Camas WA 98607

Current Resident
748 NW Fremont St
Camas WA 98607

Current Resident
3001 NW 3rd Ave
Camas WA 98607

Current Resident
3023 NW 3rd Ave
Camas WA 98607

Current Resident
3045 NW 3rd Ave
Camas WA 98607

Current Resident
3119 NW 3rd Ave
Camas WA 98607

Current Resident
1915 NW Sage St
Camas WA 98607

Current Resident
2928 NW 8th Way
Camas WA 98607

Current Resident
2944 NW 8th Way
Camas WA 98607

Current Resident
169 Erica Dr
Richland WA 99352

Current Resident
842 NW Fremont St
Camas WA 98607

Current Resident
2942 NW 9th Ave
Camas WA 98607

Current Resident
909 NW Fremont St
Camas WA 98607

Current Resident
849 NW Fremont St
Camas WA 98607

Current Resident
821 NW Fremont St
Camas WA 98607

Current Resident
675 NW Ilwaco St
Camas WA 98607

Current Resident
673 NW Ilwaco St
Camas WA 98607

Current Resident
661 NW Ilwaco St
Camas WA 98607

Current Resident
653 NW Ilwaco St
Camas WA 98607

Current Resident
651 NW Ilwaco St
Camas WA 98607

Current Resident
649 NW Ilwaco St
Camas WA 98607

Current Resident
645 NW Ilwaco St
Camas WA 98607

Current Resident
509 Ilwaco St
Camas WA 98607

Current Resident
501 NW Ilwaco St
Camas WA 98607

Current Resident
800 NE Tenney Rd #110-348
Vancouver WA 98685

Current Resident
943 NW Hoquiam Ct
Camas WA 98607

Current Resident
648 NW Ilwaco St
Camas WA 98607

Current Resident
310 NW Ilwaco Ct
Camas WA 98607

Current Resident
320 NW Ilwaco Ct
Camas WA 98607

Current Resident
340 NW Ilwaco Ct
Camas WA 98607

Current Resident
737 NW Ilwaco St
Camas WA 98607

Current Resident
PO Box 208
Washougal WA 98671

Current Resident
PO Box 208
Washougal WA 98676

Current Resident
616 NE 4th Ave
Camas WA 98607

Current Resident
736 NW Ilwaco St
Camas WA 98607

Current Resident
710 Ilwaco St
Camas WA 98607

Current Resident
676 NW Ilwaco St
Camas WA 98607

Current Resident
PO Box 470
Camas WA 98607

Current Resident
656 NW Ilwaco St
Camas WA 98607

Current Resident
652 NE Ilwaco St
Camas WA 98607

Current Resident
40220 SE Gibson Rd
Washougal WA 98671

State Environmental Policy Act
Determination of Non-Significance

CASE NO: SEPA22-15 McIntosh Subdivision

APPLICANT: Scott Taylor
SGA Engineering
2005 Broadway Street
Vancouver, WA 98663

REQUEST: The applicant is proposing to subdivide approximately 7.1 acres into 28 single-family residential lots.

LOCATION: 3210 NW MCINTOSH ROAD, CAMAS, WA 98607
PARCEL NUMBER 127449000

LEGAL DESCRIPTION: THE PROJECT IS LOCATED IN THE CITY OF CAMAS IN THE SE ¼ OF SECTION 9, TOWNSHIP 1 NORTH, RANGE 3 EAST OF THE WILLAMETTE MERIDIAN

SEPA DETERMINATION: DETERMINATION OF NON-SIGNIFICANCE (DNS)

COMMENT DEADLINE: **DECEMBER 29, 2022, AT 5:00 P.M.**

As lead agency under the State Environmental Policy Act (SEPA) Rules [Chapter 197-11, Washington Administrative Code (WAC)], the City of Camas must determine if there are possible significant adverse environmental impacts associated with this proposal. The options include the following:

- DS = Determination of Significance (The impacts cannot be mitigated through conditions of approval and, therefore, requiring the preparation of an Environmental Impact Statement (EIS).
- MDNS = Mitigated Determination of Non-Significance (The impacts can be addressed through conditions of approval), or;
- DNS = Determination of Non-Significance (The impacts can be addressed by applying the Camas Municipal Code).

Published in the Post Record on December 15, 2022 Legal Publication #762840
Posted on bulletin boards at Camas City Hall, Camas Library, and the City of Camas website at: http://www.cityofcamas.us
Mailed to property owners within 300-feet on December 14, 2022

Determination:

Determination of Non-Significance (DNS). The City of Camas, as lead agency for review of this proposal, has determined that this proposal does not have a probable significant adverse impact on the environment. An Environmental Impact Statement (EIS) is not required under RCW 43.21C.030(2)(e). This decision was made after review of a completed environmental checklist, and other information on file with the City of Camas.

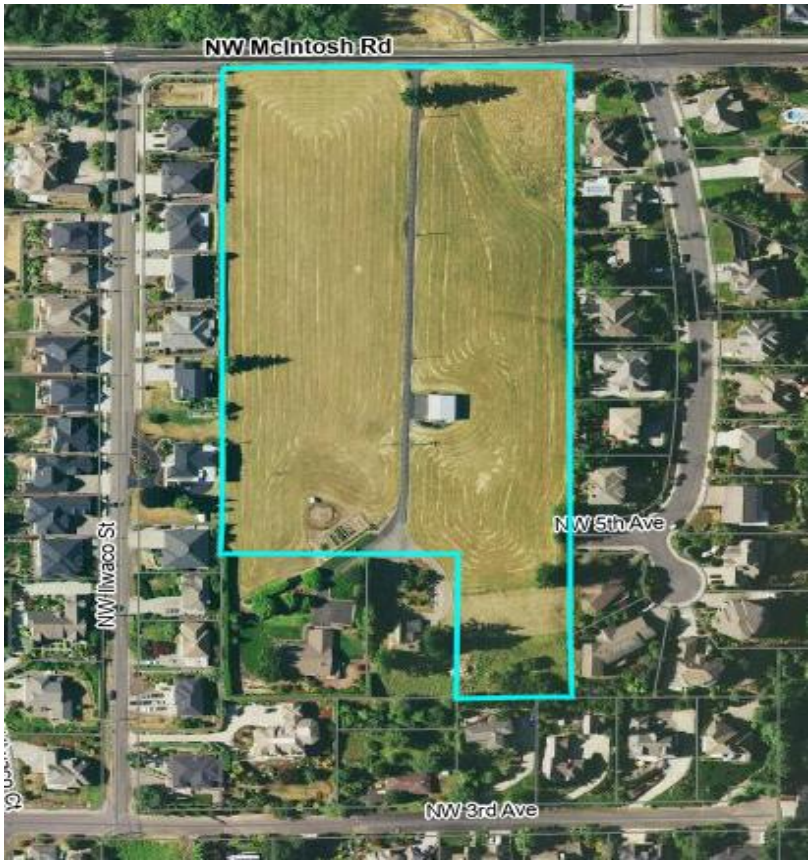
Date of Publication & Comment Period:

Publication date of this DNS is **December 15, 2022,** and is issued under WAC 197-11-340. The lead agency will not act on this proposal until the close of the 14-day comment period which ends on **December 29, 2022**. Comments may be sent by email to communitydevelopment@cityofcamas.us or regular mail to:

City of Camas SEPA Official
Community Development Department
616 NE Fourth Avenue
Camas, Washington 98607

Responsible Official: Robert Maul (360) 817-1568

Robert Maul, Planning Manager and Responsible Official	**December 15, 2022** **Date of publication**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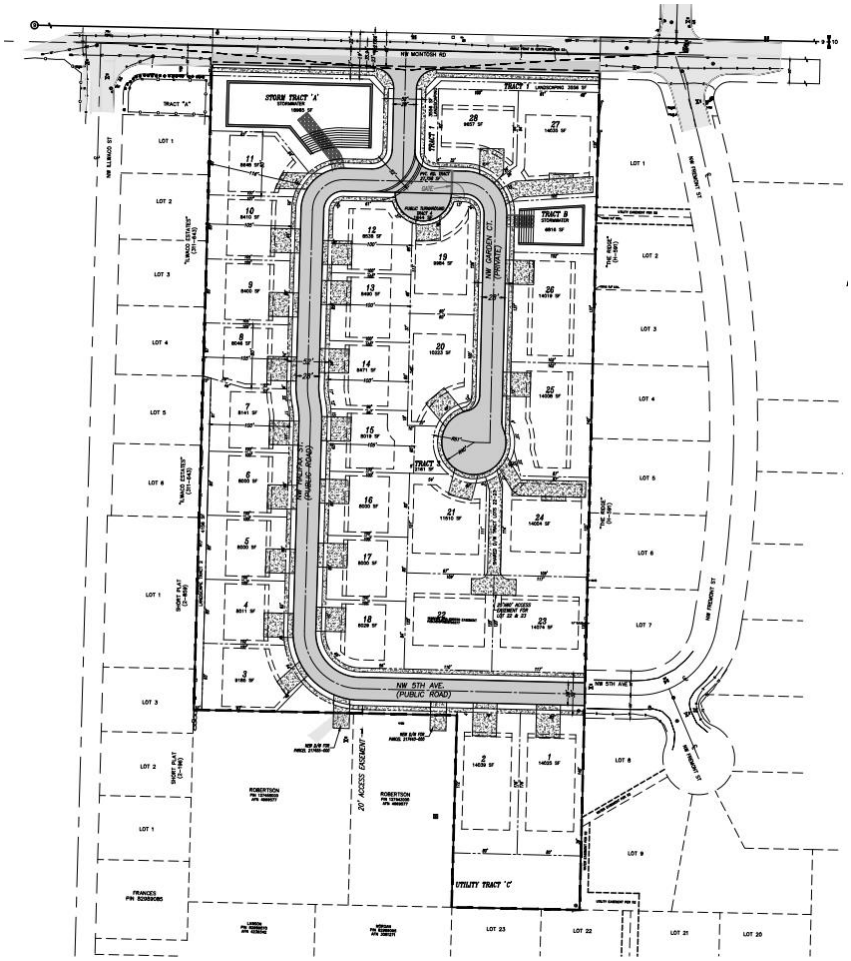
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(PUBLIC ROAD)
NW GARDEN CT.
(PRIVATE)
20' ACCESS EASEMENT
UTILITY TRACT 'C'

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COMMUNITY DEVELOPMENT DEPARTMENT
616 NE 4th Avenue
Camas, WA 98607
www.cityofcamas.us

Date Published: December 15, 2022

To Whom It May Concern:

Please find enclosed a Determination of Non-Significance (DNS) for the **McIntosh Subdivision (SEPA22-15)** that was issued pursuant to the State Environmental Policy Act (SEPA) Rules, Chapter 197-11, Washington Administrative Code. The enclosed review comments reflect evaluation of the environmental checklist by the lead agency as required by WAC 197-11-330(1)(a)(i).

The following materials were submitted with the initial application:

- Application Form and Fees
- Pre-App Notes
- Narrative
- Archaeological Predetermination*
- Geotechnical Report
- Preliminary Plans
- SEPA checklist
- Critical Areas Report
- Preliminary Stormwater Report
- Transportation Impact Study
- Mailing List and Labels

All application materials are available for review upon request from the Community Development Department. *Archaeological information is exempt from public disclosure, consistent with RCW 42.56.300.

Written comments may be submitted on this determination within fourteen (14) days of its issuance, after which the DNS will be reconsidered in light of the comments received.

Please address all correspondence to:

City of Camas, SEPA Official
Community Development Department
616 NE Fourth Avenue
Camas, Washington 98607
communitydevelopment@cityofcamas.us

Distribution:

Applicant
Bureau of Indian Affairs
C-Tran
Camas School District
Camas Building Official, Bob Cunningham
Camas Communications Director, Bryan Rachal
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Clark County Department of Environmental Services
Clark County Department of Transportation
Clark County Natural Resources Council
Clark Public Utilities
Department of Ecology
Department of Fish and Wildlife, Region 5
Department of Natural Resources, SEPA Center
Southwest Clean Air Agency
US Army Corps of Engineers
Vancouver- Clark Parks & Recreation
Washington Office of Archaeology & Historic Preservation
Washington State Department of Transportation
Washington State Parks and Recreation Commission, Environmental Program
Property Owners within 300 feet *(mailed the SEPA Determination & map)*

State Environmental Policy Act
Determination of Non-Significance

CASE NO: SEPA22-15 McIntosh Subdivision

APPLICANT: Scott Taylor
SGA Engineering
2005 Broadway Street
Vancouver, WA 98663

REQUEST: The applicant is proposing to subdivide approximately 7.1 acres into 28 single-family residential lots.

LOCATION: 3210 NW MCINTOSH ROAD, CAMAS, WA 98607
PARCEL NUMBER 127449000

LEGAL DESCRIPTION: THE PROJECT IS LOCATED IN THE CITY OF CAMAS IN THE SE ¼ OF SECTION 9, TOWNSHIP 1 NORTH, RANGE 3 EAST OF THE WILLAMETTE MERIDIAN

SEPA DETERMINATION: DETERMINATION OF NON-SIGNIFICANCE (DNS)

COMMENT DEADLINE: **DECEMBER 29, 2022, AT 5:00 P.M.**

As lead agency under the State Environmental Policy Act (SEPA) Rules [Chapter 197-11, Washington Administrative Code (WAC)], the City of Camas must determine if there are possible significant adverse environmental impacts associated with this proposal. The options include the following:

- DS = Determination of Significance (The impacts cannot be mitigated through conditions of approval and, therefore, requiring the preparation of an Environmental Impact Statement (EIS).
- MDNS = Mitigated Determination of Non-Significance (The impacts can be addressed through conditions of approval), or;
- DNS = Determination of Non-Significance (The impacts can be addressed by applying the Camas Municipal Code).

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Mailed to property owners within 300-feet on December 14, 2022

Determination:

Determination of Non-Significance (DNS). The City of Camas, as lead agency for review of this proposal, has determined that this proposal does not have a probable significant adverse impact on the environment. An Environmental Impact Statement (EIS) is not required under RCW 43.21C.030(2)(e). This decision was made after review of a completed environmental checklist, and other information on file with the City of Camas.

Date of Publication & Comment Period:

Publication date of this DNS is **December 15, 2022,** and is issued under WAC 197-11-340. The lead agency will not act on this proposal until the close of the 14-day comment period which ends on **December 29, 2022**. Comments may be sent by email to communitydevelopment@cityofcamas.us or regular mail to:

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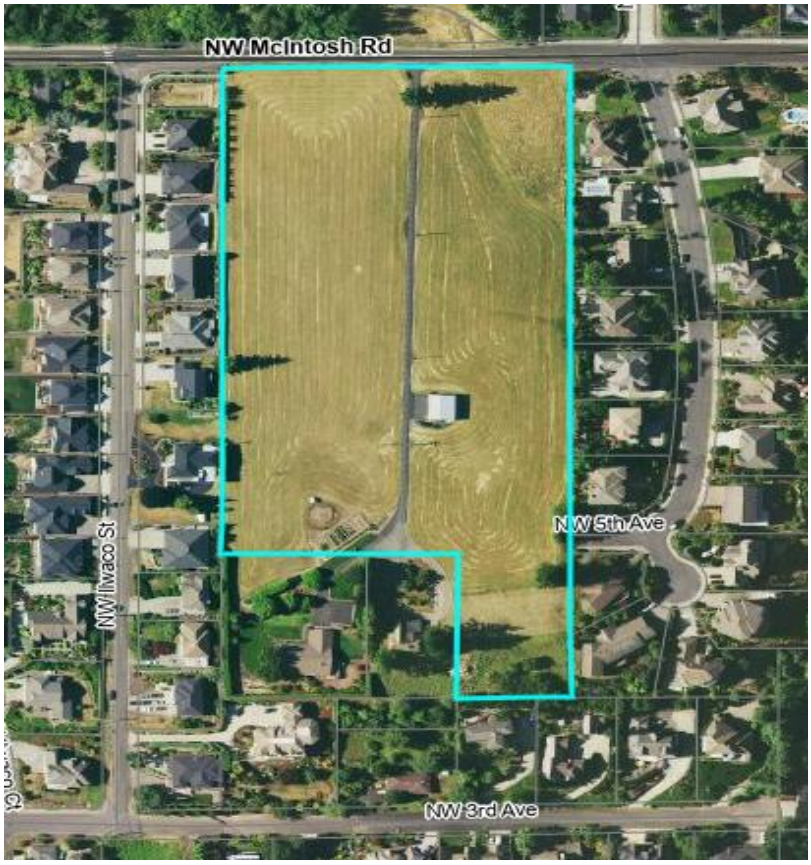
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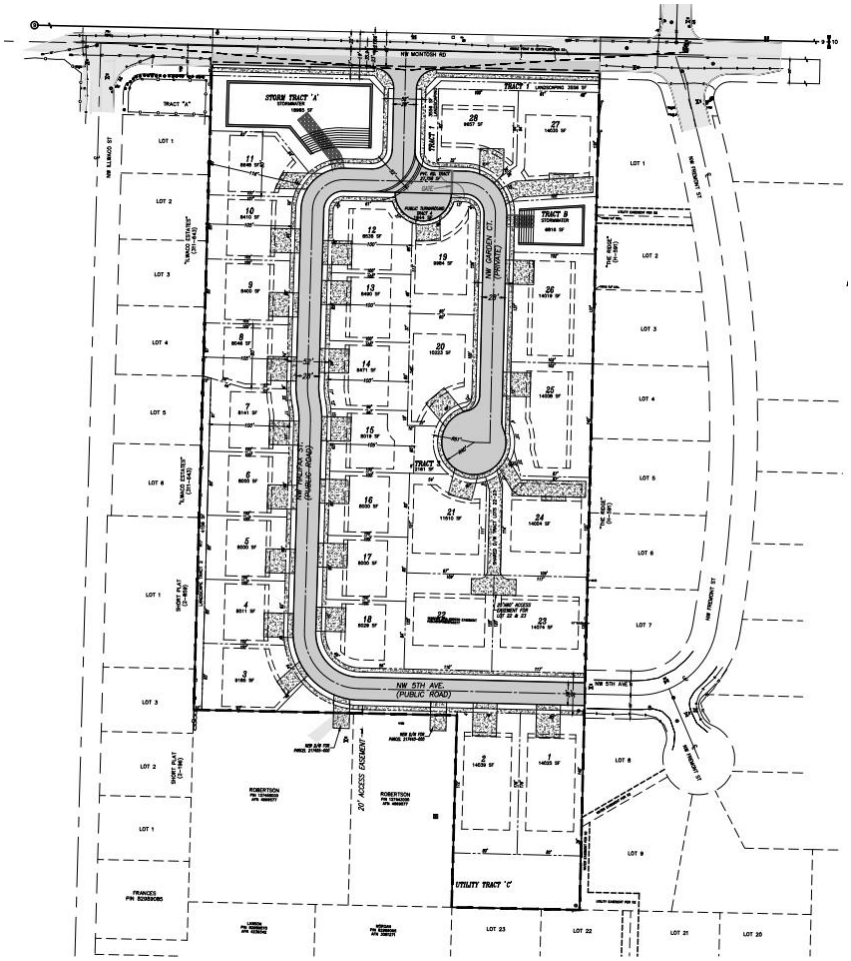
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SEPA ENVIRONMENTAL CHECKLIST

Purpose of checklist:

Governmental agencies use this checklist to help determine whether the environmental impacts of your proposal are significant. This information is also helpful to determine if available avoidance, minimization or compensatory mitigation measures will address the probable significant impacts or if an environmental impact statement will be prepared to further analyze the proposal.

Instructions for applicants:

This environmental checklist asks you to describe some basic information about your proposal. Please answer each question accurately and carefully, to the best of your knowledge. You may need to consult with an agency specialist or private consultant for some questions. You may use "not applicable" or "does not apply" only when you can explain why it does not apply and not when the answer is unknown. You may also attach or incorporate by reference additional studies reports. Complete and accurate answers to these questions often avoid delays with the SEPA process as well as later in the decision-making process.

The checklist questions apply to all parts of your proposal, even if you plan to do them over a period of time or on different parcels of land. Attach any additional information that will help describe your proposal or its environmental effects. The agency to which you submit this checklist may ask you to explain your answers or provide additional information reasonably related to determining if there may be significant adverse impact.

Instructions for Lead Agencies:

Please adjust the format of this template as needed. Additional information may be necessary to evaluate the existing environment, all interrelated aspects of the proposal and an analysis of adverse impacts. The checklist is considered the first but not necessarily the only source of information needed to make an adequate threshold determination. Once a threshold determination is made, the lead agency is responsible for the completeness and accuracy of the checklist and other supporting documents.

Use of checklist for nonproject proposals: [help]

For nonproject proposals (such as ordinances, regulations, plans and programs), complete the applicable parts of sections A and B plus the SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS (part D). Please completely answer all questions that apply and note that the words "project," "applicant," and "property or site" should be read as "proposal," "proponent," and "affected geographic area," respectively. The lead agency may exclude (for non-projects) questions in Part B - Environmental Elements –that do not contribute meaningfully to the analysis of the proposal.

A. Background [help]

1. Name of proposed project, if applicable: [help]
   McIntosh Subdivision
2. Name of applicant: [help]
   METT RI, LLC. Attn: Sam Madison

3. Address and phone number of applicant and contact person: [help] Contact Person: 2005 Broadway Street, Vancouver WA 98663
360-993-0911

4. Date checklist prepared: [help]
June 14, 2022

5. Agency requesting checklist: [help]
City of Camas

6. Proposed timing or schedule (including phasing, if applicable): [help]
Build project in 2022 and 2023.

7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain. [help]
No.

8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal. [help]
Tree Survey, Geotechnical Report and Slope stability analysis have been prepared.

9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain. [help]
NPDES permit for stormwater with Ecology and DAHP review of the Archaeological pre-determination report.

10. List any government approvals or permits that will be needed for your proposal, if known. [help] Clark County will approve any septic and well removals. City of Camas will approve Planning and Engineering.

11. Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.) [help] 28 Lot Subdivision on 9.94 Acre site.
28 new Single-family residential homes will be built on-site.

12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist. [help] Access will come from the existing NW McIntosh Road at the north edge of the property. The site address is 3210 NW McIntosh Road in Camas, WA.
Section 09, T1N R3E WM Parcel #127449-000

B. ENVIRONMENTAL ELEMENTS [help]

1. Earth [help]

a. General description of the site: [help]

(circle one): Flat, rolling, hilly, steep slopes, mountainous, other Moderate slope from south to north.

b. What is the steepest slope on the site (approximate percent slope)? [help]
Approx. 20%

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any agricultural land of long-term commercial significance and whether the proposal results in removing any of these soils. [help]
Powell Silt Loams, PoB & PoD

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe. [help]
No surface indications of unstable soils.

e. Describe the purpose, type, total area, and approximate quantities and total affected area of any filling, excavation, and grading proposed. Indicate source of fill. [help]
Site grading will occur for new streets, utility infrastructure and homes. Approx. 50,000 cubic yards of grading will occur.

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe. [help]
Yes, so erosion control methods are used like, straw, seeding, sediment ponds, waddles and silt fence.

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)? [help]
Approx. 50%

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any: [help]
Erosion control methods such as: straw, seeding, sediment ponds, waddles and silt fence may be used.
Site watering may occur if the site becomes too dry or dusty.

2. Air [help]

a. What types of emissions to the air would result from the proposal during construction, operation, and maintenance when the project is completed? If any, generally describe and give approximate quantities if known. [help]
Construction equipment will emit exhaust and air may get dusty during construction. This is a short term issue on-site.

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe. [help]
No.

c. Proposed measures to reduce or control emissions or other impacts to air, if any: [help]
Erosion control measures will help control the dust.

3. **Water** [help]

a. Surface Water:

1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into. [help]
No.

2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans. [help]
No.

3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material. [help]
N/A

4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known. [help]

No.

5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan. [help]

No.

6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge. [help]

No.

b. Ground Water:

1) Will groundwater be withdrawn from a well for drinking water or other purposes? If so, give a general description of the well, proposed uses and approximate quantities withdrawn from the well. Will water be discharged to groundwater? Give general description, purpose, and approximate quantities if known. [help]

No. Public water will be provided by Camas. Any existing wells on-site will be decommissioned.

2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals. . . ; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve. [help]

None. Any existing septic systems and drainfields will be removed with this project.

c. Water runoff (including stormwater):

1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe. [help]

Treated stormwater, from rainfall, will be detained on-site and released at below pre-developed rates. This treated water will flow into adjacent stormwater systems along the natural drainage paths.

2) Could waste materials enter ground or surface waters? If so, generally describe. [help]

No.

3) Does the proposal alter or otherwise affect drainage patterns in the vicinity of the site? If so, describe. [help]

No. existing drainage patterns will remain the same across this site and on adjacent sites.

d. Proposed measures to reduce or control surface, ground, and runoff water, and drainage pattern impacts, if any: [help]

The stormwater system will be designed to collect, convey, treat, detain and release runoff from the site in a controlled manor.

4. **Plants** [help]

a. Check the types of vegetation found on the site: [help]

_x_ deciduous tree: alder, maple, aspen, other
_x_ evergreen tree: fir, cedar, pine, other
_x_ shrubs
_x_ grass
_x_ pasture
____ crop or grain
____ Orchards, vineyards or other permanent crops.
____ wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other
____ water plants: water lily, eelgrass, milfoil, other
____ other types of vegetation

b. What kind and amount of vegetation will be removed or altered? [help]

Approx. 9 acres of the site will have the vegetation removed and soils graded. Existing trees and shrubs will be removed.

c. List threatened and endangered species known to be on or near the site. [help]

None Known. There are no Oregon White Oak trees on the site.

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any: [help]

Native plants will be used on-site wherever possible. Existing smaller deciduous and evergreen trees will be retained around the perimeter of the project where feasible.

e. List all noxious weeds and invasive species known to be on or near the site. [help]

Himalayan Black Berry is the primary noxious weed on-site. There may be some english ivy too which will be removed with site construction.

5. **Animals** [help]

a. List any birds and other animals which have been observed on or near the site or are known to be on or near the site. [help]

Examples include:

birds: hawk, heron, eagle, songbirds, other: All of these birds could use the site.
mammals: deer, bear, elk, beaver, other: No large mammals have been seen on-site.
fish: bass, salmon, trout, herring, shellfish, other _____ No fish on this site.

b. List any threatened and endangered species known to be on or near the site. [help]

c. Is the site part of a migration route? If so, explain.
[help] This site is located in what is referred to as the Pacific Flyway. The flyway stretches from Alaska to Mexico and from the Pacific Ocean to the Rocky Mountains.

d. Proposed measures to preserve or enhance wildlife, if any: [help]
Landscape plantings and some tree retention on the perimeter of the project will provide food and cover for small birds, insects, small mammals and soil organisms.

e. List any invasive animal species known to be on or near the site. [help]
None known.

6. **Energy and Natural Resources** [help]

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc. [help]
Electricity or natural gas will be used to heat the homes and electricity will be used for lighting.

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe. [help]
No.

c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any: [help]
Comply with state building codes. Utilize efficient building designs to maximize building materials and minimize waste.

7. **Environmental Health** [help]

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal? If so, describe. [help]
No.

1) Describe any known or possible contamination at the site from present or past uses. [help]
None Known.

2) Describe existing hazardous chemicals/conditions that might affect project development and design. This includes underground hazardous liquid and gas transmission pipelines located within the project area and in the vicinity. [help]
None known.

3) Describe any toxic or hazardous chemicals that might be stored, used, or produced during the project's development or construction, or at any time during the operating life of the project. [help]
None known. Contractors may fuel up equipment on-site with truck mounted fuel tanks. Any spillage would be small and cleaned up immediately by the contractor.

4) Describe special emergency services that might be required. [help]
Fire, Police or Ambulance.

5) Proposed measures to reduce or control environmental health hazards, if any: [help]
None are necessary.

b. Noise [help]

1) What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)? [help]
Mild vehicular traffic can be heard on-site.

2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site. [help]
7 am - 7pm construction noise may come from the site.

3) Proposed measures to reduce or control noise impacts, if any: [help]
Contractors will abide by city noise rules and future home owners as well.

8. **Land and Shoreline Use** [help]

a. What is the current use of the site and adjacent properties? Will the proposal affect current land uses on nearby or adjacent properties? If so, describe. [help]
The site currently has one shop on the site. Adjacent lots to the N,S,E & W have existing homes. The project will not affect land uses on adjacent properties.

b. Has the project site been used as working farmlands or working forest lands? If so, describe. How much agricultural or forest land of long-term commercial significance will be converted to other uses as a result of the proposal, if any? If resource lands have not been designated, how many acres in farmland or forest land tax status will be converted to nonfarm or nonforest use? [help]
No.

1) Will the proposal affect or be affected by surrounding working farm or forest land normal business operations, such as oversize equipment access, the application of pesticides, tilling, and harvesting? If so, how: [help]
No.

c. Describe any structures on the site. [help]
Existing shop on-site.

d. Will any structures be demolished? If so, what? [help]
Yes, the existing shop will be removed from the site.

e. What is the current zoning classification of the site? [help]
R-10 Residential

f. What is the current comprehensive plan designation of the site? [help]
Single-Family_Low Density

g. If applicable, what is the current shoreline master program designation of the site? [help]
N/A

h. Has any part of the site been classified as a critical area by the city or county? If so, specify. [help]
Steep slopes, > 15% are classified as critical area by City of Camas. This has been reviewed by Geotech.

i. Approximately how many people would reside or work in the completed project? [help]
Approx. 70 people may live in the project on the 28 lots.

j. Approximately how many people would the completed project displace? [help]
None.

k. Proposed measures to avoid or reduce displacement impacts, if any: [help]
None.

L. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any: [help]
Design of the project to meet city codes and standards for the R-10 zone.

m. Proposed measures to reduce or control impacts to agricultural and forest lands of long-term commercial significance, if any: [help]
None.

9. **Housing** [help]

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing. [help]
28 total units would be provided. Homes will likely be middle to high income given adjacent development patterns.

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing. [help]
None.

c. Proposed measures to reduce or control housing impacts, if any: [help]
None.

10. **Aesthetics** [help]

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed? [help]
Camas allows a maximum building height of 35 feet. It is anticipated that two story homes will be built on-site approx. 25-30 feet tall.

b. What views in the immediate vicinity would be altered or obstructed? [help]
Only adjacent homes/neighbors will have a view of this project. New homes are being constructed or have recently been constructed on three sides of this property.

b. Proposed measures to reduce or control aesthetic impacts, if any: [help]
Construction of visually appealing homes. Retention of perimeter trees to screen site from neighboring homes.

11. **Light and Glare** [help]

a. What type of light or glare will the proposal produce? What time of day would it mainly occur? [help]
Only residential lighting will occur in the front and back yards of the 28 lots. Street lights will be used per city standards and will be on at night over the public roadway.

b. Could light or glare from the finished project be a safety hazard or interfere with views? [help]

No. Proper shielding and orientation should eliminate any glare or safety hazards.

c. What existing off-site sources of light or glare may affect your proposal? [help]

None. Only adjacent homes and street lights will be visible from this project.

d. Proposed measures to reduce or control light and glare impacts, if any: [help]

Proper shielding and orientation of the lights will reduce glare and off-site issues.

12. **Recreation** [help]

a. What designated and informal recreational opportunities are in the immediate vicinity? [help]

Klickitat Park is north of the site.

b. Would the proposed project displace any existing recreational uses? If so, describe. [help]

No.

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any: [help]

None. Public sidewalks on-site will connect to other public sidewalks and trail systems.

13. **Historic and cultural preservation** [help]

a. Are there any buildings, structures, or sites, located on or near the site that are over 45 years old listed in or eligible for listing in national, state, or local preservation registers ? If so, specifically describe. [help]

None known.

b. Are there any landmarks, features, or other evidence of Indian or historic use or occupation? This may include human burials or old cemeteries. Are there any material evidence, artifacts, or areas of cultural importance on or near the site? Please list any professional studies conducted at the site to identify such resources. [help]

No.

c. Describe the methods used to assess the potential impacts to cultural and historic resources on or near the project site. Examples include consultation with tribes and the department of archeology and historic preservation, archaeological surveys, historic maps, GIS data, etc. [help]

A site pre-determination survey was completed by ASCC and sent to the state Archaeological group, DAHP. No artifacts or historic items were found on the site surface or in the test pits they dug.

d. Proposed measures to avoid, minimize, or compensate for loss, changes to, and disturbance to resources. Please include plans for the above and any permits that may be required. [help]

An inadvertent discovery plan and language is placed on the construction plans in the event the contractor finds any historic artifacts or remains.

14. **Transportation** [help]

a. Identify public streets and highways serving the site or affected geographic area and describe proposed access to the existing street system. Show on site plans, if any. [help]

NW McIntosh Road is a public road on the north side of the project which will provide access to the site.

b. Is the site or affected geographic area currently served by public transit? If so, generally describe. If not, what is the approximate distance to the nearest transit stop? [help]

Public transportation is provided by C-Trans and operates approx. 1/2 mile south of the site.

c. How many additional parking spaces would the completed project or non-project proposal have? How many would the project or proposal eliminate? [help]

The project will not eliminate any parking spaces. The total parking spaces on-site will exceed 112. Each home will have a two car driveway and two car garage minimum.

d. Will the proposal require any new or improvements to existing roads, streets, pedestrian, bicycle or state transportation facilities, not including driveways? If so, generally describe (indicate whether public or private). [help]

Yes, NW McIntosh will be built to City standards. Internal roads will be constructed to serve the proposed lots.

e. Will the project or proposal use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe. [help]

No.

f. How many vehicular trips per day would be generated by the completed project or proposal? If known, indicate when peak volumes would occur and what percentage of the volume would be trucks (such as commercial and nonpassenger vehicles). What data or transportation models were used to make these estimates? [help]

Approx. 264 average daily trips would occur to and from this site. Very few trips would be commercial or non passenger vehicles. The ITE 11th Edition was used for the 9.52 ADT/Unit rate. AM peak is usually around 20 and PM around 25.

g. Will the proposal interfere with, affect or be affected by the movement of agricultural and forest products on roads or streets in the area? If so, generally describe. [help]

No.

h. Proposed measures to reduce or control transportation impacts, if any: [help]

Build NW McIntosh Road and internal roadways to city standards for new homes and the public to use.

15. **Public Services** [help]

a. Would the project result in an increased need for public services (for example: fire protection, police protection, public transit, health care, schools, other)? If so, generally describe. [help]

Yes, the project will require all public services. Emergency services like fire, police and ambulance, other services include trash & recycling, delivery services, public schooling and utilities.

b. Proposed measures to reduce or control direct impacts on public services, if any. [help]

Build project per city standards. 28 of the lots will pay impact fees for schools, traffic and parks. Future residents will pay taxes to the city and county for use in public services.

16. **Utilities** [help]

a. Circle utilities currently available at the site: [help]

electricity, natural gas, water, refuse service, telephone, sanitary sewer, septic system,

other _____

Electricity, Natural Gas, Water, Telephone, Sanitary Sewer and Refuse services.

b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed. [help] Water & Sewer: City of Camas, Telephone: Comcast or Qwest
Electricity: Clark Public Utilities, Gas: NW Natural Gas

C. Signature [help]

Under the penalty of perjury, the above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

Signature: _____

Name of signee Scott Taylor

Position and Agency/Organization Land Use Planner

Date Submitted: 4-06-2021

Carey Certo

From: Jerry BigEagle <jbigeagle@cowlitz.org>
Sent: Thursday, December 15, 2022 12:41 PM
To: Community Development Email; Bureau of Indian Affairs; Camas School District, Laura Nowland; Camas School District, Sherman Davis; Camas Washougal Post Record; Chinook Indian Nation; Clark County Concurrency Engineer; Clark County Natural Resources, John S. Karpinski; Clark County, Environmental Services, Kevin Tyler; Clark PUD, Construction Design Manager, David Tetz; Clark PUD, Senior ROW Agent, Vera Anderson; PermitReview; NRDpermit; C-Tran Analyst; Dept of Fish & Wildlife; Dept. of Archeological & Historic Preservation; Dept. of Natural Resources SEPA Center; Lorie Clark, Lower Columbia Fish Recovery Board; Southwest Clean Air Agency, Duane Johnson; US Army Corps of Engineers; Vancouver-Clark Parks & Recreation; Washington Parks & Recreation Commission, Environmental Program Manager; WSDOT SW Region; Yakama Indian Nation, Environmental Resources; Yakama Indian Nation, Environmental Resources, Elizabeth Sanchey
Cc: Alan Peters; Allen Westersund; Anita Ashton; Bonnie Carter; Brian Smith; permits; Cathy Huber Nickerson; Connie Urquhart; Curleigh (Jim) Carothers; Don Chaney; Greg Anderson; Jeff Swanson; Jim Hodges; John Nohr; Lauren Hollenbeck; Leslie Lewallen; Madeline Sutherland; Marilyn Boerke; Mitch Lackey; Randy Miller; Robert Maul; Steve Hogan; Steve Wall; Steven Durspek; Tim Hein; Trang Lam; Yvette Sennewald
Subject: RE: SEPA22-04 McIntosh Subdivision (File No. SUB22-04)

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Hello All, et al:

Thank you for contacting the Cowlitz Tribe, Cultural Resources Department, and for providing documentation of the referenced Project (McIntosh Subdivision SUB22-04)(SEPA22-22).

Based on the Report, the review of DAHP overlay, the visual inspection, and the ground SEPA efforts; we concur with the results and the recommendations to proceed. If any artifact discoveries are located please initiate the NHPA Section 106 process for Tribal guidance exercising confidential sensitivity. I can provide a brief list of monitoring recommendations:

1. The archaeological monitor will be provided sufficient workspace and an unobstructed view of excavations.
2. The archaeological monitor will have the authority to temporarily pause construction, as needed, to examine potential archaeological resources.
3. An archaeological monitor will be present for all geotechnical test pit excavations conducted in the archaeological monitoring area.
4. If project-related ground disturbance occurs in more than one location simultaneously, the proximity and rate of ground disturbance will be assessed to determine whether an archaeological monitor will be needed to adequately monitor at each location.

Please note that the recommendations in this email reflect only the Review of the Cowlitz Tribe, any other interest Tribes may have different recommendations. We expect continuing correspondence and communication on this project (McIntosh Subdivision)(SEPA22-22).

Thank you, **náxʷɬqʷul'as (thank you)**

Jerry BigEagle
Tribal Historic Preservation Officer, Cowlitz Indian Tribe
Physical: 4217 NW 319th St
Ridgefield, WA 98642

Mailing: PO Box 2547
Longview, WA 98632

O – 360-353-9924
C – 360-916-1582
F – 360-577-6207

The confidentiality of this message is protected by Federal Law and Tribal Code. Nothing in this message constitutes a waiver of the Tribe's Sovereign Immunity. All Archaeological Sites are exempt from public disclosure per RCW 42.56.300

www.cowlitz.org

From: Community Development Email <communitydevelopment@cityofcamas.us>
Sent: Thursday, December 15, 2022 11:22 AM
To: Bureau of Indian Affairs <brian.haug@bia.gov>; Camas School District, Laura Nowland <laura.nowland@camas.wednet.edu>; Camas School District, Sherman Davis <sherman.davis@camas.wednet.edu>; Camas Washougal Post Record <kelly.moyer@camaspostrecord.com>; Chinook Indian Nation <Office@chinooknation.org>; Clark County Concurrency Engineer <David.Jardin@clark.wa.gov>; Clark County Natural Resources, John S. Karpinski <karpjd@comcast.net>; Clark County, Environmental Services, Kevin Tyler <kevin.tyler@clark.wa.gov>; Clark PUD, Construction Design Manager, David Tetz <dtetz@clarkpud.com>; Clark PUD, Senior ROW Agent, Vera Anderson <vanderson@clarkpud.com>; PermitReview <permitreview@cowlitz.org>; NRDpermit <nrdpermit@cowlitz.org>; C-Tran Analyst <devrev@c-tran.org>; Dept of Fish & Wildlife <R5Planning@dfw.wa.gov>; Dept. of Archeological & Historic Preservation <sepa@dahp.wa.gov>; Dept. of Natural Resources SEPA Center <sepacenter@dnr.wa.gov>; Lorie Clark, Lower Columbia Fish Recovery Board <lclark@lcfrb.gen.wa.us>; Southwest Clean Air Agency, Duane Johnson <Duane@swcleanair.org>; US Army Corps of Engineers <james.h.carsner@usace.army.mil>; Vancouver-Clark Parks & Recreation <parksrec@cityofvancouver.us>; Washington Parks & Recreation Commission, Environmental Program Manager <sepa@parks.wa.gov>; WSDOT SW Region <SW-SEPA-REVIEW@WSDOT.WA.GOV>; Yakama Indian Nation, Environmental Resources <enviroreview@yakama.com>; Yakama Indian Nation, Environmental Resources, Elizabeth Sanchey <esanchey@yakama.com>
Cc: Alan Peters <APeters@cityofcamas.us>; Allen Westersund <AWestersund@cityofcamas.us>; Anita Ashton <AAshton@cityofcamas.us>; Bonnie Carter <BCarter@cityofcamas.us>; Brian Smith <BSmith@cityofcamas.us>; permits <permits@cityofcamas.us>; Cathy Huber Nickerson <chuber@cityofcamas.us>; Community Development Email <communitydevelopment@cityofcamas.us>; Connie Urquhart <CUrquhart@cityofcamas.us>; Curleigh (Jim) Carothers <jcarothers@cityofcamas.us>; Don Chaney <dchaney@cityofcamas.us>; Greg Anderson <ganderson@cityofcamas.us>; Jeff Swanson <JSwanson@cityofcamas.us>; Jim Hodges <JHodges@cityofcamas.us>; John Nohr <JNohr@cityofcamas.us>; Lauren Hollenbeck <LHollenbeck@cityofcamas.us>; Leslie Lewallen <LLewallen@cityofcamas.us>; Madeline Sutherland <MSutherland@cityofcamas.us>; Marilyn Boerke <MBoerke@cityofcamas.us>; Mitch Lackey <MLackey@cityofcamas.us>; Randy Miller <RMiller@cityofcamas.us>; Robert Maul <RMaul@cityofcamas.us>; Steve Hogan <shogan@cityofcamas.us>; Steve Wall <SWall@cityofcamas.us>; Steven Durspek <SDurspek@cityofcamas.us>; Tim Hein <THein@cityofcamas.us>; Trang Lam <TLam@cityofcamas.us>; Yvette Sennewald <YSennewald@cityofcamas.us>
Subject: SEPA22-04 McIntosh Subdivision (File No. SUB22-04)

WARNING: This email originated outside of the Cowlitz Indian Tribe. Please verify sender before replying, opening attachments or clicking on links.

Attached is a SEPA Determination of Non-Significance (DNS) for McIntosh Subdivision for your review and comment.

Request: The applicant is proposing to subdivide approximately 7.1 acres into 28 single-family residential lots.

Publication: The publication date for this DNS is Thursday, December 15, 2022. The SEPA comment period ends on Thursday, December 29, 2022, at 5:00 p.m.

Comments: Send comments to **communitydevelopment@cityofcamas.us** or by standard mail to the City of Camas SEPA Official, Community Development Department at 616 NE Fourth Avenue, Camas, WA 98607.

Carey Certo
Administrative Support Assistant for Community Development
Desk: 360.817.7239
www.cityofcamas.us I CCerto@cityofcamas.us

The Permit Center is closed from 12pm-1pm daily

NOTICE OF PUBLIC DISCLOSURE: This e-mail account is public domain. Any correspondence from or to this e-mail account may be a public record. Accordingly, this e-mail, in whole or in part may be subject to disclosure pursuant to RCW 42.56, regardless of any claim of confidentiality or privilege asserted by an external party.

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
Southwest Region Office
PO Box 47775, Olympia, WA 98504-7775 • 360-407-6300

December 29, 2022

Robert Maul, Planning Manager
City of Camas
Community Development Department
616 Northeast 4th Avenue
Camas, WA 98607

Dear Robert Maul:

Thank you for the opportunity to comment on the determination of nonsignificance for the McIntosh Subdivision Project (SEPA22-15) located at 3210 Northwest McIntosh Road as proposed by Scott Taylor for SGA Engineering. The Department of Ecology (Ecology) reviewed the environmental checklist and has the following comment(s):

SOLID WASTE MANAGEMENT: Derek Rockett (360) 407-6287

The applicant proposes to demolish an existing structure(s). In addition to any required asbestos abatement procedures, the applicant should ensure that any other potentially dangerous or hazardous materials present are removed prior to demolition. It is important that these materials and wastes are removed and appropriately managed prior to demolition. It is equally important that demolition debris is also safely managed, especially if it contains painted wood or concrete, treated wood, or other possibly dangerous materials. Please review the "Dangerous Waste Rules for Demolition, Construction, and Renovation Wastes," on Ecology's website at: Construction & Demolition Guidance. All removed debris resulting from this project must be disposed of at an approved site. All grading and filling of land must utilize only clean fill. All other materials may be considered solid waste and permit approval may be required from your local jurisdictional health department prior to filling. Contact the local jurisdictional health department for proper management of these materials.

TOXICS CLEANUP: Sam Meng (360) 999-9587

No confirmed or suspected cleanup sites within a quarter of mile from the project area. No comment. For questions contact Sam Meng with the Toxics Cleanup Program at the Southwest Regional Office at (360) 999-9587.

WATER QUALITY/WATERSHED RESOURCES UNIT:
Brian Johnson (360) 624-5741

Erosion control measures must be in place prior to any clearing, grading, or construction. These control measures must be effective to prevent stormwater runoff from carrying soil

and other pollutants into surface water or stormdrains that lead to waters of the state. Sand, silt, clay particles, and soil will damage aquatic habitat and are considered to be pollutants.

Any discharge of sediment-laden runoff or other pollutants to waters of the state is in violation of Chapter 90.48 RCW, Water Pollution Control, and WAC 173-201A, Water Quality Standards for Surface Waters of the State of Washington, and is subject to enforcement action.

Construction Stormwater General Permit:
The following construction activities require coverage under the Construction Stormwater General Permit:

1. Clearing, grading and/or excavation that results in the disturbance of one or more acres **and** discharges stormwater to surface waters of the State; and
2. Clearing, grading and/or excavation on sites smaller than one acre that are part of a larger common plan of development or sale, if the common plan of development or sale will ultimately disturb one acre or more **and** discharge stormwater to surface waters of the State.
    a) This includes forest practices (including, but not limited to, class IV conversions) that are part of a construction activity that will result in the disturbance of one or more acres, **and** discharge to surface waters of the State; and
3. Any size construction activity discharging stormwater to waters of the State that Ecology:
    a) Determines to be a significant contributor of pollutants to waters of the State of Washington.
    b) Reasonably expects to cause a violation of any water quality standard.

If there are known soil/ground water contaminants present on-site, additional information (including, but not limited to: temporary erosion and sediment control plans; stormwater pollution prevention plan; list of known contaminants with concentrations and depths found; a site map depicting the sample location(s); and additional studies/reports regarding contaminant(s)) will be required to be submitted. For additional information on contaminated construction sites, please contact Evan Wood at evan.wood@ecy.wa.gov, or by phone at (360) 706-4599.

Additionally, sites that discharge to segments of waterbodies listed as impaired by the State of Washington under Section 303(d) of the Clean Water Act for turbidity, fine sediment, high pH, or phosphorous, or to waterbodies covered by a TMDL may need to meet additional sampling and record keeping requirements. See condition S8 of the Construction Stormwater General Permit for a description of these requirements. To see if your site discharges to a TMDL or 303(d)-listed waterbody, use Ecology's Water Quality Atlas at: https://fortress.wa.gov/ecy/waterqualityatlas/StartPage.aspx.

The applicant may apply online or obtain an application from Ecology's website at: http://www.ecy.wa.gov/programs/wq/stormwater/construction/ - Application. Construction site operators must apply for a permit at least 60 days prior to discharging stormwater from construction activities and must submit it on or before the date of the first public notice.

Ecology's comments are based upon information provided by the lead agency. As such, they may not constitute an exhaustive list of the various authorizations that must be obtained or legal requirements that must be fulfilled in order to carry out the proposed action.

If you have any questions or would like to respond to these comments, please contact the appropriate reviewing staff listed above.

Department of Ecology
Southwest Regional Office

(GMP:202206197)

cc: Derek Rockett, SWM
Sam Meng, TCP
Brian Johnson, WQ

In re: McIntosh Subdivision

) NO. SUB22-04
)
) AFFIDAVIT OF MAILING
)
)
)
)
)
Respondent.)

STATE OF WASHINGTON)
) ss.
CLARK COUNTY)

I, Carey Certo, on oath says:

I, Carey Certo, on January 4, 2023, I directed a true and correct copy of the Notice of Application to be served upon the parties herein, in the above-entitled action, by depositing with the U.S. Post Office, Camas, Washington, a postage-prepaid envelope containing same addressed as follows: See attached list.

Carey Certo
SIGNATURE

SUBSCRIBED and SWORN to before me this 5th day of January, 2023.

AIREANNA BALDWIN NOTARY PUBLIC STATE OF WASHINGTON My Comm. Expires October 01, 2024 No. 183848

Aireanna Baldwin
Notary Public in and for the State of Washington, residing at Clark County
My appointment expires: 10/1/2024

Current Resident
430 NW Ilwaco St
Camas WA 98607

Current Resident
330 NW Ilwaco St
Camas WA 98607

Current Resident
500 NW Ilwaco
Camas WA 98607

Current Resident
3046 NW 3rd Ave
Camas WA 98607

Current Resident
PO Box 484
Camas WA 98607

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748 NW Fremont St
Camas WA 98607

Current Resident
3001 NW 3rd Ave
Camas WA 98607

Current Resident
3023 NW 3rd Ave
Camas WA 98607

Current Resident
3045 NW 3rd Ave
Camas WA 98607

Current Resident
3119 NW 3rd Ave
Camas WA 98607

Current Resident
1915 NW Sage St
Camas WA 98607

Current Resident
2928 NW 8th Way
Camas WA 98607

Current Resident
2944 NW 8th Way
Camas WA 98607

Current Resident
169 Erica Dr
Richland WA 99352

Current Resident
842 NW Fremont St
Camas WA 98607

Current Resident
2942 NW 9th Ave
Camas WA 98607

Current Resident
909 NW Fremont St
Camas WA 98607

Current Resident
849 NW Fremont St
Camas WA 98607

Current Resident
821 NW Fremont St
Camas WA 98607

Current Resident
675 NW Ilwaco St
Camas WA 98607

Current Resident
673 NW Ilwaco St
Camas WA 98607

Current Resident
661 NW Ilwaco St
Camas WA 98607

Current Resident
653 NW Ilwaco St
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651 NW Ilwaco St
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649 NW Ilwaco St
Camas WA 98607

Current Resident
645 NW Ilwaco St
Camas WA 98607

Current Resident
509 Ilwaco St
Camas WA 98607

Current Resident
501 NW Ilwaco St
Camas WA 98607

Current Resident
800 NE Tenney Rd #110-348
Vancouver WA 98685

Current Resident
943 NW Hoquiam Ct
Camas WA 98607

Current Resident
648 NW Ilwaco St
Camas WA 98607

Current Resident
310 NW Ilwaco Ct
Camas WA 98607

Current Resident
320 NW Ilwaco Ct
Camas WA 98607

Current Resident
340 NW Ilwaco Ct
Camas WA 98607

Current Resident
737 NW Ilwaco St
Camas WA 98607

Current Resident
PO Box 208
Washougal WA 98671

Current Resident
PO Box 208
Washougal WA 98676

Current Resident
616 NE 4th Ave
Camas WA 98607

Current Resident
736 NW Ilwaco St
Camas WA 98607

Current Resident
710 Ilwaco St
Camas WA 98607

Current Resident
676 NW Ilwaco St
Camas WA 98607

Current Resident
PO Box 470
Camas WA 98607

Current Resident
656 NW Ilwaco St
Camas WA 98607

Current Resident
652 NE Ilwaco St
Camas WA 98607

Current Resident
40220 SE Gibson Rd
Washougal WA 98671

NOTICE OF APPLICATION FOR MC INTOSH SUBDIVISION

(File no. SUB22-04)

Consolidated Files: Archeological Review (ARCH22-10), Critical Areas Review (CA22-11), Major Variance (MAJVAR22-05), and State Environmental Policy Act (SEPA22-15)

NOTICE IS HEREBY GIVEN that an application for the "McIntosh Subdivision" a 28-lot single-family residential subdivision requesting preliminary plat approval was received on June 24, 2022, and deemed technically complete on November 7, 2022. A public hearing is required for the development proposal and will be scheduled at a later date. A separate public hearing notice will be mailed to all property owners within 300-feet of the subject development and published in the Post Record.

Location: The approximate 10-acre site is zoned Single-Family Residential (R-10) in the City of Camas. The site is located at 3210 NW McIntosh Road in the SE ¼ of Section 9 Township 1 North, Range 3 East, Camas, WA, Parcel Number: 127449000.

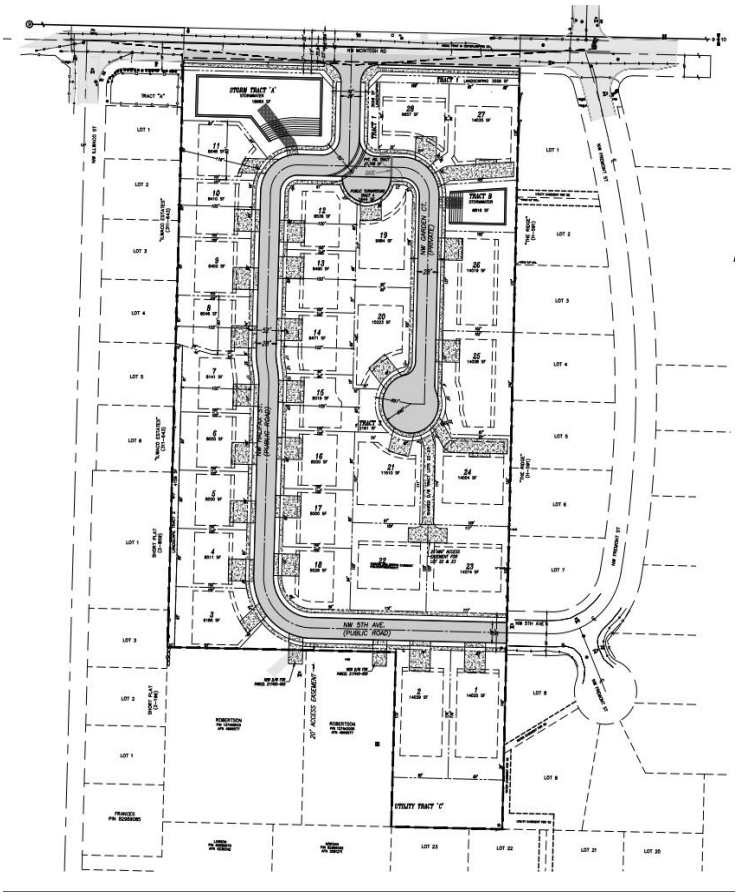
Application Materials: The application included the following: project narrative, SEPA checklist, preliminary development plans, tree report, geotechnical report, archaeological predetermination*, preliminary stormwater report, and traffic study. Application materials are available for review from the Community Development Department during regular business hours Monday – Friday 8am-5pm.

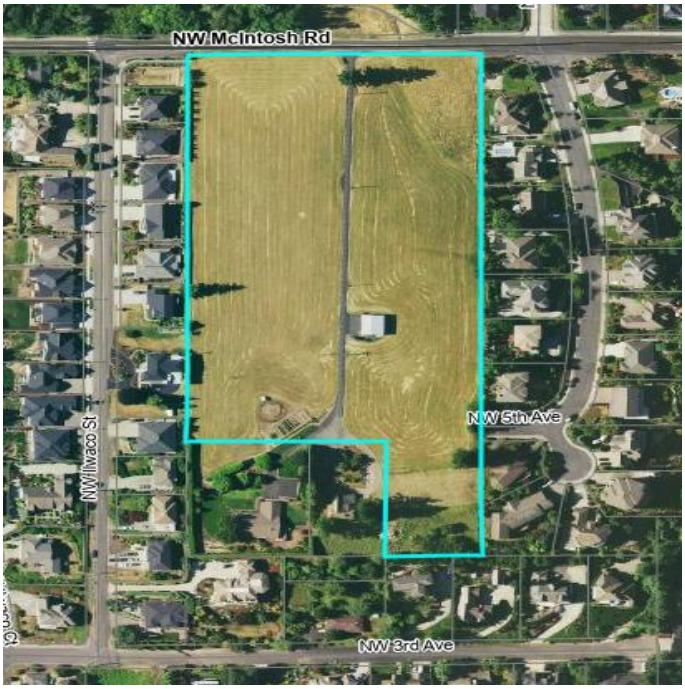
Questions/Comments: For questions related to this application, please contact Yvette Sennewald, Senior Planner, at (360) 817-1568 or by email at communitydevelopment@cityofcamas.us.

*consistent with RCW 42.56.300, Archaeological information is exempt from public disclosure.

Published in the Post Record on January 5, 2023 Legal Publication # 768340
Posted at Camas City Hall, Camas Library, City of Camas website at: http://www.cityofcamas.us
Mailed to property owners within 300-feet on January 4, 2023

Preliminary Plat for McIntosh Subdivision





Carey Certo

From: Anne Garsztka <anne.garsztka@gmail.com>
Sent: Saturday, January 21, 2023 11:50 AM
To: Community Development Email
Subject: Concerns and Question about Application for McIntosh Subdivision (File No. SUB22-04)

WARNING: This message originated outside the City of Camas Mail system. DO NOT CLICK on links or open attachments unless you recognize the sender and are expecting the content. If you recognize the sender as a city employee and you see this message this email is a phishing email. If you are unsure, click the Phish Alert button to redirect the email for ITD review.

Yvette -

My name is Anne Garsztka, and I reside at 909 NW Fremont Street. I have a few questions about the development plan concerning traffic along McIntosh.

My questions are the following.

1. What crosswalk location(s) is planned between the new development and the Klickitat Park side of McIntosh?
2. Will the crosswalk location(s) be developed with light indicators as is the case with the crosswalk at the Dawsons Ridge development?
3. Given the increased expected traffic, will existing crosswalks be provided with light indicators?

And my biggest concern is that the hill between the planned entrance to this development and the intersection of Fremont is the blind hill in both directions. I am concerned that there will be a greater likelihood of car or pedestrian accidents along McIntosh. There is also a tendency for traffic to accelerate along the straightaway between Fremont Street and 11th, in the direction of Brady. The speed of those drivers has always been a concern, but it will now increase with the additional traffic.

I have children who catch the school bus at the corner of Fremont and McIntosh. This increased traffic without measures to slow traffic and/or provide better guidance will put their safety at risk.

Thank you.
Anne

--
Anne (Penikis) Garsztka
She/Her/Hers (Why I use pronouns)
anne.garsztka@gmail.com
415-902-9283

Tell people they matter. Let them know they are seen and heard.

Notice of Proposed Development
"McIntosh Subdivision"
An application for approval of a 28 Lot Subdivision has been submitted to the City of Camas. The proposal includes 28 single-family lots in the R-10 zone with necessary stormwater and landscaping. Public and private road improvements are proposed
Applications applied for with City:
Subdivison Type III review, critical areas review, SEPA checklist, Archaeological review and Fire Dept. review.
Public Hearing Schedule:
Hearing Date/Time:
Hearing Location: 616 NE 4th Ave., Camas, WA 98607 or via Zoom:
For information regarding this project contact:
Applicant contact: Scott Taylor, 360-993-0911 or staylor@sgaengineering.com
City Contact: Madeline Sutherland, Planner, 360-817-7237 or msutherland@cityofcamas.us

In re: McIntosh Subdivision

) NO. SUB22-04
)
) AFFIDAVIT OF MAILING
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)
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)
)
Respondent.)

STATE OF WASHINGTON)
) ss.
CLARK COUNTY)

I, Carey Certo, on oath says:

I, Carey Certo, on February 1, 2023, I directed a true and correct copy of the Notice of Public Hearing to be served upon the parties herein, in the above-entitled action, by depositing with the U.S. Post Office, Camas, Washington, a postage-prepaid envelope containing same addressed as follows: See attached list.

Carey Certo
SIGNATURE

SUBSCRIBED and SWORN to before me this 7th day of February, 2023.

AIREANNA BALDWIN NOTARY PUBLIC STATE OF WASHINGTON My Comm. Expires October 01, 2024 No. 183848

Aireanna Baldwin
Notary Public in and for the State of Washington, residing at Clark County
My appointment expires: 10/01/2024

Current Resident
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Camas WA 98607

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Current Resident
3023 NW 3rd Ave
Camas WA 98607

Current Resident
3045 NW 3rd Ave
Camas WA 98607

Current Resident
3119 NW 3rd Ave
Camas WA 98607

Current Resident
1915 NW Sage St
Camas WA 98607

Current Resident
2928 NW 8th Way
Camas WA 98607

Current Resident
2944 NW 8th Way
Camas WA 98607

Current Resident
169 Erica Dr
Richland WA 99352

Current Resident
842 NW Fremont St
Camas WA 98607

Current Resident
2942 NW 9th Ave
Camas WA 98607

Current Resident
909 NW Fremont St
Camas WA 98607

Current Resident
849 NW Fremont St
Camas WA 98607

Current Resident
821 NW Fremont St
Camas WA 98607

Current Resident
675 NW Ilwaco St
Camas WA 98607

Current Resident
673 NW Ilwaco St
Camas WA 98607

Current Resident
661 NW Ilwaco St
Camas WA 98607

Current Resident
653 NW Ilwaco St
Camas WA 98607

Current Resident
651 NW Ilwaco St
Camas WA 98607

Current Resident
649 NW Ilwaco St
Camas WA 98607

Current Resident
645 NW Ilwaco St
Camas WA 98607

Current Resident
509 Ilwaco St
Camas WA 98607

Current Resident
501 NW Ilwaco St
Camas WA 98607

Current Resident
800 NE Tenney Rd #110-348
Vancouver WA 98685

Current Resident
943 NW Hoquiam Ct
Camas WA 98607

Current Resident
648 NW Ilwaco St
Camas WA 98607

Current Resident
310 NW Ilwaco Ct
Camas WA 98607

Current Resident
320 NW Ilwaco Ct
Camas WA 98607

Current Resident
340 NW Ilwaco Ct
Camas WA 98607

Current Resident
737 NW Ilwaco St
Camas WA 98607

Current Resident
PO Box 208
Washougal WA 98671

Current Resident
PO Box 208
Washougal WA 98676

Current Resident
616 NE 4th Ave
Camas WA 98607

Current Resident
736 NW Ilwaco St
Camas WA 98607

Current Resident
710 Ilwaco St
Camas WA 98607

Current Resident
676 NW Ilwaco St
Camas WA 98607

Current Resident
PO Box 470
Camas WA 98607

Current Resident
656 NW Ilwaco St
Camas WA 98607

Current Resident
652 NE Ilwaco St
Camas WA 98607

Current Resident
40220 SE Gibson Rd
Washougal WA 98671

Community Development Department

Notice of Public Hearing

McIntosh Subdivision

Planning Case No. SUB22-04

A public hearing will be held on **Thursday, February 16, 2023, at 5:00 p.m.,** or soon thereafter, before the City's Hearings Examiner to consider the preliminary plat application for the McIntosh Subdivision. The public hearing will be held remotely and in person at city hall. The applicant proposes to construct a 28-lot subdivision. The approximately 10-acre site is situated in the R-10 – Single Family Residential Zone and is located at 3210 NW McIntosh Road in the SE ¼ of Section 9, Township 1 North, Range 3 East; Camas, WA., Parcel Number 127449000. The application was determined technically complete on November 7, 2022.

Questions/Comments: The public hearing will follow the quasi-judicial process described within Camas Municipal Code §18.55.180. Comments related to this development may be submitted as follows: (1) In person by testifying at the public hearing; (2) by regular mail to Community Development Department staff, Yvette Sennewald, Senior Planner, at Camas City Hall, 616 Northeast Fourth Avenue, Camas, WA 98607; (3) by phone at (360) 817-1568; or (4) by email to: communitydevelopment@cityofcamas.us. It is preferable that written comments be received at least five working days prior to the public hearing, in order to be available with the online agenda and materials. After the agenda has been posted online, all other written comments must be received no later than noon (12:00 p.m.) the day of the hearing, in order for those comments to be handed to the Hearings Examiner by Staff. Written and oral comments may also be submitted in person during the hearing.

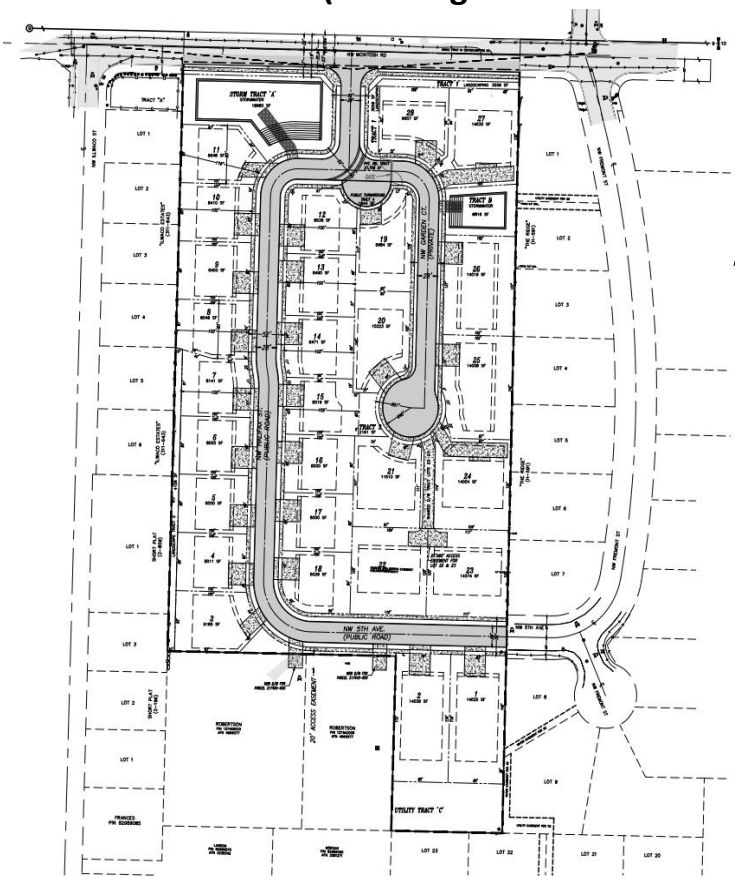
Application Materials: The application included the following: project narrative, development plans and environmental reports, as required for a complete application pursuant to Camas Municipal Code (CMC) §18.55.110. The application materials are also available for viewing at the Community Development Department (616 NE 4th Avenue, Camas, WA) during regular business hours Monday – Friday 8 a.m-5 p.m.

Participate: All citizens are entitled to have equal access to the services, benefits and programs of the City of Camas. Please contact the **City Clerk at (360) 817-1591** for special accommodations if needed. The city will provide translators for non-English speaking persons who request assistance at least three working days prior to a public meeting or hearing.

More Information: The public hearing agenda and supporting documents will be available for review on the City's website at the "Minutes, Agendas & Videos" link within the drop-down menu that is labeled "Your Government" or follow this link: http://www.cityofcamas.us/yourgovernment/minuteagendavideo.

Published in the Post Record on February 2, 2023 Legal Publication #774360
Posted at Camas City Hall, Camas Library, City of Camas website at: http://www.cityofcamas.us
Mailed to property owners within 300-feet on February 1, 2023

Excerpt from Preliminary Plat Application
McIntosh Subdivision (Planning Case No. SUB22-04)



Gmail

Madeline Lyne <lyne272@gmail.com>

Tree Ordinances

Madeline Lyne <lyne272@gmail.com> Wed, Oct 12, 2022, 9:33 PM
To: Tim Hein <thein@cityofcamas.us>, Leslie Lewallen <llewallen@cityofcamas.us>
Cc: Alicia King <alicia@justagirlincamas.com>, Heather Kesmodel <wonkabar7@gmail.com>
Bcc: Dan Lyne <vridgemarket@gmail.com>

Tim
Thank you for resending the 2018 Tree Ordinances. I have no experience in this area and nothing with which to compare our policies. I read the 13 pages and took notes and do have some questions. Before I ask those questions and for clarification on some points, I have realized that, unfortunately, our western culture does not typically view our environment in a way that respects its value as it should. There's "mutual responsibility" (pg 42 from Braiding Sweetgrass - A Hymn of Love to the world, Robin Wall Kimmerer) between us and nature. We depend on it for so much, including the air we breathe and it depends on us to protect and preserve it. The Western mindset still favors development and progress, often at the expense of nature. And so I am not optimistic that anything will change in Camas with regards to prioritizing tree preservation soon enough, or at all, to protect our shrinking tree canopy and animal habitat. But I will ask my questions and ask for assistance in clarifying some things I've read in the 13 pages and make some comments. I will do this in the order the ordinance is written.

1. **18.03.40.** Environmental Definitions- **"Significant Trees" = Evergreens that are 8" DBH** (diameter of tree measured at breast height 4'6" from ground
The tree that prompted me to write in the first place is an evergreen in the McIntosh Subdivision and I believe fits this criteria especially because there are not many trees on this property which makes it even more **significant. It is also astonishingly tall!**

2. **18.13.010**. Purpose
B. To. implement the city's comprehensive plan goals which include **preserving natural beauty** in the city and **protecting Camas' native landscape** and **mature tree cover.** CAN YOU TELL ME WHERE THIS IS BEING DONE? For example, I can see clearcutting being done on the other side of the lake. This evergreen on the McIntosh Subdivision certainly is part of our natural beauty.

3. **18.13.020.** Scope
The term "unless otherwise exempted" is used. What does this refer to and does this relate to the trees in the McIntosh Subdivision?

D. .....Removal of trees on parcels of less than 1 acre in size shall be limited in proportion to 6 trees per acre (ex. a 1/2 acre parcel can remove 3 trees)----But McIntosh Subdivision's land does not have many trees so shouldn't its mature trees be preserved to be in line with section 18.13.010 under #2B above?

4. **18.13.045.** Tree Survey
A. Tree survey prepared by a certified arborist or professional forester.
What is the outcome of this survey for McIntosh Subdivision?
B. Tree survey must contain an Inventory and Assessment. And part of the assessment is (d) Recommendation for preservation or removal. This section appears to favor the development project by stating "The recommendation WILL consider proposed grading, trenching, paving, fencing and other construction plans." Again, referring to 2B above the tree I'm concerned about is a **mature tree** on land without many trees to consider.

5. **18.13.051**. Minimum Tree Density Requirement
A. Tree Density - A minimum tree density per net acre is required and must be incorporated within the overall landscape plan. The tree density **MAY** consist of existing trees ***** How does the city ensure mostly, if not all existing (mature) trees remain and are not replaced with replacement trees OR a combination of existing and replacement trees? *** PURSUANT TO THE PRIORITY ESTABLISHED IN THE FOLLOWING SECTION**

6. **18.13.052.** Tree and Native Vegetation Preservation

A. When determining where to retain or plant trees, locations with healthy soils, native understory vegetation, and **mature trees shall have priority** when there are feasible alternative locations on site for proposed buildings and site improvements to achieve the minimum tree unit density per acre. This may require site redesign. Provided, where necessary, density transfer areas may be used to ensure protection and retention of trees.--**WHAT DOES THIS LAST LINE MEAN?**

*****I believe Robert Maul said in a voicemail (9/27) "spacing issues that are a requirement from the city and transportation & the road access points kind of fixed right in the middle which is right where the tree is of course....been through multiple designs...." This was from the transcript of the voice mail. This is probably where protecting/preserving the tree will lose out unfortunately. **And also where the language can be in favor of the tree.**

B. In designing a development project and in meeting the required tree density, the applicant must provide a Landscape, Tree & Vegetation Plan **that retains healthy, wind firm trees in the following priority**

1. Trees located within critical area buffers. Trees must be identified within a protected tract.
2. **Significant** wildlife habitat, or areas adjacent and buffering habitat.-HOW DO YOU DEFINE SIGNIFICANT HERE?

This tree may house nests (potentially of owls) so has it been checked? And Klikitat Park is adjacent and has signs delineating its "Habitat Area"

3. Significant trees that are greater than 36" DBH. WHAT ABOUT MATURE TREES OF A CERTAIN HEIGHT? This tree on McIntosh subdivision is massively tall and has probably been there for close to 100 years.

C. Mitigation and Replacement. In areas where there are currently **inadequate numbers of existing trees to meet minimum tree density,** where the trees are inappropriate for preservation, the soils are poor, or there are significant invasive species, then mitigation shall be required to meet the minimum tree density. The bolded part of this sentence should then defer to healthy mature trees being preserved due to the limited number of trees present in the first place.

The applicant's proposed location for replacement trees or mitigation shall be subject to the city's approval of the Landscape Plan. WHAT'S THE DIFFERENCE BETWEEN REPLACING TREES AND MITIGATION? IS MITIGATION PRESERVING EXISTING TREES/VEGETATION?

So I thank you for taking the time to read my concerns. I hope it was readable!! We all live in Camas and cannot deny the change in our natural environment due to many mature trees being taken down and clearcutting permitted to make way for development. Without our natural beauty, Camas would be just a community of subdivisions with a quaint downtown. But we are more than that, and so it's our responsibility to grow conscientiously by preserving our mature trees, tree canopy, animal habitat and amazing beauty.

****None of my emails about this particular tree in the McIntosh Subdivision, nor my attendance and comments at past council meetings or meetings with city planners regarding tree preservation has mentioned anything that would require money from the budget. My point of view is about stronger wording that prioritizes tree preservation and policies that prohibit clear cutting. So I don't know why Tim and Leslie, you both mention the city's budget. This is policy and Robert also said in his voicemail,**
"....going to be up to Council to direct staff on if they want to pursue policy changes.."
[Quoted text hidden]

From: Don Bruno <dbgeservices@yahoo.com>
Sent: Monday, February 13, 2023 2:27 PM
To: staylor@sgaengineering.com
Subject: Re: McIntosh Subdivision - Geotechnical Engineering Report & Invoice

Hello Scott,

Have reviewed the revised lot lay out for the subject project :
McIntosh Subdivision @3210 NW McIntosh Road, Camas, WA 98607 - Lot No. 127449000

It is our opinion the geotechnical engineering recommendations and design parameters provided for this project by Earth Engineering Inc., in our Geotechnical Engineering Study, G12-0122, Dated March 1st of 2022 is still applicable for the proposed development.

Respectfully, Don Bruno,CEG
Earth Engineering Inc.
PO Box 1512
Ridgefield, WA 98642

(360) 600-6518

On Monday, February 13, 2023, 1:30:40 PM PST, <staylor@sgaengineering.com> wrote:

Hello Don,

We are getting ready for the public hearing on this project this Thursday.

The city planner asked if we could reach out to you and get an updated “all things are good” with our current layout ahead of the hearing. The Geotech report we have from last March was using a different layout where we did not connect to McIntosh Road. We received push back on that design and the city required that we connect to McIntosh Road with our on-site road. See attached current plans for reference.

Could you please give us your thumbs up and review on the current plan, letting us know if all of the Geotechnical recommendations still are good to go for final engineering? I don’t think we need a memo or anything, just an email confirmation.

I really appreciate the extra assistance. Let me know if you have any questions on this.

Sincerely,

Scott Taylor

From: Don Bruno <dbgeservices@yahoo.com>
Sent: Monday, March 28, 2022 2:03 PM
To: Scott Taylor <staylor@sgaengineering.com>; scamalama72@gmail.com
Subject: McIntosh Subdivision - Geotechnical Engineering Report & Invoice

Hell Scott & Sam,

See attached geotechnical report & invoice.

Note that an 11x17 Site Plan has also been included and can be printed to replace the 8-1/2 x 11.

At your request we can mail a hard copy to your office.

Respectfully, Don Bruno,CEG

Earth Engineering Inc.

PO Box 1512

Ridgefield, WA 98642

(360) 600-6518

TO: Hearings Examiner and City of Camas Development Dept,

Today you will hear the McIntosh subdivision application. There is one lone large tree on this lot. And it is not to be saved. It's another sad day for Camas.

A Major Zoning Variance to be granted Thursday allows the developer of this 28-lot subdivision to increase the lot coverage on the 10k sq. ft. average lots from 35% to 50%. That's an extra 1,500 sq. ft per lot. A total of 142k additional sq. ft. If you place a Camas new build value of $300/ sq ft (Including all of the air space allowed in the R-10 zone), that's an extra 12.6M as a gift to the developer from the city of Camas.

We are under no burden to grant this. The community has spoken time and time again about the detrimental effects of this McMansion Crunch. Traffic that is unable to accommodate. Trees that are clearcut. These are issues that have been brought up with City Council numerous times.

There is one large tree on this lot. One. This is the only thing the community has asked to save. We should be asking for more. We need new codes. We need a heritage tree program and a city arborist or forester.

Respectfully,
Heather Gulling
Camas resident

Public Comments 2/16/2023 **regarding McIntosh Subdivision SUB22-04**

Greg K. Anderson, residence in Camas adjacent to the west of the proposed subdivision.

We have several concerns:

A. The most significant concern is storm water management. Currently our property receives storm water runoff from the now vacant field as our location is of lower elevation. When we built our home, we were required to place a 5' wide drainage system the entire width of the back property line to capture and convey this runoff to our stormwater facility.
    a. Even with the drainage system, a sizeable amount of runoff was accumulating on our property below the drainage area. To remedy this issue, two French drains were installed and connected to the gutter/downspouts system. These drains have flowing water many months of the year.
    b. During large storm events, sizeable amounts of runoff enter the yard in what I will call sheets of water. The force of the runoff has scoured the dirt around the fenceposts and deposits sizeable amounts of debris and silt into the drainage system. The drainage system then needs to be cleared and the fence reinforced.
    c. **Our concerns are**:
        i. The proposed subdivision stormwater preliminary plan includes a system that connects 6 or more lots together. Each lot would connect the roof drains and foundation drains into an infiltration trench (unknown details about this as of this comment, see conditions of approval #35 through 40) AND additional impervious surfaces. This increased in water will be traveling along the subdivision's west property line. The infiltration trench begins uphill from our property adding storm flow toward our home than currently. We do not want more water entering our property.
        ii. Once the subdivision is declared "final acceptance" by the city, the property owners will be able to add additional impervious surfaces, change the flow of the storm water with fill dirt or other means with no opportunity for us to intercede.
        iii. Also, ongoing maintenance of the storm water trench system may be neglected, modified, or even fail to perform as designed, leaving us little recourse.
        iv. Our asks are:
            1. That the infiltration idea for the lots be changed to a sealed pipe system to move the water from the roof and foundation runoff to the facility in tract B, not through an infiltration trench.
            2. Maintenance and functional preservation of the storm water conveyance system I'm discussing adjacent to our home be clearly stated for future owners, see Conditions of Approval #65 c and #77 and Final Plat Note 11.
            3. Or, that some other solution be provided that does not increase our risk of storm water flow for the life of the subdivision except for acts of God.

4. During construction of the subdivision, and of any adjacent homes while they are being built and landscaped, that measures are taken to insure erosion sediments does not leave their property and enter ours. This contradicts Conditions of Approval #14 and 73.

B. Tree preservation:
   a. We have a sizeable pine tree near our rear property line and we would like precautions taken to insure it's safety during any construction.

C. Staff Report Finding #3 on page 12 near the bottom of the page states:

   Finding: Staff finds that as there is over 400-feet (approximately 980-feet) of sight distance looking west, staff would support shifting the proposed future public access road intersection (NW Halifax Street) further to the west to increase the intersection sight distance looking east. Shifting the proposed public access road intersection further to the west would also allow the applicant to potentially preserve the existing significant fir tree that will be impacted with the currently proposed location of the future public access road (NW Halifax Street).

   I don't find a Condition of Approval for this Finding and yet it appears to be a significant finding for safety and tree preservation for tree #1 as listed in the tree report.

D. Staff Report Finding #5 states:

   Finding: Aside from lots requesting a variance, staff finds the proposed lot sizes can conform to the requirements of the R-10 zone as conditioned.

   a. Proposed Plat Notes#5 says Maximum building lot coverage for this subdivision is 40%.
   b. I don't see any justification for the Plat note, nor can I support increased density on the building lots (referencing my comments regarding stormwater). For reference, please see CMC 18.45.020 the maximum building lot coverage is 35% for R-10 zone.

E. Per CMC: 18.55.110 - Application—Required information is:
   a. "H. Signage for Type III applications and short subdivisions: Prior to an application being deemed complete and Type III applications are scheduled for public bearing, the applicant shall post one four-foot by eight-foot sign per road frontage, unless a different size (not to be less than six square feet) is approved by the director…." and "The sign shall be clearly visible from adjoining rights-of-way…"
   b. As of February 13, 2023, no sign is visible from NW 5th Avenue or NW Fremont Street.

Thank you for your consideration. If you have any questions staff knows how to contact us.

Greg K. Anderson

Colete Anderson

Carey Certo

From: Ken Miles <kemiles@comcast.net>
Sent: Thursday, February 16, 2023 4:38 PM
To: Community Development Email
Subject: Comments on McIntosh Subdivision

WARNING: This message originated outside the City of Camas Mail system. DO NOT CLICK on links or open attachments unless you recognize the sender and are expecting the content. If you recognize the sender as a city employee and you see this message this email is a phishing email. If you are unsure, click the Phish Alert button to redirect the email for ITD review.

Hello Community Development:

Regarding the McIntosh Subdivision project I have noted that the evergreen tree at the entrance of the property is slated for removal per these notes on P19 in the agenda packet:

> "The applicant has indicated that the project would provide more mature trees and shrubs to create an entry statement into the development to offset the removal of the large evergreen tree. A final landscape, tree, and vegetation plan consistent with the landscaping standards in CMC Chapter 18.13 should be submitted to the City for review and approval prior to engineering plan approval..."

I am disappointed that a way has not been found to preserve the tree at the entrance of the property. But assuming that we can take the applicant at his word to install "mature trees and shrubs to create an entry statement into the development" as mitigation for the loss of this tree, I want to propose a potential solution:

Transplant tree #12026 from the Camas Heights project to this location. This is a Sequoia tree, approximately 30 years old, that is much loved in the community and is slated for removal by Lennar. Lennar gained approval for removing this tree, and most others on the site in spite of pleas to spare it (e.g see Camas Heights Subdivision file SUB21-01 dated 4/28/2022 comments on P749).

I do believe that the developer should provide one or more mature trees as the plan states, not a 2-inch sapling that will become mature one day. Here is an example of this being done elsewhere in the world:

https://www.facebook.com/BeautifulWorldPage/photos/a.502747830086588/1776461962715162/

I am including the photo in that post for reference.

I am also including a photo of tree #12026 in Camas Heights.

Regards,

-Ken Miles

Camas

In Japan if a tree is
building, they bind t

BEFORE THE LAND USE HEARING EXAMINER
FOR THE CITY OF CAMAS, WASHINGTON

Regarding an application by METT RI, LLC	)	**F I N A L O R D E R**
for approval of a preliminary plat to divide	)	
10.4-acres into 28 lots in the R-10 zone at	)	**File# SUB22-04[1]**
3210 NW McIntosh Road, in the City of Camas	)	**(McIntosh Subdivision)**

A. SUMMARY

1. The applicant, METT RI, LLC, requests approval to divide the 10.4-acre site into 28 lots and tracts for stormwater, private roads, and open space/landscape buffers. The site is located at 3210 NW McIntosh Road; also known as tax parcel 127449-000, Section 9, Township 1 North, Range 3 East, Willamette Meridian (WM), Camas Washington (the "site").

a. The site and properties abutting the northern portion of the west boundary of the site and the lot abutting the western portion of the south boundary are zoned R-10 (Single Family Residential, 10,000 square-foot average lot size). Properties abutting the east boundary and the remainder of the south and west boundaries are zoned R-15 (Single Family Residential, 15,000 square-foot average lot size). The property to the north, across NW McIntosh Road, is zoned NP (Neighborhood Park) and developed as Klickitat Park.

b. The site is currently developed with a shop building that will be removed to accommodate the proposed development. All proposed lots comply with the minimum dimensional standards for the R-10 zone.

c. The site contains a mapped geologically hazardous area (i.e., steep slopes) in the northwest and southern portions of the site. The applicant submitted a geotechnical report demonstrating that the geologic conditions and slopes on the site will not preclude the proposed development. (Exhibits 4 and 30).

d. The site contains eight individual trees and ten clumps of Hazelnut trees, including a roughly 90-foot-tall Douglas fir tree located near the center of the north boundary of the site. The applicant proposed to remove six of the existing trees to facilitate the subdivision, including the tall Douglas fir.

e. The City of Camas will supply domestic water and sanitary sewer service to the proposed development. The applicant will collect stormwater from all public and private roads, sidewalks, and driveway on the site and convey it to stormwater facilities in proposed Tracts A and B for treatment and detention. Stormwater from roofs will discharge to linked infiltration trenches on the rear of the proposed lots, with overflow connections to the stormwater facilities in Tracts A and B. The applicant will

[1] This approval includes consolidated files: ARCH22-10 (Archaeological Review), CA22-11 (Critical Areas Review), MAJVAR22-05 (Major Variance), and SEPA22-15 (State Environmental Policy Act).

discharge treated stormwater from the stormwater facilities into the existing public storm sewers in NW McIntosh Road at less than predevelopment rates.

f. The applicant will dedicate right-of-way and construct frontage improvements along the site's NW McIntosh Road frontage. In addition, the applicant will construct roughly 60-feet of offsite sidewalk, between the east property line of the site and the existing curb return at the southwest corner of Fremont Street. The applicant will extend a public street, proposed NW Halifax Street, into the site from NW McIntosh Road. Proposed NW Halifax Street will turn east near the south boundary of the site, becoming proposed NW 5th Avenue, which will intersect the existing street stub of NW 5th Avenue/Fremont Street abutting the east boundary of the site. The applicant will extend a new private street, proposed NW Garden Court, into the site from NW Halifax Street, terminating in a cul-de-sac turnaround north of proposed NW 5th Avenue. The applicant proposed a gate and turnaround at the intersection of NW Garden Court and NW Halifax Street. The applicant will extend a shared driveway south of the NW Garden Court cul-de-sac to provide access to proposed Lots 22 and 23.

2. The applicant also requests approval of major variances to:

a. Reduce the front yard setbacks for lots 25 and 26 from 25 to 20 feet;

b. Reduce the rear yard setback for lots 25, 26, and 28 from 30 feet to 25 feet; and

c. Increase the maximum permitted lot coverage from 35-percent to 50-percent for all of the proposed lots.

3. The City issued a Determination of Nonsignificance ("DNS") for the subdivision pursuant to the State Environmental Policy Act ("SEPA") on December 15, 2022. The SEPA determination was not appealed and is now final.

4. City of Camas Hearing Examiner Joe Turner (the "examiner") conducted a duly noticed public hearing to receive testimony and evidence about the application. City staff recommended the examiner approve the preliminary plat subject to conditions, as modified at the hearing. See the City of Camas Staff Report to the Hearing Examiner dated February 13, 2023 (the "Staff Report"). The applicant accepted the findings and conditions in the Staff Report, as modified, with certain exceptions. Four persons testified orally in opposition to, or with questions and concerns about, the application. Other persons testified in writing. Contested issues in the case include:

a. Whether the applicant and City provided adequate notice of the public hearing in this matter;

b. Whether the applicant can be required to retain the 90-foot-tall Douglas fir tree on the site;

c. Whether the applicant can be required to transplant a large tree from the Camas Heights development site or plant larger trees on the site;

d. Whether the intersection of proposed NW Halifax Street with NW McIntosh Road will operate safely;

e. Whether the applicant is required to provide a pedestrian and bicycle connection between the terminus of proposed NW Garden Court and the nearest available street;

f. Whether, and to what extent, the applicant can be required to construct off-site sidewalks;

g. Whether the applicant can be required to provide a crosswalk across NW McIntosh Road at the proposed NW Halifax Street intersection;

h. Whether the applicant is required to provide a turnaround at the end of the shared driveway south of NW Garden Court;

i. Whether construction on the site will cause prohibited erosion, sedimentation, and runoff impacts on adjacent properties;

j. Whether the proposed development will increase stormwater runoff onto adjacent properties;

k. Whether the applicant sustained its burden of proof that the setback variances for Lots 25, 26, and 28 complies with the applicable approval criteria;

l. Whether the applicant sustained its burden of proof that the proposed lot size variance complies with the applicable approval criteria; and

m. Whether smaller utility easements are warranted on proposed Lot 1.

5. Based on the findings provided or incorporated herein, the examiner approves the preliminary plat subject to the conditions at the end of this final order.

B. HEARING AND RECORD HIGHLIGHTS

1. The examiner received testimony at a public hearing about this application on February 16, 2023. All exhibits and records of testimony are filed at the City of Camas. At the beginning of the hearing, the examiner described how the hearing would be conducted and how interested persons could participate. The examiner disclaimed any *ex parte* contacts, bias, or conflicts of interest. The following is a summary by the examiner of selected testimony and evidence offered at the public hearing.

2. City planner Yvette Sennewald summarized the Staff Report and her PowerPoint presentation.

a. The site consists of a 10.4-acre parcel located south of NW McIntosh road. The applicant proposed to subdivide the site into 28 lots ranging in size from 8,000 to 14,074 square-feet.

b. Properties abutting the east boundary of the site are zoned R-15. Therefore, all lots abutting the east boundary must be 14,000 square feet in area in order to meet the City's "beveling" requirement. Properties abutting the southern portion of the west boundary of the site are also zoned R-15. However, the applicant proposed to create a ten-foot-wide landscape buffer tract between proposed Lots 3 through 7, eliminating the need to comply with the beveling standard in this section of the development, as these lots will not "abut" the adjacent R-15 zoned properties.

c. The applicant also requests major variance approvals to reduce the front and rear yard setbacks for proposed 25 and 26 and the rear yard setback for lots 28 by five feet and to increase the maximum permitted lot coverage from 35-percent to 50-percent for all of the proposed lots.

d. The applicant proposed to remove six of the existing trees on the site, including the tall Douglas fir located near the center of the north boundary of the site, in order to facilitate the proposed subdivision. Based on the report from the applicant's arborist (Exhibit 10), the evergreen tree appears to be in good condition but it exhibits some past breakage about 15-feet from the top, which resulted in several branches growing upward to become new tops and creates a weak area subject to future breakage. The tree conflicts with the proposed access road for the subdivision. The arborist report states that grading required for the proposed development would cause severe impacts to the tree and there are no viable options for moving the road location while providing the safety, sight distance, and slope requirements for the project.

e. She requested that the examiner delete condition 31, as the applicant submitted the required addendum to the geotechnical report, Exhibit 30.

f. She corrected the following typographical errors in the Staff Report:

i. The second sentence in the second bullet on page 21 should be amended to read "~~Tue~~ The measured intersection sight distance was…"

ii. The second bullet on page 22 should be amended to read "To allow a rear yard setback for lots 25 and 26 to be 25-feet where CMC permits a minimum rear yard setback of ~~25~~ 30-feet."

g. The City received two additional comment letters, Exhibit 31 and 33.

3. City engineering project manager Anita Ashton summarized the engineering issues for this project.

a. The applicant is required to provide a fifteen-foot access and utility easement on the east boundary of Lot 1, which will provide access to proposed Tract C.

b. The proposed development is largely retaining existing drainage patterns as required by Minimum Requirement #4 of the Stormwater Management manual. Based on the topography of the site, stormwater falling on the site flows downhill in all directions. The proposed development will largely replicate that existing condition. The applicant will collect stormwater runoff from all new impervious surfaces on the site and convey it to the proposed stormwater facilities. Runoff from all public and private streets, driveways, and sidewalks will be conveyed to one of the detention ponds in Tracts A and B for treatment and detention. The applicant will discharge treated runoff from these facilities into the existing storm sewer in NW McIntosh Road at less than predevelopment rates. The applicant will collect runoff from roofs and discharge it to rear-yard infiltration trenches, replicating existing conditions where stormwater falling on the site infiltrates into the ground. The City has not reviewed the designs of the infiltration facilities and may require an alternative disposal method during final engineering review.

i. The City can monitor and enforce maintenance of stormwater facilities located in roads and tracts. The City has no authority to review and enforce maintenance of private stormwater facilities located on individual lots.

c. The applicant is required to install and maintain erosion and dust control measures consistent with state and local laws. She requested the examiner add a plat note condition requiring retention of erosion control measures on the perimeter of the site until home construction is completed on the proposed lots.

d. She noted that CMC 17.19.040.B(10(b)(ii) requires a direct pedestrian or bicycle connection to the nearest available street for cul-de-sac and permanent dead-end streets over 300-feet in length. However, proposed NW Garden Court only exceeds the maximum length standard by 65 feet. A pedestrian/bicycle connection from the end of this street would not provide direct access to any pedestrian oriented uses. Therefore, she recommended approval of a deviation to waive compliance with this requirement.

e. She agreed with the applicant's request to reduce the easement width on Lot 1 to 15 feet for those easement sections that include a single utility, sewer or water. Easements with two utilities (sewer and water) should be 20 feet wide, unless otherwise approved by city engineering staff.

f. Note 3 of Table 1 of the Camas Design Standards Manual requires a turnaround at the end of all dead-end roads in excess of 150 feet in length, whether public or private roads or driveways.

g. She requested the examiner add a condition of approval requiring that all construction traffic access the site from NW McIntosh Road, with no construction traffic on NW Fremont Street, until infrastructure construction has been completed on the site.

4. Planning manager Robert Maul noted that the applicant submitted a revised preliminary plat that largely complies with the maximum lot size requirement of the R-10 zone. (Exhibit 14).

a. The Dawson Ridge development cited by the applicant was not approved for lot coverage in excess of the maximum allowed by the Code. However, the City Council subsequently amended the Code to allow the City to negotiate flexibility for certain standards, including maximum lot coverage, where a development provides ½ acre or more of open space or recreational tract, CMC 18.09.060.D.

b. It is the City's policy, adopted by the City Council, to require private ownership and maintenance of stormwater facilities by homeowners' associations or individual property owners.

5. City engineer James Carothers testified that the proposed NW Halifax Street/NW McIntosh Road intersection does not meet intersection sight distance requirements, but it exceeds stopping distance requirements. Although the proposed intersection meets minimum standards, he requested the applicant work with City engineering staff to design a refuge/acceleration lane for vehicles turning left onto westbound NW McIntosh Road. This would reduce potential conflicts between westbound traffic on NW McIntosh Road and vehicles turning left out of the site. Frontage improvements constructed by this development will provide sufficient pavement area to allow striping of such a refuge/acceleration lane. The applicant cannot eliminate this intersection, terminating the extension of existing NW 5th Avenue as a dead-end street on the site; the applicant is required to extend this street to comply with the City's cross-circulation standards. Designing this street as a one-way loop would likely cause additional safety issues.

a. The City has a long-range plan to construct sidewalks on the north side of NW McIntosh Road. However, that plan is not currently funded. The City cannot require this applicant to construct those sidewalks, as it would exceed the roughly proportional impact of this development on the need for such sidewalks.

6. Planner Scott Taylor testified on behalf of the applicant, METT RI, LLC.

a. He argued that compliance with the various criteria that apply to this development create "a domino effect" that makes it necessary to request variances to the setback and lot coverage standards of the Code. The abutting development was not subject to the beveling requirement of CMC 18.090.080.B, which would have required 12,000 square foot lots abutting the site. Although the adjacent properties east of the site are zoned R-15, all but two of the lots abutting the site are less than 14,000 square feet in area; ranging from 10,684 to 13,811 square feet. The lots at the north and south ends of the site exceed 17,000 square feet. Homes on this site will be comparable in size and value to the existing homes to the east.

i. Proposed Lots 25, 26, and 28 are relatively shallow, due to the location of the NW Halifax Street/NW McIntosh Road intersection, NW Garden Court, and compliance with the beveling standard. The applicant is requesting reduced front and rear yard setbacks for proposed lots 25 and 26 and reduced rear yard setback for proposed Lot 28 in order to increase home design options on these narrow lots. The proposed 25-foot rear yard setbacks will allow ample room for landscaping to buffer the adjacent

properties east of the site. Proposed Lot 24 takes access from the north. Therefore, the east boundary of that lot is subject to a ten-foot side yard setback, substantially less than the 25-foot rear yard setbacks proposed for Lots 25 and 26. There are no lots abutting the reduced rear yard setback on Lot 28. The rear yard of this lot will abut a landscape tract and the NW McIntosh Road right-of-way.

ii. Compliance with the beveling standard on the east boundary of the site required that the applicant construct smaller, 8,000 square-foot, lots on the remainder of the site in order to meet the 10,500 square-foot average lot size requirement of the R-10 zone; the majority of the lots on the site are in the 8,000 square foot range. Additional lot coverage is needed on these lots in order to construct home sizes consistent with the remainder of the site and surrounding properties. If the proposed variance is approved to allow 50-percent lot coverage, most of the lots will only achieve 42 to 45-percent coverage, given setback and building design constraints. He requested the examiner modify Plat Note 3 to allow up to 50-percent lot coverage.

b. He agreed to the additional condition proposed by Ms. Ashton prohibiting construction traffic on NW Fremont Street. The applicant will utilize the existing driveway as a construction entrance with "laydown areas" on either side of the driveway for storage of construction materials and equipment. However the applicant must also maintain access for the two existing homes near the southwest corner of the site. The applicant may extend a temporary driveway to NW 5th Avenue/Fremont Street for these homes. The temporary driveway will include measures to collect, treat, and detain stormwater runoff until the new roads are completed.

c. He requested the examiner modify the conditions of approval to reduce the required easement width on proposed Lot 1 from 20 feet to 15 feet. There are existing ten-foot wide waterline easements on lots 8 and 9 of "The Ridge" subdivision east of the site. These easements, in combination with the proposed 15-foot easement on Lot 1, will result in a 25-foot easement width, which will allow adequate maintenance access for underground sewer and water utilities. The sewer lines adjacent to Lot 1 are only six to seven feet deep, so a wider easement is not warranted to accommodate deeper excavations.

i. He requested the examiner amend proposed condition 42 to refer to a utility "easement" rather than a utility "tract."

d. It is not possible to provide access from the site to NW McIntosh Road in compliance with the 600-foot intersection spacing requirement of the Code, as the existing intersections to the east and west of the site are 722 feet apart. The applicant proposed to locate the NW Halifax intersection roughly half-way between these intersections: 380 feet from the road to the west and 340 feet from the road to the east. The applicant cannot move this intersection further east without violating sight distance requirements. The applicant cannot move the intersection west without impacting the stormwater facility in Tract A, which is the minimum size necessary to accommodate the projected volume of stormwater runoff from the roads on the site. Reducing the number of proposed lots would not reduce the size of the stormwater facility. Existing topography

and setback requirements further limit the design and preclude relocation of this stormwater facility.

i. Although not required by the Code, the applicant is willing to consider the center left-turn lane suggested by Mr. Carothers to mitigate the sight distance limitations at the NW Halifax Street/NW McIntosh Road intersection.

ii. This development will increase the number of intersections on NW McIntosh Road, but it will not create a hazard. The proposed NW Halifax Street/NW McIntosh Road intersection will provide better sight distance than the existing NW Fremont Street/NW McIntosh Road intersection, creating a safer alternative route for existing residents. In addition, the applicant will widen the section of NW McIntosh Road abutting the site from 21 feet to 36 feet.

iii. There is an existing crosswalk across NW McIntosh Road west of the site, at NW Ilwaco Street, which provides a safe pedestrian crossing and access to Klickitat Park. The City would be unlikely to allow a crosswalk at the NW Halifax Street/NW McIntosh Road intersection due to the limited sight distance at this intersection. The applicant will install "limited sight distance" signs on NW McIntosh Road east of the site to warn westbound drivers of the upcoming intersection.

iv. The applicant will construct roughly 60 feet of offsite sidewalk between the site and NW Fremont Street.

e. The proposed development will retain the existing drainage patterns on the site. The existing topography on the site slopes downhill in four directions. The applicant will replicate those conditions with two stormwater facilities in the northeast and northwest corners of the site, roof infiltration facilities on the east and west boundaries, and surface runoff to the south from the rear yards of proposed Lots 1 and 2.

i. The proposed development is likely to reduce the volume of stormwater flowing onto adjacent properties. Under existing conditions, stormwater falling on this site infiltrates into the ground until the ground becomes saturated. The water then sheet flows downhill onto adjacent properties. The applicant will collect runoff from all new impervious areas and convey it to the proposed infiltration and/or detention facilities. Reducing the volume of surface water flowing onto adjacent properties.

ii. The applicant will collect stormwater runoff from NW 5th Avenue and direct it to the stormwater facilities in Tracts A and B to ensure this street connection will not increase the volume of stormwater flowing onto the offsite section of NW 5th Avenue.

iii. The measured infiltration rates on this site are relatively low, between four and forty inches per hour. The applicant is required to design the stormwater system based on the lowest measured rate and reduce the rate by a factor of four in the design of stormwater infiltration and detention facilities in order to ensure that the stormwater system has adequate capacity. Given these constraints, the majority of

stormwater runoff from the rear-yard infiltration facilities will flow into the stormwater ponds in Tracts A and B.

iv. The applicant is required to detain stormwater runoff on the site and release it into the existing storm sewer system at less than predevelopment rates, ensuring that runoff from this site will not exceed the capacity of the downstream drainage system. Runoff from Tract A will discharge to the storm sewer in NW McIntosh Road. Runoff from Tract B will discharge to the existing storm inlet within The Ridge development to the east, which currently collects runoff from this site.

vi. If any springs are discovered on the site during construction the applicant will direct that water into the proposed stormwater collection and disposal system.

f. It is not feasible to modify the design of the development to maintain the tall Douglas fir tree located near the center of the north boundary of the site, just east of the existing driveway. There is an underground water line within the existing driveway on the site. In addition, there is a stump of a large tree on the west side of the driveway. Grading necessary to remove the existing driveway, stump, and water line will result in unavoidable impacts to the root system of the remaining evergreen tree. The applicant must excavate six to eight feet deep within six feet of the base of this tree. In addition, this 90-foot-tall tree has a very large hazard radius; if it were to fall it could potentially strike NW McIntosh Road, homes on proposed Lots 28, 19, and 12, and the stormwater facility in Tract A. As noted in the arborist report, the top of the tree was broken during an ice storm. The tree regrew numerous new tops, which creates a weak area and potential break point near the top of the tree. The applicant will review options for retaining this tree, but it does not appear feasible to do so.

i. The applicant will retain or plant sufficient trees on the site to meet the minimum 150 tree units required by the Code. Future residents on the site are likely to plant additional trees on their individual lots.

g. He argued that the shared driveway extending south of the cul-de-sac at the end of proposed NW Garden Court is not a “dead end road” subject to the emergency turnaround requirements of Table 1, Note 3 of the Camas Design Standards Manual. Driveways serving proposed Lots 22 and 23 will function as turnarounds. He requested the examiner modify proposed condition 51 to that effect and to refer to a “shared driveway” rather than a “private road.”

h. The shared driveway south of NW Garden Court will serve proposed Lots 22 and 23, not 23 and 24 as listed in the Staff Report. He requested the examiner modify proposed Plat Note 17 to that effect.

i. Some of the proposed lots are slightly larger than 14,000 square feet, the maximum lot size permitted by the R-10 zone. Some flexibility should be allowed, as it is difficult to design lots that are exactly 14,000 square feet as required by the beveling standard of CMC 18.090.080.B.

j. The applicant and future contractors are required to install and maintain inlet protection measures for all stormwater inlets. Properly maintained inlet protection measures will not block stormwater from flowing into the stormwater facilities.

k. The applicant will maintain silt fencing and other required erosion control measures until removal is approved by the City.

l. The applicant will revise its grading plans and install fencing and/or other measures as necessary to protect the root system of offsite trees that may extend onto the site. The applicant will be required to show such tree protection measures on the final construction plans approved by the City.

7. John Vokober expressed concern that development on this site will increase runoff onto his property, Lot 1 of the "Ilwaco Estates" development located near the northwest corner of the site. His property is at the low end of this area and stormwater flows onto his property from this site under existing conditions. He questioned why the applicant should be allowed to exceed the 35-percent lot coverage allowed by the R-10 zone for all of the lots on the site.

8. Greg Anderson summarized his written testimony, Exhibit 32.

a. He expressed concern that development on this site will increase the volume of stormwater flowing onto his property west of the site. He had to construct a drainage ditch on the east boundary of his property to direct runoff from this site away from his home. The proposed rear-yard infiltration systems will discharge stormwater close to his property line, which may increase the volume of water flowing downhill onto his property. Future residents of the site may not maintain these drainage facilities, causing them to fail and flood downhill properties. He requested that the linked infiltration facilities be replaced with a solid pipe to convey runoff to the stormwater facility in Tract A.

b. Grading and construction on the site could also increase erosion, allowing stormwater runoff to carry sediment onto his property. Erosion control measures are often removed after the final plat is approved but before homes are constructed and landscaping is installed on individual lots. Exposed soils on the lots may erode and impact downstream properties.

c. There is a large pine tree near the east boundary of his property that could be impacted by grading on the site. The applicant should be required to modify the grading plan to avoid impacts to this offsite tree.

d. CMC 18.55.110.H requires one sign per road frontage and the sign must "[b]e clearly visible from adjoining rights-of-way…" In this case, there is no sign visible from NW 5th Avenue/NW Fremont Street.

9. Joe Schneid testified that there is an existing spring flowing through his property south of the site under existing conditions. Water flows from the spring and onto NW 3rd Avenue nine to ten months a year. He expressed concern that grading and

development on the site may impact groundwater flows, creating or redirecting springs that may increase the volume of runoff flowing onto his property.

a. He argued that NW McIntosh Road is currently at capacity for turning movements. The additional intersection proposed on this site will create a hazard. Therefore, the proposed extension of NW 5th Avenue should terminate in a dead-end on the site and all traffic from this development should be directed onto NW 5th Avenue/NW Freemont Street. In the alternative, these roads could be designed as a one-way street system in order to limit turning movements onto NW McIntosh Street.

b. There is a need for additional sidewalks on the north side of NW McIntosh Road, abutting Klickitat Park.

10. Chuck Richards expressed concern that development on this site will generate erosion and dust impacts on neighboring properties. He questioned how the applicant will collect stormwater runoff from NW 5th Avenue near the southeast corner of the site and prevent runoff from flowing east onto NW Fremont Street. Erosion protection for the existing catch basins on that road may block some stormwater from flowing into the inlets, causing flooding in the existing cul-de-sac east of the site. He argued that the proposed NW/Halifax Street/NW McIntosh Road intersection will not operate safely. Limited sight distance at this location will create a hazard for pedestrians trying to cross NW McIntosh Road to reach Klickitat Park. Construction traffic from this development may damage the pavement on NW Fremont Street, given the six-percent side slope of this roadway.

11. The examiner closed the record at the end of the public hearing and announced his intention to approve the application subject to the conditions of approval. The examiner took under advisement several of the issues raised in the oral and written testimony in the record.

C. DISCUSSION

1. City staff recommended approval of the revised preliminary subdivision plat (Exhibit 14), based on the affirmative findings and subject to conditions of approval in the Staff Report, as modified at the hearing. The applicant accepted those findings and conditions, as modified, with certain exceptions.

2. The examiner concludes that the affirmative findings in the Staff Report, as modified, show that the proposed preliminary plat does or can comply with the applicable standards of the Camas Municipal Code (the "CMC") and Revised Code of Washington. The examiner adopts the affirmative findings in the Staff Report, as modified, as his own, except to the extent they are inconsistent with the following findings.

3. CMC 18.55.110.H requires that the applicant "[p]ost one…sign per road frontage…."

a. The Code does not define the terms "road frontage" or "frontage." Therefore, the examiner must rely on the dictionary definition of that term. "To

determine the plain meaning of an undefined term, we may look to the dictionary." *Homestreet, Inc. v. State, Dep't of Revenue*, 166 Wash. 2d 444, 451, 210 P.3d 297, 300 (2009). Webster's Dictionary defines "frontage" as "1.a - a piece of land that lies adjacent (as to a street or the ocean)." "Frontage." *Merriam-Webster.com Dictionary, Merriam-Webster*, https://www.merriam-webster.com/dictionary/frontage. Accessed 19 Feb. 2023. The examiner finds that the stub of NW 5th Avenue abutting the site is a "road" as that term is commonly used. This road is adjacent to the site. Therefore, NW 5th Avenue is a "road frontage" where CMC 18.55.110.H requires that the applicant post a sign.

b. The applicant posted a single sign along the site's NW McIntosh Road frontage. (Exhibit 28). The applicant did not post a second sign on the site's NW 5th Avenue frontage. This is a violation of CMC 18.55.110.H.

i. The sign posting requirement of CMC 18.55.110.H is a submittal requirement, which CMC 18.55.110 authorizes director to waive. Therefore, the director had the authority to waive compliance with this standard. However, there is no evidence in the record that the director did so in this case.

c. The examiner finds that this procedural error did not limit the public's ability to participate in the review of the application or otherwise affect their substantive rights. The public received adequate notice of this application. The City mailed notice of the hearing to the owners of properties located within 300 feet of the site as required by CMC 18.55.150.E and published notice of the hearing in the newspaper as required by CMC 18.55.150.D. Multiple forms of notice are required, in part, to provide a measure of overlap so that if notice in one form is not effective another form of notice will be effective. The neighborhood was well represented at the hearing and in the written record. Residents of the neighborhood testified clearly and succinctly regarding issues of concern to them.

4. The examiner finds that it is not feasible to retain the 90-foot-tall Douglas fir located near the north boundary of the site, identified as "Tree #1" on the report from the applicant's arborist (Exhibit 10).

a. Tree #1 is located near the center of the north boundary of the site, just east of the existing driveway and proposed NW Halifax Street. There is a stump of another large tree on the west side of the driveway, the former "twin" of Tree #1 that was previously removed. In addition, there is an existing underground waterline beneath the existing driveway that must be removed. As noted in Exhibit 10, excavation for removal of the large stump and water line, installation of new utilities within the right of way for proposed NW Halifax Street and grading for construction of this street and sidewalks will significantly impact the roots of Tree #1, requiring up to seven feet of excavation "cut" adjacent to the tree. This excavation will cut the roots on the west side of Tree #1, impacting its stability and long-term survival.

i. Based on Mr. Taylor's unrebutted testimony, it is not feasible to shift the proposed NW Halifax Street/NW McIntosh Road intersection away from this tree. It is not feasible to shift the intersection to the east and still meet minimum sight distance requirements. The stormwater facility in Tract A precludes shifting the

intersection to the west. The stormwater facility must be located in this area, a topographic low point, in order to provide gravity flow storm sewer connections throughout the site and maintain existing drainage patterns. The facility is the minimum size needed to accommodate the projected volume of runoff generated by this development.

b. In addition, as noted in Exhibit 10, although this tree looks in good condition, the top of the tree was broken in the past and the tree has formed multiple new tops, which creates a weak area subject to future breakage, especially from a freezing rain, ice/snow event. Given the height of the tree, falling branches would pose a significant risk of damage to homes on the surrounding lots as well as to NW McIntosh Road.

c. The applicant will plant additional trees on the site to meet the City's minimum tree density requirement.

i. The applicant cannot be required to transplant tree #12026 from the Camas Heights project to this location. The applicant does not own or control the Camas Heights project and therefore, has no authority to move this tree. In addition, there is no evidence that it is feasible to transplant this large tree. The Code does not require planting of larger trees.

e. Grading and construction on the west boundary of the site may adversely affect the large pine tree on Mr. Anderson's property by damaging roots that cross the property line or cutting branches that overhang the site. However, based on the applicant's storm & utility and grading plan (pages 3 and 7 of Exhibit 14), the applicant does not propose significant grading or excavation near the west boundary of the site. State law provides that the applicant has a right to cut any branches or roots that extend onto this site. Owners of adjoining properties have a right of remedy in superior court if the applicant's actions cause damage to adjoining properties. They should consult a lawyer to advise them about such rights. However, it is in the applicant's interest to protect trees on adjacent properties to the extent feasible in order to avoid potential liability. As Mr. Taylor testified, the applicant intends to install tree protection measures as necessary to protect any off-site trees located near the boundaries of the site.

5. The applicant must provide an intersection with NW McIntosh Road in order to meet the City's cross-circulation (maximum block length and perimeter) standards. In addition, a dead-end road on this site would greatly exceed the City's maximum length standard for dead-end streets. Creating a one-way loop through the site to NW Fremont Street could create a potential safety hazard, based on Mr. Carothers's expert testimony. Mr. Schneid's testimony that NW McIntosh Road is "currently at capacity for turning movements" is not supported by substantial evidence.

a. This intersection will operate safely, as it will comply with applicable City standards. Based on the applicant's traffic study, the intersection is projected to operate at Level Of Service ("LOS") A. Although the intersection will not meet "intersection sight distance" requirements due to the existing vertical curve on NW McIntosh Road east of the site, it will exceed "stopping sight distance" standards.

AASHTO standards require a minimum 390 feet of intersection sight distance and 250 feet of stopping sight distance, based on the 35 mph posted speed limit on NW McIntosh Road. Roughly 980 feet of sight distance is available to the west and 350 feet to the east of this intersection. The City may require the applicant to install "limited sight-distance" signage, warning oncoming drivers to the east of the approaching intersection. The City will review the need for such signing during the engineering plan review process.

b. In addition, the applicant will widen the section of NW McIntosh Road abutting the site from 21 feet to 36 feet. This will provide sufficient pavement for the striping of a center refuge/acceleration lane for vehicles turning left onto westbound NW McIntosh Road, reducing potential conflicts between left-turn and westbound through movements at this intersection. The Code does not require such a refuge/acceleration lane. Therefore, the examiner encourages the applicant to work with City engineering staff to design such a lane.

6. CMC 17.19.040.B(10)(b)(3) requires a direct pedestrian and bicycle connection between the cul-de-sac terminus of proposed NW Garden Court and "the nearest available street or pedestrian oriented use." Pursuant to CMC 17.19.040.B(10)(b)(4), the city engineer recommended approval of a deviation to delete this requirement, noting that NW Garden Court only exceeds the maximum length standard by 65 feet and this connection would not provide a substantial benefit to the residents of this street, as, such a connection would not provide access to any pedestrian oriented uses in the area. The examiner agrees and approves the proposed deviation.

7. The applicant will construct 60 feet of off-site sidewalk on the south side of NW McIntosh Road between the site and the existing sidewalk and curb return on the west side of NW Fremont Street. This sidewalk is necessary to provide a safe walking route for students between the site and the existing school bus stop at the corner of NW McIntosh Road and NW Fremont Street. The applicant cannot be required to construct offsite sidewalks elsewhere in the area, i.e., on the north side of NW McIntosh Road abutting Klickitat Park. The need for sidewalks and other improvements is one that exists generally along streets in the area and is a need to which all adjoining properties contribute, not just the development proposed in this case. The City cannot require this applicant to bear the full cost of such additional improvements, because the costs would exceed the roughly proportional impact of the proposed development and it is a need to which all of the properties in the area contribute.

8. The Code does not require a crosswalk across NW McIntosh Road at the proposed NW Halifax Street intersection and staff recommended against a crosswalk at this location due to sight distance constraints. There is an existing marked crosswalk west of the site, at NW Ilwaco Street, which provides a safe pedestrian crossing and access to Klickitat Park. Neighbors can petition the City to review the need for a pedestrian signal this intersection, but it is not something this applicant can be required to provide as a condition of this development.

9. The applicant is required to provide a turnaround at the end of the shared driveway south of NW Garden Court. Note 3 of Table 1 of the Camas Design Standards Manual requires a turnaround at the end of all dead-end roads in excess of 150 feet in

length. The Code does not define the term "road." Therefore, the examiner must rely on the dictionary definition of that term. Webster's Dictionary defines "road" as "2.a: an open way for vehicles, persons, and animals. "Road." *Merriam-Webster.com Dictionary*, *Merriam-Webster*, https://www.merriam-webster.com/dictionary/road. Accessed 19 Feb. 2023. The examiner finds that a shared driveway is a "road" as defined by the dictionary and therefore, subject to the turnaround requirement. The Design Standards Manual does not distinguish between public and private roads or driveways.

10. Construction on this site will temporarily cause increased noise, dust, traffic, and other impacts on adjacent roads and properties. The Code and state law regulate construction activities, including requirements for dust and erosion control, construction vehicle access, road closures etc., which will limit impacts on surrounding residents. City staff will inspect the site during construction to ensure ongoing compliance with applicable requirements. Compliance with these regulations will not eliminate all potential impacts. However, the examiner finds that, while such impacts may occur, they are not significant enough to require specific limitations on construction other than those imposed by State law and the Code. The examiner encourages residents to contact the City if excessive impacts occur.

a. The applicant agreed to a condition of approval requiring that all construction traffic access the site from NW McIntosh Road until infrastructure construction has been completed on the site. Construction traffic would be prohibited on NW Fremont Street or the offsite section of NW 5th Avenue, except as necessary to extend the existing road and utilities into site and to build a temporary driveway necessary to maintain access for the two existing homes near the southwest corner of the site.

b. There is no evidence that the existing six-percent side slope on NW Fremont Street will result in unusual wear and tear on this roadway.

c. The applicant will be required to install erosion control measures on the site prior to undertaking any land disturbing activities and maintain those measures until the development is completed and the City approves their removal. The applicant is required to remove all temporary erosion prevention and sediment control measures from the site at prior to Final Acceptance. However, the applicant must stabilize all disturbed soils on the site prior to such removal. In addition, staff recommended the examiner require the applicant to retain erosion control measures on the perimeter of the site until home construction is completed on the proposed lots. See condition 14.

d. The applicant will be required to install and maintain inlet protection measures for all existing and proposed stormwater inlets while construction is occurring. Properly maintained inlet protection measures will not block stormwater from flowing into the stormwater facilities. The City will ensure proper maintenance through its construction inspection program. In addition, people who live near the site can report violations they observe and the City can take actions to require compliance and remedy violations.

e. The applicant will be required to install temporary measures to collect, treat, detain, and convey stormwater runoff from the site while construction is occurring, including runoff from the proposed temporary driveway serving the existing homes south of the site. The City will review plans for such temporary and permanent post-construction stormwater and erosion control measures through its engineering design and construction plan review processes. Engineering and construction plan review does not require additional public notice and opportunity to comment. City staff's review of these plans provides adequate protection of the public interest. However, the applicant's engineering and construction plans are public records that the public may review.

11. The examiner finds that the proposed development will accommodate increased stormwater runoff from this development consistent with local and state laws. The applicant is not required to remedy existing drainage issues or prevent any runoff from the site from flowing onto adjacent properties. The applicant is merely prohibited from making such conditions worse. As designed, the proposed development will not increase or concentrate, and may reduce, the volume of stormwater flowing onto adjacent properties.

a. The design of the proposed development will largely retain existing drainage patterns as required by Minimum Requirement #4 of the Stormwater Management manual. Based on the topographic maps in the record, stormwater falling on the site currently flows downhill in all directions from the high point near the southeast corner of the site. (See page 1 of Exhibit 14). The proposed stormwater plan will replicate this existing condition. The applicant will collect runoff from roads in the western portion of the site and convey it to the stormwater facility in Tract A in the northwest corner of the site. The applicant will collect runoff from roads in the east portion of the site and convey it to the facility in Tract B. The applicant will install a series of linked infiltration trenches along the rear yards of the proposed lots to collect roof runoff. These pipes will convey excess runoff that cannot be infiltrated into the ground to the facilities in Tracts A and B. The applicant will discharge treated runoff from the stormwater facilities into the existing storm sewers at less than predevelopment rates. Tract A will discharge into the existing storm sewer in NW McIntosh Road and Tract B will discharge into the existing storm sewer in The Ridge subdivision, connecting to the existing area drain on the east boundary of the site. Runoff from the backyards of the proposed lots will continue to surface flow offsite as it does now. However, runoff from roofs and roads will be infiltrated into the ground or diverted into the stormwater facilities, away from abutting properties, potentially reducing the amount of surface runoff from this site.

b. Some volume of rainwater falling on the site infiltrates into the ground under existing conditions. The proposed infiltration trenches will replicate that existing condition. However, as noted in the applicant's geotechnical report, some of the soils on this site have limited infiltration capacity, with infiltration rates ranging from one to forty inches per hour. Therefore, much of the stormwater that currently falls on the site likely sheet flows offsite, onto adjacent properties. The proposed infiltration trenches will replicate this existing condition. However, instead of excess runoff that exceeds the infiltration capacity of the soils flowing onto adjacent properties, it will be piped to the stormwater detention facilities where it will be detained prior to discharge to the existing public storm sewers at less than predevelopment rates.

i. The proposed stormwater facilities, including the infiltration facilities, will be private, owned and maintained by a homeowners' association or individual property owners. That is a policy choice the City Council. The City will monitor and enforce ongoing maintenance of the treatment and detention facilities. The City has no authority to monitor and enforce maintenance of the private infiltration facilities. However, it is in the best interest of the homeowners' association and property owners to maintain these systems in order to avoid damage to their properties as well as liability for potential damage to downstream properties.

c. The proposed development will not discharge additional runoff onto existing NW 5th Avenue east of the site. The applicant will install catch basins in the on-site road to collect stormwater runoff and grade the onsite road to direct runoff into these catch basins.

d. The applicant will collect runoff from any springs that are discovered on the site during construction and convey that water to the stormwater facilities.

12. The examiner finds that the applicant sustained its burden of proof that the setback variances proposed for Lots 25, 26, and 28 complies with the applicable approval criteria and should be approved.

a. The setback variance will not constitute a grant of special privilege inconsistent with the limitation upon uses of other properties in the vicinity and zone in which the subject property is located. CMC 18.45.040.B(1). The site will be developed with single-family residential lots, a use permitted in the R-10 zone and other residential zones abutting the site. All of the proposed lots will comply with the dimensional standards of the R-10 zone, with the exception of the proposed setback variances.

b. The setback variance is necessary, because of special circumstances or conditions relating to the size, shape, location, and surroundings of the site, to provide it with use, rights, and privileges permitted to other properties in the vicinity and in the R-10 zone. CMC 18.45.040.B(2). This site is subject to unique constraints that do not apply to other properties in the vicinity or in the R-10 zone. Lower density zoned lands abut the site on multiple boundaries, requiring larger lots or buffer tracts to comply with the beveling standards of CMC 18.09.080.B. In addition, the site is relatively narrow in the east west direction and the applicant is required to extend north-south streets in order to provide access to the proposed lots and comply with the City's cross-circulation standards. The abutting properties are largely developed and there are no street stubs to the west or south that would allow alternative street designs. These design constraints result in large, relatively shallow, lots along the east boundary of the site (Lots 25 and 26) and a shallow lot on the north boundary. These shallow lot depths and required setbacks limit the size and design of homes that can be built on these lots, requiring relatively long and narrow homes. The variance is necessary to allow the applicant to utilize standard home designs on these lots.

c. The setback variance will not be materially detrimental to the public welfare or injurious to the property or improvements in the vicinity and in the R-10 zone

that applies to the site. As proposed, Lots 25 and 26 would provide 25-foot rear yards, which allows substantial separation between the homes and adjacent properties, as well as allowing room for landscaping to further buffer adjacent properties. The future home on proposed Lot 24 can be located ten feet from the east boundary of the site as, due to the location of the access to this lot, the east boundary of Lot 24 constitutes a side yard. The rear yard of Lot 28 abuts a landscape tract and street right-of-way. Therefore, the reduced setback will not impact any adjacent parcels. The reduced front yard setbacks for Lots 25 and 26 will allow ample room for parking in front of the garages as well as separation from the street.

d. Therefore, the examiner grants the requested setback variances for proposed Lots 25, 26, and 28. A condition of approval is warranted to that effect.

13. The examiner further finds that the applicant failed to sustain its burden of proof that a blanket variance to the maximum lot coverage standard complies with the applicable approval criteria.

a. The lot coverage variance will constitute a grant of special privilege inconsistent with the limitation upon uses of other properties in the vicinity and zone in which the subject property is located. CMC 18.45.040.B(1). The site will be developed with single-family residential lots, a use permitted in the R-10 zone and other residential zones abutting the site. However, the applicant is requesting a blanket variance to the maximum lot coverage requirement. The examiner finds that allowing homes on all of the proposed lots, some of which are the largest lot size allowed in the R-10 zone, to exceed the maximum lot coverage standards would grant a special privilege to this development that is not available to other large lots in the vicinity or the R-10 zone.

b. The applicant failed to demonstrate that the lot coverage variance is necessary, because of special circumstances or conditions relating to the size, shape, topography, location, or surroundings of the site, to provide it with use, rights, and privileges permitted to other properties in the vicinity and in the R-10 zone. CMC 18.45.040.B(2).

i. Assertions that the Dawsons Ridge Subdivision was granted a similar variance are incorrect. The Hearings Officer denied a variance to the maximum lot coverage standard for that development. The City Council subsequently amended the Code to allow negotiated flexibility for certain standards, including lot coverage, where a development provides ½ acre or more of open space. CMC 18.09.060.D. The Dawson Ridge development provided such open space and therefore, was allowed increased lot coverage. This development will not provide sufficient open space to qualify for such negotiated flexibility.

ii. Compliance with the beveling standard on the east boundary of the site and the and the average lot size requirement of CMC 18.09.040 Table 1.A results in smaller lots on the western portion of the site. However, the lot sizes are consistent with other lots in the R-10 zone. Other properties in the vicinity and in the R-10 zone are subject to the same lot coverage constraints. Larger homes with greater lot coverage is not a use, right, or privilege permitted to other properties in the vicinity or zone. In

addition, the applicant is requesting a blanket variance to the maximum lot coverage requirement. There is no evidence that the conditions on this site warrant larger homes on the largest lots allowed in the R-10 zone.

c. The lot coverage will not be materially detrimental to the public welfare or injurious to the property or improvements in the vicinity and in the R-10 zone that applies to the site. With the exception of Lots 25, 26, and 28, all lots would remain subject to the same setback standards as other lots of similar size.

d. Therefore, the examiner denies the requested variance to the maximum lot coverage standard. Plat Note 3 should be modified to that effect.

14. Some of the proposed lots are slightly larger than 14,000 square feet, the maximum lot size permitted by the R-10 zone. Unfortunately, the Code does not allow any flexibility in the lot size requirements. CMC 18.090.080.B requires that lots abutting a lower density zone must be the maximum lot size allowed for the zone designation of the new development. CMC 18.09.040 Table 1.A allows a maximum lot size of 14, 000 square feet. Footnote 3 of CMC 18.09.040 Table 1.A allows a single exception to the maximum lot size standard for lots with existing dwellings. Footnote 3 of CMC 18.09.040 Table 1.A allows the average lot size to vary up to 500 square feet. The Code does not provide similar flexibility in the maximum lot size standard. The plain language of the Code requires that lots abutting the east boundary of the site contain 14,000 square feet, no more, not less. Therefore, the applicant must modify these lots to provide 14,000 square feet of lot area or obtain City approval of a minor variance to the maximum lot size standard.[2]

15. As discussed at the hearing, staff concluded that a 15-foot easement provides sufficient area for a single underground utility, sewer or water. A 20-foot easement is warranted where two underground utilities, sewer and water, are located within the same easement. There is an existing utility easement abutting the southern portion of the east boundary of proposed Lot 1, which may increase the total easement width available in this area, reducing the need for a 20-foot variance on this portion of Lot 1. However, that determination is best left to City engineering staff to determine during the final engineering review. Conditions of approval 42 and 66 and Plat Notes 12 and 15 should be modified to that effect.

D. CONCLUSION

Based on the above findings and discussion provided or incorporated herein, the examiner concludes that SUB22-04 (McIntosh Subdivision) and consolidated files ARCH22-10, CA22-11, MAJVAR22-05, and SEPA22-15 should be approved, because it does or can comply with the applicable standards of the Camas Municipal Code, the Revised Code of the State of Washington.

E. DECISION

[2] The City may want to consider amending the Code to allow some minor flexibility in the maximum lot size requirement for lots subject to the beveling requirement of CMC 18.090.080.B.

The examiner hereby approves File# SUB22-04 (McIntosh Subdivision) and consolidated files ARCH22-10, CA22-11, MAJVAR22-05, and SEPA22-15, subject to the following conditions.

Standard Conditions:

1. Engineering site improvement plans shall be prepared in accordance with the City of Camas Design Standards Manual (CDSM) and CMC 17.19.040.
2. The engineering site plans shall be prepared by a licensed civil engineer in Washington State and submitted to the City's Community Development (CDEV) Engineering Department for review and approval. Submittal requirements for first review are as follows:
    a. Submit four (4) full size sets and one (1) half size set of plans.
    b. Submit one (1) electronic version of the final (TIR) stormwater report. Do not submit any hard copies of the Final TIR.
    c. Submit a stamped preliminary engineer's estimate.
3. Community Development (CDEV) Engineering shall collect a total three-percent plan review and construction inspection (PR&CI) fee for the proposed development.
    a. A preliminary construction estimate shall be submitted to the CDEV Engineering Dept prior to or with submittal of plans for first review.
    b. Payment of the one-percent plan review (PR) fee shall be due prior to the start of the plan review process. The PR fees will be provided by the engineering staff.
    c. Payment of the two-percent construction inspection (CI) fee shall be due prior to construction plan approval and release of approved plans to the applicant's consultant. The CI fees due will be provided by the engineering staff.
    d. Under no circumstances will the applicant be allowed to begin construction prior to construction plan approval.
4. Installation of public improvements shall be in accordance with CMC 17.21 Procedures for Public Improvements.
5. If applicable, existing wells, septic tank, and septic drain fields shall be decommissioned in accordance with state and county guidelines, per CMC 17.19.020.
6. Any entrance structures or signs proposed or required for this project will be reviewed and approved by the city.
    a. All designs will be in accordance with applicable City codes.
    b. The maintenance of the entrance structure will be the responsibility of the homeowners.
7. The applicant will be responsible for ensuring that private utilities; underground power, telephone, gas, CATV, streetlights, and associated appurtenances are installed.
8. A six-foot private utility easement (PUE) shall be located outside of the right-of-way on public streets and outside of the tracts on private streets.
9. A draft street lighting plan shall be submitted to development engineering for review prior to final plan submittal to Clark Public Utility.

10. The applicant will be required to purchase all permanent traffic control signs, street name signs, street lighting, traffic control markings, and gate and controller for the improved subdivision.
11. Prior to any land-disturbing activities of an acre or more, the applicant shall have approved final engineering plans and shall submit a copy of the *NPDES General Construction Stormwater Permit* (GCSWP), which is issued by the Washington State Department of Ecology, and the *Stormwater Pollution Prevention Plan* (SWPPP), which is required as a component of the NPDES GCSWP permit.
12. Prior to commencing any land-disturbing activities of an acre or more, the applicant shall submit an Erosion Control Bond (ESC) in the amount of 200-percent of the cost for erosion control measures, per CMC 17.21.030.B and CMC 14.06.200.
13. In the event any item of archaeological interest is uncovered during a permitted ground disturbing action or activity, all ground disturbing activities shall immediately cease, and the applicant shall notify the City and the Department of Archaeology and Historic Preservation (DAHP).
14. Prior to final acceptance, the applicant shall remove all temporary erosion prevention and sediment control measures from the site at completion of all site improvements, which includes stabilization of all disturbed soil, prior to issuance of Final Acceptance from CDEV Engineering.
15. Prior to final acceptance, final as-built construction drawing submittals shall meet the requirements of the Camas Design Standards Manual (CDSM).
    a. As-builts are to be submitted as PDFs and in either AutoCad or Carlson formats. The cover sheet for the as-builts is to include the originally approved and signed cover sheet.
16. Prior to final acceptance the two-year warranty maintenance bond is to be submitted in accordance with CMC 17.21.070.A Upon final acceptance of the development improvements a two-year (2) warranty bond commences.
17. Per CMC 17.21.070.E A letter of final acceptance will be issued once all items listed in 17.21.070.B-C are completed.
18. Final plat submittals shall meet the requirements of the CMC 17.11.060, CMC 17.01.050, and the Camas Design Standards Manual.
19. A homeowner's association (HOA) will be required and a copy of the CC&Rs for the development will need to be submitted to the City for review and approval. Specifically, the applicant will need to make provisions in the CC&Rs for ownership and maintenance of the private storm drainage systems, open spaces, retaining walls, fencing, walls, landscaping, irrigation, private roads, and tracts or easements outside of the City's right-of-way if applicable. Further, all necessary easements and dedications should be noted on the final plat.
20. The CC&R' shall not preclude accessory dwelling units.
21. The applicant shall take appropriate measures to ensure landscaping success for a minimum of three years after issuance of Certificate of Occupancy. If plantings fail to survive, the property owner shall promptly replace them.

22. Automatic fire sprinklers installed per NFPA 13D or 13R shall be required in all new residential structures.
23. Provisions for parking enforcement on private Tracts/access driveways, acceptable to the Fire Marshal, shall be included in the CC&Rs at the time of final platting.
24. Per CMC 17.21.060.H Permits for one sales office and/or one model home per plat or phase may be issued after the final plat is recorded, and prior to final acceptance. Building permit applications, for any other residential buildings, will not be accepted until after final acceptance is issued.

Special Conditions of Approval:

Planning:

25. The recommendations provided by the Department of Ecology shall be complied with.
26. The recommendations in the Geotechnical Report by Earth Engineering, Inc. dated March 1, 2022, shall be followed.
27. The recommendations in the Arborists Report by Jerry Hofer, dated February 6, 2023, shall be followed.
28. If potential artifacts are discovered during construction, work must immediately cease, and both the State Department of Archaeological and Historic Preservation and the City shall be notified.

Prior to Final Engineering Plan Approval:

Planning:

29. Retaining walls shall comply with CMC 18.17.060.
30. A final landscape, tree, and vegetation plan consistent with the landscaping standards in CMC Chapter 18.13 shall be submitted to the City for review and approval prior to engineering plan approval. The final landscape plan shall specify what larger tree or shrubs can be installed at the north entrance of the subdivision to create an entry statement. Plants utilized will need to be per the approved City's Tree list and per the Camas Design Manual planting specifications and landscape notes.

Engineering:

Water

31. The applicant shall submit revised water utility plans with all the future services and meter boxes located in planter strips or behind curb tight sidewalks.
32. The applicant shall submit revised the water utility plans to include the location for installation of the water sampling station onsite.
33. The applicant shall submit revised water utility plans showing the locations of all proposed irrigation services and the size of each irrigation meter.

Storm Drainage:

34. The applicant shall submit a complete set of stormwater plans for review and approval, per MR #1 of the TIR.

35. The applicant shall submit a revised stormwater plan that includes limiting impacts from roof drain and surface water runoff from Lots 1, 2, 27 and 28, in addition to the measures proposed for Lots 3 thru 26. Said plan should ensure that adjacent parcels and downstream drainageways and/or adjacent properties are not negatively affected by roof drain downspouts and surface water runoff, per Camas Municipal Code (CMC) 14.02 and 17.19.040.C.
36. The applicant shall revise the stormwater plans to show the proposed Filterra treatment structure at future Tract A located outside of the public right-of-way, within Tract A. Additionally, private rear or side yard drainage systems are to be placed within an easement across the applicable lots.
37. The stormwater utility plans shall be submitted with design information for proposed detention ponds and rear or side yard roof drain infiltration trenches.
38. The final stormwater TIR is to be submitted with both the City of Camas June 2022 *Stormwater Sewer System Operations & Maintenance Manual* and the maintenance requirements for the treatment vaults.
39. A final stormwater report (TIR) is to be submitted to the City for review and approval.
40. The applicant shall provide measures to accommodate stormwater runoff from the proposed temporary driveway serving the existing homes southwest of the site.

Erosion Control:

41. The applicant shall submit a complete set of Erosion Sediment Control (ESC) plans, as a part of the site improvement plans for review and approval.

Sanitary Sewer Disposal:

42. The engineering plans shall be revised with the existing sanitary sewer main, sewer manholes, and water main placed in a utility easement that is to be dedicated to the city, along the eastern property line of future Lot 1. The easement shall be a minimum 15 feet wide where it contains one utility (water or sewer) and 20 feet wide where it contains two utilities (water and sewer), unless otherwise approved by City engineering staff.
    a. The access and utility easement is to consist of a minimum 12-foot-wide hard surfacing to allow for access to the sewer main and manholes, the water main, and future Tract C, Utility Tract.
43. The engineering plans shall be revised to include a minimum 15-foot-wide utility access and maintenance easement from the end of future "NW Garden Court", between future Lots 21 thru 24, and south to future NW 5th Avenue, with right-of-entry granted to the city.

[Existing wells, septic tanks, and septic drain fields]:

44. The applicant shall provide documentation to the city that any existing wells, or septic systems have been properly decommissioned in accordance with State and County guidelines. Additionally, any water rights associated with a decommissioned well shall be transferred to the City.

Roads:

[Public Roads]

45. The engineering plans shall provide for a continuous sidewalk connection from the east end of the sidewalk installed with the adjacent Ilwaco subdivision, along the frontage of the proposed development, and ending at the west end of the curb ramp installed with The Ridge subdivision at NW Fremont Street.
46. The engineering plans shall be submitted with the required 17-foot right-of-way dedication on NW McIntosh Road to allow for the 37-foot full depth half-width street improvement, including a minimum of 23-feet of paved surface, curb & gutter, eight-foot planter strip, and six-foot detached sidewalk in accordance with CDSM Street Detail ST5 3 Lane Collector/Arterial.
47. The engineering plans shall be submitted with the minimum curb radius of 35-feet on both sides of the intersection at NW McIntosh Road and the future public access road (NW Halifax Street).
48. Prior to final engineering plan approval, the applicant shall work with staff to provide an acceptable transition between the future extension of NW 5th Avenue to tie into the existing NW 5th Avenue to the east.
49. The engineering plans shall be submitted with the unidentified triangular shaped parcel on the east side of future Lot 3 shown as a public tract to allow for future access improvements to the southern parcel (PIN 217455000).
50. All construction traffic shall access the site from NW McIntosh Road until infrastructure construction has been completed on the site.

[Private Roads]

51. The applicant shall be required to provide a design for a 'No Parking and Towing' sign for review and approval.
    a. Said sign is to include contact information for a towing company.
    b. The applicant shall be required to install the 'No Parking and Towing' signs prior to final acceptance on future private road (NW Garden Court) and on the private road access to Lots 22 and 23.
52. The applicant is to work with the engineering staff and the Fire Marshal to provide an acceptable dead-end turnaround on the private road/shared driveway serving Lots 22 and 23. Additionally, the private road access to Lots 22 and 23 is to be placed in a Tract to be owned and maintained by the adjacent homeowners and/or the homeowners' association (HOA).
53. The applicant shall obtain City approval of the temporary private driveway serving the existing homes southwest of the site.

[Street lighting]:

54. All street light locations are to be shown on the engineering and landscape plans.
55. Streetlights on private streets are required to be metered separately and are to be owned and maintained by the HOA/homeowners.
56. Prior to submittal of electrical plans to Clark Public Utilities, the preliminary electrical plans for streetlights, transformers, J-boxes, etc., which are prepared by others, are to be submitted to the city for review and approval.

[Street trees and Landscaping]:

57. The applicant shall show proposed driveway locations for each lot to ensure that street trees are not impacted.

58. The applicant shall submit a final landscape plan consistent with the landscaping standards in CMC Chapter 18.13 to the City for review and approval, in addition to CMC Chapter 17.19.030.F.6, and include plantings from the City's approved plant list.

[Storm Facility Landscaping]:

59. The applicant shall submit revised stormwater facility plans that provide for a minimum six-foot-high black vinyl coated chain link fence with top rail installed along the property lines of Tracts A and B where the tracts abuts the future Lot 11 and Lots 26 and 27. Additionally, the plans are to provide for a minimum 16-foot-wide double gate at the access road to the facility and a minimum 4-foot-wide man gate.

Traffic Impact Analysis:

60. The engineering plans are to be submitted with the site vision clearance/site distance triangles shown on the final engineering plans at the intersection of future public road (NW Halifax Street) and NW McIntosh Road.

Prior to Land-Disturbing Activities:

61. Prior to any land-disturbing activities the applicant shall submit the required SWPPP, per MR #2 of the preliminary TIR.

62. Prior to any land-disturbing activities, an electronic copy of Ecology's NPDES GCSWP permit, an electronic copy of the SWPPP, and the financial security for erosion and sediment control are to be submitted to the city.

63. Prior to any land-disturbing activities, which includes tree cutting, clearing and grading, an approved set of final engineering plans, including the erosion prevention and sediment control measures is required.

Prior to Final Plat Approval:

Planning:

64. Lots 25 and 26 shall provide a minimum 25-foot rear yard setback and a minimum 20-foot front yard setback. Lot 28 shall provide a minimum 20-foot rear yard setback. All other lots and setbacks shall comply with the setback requirements of CMC 18.090.040 Table 2.

65. Lots 5 and 6 are not considered irregular lots and shall follow current setbacks per CMC 18.09.040 Table 2.

66. All lots shall comply with the maximum 35-percent building lot coverage allowed by CMC 18.09.040 Table 1.A.

Engineering:

67. Prior to final plat approval the following note is to be added to the final plat.
    a. Tract _, a private road, includes a blanket utility access and maintenance easement conveyed to the city, over and under the water main located in the private street.

68. The following notes shall be added to the final plat stating that:
    a. The stormwater facilities located on Tract A and Tract B are to be owned and maintained by the homeowners/Homeowner Association (HOA) at the end of the two-year warranty period, which expires two -years after final acceptance.
    b. Right-of-entry is to be granted to the city for inspection purposes of the stormwater facilities located on Tract A and Tract B.
    c. Private rear or side yard drainage systems are to be owned and maintained by the HOA or the applicable lot owners upon which the private stormwater systems/easements are located.
69. The final plat shall be revised with the existing sanitary sewer main, sanitary sewer manholes, and water place in an easement along the eastern property line of future Lot 1. The easement is to an access and utility easement over and under the existing water and sanitary sewer, with right-of-entry granted to the city. The easement shall be a minimum 15 feet wide where it contains one utility (water or sewer) and 20 feet wide where it contains two utilities (water and sewer), unless otherwise approved by City engineering staff.
70. A note is to be added to the plat that a blanket utility access and maintenance easement is provided to the city over and under the sanitary sewer main located in the future private road "NW Garden Court".
71. The final plat shall be revised with a 15-foot-wide utility access and maintenance easement over the new sanitary sewer main and sewer manhole from the end of future "NW Garden Court", between Lots 21 thru 24, and south to future NW 5th Avenue, with right-of-entry granted to the city.
72. The final plat shall provide for the dedication of Tract _, the unidentified triangular shaped parcel, located on the east side of proposed Lot 3. Tract _ is to be dedicated as a public tract set aside for future access improvements to parcel number 217455000.
73. The private road access to Lots 22 and 23 is to be placed in a Tract to be owned and maintained by the adjacent homeowners and/or the homeowners' association (HOA).

<u>Prior to Final Acceptance:</u>
Planning:

74. Irrigation and landscaping should be installed or bonded for prior to final acceptance.

Engineering:

75. The applicant shall provide a design for a 'No Parking and Towing' sign for review and approval.
    a. Said sign is to include contact information for a towing company, as the city does not provide towing on private roads, nor does the city enforce no parking on private roads.
    b. The applicant shall install the 'No Parking and Towing' signs prior to final acceptance.

76. With the exception of perimeter erosion fencing, the applicant shall remove all temporary erosion prevention and sediment control measures from the site at completion of all site improvements, which includes stabilization of all disturbed soil, prior to issuance of Final Acceptance from CDEV Engineering. The applicant shall retain erosion control measures on the perimeter of the site until home construction is completed on the proposed lots.
77. Final as-built construction drawing submittals shall meet the requirements of the Camas Design Standards Manual (CDSM).
    a. As-builts are to be submitted as PDFs and in either AutoCad or Carlson formats. The cover sheet for the as-builts is to include the originally approved and signed cover sheet.
78. The two-year warranty maintenance bond is to be submitted in accordance with CMC 17.21.070.A Upon final acceptance of the development improvements a two-year (2) warranty bond commences.
79. The applicant is required to pay the proportionate share amount of $34,000.00 to the City of Vancouver. The applicant is to provide Camas staff with documentation of payment of said proportionate share amount.

Prior to Building Permit Approval:

80. Single-family building permit applications are to include information regarding connection of roof drain downspouts to the rear yard stormwater laterals that discharge to the rear yard infiltration trenches.

Prior to Final Occupancy:

Planning:

81. Street trees adjacent to lots should be installed prior to final occupancy or bonded for per CMC 17.19.030.F.4.

Proposed Plat Notes

1. A homeowner's association (HOA) will be required for this development. Copies of the CC&Rs shall be submitted and on file with the City of Camas.
2. Building permits will not be issued by the Building Department until all subdivision improvements are completed and Final Acceptance has been issued by the City.
3. Maximum building lot coverage for this subdivision is 35-percent per CMC 18.09.040 Table 1.A.
4. The lots in this subdivision are subject to traffic impact fees, school impact fees, fire impact fees and park/open space impact fees. Each new dwelling will be subject to the payment of appropriate impact fees at the time of building permit issuance.
5. Wetlands, critical areas, and associated buffers shall be maintained in their natural state as described in the Final Wetland Mitigation Plan (Note: add date after approval) that is recorded with this plat by the HOA. Any modifications to critical

areas and buffers must be approved in writing by the city after submittal of a revised critical area report.

6. Tree topping is not permitted within this development, nor removal of more than 20 percent of a tree's canopy. Trees that are determined to be hazardous by a licensed arborist may be removed after approval by the City. Required street trees shall be promptly replaced with an approved species.
7. In the event any item of archaeological interest is uncovered during the course of a permitted ground disturbing action or activity, all ground disturbing activities shall immediately cease, and the applicant shall notify the City and the Department of Archaeology and Historic Preservation (DAHP).
8. Tract _, a private road includes a utility access and maintenance easement conveyed to the city, over and under the water main located in the private street.
9. Stormwater facilities in Tracts A and B shall be owned and maintained by the homeowners/Homeowner Association (HOA) at the end of the two-year warranty period, which expires two -years after final acceptance.
10. Right-of-entry is to be granted to the city for inspection purposes of the stormwater facilities located on Tract A and Tract B.
11. Private rear and/or side yard stormwater drainage systems are to be placed in private stormwater easements and owned and maintained by the HOA or the applicable lot owners upon which the private stormwater systems easements are located.
12. The easement along the eastern property line of future Lot 1 is an access and utility easement over and under the existing water and sanitary sewer, with right-of-entry granted to the city.
13. Tract _, a private road "NW Garden Court" is covered by a blanket access and maintenance easement over and under the sanitary sewer main.
14. The 15-foot-wide access and utility easement, from the end of future "NW Garden Court", between Lots 21 thru 24, and south to NW 5th Avenue is provided over and under the sanitary sewer main and sanitary manhole, with a right-of-entry granted to the city.
15. Tract _ contains an access and maintenance easement over and under the existing water, sanitary sewer main, and sanitary sewer manholes, with right-of entry granted to the city.
16. Tract _ is a public tract set aside for future access improvements to Parcel Number 217455000. Ownership and maintenance of said tract will be the responsibility of the city.
17. Tract _ is a private road access to Lots 22 and 23 and is to be owned and maintained by the adjacent homeowners and/or the homeowners' association (HOA).
18. Lots 25 and 26 shall provide a minimum 25-foot rear yard setback and a minimum 20-foot front yard setback. Lot 28 shall provide a minimum 20-foot rear

yard setback. All other setbacks shall comply with the setback requirements of CMC 18.090.040 Table 2.

DATED this 27th day of February 2023.

Joe Turner, AICP
City of Camas Land Use Hearing Examiner

SGA Engineering, PLLC
CIVIL ENGINEERING, LAND PLANNING, & DEVELOPMENT SERVICES
2005 Broadway Street | Vancouver, WA 98663 | Phone: 360.993.0911 | Fax: 360.993.0912

Date: **March 7, 2023**

Subject: **Motion for Reconsideration**

Project: **McIntosh Subdivision SUB22-04 (MAJVAR22-05 Major Variance)**

The applicant respectfully requests a Motion for Reconsideration on the final order decision for the above referenced subdivision. More specifically, the applicant wishes to have the hearings examiner reconsider the major variance for maximum permitted lot coverage. This request would also modify condition of approval #3 under the proposed plat notes section on page 27 of the final order.

The applicant initially requested to increase the allowed lot coverage on all lots within the project from 35% up to 50%. City Staff recommended approval of this variance for increased lot coverage. This motion for reconsideration has attempted to not repeat all the variance justifications previously provided in the narrative and during testimony at the public hearing.

Under section 6.a.ii, page 7 of the final order, the examiner summarized the testimony regarding the challenges of this site and Camas municipal code. Due to beveling and maximum average lot area requirements, this project was forced to design nearly half of the lots at or close to 8,000 square feet. If not for the beveling requirements, this project would have proposed all 10,000+ square foot lots with no need to modify the 35% maximum lot coverage standard. Additional lot coverage is necessary on the 8,000+/- square foot lots in order to construct home sizes consistent with the remainder of the site and surrounding properties. The anticipated lot coverage was also summarized at 42-45% in the final order.

We would like to revise and clarify our request for increased lot coverage. It was unnecessary to request a blanket increase to the maximum lot coverage for all of the lots within the subdivision. The intent was not to increase additional lot coverage above 35% for the proposed lots between 10,000-14,000 square feet. The more accurate variance request would only be for the smaller 16 lots. Therefore, the applicant requests reconsideration that maximum lot coverage be increases from 35% to 45% for only lots 3-18. These lots and future homes built at the 35% max lot coverage would not be commensurate with adjacent homes in the area. Below are a list of justification points in addition to those which were discussed in the variance narrative, staff report, land use hearing and final order.

- An 8,000 sf lot at 35% lot coverage = 2,800 sf building footprint. After subtracting out the garage (600sf) and covered porches (300sf) you are left with 1,900 sf of living space.
- An 8,000 sf lot at 45% lot coverage = 3,600 sf building footprint. After subtracting out the garage (600sf) and covered porches (300sf) you are left with 2,700 sf of living space.
- The average building square footage for the lots surrounding this project is 3,944 sf.

- The 45% lot coverage for lots 3-18 will allow for homes to be equal in size to those surrounding the project.
- The majority of new homes built in this development will be one story. Home buyers need to be able to age in place and are not building two story homes.
- 25 foot rear yard setbacks provide adequate space to plant trees and shrubs to screen between adjacent parcels.
- Lots 3-18 have not requested any reductions to the standard R-10 setbacks. All setbacks will still be met with the 45% lot coverage.
- Allowing these smaller lots to build comparable size homes to the adjacent parcels does not constitute a grant of special privilege. It allows for equality.
- This variance is necessary due to special circumstances described throughout the application package.
- Approving this variance will not be injurious to the surrounding public and properties.
- This variance request is the minimum necessary to alleviate the hardship placed on these 16 lots.
- This variance request is supported by Camas Planning Staff.

Thank you for your time and reconsideration on this matter.

Sincerely,
Scott Taylor, Project Planner and Landscape Architect

3-7-23

BEFORE THE LAND USE HEARING EXAMINER
FOR THE CITY OF CAMAS, WASHINGTON

Regarding an application by METT RI, LLC	)	**FINAL ORDER ON**
for approval of a preliminary plat to divide	)	**RECONSIDERATION**
10.4-acres into 28 lots in the R-10 zone at	)	**File# SUB22-04[1]**
3210 NW McIntosh Road, in the City of Camas	)	**(McIntosh Subdivision)**

A. SUMMARY

1. On February 27, 2023, City of Camas Hearing Examiner Joe Turner (the "examiner") issued a Final Order approving this application subject to conditions (the "Original Final Order"). Section 18.55.235 of the Camas Municipal Code (the "CMC") provides that any party may request reconsideration of the examiner's decision if they believe that the examiner's decision is "[b]ased on erroneous procedures, errors of law or fact, or the discovery of new evidence which could not be reasonably available at the public hearing…"

2. On March 7, 2023, representatives of the applicant filed a request for reconsideration of the Original Final Order.[2]

3. Based on the findings provided or incorporated herein, the examiner grants the reconsideration request and modifies the findings and conditions set out in the Original Final Order.

B. DISCUSSION

1. CMC 18.55.235 provides:

> Any party of record believing that a decision of the hearings examiner is based on erroneous procedures, errors of law or fact, or the discovery of new evidence which could not be reasonably available at the public hearing, may make a written request to the examiner, filed with the city clerk, to be accompanied by an appeal fee, for reconsideration by the examiner.
>
> A. Time Frame. The request for reconsideration shall be filed within fourteen calendar days of the date the decision was rendered.
> B. Content. The request for reconsideration shall contain the following:
> 1. The case number designated by the city and the name of the applicant;
> 2. The name and signature of each Petitioner;
> 3. The specific aspect(s) of the decision being appealed, the reasons why each aspect is in error as a matter of fact or law, and the

[1] This approval includes consolidated files: ARCH22-10 (Archaeological Review), CA22-11 (Critical Areas Review), MAJVAR22-05 (Major Variance), and SEPA22-15 (State Environmental Policy Act).

[2] The applicant submitted a signed copy of the motion on March 9, 2022.

evidence relied on to prove the error. If Petitioner wants to introduce new evidence in support of the appeal, the written appeal must explain why such evidence should be considered.

C. The hearings examiner may, after review of the materials submitted in conjunction with the reconsideration request, and review of the open record hearing transcript, take further action as he or she deems proper; including, but not limited to, denying the request, modifying the decision, or affirming the decision.

D. The hearings examiner shall issue a decision on a request for reconsideration within forty-five (45) days of the filing of the request for reconsideration. When a request for reconsideration has been timely filed, any appeal to Clark County Superior Court under the Land Use Petition Act shall be filed within twenty-one (21) days after a hearings examiner issues its decision on the request for reconsideration.

2. The examiner finds that the applicant is a party of record. The applicant submitted the application and representatives of the applicant participated in review of the application, submitting oral and written testimony into the record.

3. The applicant filed the signed request for reconsideration on March 9, 2023, within the 14-day deadline established by CMC 18.55.235.A. The request for reconsideration includes the applicant's name, is signed by the applicant's representatives, and specifies which aspects of the decision are being appealed. Therefore, the examiner finds that the request complies with the procedural requirements of CMC 18.55.235.

4. The applicant objected to the examiner's denial of the requested variance to the maximum building coverage requirement of CMC 18.09.040 Table 1.A and "Plat Note" 3 in the conditions of approval of the Original Final Order. The applicant originally proposed a variance to allow a blanket 50-percent lot coverage for all of the proposed lots on the site, regardless of size. With the motion for reconsideration, the applicant clarified that they only intended the variance for smaller lots, "8,000+/-" square feet, in order to allow construction of homes on the smaller lots that are comparable to homes on the remainder of the site and on surrounding properties. As modified, the variance would only apply to proposed Lots 3 through 18 on the western portion of the site.

5. The examiner finds that a variance to the maximum lot coverage standard for smaller lots complies with the applicable approval criteria.

a. This limited lot coverage variance will not constitute a grant of special privilege inconsistent with the limitation upon uses of other properties in the vicinity and zone in which the subject property is located. CMC 18.45.040.B(1).

i. The site and properties abutting the northern portion of the site are zoned R-10 (Single Family Residential, 10,000 square-foot average lot size), which allows lot sizes between 8,000 and 14,000 square feet, with an average lot size of 10,000 square feet. (CMC 18.09.040, Table 1.A). However, properties abutting the remainder of

the site are zoned R-15 (Single Family Residential, 15,000 square-foot average lot size). Therefore, development on this site is subject to the beveling requirements of CMC 18.09.080.B, which requires that any lots abutting R-15 zoned properties contain 14,000 square feet, the maximum size allowed by the R-10 zoning. Nearly three-quarters of the site is bounded by R-15 zoned properties. In addition, the size and shape of the site and location of existing roads further limit design options on this site. Therefore, the applicant had to develop the remainder of the site with 8,000+/- square foot lots in order to offset the required 14,000 square foot lots and meet the 10,000 square foot average lot size requirement for the site.

ii. As discussed in the Original Final Order, a blanket variance allowing homes on all of the proposed lots, some of which are the largest lot size allowed in the R-10 zone, to exceed the maximum lot coverage standards would grant a special privilege to this development that is not available to other large lots in the vicinity, or the R-10 zone.

iii. However, the examiner finds that limiting the lot coverage variance to only the smallest lots on the site would not grant a special privilege to this development. The limited variance would merely allow the applicant to develop these lots with home sizes comparable to those allowed on other R-10 zoned properties that are not as constrained by the beveling requirement. Therefore, approval of this variance will not constitute a grant of special privilege inconsistent with the limitation upon uses of other properties in the vicinity or the R-10 zone. The variance will allow the applicant to develop homes on all lots on the site that are comparable in size and value to those on abutting properties.

b. The limited lot coverage variance is necessary, because of special circumstances or conditions relating to the size, shape, topography, location, or surroundings of the site, to provide it with use, rights, and privileges permitted to other properties in the vicinity and in the R-10 zone. CMC 18.45.040.B(2). All residential zoned properties are subject to the beveling requirement of CMC 18.09.080.B. However, most other R-10 zoned parcels are not subject to the same constraints as this site; a relatively narrow parcel with R-15 zoned lands abutting nearly three-quarters of the site boundaries. This is a special circumstance or condition that does not apply to most other properties in the vicinity and in the R-10 zone.

c. The lot coverage will not be materially detrimental to the public welfare or injurious to the property or improvements in the vicinity and in the R-10 zone that applies to the site. With the exception of Lots 25, 26, and 28, all lots would remain subject to the same setback standards as other lots of similar size.

d. Therefore, the examiner grants the requested variance to the maximum lot coverage standard for proposed Lots 3 through 18. Plat Note 3 should be modified to that effect.

D. CONCLUSION AND DECISION

Based on the above findings and discussion, the examiner grants the applicant's reconsideration request and approves SUB22-04 (McIntosh Subdivision) and consolidated files ARCH22-10, CA22-11, MAJVAR22-05, and SEPA22-15 subject to the following revised conditions.

Conditions of Approval

Standard Conditions:

1. Engineering site improvement plans shall be prepared in accordance with the City of Camas Design Standards Manual (CDSM) and CMC 17.19.040.
2. The engineering site plans shall be prepared by a licensed civil engineer in Washington State and submitted to the City's Community Development (CDEV) Engineering Department for review and approval. Submittal requirements for first review are as follows:
    a. Submit four (4) full size sets and one (1) half size set of plans.
    b. Submit one (1) electronic version of the final (TIR) stormwater report. Do not submit any hard copies of the Final TIR.
    c. Submit a stamped preliminary engineer's estimate.
3. Community Development (CDEV) Engineering shall collect a total three-percent plan review and construction inspection (PR&CI) fee for the proposed development.
    a. A preliminary construction estimate shall be submitted to the CDEV Engineering Dept prior to or with submittal of plans for first review.
    b. Payment of the one-percent plan review (PR) fee shall be due prior to the start of the plan review process. The PR fees will be provided by the engineering staff.
    c. Payment of the two-percent construction inspection (CI) fee shall be due prior to construction plan approval and release of approved plans to the applicant's consultant. The CI fees due will be provided by the engineering staff.
    d. Under no circumstances will the applicant be allowed to begin construction prior to construction plan approval.
4. Installation of public improvements shall be in accordance with CMC 17.21 Procedures for Public Improvements.
5. If applicable, existing wells, septic tank, and septic drain fields shall be decommissioned in accordance with state and county guidelines, per CMC 17.19.020.
6. Any entrance structures or signs proposed or required for this project will be reviewed and approved by the city.
    a. All designs will be in accordance with applicable City codes.
    b. The maintenance of the entrance structure will be the responsibility of the homeowners.
7. The applicant will be responsible for ensuring that private utilities; underground power, telephone, gas, CATV, streetlights, and associated appurtenances are installed.
8. A six-foot private utility easement (PUE) shall be located outside of the right-of-way on public streets and outside of the tracts on private streets.

9. A draft street lighting plan shall be submitted to development engineering for review prior to final plan submittal to Clark Public Utility.
10. The applicant will be required to purchase all permanent traffic control signs, street name signs, street lighting, traffic control markings, and gate and controller for the improved subdivision.
11. Prior to any land-disturbing activities of an acre or more, the applicant shall have approved final engineering plans and shall submit a copy of the *NPDES General Construction Stormwater Permit* (GCSWP), which is issued by the Washington State Department of Ecology, and the *Stormwater Pollution Prevention Plan* (SWPPP), which is required as a component of the NPDES GCSWP permit.
12. Prior to commencing any land-disturbing activities of an acre or more, the applicant shall submit an Erosion Control Bond (ESC) in the amount of 200-percent of the cost for erosion control measures, per CMC 17.21.030.B and CMC 14.06.200.
13. In the event any item of archaeological interest is uncovered during a permitted ground disturbing action or activity, all ground disturbing activities shall immediately cease, and the applicant shall notify the City and the Department of Archaeology and Historic Preservation (DAHP).
14. Prior to final acceptance, the applicant shall remove all temporary erosion prevention and sediment control measures from the site at completion of all site improvements, which includes stabilization of all disturbed soil, prior to issuance of Final Acceptance from CDEV Engineering.
15. Prior to final acceptance, final as-built construction drawing submittals shall meet the requirements of the Camas Design Standards Manual (CDSM).
    a. As-builts are to be submitted as PDFs and in either AutoCad or Carlson formats. The cover sheet for the as-builts is to include the originally approved and signed cover sheet.
16. Prior to final acceptance the two-year warranty maintenance bond is to be submitted in accordance with CMC 17.21.070.A Upon final acceptance of the development improvements a two-year (2) warranty bond commences.
17. Per CMC 17.21.070.E A letter of final acceptance will be issued once all items listed in 17.21.070.B-C are completed.
18. Final plat submittals shall meet the requirements of the CMC 17.11.060, CMC 17.01.050, and the Camas Design Standards Manual.
19. A homeowner's association (HOA) will be required and a copy of the CC&Rs for the development will need to be submitted to the City for review and approval. Specifically, the applicant will need to make provisions in the CC&Rs for ownership and maintenance of the private storm drainage systems, open spaces, retaining walls, fencing, walls, landscaping, irrigation, private roads, and tracts or easements outside of the City's right-of-way if applicable. Further, all necessary easements and dedications should be noted on the final plat.
20. The CC&R' shall not preclude accessory dwelling units.

21. The applicant shall take appropriate measures to ensure landscaping success for a minimum of three years after issuance of Certificate of Occupancy. If plantings fail to survive, the property owner shall promptly replace them.
22. Automatic fire sprinklers installed per NFPA 13D or 13R shall be required in all new residential structures.
23. Provisions for parking enforcement on private Tracts/access driveways, acceptable to the Fire Marshal, shall be included in the CC&Rs at the time of final platting.
24. Per CMC 17.21.060.H Permits for one sales office and/or one model home per plat or phase may be issued after the final plat is recorded, and prior to final acceptance. Building permit applications, for any other residential buildings, will not be accepted until after final acceptance is issued.

Special Conditions of Approval:

Planning:

25. The recommendations provided by the Department of Ecology shall be complied with.
26. The recommendations in the Geotechnical Report by Earth Engineering, Inc. dated March 1, 2022, shall be followed.
27. The recommendations in the Arborists Report by Jerry Hofer, dated February 6, 2023, shall be followed.
28. If potential artifacts are discovered during construction, work must immediately cease, and both the State Department of Archaeological and Historic Preservation and the City shall be notified.

Prior to Final Engineering Plan Approval:

Planning:

29. Retaining walls shall comply with CMC 18.17.060.
30. A final landscape, tree, and vegetation plan consistent with the landscaping standards in CMC Chapter 18.13 shall be submitted to the City for review and approval prior to engineering plan approval. The final landscape plan shall specify what larger tree or shrubs can be installed at the north entrance of the subdivision to create an entry statement. Plants utilized will need to be per the approved City's Tree list and per the Camas Design Manual planting specifications and landscape notes.

Engineering:

Water

31. The applicant shall submit revised water utility plans with all the future services and meter boxes located in planter strips or behind curb tight sidewalks.
32. The applicant shall submit revised the water utility plans to include the location for installation of the water sampling station onsite.
33. The applicant shall submit revised water utility plans showing the locations of all proposed irrigation services and the size of each irrigation meter.

Storm Drainage:

34. The applicant shall submit a complete set of stormwater plans for review and approval, per MR #1 of the TIR.
35. The applicant shall submit a revised stormwater plan that includes limiting impacts from roof drain and surface water runoff from Lots 1, 2, 27 and 28, in addition to the measures proposed for Lots 3 thru 26. Said plan should ensure that adjacent parcels and downstream drainageways and/or adjacent properties are not negatively affected by roof drain downspouts and surface water runoff, per Camas Municipal Code (CMC) 14.02 and 17.19.040.C.
36. The applicant shall revise the stormwater plans to show the proposed Filterra treatment structure at future Tract A located outside of the public right-of-way, within Tract A. Additionally, private rear or side yard drainage systems are to be placed within an easement across the applicable lots.
37. The stormwater utility plans shall be submitted with design information for proposed detention ponds and rear or side yard roof drain infiltration trenches.
38. The final stormwater TIR is to be submitted with both the City of Camas June 2022 *Stormwater Sewer System Operations & Maintenance Manual* and the maintenance requirements for the treatment vaults.
39. A final stormwater report (TIR) is to be submitted to the City for review and approval.
40. The applicant shall provide measures to accommodate stormwater runoff from the proposed temporary driveway serving the existing homes southwest of the site.

Erosion Control:

41. The applicant shall submit a complete set of Erosion Sediment Control (ESC) plans, as a part of the site improvement plans for review and approval.

Sanitary Sewer Disposal:

42. The engineering plans shall be revised with the existing sanitary sewer main, sewer manholes, and water main placed in a utility easement that is to be dedicated to the city, along the eastern property line of future Lot 1. The easement shall be a minimum 15 feet wide where it contains one utility (water or sewer) and 20 feet wide where it contains two utilities (water and sewer), unless otherwise approved by City engineering staff.
    a. The access and utility easement is to consist of a minimum 12-foot-wide hard surfacing to allow for access to the sewer main and manholes, the water main, and future Tract C, Utility Tract.
43. The engineering plans shall be revised to include a minimum 15-foot-wide utility access and maintenance easement from the end of future "NW Garden Court", between future Lots 21 thru 24, and south to future NW 5th Avenue, with right-of-entry granted to the city.

[Existing wells, septic tanks, and septic drain fields]:

44. The applicant shall provide documentation to the city that any existing wells, or septic systems have been properly decommissioned in accordance with State and County

guidelines. Additionally, any water rights associated with a decommissioned well shall be transferred to the City.

Roads:
[Public Roads]

45. The engineering plans shall provide for a continuous sidewalk connection from the east end of the sidewalk installed with the adjacent Ilwaco subdivision, along the frontage of the proposed development, and ending at the west end of the curb ramp installed with The Ridge subdivision at NW Fremont Street.
46. The engineering plans shall be submitted with the required 17-foot right-of-way dedication on NW McIntosh Road to allow for the 37-foot full depth half-width street improvement, including a minimum of 23-feet of paved surface, curb & gutter, eight-foot planter strip, and six-foot detached sidewalk in accordance with CDSM Street Detail ST5 3 Lane Collector/Arterial.
47. The engineering plans shall be submitted with the minimum curb radius of 35-feet on both sides of the intersection at NW McIntosh Road and the future public access road (NW Halifax Street).
48. Prior to final engineering plan approval, the applicant shall work with staff to provide an acceptable transition between the future extension of NW 5th Avenue to tie into the existing NW 5th Avenue to the east.
49. The engineering plans shall be submitted with the unidentified triangular shaped parcel on the east side of future Lot 3 shown as a public tract to allow for future access improvements to the southern parcel (PIN 217455000).
50. All construction traffic shall access the site from NW McIntosh Road until infrastructure construction has been completed on the site.

[Private Roads]

51. The applicant shall be required to provide a design for a 'No Parking and Towing' sign for review and approval.
    a. Said sign is to include contact information for a towing company.
    b. The applicant shall be required to install the 'No Parking and Towing' signs prior to final acceptance on future private road (NW Garden Court) and on the private road access to Lots 22 and 23.
52. The applicant is to work with the engineering staff and the Fire Marshal to provide an acceptable dead-end turnaround on the private road/shared driveway serving Lots 22 and 23. Additionally, the private road access to Lots 22 and 23 is to be placed in a Tract to be owned and maintained by the adjacent homeowners and/or the homeowners association (HOA).
53. The applicant shall obtain City approval of the temporary private driveway serving the existing homes southwest of the site.

[Street lighting]:

54. All street light locations are to be shown on the engineering and landscape plans.
55. Streetlights on private streets are required to be metered separately and are to be owned and maintained by the HOA/homeowners.

56. Prior to submittal of electrical plans to Clark Public Utilities, the preliminary electrical plans for streetlights, transformers, J-boxes, etc., which are prepared by others, are to be submitted to the city for review and approval.

[Street trees and Landscaping]:

57. The applicant shall show proposed driveway locations for each lot to ensure that street trees are not impacted.

58. The applicant shall submit a final landscape plan consistent with the landscaping standards in CMC Chapter 18.13 to the City for review and approval, in addition to CMC Chapter 17.19.030.F.6, and include plantings from the City's approved plant list.

[Storm Facility Landscaping]:

59. The applicant shall submit revised stormwater facility plans that provide for a minimum six-foot-high black vinyl coated chain link fence with top rail installed along the property lines of Tracts A and B where the tracts abuts the future Lot 11 and Lots 26 and 27. Additionally, the plans are to provide for a minimum 16-foot-wide double gate at the access road to the facility and a minimum 4-foot-wide man gate.

Traffic Impact Analysis:

60. The engineering plans are to be submitted with the site vision clearance/site distance triangles shown on the final engineering plans at the intersection of future public road (NW Halifax Street) and NW McIntosh Road.

Prior to Land-Disturbing Activities:

61. Prior to any land-disturbing activities the applicant shall submit the required SWPPP, per MR #2 of the preliminary TIR.

62. Prior to any land-disturbing activities, an electronic copy of Ecology's NPDES GCSWP permit, an electronic copy of the SWPPP, and the financial security for erosion and sediment control are to be submitted to the city.

63. Prior to any land-disturbing activities, which includes tree cutting, clearing and grading, an approved set of final engineering plans, including the erosion prevention and sediment control measures is required.

Prior to Final Plat Approval:

Planning:

64. Lots 25 and 26 shall provide a minimum 25-foot rear yard setback and a minimum 20-foot front yard setback. Lot 28 shall provide a minimum 20-foot rear yard setback. All other lots and setbacks shall comply with the setback requirements of CMC 18.090.040 Table 2.

65. Lots 5 and 6 are not considered irregular lots and shall follow current setbacks per CMC 18.09.040 Table 2.

66. Pursuant to the approved variance, Lots 3 through 18 are allowed a maximum 50-percent building lot coverage. All remaining lots shall comply with the maximum 35-percent building lot coverage allowed by CMC 18.09.040 Table 1.A.

Engineering:

67. Prior to final plat approval the following note is to be added to the final plat.
    a. Tract _, a private road, includes a blanket utility access and maintenance easement conveyed to the city, over and under the water main located in the private street.

68. The following notes shall be added to the final plat stating that:

    a. The stormwater facilities located on Tract A and Tract B are to be owned and maintained by the homeowners/Homeowner Association (HOA) at the end of the two-year warranty period, which expires two -years after final acceptance.

    b. Right-of-entry is to be granted to the city for inspection purposes of the stormwater facilities located on Tract A and Tract B.

    c. Private rear or side yard drainage systems are to be owned and maintained by the HOA or the applicable lot owners upon which the private stormwater systems/easements are located.

69. The final plat shall be revised with the existing sanitary sewer main, sanitary sewer manholes, and water place in an easement along the eastern property line of future Lot 1. The easement is to an access and utility easement over and under the existing water and sanitary sewer, with right-of-entry granted to the city. The easement shall be a minimum 15 feet wide where it contains one utility (water or sewer) and 20 feet wide where it contains two utilities (water and sewer), unless otherwise approved by City engineering staff.

70. A note is to be added to the plat that a blanket utility access and maintenance easement is provided to the city over and under the sanitary sewer main located in the future private road "NW Garden Court".

71. The final plat shall be revised with a 15-foot-wide utility access and maintenance easement over the new sanitary sewer main and sewer manhole from the end of future "NW Garden Court", between Lots 21 thru 24, and south to future NW 5th Avenue, with right-of-entry granted to the city.

72. The final plat shall provide for the dedication of Tract _, the unidentified triangular shaped parcel, located on the east side of proposed Lot 3. Tract _ is to be dedicated as a public tract set aside for future access improvements to parcel number 217455000.

73. The private road access to Lots 22 and 23 is to be placed in a Tract to be owned and maintained by the adjacent homeowners and/or the homeowners association (HOA).

<u>Prior to Final Acceptance:</u>
Planning:

74. Irrigation and landscaping should be installed or bonded for prior to final acceptance.

Engineering:

75. The applicant shall provide a design for a 'No Parking and Towing' sign for review and approval.

a. Said sign is to include contact information for a towing company, as the city does not provide towing on private roads, nor does the city enforce no parking on private roads.

b. The applicant shall install the 'No Parking and Towing' signs prior to final acceptance.

76. With the exception of perimeter erosion fencing, the applicant shall remove all temporary erosion prevention and sediment control measures from the site at completion of all site improvements, which includes stabilization of all disturbed soil, prior to issuance of Final Acceptance from CDEV Engineering. The applicant shall retain erosion control measures on the perimeter of the site until home construction is completed on the proposed lots.

77. Final as-built construction drawing submittals shall meet the requirements of the Camas Design Standards Manual (CDSM).
    a. As-builts are to be submitted as PDFs and in either AutoCad or Carlson formats. The cover sheet for the as-builts is to include the originally approved and signed cover sheet.

78. The two-year warranty maintenance bond is to be submitted in accordance with CMC 17.21.070.A Upon final acceptance of the development improvements a two-year (2) warranty bond commences.

79. The applicant is required to pay the proportionate share amount of $34,000.00 to the City of Vancouver. The applicant is to provide Camas staff with documentation of payment of said proportionate share amount.

Prior to Building Permit Approval:

80. Single-family building permit applications are to include information regarding connection of roof drain downspouts to the rear yard stormwater laterals that discharge to the rear yard infiltration trenches.

Prior to Final Occupancy:

Planning:

81. Street trees adjacent to lots should be installed prior to final occupancy or bonded for per CMC 17.19.030.F.4.

Proposed Plat Notes

1. A homeowner's association (HOA) will be required for this development. Copies of the CC&Rs shall be submitted and on file with the City of Camas.
2. Building permits will not be issued by the Building Department until all subdivision improvements are completed and Final Acceptance has been issued by the City.
3. Pursuant to the approved variance, maximum building lot coverage is 50-percent for Lots 3 through 18. Per CMC 18.09.040 Table 1.A, maximum building lot coverage is 35-percent for all other lots in this subdivision.

4. The lots in this subdivision are subject to traffic impact fees, school impact fees, fire impact fees and park/open space impact fees. Each new dwelling will be subject to the payment of appropriate impact fees at the time of building permit issuance.
5. Wetlands, critical areas, and associated buffers shall be maintained in their natural state as described in the Final Wetland Mitigation Plan (Note: add date after approval) that is recorded with this plat by the HOA. Any modifications to critical areas and buffers must be approved in writing by the city after submittal of a revised critical area report.
6. Tree topping is not permitted within this development, nor removal of more than 20 percent of a tree's canopy. Trees that are determined to be hazardous by a licensed arborist may be removed after approval by the City. Required street trees shall be promptly replaced with an approved species.
7. In the event any item of archaeological interest is uncovered during the course of a permitted ground disturbing action or activity, all ground disturbing activities shall immediately cease, and the applicant shall notify the City and the Department of Archaeology and Historic Preservation (DAHP).
8. Tract _, a private road includes a utility access and maintenance easement conveyed to the city, over and under the water main located in the private street.
9. Stormwater facilities in Tracts A and B shall be owned and maintained by the homeowners/Homeowner Association (HOA) at the end of the two-year warranty period, which expires two -years after final acceptance.
10. Right-of-entry is to be granted to the city for inspection purposes of the stormwater facilities located on Tract A and Tract B.
11. Private rear and/or side yard stormwater drainage systems are to be placed in private stormwater easements and owned and maintained by the HOA or the applicable lot owners upon which the private stormwater systems easements are located.
12. The easement along the eastern property line of future Lot 1 is an access and utility easement over and under the existing water and sanitary sewer, with right-of-entry granted to the city.
13. Tract _, a private road "NW Garden Court" is covered by a blanket access and maintenance easement over and under the sanitary sewer main.
14. The 15-foot-wide access and utility easement, from the end of future "NW Garden Court", between Lots 21 thru 24, and south to NW 5th Avenue is provided over and under the sanitary sewer main and sanitary manhole, with a right-of-entry granted to the city.
15. Tract _ contains an access and maintenance easement over and under the existing water, sanitary sewer main, and sanitary sewer manholes, with right-of entry granted to the city.
16. Tract _ is a public tract set aside for future access improvements to Parcel Number 217455000. Ownership and maintenance of said tract will be the responsibility of the city.

17. Tract _ is a private road access to Lots 22 and 23 and is to be owned and maintained by the adjacent homeowners and/or the homeowners association (HOA).
18. Lots 25 and 26 shall provide a minimum 25-foot rear yard setback and a minimum 20-foot front yard setback. Lot 28 shall provide a minimum 20-foot rear yard setback. All other setbacks shall comply with the setback requirements of CMC 18.090.040 Table 2.

DATED this 13 day of March 2023.

Joe Turner, AICP
City of Camas Land Use Hearing Examiner

McIntosh Subdivision (SUB22-04)
Index of Exhibits

Exhibit No.	Title/Description	Document Date
1	Application Form and Fees	6/26/22
2	Narrative	2/6/23
3	Pre-Application Conference Notes	11/4/21
4	Geotechnical Report	3/1/22
5	SEPA Checklist	4/6/21
6	Boundary, Tree and Topo Survey	4/20/22
7	Traffic Impact Study	4/27/22
8	Preliminary Plans	6/26/22
9	Preliminary Stormwater Report	6/24/22
10	Arborist Report	2/6/23
11	Mailing Labels	6/26/22
12	Technically Incomplete Letter	7/15/22
13	Consultant Responses to Technically Incomplete Letter	7/18/22
14	Revised Preliminary Plans	2/6/23
15	Revised Preliminary Existing Conditions with Tree Retention Notes	9/21/22
16	Technically Incomplete Letter	10/6/22
17	Consultant Responses to Technically Incomplete Letter	10/6/22
18	Deviation Narrative	11/1/22
19	Technically Complete Letter	11/7/22
20	Technically Complete Letter Attachments	11/7/22
21	SEPA Notice Determination of Non-Significance	12/15/22
22	SEPA Distribution Packet	12/15/22
23	SEPA Comment	12/15/22
24	Ecology SEPA Comment	12/29/22
25	Notice of Application	1/5/23
26	Garsztka Public Comment	1/23/23
27	Development Sign	1/24/23
28	Notice of Public Hearing	2/2/23
29	Lyne Public Comment	2/10/23
30	Update Email from Geotech	2/13/23
31	Gulling Public Comment	2/16/23
32	Anderson Public Comment	2/16/23
33	Miles Public Comment	2/16/23
34	Final Order	2/27/23
35	Applicants Request for Reconsideration	3/7/23
36	Final Order on Reconsideration	3/13/23

STAFF REPORT

Monte Verde Subdivision

Planning File No. SUB22-05

(Consolidated files: ARCH22-12, CA22-13, SEPA22-17)

Report Date: January 26, 2023

TO	Hearings Examiner	**HEARING DATE**	February 16, 2023
PROPOSAL	To subdivide approximately 8.6 acres into 34 single-family residential lots.		
LOCATION	The site is located at 22205 NE 28th Street in the SE & SW ¼ of Section 21, Township 2 North, Range 3 East, of the Willamette Meridian; and described as tax parcel number 173184000.		
APPLICANT/ OWNER	Dwight A. Southern 22205 NE 28th Street Camas, WA 98607	**CONTACT**	PLS Engineering Attn: Travis Johnson, PE 604 W Evergreen Boulevard Vancouver, WA 98660
APPLICATION SUBMITTED	August 11, 2022	**APPLICATION COMPLETE**	November 7, 2022
SEPA	The City issued a SEPA Determination of Non-significance (DNS) on December 15, 2022, with a comment period that ended on December 29, 2022. The SEPA DNS was mailed to property owners on December 14, 2022, and published in the Post Record on December 15, 2022, as Legal publication #762860.		
PUBLIC NOTICES	A Notice of Application was mailed to property owners within 300 feet of the site on January 4, 2023, and published in the Post Record on January 5, 2023. Legal publication #768350. A Notice of Public Hearing was mailed to property owners within 300 feet of the site on February 1, 2023, and published in the Post Record on February 2, 2023. Legal publication #774370.		

APPLICABLE LAW: The application was submitted on August 11, 2022, and the applicable codes are those codes that were in effect at the date of the application's first submittal. Camas Municipal Code (CMC) Title 16 Environment, Title 17 Land Development, and Title 18 Zoning, specifically (but not limited to): Chapter 17.11 Subdivision, Chapter 18.11 - Parking, Chapter 18.13 - Landscaping, and Chapter 18.55 Administrative Procedures. [Note: Citations from Camas Municipal Code (CMC) are indicated in *italic* type.]

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SUMMARY

An application has been made to the City of Camas for preliminary plat approval to subdivide approximately 8.6 acres situated in the R-7.5 Single-Family Residential Zone. The preliminary plat proposes to subdivide the subject property into 34 lots, ranging in size from approximately 5,822 – 8,265 square-feet.

Surrounding uses to the north, west, and east are single-family residential. To the south of the project site is Camp Currie Park. An overhead 100-foot-wide Bonneville Power Authority powerline easement runs diagonally east/west through the site. The single-family residential properties to the east have not been annexed into the city and are designated as R-12 properties within county limits. The single-family residential properties immediately to the west of the subject site are in the R-7.5 zone. The properties to the north (Green Mountain Subdivision) are zoned R-6. The properties adjacent to the easterly and southerly property lines include parcels that are zoned PF – Public Facilities.

The subject property is currently developed with one single-family residence and two outbuildings that are proposed to be removed to facilitate the future development of 34 future single-family residences. The site is primarily grass with scattered trees. A forested area exists on the southern portion of the site. The property slopes gently towards the south; no steep slopes or severe erosion hazard areas are known to be located on site. The preliminary plans indicate that there will be tracts set aside for a stormwater facility, open space, access, landscaping, stormwater facilities, and other related infrastructure.

The proposed preliminary plat does or can comply with the applicable standards of the Camas Municipal Code (CMC) and Revised Code of Washington (RCW).

FINDINGS

Chapter 16.07 State Environmental Policy Act

A SEPA checklist was submitted, and a Determination of Non-Significance (DNS) was issued on December 15, 2022, as the proposed development includes more than nine residential dwelling units per CMC 16.07.020.A.1. and contains critical areas. The comment period ended December 29, 2022. Two comments were received. One comment was from the Department of Ecology regarding solid waste management and water quality (Exhibit 28). The other public comment (Exhibit 27) is regarding street and sidewalk improvements, as well as traffic. These comments are addressed throughout the report.

> **FINDING:** Staff finds the comments provided by the Department of Ecology should be complied with.

Chapter 16.31 Archaeological Preservation

The subject property is within a high and moderate – high archeological predictive area, therefore an archaeological predetermination report has been prepared for the site. The report prepared by Archeological Services LLC, dated July 5, 2022, was sent to the Department of Archaeology and Historic Preservation as well as the tribes. Based on the findings in the report, no further archaeological work is recommended at this time. The report and findings are not subject to the open public records act and as such, the City cannot disclose the results.

> **FINDING:** Staff finds a condition of approval is warranted that if potential artifacts are discovered during construction, work must immediately cease, and both the State Department of Archaeological and Historic Preservation and the City shall be notified.

Chapter 16.51 Critical Areas

CMC Chapter 16.53 - Wetlands

Per Clark County GIS, the subject property is mapped as having wetlands within the southwest corner of the site. A Critical Areas Report prepared by Ash Eco Solutions dated August 5, 2022 (Exhibit 10), and updated October 12, 2022 (Exhibit 18), indicates that no wetlands were identified within the subject site. The report notes site reconnaissance by Ash Eco Solutions identified that the mapped wetlands was located over 300-feet south of the project site.

CMC Chapter 16.61 – Fish and Wildlife Habitat Conservation Areas

Habitats of Local Importance- Oregon White Oaks

Oregon White Oaks were identified in the Critical Areas Report from Ash Eco Solutions, LLC dated October 12, 2022. Per CMC 16.61.010.3.a.i, Oregon White Oaks over 20-inch DBH are considered habitat of local importance. Eleven individual Oregon white oak trees were identified within or immediately adjacent to the subject site and have numbered by the tree survey, Appendix C in the Critical Areas report. Three oaks with over 20-inch DBHs were documented onsite north of the existing barn (Oak #'s 14, 15, and 16). One non-jurisdictional oak is located centrally onsite (Oak #32). One oak is a hazard snag (Oak #27). Three oaks are located along the property boundaries with partial canopies encroaching into the subject site (Oak #'s 76, 79, and 126). The remaining three oaks identified were determined to be entirely offsite (Oak #'s 31, 38, and 127). Six of the oak trees inventoried by the tree survey are jurisdictional and meet the Washington Department of Fish and Wildlife (WDFW) criteria for "individual oak" Priority Habitats as they have dbh measurements of 20-inches or larger. Oregon white oak Priority Habitat is protected by WDFW and jurisdictional under the local CMC habitat code. The understory and herbaceous layer associated with the onsite oak habitat is highly disturbed due to grazing or dominated by Himalayan blackberry. The applicant proposes the removal of three jurisdictional Oregon white oak trees (Oak #'s 14, 15, and 16). Therefore, mitigation to offset the removal of these jurisdictional trees under CMC 16.61.010 is required.

After a preliminary review of the Critical Areas report, staff collaborated with WDFW, the applicant, and Ash Eco Solutions, LLC regarding the proposed impacts and mitigation plan associated with this project. The initial report dated August 5, 2022, was augmented to include updated impact and mitigation area calculations and conclusions agreed upon by the applicant. The mitigation plan was developed following CMC 16.61.010 and the applicant proposes to offset the impacts to allow for no net loss of habitat functions onsite.

The proposed project will retain and protect three Oregon white oak trees (Oak #'s 76, 79, and 126) that are present along the western, southern, and eastern property lines. The understories of these oaks will

be restored by removing invasive species and enhancement of the native shrubs. Additionally, the removal of adjacent Douglas fir and big leaf maple trees will provide additional oak habitat enhancement. The project also proposes oak tree and native shrub plantings within onsite mitigation areas to offset the removal of three Oregon oak trees (Oak #'s 14, 15, and 16) located within the northern portion of the project site.

Following the mitigation sequencing requirements outlined in CMC 16.51.170, the proposed project has avoided and minimized impacts to the full extent practical while still meeting the required design elements for a subdivision of this size. According to the revised Critical Areas report, the unavoidable impacts have been quantified, and appropriate mitigation is proposed onsite for a no net loss of habitat area or function. The project has been designed to avoid direct impacts to three oak trees with driplines present onsite. These trees are situated along the property line and have critical root zones that extend into the project site. The mitigation plan indicates that the dripline of each tree will be located, staked, and fenced prior to construction to protect them during site grading and construction. Native shrubs will be added as understory plants within the driplines, connecting the proposed mitigation areas to the offsite oak habitat.

Avoidance of Oak trees 14, 15, and 16 was originally attempted, however it was determined that in order to meet the required design elements for site access and lot configuration, that the site plan would need to be altered resulting in the unavoidable impact. Jurisdictional Oak #'s 15 and 16 are located within the proposed site access road and sidewalk. Alternate access road options were proposed by the applicant but the preferred location for access into the proposed subdivision is directly south of the existing North Hargrave Street and NE 28th Street intersection. Oak #14 is within the northwest corner of the subject site and is within construction limits of the proposed northwestern lots, however the amount of fill needed for grading within this area would be detrimental to the health of the tree.

The updated mitigation plan was designed to follow the requirements of CMC 16.51.180 and will offset the loss of habitat. The mitigation plan has further been designed to offset the temporal loss of the oak habitat onsite, enhance the functions of the oak habitat to be retained, provide greater connectivity to oak habitat present directly offsite, and will be managed by the future HOA for perpetuity to ensure maintenance and survival of the habitat. The mitigation plan includes details for planting, protective signage, maintenance, monitoring, contingency, and site protection.

CMC Chapter 16.51 – General Provisions for Critical Areas

Staff recommends a condition of approval for the installation of temporary construction fencing prior to construction that clearly marks in the field critical area buffers (i.e., Oregon White Oak) and fencing should remain throughout permitted construction activities. In addition, prior to final engineering plan final acceptance, permanent signs and fencing should be installed at the edge of the critical area buffers per CMC 16.51.210.B and C. Sign and fencing specifications should be submitted to the City for review and approval prior to installation.

Prior to final acceptance, a conservation covenant should be recorded with the County to ensure the long-term preservation of the critical areas and any associated buffers, including maintenance of any mitigation actions, per CMC 16.51.240 and conditioned as such. Further, a copy of the recorded conservation covenant document must be submitted to the city prior to final acceptance.

The applicant will be required to post a mitigation bond in an amount deemed acceptable by the city to ensure the oak mitigation is fully functional per CMC 16.51.250.

Staff finds a condition of approval is required that detailed construction drawings per CMC 16.53.050.E.3 are submitted to the City for review and approval prior to final engineering plan approval.

FINDING: Staff finds the proposal, as conditioned, can or will comply with the applicable provisions of CMC Title 16 Environment as discussed above.

Chapter 17.11 Subdivisions

CMC Chapter 17.11.030(D) Criteria for Preliminary Plat Approval:
The hearings examiner's decision on application for preliminary plat approval shall be based on the following criteria:

1. The proposed subdivision is in conformance with the Camas Comprehensive Plan, Parks and Open Space Comprehensive Plan, Neighborhood Traffic Management Plan, and any other City adopted plans.

Comprehensive Plan
The subject property is designated as Single-Family Medium in the City's Comprehensive Plan, which includes the Single-Family Residential R-7.5 zone designation.

Overall, the 2035 City of Camas Comprehensive Plan supports the subdivision through several land use policies such as the following:

- Land Use Policy 1.3: Maintain compatible use and design with the surrounding built and natural environments when considering new development or redevelopment.
- Land Use Policy 1.5: Where compatible with surrounding uses, encourage redevelopment or infill development to support the efficient use of urban land.
- Land Use Policy 3.3: Encourage connectivity between neighborhoods (vehicular and pedestrian) to support citywide connectivity and pedestrian access.
- Housing Policy 1: Maintain the strength, vitality, and stability of all neighborhoods and promote the development of a variety of housing choices that meet the needs of all members of the community.
- Housing Policy 1.6: Encourage in-fill development on vacant or underutilized sites, subject to design review guidelines, that have adequate urban services, and ensure that the development is compatible with the surrounding neighborhood.

The proposed subdivision will help accommodate the projected growth through the utilization of existing land. The proposed houses, when built, will provide housing opportunities to meet the needs of the community in accordance with the Housing Element of the Comprehensive Plan.

Parks and Open Space Plan
The Parks and Recreation Open Space Plan does not identify any trails or open spaces on the site; however, per the 2022 Parks, Recreation, and Open Space (PROS) Comprehensive Plan, a segment of the T-27 trail, shown to traverse west-to-east, is situated at the southernmost limits of the proposed subdivision. The property located to the south and east of the project site is owned by Clark County Parks. A paved sidewalk is proposed to be stubbed to the south end of the project site for pedestrian connection to a future trail.

Neighborhood Traffic Management Plan: The City has a Neighborhood Traffic Management Plan (NTM). The NTM plan identifies the need for installation of acceptable traffic calming features when a proposed development will create 700 Average Daily Trips (ADT) or more.

The Transportation Impact Study (TIA) prepared by Lancaster Mobley (Exhibit 6), dated July 13, 2022, found the project is expected to generate approximately 310 Average Daily Trips (ADT) with 23 new AM Peak Hour trips (6 In / 18 Out) and 31 PM Peak Hour trips (20 In / 12 Out). Therefore, the proposed development will not be required to install traffic calming features.

FINDING: Staff finds that the proposed project, can and will meet the requirements as noted in the City's NTM plan.

2. Provisions have been made for water, storm drainage, erosion control, and sanitary sewage disposal for the subdivision that are consistent with current standards and plans as adopted in the Camas Design Standard Manual.

Water:
In accordance with CMC 17.19.040.C.4 Water System, each lot within a development shall be served by a water distribution system designed and installed in accordance with the city's *Design Standards Manual* (CDSM).

Preliminary utility plans were submitted with the application (Exhibit 12). Revised preliminary utility plans (Exhibit 30) were submitted on January 31, 2023. Revisions are based on a discussion between the applicant's consultant and city staff.

There is an existing 24-inch ductile iron transmission water main located on the north side NE 28th Street. Per CDSM, a minimum 8-inch water distribution system will be provided for the benefit of the proposed development with a minimum 1-inch water service provided to each lot.

The revised preliminary utility plans (Exhibit 30) show a new water main tapped at NE 28th Street and located on the west side of future "NE/NW Noble Avenue". The new water main is shown to extend south to a dead-end blowoff valve at the cul-de-sac, and additional dead-end blowoff valves at the east and west legs of future NE 26th Street. The proposed water main is shown as an 8-inch water main from NE 28th Street south to a proposed fire hydrant at future Lot 23, where it is then shown to be reduced to a 6-inch water main to the end of the cul-de-sac. Per Camas Design Standards Manual (CDSM), new water mains are to be a minimum of 8-inch in diameter.

Staff recommends a condition of approval that prior to final engineering plan approval, the applicant should submit revised utility plans that show an 8-inch water main from NE 28th Street, through the entire length of future "NE/NW Noble Avenue" and south to the end of the cul-de-sac, as well as an 8-inch water main in the east and west dead-end leg of in future NE 26th Street.

Per CMC 17.19.040.C.4.d Landscaping in open space tracts must have a service for an irrigation meter. Irrigation services are to be a minimum 1-inch service. The size of the irrigation meter is to be determined in advance and shown on the water and landscape plans. The owner of the open space tract is responsible for installation of the meter and the water usage. Landscaping water services and meters are to be privately owned and maintained by the Owner and/or Homeowners Association (HOA).

Staff recommends a condition of approval that prior to final engineering plan approval, the applicant should submit revised water utility plans showing the locations of all proposed irrigation services and the size of each irrigation meter.

FINDINGS: Staff finds that, as conditioned, adequate provisions for water can or will be made in accordance with CDSM and CMC 17.19.040.

Storm Drainage:
In accordance with CMC 17.19.040.C.3 the storm drainage collection system shall meet the requirements of the city's stormwater standards, the *Camas Design Standards Manual* (CDSM), and CMC 14.02 Stormwater Control.

Per Clark GIS Property Information, the site for the proposed development is approximately 8.84 acres (385,070 SF) in size. Per Figure 1-3.2: Flow Chart for Determining Requirements for Redevelopment of

Ecology's Stormwater Management Manual for Western Washington (SWMMWW), if the land-disturbing activities are greater than 7,000-square feet, minimum requirements #1-#9 will apply. The proposed development will have land-disturbing activities greater than 7,000-square feet, therefore Minimum Requirements (MR) #1-#9 apply.

A preliminary stormwater Technical Information Report (TIR) (Exhibit 7), dated July 2022, was prepared by PLS Engineering. The site contains existing structures; a 1,900 square-foot house, a 1,200 square-foot shop, and a 3,080 square-foot chicken coop. There is an existing 100-foot-wide BPA easement that transects the site from northwest to southeast; with electrical power line towers that support the high-voltage power lines located within the easement. The reminder of the site is vegetated with grass, weeds, and a variety of trees. The site slopes generally from the northeast to the southwest with grades ranging from 3% to 10%. There are slopes up to 20% in the southwestern portion of the site.

MR #1 – Preparation of Stormwater Site Plans: The preliminary stormwater utility plan was incomplete, as the plans did not include sizing for the conveyance piping or manholes; design plans for the stormwater facilities; nor profiles of said conveyance system.

> Staff recommends a condition of approval that prior to final engineering plan approval the applicant should submit a complete set of stormwater plans for review and approval, per MR #1 of the TIR.

MR #2 – Construction Stormwater Pollution Prevention Plan (SWPPP): The SWPPP was included as Appendix E of the preliminary TIR.

MR #3 – Source Control of Pollution: The preliminary TIR addresses the various BMPs required for source control in the SWPPP included in Appendix E.

MR #4 – Preservation of Natural Drainage Systems and Outfalls: The preliminary TIR states that the proposed development will capture existing runoff; via infiltration and detention, in accordance with the current 2019 SWMMWW.

MR #5 – On-Site Stormwater Management: The preliminary TIR addresses this requirement in Section E.

MR #6 – Runoff Treatment: The preliminary TIR addresses this requirement in Section F. Treatment is proposed via treatment catch basins and manholes. Treatment and detention structures located in the public right-of-way is not supported by staff.

> Staff recommends a condition of approval that prior to final engineering plan approval the stormwater plans are to be revised with any and all proposed treatment and/or detention structures located outside of the public right-of-way.

MR #7 – Flow Control: The preliminary stormwater report (TIR), proposes an infiltration trench design for basins 1, 2 and 3 which is 100 ft. long by 8 ft. wide and 3 ft. deep. The Basin 1 infiltration trench is designed to overflow into the trench for Basin 2, which will overflow to a detention pond at the SW corner of the site. Basin 3 runoff areas can't be infiltrated and are directly discharged to the detention facility. Additionally, the preliminary TIR states that conveyance systems analysis and design are not currently provided and will be provided with the Final TIR.

> Staff recommends a condition of approval that prior to final engineering plan approval, the applicant should submit a final stormwater report (TIR) that addresses the on-site conveyance systems analysis and design as well as an updated infiltration trench design and locations.

MR #8 – Wetlands Protection: Appendix F on the preliminary TIR states that there are not any wetlands on-site, therefore wetland protections are not applicable.

MR #9 – Operation and Maintenance (O&M): The preliminary TIR provided an O&M manual in Appendix D. However, the referenced O&M Manual is Book 4 of the *2015 Clark County Stormwater Facility Operations and Maintenance Manual*. The proposed development is located in the City of Camas. The city has a stormwater operation and maintenance manual included in the Camas Design Standards Manual.

Staff recommends a condition of approval that prior to final engineering plan approval the final stormwater TIR is to be revised and submitted with the City of Camas June 2022 *Stormwater Sewer System Operations & Maintenance Manual.*

Preliminary utility plans were submitted with the application (Exhibit 12). Revised preliminary utility plans (Exhibit 30) were submitted on January 31, 2023. Revisions are based on a discussion between the applicant's consultant and city staff. The preliminary utility plans showed infiltration trenches located with the public road sections in future "NW Noble Avenue" and future NE 26th Street. The city does not allow for stormwater treatment or detention within the public right-of-way. Therefore, the applicant submitted revised preliminary stormwater plans (Exhibit 30) with the treatment and detention located in dedicated stormwater tracts.

The revised preliminary stormwater plans propose to construct a stormwater collection system which will collect the stormwater runoff via a series of catch basins, manholes, and conveyance piping. The preliminary stormwater system also provides an underground storm infiltration system located at the southern end of Tract 'B' below the proposed playground area and in the northeast corner of Tract 'E' adjacent to the southern property line of future Lot 2; and a storm detention facility Tract 'D' at the southeast corner of the proposed development.

Staff recommends a condition of approval that prior to final engineering plan approval, the applicant should submit a complete set of stormwater plans, including the design for the conveyance system in accordance with the Camas Design Standards Manual (CDSM). Additionally, the underground infiltration system on Tract B should be located such that it is not situated below the proposed playground area.

Per CMC 14.02 and 17.19.040, stormwater is not to negatively affect adjacent property owners. This requirement encompasses both roof drain downspouts and overland surface flow as noted below:

- CMC 14.02 Stormwater Control:
  14.02.010.B.2 Minimize damage to property from increased runoff rates and volumes.
- CMC 17.19 Design and Improvement Standards:
  17.19.040.C.3 Storm Drainage - The storm drainage collection system shall meet the requirements of the city's officially adopted storm water standards.
  17.19.040.C.3.e - All lots shall provide drainage for stormwater runoff from roof and footing drains to an approved drainage system. Rear yard low point area drains and/or storm drain lateral stubs connected to an approved drainage system shall be provided to each lot as necessary to prevent stormwater runoff impacts to adjoining parcels as determined by the city.

Staff recommends a condition of approval that, prior to final engineering plan approval, the applicant should submit a revised stormwater plan for Lots 1-34. Said plan should ensure that adjacent parcels and downstream drainageways and/or adjacent properties are not negatively affected by roof drain downspouts and surface water runoff, per Camas Municipal Code (CMC) 14.02 and 17.19.040.C.

Per CMC 17.19.040.C.a, storm drainage facilities shall be placed on their own tract or within an open space tract and are to be owned and maintained by the homeowners and/or the HOA. The preliminary

stormwater plans propose to construct the following stormwater facilities located on Tract B, Tract D, and Tract E.

Per CMC 14.02.090.1 Stormwater facilities, located within residential subdivisions and short plats, shall be the maintenance responsibility of the applicant for two years after date of final acceptance. The 2-year maintenance period shall run concurrent with the city's required two-year warranty period that begins at final acceptance.

Prior to end of the two-year warranty period, and upon inspection by the city, the applicant shall ensure that a fully functional facility is turned over to the new owners (e.g., homeowners' associations/homeowners). At completion of the 2-year warranty period, the stormwater facilities in Tracts B, D, and E will be owned and maintained by the Homeowner's Association/homeowners. Per CMC 14.02.C, the City shall have the right-of-entry and authority to inspect of the stormwater facility located in Tract D.

Staff recommends a condition of approval that prior to final plat approval the following notes are to be added to the final plat.

Proposed Plat Notes:

Stormwater facilities located on Tracts B, D, and E are to be owned and maintained by the homeowner's association / homeowners at the completion of the 2-year warranty period, which expires 2-years after issuance of final acceptance.

Right-of-entry shall be granted to the city for inspection purposes of the stormwater facilities located on Tracts B, D, and E.

FINDINGS: Staff finds that, as conditioned, the applicant can and will make adequate provisions for stormwater control, conveyance, and water quality treatment.

Erosion Control:

In accordance with CMC 14.06 Erosion Control, adequate erosion control measures are to be provided during the site improvements for the proposed development in accordance with the *Camas Design Standards Manual* (CDSM) and Ecology's *Stormwater Management Manual for Western Washington* (SWMMWW).

Per CMC 17.21.030.A installation of erosion prevention / sediment control measures are required per an approved erosion and sediment control plan. The preliminary plans that were submitted with the application, did not include the erosion and sediment control plans.

Staff recommends a condition of approval that prior to final engineering approval, the applicant should be required to submit a complete set of Erosion Sediment Control (ESC) plans, as a part of the site improvement plans for review and approval.

Per CMC 17.21.030.C construction of storm drainage facilities required to detain and dispose of stormwater is to commence prior to work on other portions of the project. The city may require the construction of a temporary storm drainage facility that would bypass and protect the permanent facility until such time as the rest of the project is complete and ready for the permanent facility to be brought online.

Per Clark GIS Property Information, the site for the proposed development is approximately 8.84 acres (385,070 SF) in size.

Per CMC 14.06.200 and CMC 17.21.030.B financial security for erosion control, in the amount of 200% of the estimated erosion control items is required prior to land-disturbing activities of one acre or more. The

erosion control financial security is to be submitted to the city prior to start of any land-disturbing activities. Additionally, the applicant will be required to provide a copy of both their *NPDES General Construction Stormwater Permit* (GCSWP) and their *Stormwater Pollution Prevention Plan* (SWPPP), which is a requirement of the NPDES GCSWP permit. The NPDES GCSWP permit is issued by the Washington State Department of Ecology for land-disturbing activities of an acre or more.

Staff recommends a condition of approval that prior to any land-disturbing activities, an electronic copy of Ecology's NPDES GCSWP permit, an electronic copy of the SWPPP, and the financial security for erosion and sediment control are to be submitted to the city.

Staff recommends a condition of approval that prior to any land-disturbing activities, which includes tree cutting, clearing and grading, and an approved set of final engineering plans, including the erosion prevention and sediment control measures is required.

FINDINGS: Staff finds that, as conditioned, adequate provisions for erosion control can or will be made.

Sanitary Sewage Disposal:

In accordance with CMC 17.19.040.C.2, sanitary sewers shall be provided and designed in accordance with the city's *Design Standards Manual* (CDSM).

Preliminary utility plans were submitted with the application (Exhibit 12). Revised preliminary utility plans (Exhibit 30) were submitted on January 31, 2023. The revisions are based on a discussion between the applicant's consultant and city staff.

There is an existing 8-inch gravity sanitary sewer main located in NE 28th Street in the center of the roadway. The revised preliminary utility plans (Exhibit 30) propose to construct an 8-inch gravity sanitary sewer main, from the existing 8-inch gravity sanitary sewer main in NE 28th Street and extended south from the intersection of future NE Noble Avenue and NE 28th Street. The conventional gravity is shown to transition from the 8-inch conventional gravity to a 2-inch sanitary force main at future Lot 3 and continue south to the southern property line of future Tract C. Based on the preliminary utility plans: Lots 1, 2, 3, and 34 will have conventional gravity sewer laterals and Lots 4 thru 33 will be served by a sanitary force main and grinder pump system due to the grade that slopes significantly away from NE 28th Street.

Staff recommends a condition of approval that prior to final engineering plan approval, the applicant should be required to submit the following:

- Calculations verifying that the sanitary sewer force main is adequately sized for solids and effluent to be pumped up to the highest point in the conventional gravity sewer main.
- Calculations verifying that the pressure sewer laterals, from the grinder pumps to the force main, are adequately sized for solids and effluent.
- Specifications and cutsheets for the proposed grinder pumps for approval.

Staff recommends a condition of approval that prior to final plat approval, the following note is to be added to the final plat providing the city with a utility easement for access, maintenance, replacement, repair, or extension over and under the sanitary sewer force main located in private road 'Tract C'.

Proposed Plat Note: The private road 'Tract C' consists of a utility easement for access, maintenance, replacement, repair, or extension over and under the sanitary sewer force main is conveyed to the city.

Demolition permits are issued by the city's Building Department. There is an existing house, workshop, and chicken coop on the proposed development site. The Department of Ecology submitted a SEPA

comment (Exhibit 28) regarding removal of potentially dangerous or hazardous materials. The Building Department requests documentation verifying the applicant has complied with State and County Health Department requirements for disposal of potentially dangerous or hazardous materials., prior to issuance of the demolition permit.

> **FINDINGS:** Staff finds that, as conditioned, adequate provisions for sanitary sewage disposal can or will be made.

[Existing wells, septic tanks, and septic drain fields]:
Per CMC 17.19.020.A.3 requires abandonment of existing wells, septic tanks, and septic drain fields. Any existing wells, septic tanks and drain fields should be properly decommissioned in accordance with State and County guidelines. If applicable, any water rights associated with the decommissioned well(s) shall be transferred to the City.

> Staff recommends a condition of approval that prior to final engineering plan approval, any existing wells and/or septic systems, which includes septic tanks and drain fields, are to be decommissioned and documentation should be provided to the city that said wells and/or septic systems have been properly decommissioned in accordance with State and County guidelines. Additionally, any water rights associated with a decommissioned well shall be transferred to the City.
>
> **FINDINGS:** Staff finds that, as conditioned, adequate provisions for decommissioning of existing wells and septic systems can or will be made.

3. Provisions have been made for road, utilities, street lighting, street trees, and other improvements that are consistent with the Six-Year Street Plan, the Camas Design Standards Manual and other State adopted standards and plans;

Roads:
Streets for the proposed development shall be designed in accordance with CMC 17.19.040.B Streets and the Camas Design Standards Manual (CDSM).

The proposed development is located on the south side of NE 28th Street, which is designated as a future 3-lane arterial, per the 2016 Road Designation Comprehensive Plan. Half-width frontage improvements have been constructed along those portions on the north side of NE 28th Street that abut previous developments. These frontage improvements have consisted of curb & gutter, sidewalks, planter strips, and increased paved surfaces. The proposed Monte Verde development will be conditioned to construct half-width road improvements, consisting of curb & gutter, sidewalk, planter strip, and increased paved surface on the southside of NE 28th Street along the frontage of the proposed development.

[Public Roads]:
Per 17.19.040.B.1 half-width street improvements along an existing roadway is required when it is determined to be appropriate by the city engineer. Half-width street improvements on NE 28th Street are required along the frontage of the proposed development.

Per CDSM *Table 2 – General Guidelines for Geometry of a Roadway*, 3-lane collectors / arterials are to consist of a 74-foot right-of-way width, a 46-foot-wide paved street width, 6-foot-wide sidewalk, 5.5 to 7.5-foot-wide planter strip, and no on-street parking permitted on either side.

The preliminary plans – Preliminary Plat North (Exhibit 12) and revised Preliminary Plat North (Exhibit 21) provides for the half-width street improvements along the frontage of the proposed development on NE 28th Street, providing for the total 74-foot right-of-way width, a total 47-feet of paved street width, a 6-foot-wide sidewalk, and an 8-foot-wide planter strip. With the exception of providing sufficient design information regarding the transitions to the east and west between unimproved street widths and

improved street widths, *the preliminary plans for half-width street improvements along the frontage of the proposed development meet the minimum street standards for a 3-lane arterial in accordance with the CDSM Table 2.*

Staff recommends a condition of approval that prior to final engineering plan approval, the street improvement plans, along NE 28th Street, are to provide sufficient design information for the tapers to the east and west of the frontage improvements to allow for vehicular transitions.

Per CDSM *Table 3 - Access Spacing Standards*, the access spacing on an arterial is a minimum of 660-feet and a maximum of 1,000-feet.

The preliminary plans (Exhibit 12) show the future centerline of proposed NE Noble Avenue, on the south side of NE 28th Street, aligned with the existing centerline of NE Hargrave Street on the north side of NE 28th Street. *The proposed location of the intersection of future NE Noble Avenue and existing NE Hargrave Street meets the minimum access spacing standard on an arterial.*

Per CMC 17.19.040.B.5 *Dedication of additional right-of-way may be required for a development when it is necessary to meet the minimum street width standards or when lack of such dedication would cause or contribute to an unsafe road or intersection.*

The existing right-of-way (ROW) width along the frontage of the proposed development is 67-feet. The preliminary plans, Preliminary Plat North (Exhibit 21) show an additional 7-feet of right-of-way dedication that will allow for the 3-lane arterial consisting of a total right-of-way width of 74-feet.

Staff recommends a condition of approval that prior to final engineering plan approval, the street improvement plans are to be submitted with the required 7-foot right-of-way dedication on NE 28th Street and street sections in accordance with CDSM Street Detail ST5 3 Lane Collector / Arterial. The applicant is required to construct a 37-foot full depth half-width street improvement, including a minimum of 23-feet of paved surface, curb & gutter, 8-foot planter strip, and 6-foot detached sidewalk.

[Interior Public Roads]:
Per CDSM Table 2 – General Guidelines for Geometry of a Roadway, a 2-lane local neighborhood road requires a 60-foot-wide right-of-way width, a 36-foot paved surface, 5-foot-wide detached sidewalks and 5 to 6-foot planter strips on both sides, and parking permitted on both sides.

The preliminary plans (Exhibit 12) propose to construct the future interior public roads NE Noble Road and NE 26th Street in accordance with CDSM Table 2 – General Guidelines for Geometry of a Roadway, 2-lane local neighborhood road with 60-foot right-of-way width.

Staff recommends a condition of approval that prior to final engineering plan approval the street improvement plans are to be submitted with the future local public roads constructed in accordance with CDSM Street Detail ST2 - 2 Lane Local (60' ROW).

Street naming is the responsibility of the Building Official. The street names, as shown on the preliminary plans (Exhibit 12) and revised preliminary plats (Exhibit 21), are preliminary street names that were provided by the developer. These names are subject to change during the final engineering plan approval process.

Per CMC 17.19.040.B.10.b.i Block lengths shall not exceed the maximum access spacing for the roadway class per the city's Design Standards Manual. The maximum block length for a local roadway classification is 600-feet. *The interior local block lengths do not exceed the maximum 600-foot block length standard for a local roadway classification*.

[Private Roads]:
Per CDSM Table 1 –Guidelines for Geometry of Private Roadway, access to four dwelling units or less requires a minimum tract width of 20-feet, a minimum 12-foot-wide paved surface, and no parking on either side. Additionally, per Note 3, dead-end roads in excess of 150-feet, as measured from the centerline of the adjacent road, require a dead-end turnaround.

The preliminary plans (Exhibit 12) and revised preliminary plats (Exhibit 21) propose private street 'Tract C' to provide access to future Lots 17, 18, and 19. Per the preliminary plans and revised plat, future private street 'Tract C' is in excess of 150-feet from the center of the cul-de-sac to the end of the private road and consists of a 26-foot-wide tract, with 20-feet of paved surface, and a 5-foot-wide sidewalk on the east side. The proposed private street section meets the Minimum Private Street Standard for access to four dwelling units or less.

Per CMC 17.19.040.A.2 Adequate and reasonable provisions are made for ownership, maintenance, and repair of all utilities and the proposed private streets.

Staff recommends a condition of approval that prior to final plat approval, a note is to be added to the plat stating the Tract C is to be owned and maintained by the property owners and/or homeowners association.

Proposed Plat Note: Tract C is to be owned and maintained by the property owners and/or homeowners association.

Per CMC 17.19.040.A.7 Access requirements for recycle service, garbage service, and emergency vehicles are to be provided.

Staff recommends a condition of approval that prior to final engineering plan approval, the street plans and the preliminary plat are to be revised to provide for a dead-end turnaround at future Lot 19 and Tract D. The applicant is to work with engineering and the Fire Marshal for an acceptable dead-end turnaround to accommodate emergency vehicles. Garbage and recycling containers for Lots 17, 18, and 19 are to be placed at the public right-of-way for pickup.

Per CMC 17.19.040.A.8 Provisions for adequate parking enforcement are recorded within a private covenant to ensure emergency vehicle access. These provisions shall be noted on the final plat (e.g., Towing service).

Staff recommends a condition of approval that prior to final engineering plan approval, the applicant should provide a design for a 'No Parking and Towing' sign for review and approval. Said sign is to include contact information for a private towing company, as the city does not provide towing on private roads, nor does the city enforce no parking on private roads.

Staff recommends a condition of approval that prior to final acceptance the applicant should be required to install the 'No Parking and Towing' signs.

Staff recommends a condition of approval that prior to final plat approval, a note is to be added to the plat stating the 'on-street parking is prohibited on both sides of Tract C'.

Proposed Plat Note: On-street parking is prohibited on both sides of Tract C.

<u>Utilities, Street Lighting, Street Trees, and Other Improvements</u>:

[Street lighting]:
LED Street lighting is to be designed and installed along all street frontages in accordance with the Camas Design Standards Manual (CDSM) – Standards for Street Lighting.

The locations for streetlights are to be coordinated with the locations of other site features, such as street trees, driveways, and other utilities. Per CDSM, private streets in excess of 100-feet in length and serving more than five dwelling units are required to have streetlights. Any streetlights proposed for private streets are required to be metered separately and are to be owned and maintained by the HOA.

Staff recommends a condition of approval that prior to final engineering plan approval all street light locations are to be shown on the engineering and landscape plans. Any streetlights provided for private streets are required to be metered separately and are to be owned and maintained by the HOA / homeowners.

- Additionally, prior to submittal of electrical plans to Clark Public Utilities, the preliminary electrical plans for streetlights, transformers, J-boxes, etc., which are prepared by others, are to be submitted to the city for review and approval.

[Street Trees and Landscaping]:
CMC 17.19.030 (F1) requires one 2-inch diameter street tree in the planter strip for each dwelling unit. The preliminary landscape plan shows each proposed lot is provided with at least one street tree; most are shown with two.

Staff recommends a condition of approval that prior to final acceptance all landscaping be installed or bonded for and all proposed street trees and landscaping are to be per the CDSM Landscape Standards Plant Materials list.

Staff recommends a condition of approval that prior to final engineering approval, the applicant is required to show proposed driveway locations for each lot to ensure that street trees are not impacted.

The street tree plantings and other landscaping as discussed throughout this report, should be included on the landscaping plans with final engineering plan submittal for the site improvements.

Staff recommends a condition of approval that requires the applicant to submit a final landscape plan for review and approval that is consistent with the landscaping standards in CMC Chapter 18.13, in addition to CMC Chapter 17.19.030.F.6, and include plantings from the City's approved plant list, prior to final engineering plan approval.

Landscaping adjacent to or within tracts should be installed prior to final acceptance per CMC 17.19.030.F.3. Street trees adjacent to lots should be installed prior to final occupancy or bonded for per CMC 17.19.030.F.4.

[Storm Facility Landscaping]:
CMC 17.19.030.F.6 requires that storm drainage facilities within 30-feet from any street or accessory structure to be landscaped with a 10-foot L2 buffer. The proposed storm facility located in Tract D should be landscaped with a L2 buffer at its lot lines and the landscaping should be shown on the final landscape plans.

Per the CDSM, the storm facilities are to be fenced with a maximum height 6-foot fence with top rail and a minimum 10-foot-wide double gate for access. The preliminary stormwater plans do not provide for fencing or gated access to the future stormwater facility located on Tract D.

Staff recommends a condition of approval that prior to final engineering plan approval the applicant is to submit revised stormwater facility plans that provide for a minimum 6-foot-high black vinyl coated chain link fence with top rail installed along the north property lines of Tract D where the tract abuts the future Lot 20. Additionally, the plans are to provide for a minimum 16-foot-wide double gate at the access road to the facility and a minimum 4-foot-wide man gate.

FINDING: Staff finds that, as conditioned, the applicant can or will make adequate provisions as conditioned for roads, utilities, street lighting, street trees, and other improvements that are consistent with the six-year street plan, the Camas Design Standard Manual and other state adopted standards and plans.

4. Provisions have been made for dedications, easements, and reservations;

The applicant is conditioned to dedicate the minimum 7-foot right-of-way width on NE 28th Street required for the proposed frontage improvements and the 60-foot right-of-way widths for the internal public roads required to serve the proposed development, as shown on the preliminary plats.

Proposed Tract C is identified as private road (driveways) on the preliminary plat. A public sanitary sewer main will be located within private road 'Tract C' and Tract C provides access for maintenance and inspections of the stormwater facility located in 'Tract D'; as such the applicant is required to provide a blanket access, inspection, and utility maintenance easement over the proposed private road 'Tract C' to the City of Camas at the time of final platting.

A homeowner's association (HOA) will be required and a copy of the CC&Rs for the development will need to be submitted to the City for review and approval. Specifically, the applicant will need to make provisions in the CC&Rs for ownership and maintenance of the storm drainage facilities located on Tracts B, D, and E; fencing, walls, landscaping, irrigation, private road 'Tract C', private gates and controller if applicable, and tracts or easements outside of the City's right-of-way. Further, all necessary easements and dedications should be noted on the final plat.

FINDING: Staff finds that, as conditioned, adequate provisions for dedications, easements and reservations can or will be made by the applicant at the time of final platting.

5. The design, shape, and orientation of the proposed lots are appropriate to the proposed use.

CMC 18.09.040 Table 1 Lot Dimensional Standards

The subject property is situated in the R-7.5 - Single-Family Residential zone which permits a minimum lot size of 6,000 square-feet, a maximum lot size of 12,000 square-feet, and an average lot size of 7,500 square-feet. The maximum density for the R-7.5 zone is 5.8 dwelling units per acre.

As per CMC 18.09.060.C, density transfer standards are permitted to be used when a land division proposed to set aside a tract for the protection of critical area, natural open space, natural open space network or network connector, or a recreational area is set aside within a proposed development. As shown on the proposed plat, Tracts "B" and "E", totaling approximately 0.93 acres in size, are set aside for recreational and open space tracts. The recreational area will include a play structure, pedestrian path, picnic areas, and landscaping.

As noted in section 18.09.060.D, where a recreational tract includes at least 0.5 acres of contiguous area, the city may provide additional or negotiated flexibility to the lot size, lot width, lot depth, building setback, or lot coverage standards under CMC 18.09.040, Table 1 and 2. The applicant is proposing lots that range in size from 5,821 - 8,265 square-feet, with an average lot size of 6,415 square-feet and a proposed density of 4.43 dwelling units per acre. The applicant is requesting additional flexibility per section 18.09.060.D to allow for a minimum lot width of 52.5 feet where typically the minimum lot width in the R-7.5 zone with a density transfer bonus would be 60-feet. As noted in the applicant's narrative, the proposal for the decreased lot width was presented to staff prior to the formal application submittal and staff supports the requested 52.5 foot-lot width, provided that the roads serving the site will provide parking on both sides of the street to offset potential parking issues. A condition of approval is warranted to ensure that parking will be provided on both sides of the streets serving the proposed development.

As previously stated, there is an existing single-family residential structure along with two outbuildings currently onsite that are proposed to be removed to facilitate the development as proposed.

CMC 18.09.040 Table 2 Setbacks

The proposed lots within the development range in size form 5,821 – 8,265 square-feet. Setbacks are based on lot size, therefore all of the lots must comply with the setbacks for the lots between 5,000 and 11,999 square-feet per CMC.09.060.D.

		Required	Proposed
Setbacks			
	Front Yard	20 feet	20 feet
	Side Yard	5 feet	5 feet
	Rear Yard	25 feet	25 feet
	Garage	25 feet	25 feet
	Side Yard Flanking a Street	10 feet	10 feet
Maximum Density		5.8	4.5
Maximum Lot Coverage		40%	40%

As proposed, all lots meet the setback requirements for lots between 5,000 – 11,999 square feet in size.

6. The subdivision complies with the relevant requirements of the Camas land development and zoning codes, and all other relevant local regulations;

CMC 18.13.045 and CMC 18.13.051 Tree Density/Tree Survey:

A tree survey included in the preliminary plans for the proposed project indicates there were approximately 150 trees within the survey area, 18 of those trees were offsite, 132 are located onsite. A minimum of 20 tree units (TU) per net developable acre is required for residential developments per *CMC 18.13.051(A) Table 1 – Required Tree Density* and should be incorporated into the overall landscape plan. The net acreage of the site is 7.67 acres, thus requiring 153 tree units. A total of 129 trees are proposed to be removed to facilitate the project as recommended due to the tree health and/or impacts to site grading. Three onsite trees that provide 26 tree units will be retained. The applicant is proposing to plant a total of 157 trees, providing an additional 151 tree units. The total tree units provided for the project as proposed would be 177, which exceeds the minimum requirement. The tree density is met by providing the required street trees, and in plantings within the proposed tract areas. Staff finds the proposed landscape plan meets the minimum tree density.

As per CMC 18.13, the applicant is required to submit a final landscape, tree, and vegetation plan to the City for review and approval prior to engineering plan approval. Plants utilized will need to be per the approved City's Tree list and per the Camas Design Manual planting specifications and landscape notes. For plants not on the approved City list, a characteristic card should be submitted to the City for review and approval. Irrigation and landscaping should be installed or bonded for prior to final acceptance per CMC 17.19.030.F.3.

CMC Section 18.17.060 Retaining Walls:

The proposed site plan shows a 2-foot retaining wall located in the southeast corner of the site, along the side property line of proposed lot 19 and another 2-foot retaining wall that runs along the easterly

property line of lot 1 as well as the northerly side property line of proposed lot 2. CMC 18.17.060 allows for retaining walls up to 6 feet unless approved by the Director. The proposed 2-foot-high retaining walls are within the permitted height requirement for retaining walls.

CMC Chapter 18.34 Airport Overlay Zoning:
The subject property is located within the Airport Overlay Zone C. Staff recommends a condition of approval that an avigation easement is required to be recorded on the title that provides notice that the property is located within an air traffic area per CMC 18.34.020.B and included as a note on the final plat. Prior to building permit submittal, the applicant should consider construction techniques that would decrease the noise associated with the airport per CMC 18.34.080.A and conditioned as such.

7. Appropriate provisions are made to address all impacts identified by the transportation impact study;

[Traffic Impact Analysis]:
Per CMC 18.18.040.E a Transportation Impact Analysis (TIS/TIA) may be required when a development will generate 200 or greater average daily trips (ADTs). The proposed development will generate approximately 310 ADTs, which triggered the requirement for a TIA.

A transportation impact analysis (TIA) (Exhibit 6) dated July 13, 2022, was prepared by Lancaster Mobley for the 8.84 acres site for the proposed development of up to 34 single-family-homes. The report used the trip generation rates from the *ITE Trip Generation Manual* (11th Edition, 2021), ITE code #210 Single-Family Detached Housing, to determine the number of trips generated per weekday. The trip generation calculations show that the proposed project is estimated to have a net increase in trip generation of 23 AM Peak Hour trips (6 In / 17 Out), 31 PM Peak Hour trips (19 In / 12 Out), and a total of 310 average daily trips (ADTs).

Sight Distance Analysis
Per the TIA, the intersection sight distance was measured at the proposed access road onto NE 28th Street and evaluated in accordance with the standards established in '*A Policy on Geometric Design of Highways and Streets*'.

The posted speed limit on NE 28th Street is signed 40 MPH in both directions between NE 232 Avenue and NE Ingle Road. NE 28th Street is an existing three-lane cross-section along the sight frontage of the proposed development. Based on these factors:

- The recommended intersection sight distance is 445-feet to the east for left turning vehicles; and 385-feet to the west for right turning vehicles.
- The required stopping sight distance is 440-feet for vehicles approaching from the east and 420-feet for vehicles approaching from the west.
- Available sight distances at the proposed access intersection location were measured to exceed 450-feet in either direction provided site obstructing foliage along the edge of the proposed frontage are removed with the roadway widening.

Based on the sight distance analysis, adequate sight distances are available at the proposed site access intersection of future NE Noble Avenue and NE 28th Street to ensure safe and efficient operation along NE 28th Street. Therefore, no mitigation for sight distance is necessary or recommended. ***Staff concurs with the recommendation.***

Staff recommends a condition of approval that prior to final engineering plan approval the corner sight-distance triangles / site vision clearance triangles, at to the intersection of the future access road and NE 28th Street, are to be shown on the final engineering plans and landscaping plans.

The conclusions noted in the Transportation Impact Analysis (Exhibit 6) on page 25, are as follows:

CONCLUSIONS

- No significant trends or crash patterns were identified at any of the study intersections. Accordingly, no safety mitigation is recommended per the crash data analysis. ***Staff Concurs.***
- Provided any obstructing on-site foliage near the proposed access location is removed following redevelopment of the site, adequate intersection sight distances to the east and west of the proposed site access can be made available to ensure safe and efficient operation along NE 28th Street. No other mitigation is necessary or recommended with regard to sight distance at the proposed access intersection. ***Staff Concurs.***
- Left-turn lane warrants are not projected to be met in the eastbound and westbound directions of travel at the intersection of NE 232nd Avenue at NE 28th Street. The intersection of N Hargrave Street at NE 28th Street is currently served by a center two-way left-turn lane on the east and west intersection legs. Accordingly, no new left-turn lanes are necessary or recommended at any of the study intersections. ***Staff Concurs.***
- All-way stop warrants and traffic signal warrants at the study intersections are not projected to be met at the study intersections by the 2024 buildout year of the site. Accordingly, installation of all-way stop-controls or traffic signals at the study intersections are not necessary or recommended as part of the Monte Verde subdivision application. ***Staff Concurs.***

  Additionally, a traffic signal is under construction at the intersection of NE Ingle Road / NE 28th Street / NE Goodwin Road, which was a condition of the Green Mountain developments. The applicant was not required to study this intersection based on the limited amount of PM Peak Hour Trips generated by the proposed development.

  Exhibit 27 is a public comment that was received regarding completion of frontage improvements along NE 28th Street and NE Goodwin Road to the Lacamas Lake Trailhead parking lot. These improvements are in the city's capital improvements plan but are not currently funded. Based on code requirements and proportionality the applicant is not required to install these improvements.
- The proposed site access will be located opposite of N Hargrave Street, with nearest intersection roadways along NE 28th Street being N Juniper Street to the east (approximately 700-feet away) and N Boxwood Street to the west (approximately 650-feet away). Therefore, the proposed site access will meet the City of Camas' access spacing standards, thereby no access related mitigation is necessary. ***Staff Concurs.***
- All study intersections are currently operating acceptably per City of Camas and Clark County standards and are projected to continue operating acceptably through the 2024 buildout year of the site. Accordingly, no operational mitigation is necessary or recommended at the study intersections. ***Staff Concurs.***
- All applicable turning movements at the study intersections have adequate storage space to accommodate projected 95th percentile queue, where queues are not expected to extend back to adjacent public intersections. Accordingly, no operational mitigation is necessary or recommended at the study intersections. ***Staff Concurs.***

During the pre-application meeting the applicant was informed that the TIA was to evaluate the number of PM Peak Hour trips through City of Vancouver identified proportionate share intersections in order to help fund an intersection improvement project. The specified intersection at that time was SE 192nd

Avenue at NE 13th Street. The original TIA (Exhibit 6) estimated that approximately 20 percent or 6 PM Peak Hour trips would impact this intersection. Therefore, the proportionate share fee will be as follows:

Proportionate Share Project Name	Fee Rate	Number of Trips	Proportionate Share Cost
SE 192nd Ave & NE 13th Street	$400 per PM peak hour trip	6	$2,400.00
Total Proportionate Share Cost			**$2,400.00**

The original TIA was submitted to City of Vancouver Streets & Transportation and Clark County Concurrency Engineer for a concurrency review. The city did not receive any comments from Clark County.

However, comments were provided by the City of Vancouver (Exhibit 15) asking that the applicant provide an addendum to the original TIA showing the total number of new PM Peak Hour trips through the proportionate share intersections of SE 192nd Avenue at SE 34th Street and SE 192nd Avenue at WB SR-14 ramps; and to calculate the expected fees. The addendum to the original TIA (Exhibit 16), dated September 13, 2022, was prepared and submitted by Lancaster Mobley, with the number of PM Peak Hour trips to the following proportionate share intersections:

Proportionate Share Project Name	Fee Rate	Number of Trips	Proportionate Share Cost
SE 192nd Ave & SE 34th St	$150 per PM peak hour trip	5	$750.00
SE 192nd Ave & WB SR-14 ramps	$2,000 per PM peak hour trip	5	$10,000.00
Total Proportionate Share Cost			**$10,750.00**

Based on the original TIA and the addendum to the TIA, the proportionate share amounts for intersection improvement projects in the City of Vancouver are as follows:

Proportionate Share Project Name	Fee Rate	Number of Trips	Proportionate Share Cost
SE 192nd Ave & NE 13th Street	$400 per PM peak hour trip	6	$2,400.00

SE 192nd Ave & SE 34th St	$150 per PM peak hour trip	5	$750.00
SE 192nd Ave & WB SR-14 ramps	$2,000 per PM peak hour trip	5	$10,000.00
Total Proportionate Share Cost			**$13,150.00**

Staff recommends a condition of approval that prior to final acceptance the applicant is required to pay the proportionate share amount of $13,500.00 to the City of Vancouver. The applicant is to provide Camas staff with documentation of payment of said proportionate share amount.

FINDING: Staff finds that this development, as conditioned, can or will meet any impacts identified by the transportation impact study.

8. Appropriate provisions for maintenance of commonly owned private facilities have been made;

Per CMC 14.02.090.A.1 Stormwater facilities, located within residential subdivisions and short plats, shall be the maintenance responsibility of the applicant for two-years after the date of final acceptance. This maintenance period shall run concurrent with the city's required two-year warranty period that begins at final acceptance.

Per CMC 14.02090.C, the City shall have the right-of-entry and authority to inspect of the stormwater facilities for compliance with this chapter. A note is to be added to the final plat granted the city right-of-entry for inspection purposes. A condition of approval is warranted.

Per CMC 17.19.040.A.2 the HOA and/or homeowners are responsible for the ownership and maintenance of the private streets. A note is to be added to the final plat stating that private Tract C is to be owned and maintained by the individual property owners and/or homeowners association (HOA). A condition of approval is warranted.

FINDING: Staff finds that, as conditioned, this development can or will meet the appropriate provisions for maintenance of private facilities.

9. Appropriate provisions in accordance with RCW 58.17.110, are made for (a) the public health, safety, and general welfare, and (b)The public use and interest will be served by the platting of such subdivision and dedication.

FINDING: As discussed throughout this report, staff finds that the subdivision can be conditioned to provide the appropriate provisions for public health, safety, general welfare, and assure the public interest is served.

10. The application and plans shall be consistent with the applicable regulations of the adopted comprehensive plans, shoreline master plan, state, and local environmental acts, and ordinances in accordance with RCW36.70B.030.

FINDINGS: Staff concurs that the proposed subdivision can or will meet the requirements of RCW 58.17 and other applicable state and local laws that are in at the time of final platting. The final plat will be processed in accordance with the requirements of CMC 17.21.060.

PUBLIC COMMENTS

As of the writing of this staff report, staff received written public comments from the Department of Ecology (Exhibit 28) and a resident (Exhibit 27) regarding traffic, stormwater, demolition of existing structures, and setbacks. These comments are addressed throughout the staff report.

CONCLUSION

Based on the above findings and discussion provided in this staff report, staff concludes that Monte Verde Subdivision (SUB22-05) should be approved because it does comply with the applicable standards if all the conditions of approval are met.

RECOMMENDATION

Staff recommends APPROVAL of the preliminary plat of Monte Verde Subdivision (SUB22-05) subject to the following conditions of approval:

CONDITIONS OF APPROVAL

Standard Conditions:

1. Standards Manual (CDSM) and CMC 17.19.040.
2. The engineering site plans shall be prepared by a licensed civil engineer in Washington State and submitted to the City's Community Development (CDEV) Engineering Department for review and approval. Submittal requirements for first review are as follows:
    a. Submit four (4) full size sets and one (1) half size set of plans.
    b. Submit one (1) electronic version of the final (TIR) stormwater report. Do not submit any hard copies of the Final TIR.
    c. Submit a stamped preliminary engineer's estimate.
3. Community Development (CDEV) Engineering shall collect a total 3% plan review and construction inspection (PR&CI) fee for the proposed development.
    a. A preliminary construction estimate shall be submitted to the CDEV Engineering Dept prior to or with submittal of plans for first review.
    b. Payment of the 1% plan review (PR) fee shall be due prior to the start of the plan review process. The PR fees will be provided by the engineering staff.
    c. Payment of the 2% construction inspection (CI) fee shall be due prior to construction plan approval and release of approved plans to the applicant's consultant. The CI fees due will be provided by the engineering staff.
    d. Under no circumstances will the applicant be allowed to begin construction prior to construction plan approval.
4. Installation of public improvements shall be in accordance with CMC 17.21 Procedures for Public Improvements.
5. If applicable, existing wells, septic tank, and septic drain fields shall be decommissioned in accordance with state and county guidelines, per CMC 17.19.020.
6. Any entrance structures or signs proposed or required for this project will be reviewed and approved by the city.
    a. All designs will be in accordance with applicable City codes.

b. The maintenance of the entrance structure will be the responsibility of the homeowners.

7. The applicant will be responsible for ensuring that private utilities; underground power, telephone, gas, CATV, streetlights, and associated appurtenances are installed.
8. A 6-foot private utility easement (PUE) shall be located outside of the right-of-way on public streets and outside of the tracts on private streets.
9. A draft street lighting plan shall be submitted to development engineering for review prior to final plan submittal to Clark Public Utility.
10. The applicant will be required to purchase all permanent traffic control signs, street name signs, street lighting, traffic control markings, and gate and controller for the improved subdivision.
11. Prior to any land-disturbing activities of an acre or more, the applicant shall have approved final engineering plans and shall submit a copy of the *NPDES General Construction Stormwater Permit* (GCSWP), which is issued by the Washington State Dept. of Ecology, and the *Stormwater Pollution Prevention Plan* (SWPPP), which is required as a component of the NPDES GCSWP permit.
12. Prior to commencing any land-disturbing activities of an acre or more, the applicant shall submit an Erosion Control Bond (ESC) in the amount of 200% of the cost for erosion control measures, per CMC 17.21.030.B and CMC 14.06.200.
13. In the event any item of archaeological interest is uncovered during a permitted ground disturbing action or activity, all ground disturbing activities shall immediately cease, and the applicant shall notify the City and the Department of Archaeology and Historic Preservation (DAHP).
14. Prior to final acceptance, the applicant shall remove all temporary erosion prevention and sediment control measures from the site at completion of all site improvements, which includes stabilization of all disturbed soil, prior to issuance of Final Acceptance from CDEV Engineering.
15. Prior to final acceptance, final as-built construction drawing submittals shall meet the requirements of the Camas Design Standards Manual (CDSM).
    a. As-builts are to be submitted as PDFs and in either AutoCad or Carlson formats. The cover sheet for the as-builts is to include the originally approved and signed cover sheet.
16. Prior to final acceptance the 2-year warranty maintenance bond is to be submitted in accordance with CMC 17.21.070.A Upon final acceptance of the development improvements a two-year (2) warranty bond commences.
17. Per CMC 17.21.070.E A letter of final acceptance will be issued once all items listed in 17.21.070.B-C.
18. Final plat submittals shall meet the requirements of the CMC 17.11.060, CMC 17.01.050, and the Camas Design Standards Manual.
19. A homeowner's association (HOA) will be required and a copy of the CC&Rs for the development will need to be submitted to the City for review and approval. Specifically, the applicant will need to make provisions in the CC&Rs for ownership and maintenance of the private storm drainage systems, open spaces, retaining walls, fencing, walls, landscaping, irrigation, private roads, and tracts or easements outside of the City's right-of-way if applicable. Further, all necessary easements and dedications should be noted on the final plat.
20. Accessory dwelling units shall not be precluded from in the CC&R's.
21. The applicant shall take appropriate measures to ensure landscaping success for a minimum of three years after issuance of Certificate of Occupancy. If plantings fail to survive, the property owner shall promptly replace them.

22. Automatic fire sprinklers installed per NFPA 13D or 13R shall be required in all new residential structures.
23. Provisions for parking enforcement on private Tracts/access driveways, acceptable to the Fire Marshal, shall be included in the CC&Rs at the time of final platting.
24. Per CMC 17.21.060.H Permits for one sales office and/or one model home per plat or phase may be issued after the final plat is recorded, and prior to final acceptance. Building permit applications, for any other residential buildings, will not be accepted until after final acceptance.

Special Conditions of Approval:

Planning:

25. If potential artifacts are discovered during construction, work must immediately cease, and both the State Department of Archaeological and Historic Preservation and the City shall be notified.
26. The recommendations provided by the Department of Ecology shall be complied with.
27. The recommendations in the geotechnical report shall be followed.
28. If potential artifacts are discovered during construction, work must immediately cease, and both the State Department of Archaeological and Historic Preservation and the City shall be notified.
29. The Mitigation Plan contained in the Critical Areas Report & Oregon White Oak Mitigation Plan prepared by Ash Eco Solutions, LLC shall be followed.
30. The installation of temporary construction fencing prior to construction that clearly marks in the field critical area buffers (i.e., Oregon White Oak) and fencing should remain throughout permitted construction activities.
31. The trees identified for preservation shall comply with the tree protection recommendations contained in the Critical Areas report. Any required revisions to the site plan, such as building setbacks and/or site improvements, will require an updated Tree Survey for review and approval prior to Engineering Plan approval and will be conditioned as such.
32. Exterior retaining walls facing the public right-of-way shall be "set back a distance of one foot for every foot in height of a fence in excess of allowed height" per CMC 18.17.060.D. and provide additional landscaping consisting of groundcover, shrubs, and trees.
33. The applicant should consider construction techniques that would decrease the noise associated with the airport per CMC 18.34.080.A

<u>Prior to Final Engineering Plan Approval:</u>

Planning:

34. A detailed construction drawing per CMC 16.53.050.E.3 is to be submitted to the City for review and approval Retaining walls shall comply with CMC 18.17.060.D.
35. A final landscape, tree, and vegetation plan consistent with the landscaping standards in CMC Chapter 18.13 should be submitted to the City for review and approval prior to engineering plan approval. Plants utilized will need to be per the approved City's Plant list and per the Camas Design Manual planting specifications and landscape notes. For plants not on the approved City list, a characteristic card should be submitted to the City for review and approval. Irrigation and landscaping should be installed or bonded for prior to final acceptance per CMC 17.19.030.F.3.

Engineering*:*

Water:

36. The applicant shall submit revised utility plans that show an 8-inch water main from NE 28th Street, through the entire length of future "NE/NW Noble Avenue" and south to the end of the cul-de-sac, as well as an 8-inch water main in the east and west dead-end leg of in future NE 26th Street.
37. The applicant shall submit revised water utility plans showing the locations of all proposed irrigation services and the size of each irrigation meter.

Storm Drainage:

38. The applicant shall submit a complete set of stormwater plans for review and approval, per MR #1 of the TIR.
39. The stormwater plans are to be revised with any and all proposed treatment and/or detention structures located outside of the public right-of-way.
40. The applicant shall submit a final stormwater report (TIR) that addresses the on-site conveyance systems analysis and design as well as an updated infiltration trench design and locations.
41. The final stormwater (TIR) report is to be revised and submitted with the current *June 2022 City of Camas Stormwater Sewer System O&M Manual*.
42. The applicant shall submit a complete set of stormwater plans, including the design for the conveyance system in accordance with the Camas Design Standards Manual (CDSM). Additionally, the underground infiltration system on Tract B should be located such that it is not situated below the proposed playground area.
43. The applicant shall submit a revised stormwater plan for Lots 1-34. Said plans should ensure that adjacent parcels and downstream drainageways and/or adjacent properties are not negatively affected by roof drain downspouts and surface water runoff, per Camas Municipal Code (CMC) 14.02 and 17.19.040.C.

Erosion Control:

44. The applicant shall be required to submit a complete set of Erosion Sediment Control (ESC) plans, as a part of the site improvement plans for review and approval.

Sanitary Sewer Disposal:

45. The applicant shall be required to submit the following:
    a. Calculations verifying that the sanitary sewer force main is adequately sized for solids and effluent to be pumped up to the highest point in the conventional gravity sewer main.
    b. Calculations verifying that the pressure sewer laterals, from the grinder pumps to the force main, are adequately sized for solids and effluent.
    c. Specifications and cutsheets for the proposed grinder pumps for approval.

Existing wells, septic tanks, and septic drain fields:

46. Any existing wells, or septic systems are to be decommissioned and documentation shall be provided to the city that said wells and/or septic systems have been properly decommissioned in accordance with State and County guidelines. Additionally, any water rights associated with a decommissioned well shall be transferred to the City.

Roads:

[Public Roads]

47. The street improvement plans, along NE 28th Street, are to provide sufficient design information for the tapers to the east and west of the frontage improvements to allow for vehicular transitions.

48. The street improvement plans are to be submitted with the required 7-foot right-of-way dedication on NE 28th Street and street sections in accordance with CDSM Street Detail ST5 3 Lane Collector / Arterial. The applicant is required to construct a 37-foot full depth half-width street improvement, including a minimum of 23-feet of paved surface, curb & gutter, 8-foot planter strip, and 6-foot detached sidewalk.

[Interior Public Roads]:

50. The street improvement plans are to be submitted with the future local public roads constructed in accordance with CDSM Street Detail ST2 - 2 Lane Local (60' ROW).

[Private Roads]:

51. The street plans and the preliminary plat are to be revised to provide for a dead-end turnaround at future Lot 19 and Tract D. The applicant is to work with engineering and the Fire Marshal for an acceptable dead-end turnaround to accommodate emergency vehicles. Garbage and recycling containers for Lots 17, 18, and 19 are to be placed at the right-of-way for pickup.

52. The applicant should provide a design for a 'No Parking and Towing' sign for review and approval. Said sign is to include contact information for a private towing company, as the city does not provide towing on private roads, nor does the city enforce no parking on private roads.

[Street lighting]

53. All street light locations are to be shown on the engineering and landscape plans. Any streetlights provided for private streets are required to be metered separately and are to be owned and maintained by the HOA / homeowners.

54. Prior to submittal of electrical plans to Clark Public Utilities, the preliminary electrical plans for streetlights, transformers, J-boxes, etc., which are prepared by others, are to be submitted to the city for review and approval.

[Street trees and Landscaping]:

55. The applicant is to show proposed driveway locations for each lot to ensure that street trees are not impacted.

56. The applicant is required to submit to the City for review and approval a final landscape plan consistent with the landscaping standards in CMC Chapter 18.13, in addition to CMC Chapter 17.19.030.F.6, and include plantings from the City's approved plant list.

[Storm Facility Landscaping]:

57. The applicant is to submit revised stormwater facility plans that provide for a minimum 6-foot-high black vinyl coated chain link fence with top rail installed along the north property lines of Tract D where the tract abuts the future Lot 20. Additionally, the plans are to provide for a minimum 16-foot-wide double gate at the access road to the facility and a minimum 4-foot-wide man gate.

Traffic Impact Analysis:

58. The corner sight-distance triangles / site vision clearance triangles, at to the intersection of the future access road and NE 28th Street, are to be shown on the final engineering plans and landscaping plans.

Prior to Land-Disturbing Activities:

55. Prior to any land-disturbing activities, an electronic copy of Ecology's NPDES GCSWP permit, an electronic copy of the SWPPP, and the financial security for erosion and sediment control are to be submitted to the city.

59. Prior to any land-disturbing activities, which includes tree cutting, clearing and grading, and an approved set of final engineering plans, including erosion prevention and sediment control measures is required.

Prior to Final Plat Approval:

Planning:

60. The applicant shall post a mitigation bond in an amount deemed acceptable by the city to ensure the oak and wetland mitigation is fully functional per CMC 16.51.250.

61. An avigation easement is required to be recorded on the title that provides notice that the property is located within an air traffic area per CMC 18.34.020.B and included as a note on the final plat.

Engineering:

62. The following notes are to be added to the final plat.

    1. Stormwater facilities located on Tracts B, D, and E are to be owned and maintained by the homeowner's association / homeowners at the completion of the 2-year warranty period, which expires 2-years after issuance of final acceptance.

    2. Right-of-entry shall be granted to the city for inspection purposes of the stormwater facilities located on Tracts B, D, and E.

62. The following note is to be added to the final plat providing to the city a utility easement for access, maintenance, replacement, repair, or extension, over and under the sanitary sewer force main located in private road 'Tract C'.

63. A note is to be added to the plat stating the Tract C is to be owned and maintained by the property owners and/or homeowners association.

64. A note is to be added to the plat stating the 'on-street parking is prohibited on both sides of Tract C'.

Prior to Final Acceptance:

Engineering:

65. The applicant is required to provide a design for a 'No Parking and Towing' sign for review and approval.
    a. Said sign is to include contact information for a towing company, as the city does not provide towing on private roads, nor does the city enforce no parking on private roads.
    b. The applicant shall be required to install the 'No Parking and Towing' sings prior to final acceptance.

66. The applicant shall remove all temporary erosion prevention and sediment control measures from the site at completion of all site improvements, which includes stabilization of all disturbed soil, prior to issuance of Final Acceptance from CDEV Engineering.

67. Final as-built construction drawing submittals shall meet the requirements of the Camas Design Standards Manual (CDSM).
    a. As-builts are to be submitted as PDFs and in either AutoCad or Carlson formats.
    b. The cover sheet for the as-builts is to include the originally approved and signed cover sheet.

68. The 2-year warranty maintenance bond is to be submitted in accordance with CMC 17.21.070.A upon final acceptance of the development improvements a two-year (2) warranty bond commences.

69. The applicant shall be required to install the 'No Parking and Towing' signs.

70. Prior to final acceptance, the applicant is required to pay the proportionate share amount of $13,500.00 to the City of Vancouver. The applicant is to provide Camas staff with documentation of payment of said proportionate share amount.

Prior to Final Occupancy:

Planning:

71. Street trees adjacent to lots should be installed prior to final occupancy per CMC 17.19.030.F.4.

Proposed Plat Notes

1. A homeowner's association (HOA) will be required for this development. Copies of the C.C. & Rs shall be submitted and on file with the City of Camas.
2. Building permits will not be issued by the Building Department until all subdivision improvements are completed and Final Acceptance has been issued by the City.
3. Maximum building lot coverage for this subdivision is 40%.
4. The lots in this subdivision are subject to traffic impact fees, school impact fees, fire impact fees and park/open space impact fees. Each new dwelling will be subject to the payment of appropriate impact fees at the time of building permit issuance.
5. Tree topping is not permitted within this development, nor removal of more than 20 percent of a tree's canopy. Trees that are determined to be hazardous by a licensed arborist may be removed after approval by the City. Required street trees shall be promptly replaced with an approved species.
6. In the event any item of archaeological interest is uncovered during a permitted ground disturbing action or activity, all ground disturbing activities shall immediately cease, and the applicant shall notify the City and the Department of Archaeology and Historic Preservation (DAHP).
7. Stormwater facilities located on Tracts B, D, and E are to be owned and maintained by the homeowner's association / homeowners at the completion of the 2-year warranty period, which expires 2-years after issuance of final acceptance.
8. Right-of-entry shall be granted to the city for inspection purposes of the stormwater facilities located on Tracts B, D, and E.
9. The private road 'Tract C' consists of a utility easement for access, maintenance, replacement, repair, or extension, over and under the sanitary sewer force main is to be conveyed to the city.
10. Tract C is to be owned and maintained by the property owners and/or homeowners association.
11. On-street parking is prohibited on both sides of Tract C.

Community Development Department | Planning
616 NE Fourth Avenue | Camas, WA 98607
(360) 817-1568
communitydevelopment@cityofcamas.us

General Application Form Monte Verde Subdivision **Case Number:** SUB22-05

Applicant Information

Applicant/Contact:: Pacific Lifestyle Homes - Ryan Stygar *Phone:* (360) 304-9901

Lisa Harker - PLS Engineering
lisa@plsengineering.com
360-944-6519

Address: 11815 NE 99th St Suite 1200
Street Address *E-mail Address*

Vancouver WA 98682
City *State* *ZIP Code*

Property Information

Property Address: 22205 NE 28th Street 173184000
Street Address *County Assessor # / Parcel #*

Camas WA 98607
City *State* *ZIP Code*

Zoning District R-7.5 Site Size 8.84 AC

Description of Project

Brief description:
35 single-family residential lots

Are you requesting a consolidated review per CMC 18.55.020(B)? YES ☐ NO ☐

Permits Requested: ☐ Type I ☐ Type II ☒ Type III ☐ Type IV, BOA, Other

Property Owner or Contract Purchaser

Owner's Name: Southern, Dwight *Phone:* ( )
Last *First*

22205 NE 28th Street
Street Address *Apartment/Unit #*

E mail Address: Vancouver WA 98607
City *State* *Zip*

Signature

I authorize the applicant to make this application. Further, I grant permission for city staff to conduct site inspections of the property.

Signature: DocuSigned by: DC05C7ABE76340A... **Date:** 7/13/2022

Note: If multiple property owners are party to the application, an additional application form must be signed by each owner. If it is impractical to obtain a property owner signature, then a letter of authorization from the owner is required.

Date Submitted: 8/11/22 Pre-Application Date:

$17,751 Receipt #701338
8/11/22 by AB

Staff: Related Cases # ARCH22-12, CA22-13, SEPA22-17

☐ **Electronic Copy Submitted**

Validation of Fees

Application Checklist and Fees [updated on January 1, 2022]

◊ Annexation	$863 - 10% petition; $3,669 - 60% petition	001-00-345-890-00		$	
◊ Appeal Fee		001-00-345-810-00	$399.00	$	
◊ Archaeological Review		001-00-345-810-00	$137.00	$	137.00 ARCH22-13
◊ Binding Site Plan	$1,879 + $24 per unit	001-00-345-810-00		$	
◊ Boundary Line Adjustment		001-00-345-810-00	$103.00	$	
◊ Comprehensive Plan Amendment		001-00-345-810-00	$5,826.00	$	
◊ Conditional Use Permit					
Residential	$3,417 + $105 per unit	001-00-345-810-00		$	
Non-Residential		001-00-345-810-00	$4,328.00	$	
◊ Continuance of Public Hearing		001-00-345-810-00	$524.00	$	
◊ Critical or Sensitive Areas (fee per type)		001-00-345-810-00	$775.00	$	775.00 CA22-13
(wetlands, steep slopes or potentially unstable soils, streams and watercourses, vegetation removal, wildlife habitat)					
◊ Design Review					
Minor		001-00-345-810-00	$433.00	$	
Committee		001-00-345-810-00	$2,375.00	$	
◊ Development Agreement	$877 first hearing; $530 ea. add'l hearing/continuance	001-00-345-810-00		$	
◊ Engineering Department Review - *Fees Collected at Time of Engineering Plan Approval*					
Construction Plan Review & Inspection	*(3% of approved estimated construction costs)*				
Modification to Approved Construction Plan Review	*(Fee shown for information only)*		$420.00		
Single Family Residence (SFR) - Stormwater Plan Review	*(Fee shown for information only)*		$208.00		
Gates/Barrier on Private Street Plan Review	*(Fee shown for information only)*		$1,041.00		
◊ Fire Department Review					
Short Plat or other Development Construction Plan Review & Insp.		115-09-345-830-10	$284.00	$	
Subdivision or PRD Construction Plan Review & Inspection		115-09-345-830-10	$354.00	$	354.00
Commercial Construction Plan Review & Inspection		115-09-345-830-10	$424.00	$	
◊ Home Occupation					
Minor - Notification (No fee)			$0.00		
Major		001-00-321-900-00	$69.00	$	
◊ LI/BP Development	$4,328 + $41.00 per 1000 sf of GFA	001-00-345-810-00		$	
◊ Minor Modifications to approved development		001-00-345-810-00	$346.00	$	
◊ Planned Residential Development	$35 per unit + subdivision fees	001-00-345-810-00		$	
◊ Plat, Preliminary					
Short Plat	4 lots or less: $1,936 per lot	001-00-345-810-00		$	
Short Plat	5 lots or more: $7,1755 + $250 per lot	001-00-345-810-00		$	
Subdivision	$7,175 + $250 per lot 34 lots	001-00-345-810-00		$	15,675.00 SUB22-05
◊ Plat, Final:					
Short Plat		001-00-345-810-00	$200.00	$	
Subdivision		001-00-345-810-00	$2,375.00	$	
◊ Plat Modification/Alteration		001-00-345-810-00	$1,196.00	$	
◊ Pre-Application (Type III or IV Permits)					
No fee for Type I or II					
General		001-00-345-810-00	$354.00	$	
Subdivision (Type III or IV)		001-00-345-810-00	$911.00	$	
◊ SEPA		001-00-345-890-00	$810.00	$	810.00 SEPA22-17
◊ Shoreline Permit		001-00-345-890-00	$1,196.00	$	
◊ Sign Permit					
General Sign Permit	(Exempt if building permit is required)	001.00.322.400.00	$41.00	$	
Master Sign Permit		001.00.322.400.00	$126.00	$	
◊ Site Plan Review					
Residential	$1,151 + $34 per unit	001-00-345-810-00		$	
Non-Residential	$2,876 + $68 per 1000 sf of GFA	001-00-345-810-00		$	
Mixed Residential/Non Residential	(see below)	001-00-345-810-00		$	
	$4,055 + $34 per res unit + $68 per 1000 sf of GFA				
◊ Temporary Use Permit		001-00-321-990-00	$80.00	$	
◊ Variance (Minor)		001-00-345-810-00	$695.00	$	
◊ Variance (Major)		001-00-345-810-00	$1,295.00	$	
◊ Zone Change (single tract)		001-00-345-810-00	$3,345.00	$	

Adopted by RES 1023 AUG 2005; Revised by RES 1113 SEPT 2007; Revised by RES 1163 OCT 2009; Revised by RES 1204 NOV 2010; Revised by RES 15-001 JAN 2015; Revised by RES 15-007 MAY 2015; Revised by RES 15-018 DEC 2015; Revised by RES 16-019 NOV 2016; Revised by RES 17-015 NOV 2017; Revised by RES 18-003 APRIL 2018; Revised by RES 18-013 NOV 2018; Revised by RES 19-018 DEC 2019 Revised by RES20-014 DEC 2020

Fees reviewed & approved by Planner: LH (*Initial*) 8/8/2022 (*Date*)

For office use only

Total Fees Due: $ 17,751.00

PLS ENGINEERING

PROJECT NARRATIVE
For The

MONTE VERDE SUBDIVISION

A PRELIMINARY TYPE III APPLICATION

Submitted to
CITY OF CAMAS

FOR
PACIFIC LIFESTYLE HOMES
11815 NE 99th St Suite 1200
Vancouver, WA 98682

August 2022

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General Information

Applicant/Owner:

Pacific Lifestyle Homes
Contact: Ryan Styger
11815 NE 99th St Suite 1200
Vancouver, WA 98682
360-213-0804
RyanS@BuildPLH.com

Owner:

Dwight A. Southern
22205 NE 28th Street
Camas, WA 98607

***Project Contacts*:**

PLS Engineering
Travis Johnson, PE
604 W Evergreen Boulevard
Vancouver, WA 98660
(360) 944-6519
pm@plsengineering.com

Location:	SE & SW ¼ of Section 21, T2N, R3E, WM
Address:	22205 NE 28th Street, Camas, WA 98607
Project Size:	8.6 acres/374,775 sf
Zoning:	R-7.5
Overlay:	Airport Overlay – Zone C
Comprehensive Plan:	SFM
Current Use:	Single Family Residence
Parcel Number:	173184000
School District:	Camas
Elementary:	Lacamas Lake
Middle School:	Liberty
High School:	Camas
Water District:	Camas
Sewer District:	Camas
Fire District:	Camas
Park District:	N/A
Clark County Reference:	PA22-05
Transportation Impact Fee:	Camas

Project Description

The Monte Verde Subdivision proposes to divide 8.6 acres into 34 single-family residential lots in the R-7.5 zone. One single-family residence and two outbuildings are currently onsite; all structures will be removed. The surrounding uses to the north, west and east are residential. To the south of the site is Camp Currie Park. A BPA Right-of-Way runs through the site.

The site is primarily grass with scattered trees, a forested area exists on the south portion of the site. The site is gently sloped down to the south; no steep slopes or severe erosion hazard areas are mapped.

Transportation and Utilities:
NE 28th Street is an existing 3-Lane Arterial that abuts the site to the north and provides access to the site. Frontage improvements are proposed to bring the street up to half-width standards including a 37' half-width ROW and 23' half-width paved section with 6' planter strip and 6' detached sidewalks.

NW Noble Avenue is a proposed public street that will provide direct access to the new lots. The street has been designed to line up with the intersection of NE Hargrave north of NE 28th Street. NW Noble Avenue will terminate with a cul-de-sac turnaround. An east/west stub road will provide future circulation to adjacent properties. There are no transit routes or stops within 1/4 mile of the development site.

A traffic study has been provided that shows the projected trip generations for the development. No offsite mitigation is required based on the study.

Stormwater will be collected and treated onsite before being routed to an onsite infiltration trench or stormwater detention facility. A stormwater report has been provided to show compliance with the City stormwater regulations. All lots will be served by public water and sewer services. Due to the grade of the site and the exiting depth of sewer in NE 28th Street, a majority of the lots will be required to be served by a grinder pump system.

Critical Areas:
There are several Oregon white oaks located onsite. No other critical areas were identified onsite per the prepared critical areas report. A Mitigation Plan has also been prepared for the proposed removal of onsite oak trees.

The parcel is within a high and moderate - high archaeological predictive area, therefore an Archaeological Predetermination has been prepared for the site and submitted with this application.

Proposal & Code Compliance Discussion

Title 16 – Environment

16.01 - SEPA

The State Environmental Policy Act (SEPA) procedures require documentation of critical areas as well as discussion on earth, air, water, plants and animals, energy and natural resources, environmental health, noise, land and shoreline uses, aesthetics, recreation, historic and cultural preservation, transportation, and public services and utilities. A SEPA application is required and has been included with this application.

16.31 – Archaeological Resource Preservation

The site is located in an area of high probability for the presence of archaeological artifacts. An Archaeological Predetermination Survey Report is required for this project. Archaeological Services, LLC (ASCC) performed an onsite field investigation on June 2, 2022. A Cultural Resource Survey Report was completed for this site. The report dated July 5, 2022 documents 2 potentially historic era buildings: the single family residence and the detached garage. These structures are not likely to be eligible for listing on any historic register. Given the negative results of the predetermination, ASCC recommended that no further archaeological work is needed.

16.51 – Critical Areas - 16.53 Wetlands - 16.61 Fish and Wildlife Habitat

Per Clark County Gis, the property is mapped as having wetlands on the south end. A Critical Areas Report has been prepared by Ash Eco Solutions that shows there are no wetlands on site. The Critical Areas Report also addresses several Oregon white oaks onsite. Some of the onsite oak trees are proposed to be removed due to the proposed roadway construction and site grading. A Mitigation Plan is included that provides onsite mitigation for critical area impacts.

Title 17 – Land Development

17.11 – Subdivisions

This project is subject to a Type III process for land division. The application will be subject to the development approval and application timelines of this chapter.

The applicant has submitted the required documents and information as required by this section of code. A Submittal Requirements checklist was thoroughly reviewed with this application prior to submittal.

17.11.030.D. - Criteria for Preliminary Plat Approval.

The following addresses how the plat meets the criteria for approval:

1. *The proposed subdivision is in conformance with the Camas comprehensive plan, parks and open space comprehensive plan, neighborhood traffic management plan, and any other city adopted plans;*

   By complying with the zoning and allowed uses as well as development code, this proposal will meet the goals and objectives of the Camas comprehensive plan, parks and open space comprehensive plan, neighborhood traffic management plan and other city adopted plans.

2. *Provisions have been made for water, storm drainage, erosion control and sanitary sewage disposal for the subdivision that are consistent with current standards and plans as adopted in the Camas Design Standard Manual;*

   All future lots will be served by public water and sanitary sewer. A storm drainage and erosion control plan, and utility plan are submitted with this application demonstrating how the plan meets current standards as adopted in the Camas Design Standards Manual. See section *17.19.040 – Infrastructure Standards* further below in this narrative, and the proposed plans, for further details.

3. *Provisions have been made for road, utilities, street lighting, street trees and other improvements that are consistent with the six-year street plan, the Camas Design Standard Manual and other state adopted standards and plans;*

   The applicant is proposing frontage improvements to NE 28th Street and new public internal streets to serve the site. The improvements meet the Camas Design Standard Manual. Please refer to the proposed plans and section *17.19.040 – Infrastructure Standards* further below in this narrative.

4. *Provisions have been made for dedications, easements and reservations;*

   Right-of-way will be dedicated for the roadway improvements and the appropriate easements will be recorded for each of the onsite utilities that are located outside of the roadway.

5. The design, shape and orientation of the proposed lots are appropriate to the proposed use;

   The lots proposed meet code with the exception of lot width; the lot width is proposed to be reduced utilizing density transfer standards. See section *18.09 – Density and Dimensions* further below in this narrative.

6. *The subdivision complies with the relevant requirements of the Camas land development and zoning codes, and all other relevant local regulations;*

   This narrative shows that the application complies with the applicable land development and zoning codes.

7. *Appropriate provisions are made to address all impacts identified by the transportation impact study;*

A transportation impact study has been prepared for this project. This study indicates that all existing roadway infrastructure that will be used to serve the site will operate at acceptable levels of service at the time of full buildout. The applicant will be required to contribute $2400 toward a City of Vancouver project for trip impacts to NE 192nd Ave at NE 13th Street.

8. *Appropriate provisions for maintenance of commonly owned private facilities have been made;*

   The proposed park areas and the stormwater facility are proposed to be owned and maintained by a homeowner's association.

9. *Appropriate provisions, in accordance with RCW 58.17.110, are made for:*

   a. *The public health, safety, and general welfare and for such open spaces, drainage ways, streets, or roads, alleys or other public ways, transit stops, potable water supplies, sanitary wastes, parks and recreation, playgrounds, schools and school grounds and all other relevant facts, including sidewalks and other planning features that assure safe conditions at schools bus shelter/stops, and for students who walk to and from school, and*

   Open space is provided with the project which is in addition to the ample open space located adjacent to the site. Drainage systems have been designed to meet city requirements. Public streets are proposed for the subdivision that will provide access to all proposed lots. All lots will be connected to public water and sewer services. A park/play area is provided within the development.

   It is not likely that potential students would walk to schools from this site. Lacamas Lake Elementary is 1.7 miles from the site. Liberty Middle School is 4.5 miles from the site. Camas High School is 4 miles from the site.

   b. *The public use and interest will be served by the platting of such subdivision and dedication;*

   The proposal provides much needed housing within an urban area that can be efficiently served with public facilities. The general public's interest will be served by this proposed development.

10. *The application and plans shall be consistent with the applicable regulations of the adopted comprehensive plans, shoreline master plan, state and local environmental acts and ordinances in accordance with RCW 36.70B.030.*

This narrative shows how the project complies with the applicable codes and environmental regulations. See the critical areas report for more information.

17.19.030 – Tract, block and lot standards

A. Generally, the proposed lots do not contain critical areas or buffers. There are a few Oregon White Oak trees that will be retained along the property line that will need to be protected.

B. Blocks have been provided in the only manner allowed on this narrow site. Future developments to the east and west will be served with stub streets from this development.

C. The use is compatible with existing uses therefore buffering is not required.

D. All lots front on a public street except for 2 lots that have access from a private tract on the south end of the site. Lot lines generally run at right angles to streets. Lot 1 will comply with provisions for double frontage lots: a 10' landscaped buffer is proposed to screen the rear yard from public view; the home is not proposed to front on NE 28th Street. Building envelopes are shown on the Preliminary Plans.

E. There is a segment of the T-27 trail mapped at the southernmost end of the site. A paved sidewalk is stubbed to the south end of the site for pedestrians to connect to a future trail.

F. Landscaping will be provided on each lot and within common areas as required by code. Please see section *18.13 – Landscaping* below as well as the Preliminary Landscape Plan which has been submitted with this application for reference.

G. A 6' public utility easement is proposed along the street frontage of all lots for electric lines and other public utilities not owned by the city.

H. There are no watercourses located on or near the site.

I. Street signs will be installed by the developer.

J. Street lighting is proposed for the development along the public street as required.

17.19.040 – Infrastructure Standards

NE 28th Street is an existing 3-lane collector/arterial that abuts the site to the north. Half width improvements are proposed as part of this project. A 37' half-width right-of-way will be provided with a 23' half-width paved roadway, 6' detached sidewalks and a 6' planter strip. No lots will directly access NE 28th Street.

NW Noble Avenue is a proposed 2-lane public local access roadway that will serve the development, as is the east/west stub road provided. These streets will provide a 60' right-of-way, 36' paved width, 5' detached sidewalks with 7' planter strips. NW Noble Avenue will terminate in a cul-de-sac. Streetlights will be installed per code requirements.

Table 17.19.040-2 Minimum Public Street Standards			
Roadway Type	**ROW Width**	**Pavement Width**	**Sidewalk**
B. Street (two-lane)	60’	36'	5' detached both sides of the street with planter strip. Parking allowed on both sides of the street.
C. Street (three-lane)	74’	46	6’ detached sidewalks required on both sides of the street, with planter strip, bike lanes, no on-street parking.

Circulation:
The site is designed to meet the circulation standards of the city. The N-S block length between NE 28th Street and NE 26th Street is 542’. This is less than the maximum allowed block length of 600’. NE 26th Street is stubbed to the properties to the east and west to allow for future developments to meet circulation standards and meet intersection spacing standards on NE 28th Street. The proposed cul-de-sac at the south end of the site has a dead-end length of 583’. The site to the south is not within the urban growth boundary and is also owned by Clark County. No vehicular circulation is shown extended to the south. A pedestrian connection will extent to the south that may connect into a future trail on the county property.

Turnarounds:
The proposed NW Noble Avenue terminates in a cul-de-sac that can be utilized as a fire turnaround. The dead end length of the road as measured from the face of curb on NE 26th Street to the end of the cul-de-sac is 583’. The cul-de-sac has a 44’radius as measured to the back of sidewalk and complies with standard detail ST-36.

Intersection Design:
The intersection of NW Noble Avenue with NE 28th Street has been designed to line up with NE Hargrave Street to the north. The curb return will be constructed on the east end of the intersection. On the west end there isn’t sufficient right-of-way to complete the curb return

Pedestrian/Bicycle Circulation:
All sidewalks, driveway aprons, and road intersections will comply with the American with Disabilities Act.

Traffic Study:
A Traffic Study has been prepared for this project by Lancaster Mobley and is included with this application. The following is a summary of the study as found on page 4 of the report:

1. The proposed Monte Verde Subdivision will include the construction of a residential subdivision located on a single property addressed at 22205 NE 28th Street in Camas, Washington. The proposed development will include the construction of 34 single-family detached houses, removing 1 existing house for a net increase of 33 houses. Access to the site will be provided via the proposed extension of NE Hargrave Street to the south of NE 28th Street.

2. The trip generation calculations show that the proposed project is projected to generate an additional 23 morning peak hour trips, 31 evening peak hour trips, and 310 average weekday trips.
3. Based on the 6 projected evening peak hour trip impacts to the intersection NE 192nd Avenue at NE 13th Street, the proposed Monte Verde Subdivision is required to contribute approximately $2,400 toward a City of Vancouver intersection improvement project.
4. No significant trends or crash patterns were identified at any of the study intersections that are indicative of safety concerns. Accordingly, no safety mitigation is recommended per the crash data analysis.
5. Provided any obstructing on-site foliage near the proposed access location is removed following redevelopment of the site, adequate intersection sight distances to the east and west of the proposed site access can be made available to ensure safe and efficient operation along NE 28th Street. No other mitigation is necessary or recommended with regard to sight distance at the proposed access intersection.
6. Left-turn lane warrants are not projected to be met in the eastbound and westbound directions of travel at the intersection of NE 232nd Avenue at NE 28th Street. The intersection of N Hargrave Street at NE 28th Street is currently served by a center two-way left-turn lane on the east and west intersection legs. Accordingly, no new left-turn lanes are necessary or recommended at any of the study intersections.
7. All-way stop warrants and traffic signal warrants at the study intersections are not projected to be met at the study intersections by the 2024 buildout year of the site. Accordingly, installation of all-way stop-controls or traffic signals at the study intersections are not necessary or recommended as part of the Monte Verde Subdivision application.
8. The proposed site access will be located opposite of N Hargrave Street, with the nearest intersecting roadways along NE 28th Street being N Juniper Street to the east (approximately 700 feet away) and N Boxwood Street to the west (approximately 650 feet away). Therefore, the proposed site access will meet the City of Camas' access spacing standards, whereby no access related mitigation is necessary.
9. All study intersections are currently operating acceptably per City of Camas and Clark County standards and are projected to continue operating acceptably through the 2024 buildout year of the site. Accordingly, no operational mitigation is necessary or recommended at the study intersections.
10. All applicable turning movements at the study intersections have adequate storage space to accommodate projected 95th percentile queue, where queues are not expected to extend back to adjacent public intersections. Accordingly, no intersection queuing related mitigation is necessary or recommended as part of the proposed development.

Sewer and Water

The site will be served by the City of Camas for public sewer service. There is an 8" gravity sewer line located in the north half of NE 28th Street. This gravity sewer will be extended into the site and will directly serve the first 3 lots in the development. Due to the existing grade that

slopes significantly away from NE 28th Street, the remining lots will be serve by a grinder pump system.

City of Camas will provide public water service. There in an existing 24" water main located in the south half of NE 28th Street. The development will extend a new 8" water main through the site from NE 28th Street to serve the new lots. Two new fire hydrants are proposed within the development. A separate irrigation service will be provided for the public landscape areas.

Stormwater and Erosion Control
Stormwater runoff from pollution generating surfaces is proposed to be treated using filter cartridges and then routed to either an infiltration trench or a detention pond. Infiltration was deemed feasible for the northern portion of the site but is infeasible on the southern portion due to the soil type and groundwater.

A preliminary stormwater plan has been submitted with this application. The preliminary technical information report (TIR) has also been submitted with this application which better explains the stormwater system and how it meets the applicable code.

Title 18 - Zoning

18.07 – Use Authorization

The site is designated as being within the R-7.5 zoning district, a single-family residential district. The applicant proposes to subdivide the site into 34 lots for the intended use of single-family detached dwellings. This use is permitted outright in the R-7.5 zone.

18.09 – Density and Dimensions

Lots in the R-7.5 zone are required to meet the requirements of Table 1 of CMC 18.09.040.

Table 1 – Density and Dimensions for Single-family Residential Zones			
	R-7.5	**Density Transfer**	**Proposed**
Maximum density (dwelling units/net acre)	5.8	5.8	4.43
Average lot area (square feet)	7,500	-	6,415
Minimum lot size (square feet)	6,000	5,250	5,821
Maximum lot size (square feet)	12,000	9,000	8,265
Minimum lot width (feet)	70	60	52.5
Minimum lot depth (feet)	90	80	80' (lot 1)
Maximum building lot coverage	40%	40%	40%
Maximum building height (feet)	35	35	35

Table 2 – Building Setbacks for Single-family Residential Zones	
Minimum front yard	20’
Minimum side yard	5’
Minimum side yard flanking a street and corner lot rear yard	10’
Minimum rear yard	25’
Maximum lot frontage on a cul-de-sac or curve	30’

The applicant proposes to utilize density transfer standards to allow for an average lot size of 6,415 sf and a minimum lot size of 5,821 sf. Also, the applicant is requesting additional flexibility per section 18.09.060.D to allow for a minimum lot width of 52.5’.

CMC 18.09.060.C permits density transfer standards to be use when a recreational area is set aside withing the development. The applicant is proposing to develop a 0.5-acre tract as a recreational area that includes, a play structure, path, picnic areas, and landscaping.

Because the tract is at least 0.5 acres in size “the city may provide additional or negotiated flexibility to the lot size, lot width, lot depth, building setback, or lot coverage standards” as approved by the Community Development Director.

Prior to this preliminary land use submittal, a letter and proposed plan was submitted to Robert Maul, the interim Community Development Director, to request/negotiate flexibility in lot width dimensions. The City supported the request to have a minimum lot width of 52.5’ as long as the roads serving the site will provide parking on both sides of the street to offset potential parking issues.

18.11 – Parking

Single-family residential dwellings are required to provide 2 parking spaces per unit. Each home will have a 2-car garage plus driveway space for parking, meeting and exceeding the minimum requirement.

Per CMC 17.19.040.B.10.e 1 additional off-street parking space is required for every five units when the average lot size is less than 7400 sf. With 34 proposed lots 7 off-street parking spaces are required. 8 total off-street parking spaces are proposed. 4 are located on tract E and 4 are proposed on tract B. Both tracts will be owned and maintained by a homeowner’s association. These parking spaces meet the standard space dimensions and have a width of 9’ and a depth of at least 18’.

18.13 – Landscaping

A Landscape, Tree and Vegetation Plan has been submitted with this application showing proposed landscaping, and all onsite trees proposed to be retained or removed.

A 20-unit/acre tree density per net acre has been incorporated into the site plan. The tree density is met by providing street trees, and plantings withing the proposed tract areas. The

proposed and adjacent uses are residential or open space, so specific landscape buffers are not required.

18.15 – Signs

No signs are proposed with this project at this time.

18.17 – Supplemental Development Standards

This application will need to comply with the standards found in this section. Some standards that will apply include:

- 18.17.030 - Corner lot vision clearance area: a 15'x15' vision clearance area is required on all corner lots.
- 18.17.040 - Accessory structures: No accessory structures are proposed with this application. If accessory structures are proposed by individual lot owners, they will need to comply with this section.
- 18.17.050 - Fences and walls: fences will be limited to 6'.
- 18.17.060 - Retaining walls: walls are generally limited to 6'.

18.55 – Administration and Procedures

This project is subject to a Type III process for land division. The application will be subject to the development approval and application timelines of this chapter.

A preapplication meeting is required per CMC 18.55.060. A preapplication conference was held on January 20, 2022 and a land use application was not submitted within 180 days. The applicant reached out to Robert Maul, the interim Community Development Director, on July 19th 2022 requesting that additional preapplication requirements be waived. Robert Maul indicated that he would support waiving additional preapplication requirements.

The applicant has submitted the required documents and information as required CMC 18.55.110.

PRE-APPLICATION MEETING NOTES
Monte Verde Subdivision
PA22-05

Thursday, January 20, 2022
2:30pm, City Hall (meeting via zoom)
616 NE 4th Ave. Camas, WA. 98607

Applicant:	Nick Peets Pacific Lifestyle Homes, Inc.
City of Camas:	Lauren Hollenbeck, Senior Planner Eric Dugger, Sr. Engineering Technician Brian Smith, Building Official Ron Schumacher, Fire Dept.
Location:	22205 NE 28th Street Camas, WA 98607 Parcel Number: 173184000
Zoning:	R-7.5 (Single-Family Residential)
Description:	To subdivide 8.84-acres into 32 single-family residential lots.

NOTICE: Notwithstanding any representation by City staff at a pre-application conference, staff is not authorized to waive any requirement of the City Code. Any omission or failure by staff to recite to an applicant all relevant applicable code requirements shall not constitute a waiver by the City of any standard or requirement. [CMC 18.55.060 (C)] This pre-application conference shall be valid for a period of 180 days from the date it is held. If no application is filed within 180 days of the conference or meeting, the applicant must schedule and attend another conference before the City will accept a permit application. [CMC 18.55.060 (D)] Any changes to the code or other applicable laws, which take effect between the pre-application conference and submittal of an application, shall be applicable. [CMC 18.55.060 (D)]. A link to the Camas Municipal Code (CMC) can be found on the City of Camas website, http://www.cityofcamas.us on the main page under "City Codes".

PLANNING DIVISION **LAUREN HOLLENBECK (360) 817-7253**

An application for a subdivision is considered a Type III permit. Applicable codes for this proposal include Title 16 Environment, Title 17 Land Development and Title 18 Zoning of the Camas Municipal Code (CMC), which can be found on the city website. Please note it remains the **applicant's responsibility** to review the CMC and address all applicable provisions. The following pre-application notes are based on application materials and site plan submitted to the City on December 20, 2021:

Application Requirements

Your proposal will need to comply with the general application requirements per **CMC Section 18.55.110** in addition to the specific applicable application requirements outlined in **CMC Section 17.11.030.B** for a preliminary subdivision plat. The following is an excerpt from the requirements of CMC Section17.11.030.B (see code section for full text):

1. A completed city application form and required fee(s);

Fees will be based on the adopted fees at the time of land use application submittal. The current fees include the following:	
1. Preliminary Plat	$7,175 + $250 per lot
2. SEPA	$810.00
3. Critical Areas Review *(for each type)*	$775.00
4. Archaeological Review	$137.00
5. Fire Department Review	$354.00
Fees for building permit are collected at the time of the building permit submittal. Fees for engineering are collected at time of engineering plan approval.	
6. Building Permit and Plan Review	based on the valuation of the project
7. Engineering Review	3% of estimated construction costs

2. A completed and signed SEPA checklist;
3. Complete applications for other required land use proposals applicable to the proposal;
4. A vicinity map showing location of the site;
5. A survey of existing significant trees as required under CMC Section 18.13.045;
6. All existing conditions shall be delineated on the site plan per CMC Section 17.11.030.B.6(a-p);
7. A preliminary grading plan as slopes are greater than ten percent;
8. Preliminary stormwater plan and report;
9. A geotechnical report consistent with CMC Chapter 16.59 if development is proposed on slopes greater than ten percent
10. A copy of the Clark County assessor's map which show the location of each property within 300 feet of the subdivision;
11. One set of mailing labels for all property owners as provided in CMC Section 18.55.110;
12. A traffic study
13. A narrative addressing ownership and maintenance of open spaces, stormwater facilities, public trails and critical areas, and the applicable approval criteria (CMC Section 17.11.030.D) and standards of the Camas Municipal Code. It should also address any proposed building conditions or restrictions.
14. A development sign must be posted on site per CMC Section 18.55.110.H (1-5).
15. Necessary drawings and reports- three sets and an electronic copy (send as a PDF by email or on a disc). All documents and reports must be submitted as separate pdf copies.

Preliminary Plat

The following comments are based on the site plan materials submitted with this Pre Application:

1. The preliminary plat drawings must meet the density and dimensional standards for lots in a Single-Family Residential (R-7.5) zone, and infrastructure improvements (i.e. roads, easements, etc.).
2. Density calculation is based on development/net acreage which is defined as the total land use development exclusive of open space and critical areas.

3. Density transfer provisions of CMC 18.09.040.B Table-1 may be utilized if a land division sets aside of tract for the protection of a critical area, natural open space network, or network connector, or approved as a recreational area. Further, the city may provide additional or negotiated flexibility to the lot size, lot width, lot depth, building setback, or lot coverage standards under CMC Section 18.09.040 Table 1 and 2. A letter explaining the request for negotiated flexibility shall be submitted to the director for consideration per CMC 18.09.060.D.
4. Building setback requirements are found at CMC 18.09.040-Table 2, which includes the requirement for setbacks to be drawn on the plat. Per Note 2, *"Garage setback is five feet behind the front of the dwelling."*
5. The side lot lines of lots 19 and 20 shall be radial to curved streets per CMC 17.19.030.D.2.
6. Building envelopes (setbacks) shall be shown on the preliminary and final plats. Per CMC Section 17.19.030.D.3.a, a 40ft. by 40ft. square dwelling should be able to fit within the building envelope.
7. Per CMC 17.19.030.D.6, Lot 1 shall comply with the provisions for double frontage lots.
8. Each dwelling unit within a new development shall be landscaped with at least one tree per CMC 17.19.030.F.
9. Per CMC 17.19.040.B.1.c, if the average lot size is less than 7,500 square feet, one additional off-street parking space is required for every 5 units and shall be located within a common tract.
10. Per CMC 17.19.040.B.10.a, a Circulation plan is required at application that includes the subject site and properties within six hundred feet showing topography, critical areas and existing and proposed streets, trails, etc.
11. The storm drainage facility shall include a 10-foot L2 landscape buffer per CMC 17.19.030.F.6.
12. The location and height of any retaining walls shall be shown on the grading plan. Retaining wall height requirements are found in CMC 18.17.060.

Landscaping Regulations and Tree Retention

Landscaping standards shall apply to all new land divisions per CMC 18.13.020.B.1. A Landscape, Tree and Vegetation plan must be submitted pursuant to CMC 18.13.040.A. If trees are proposed for removal, a Tree Survey is required per CMC 18.13.040.B and must be prepared by a certified arborist or professional forester pursuant to the requirements outlined in CMC 18.13.045. A minimum 20-unit tree density per net acre is required and needs to be incorporated in the overall landscape plan per CMC 18.13.051.A.

SEPA

The proposed development is not categorically exempt from the requirements of the State Environmental Policy Act (SEPA) per CMC Section 16.07.020.A as the proposed is more than ten residential units and contains environmentally sensitive areas per CMC 16.07.025.C. The current SEPA environmental checklist is on the website.

Critical Areas Review

Clark County GIS mapping identifies wetlands on the subject property. As such, per CMC Section 16.51.130, a critical areas report prepared by a qualified professional is required if a proposed development is within or adjacent to a critical area. The general requirements for a critical areas report are found in CMC Section 16.51.140. The City's code contains additional requirements for each type of critical area.

- The critical areas report requirements for *Wetlands* are found in CMC 16.53.030.

- If Oregon White Oaks greater than 20" dbh, which are considered a habitat of local importance, are surveyed on site, a critical areas report is required per CMC 16.61.020 *Fish and Wildlife Habitat Conservation areas*.

Archaeological Review

The site is located in an area of high probability for the presence of archaeological objects. As such, an archaeological predetermination report is required consistent with the requirements of CMC 16.31.070.A. Submit proof of mailing or emailing the tribes per CMC 16.31.160.

ENGINEERING DIVISION **ANITA ASHTON (360) 817-7231 aashton@cityofcamas.us**
ERIC DUGGER (360) 842-0907 edugger@cityofcamas.us

General Requirements:

1. Civil site construction plans shall be prepared by a licensed Washington State Engineer in accordance with the *Camas Design Standards Manual (CDSM)* and CMC 17.19.040.
2. The Community Development Engineering Dept. is responsible for plan review (PR) and construction inspection (CI).
3. A 3% PR&CI fee is collected by engineering for all infrastructure improvements.
    a. A stamped preliminary engineer's estimate shall be submitted to the CDEV Engineering Dept prior to or with submittal of plans for first review.
        i. The first review submittal shall consist of three (3) full size sets and one (1) half size set of the engineering plans, and one (1) hard copy of the revised TIR.
    b. Payment of the 1% plan review (PR) fee shall be due prior to start of first review.
    c. Payment of the 2% construction inspection (CI) fee shall be due prior to construction plan approval and release of approved plans to the applicant's consultant.
    d. Under no circumstances will the applicant be allowed to begin construction prior to construction plan approval.
4. *Engineering site improvements plans are not to be submitted until after land-use decision is issued.*
5. *Per CMC 17.21.060.H Except for one sales office or one model home, building applications will not be accepted until after Final Acceptance has been issued for all infrastructure improvements.*
6. *Final acceptance is issued by the Community Development Engineering Dept.*
7. Any existing wells, septic tanks, and septic drain fields shall be decommissioned in accordance with State and County guidelines per CMC 17.19.020 (A3).
8. The applicant will be required to purchase all permanent traffic control signs, street name signs, street lighting, and traffic control markings for the proposed development.
9. Regulations for installation of public improvements, improvement agreements, bonding, final platting, and final acceptance can be found at CMC 17.21.
10. The applicant will be responsible for ensuring that private utilities; underground power, telephone, gas, CATV, interior street/parking lighting, and associated appurtenances are installed.

Traffic/Transportation:

1. A transportation impact study (TIA) is required as the proposed development will result in 200 vehicle trips per day (VPD) or more.
2. The transportation impact study (TIA) shall be prepared in accordance with the City's adopted Traffic Impact Study Guidelines as outlined in the CDSM Chapter I Support Documentation and the latest edition of the ITE Manual (11th Edition).
3. The applicant will be required to have a traffic engineer analyze the following:
    a. Site distance access (es) at the intersection with NE 28th Street.
    b. A traffic circulation plan showing ingress and egress, per CMC 17.19.040 (B.10.a).

   c. Address movement conflicts with nearby intersections, left-turn pocket analysis on NE 28th Street at the proposed access location, and applicable private driveways along NE 28th Street.
4. Provide trip AM and PM Peak distribution to and from the site. Offsite intersections to be analyzed, will be based on the trip distribution out to a threshold of 20 new trips per intersection.

Streets:

1. The proposed development is located along the south side of NE 28th Street.
2. NE 28th Street is classified as an existing 3-lane arterial per the City's 2016 Transportation Comp Plan.
3. Per CMC 17.19.040.B.1, the applicant will be required to construct full half-width street improvements along the frontage of the proposed development on NE 28th Street.
4. Per CMC 17.19.040.B.5, the applicant will be required to dedicate sufficient right-of-way for full half-width full depth street improvements along the proposed frontage on NE 28th Street.
   a. The existing right-of-way (ROW) width along the frontage of the proposed development is 67-feet wide.
   b. The applicant will be required to dedicate sufficient ROW to provide for a 37-foot wide ROW width from the centerline of NE 28th Street.
   c. Current ROW width from centerline is 30-feet.
5. Per CMC 17.19.040.B Streets, public roads shall meet the requirements as shown on Table 17.19.040-2 'Minimum Public Street Standards'.
   a. The applicant has proposed to construct public roads as follows: 60-foot wide right-of-way, 36-foot paved surface, 5-foot wide detached sidewalks and planter strips on both sides. Except for the width of the planter strip on one side of the road, this meets the street standards for Local Road Section B.
6. Per CDSM, Table 3 - Access Spacing Standards:
   a. The minimum intersection setback from an arterial is 300-feet, as measured centerline to centerline. Proposed N 84th Avenue does not meet the minimum intersection setback standard. As shown it is approximately 168-feet from the centerline of NE 28th Street.
7. Per CDSM Table 3 – Access Spacing Standards:
   a. The access spacing standard on an arterial is 660-feet with a maximum of 1,000-feet.
   b. The applicant will be required to align the centerline of proposed NE Hargrave Street, on the south side of NE 28th Street, with the centerline of NE Hargrave Street on the north side of NE 28th Street.
8. The applicant should verify with BPA the location and construction of the proposed un-named public road within the BPA easement.
9. Per CMC 17.19.040.B.10.b.ii Cul-de-sacs and permanent dead-end streets over three hundred feet in length may be denied unless topographic or other physical constraints prohibit achieving this standard. When cul-de-sacs or dead-end streets are permitted, a direct pedestrian or bicycle connection shall be provided to the nearest available street or pedestrian oriented use.
   a. The proposed cul-de-sac is approximately 350-feet in length.
   b. The applicant will be required to provide a pedestrian path to the south for a future connection to the future T-27 trail to the south.
10. Street tree planting is required in accordance with CMC 17.19.030 (F).
11. LED street lighting is to be installed along all street frontages within and adjacent to the proposed development, in accordance with CDSM.

Stormwater:

1. The site of proposed development is approximately 8.84 acres.
2. The applicant shall provide a preliminary stormwater report (TIR), using the most current edition of Ecology's Stormwater Management Manual for Western Washington (latest edition 2019 SWMMWW).
3. Per CMC 14.02 Stormwater Control, stormwater treatment and detention shall be designed in accordance with the latest edition of Ecology's SWMMWW (2019 edition).
4. Refer to Ecology's Figure I-3.2 Flow Chart for Determining Requirements for Re- Development (Vol. I, Chapter 3).
    a. All development projects shall comply with Minimum Requirement (MR) #2 – Submittal of a Stormwater Pollution Prevent Plan (SWPPP).
    b. As the project will result in 5,000 sf, or greater, of new plus replaced hard surface area; than Minimum Requirements (MR) #1- #9 will apply.
5. Stormwater facilities are to be placed in a Tract, with right-of-entry to the City for inspection purposes.
6. Ownership and maintenance of onsite stormwater facilities will be the responsibility of the Owner/HOA, per CMC 17.19.040 (C3).
7. Public and private storm easements, if required, are to be shown on the construction drawings.
8. Provisions are to be provided for roof downspout controls. Stormwater from downspouts is not to be directed onto adjoining parcels. Reference Ecology's latest edition of the SWMMWW (2019) for roof downspout controls and CMC 14.02 and 17.19.040.C.
9. A designated concrete washout area (BMP C154, Vol. II, Chap. 3, pgs. 320-326) is to be shown on the engineering site plans. The concrete washout area is to be removed prior to issuance of final acceptance.
10. A designated concrete washout area will be required during the homebuilding phase. Said washout area is to be removed prior to issuance of final occupancy.

Erosion Control

1. The site of proposed development is approximately 8.84 acres.
2. As the land-disturbing activities are greater than one acre, the applicant will be required to obtain an NPDES Construction Stormwater General Permit from Ecology, which includes the Stormwater Pollution Prevention Plan (SWPPP).
    a. Copies of both are to be submitted to Engineering prior to any land-disturbing activities.
3. The applicant will be responsible for all erosion and sediment control measures to ensure that sediment laden water does not leave the site or impact adjacent parcels.
4. Per CMC 17.21.030.B an erosion and sediment control (ESC) bond, in the amount 200% of the engineer's estimate for ESC measures, is to be submitted prior to any land-disturbing activities.
5. Mud tracking onto the road surface is discouraged and any mud tracking is to be cleaned up immediately.

Water

1. There is an existing 24-inch ductile iron water main located in the south half of NE 28th Street.
2. The applicant will be required to design and construct a minimum 8-inch ductile iron water main from NE 28th Street to serve the proposed development.
3. The applicant shall provide a separate 1-inch water service and install water meter boxes to each of the lots located within this development.
4. There is an existing fire hydrant on the North side of NE 28th Street, near the intersection of the proposed development.
    a. The applicant will be required to provide a minimum of two new fire hydrants located within the new development, per FMO.

5. Trenching, backfill, and surface restoration on NE 28th Street will be required, per CDSM Detail G2 and G2A.
6. An onsite water sampling station will be required.
7. A separate irrigation service with meter and backflow prevention device will be required.
    a. Irrigation meters are to be owned by the HOA.
8. Applicant shall demonstrate that there are adequate fire flows available for the development.
9. The tap on the existing water main is to be performed by a tapping Contractor approved by the City's Water/Sewer Dept. Approved list of Contractor's provided below.
10. A 10-foot separation shall be maintained between water and sanitary sewer lines.

Sanitary Sewer:

1. There is an existing 8-inch gravity sanitary sewer line that is located in the north half of NE 28th Street.
2. The Applicant will be required to design and construct a gravity sewer system to serve the development, with minimum 6-inch service laterals provided to each lot. At the time of home building, each single-family residence will require a gravity sewer service with grinder pump, per CDSM Sewer Detail SG4, that will be owned and maintained by the individual home owners.
3. Trenching, backfill, and surface restoration on NE 28th Street will be required, per CDSM Detail G2 and G2A.
4. A 10-foot separation shall be maintained between water and sanitary sewer lines.

City Approved Tapping Contractors:

1. A&A Drilling Services, Inc (water & pressure sewer):
   16734 SE Kens Ct. #B, Milwaukie, OR 97267, 800-548-3827,
   http://www.aadrilling.com
2. Ferguson Waterworks (water only):
   14103 NW 3rd Court, Vancouver, WA 98685, 360-896-8708,
   http://www.ferguson.com/branch/nw-3rd-ct-vancouver-wa-waterworks

Parks/Trails:

1. Per the 2014 Parks, Recreation, and Open Space (PROS) Comprehensive plan, there is a segment of the T-27 trail, shown to traverse west-to-east, at the southernmost limits of the proposed development.
2. The property to the south and east of the proposed development is owned by Clark County Parks.

Garbage & Recycling:

1. Garbage and recycling receptacles are to be placed at the city right-of-way/sidewalks for pickup.

Impact Fees & System Development Charges (SDCs):

1. The proposed development is in the North District.
2. Impact Fees and SDCs are collected at time of building permit issuance.
3. Impact fees and SDCs are adjusted on January 1st of each year.

Impact Fees for 2022:

1. Single Family Detached:
    a. Traffic Impact Fees (TIF) - $9,608.00
    b. School Impact Fees (SIF) (Camas) – $5,371.00
    c. Park/Open Space Impact Fees (PIF) – $5,217.00
    d. Fire Impact Fees (FIF) - $0.20 sf

System Development Charges (SDCs) for 2022:

1. Water
    a. 3/4" meter - $8,071.00 + $401.00 connection fee
2. Sewer
    a. Residential - $4,420.00

BUILDING DIVISION **BRIAN SMITH (360) 817-7243**

1. The address for the existing home at 3010 NW 18th Ave may need to be updated and addressed off of 17th Ave as currently proposed.
2. Existing structures need an asbestos survey and demolition permit.
3. Decommissioning of septic tanks and drain fields through Clark County Department of Health
4. The structures will be reviewed under the most current building codes as adopted by The State of Washington.
5. The structural drawings and calculations shall be prepared and stamped by a Professional Engineer licensed by the State of Washington.
6. The placement of buildings and structures on or adjacent to slopes steeper than one unit vertical in three units horizontal shall conform to Sections R403.1.7.1 through R403.1.7.4.
7. Geotechnical engineer's report may be required
8. The required fire distance between buildings and property line shall be in accordance with the International Building Codes.
9. The required fire suppression system shall be in accordance with IBC and other applicable codes standards and shall be reviewed by the Camas Fire Marshal's office.
10. Storm sewer disposal and connections shall be identified on the approved plans.
11. All lots shall be provided a storm drain lateral at the lowest practical location.
12. Developer shall provide a designated concrete wash out area.
13. Storm water from adjacent properties and existing developments should be taken into consideration.
14. System Development Charges and Impact fees shall be assessed prior to permits
15. An approved monument sign for posting addresses shall be provided at all Flag lots. The monument sign, location and design shall be noted on the Plat.
16. Any development located within a special flood hazard area shall be in accordance with CMC 16.57
17. Impact fees and System Development charges shall be applicable.

FIRE DEPARTMENT **RON SCHUMACHER (360) 834-6191**

1. NFPA 13D Residential Fire Sprinklers required in all new dwellings. It is recommended that the owner additionally install fire sprinklers in the garage in consultation with their fire sprinkler contractor.
2. If a larger water meter is required and proven by design to be needed because of the fire sprinkler system and is not required for reasons of the international residential code from the building department then the SDC up-charge is waived and the minimal cost difference in the actual meter shall be paid.
3. If a PRV is needed for pressures over 80 PSI on the domestic supply, it shall be installed after the fire line supply. If the pressure is over 80 PSI a PRV may be needed on the toilet supply line supplied from the fire sprinkler system.
4. Water supply line from the meter into the structure shall be sized per the fire sprinkler contractors design calculations
5. A fire hydrant will be required at the intersection of 84th and Noble as well as at the four-way intersection
6. Witnessed hydrant flushing and flow testing required with the FMO on any new fire hydrant installations.
7. Approved Fire Department turnaround required for access driveway/roads over 150 ft to residential structures, provide site plan with designation clearly drawn.
8. Any discovered underground oil or fuel storage tank is a decommissioning permit through the FMO.

9. A propane tank Permit is required with the Fire Marshals Office if over 124 gallons.
10. Approved address monument with the FMO is required where the access road leaves the main public access. Shall be clearly visible and readable from all directions.
11. Temporary Addresses required at all times for each structure/lot during the vertical build.
12. If the owner of the property is interested in donating any structures for a practice burn for our firefighters please contact our office. There is a cost however
13. Please don't hesitate to contact the FMO if you have any questions. 360-834-6191 or FMO@cityofcamas.us

CLARK COUNTY WASHINGTON
clark.wa.gov
PUBLIC HEALTH
1601 E Fourth Plain Blvd, Bldg 17
PO Box 9825
Vancouver, WA 98666-8825
360.397.8000

April 25, 2022

Travis Johnson
PLS Engineering
604 W Evergreen Blvd
Vancouver, WA 98660

RE: Conditional Development Review Evaluation for "Monte Verde Subdivision" located at 22205 NE 28th St., Camas, WA (SR53191; Tax Parcel(s) 173184000), PA22-05
****Final Approval Required by Clark County Public Health****

The Development Review Evaluation for which you applied has been completed by Clark County Public Health (CCPH). This evaluation is limited to the area of the proposed development located at 22205 NE 28th St in Camas, WA.

On-Site Sewage Treatment Systems (CCC 24.17, WAC 246-272A, CCC 40.370, RCW 58.17):

A municipal sewage system is proposed and required for this development. We have records for one septic system under ON0028216 (Operational Septic). There are several documents indicating the location of septic systems on the property. An "as-built" dated 3/21/1977, attached to this letter identified a septic system south of the current residence and a second system associated with a former mobile home southeast of the residence. A field review was performed by Clark County Public Health. While the systems were not observed in the field, staff identified a cleanout south of the residence and disturbed ground in the area identified on the plot plan. Black ABS pipe was also identified near the location of the former mobile home. This septic tank was not observed in the field. It is assumed there are two septic systems on the property. Also identified during the field review was an apparent septic holding tank associated with an RV on the property east of the primary residence. These OSS and any other OSS discovered during development must be properly abandoned with written notice provided to Clark County Public Health.

Please submit to CCPH a notification of abandonment with a written description of the actions taken to legally abandon any systems identified on the property with an Online RME Pumper Report attached. Proper abandonment of the systems requires tank pumping by a licensed pumper, breaking in the tank lids, and filling the cavities with compacted soil. Also, note that any cesspools, drywells, or pump chambers discovered during development must also be abandoned in this manner.

The proposed development must connect to an approved public sewer system. A copy of the final acceptance letter from the sanitary sewer purveyor or the equivalent must be submitted along with the Mylar (final plat).

Water Systems (WAC 173-160, WAC 246-290, CCC 40.370, RCW 58.17):

A municipal water supply is proposed and required for this development. County records indicate an operational water well (WP0006175) located on parcel 173184000 with address 22205 NE 28th Avenue. Records identify this well as an operational drilled well with a depth of 77 feet. During the field review, this well was found located inside a structure on the north side of the primary residence. Another well (WP0013249) was also found on the north side of the property and appears to be hand-dug with no records associated with it.

These wells and any other wells discovered during development must be properly decommissioned per WAC 173-160-381 by a Washington licensed well driller. Written verification and the decommissioned well report must be submitted to Public Health and the well location must be marked on the final plat.

The proposed development must connect to an approved public water system. A copy of the final acceptance letter from the purveyor or the equivalent must be submitted along with the Mylar (final plat).

If you have any questions concerning this letter, please contact me at (564) 397-7273.

Sincerely,

Lizzie Simon Digitally signed by Lizzie Simon Date: 2022.04.26 11:28:25 -07'00'

Lizzie Simon

Environmental Health Specialist II

CC: Travis Johnson, PLS Engineering
Lauren Hollenbeck, Senior Planner

Pacific Lifestyle Homes, Inc.
Geotechnical Engineering Evaluation

Monte Verde Subdivision
22205 NE 28th St, Camas WA 98607
Camas, Washington 98607

True North Project No. 22-0111-1
July 2022

July 12, 2022

Pacific Lifestyle Homes, Inc
11815 NE 99th Street, Suite 1200
Vancouver, WA 98682

Attn: Mr. Nick Peets

Subject: Geotechnical Engineering Evaluation
Monte Verde Subdivision
22205 NE 28th St, Camas, WA 98607
Clark County Parcel No. 173184000
True North Project # 22-0111-1

Dear Mr. Peets:

At your request, True North Geotechnical Services (True North) is providing you with this report summarizing our geotechnical services for the proposed new Monte Verde Subdivision residential development to be located at the above-mentioned address in Camas, Washington (site). The purpose of our services was to provide a geotechnical evaluation of the site as it pertains to the proposed new development.

We have endeavored to prepare this report in accordance with generally accepted geotechnical engineering practices at the time we prepared it, for the exclusive use of Pacific Lifestyle Homes, Inc. (PLH), the owner, and their agents, for specific application to this project. Use or reliance upon this report by a third party is at their own risk. True North does not make any representation or warranty, express or implied, to such other parties as to the accuracy or completeness of this report or the suitability of its use by such other parties for any purpose whatever, known or unknown, to True North.

Based on the results of our study, development of the site with the proposed buildings and associated parking and utilities is feasible provided the recommendations in this report are included in the project design and implemented during construction. The chief geotechnical concerns of note associated with the project are ensuring foundations are bearing on dense, competent native soils and designing a stormwater system that meets the needs of the site while taking into account the depth of groundwater within the lower, southern portion of the site.

The attached report includes a summary of our project understanding, geologic site reconnaissance, subsurface explorations, and our conclusions regarding the expected effect that the proposed lot development will have on the site.

PURPOSE AND SCOPE OF WORK

The purpose of our services was to provide a geotechnical evaluation of the site as it pertains to the proposed new development. This report includes a summary of our project understanding, geologic site reconnaissance, subsurface exploration, our conclusions regarding the effects of the proposed lot development on the site, and recommendations for design and construction.
The following describes our specific scope of work that was completed:

- **Geologic Map and Literature Review**: We reviewed published geologic and geologic hazard mapping for the site.
- **Test Pit Excavations:** We completed eight (8) test pit excavations on the property. The test pit excavations extended to depths ranging from about 6 to 12 feet below the ground surface (bgs).
- **Laboratory Testing:** Samples collected from the borings were returned to our office for further examination including classification in general accordance with the Unified Soil Classification, Visual-Manual Procedure. Select samples were subjected to laboratory testing, including natural moisture content analysis, and fines content analysis.
- **Analysis:** Data collected during the literature research, subsurface explorations, and laboratory testing were used to develop site-specific geotechnical design parameters and construction recommendations.
- **Report Preparation:** This Geotechnical Engineering Evaluation summarizes the results of our explorations and analyses, including information relating to the following:
    - Exploration logs and site plan with exploration locations
    - Laboratory test results
    - Summary of interpreted surface and subsurface conditions
    - Shallow foundation design recommendations
        - Minimum embedment and allowable bearing pressure
        - Estimated settlement
        - Sliding coefficient and passive earth pressure
    - Subsurface drainage requirements
    - Earthwork recommendations
        - Temporary and permanent slope inclinations
        - Structural fill materials and preparation
        - Suitability of native and on-site soils for reuse as structural fill
        - Wet weather/conditions consideration
    - Foundation, slab and pavement subgrade preparation recommendations
    - Flexible and rigid pavement design recommendations
    - Utility trench excavation and backfill recommendations for associated utilities
    - Seismic design criteria and design considerations

PROJECT UNDERSTANDING

True North understands that you are planning to subdivide an existing City of Camas/Clark County Tax Parcel, No. 173184000, comprising approximately 8.84 acres.

True North's understanding of the proposed development is based on a review of a "Preliminary Plat" for the project, prepared by PLS Engineering, dated October 6, 2021. We understand that the proposed project consists of the subdivision of the existing lot into 34 new lots. The new lots will range in size from approximately to 5900 to 8300 square-feet, and will each accommodate one single-family home. An existing Bonneville Power Administration (BPA) transmission line easement bisects the site, where we understand no new lots will be developed, and instead a shared park area will be constructed. We understand that one new private roadway, NW Noble Ave, is planned to provide access to the lots from NE 28th Street, where some frontage improvements to NE 28th Street will be also be completed. In general, we understand that utilities are planned below the new roadways. The site with respect to existing nearby features is shown in the attached Vicinity Map, Figure 1. The location of our explorations with respect to existing site conditions and boundaries is shown on the attached Figure 2, Site and Exploration Plan.

We anticipate the future homes at all lots will have relatively short driveways to the new private roadway and will be supported by conventional concrete spread footings. We also understand that the stormwater management is planned for the lots at a planned storm facility tract located at the southwest corner of the site. Based on our understanding of proposed development, we anticipate cuts and fills of less than 4 feet across the site. The purpose of our explorations was to evaluate subsurface conditions and provide geotechnical recommendations for design and construction, including site preparation and support of the proposed new development.

SITE CONDITIONS

Geologic Setting

The site is located in the eastern margin of the Portland Basin, a structural basin with basalt bedrock overlain by sediment associated with repeated glacial outburst flooding of the Columbia River and its tributaries. The last of these outburst flooding events, known as the Missoula Floods, occurred about 10,000 years ago. The flood deposits include layers of clay, silt, sand, and gravel. Some layers may include boulders up to 8 feet in diameter.

In the immediate vicinity of the site, the near surface soils are mapped as Pliocene-age gravel facies (Qfg), consisting of unconsolidated bouldery pebble to cobble gravel, underlain at depth by Pleistocene- or Pliocene-age unconsolidated to semi-consolidated pebble to boulder conglomerate (QTc).

Surface Conditions

The site consists of the above-mentioned parcel, which comprises approximately 8.84 acres located on the south side of NE 28th Street. There is a 0.37 acre parcel currently developed with a

manufactured home at the northeastern extent of the site, which includes a driveway. The parcel to the west of the site is developed with a single family home, detached garage, and two outbuildings, including a driveway. The parcel to the east of the site is undeveloped and owned by Clark County Parks.

The ground surface at the site slopes gently towards the south at a gradient of approximately 0 to 10 percent. The site ranges in elevation from about 286 feet above mean sea level (AMSL) at the northern end of the property to about 238 feet AMSL at the southern extent. The majority of the site is open pasture and the southernmost quarter of the site is lightly wooded, consisting of undergrowth, shrubs, and tall deciduous and evergreen trees.

Subsurface Conditions

On May 6th, 2022, we visited the site to excavate eight test pits and to perform two infiltration tests (see attached Site Plan, Figure 2). The test pit explorations, designated TP-1 through TP-8, were excavated to maximum depths between about 6 and 12 feet bgs. The approximate test pit locations are shown on Figure 2. Descriptions of field and laboratory procedures and the interpreted exploration logs are included in Attachment A. The following is a generalized description of the subsurface units encountered in our explorations:

TOPSOIL: Dark brown silty topsoil with varying amounts of organics and tree roots was observed at the surface in all our test pits, extending to depths ranging from about 6 to 24 inches bgs.

Silty/Clayey SAND: Dark brown to light brown silty/clayey Sand (SM) with gravel was encountered just below the topsoil in all the test pits, extending to depths of about 4 to 9 feet below grade. Samples from TP-7 and TP-8 contained more clay and silt. Generally, the relative density of this layer was medium dense, with the density increasing with depth, and becoming consistently coarser with depth. The moisture content of eight samples tested from this layer ranged from about 27 to 36 percent. The fines content of one sample from this layer in TP-7 was measured to be about 14 percent.

Sandy GRAVEL: Gray-brown to brown Sandy Gravel (GP) with silt and cobbles was encountered below the sand layer in all test pits extending to the termination depth in all, at about 6 to 12 feet bgs. In general, the relative density of this layer was dense to very dense, and soil particles were observed to consistently increase in size with depth. The moisture content of samples tested from this layer ranged from about 18 to 58 percent. The fines content of one sample from this layer in TP-3 was about 4 percent.

Groundwater

Groundwater was encountered at three of the eight test pit explorations, TP-1, TP-2, and TP-4. At each of these locations, moderate seepage was observed at about 4 feet bgs and heavy seepage was encountered at approximately 5 to 7 feet bgs. These three test pits were all located within the lower, southern portion of the site. Based on a review of nearby well logs as well as Clark County data, the static groundwater level at the property is mapped at about 10 to 20 feet bgs, although zones of isolated restrictive layers may occur, resulting in seasonally higher perched water levels at times.

Infiltration Testing

Infiltration testing was completed in TP-3 and TP-7 at depths of about 5 and 2 feet bgs, respectively. The infiltration tests were conducted within 6-inch outside diameter PVC pipes embedded into the underlying soils using the single-ring falling head method, in general accordance with the 2015 Clark County Stormwater Manual. Water was placed into each pipe to achieve a minimum 6-inch-high column of water (head). After a period of saturation, the height of the water column in each pipe was measured initially and at regular timed intervals to determine the rate of water infiltration into the soil. Results of the field infiltration testing are presented in Table 1.

Table 1. Infiltration Testing Results

Location	Depth of Test (feet bgs)	Coefficient of Permeability, k (inches/hour)	Fines Content (percent)	Soil Classifiction[2]
TP-3	5	42.2	14.4	Brown Silty GRAVEL with Sand and Cobbles, moist
TP-7	2	4.7	32.3	Brown Silty SAND with Gravel, damp

[1] Average rate after saturation. [2] Based on visual-manual classification and limited lab testing

The recommended coefficients of permeability, k, presented in Table 1 have been determined using the guidelines presented in CCSM. It is recommended that the designer also include correction factors to account for the level of maintenance, type of system, vegetation, siltation, etc., as necessary.

Hydrologic Soil Properties

According to the USDA Web Soil Survey, the near-surface soils at the site are generally identified as Lauren Loam, which generally consists of soils classified as gravelly loamy coarse sand at the approximate test depths and are assigned the hydrologic soil group “B” based on drainage and other properties, indicating the soils have a moderately high to high capacity to transmit water.

For the purposes of the stormwater system design using the Western Washington Hydrologic Model (WWHM), it is our opinion, based on the results of our explorations, infiltration testing, and laboratory testing, that the native near-surface soil conditions observed in our explorations can generally be classified as Soil Group 4 (SG4).

Geologic Hazards

The following provides a geologic hazard review for the subject site. The geologic hazard review as based on our site reconnaissance and explorations, as well as a review of publicly available published literature and maps.

Slope and Landslide Hazards:

For the most part the site is relatively level, with no slopes exceeding 15 percent within the site boundaries, or at adjacent lots. As a result, slope and landslide hazards are not a concern at the property.

Seismic Hazards:

The following seismic hazards have been considered as part of our geologic hazards review for the project site:

Ground Motion Amplification: Based on a review of Clark County Maps Online, the site is designated as seismic Site Class "C". Based on the presence of dense cobbly/gravelly soils at shallow depths in our explorations, it is our opinion that Site Class "C" is indeed appropriate for use at the site. The seismic design parameters, in accordance with the 2018 IBC (with Washington State amendments), are summarized in Table 2.

Table 2. 2018 IBC Seismic Design Parameters

Location	Short Period	1-Second
Maximum Credible Earthquake Spectral Acceleration	S_s = 0.793 g	S_1 = 0.350 g
Site Class	C	
Site Coefficient	F_a = 1.2	F_v = 1.5
Adjusted Spectral Acceleration	S_{MS} = 0.951 g	S_{M1} = 0.524 g
Design Spectral Response Acceleration Parameters	S_{DS} = 0.634 g	S_{D1} = 0.350 g

g – acceleration due to gravity

Liquefaction: While relatively shallow groundwater was encountered at the site, based on the relative density and grain size of the soils encountered in our explorations, we consider the potential for liquefaction settlement within the site boundaries to be low. Indeed, site is mapped as having a "very low" liquefaction susceptibility based on the Liquefaction Susceptibility Map of Clark County.

CONCLUSIONS AND RECOMMENDATIONS

Geotechnical Design and Construction Considerations

Based on the results of our site reconnaissance, subsurface explorations, and geologic map review, it is our opinion that the planned single-family residential development of the site within the proposed new lots and the associated utilities, access roads and driveways are feasible

provided the recommendations in this report are included in the project design and implemented during construction. The chief geotechnical concerns of note associated with the project are ensuring foundations are bearing on competent dense native soils and designing a stormwater system that meets the needs of the site while taking into account the depth of groundwater within the lower portion of the site. Our opinion is based on field observations and subsurface explorations completed by True North and review of the following documents and information sources: County soils and groundwater mapping, a published geologic map, and our understanding of the proposed development plans.

Site Preparation

After any surface and near surface water sources have been controlled, the construction areas should be cleared and stripped of organic matter, and other deleterious materials. Silt fences, hay bales, buffer zones of natural growth, sedimentation ponds, and granular haul roads should be used as required to reduce sediment transport during construction to acceptable levels.

Where present, existing topsoil, buried structures, and other disturbed surface materials should be stripped and removed from proposed development locations and for a five-foot-margin around such areas. Based on our explorations, the depth of stripping may range from 6 to up to 24 inches, although greater stripping depths may be required if loose or soft materials are encountered, abandoned utilities or other embedded structures, or where mature trees and their associated roots are removed. Deleterious materials encountered during site preparation should be removed from the subgrade soils and hauled off site for disposal. Stripped material should be transported off site for disposal or stockpiled for use in landscaped areas. If stripping operations occur during wet weather, a generally greater stripping depth might be required in order to remove disturbed moisture sensitive soils; therefore, stripping is best performed during a period of dry weather.

Subgrade Verification

Following site preparation, including removal of all topsoil/till zone and compaction of the exposed subgrade and prior to placing aggregate base for the foundations, building pad, or pavement section, the exposed subgrade should be evaluated. The subgrades should be evaluated by qualified True North personnel using a steel foundation probe, proofroll, or other acceptable method. Unsuitable areas identified during the field evaluation should be re-compacted to or be excavated to firm ground and replaced with structural fill.

Wet/Freezing-Weather/Wet-Soil Conditions

Due to the presence of fine-grained silt and clay in the near-surface materials at the site, construction equipment may have difficulty operating on the near-surface soils when the moisture content of the surface soil is more than a few percentage points above the optimum moisture required for compaction. Soils that have been disturbed during site preparation activities, or unsuitable areas identified during proofrolling or probing, should be removed and replaced with compacted structural fill.

Site earthwork and subgrade preparation should not be completed during freezing conditions.

Protection of the subgrade is the responsibility of the contractor. Construction of granular haul roads may help reduce further damage to the pavement and disturbance of site soils. The thickness of the granular material for haul roads and staging areas will depend on the amount and type of construction traffic. The actual thickness of haul roads and staging areas should be based on the contractors' approach to site development, and the amount and type of construction traffic. The imported granular material should be placed in one lift over the prepared, undisturbed subgrade and compacted using a smooth-drum, non-vibratory roller. A geotextile fabric should be used to separate the subgrade from the imported granular material in areas of repeated construction traffic.

Excavations

Where required, temporary soil cuts associated with site excavations or regrading activities should be adequately sloped back to prevent sloughing and collapse, unless a shoring box or other suitable excavation side wall bracing is provided. It is the responsibility of the contractor to ensure that excavations are properly sloped or braced for worker safety protection, in accordance with OSHA safety guidelines.

Structural Fill

Structural fill includes any fill materials placed under footings, pavements, or driveways and backfill over the embedded mat foundation. Typical materials used for structural fill include: clean, well-graded sand and gravel; clean sand; crushed rock; controlled-density fill (CDF); lean-mix concrete; and various soil mixtures of silt, sand, and gravel. Use of the on-site soils as structural fill may be feasible, provided they are properly moisture conditioned prior to placement and compaction.

Imported granular structural fill should consist of angular pit or quarry run rock, crushed rock, or crushed gravel and sand that is fairly well graded between coarse and fine particle sizes. The fill should contain no organic matter or other deleterious materials, have a maximum particle size of one inch, and have less than 5 percent passing the U.S. No. 200 Sieve. In deep excavations, or where subgrade soils require stabilization, the particle size may be increased to four inches. The percentage of fines can be increased to 12 percent of the material passing the U.S. No. 200 Sieve if placed during dry weather and provided the fill material is moisture-conditioned, as necessary, for proper compaction. The material should be placed in lifts with a maximum uncompacted thickness of 12 inches and be compacted to not less than 95 percent of the maximum dry density, as determined by ASTM D 1557. During the wet season or when wet subgrade conditions exist, the initial lift thickness may be increased to 24 inches and should be compacted by rolling with a smooth-drum, nonvibratory roller.

Foundations

Continuous-wall and isolated-spread footings should be at least 12 and 24 inches wide, respectively. For frost protection, the footings should be founded at least 12 inches below the lowest adjacent grades or deeper if required by local building code. The footings should be founded below an imaginary line project at a 1H:1V slope from the base of any adjacent, parallel utility trenches.

Footings should bear on the near-surface silt or gravelly clay or structural fill placed in accordance with our recommendations. Footings should be sized for an allowable bearing capacity of 1,500 psf. We estimate post construction settlements will be less than one inch for our recommended allowable bearing capacity. We estimate that the differential settlement will be approximately half of the total settlement. Our recommended bearing capacity is based on limiting settlements and includes a minimum factor of safety of 3 against ultimate bearing failure.

Lateral loads acting on the foundations can be resisted by passive earth pressures on the sides of the foundation and by friction along the soil-rock-concrete interface at the base of the foundation. We recommend using an allowable passive earth pressure of 250 pounds per cubic foot (pcf) for foundations confined by the near-surface silty sand or structural fill placed in accordance with our recommendations. We recommend an allowable coefficient of friction of 0.35 for foundations. In order to develop these capacities, concrete must be poured neat in excavations, the adjacent grade must be level, and the static ground water level must remain below the base of the footing throughout the year. The passive pressure within the upper foot of embedment should be neglected. These allowable lateral resistance values include a factor of safety of 1.5.

Slab-on-grade Floors

Satisfactory subgrade support for lightly-loaded building floor slabs can be obtained on the undisturbed native soil or on engineered structural fill. A subgrade modulus of 125 pounds per cubic inch may be used to design floor slabs.

A minimum 6-inch-thick layer of drain rock should be placed and compacted over the prepared subgrade to assist as a capillary break and blanket drain. The drain rock may include a capping layer of clean ¾ inch minus crushed rock that contains no more than 5% fines. The drain rock and capping rock should be placed in one lift and compacted until well-keyed, about 90% of the maximum dry density as determined by ASTM D698.

A vapor retarder manufactured for use beneath floor slabs should be installed according to the manufacturer’s recommendations. Careful attention should be made during construction to prevent perforating the retarder, and to seal edges and utility penetrations. We recommend following ACI 302.1, Chapter 3 with regard to installing a vapor retarder.

Pavement Design

The following pavement design recommendations are based on our experience with similar facilities and subgrade conditions.

For automobile parking areas, we recommend a pavement section consisting of 3 inches of asphaltic concrete (AC) over 8 inches of crushed rock base (CRB) or 5 inches of Portland Cement concrete (PCC) over 5 inches of crushed rock base (CRB). For truck traffic areas, the pavement section should consist of 4 inches of AC over 12 inches of CRB or 6 inches of PCC over 8 inches of CRB. These recommended pavement sections are based on the assumption that the subgrade consists of firm structural fill or compacted native subgrade and that the pavement will be constructed during the dry summer months. Proofrolling should be used to evaluate pavement subgrade. Any soft areas disclosed by proofrolling will likely need to be reworked. Some contingency should be provided for the repair of any soft areas. If pavement construction is scheduled for the wet season, it will be necessary to increase the above-recommended base course sections.

AC and CRB materials should conform to WSDOT specifications. All CRB should be compacted to at least 95 percent of the modified proctor ASTM D-1557 laboratory test standard.

Permanent, properly installed drainage is also an essential aspect of pavement design and construction. All paved areas should have positive drainage to prevent ponding of surface water and saturation of the base course. This is particularly important in cut sections or at low points within the paved areas, such as around stormwater catch basins.

Drainage

The Contractor should be made responsible for temporary drainage of surface water and groundwater as necessary during construction to prevent standing water and/or erosion at the site.

As a matter of good construction practice, we recommend that perimeter drains be installed for all buildings. Perimeter drains should consist of perforated drainpipe embedded in a zone of free draining fill that is wrapped in a non-woven geotextile filter. The pipe should be connected to a tightline drainpipe leading to storm drain facilities. Foundation and crawl space drainage should be sloped to drain to a sump or low point drain outlet. Water should not be allowed to pond within crawl spaces. Roof drains should be connected to a tightline drainpipe leading to storm drain outlet facilities.

Water should not be allowed to “pond” or collect anywhere on the site. The ground surface around structures should be sloped to drain away from building foundations for a distance of at least 5 feet. Surface water should be directed away from all buildings into drainage swales or other

approved drainage areas. “Trapped” planting areas should not be created next to any buildings without providing means for drainage.

Soil Erosion

Site-specific erosion control measures should be implemented to address the maintenance of slopes or exposed areas. This may include silt fence, bio-filter bags, straw wattles, or other suitable methods. During construction, all exposed areas should be well compacted and protected from erosion. Temporary slopes or expose areas may be covered with straw, crushed aggregate, or rip in localized areas to minimize erosion.

Finished slopes should be vegetated as soon as possible with erosion-resistant native grasses and plants. Once established, slope vegetation should be properly maintained. Concentrated water should be prevented from flowing over slope faces.

CONSTRUCTION OBSERVATIONS

Satisfactory earthwork performance depends on the quality of construction. Sufficient monitoring of the contractor’s activities is a key part in ensuring that work is completed in accordance with the construction drawings and specifications. We recommend that True North observe that the subsurface conditions observed during our site investigation are consistent with those encountered during construction, and that foundation subgrades are suitable for placement of structural fill, rebar, or concrete for the new structures.

The City of Camas and/or Clark County may require a final letter of geotechnical compliance before they will finalize a permit. If such a letter is required, a representative from True North MUST observe foundation subgrades PRIOR to concrete being poured for the foundation. If True North does not perform this observation, we cannot provide a final letter of geotechnical compliance, and a permit will not be eligible for final sign-off. It is the owner’s responsibility to ensure that True North be notified in a timely manner (i.e., at least 48 hours prior to the required site observation) of the need for our services on site during construction.

LIMITATIONS

We have prepared this report for use by the owner/developer and other members of the design and construction team for the proposed Monte Verde Subdivision. The opinions and recommendations contained within this report are not intended to be construed as a warranty of subsurface conditions, but are forwarded to assist in the planning and design process. The conclusions and recommendations contained in this report are based on our understanding of the currently proposed project, as derived from written and verbal information supplied to us by you.

The conclusions and recommendations contained in this report are based on our understanding of the currently proposed project and potential future development, as derived from written and verbal information supplied to us by you. When the design has been finalized, we recommend

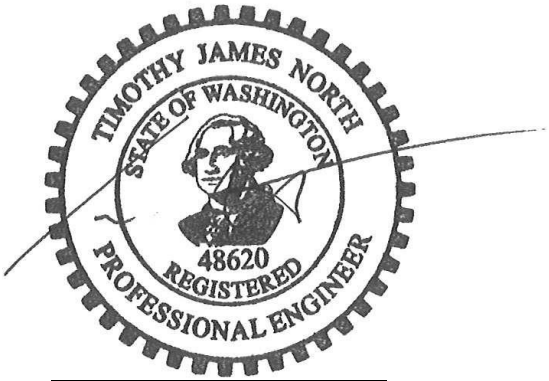
that we review the design and specifications to see that our recommendations have been interpreted and implemented as intended. If design changes are made, we request that we be retained to review our conclusions and recommendations and to provide a written modification or verification.

Within the limitations of scope, schedule, and budget, our services have been executed in accordance with the generally accepted practices in this area at the time this report was prepared. No warranty or other conditions, express or implied, should be understood.

CLOSING

We appreciate the opportunity to be of service to you. If you have any questions, or if we can be of further assistance to you, please contact us at (360) 984-6584.

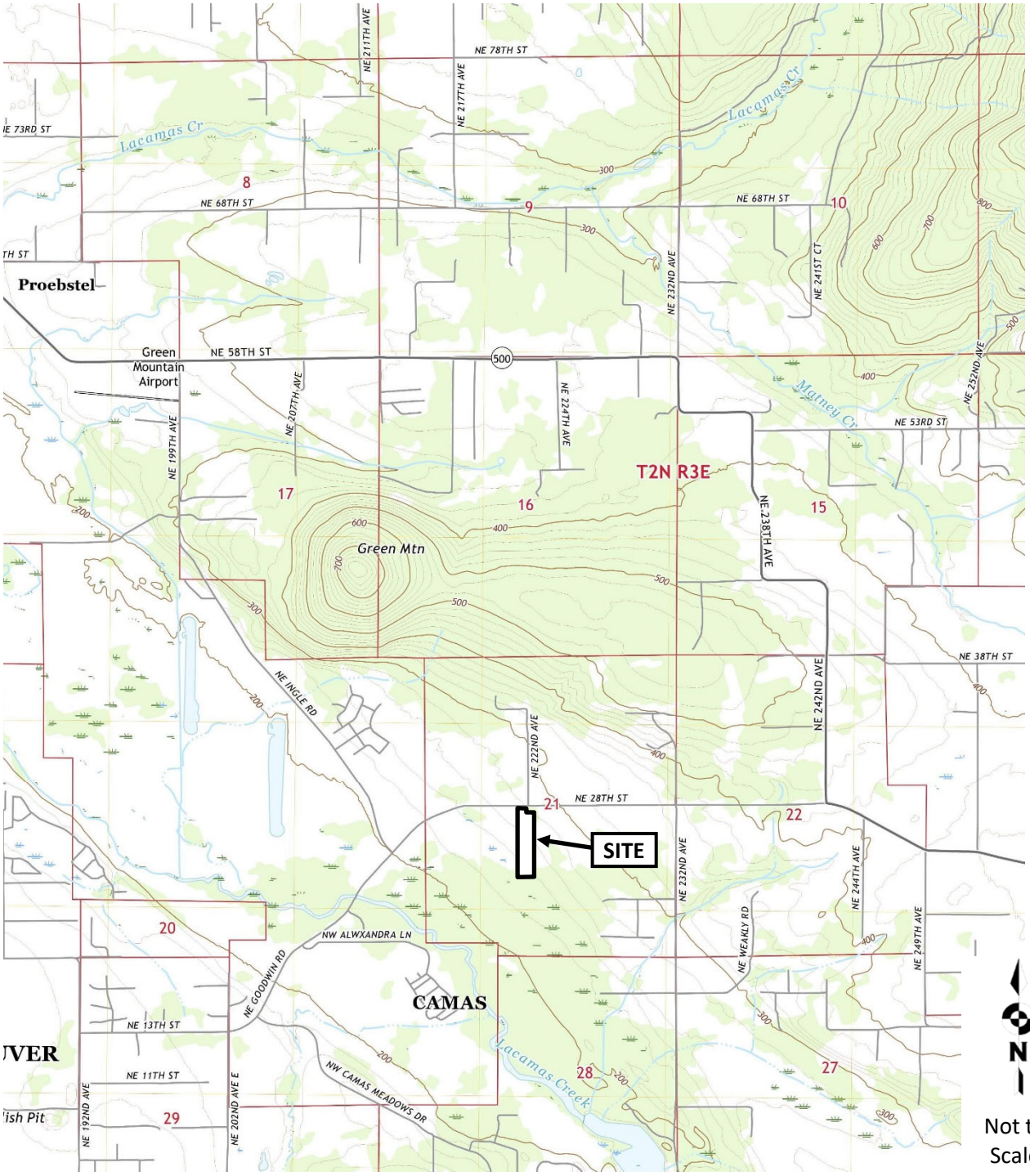
Respectfully Submitted,



Timothy J. North, P.E.
Geotechnical Engineer

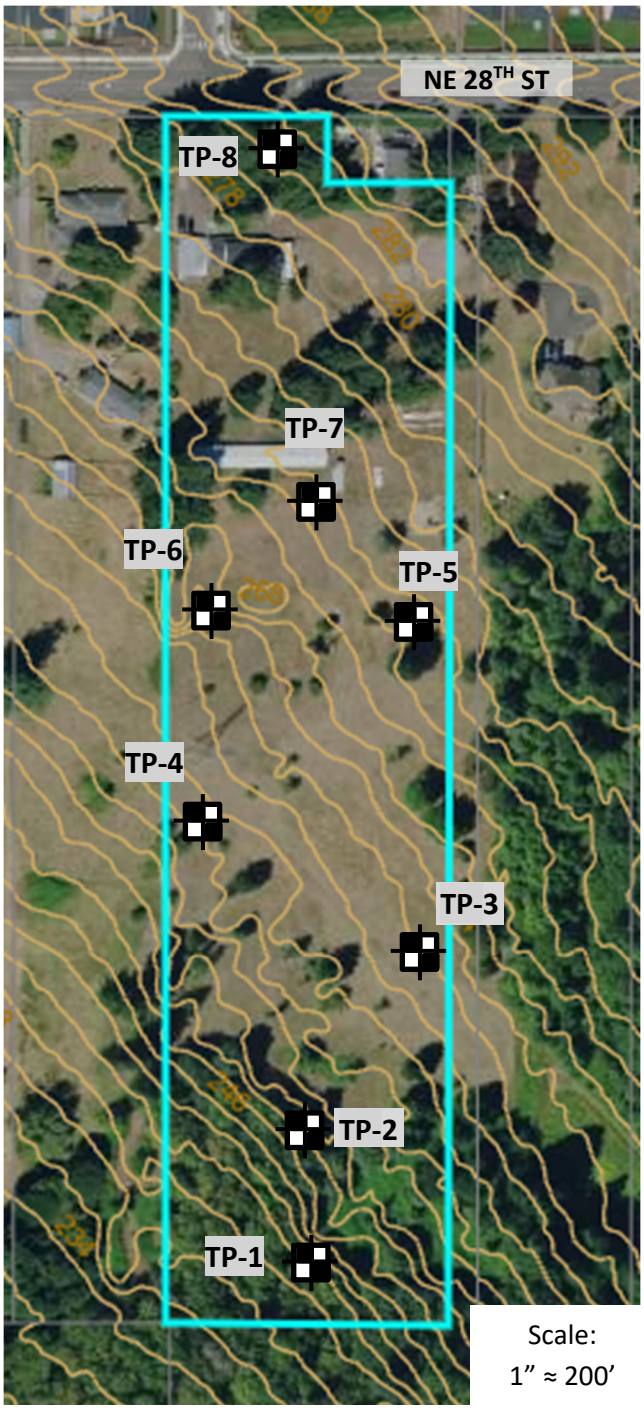
Attachment: Figure 1 – Vicinity Map
Figure 2 – Site Plan
Figure 3 – Site Photographs
Appendix A – Field and Laboratory Procedures
Test Pit Logs TP-1 through TP-8

FIGURES



Source: "Topographic Map of the Lacamas Creek Quadrangle, 7.5 minute series" 2020, United States Geological Survey (USGS).

TRUE NORTH GEOTECHNICAL	Pacific Lifestyle Homes Monte Verde Subdivision Camas, WA	Project # 22-0111-1
202 E Evergreen St, Suite B Vancouver, WA 98660 360-984-6584	July 2022	Figure 1 – Vicinity Map



Scale:
1” ≈ 200’

TP-1 Approximate Exploratory Test Pit Locations, May 6, 2022.

Source: Aerial & Topo – Clark County MapsOnline, accessed July 05, 2022.

N

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202 E. Evergreen Blvd Suite B Vancouver, WA 98660 360-984-6584	July 2022	Figure 2 –Site Plan

Photo 1. Seepage observed at TP-1.

Photo 2. Seepage ponding at TP-2 during backfill operations.

TRUE NORTH GEOTECHNICAL	Pacific Lifestyle Homes Monte Verde Subdivision Camas, WA	Project # 22-0111-1
202 E Evergreen Blvd, Suite B Vancouver, WA 98660 360-984-6584	July 2022	Figure 3A – Site Photographs (1 of 2)

Photo 3. Cobbles and gravel evident at TP-3.

Photo 4. Infiltration testing at TP-7.

TRUE NORTH GEOTECHNICAL	Pacific Lifestyle Homes Monte Verde Subdivision Camas, WA	Project # 22-0111-1
202 E Evergreen Blvd, Suite B Vancouver, WA 98660 360-984-6584	July 2022	Figure 3B – Site Photographs (2 of 2)

APPENDIX A

Field Exploration Procedures
Laboratory Testing Procedures
Exploration Test Pit Logs

FIELD EXPLORATION PROCEDURES

General

We explored subsurface conditions at the site by excavating eight test pits, designated TP-1 through TP-8, to depths ranging from about 6.0 to 12.0 feet bgs. The test pit explorations were excavated on May 6, 2022 with Deere 75G tracked excavator, owned and operated by Dan Tapani Excavating of Battle Ground, Washington. Upon completion, the test pits were backfilled with excavated soils tamped into place as best possible.

Soil Sampling

A True North representative observed subsurface explorations to record the soil, rock, and groundwater conditions encountered, and to obtain soil samples. Disturbed soil samples were obtained from the sidewalls of the excavation and the excavator bucket at selected depths throughout the explorations. Soil samples were sealed to retain moisture and returned to our laboratory for additional examination and testing.

Field Classification

The observed soils were classified initially on site in general accordance with ASTM D 2488 Description and Identification of Soils (Visual-Manual Procedure). Consistency, color, relative moisture, degree of plasticity, peculiar odors, and other distinguishing characteristics of the soil samples were noted. The terminology used is described in the key and glossary that follow.

Summary Exploration Logs

Results from the test pits are shown in the summary exploration logs. The left-hand portion of a log provides our interpretation of the soil encountered, sample depths, and groundwater information. The right-hand portion of a log shows the results of field and laboratory testing. Soil descriptions and interfaces between soil types shown in summary logs are interpretive, and actual transitions may be gradual.

LABORATORY TESTING PROCEDURES

Soil samples obtained during field explorations are examined in a laboratory, and representative samples may be selected for further testing. The testing program included visual-manual classification and natural moisture content testing.

Visual Manual Classification

Soil samples are classified in general accordance with guidelines presented in ASTM D2488, Standard Practice for Description and Identification of Soils (Visual-Manual Procedure). The physical characteristics of the samples are noted and the field classifications are modified, where necessary, in accordance with ASTM terminology, though certain terminology that incorporates current local engineering practice may be used. The term which best described the major portion of the sample is used to describe the soil type.

Natural Moisture Content

Natural moisture content is determined in general accordance with guidelines presented in ASTM D2216, Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass. The natural moisture content is the ratio, expressed as a percentage, of the weight of water in a given amount of soil to the weight of solid particles.

Fines Content

Fines content testing is performed in general accordance with guidelines presented in ASTM D1140, *Standard Test Methods for Determining the Amount of Material Finer than 75-µm (No.200) Sieve in Soils by Washing*. The fines content is the fraction of soil that passes the U.S. Standard Number 200 Sieve. This sieve differentiates fines (silt and clay) from sand and gravel. Soil material that remains on the Number 200 sieve is sand and gravel. Material that passes the sieve is fines. The test is used to refine soil type.

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TABLE A1
Key to Test Pit and Boring Terminology and Symbols

MAJOR DIVISIONS			SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTION
Coarse Grained Soils: More Than 50% Material Retained on No. 200 Sieve	Gravel and Gravelly Soils: More Than 50% Coarse Fraction Retained on No. 4 Sieve	Clean Gravels (Little or No Fines)		GW	Well-graded Gravels, Gravel-Sand Mixtures, Little or No Fines
				GP	Poorly-graded Gravels, Gravel-Sand Mixtures, Little or No Fines
		Gravels with Fines (Significant Percentage of FIne)		GM	Silty Gravels, Gravel-Sand-Silt Mixtures
				GC	Clayey Gravels, Gravel-Sand-Clay Mixtures
	Sand and Sandy Soils: More Than 50% Coarse Fraction Passing No. 4 Sieve	Clean Sands (Little or No Fines)		SW	Well-graded Sands, Gravelly Sands, Little or No Fines
				SP	Poorly-graded Sands, Gravelly Sands, Little or No Fines
		Sands with Fines (Significant Percentage of FIne)		SM	Silty Sands, Sand-Silt Mixtures
				SC	Clayey Sands, Sand-Clay Mixtures
Fine Grained Soils: More Than 50% Material Passing No. 200 Sieve	Silts and Clays	Liquid Limit Less than 50 percent		ML	Inorganic Silts and Very Fine Sands, Rock Flour, Silty-Clayey Fine Sands, Clayey Silts
				CL	Inorganic Clays of Low to Medium Plasticity, Gravelly Clays, Sandy Clays, Silty Clays
				OL	Organic Silts and Organic Silty Clays of Low Plasticity
	Silts and Clays	Liquid Limit Greater than 50 percent		MH	Inorganic Silts Micaceous or Diatomaceous Fine Sand or Silty Soils
				CH	Inorganic Clays of High Plasticity, Fat Clays
				OH	Organic Clays of Medium to High Plasticity, Organic Silts
				PT	Peat, Humus, Swamp Soils
Topsoil					Humus and Duff Layer
Fill					Highly Variable Constituents

Relative Density of Coarse-Grained Soils	
Relative Density	**N - Blows per Foot**
Very Loose	0 - 4
Loose	4 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	50+

Consistency of Fine-Grained Soils	
Relative Density	**N - Blows per Foot**
Very Soft	0 - 2
Soft	2 - 4
Medium Stiff	4 -8
Stiff	8 - 15
Very Stiff	15 - 30
Hard	30 - 50
Very Hard	50+

Key to Sampler Type Symbols

G				
Grab	SPT	Shelby Tube	Dames & Moore	Rock Core

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Project Name: PLH - Monte Verde Subdivision		TEST PIT LOG TP-1
Project Location: 22205 NE 28th St, Camas, WA 98607		Project No.: 22-0111-1
Operator: Dan Tapani Excavating	Equipment: Deere 75G with 2 ft bucket	Date Started: 05/6/22
Logged By: LS	Checked By: TJN	Date Completed: 05/6/22

Depth (feet)	Sample Type	Sample No.	Graphic Log	USCS Symbol	Soil Description	Water Content, %	Field Testing	Notes and Lab Data
0	G	S-1			Soft to medium stiff, dark brown silty TOPSOIL with roots and other organics; moist.	37		
1–7	G	S-2		SC	Medium dense, light brown Clayey SAND with gravel; moist.	33		
7–10	G	S-3		SM	Medium dense, gray-brown Silty SAND with clay; wet.	24		
10	G	S-4		GP	Dense to very dense, gray-brown Sandy GRAVEL with clay; wet.	39		
10.5					Excavation terminated at 10.5 feet bgs. Groundwater encountered at about 7 feet bgs during excavation. Backfilled with excavated soils.			

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Project Name: PLH - Monte Verde Subdivision		TEST PIT LOG TP-2
Project Location: 22205 NE 28th St, Camas, WA 98607		Project No.: 22-0111-1
Operator: Dan Tapani Excavating	Equipment: Deere 75G with 2 ft bucket	Date Started: 05/6/22
Logged By: LS	Checked By: TJN	Date Completed: 05/6/22

Depth (feet)	Sample Type	Sample No.	Graphic Log	USCS Symbol	Soil Description	Water Content, %	Field Testing	Notes and Lab Data
1	G	S-1			Soft to medium stiff, dark brown silty TOPSOIL with roots and other organics; moist.	32		
2				SC	Medium dense, light brown Clayey SAND with gravel; moist.		PP = 0.5	
3								
4	G	S-2				36		
5								
6	G	S-3		GP	Dense, gray-brown Sandy GRAVEL with cobbles; wet.	37		
7					increasing sand with depth, increasing cobble size with depth			
8	G	S-4				28		
9					Excavation terminated at 8.5 feet bgs. Groundwater encountered at about 6 feet bgs during excavation. Backfilled with excavated soils.			
10								
11								
12								
13								
14								
15								

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Project Name: PLH - Monte Verde Subdivision		TEST PIT LOG TP-3
Project Location: 22205 NE 28th St, Camas, WA 98607		Project No.: 22-0111-1
Operator: Dan Tapani Excavating	Equipment: Deere 75G with 2 ft bucket	Date Started: 05/6/22
Logged By: LS	Checked By: TJN	Date Completed: 05/6/22

Depth (feet)	Sample Type	Sample No.	Graphic Log	USCS Symbol	Soil Description	Water Content, %	Field Testing	Notes and Lab Data
					Soft to medium stiff, dark brown silty TOPSOIL with organics; moist.			
1	G	S-1		SC	Medium dense, light brown Clayey SAND with gravel; moist.	22	PP = 0.5	
2								
3					increasing gravel and cobble content with depth			
4	G	S-2				27	PP = 0.5	
5	G	S-3		GP	Dense, gray-brown Sandy GRAVEL with cobbles; moist.			Fines content = 4%
6								
7	G	S-4				18		
8								
9					increasing cobble size with depth			
10								
11					Excavation terminated at 11 feet bgs. Groundwater not encountered. Backfilled with excavated soils.			
12								
13								
14								
15								

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Project Name: PLH - Monte Verde Subdivision		TEST PIT LOG TP-4
Project Location: 22205 NE 28th St, Camas, WA 98607		Project No.: 22-0111-1
Operator: Dan Tapani Excavating	Equipment: Deere 75G with 2 ft bucket	Date Started: 05/6/22
Logged By: LS	Checked By: TJN	Date Completed: 05/6/22

Depth (feet)	Sample Type	Sample No.	Graphic Log	USCS Symbol	Soil Description	Water Content, %	Field Testing	Notes and Lab Data
					Soft to medium stiff, dark brown silty TOPSOIL with organics; moist.			
1	G	S-1		SC	Medium dense, light brown Clayey SAND with gravel; moist.	25	PP = 0.5	
2							PP = 0.5	
3								
4	G	S-2				30	PP = 1.0	
5				GP	Dense, gray-brown Sandy GRAVEL with cobbles; moist.			
6	G	S-3				30		
					Excavation terminated at 6 feet bgs. Groundwater not encountered. Backfilled with excavated soils.			
7								
8								
9								
10								
11								
12								
13								
14								
15								

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Project Name: PLH - Monte Verde Subdivision		TEST PIT LOG TP-5
Project Location: 22205 NE 28th St, Camas, WA 98607		Project No.: 22-0111-1
Operator: Dan Tapani Excavating	Equipment: Deere 75G with 2 ft bucket	Date Started: 05/6/22
Logged By: LS	Checked By: TJN	Date Completed: 05/6/22

Depth (feet)	Sample Type	Sample No.	Graphic Log	USCS Symbol	Soil Description	Water Content, %	Field Testing	Notes and Lab Data
					Soft to medium stiff, dark brown silty TOPSOIL with organics; moist.			
1	G	S-1		SC	Medium dense, brown Clayey SAND; moist.	33	PP = 0.5	
2	G	S-2				27	PP = 0.5	
3								
4	G	S-3			Medium dense, brown Clayey SAND with gravel and cobbles; moist.	26	PP = 0.75	
5								
6								
7								
8								
9	G	S-4		GP	Dense, yellow-gray GRAVEL with sand and clay; moist to wet.	58		
10								
11					Excavation terminated at 10.5 feet bgs. Groundwater not encountered. Backfilled with excavated soils.			
12								
13								
14								
15								

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Project Name: PLH - Monte Verde Subdivision		TEST PIT LOG TP-6
Project Location: 22205 NE 28th St, Camas, WA 98607		Project No.: 22-0111-1
Operator: Dan Tapani Excavating	Equipment: Deere 75G with 2 ft bucket	Date Started: 05/6/22
Logged By: LS	Checked By: TJN	Date Completed: 05/6/22

Depth (feet)	Sample Type	Sample No.	Graphic Log	USCS Symbol	Soil Description	Water Content, %	Field Testing	Notes and Lab Data
0					Soft to medium stiff, dark brown silty TOPSOIL with organics; moist.	29	PP = 0.5	
1	G	S-1						
2				ML/CL	Medium stiff, brown Clayey SILT with sand; moist.		PP = 1.0	
3	G	S-2				26	PP = 1.25	
4								
5								
6								
7				SP	Dense, gray-brown Gravelly SAND with cobbles; moist.			
8								
9					increasing cobble content and size with depth			
10								
11	G	S-3				30		
12					Excavation terminated at 12 feet bgs. Groundwater not encountered. Backfilled with excavated soils.			
13								
14								
15								

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Project Name: PLH - Monte Verde Subdivision		TEST PIT LOG TP-7
Project Location: 22205 NE 28th St, Camas, WA 98607		Project No.: 22-0111-1
Operator: Dan Tapani Excavating	Equipment: Deere 75G with 2 ft bucket	Date Started: 05/6/22
Logged By: LS	Checked By: TJN	Date Completed: 05/6/22

Depth (feet)	Sample Type	Sample No.	Graphic Log	USCS Symbol	Soil Description	Water Content, %	Field Testing	Notes and Lab Data
0					Soft to medium stiff, dark brown silty TOPSOIL with organics; moist.	23	PP = 0.25	Infiltration Testing at 2.0 feet bgs Fines content = 14%
1	G	S-1						
2					Medium dense, brown Clayey SAND with gravel and cobbles; moist.		PP = 1.5	
3	G	S-2				33		
4								
5					increasing gravel and cobble content with depth			
6				SM				
7								
8								
9								
10								
11	G	S-3		GP	Dense, yellow-gray Sandy GRAVEL with clay; moist to wet.	57		
12					Excavation terminated at 12 feet bgs. Groundwater not encountered. Backfilled with excavated soils.			
13								
14								
15								

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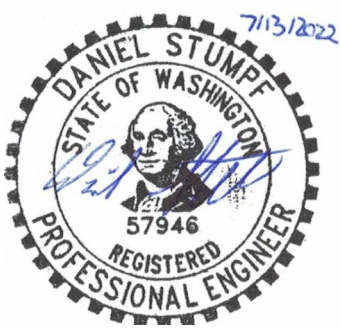
Project Name: PLH - Monte Verde Subdivision		TEST PIT LOG TP-8
Project Location: 22205 NE 28th St, Camas, WA 98607		Project No.: 22-0111-1
Operator: Dan Tapani Excavating	Equipment: Deere 75G with 2 ft bucket	Date Started: 05/6/22
Logged By: LS	Checked By: TJN	Date Completed: 05/6/22

Depth (feet)	Sample Type	Sample No.	Graphic Log	USCS Symbol	Soil Description	Water Content, %	Field Testing	Notes and Lab Data
1	G	S-1			Soft to medium stiff, dark brown silty TOPSOIL with organics; moist.	29	PP = 1.0	
2							PP = 0.5	
3	G	S-2			Medium dense, orange-brown Silty SAND with gravel and cobbles; moist.	31	PP = 0.5	
4					increasing gravel and cobble content with depth			
5								
6				SM				
7								
8								
9	G	S-3				25		
					Excavation terminated at 9 feet bgs. Groundwater not encountered. Backfilled with excavated soils.			
10								
11								
12								
13								
14								
15								

lancaster mobley



Monte Verde Subdivision

Transportation Impact Study

Camas, Washington

Date:
July 13, 2022

Prepared for:
Samantha Zimmer
Pacific Lifestyle Homes, Inc.

Prepared by:
Daniel Stumpf, PE

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Executive Summary

1. The proposed Monte Verde Subdivision will include the construction of a residential subdivision located on a single property addressed at 22205 NE 28th Street in Camas, Washington. The proposed development will include the construction of 34 single-family detached houses, removing 1 existing house for a net increase of 33 houses. Access to the site will be provided via the proposed extension of NE Hargrave Street to the south of NE 28th Street.
2. The trip generation calculations show that the proposed project is projected to generate an additional 23 morning peak hour trips, 31 evening peak hour trips, and 310 average weekday trips.
3. Based on the 6 projected evening peak hour trip impacts to the intersection NE 192nd Avenue at NE 13th Street, the proposed Monte Verde Subdivision is required to contribute approximately $2,400 toward a City of Vancouver intersection improvement project.
4. No significant trends or crash patterns were identified at any of the study intersections that are indicative of safety concerns. Accordingly, no safety mitigation is recommended per the crash data analysis.
5. Provided any obstructing on-site foliage near the proposed access location is removed following redevelopment of the site, adequate intersection sight distances to the east and west of the proposed site access can be made available to ensure safe and efficient operation along NE 28th Street. No other mitigation is necessary or recommended with regard to sight distance at the proposed access intersection.
6. Left-turn lane warrants are not projected to be met in the eastbound and westbound directions of travel at the intersection of NE 232nd Avenue at NE 28th Street. The intersection of N Hargrave Street at NE 28th Street is currently served by a center two-way left-turn lane on the east and west intersection legs. Accordingly, no new left-turn lanes are necessary or recommended at any of the study intersections.
7. All-way stop warrants and traffic signal warrants at the study intersections are not projected to be met at the study intersections by the 2024 buildout year of the site. Accordingly, installation of all-way stop-controls or traffic signals at the study intersections are not necessary or recommended as part of the Monte Verde Subdivision application.
8. The proposed site access will be located opposite of N Hargrave Street, with the nearest intersecting roadways along NE 28th Street being N Juniper Street to the east (approximately 700 feet away) and N Boxwood Street to the west (approximately 650 feet away). Therefore, the proposed site access will meet the City of Camas' access spacing standards, whereby no access related mitigation is necessary.
9. All study intersections are currently operating acceptably per City of Camas and Clark County standards and are projected to continue operating acceptably through the 2024 buildout year of the site. Accordingly, no operational mitigation is necessary or recommended at the study intersections.
10. All applicable turning movements at the study intersections have adequate storage space to accommodate projected 95th percentile queue, where queues are not expected to extend back to adjacent public intersections. Accordingly, no intersection queuing related mitigation is necessary or recommended as part of the proposed development.

Project Description

Introduction

The proposed Monte Verde Subdivision will include the construction of a residential subdivision located on a single property addressed at 22205 NE 28th Street in Camas, Washington. The proposed development will include the construction of 34 single-family detached houses, removing 1 existing house for a net increase of 33 houses. Access to the site will be provided via the proposed extension of NE Hargrave Street to the south of NE 28th Street.

Based on correspondence with City of Camas, City of Vancouver, and Clark County staff, the report conducts safety and capacity/level of service analyses at the following intersections:

1. N Hargrave Street at NE 28th Street (Site Access); and
2. NE 232nd Avenue at NE 28th Street.

The purpose of this study is to determine whether the transportation system within the vicinity of the site is capable of safely and efficiently supporting the existing and proposed uses, and to determine any mitigation that may be necessary to do so. Detailed information on traffic counts, trip generation calculations, safety analyses, and level of service calculations is included in the appendix to this report.

Location Description

The project site is located south of NE 28th Street, east of NE Goodwin Road, and west at NE 232nd Avenue in Camas, Washington. The subject site is located within a developing residential area of the City with a residential subdivision to the north, lower density single-family detached houses to the east and west, and undeveloped/forested land to the south.

The site consists of a single assessor parcel (parcel 173184000) which encompasses an approximate total of 8.84 acres. A single-family detached house and several ancillary structures are currently built on-site. Following redevelopment of the site the existing house these ancillary structures removed. The site is currently served by two driveways along NE 28th Street, where the east driveway will be removed and the west driveway replaced by the proposed extension of N Hargrave Street.

Figure 1 presents an aerial image of the nearby vicinity with the project site outlined in yellow.

Figure 1: Aerial Photo of Site Vicinity (Image from Google Earth)

Vicinity Streets

The proposed development is expected to impact three roadways near the site. Table 1 provides a description of each vicinity roadway.

Table 1: Vicinity Roadway Descriptions

Street Name	Jurisdiction	Functional Classification	Speed (MPH)	On-Street Parking	Curbs & Sidewalks	Bicycle Lanes
NE 28th Street	Camas/Clark County	Arterial/Rural Major Collector	40/50	Not Permitted	Partial North	None
N Hargrave Street	Clark County	Local Street	25	Permitted Both Sides	Both Sides	None
NE 232nd Avenue	Clark County	Rural Major Collector	45	Not Permitted	None	None

Table Notes: Functional classification based on City of Camas Traffic Impact Fee Update and Clark County 2016 Arterial Atlas.

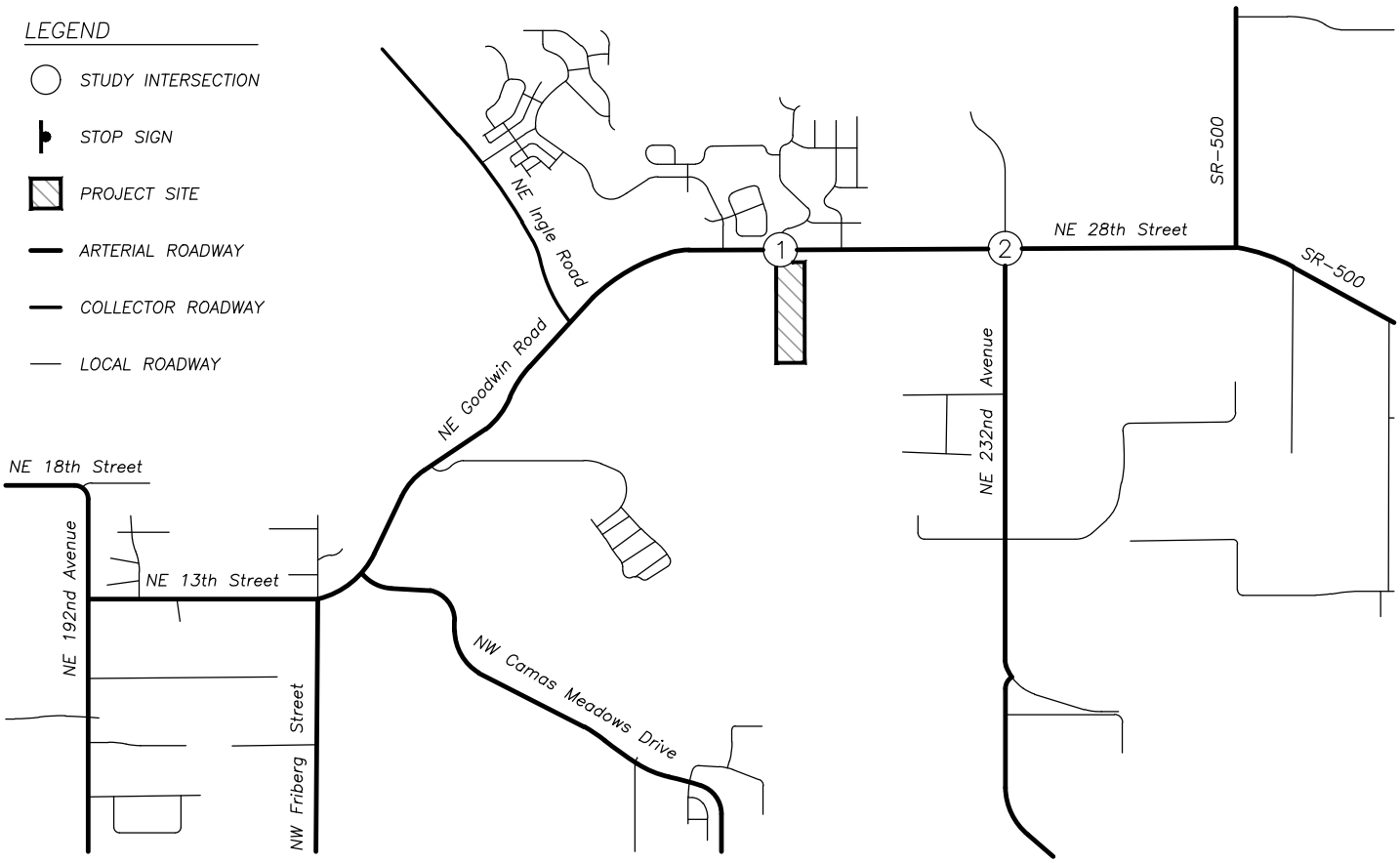
Study Intersections

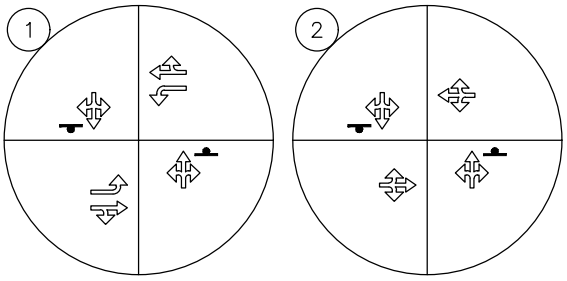
A majority of site trips generated by the proposed development are expected to impact two existing, nearby intersections of significance. A summarized description of these study intersections is provided in Table 2.

Table 2: Study Intersection Descriptions

Number	Intersection	Geometry	Traffic Control	Phasing/Stopped Approaches
1	N Hargrave Street at NE 28th Street	Three-Legged	Stop Controlled	NB/SB Stop-Controlled Approaches
2	NE 232nd Avenue	Four-Legged	Stop Controlled	NB/SB Stop-Controlled Approaches

A vicinity map showing the project site, vicinity streets, and study intersection configurations are shown in Figure 2.





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VICINITY MAP

Figure 2

Monte Verde Subdiv 505

7/13/2022

Site Trips

Trip Generation

The proposed development will include the construction of a 34-lot residential subdivision, removing 1 existing single-family detached house for a net increase of 33 houses. To estimate the number of trips that are currently and will be generated by the existing and proposed uses, trip rates from the *Trip Generation Manual*[1] were used. Specifically, data from land use code 210, *Single-Family Detached Housing*, was used to estimate site trip generation based on the number of dwelling units.

The trip generation calculations show that the proposed project is projected to generate an additional 23 morning peak hour trips, 31 evening peak hour trips, and 310 average weekday trips. The trip generation estimates are summarized in Table 3. Detailed trip generation calculations are included in the technical appendix.

Table 3: Trip Generation Summary

	ITE Code	Size/Rate	Morning Peak Hour			Evening Peak Hour			Weekday Total
			Enter	Exit	Total	Enter	Exit	Total	
Existing Conditions	210	1 dwelling units	0	1	1	1	0	1	10
Proposed Conditions	210	34 dwelling units	6	18	24	20	12	32	320
Net New Trips		**33 dwelling units**	**6**	**17**	**23**	**19**	**12**	**31**	**310**

Trip Distribution

A trip distribution of site trips for the proposed development was estimated based on the geographical location of the project site, locations of likely trip origins and destinations, locations of major transportation facilities in the site vicinity, and US residential/employment census data retrieved at <https://onthemap.ces.census.gov/>. The following trip distribution was estimated:

[1] Institute of Transportation Engineers (ITE), *Trip Generation Manual*, 11th Edition, 2021.

The following trip distribution is projected:

- Approximately 25 percent of site trips will travel to/from the northwest along NE Ingle Road;
- Approximately 20 percent of site trips will travel to/from the south along NE 232nd Avenue;
- Approximately 15 percent of site trips will travel to/from the south along NE 192nd Avenue;
- Approximately 15 percent of site trips will travel to/from the east along SR-500;
- Approximately 10 percent of site trips will travel to/from the southeast along NW Camas Meadows Drive;
- Approximately 5 percent of site trips will travel to/from the west along NE 18th Street;
- Approximately 5 percent of site trips will travel to/from the south along NW Friberg Street; and
- Approximately 5 percent of site trips will travel to/from the north along SR-500.

The trip distribution and assignment for the site trips generated during the morning and evening peak hours are shown in Figure 3.

Proportionate Share Contributions

Based on input provided by City of Vancouver staff, proportionate share fees are being collected at the intersection of NE 192nd Avenue at NE 13th Street in order to help fund an intersection improvement project. It is estimated that approximately 20 percent of site trips will impact this intersection. Table 4 below details this transportation improvement project and proportionate share fee contributions attributable to the proposed development.

Table 4: Proportionate Share Contributions

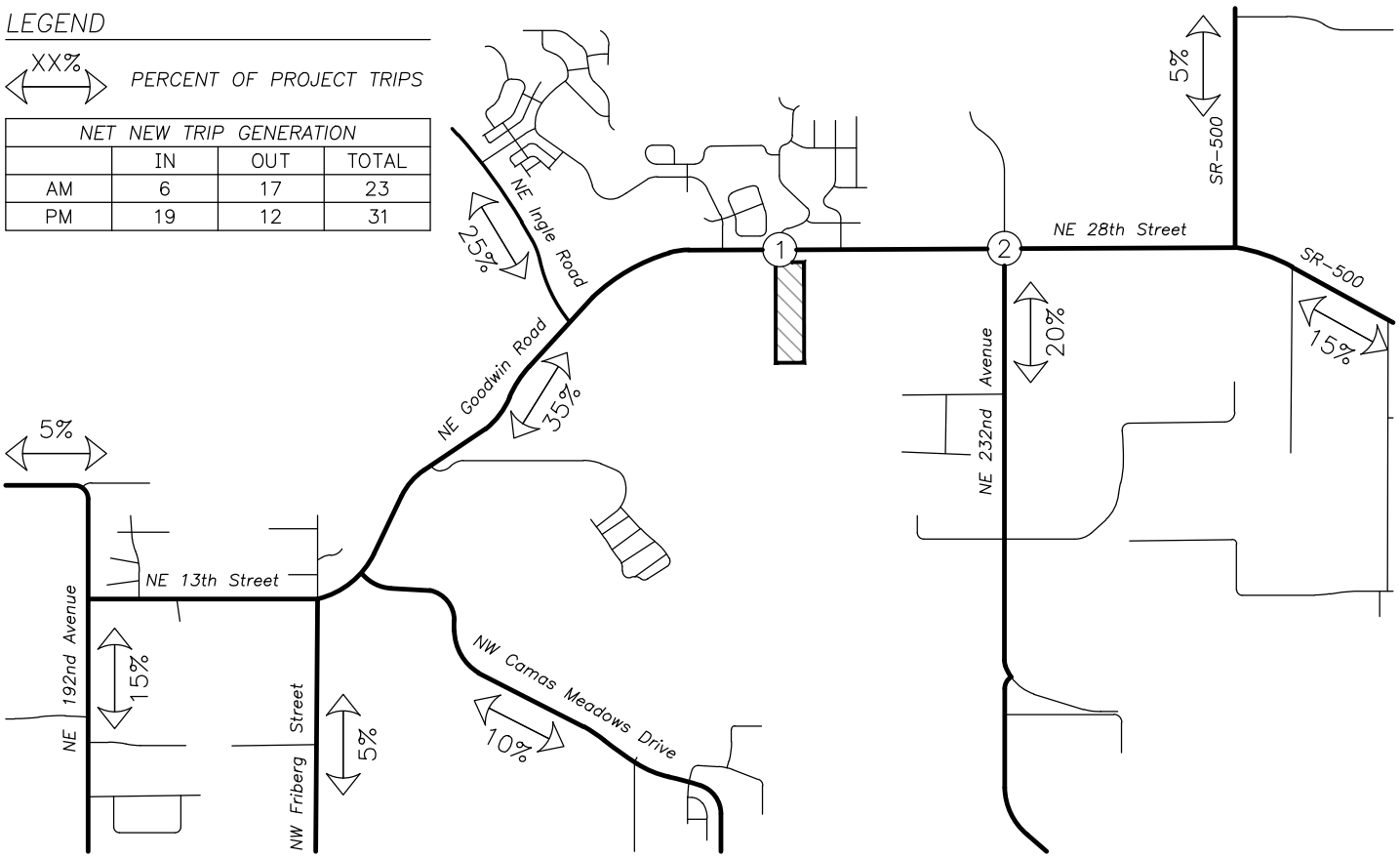
Project Location	Unit Cost Per Trip		Peak Hour Trip Impact		Proportionate Share Contribution
NE 192nd Avenue at NE 13th Street	$400	PM	6	PM	$2,400

Based on the projected evening peak hour trip impacts to the transportation facility detailed in Table 5, the proposed Monte Verde Subdivision is required to contribute approximately $2,400 toward this intersection improvement project.

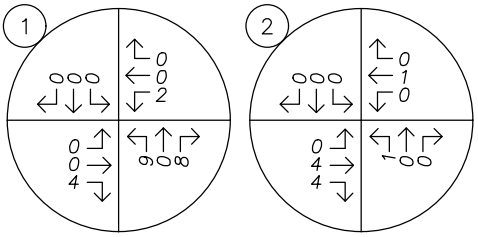
LEGEND

XX% PERCENT OF PROJECT TRIPS

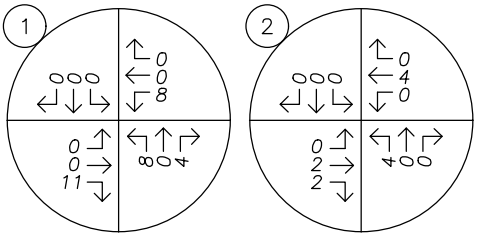
NET NEW TRIP GENERATION			
	IN	OUT	TOTAL
AM	6	17	23
PM	19	12	31



AM PEAK HOUR



PM PEAK HOUR



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SITE TRIP DISTRIBUTION & ASSIGNMENT

Proposed Development Plan - Site Trips
AM & PM Peak Hours

Figure 3

Traffic Volumes

Existing Conditions

Due to the ongoing COVID-19 viral pandemic, as of mid-March 2020 traffic volumes around Clark County have been depressed relative to normal conditions whereby traditional traffic count data collection methods are typically not recommended. Based on correspondence with City of Camas staff, the collection of new traffic counts without COVID-19 adjustments is acceptable. However, Clark County staff had requested analysis of one intersection under County jurisdiction whereby adjustments need to be applied to new counts per the Clark County Management Decision memorandum, dated March 20, 2020. For consistency, adjustment factors were calculated and applied to all study intersections.

A review of available traffic count data yielded traffic counts at the following locations:

- NE 28th Street west of NE 232nd Avenue (September 24, 2019).

Given these available counts, the following methodology for data collection and volume adjustment was utilized:

- Historical 2019 traffic counts were grown to reflect 2022 existing conditions by applying a 1.26 percent per year compounded growth factor, in accordance with the Clark County Management Decision memorandum.
- Since 2018 - early 2020 traffic counts are not available at the study intersections, current year 2022 traffic counts were collected at these intersections on Wednesday, June 29, 2022, from 7:00 AM to 9:00 AM and from 4:00 PM to 6:00 PM.
- The 2019 historical count data (grown to reflect 2022 conditions) and the recently collected 2022 counts at the intersection of NE 232nd Avenue at NE 28th Street compared. Based on the difference in peak hour volumes along NE 28th Street, just west of NE 232nd Avenue, morning and evening peak hour adjustment factors were calculated. These adjustment factors are intended to estimate normal traffic conditions without impacts from the COVID-19 virus (i.e. normal commuter patterns, businesses open, etc).
- The calculated adjustment factors were applied to the recently collected year 2022 traffic counts for all study intersections.

Table 5 presents the calculated adjustment factors for the morning and evening peak hours.

Table 5: COVID-19 Adjustment Factor Calculations

	AM Peak Hour (7:00 AM - 9:00 AM)	PM Peak Hour (4:00 PM - 6:00 PM)
NE 28th Street (West of NE 232nd Avenue)		
Collected 2022 Peak Hour Volumes	614	1,170
Historical 2019 Peak Hour Volumes	886	1,095
Compounded Growth Factor (1.26% Per Year Over 3 Years)	1.0383	1.0383
Historical 2019 Peak Hour Volumes (Grown to 2022)	920	1,137
New Volumes > Grown Historical Volumes?	No	Yes
Adjustment Factor	**1.498**	**1.000**

Figure 4 shows the adjusted year 2022 existing traffic volumes at the study intersections during the morning and evening peak hours.

Background Conditions

Volume Growth

To provide analysis of the impact of the proposed development on the nearby transportation facilities, an estimate of future traffic volumes is required. In order to approximate the future year 2024 traffic volumes at the study intersections, a compounded growth rate of two percent per year for an assumed buildout condition of two years was applied to the adjusted year 2022 existing traffic volumes.

In-Process Data

In addition to the traffic volume growth described above, there are several in-process developments that are currently approved/proposed for construction within the site vicinity that are expected to impact nearby study intersections. The in-process developments include the following:

1. CJ Dens East Subdivision (0 percent developed as of June 2022)
2. Green Mountain B1 South Phase (0 percent developed as of June 2022)
3. Green Mountain Estates Phases 1-7 (50 percent buildout as of June 2022)

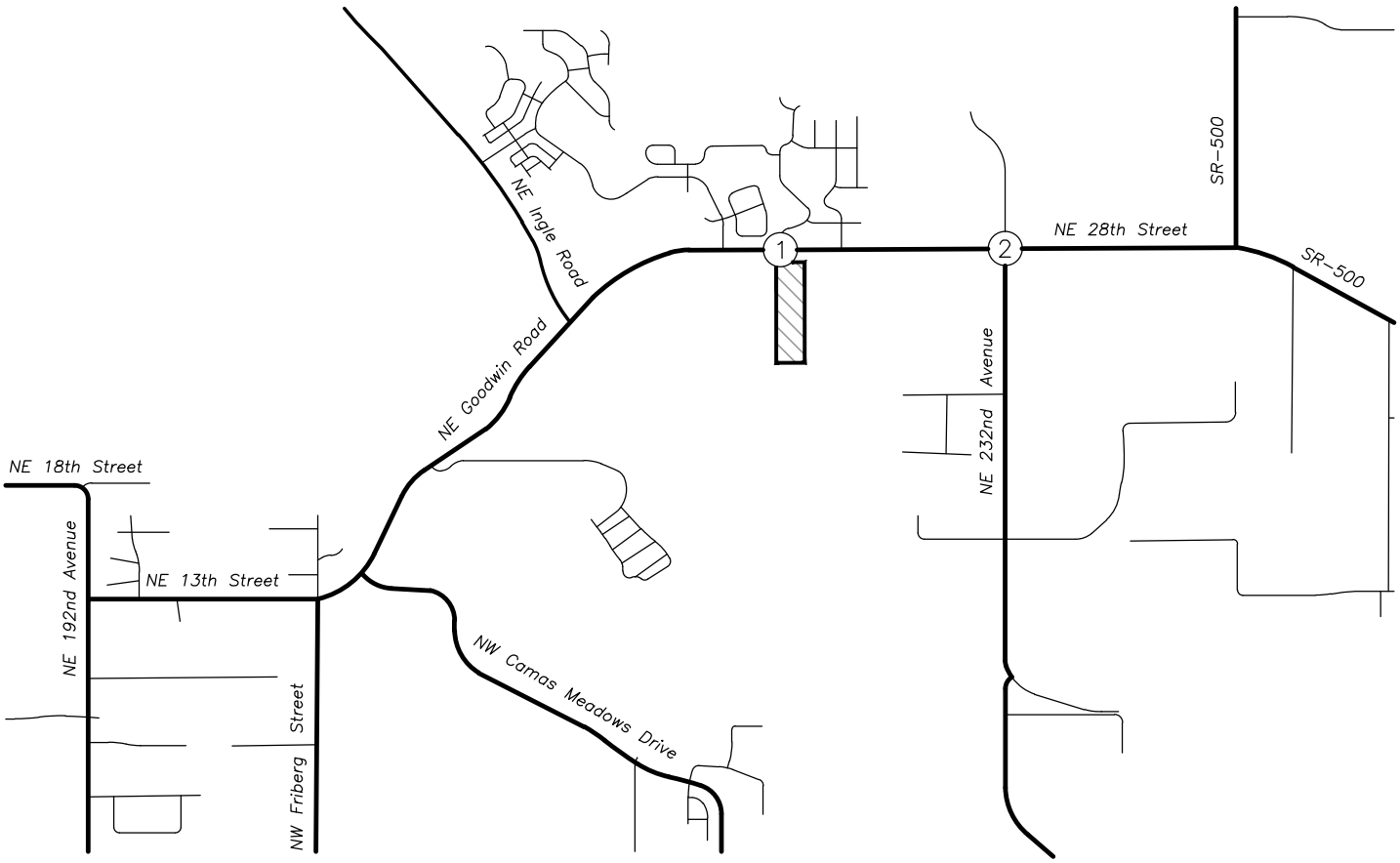
The in-process developments are currently not fully contributing trips to the transportation system but may potentially be by the assumed 2024 buildout year of the site. Additional trips corresponding to each in-process development were added to the existing year traffic volumes in addition to the two years of traffic growth at each of the applicable study intersections. To maintain a conservative analysis of operation at the study intersections, all in-process developments were assumed to be constructed by year 2024. Figure A in the technical appendix shows the in-process development trips at the study intersections during the morning and evening peak hours.

Figure 5 shows the projected year 2024 background traffic volumes at the study intersections during the morning and evening peak hours.

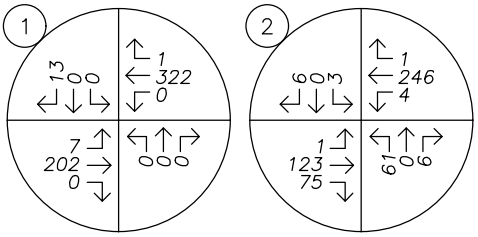
Buildout Conditions

Peak hour trips calculated to be generated by the proposed development, as described earlier within the *Site Trips* section, were added to the projected year 2024 background traffic volumes to obtain the expected 2024 site buildout volumes.

Figure 6 show the year 2024 buildout traffic volumes at the study intersections during the morning and evening peak hours.



AM PEAK HOUR



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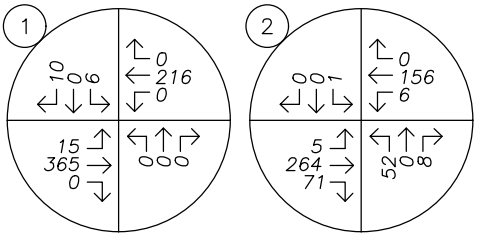

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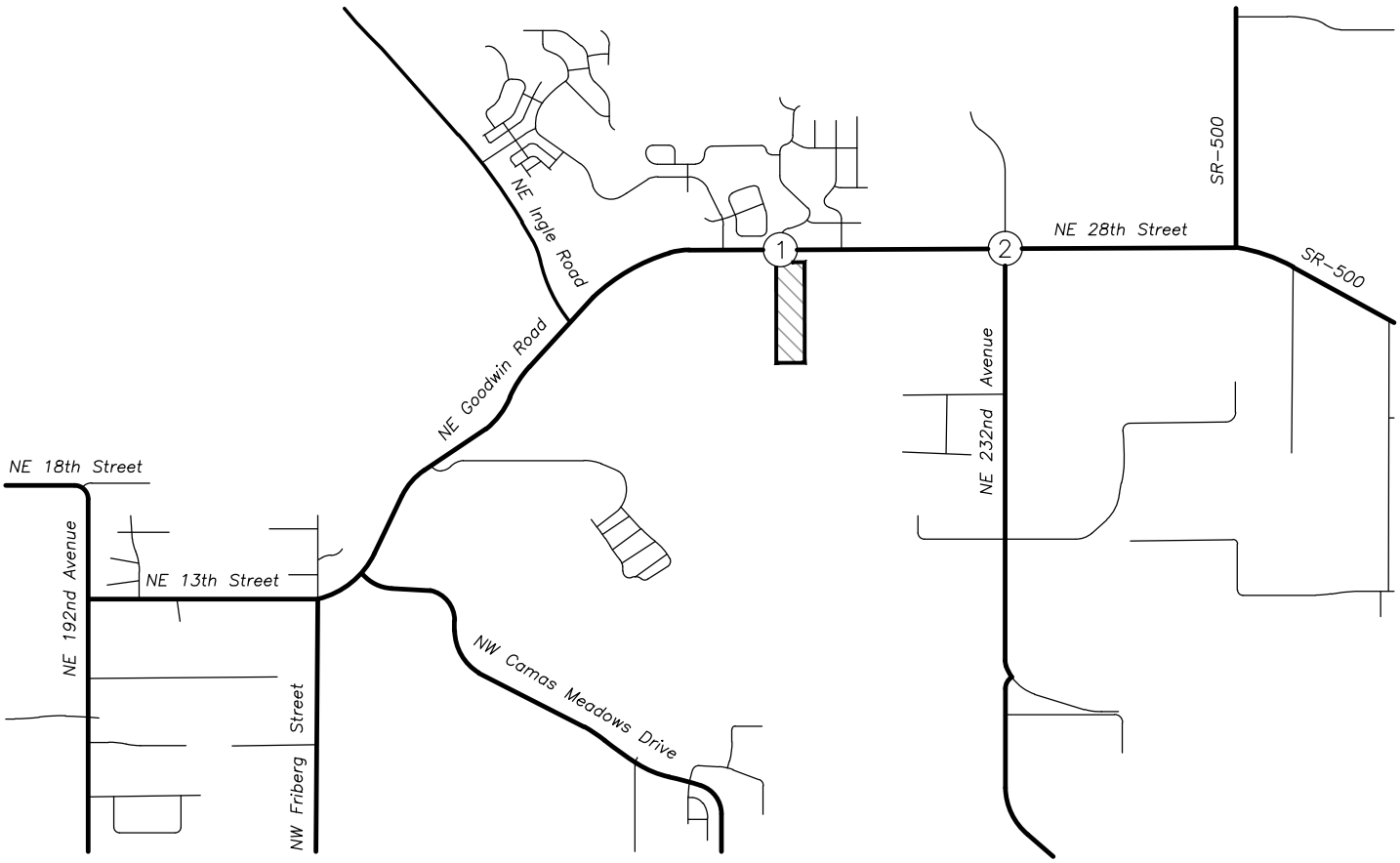
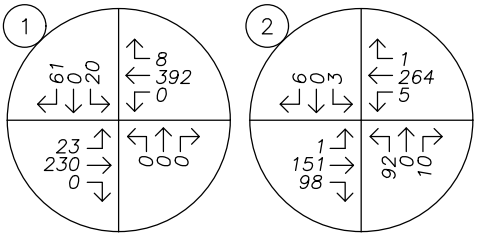
TRAFFIC VOLUMES
Year 2022 Existing Conditions
AM & PM Peak Hours

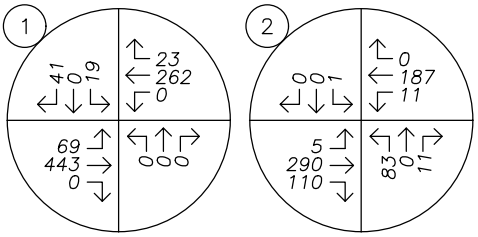
Figure 4



AM PEAK HOUR



PM PEAK HOUR



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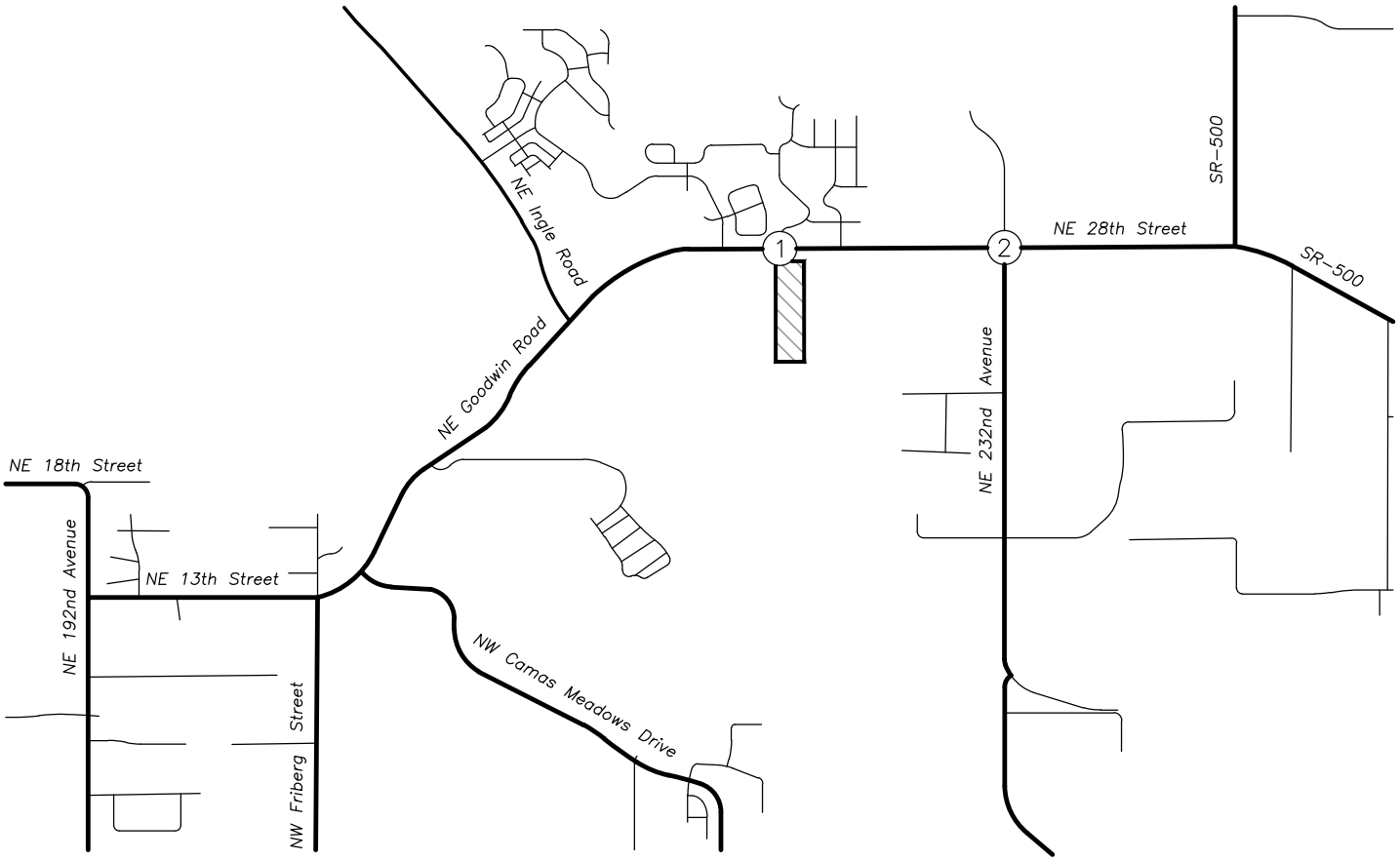
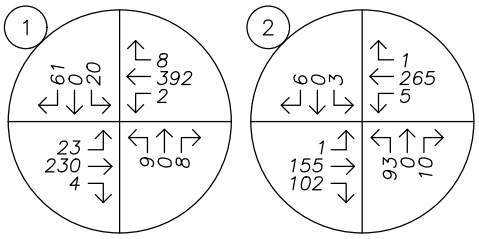
TRAFFIC VOLUMES
Year 2024 Background Conditions
AM & PM Peak Hours

Figure 5



AM PEAK HOUR



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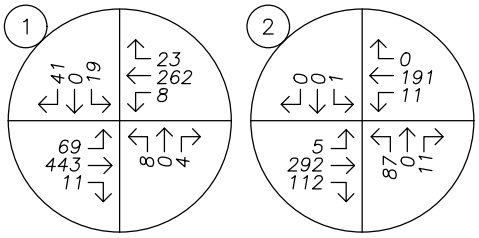

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TRAFFIC VOLUMES
Year 2024 Buildout Conditions
AM & PM Peak Hours

Figure 6

Safety Analysis

Crash History Review

Using data obtained from the Washington Department of Transportation (WSDOT) Crash Data and Reporting Branch, a review of the most recent available five years of crash history (January 2017 to December 2021) at the study intersections was performed. The crash data was evaluated based on the number of crashes, the type of collisions, the severity of the collisions, and the resulting crash rate for the intersection.

Crash rates provide the ability to compare safety risks at different intersections by accounting for both the number of crashes that have occurred during the study period and the number of vehicles that typically travel through the intersection. Crash rates were calculated using the common assumption that traffic counted during the evening peak hour represents approximately 10 percent of the annual average daily traffic (AADT) at the intersection. Crash rates in excess of 1.00 crashes per million entering vehicles (CMEV) may be indicative of design deficiencies and therefore require a need for further investigation and possible mitigation.

With regard to crash severity, WSDOT classifies crashes in the following categories:

- *No Apparent Injury* (NA);
- *Possible Injury* (P);
- *Suspected Minor Injury* (SM);
- *Suspected Serious Injury* (SS); and
- *Fatality* or *Fatal Injury*.

Table 6 provides a summary of crash types while Table 7 summarizes crash severities and rates for each of the applicable study intersections. Crash data is included in the technical appendix to this report.

Table 6: Crash Type Summary

Number	Intersection	Crash Type							Total
		Rear End	Turn	Angle	Fixed Object	Side swipe	Ped/ Bike	Other	
1	N Hargrave Street at NE 28th Street	1	0	0	0	0	0	0	1
2	NE 232nd Avenue at NE 28th Street	2	4	0	1	0	1	0	8

Table 7: Crash Severity and Rate Summary

Number	Intersection	Crash Severity					Total Crashes	AADT	Crash Rate
		NA	P	SM	SS	Fatal			
1	N Hargrave Street at NE 28th Street	0	1	0	0	0	1	6,120	0.08
2	NE 232nd Avenue at NE 28th Street	5	2	1	0	0	8	5,630	0.78

Table Notes: ***BOLDED*** *text indicates a crash rate in excess of 1.00 CMEV.*

Per Table 6, one crash at the intersection of NE 232nd Avenue at NE 28th Street involved a bicyclist. The crash occurred when the driver of a westbound truck collided with a bicyclist. No injuries were reported and the crash was classified as *No Apparent Injury*.

Based on a review of available crash data, no significant trends or crash patterns were identified at any of the study intersections that are indicative of safety concerns. Accordingly, no safety mitigation is recommended per the crash data analysis.

Sight Distance Evaluation

Intersection sight distance was measured for the proposed site access intersection approach along NE 28th Street and evaluated in accordance with the standards established in *A Policy of Geometric Design of Highways and Streets*[2]. According to AASHTO, the driver's eye is assumed to be approximately 15 feet from the near edge of the nearest travel lane of the intersecting street and at a height of 3.5 feet above the minor-street approach pavement. The vehicle driver's eye height along the major-street approach is assumed to be 3.5 feet above the cross-street pavement. Based on the posted speed of 40 mph along NE 28th Street, the minimum recommended intersection sight distances include the following:

- 445 feet to the east for left turning vehicles.
- 385 feet to the west for right turning vehicles.

Provided any obstructing on-site foliage near the access is removed following redevelopment of the site, sight distances to the east and west were measured to be in excess of 450 feet in both directions. Therefore, adequate intersection sight distances to the east and west of the proposed site access can be made available to ensure safe and efficient operation along NE 28th Street. No other mitigation is necessary or recommended with regard to sight distance at the proposed access intersection.

[2] American Association of State Highway and Transportation Officials (AASHTO), *A Policy on Geometric Design of Highways and Streets*, 6th Edition, 2011.

Warrant Analysis

Left-turn lane, all-way stop-control, and preliminary traffic signal warrants were examined for the study intersections where such treatments would be applicable.

Left-Turn Lane Warrants

A left-turn refuge lane is primarily a safety consideration for the major-street, removing left-turning vehicles from the through traffic stream. The left-turn lane warrants used were developed from the *National Cooperative Highway Research Project's* (NCHRP) *Report 457*. Turn lane warrants were evaluated based on the number of advancing and opposing vehicles as well as the number of turning vehicles, the travel speed, and the number of through lanes.

Left-turn lane warrants are not projected to be met in the eastbound and westbound directions of travel at the intersection of NE 232nd Avenue at NE 28th Street. The intersection of N Hargrave Street at NE 28th Street is currently served by a center two-way left-turn lane on the east and west intersection legs. Accordingly, no new left-turn lanes are necessary or recommended at any of the study intersections.

All-Way Stop-Control Warrants

To determine whether the installation of all-way stop-controls is warranted or nearing warrants at the study intersections, the *Manual of Uniform Traffic Control Devices for Streets and Highways*[3] (MUTCD) was referenced. According to *Section 2B.07 Multi-Way Stop Applications* of the MUTCD, installation of a multi-way stop control may be implemented at an intersection given the following criteria are considered:

A. *Where traffic control signals are justified, the multi-way stop is an interim measure that can be installed quickly to control traffic while arrangements are being made for the installation of the traffic control signal.*

B. *Five or more reported crashes in a 12-month period that are susceptible to correction by a multi-way stop installation. Such crashes include right-turn and left-turn collisions as well as right-angle collisions.*

C. *Minimum volumes:*

   1. *The vehicular volume entering the intersection from the major street approaches (total of both approaches) averages at least 300 vehicles per hour for any 8 hours of an average day; and*

   2. *The combined vehicular, pedestrian, and bicycle volume entering the intersection from the minor street approaches (total of both approaches) averages at least 200 units per hour for the same 8 hours, with an average delay to minor-street vehicular traffic of at least 30 seconds per vehicle during the highest hour; but*

[3] Federal Highway Administration (FTA), American Traffic Safety Services Association (ATSSA), Institute of Transportation Engineers (ITE), American Association of State Highway and Transportation Officials (AASHTO), *Manual on Uniform Traffic Control Devices for Streets and Highways* (MUTCD), 2009 Edition, 2010.

3. *If the 85th-percentile approach speed of the major-street traffic exceeds 40 mph, the minimum vehicular volume warrants are 70 percent of the values provided in Items 1 and 2.*

D. *Where no single criterion is satisfied, but where Criteria B, C.1, and C.2 are all satisfied to 80 percent of the minimum values, Criterion C.3 is excluded from this condition.*

Reviewing the above criteria, neither *A* nor *B* are met, and *D* cannot be utilized due to *B* not being met at 80 percent of the minimum threshold. Taking into consideration *Criterion C* alone, all-way stop warrants at the study intersections are not projected to be met by the 2024 buildout year of the site due to volumes and the minor-street approach delays being less than 30 seconds (see the *Intersection Capacity Analysis* section for details).

Preliminary Traffic Signal Warrants

Preliminary traffic signal warrants were examined for the unsignalized study intersections to determine whether the installation of a new traffic signal will be warranted at the intersections by the 2024 buildout year of the site. Based on the analysis, traffic signal warrants are not projected to be met at any of the study intersections by the 2024 site buildout year. Accordingly, no new traffic signals are necessary at the study intersections as part of the Monte Verde Subdivision application.

Access Spacing

According to Table 3 of the City of Camas' Engineering Design Standards[4], the minimum and maximum spacing standards for Arterial roadways (i.e. NE 28th Street) are 660 feet and 1,000 feet, respectively. The proposed site access will be located opposite of N Hargrave Street, with the nearest intersecting roadways along NE 28th Street being N Juniper Street to the east (approximately 700 feet away, measured centerline-to-centerline) and N Boxwood Street to the west (approximately 650 feet away, measured centerline-to-centerline). Therefore, the proposed site access will meet the City of Camas' access spacing standards, whereby no access related mitigation is necessary.

[4] 03b_design_standards.pdf (cityofcamas.us)

Operational Analysis

Intersection Capacity Analysis

A capacity and delay analysis were conducted for each of the study intersections per the unsignalized intersection analysis methodologies in the *Highway Capacity Manual* (HCM)[5]. Intersections are generally evaluated based on the average control delay experienced by vehicles and are assigned a grade according to their operation. The level of service (LOS) of an intersection can range from LOS A, which indicates very little or no delay experienced by vehicles, to LOS F, which indicates a high degree of congestion and delay. The volume-to-capacity (v/c) ratio is a measure that compares the traffic volumes (demand) against the available capacity of an intersection.

Performance Standards

According to the City of Camas Transportation Impact Study Guidelines[6], a minimum LOS C or better on minor and local streets, and D on collector/arterials or better should be maintained for traffic operations.

According to Clark County's Unified Development Code, Title 40.350 – *Transportation and Circulation*[7], Clark County's performance standards require unsignalized intersections to operate at LOS E or better unless traffic signal warrants are met. If traffic signal warrants are met, the intersection is required to operate at LOS D or better. Individual movements at signalized intersections of regional significance are to operate with average delays of less than two cycle lengths or 240 seconds, whichever is less.

Delay & Capacity Analysis

The LOS, delay, and v/c results of the capacity analysis are shown in Table 8 for the morning and evening peak hours. Detailed calculations as well as tables showing the relationship between delay and LOS are included in the appendix to this report.

[5] Transportation Research Board, Highway Capacity Manual 6th Edition, 2016.

[6] transportation_impact_study.pdf (cityofcamas.us)

[7] Section 40.350.020 (codepublishing.com)

Table 8: Intersection Capacity Analysis Summary

Analysis Scenario	AM Peak Hour			PM Peak Hour		
	LOS	Delay (s)	v/c	LOS	Delay (s)	v/c
1. N Hargrave Street at NE 28th Street						
2022 Existing Conditions	B	11	0.02	B	11	0.03
2024 Background Conditions	B	13	0.17	B	13	0.13
2024 Buildout Conditions	B	13	0.17	B	14	0.14
2. NE 232nd Avenue at NE 28th Street						
2022 Existing Conditions	B	11	0.16	B	14	0.14
2024 Background Conditions	B	16	0.26	C	17	0.26
2024 Buildout Conditions	C	16	0.27	C	17	0.28

Table Notes: ***BOLDED*** *text indicates intersection operation above jurisdictional standards.*

Based on the results of the operational analysis, all study intersections are currently operating acceptably per City of Camas and Clark County standards and are projected to continue operating acceptably through the 2024 buildout year of the site. Accordingly, no operational mitigation is necessary or recommended at the study intersections.

Intersection Queuing Analysis

In accordance with the City of Camas Transportation Impact Study Guidelines, a queuing analysis was conducted at the study intersections to determine whether sufficient storage is available at applicable turning movements to accommodate projected queues.

The queue lengths were projected based on the results of a Synchro/SimTraffic simulation, with the reported values representing the 95th percentile queue length. The 95th percentile queue is a statistical measurement which indicates there is a 5 percent chance that the queue may exceed this length during the analysis period; however, given this is a probability, the 95th percentile queue length may theoretically never be met or observed in the field.

The projected 95th percentile queue lengths reported in the simulation are presented in Table 9 for the morning and evening peak hours. Note the reported queue lengths were rounded up to the nearest five feet. Available lane storages at applicable turning movements were rounded to the nearest five feet. Detailed queuing analysis worksheets are included in the technical appendix to this report.

Table 9: Queuing Analysis Summary

		Available Storage (ft)	AM Peak Hour 95th (ft)	PM Peak Hour 95th (ft)
1. N Hargrave Street at NE 28th Street				
2022 Existing Conditions	EB LT Lane	-	15	15
	WB LT Lane	-	0	0
	NB Lane	-	0	0
	SB Lane	-	35	50
2024 Background Conditions	EB LT Lane	-	30	40
	WB LT Lane	-	0	0
	NB Lane	-	0	0
	SB Lane	-	60	75
2024 Buildout Conditions	EB LT Lane	-	30	40
	WB LT Lane	-	10	20
	NB Lane	-	40	35
	SB Lane	-	55	80
2. NE 232nd Avenue at NE 28th Street				
2022 Existing Conditions	EB Lane	-	5	10
	WB Lane	-	10	20
	NB Lane	-	55	50
	SB Lane	-	35	10
2024 Background Conditions	EB Lane	-	5	10
	WB Lane	-	15	20
	NB Lane	-	60	60
	SB Lane	-	35	15
2024 Buildout Conditions	EB Lane	-	5	15
	WB Lane	-	15	25
	NB Lane	-	65	65
	SB Lane	-	35	10

Table Notes: ***BOLDED*** *text indicates queue length exceeds avaialble storage.*

Based on the intersection queuing analysis, all applicable turning movements at the study intersections have adequate storage space to accommodate projected 95th percentile queue, where queues are not expected to extend back to adjacent public intersections. Accordingly, no intersection queuing related mitigation is necessary or recommended as part of the proposed development.

Conclusions

No significant trends or crash patterns were identified at any of the study intersections that are indicative of safety concerns. Accordingly, no safety mitigation is recommended per the crash data analysis.

Provided any obstructing on-site foliage near the proposed access location is removed following redevelopment of the site, adequate intersection sight distances to the east and west of the proposed site access can be made available to ensure safe and efficient operation along NE 28th Street. No other mitigation is necessary or recommended with regard to sight distance at the proposed access intersection.

Left-turn lane warrants are not projected to be met in the eastbound and westbound directions of travel at the intersection of NE 232nd Avenue at NE 28th Street. The intersection of N Hargrave Street at NE 28th Street is currently served by a center two-way left-turn lane on the east and west intersection legs. Accordingly, no new left-turn lanes are necessary or recommended at any of the study intersections.

All-way stop warrants and traffic signal warrants at the study intersections are not projected to be met at the study intersections by the 2024 buildout year of the site. Accordingly, installation of all-way stop-controls or traffic signals at the study intersections are not necessary or recommended as part of the Monte Verde Subdivision application.

The proposed site access will be located opposite of N Hargrave Street, with the nearest intersecting roadways along NE 28th Street being N Juniper Street to the east (approximately 700 feet away) and N Boxwood Street to the west (approximately 650 feet away). Therefore, the proposed site access will meet the City of Camas' access spacing standards, whereby no access related mitigation is necessary.

All study intersections are currently operating acceptably per City of Camas and Clark County standards and are projected to continue operating acceptably through the 2024 buildout year of the site. Accordingly, no operational mitigation is necessary or recommended at the study intersections.

All applicable turning movements at the study intersections have adequate storage space to accommodate projected 95th percentile queue, where queues are not expected to extend back to adjacent public intersections. Accordingly, no intersection queuing related mitigation is necessary or recommended as part of the proposed development.

Appendix A – Site Plan

Site Plan

Monte Verde Subdivision

Located in the SE ¼ of Section 21, T2N, R3E and in
the SW ¼ of Section 21, T2N, R3E, W.M.
Camas, Washington

GENERAL NOTES

Applicant:
Pacific Lifestyle Homes
Ryan Stygar
11815 NE 99th Street
Vancouver, WA 98682
Office (360) 304-9901

OWNER:
Dwight Southern
22205 NE 28th Street
Camas, WA 98607

CIVIL ENGINEER:
PLS Engineering
Contact: Travis Johnson, PE
604 W Evergreen Blvd
Vancouver, WA 98660
PH: (360) 944-6519
pm@plsengineering.com

SITE ADDRESS:
Parcel # 173184-000
22205 NE 28th Street
Camas, WA 98607

LAND USE:
The applicant is proposing a 34 lot subdivision in the R7.5 zone.

Per Municipal Code section 18.09.060, density transfer is proposed with the inclusion of an improved park area. Both of the proposed park tracts have 0.5 acres of contiguous area (total park area of 0.9 acre). The city may provide additional flexibility to the minimum lot width standards with the proposed park area.

Existing Lot Area = 8.45 Acres
Proposed open space = 1 Acre
Minimum Proposed Lot Area = 5822 sq-ft
Maximum Proposed Lot Area = 8265 sq-ft
Average Lot Area = 6521 sq-ft
Min. Lot Width = 52.5'

Maximum Density = 5.8 d.u./net acre (43 lots)
Proposed Density = 4.2 d.u./net acre (33 lots)

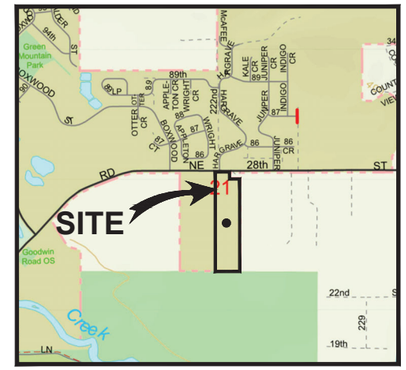
ENVIRONMENTAL CONSTRAINTS:
There are multiple Oregon white oak trees located on or near the site. There are no known water courses or water bodies, no areas within 100-year floodplain, no designated shoreline areas, no landslide or erosion hazard areas, no wetlands, no known significant historic resources and no known significant habitat onsite.

TRANSPORTATION:
For primary access to the site the applicant is proposing to construct a roadway connection to NE 28th Street that aligns with NE Hargrave Street. NE 28th Street is classified as a 3-lane collector/arterial. Half width improvements are proposed for this public roadway. Internal public roadways will consist of local access roadways with circulation provided to the east and west.

UTILITIES:
Stormwater runoff is proposed to be collected and routed to a detention facility located on the south end of the site, runoff generated from pollution generating surfaces will be treated using filter cartridges prior to entering the stormwater facility.

The site will be served by public water and sanitary sewer provided by the City of Camas. The connection point for both water and sewer are within NE 28th Street. Due to the existing grade of the site that slopes away from NE 28th Street, a majority of the lots will need to utilize a grinder pump system.

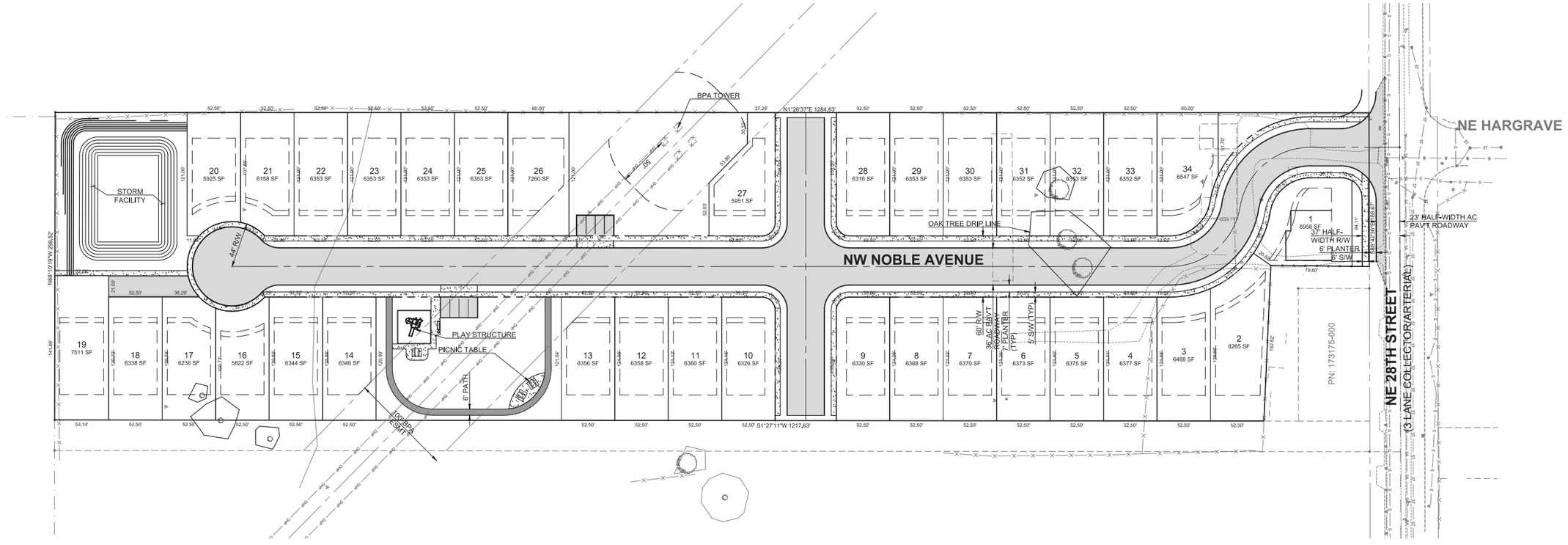
There is an existing well and septic system located on the site that will be removed/abandoned.



VICINITY MAP
NOT TO SCALE

Legend	
Proposed Asphalt Concrete	
Proposed Cement Concrete	
Proposed Gravel	

Scale 1" = 50'
50 25 0 50



ENGINEERING | PLS

Conceptual Plat for:
Monte Verde Subdivision
A Subdivision Located in the City of Camas, Washington
Engineering - Surveying - Planning | 604 W. Evergreen Blvd., Vancouver, WA 98660 | PH (360) 944-6519 | Fax (360) 944-6539

Revisions

1	2	3	4	5	6

Project No. 3382	
SCALE:	H: 1" = 50' V: N/A
DESIGNED BY:	JMT
DRAFTED BY:	JSV
REVIEWED BY:	TGJ

1

Exhibit 6 SUB22-05

Appendix B – Trip Generation and Distribution

Trip Generation

US Census Home/Work Data

TRIP GENERATION CALCULATIONS
Source: Trip Generation Manual, 11th Edition
Existing Conditions

Land Use:	Single-Family Detached Housing
Land Use Code:	210
Land Use Subcategory:	All Sites
Setting/Location	General Urban/Suburban
Variable:	Dwelling Units
Trip Type:	Vehicle
Variable Quantity:	1

WARNING: Variable Quantity is less than Minimum Survey Size for Peak Hours

AM PEAK HOUR

Trip Rate: 0.7

	Enter	Exit	Total
Directional Split	26%	74%	
Trip Ends	0	1	1

PM PEAK HOUR

Trip Rate: 0.94

	Enter	Exit	Total
Directional Split	63%	37%	
Trip Ends	1	0	1

WEEKDAY

Trip Rate: 9.43

	Enter	Exit	Total
Directional Split	50%	50%	
Trip Ends	5	5	10

SATURDAY

Trip Rate: 9.48

	Enter	Exit	Total
Directional Split	50%	50%	
Trip Ends	5	5	10

TRIP GENERATION CALCULATIONS
Source: Trip Generation Manual, 11th Edition
Proposed Conditions

Land Use:	Single-Family Detached Housing
Land Use Code:	210
Land Use Subcategory:	All Sites
Setting/Location	General Urban/Suburban
Variable:	Dwelling Units
Trip Type:	Vehicle
Variable Quantity:	34

AM PEAK HOUR

Trip Rate: 0.7

	Enter	Exit	Total
Directional Split	26%	74%	
Trip Ends	6	18	24

PM PEAK HOUR

Trip Rate: 0.94

	Enter	Exit	Total
Directional Split	63%	37%	
Trip Ends	20	12	32

WEEKDAY

Trip Rate: 9.43

	Enter	Exit	Total
Directional Split	50%	50%	
Trip Ends	160	160	320

SATURDAY

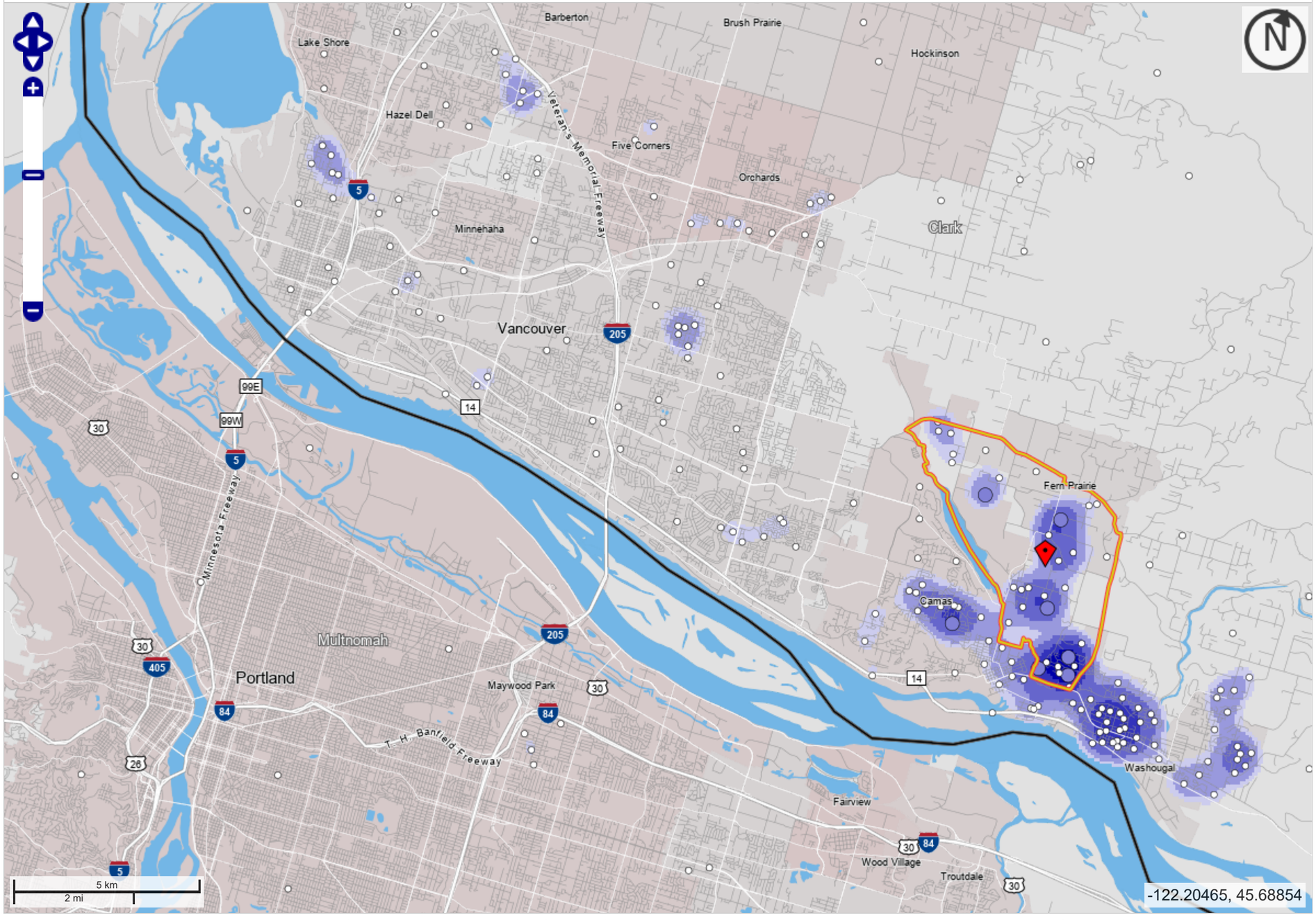
Trip Rate: 9.48

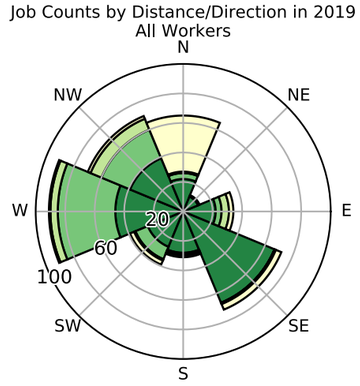
	Enter	Exit	Total
Directional Split	50%	50%	
Trip Ends	161	161	322

An official website of the United States government Here's how you know

OnTheMap

Save Load Feedback Previous Extent Show Tabs Hide Chart/Report





View as Radial Chart

Jobs by Distance - Work Census Block to Home Census Block

	2019 Count	2019 Share
Total All Jobs	414	100.0%
Less than 10 miles	261	63.0%
10 to 24 miles	78	18.8%
25 to 50 miles	22	5.3%
Greater than 50 miles	53	12.8%

Note: The U.S. Census Bureau reviewed this data product for unauthorized disclosure of confidential information and approved the disclosure avoidance practices applied to this release. CBDRB-FY21-249.

Appendix C – Traffic Volumes

Traffic Counts

In-Process Data

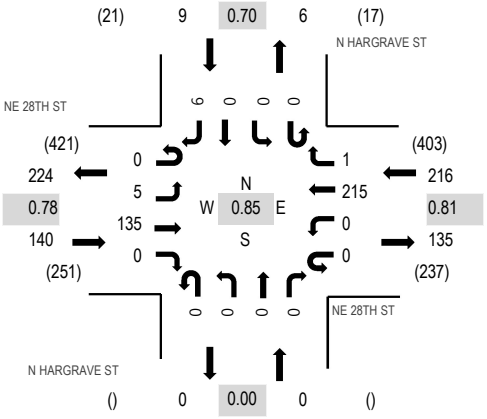
Location: 1 N HARGRAVE ST & NE 28TH ST AM

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

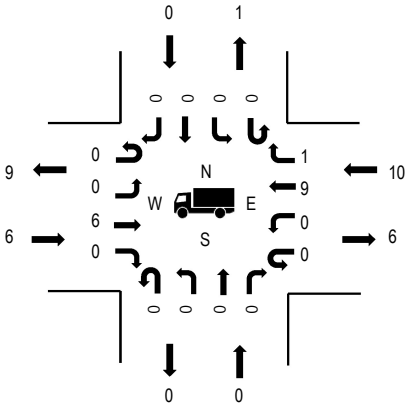
Location: 1 N HARGRAVE ST & NE 28TH ST AM
Date: Wednesday, June 29, 2022
Peak Hour: 08:00 AM - 09:00 AM
Peak 15-Minutes: 08:45 AM - 09:00 AM

Peak Hour

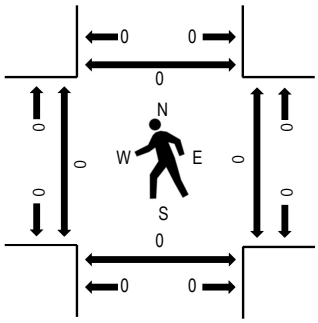
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	4.3%	0.78
WB	4.6%	0.81
NB	0.0%	0.00
SB	0.0%	0.70
All	4.4%	0.85

Traffic Counts - Motorized Vehicles

Interval Start Time	NE 28TH ST Eastbound				NE 28TH ST Westbound				N HARGRAVE ST Northbound				N HARGRAVE ST Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
7:00 AM	0	2	5	0	0	0	13	0	0	0	0	0	0	0	0	0	20	310
7:05 AM	0	0	6	0	0	0	14	0	0	0	0	0	0	0	0	1	21	310
7:10 AM	0	1	13	0	0	0	15	0	0	0	0	0	0	0	0	0	29	314
7:15 AM	0	0	9	0	0	0	13	0	0	0	0	0	0	0	0	3	25	308
7:20 AM	0	0	10	0	0	0	12	0	0	0	0	0	0	0	0	1	23	316
7:25 AM	0	2	5	0	0	0	14	0	0	0	0	0	0	0	0	0	21	324
7:30 AM	0	0	8	0	0	0	18	0	0	0	0	0	0	1	0	1	28	335
7:35 AM	0	1	12	0	0	0	24	0	0	0	0	0	0	0	0	1	38	344
7:40 AM	0	1	7	0	0	0	24	0	0	0	0	0	0	0	0	1	33	341
7:45 AM	0	1	7	0	0	0	16	1	0	0	0	0	0	0	0	0	25	330
7:50 AM	0	2	7	0	0	0	16	0	0	0	0	0	0	0	0	3	28	335
7:55 AM	0	0	12	0	0	0	7	0	0	0	0	0	0	0	0	0	19	346
8:00 AM	0	0	10	0	0	0	9	1	0	0	0	0	0	0	0	0	20	365
8:05 AM	0	0	11	0	0	0	14	0	0	0	0	0	0	0	0	0	25	
8:10 AM	0	0	7	0	0	0	13	0	0	0	0	0	0	0	0	3	23	
8:15 AM	0	0	10	0	0	0	23	0	0	0	0	0	0	0	0	0	33	
8:20 AM	0	1	9	0	0	0	19	0	0	0	0	0	0	0	0	2	31	
8:25 AM	0	0	15	0	0	0	16	0	0	0	0	0	0	0	0	1	32	
8:30 AM	0	1	13	0	0	0	23	0	0	0	0	0	0	0	0	0	37	
8:35 AM	0	0	16	0	0	0	17	0	0	0	0	0	0	0	0	2	35	
8:40 AM	0	0	7	0	0	0	14	0	0	0	0	0	0	0	0	1	22	
8:45 AM	0	0	13	0	0	0	17	0	0	0	0	0	0	0	0	0	30	
8:50 AM	0	1	14	0	0	0	24	0	0	0	0	0	0	0	0	0	39	
8:55 AM	0	2	10	0	0	0	26	0	0	0	0	0	0	0	0	0	38	
Count Total	0	15	236	0	0	0	401	2	0	0	0	0	0	1	0	20	675	
Peak Hour	0	5	135	0	0	0	215	1	0	0	0	0	0	0	0	9	365	

Location: 1 N HARGRAVE ST & NE 28TH ST AM

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

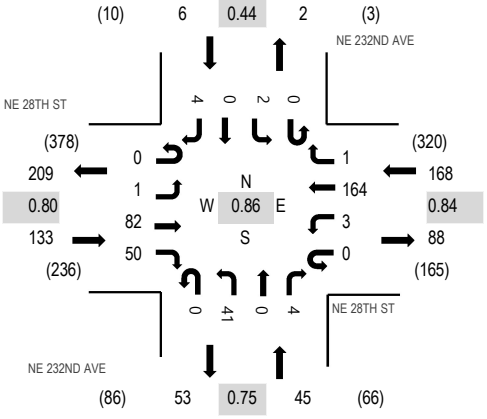
Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
7:00 AM	1	0	1	0	2	7:00 AM	0	0	0	0	0	7:00 AM	0	0	0	0	0
7:05 AM	1	0	0	0	1	7:05 AM	0	0	0	0	0	7:05 AM	0	0	0	0	0
7:10 AM	1	0	0	0	1	7:10 AM	0	0	1	0	1	7:10 AM	0	0	0	0	0
7:15 AM	1	0	0	0	1	7:15 AM	0	0	0	0	0	7:15 AM	0	0	0	0	0
7:20 AM	1	0	0	0	1	7:20 AM	0	0	0	0	0	7:20 AM	0	0	0	0	0
7:25 AM	0	0	0	0	0	7:25 AM	0	0	0	0	0	7:25 AM	0	0	0	0	0
7:30 AM	0	0	0	1	1	7:30 AM	0	0	0	0	0	7:30 AM	0	0	0	0	0
7:35 AM	2	0	0	0	2	7:35 AM	0	0	1	0	1	7:35 AM	0	0	0	0	0
7:40 AM	0	0	0	0	0	7:40 AM	0	0	0	0	0	7:40 AM	0	0	0	0	0
7:45 AM	1	0	1	0	2	7:45 AM	0	0	0	0	0	7:45 AM	0	0	0	0	0
7:50 AM	0	0	0	0	0	7:50 AM	0	0	0	0	0	7:50 AM	0	0	0	0	0
7:55 AM	1	0	0	0	1	7:55 AM	0	0	0	0	0	7:55 AM	0	0	0	0	0
8:00 AM	1	0	2	0	3	8:00 AM	0	0	0	0	0	8:00 AM	0	0	0	0	0
8:05 AM	0	0	1	0	1	8:05 AM	0	0	0	0	0	8:05 AM	0	0	0	0	0
8:10 AM	0	0	0	0	0	8:10 AM	0	0	0	0	0	8:10 AM	0	0	0	0	0
8:15 AM	0	0	1	0	1	8:15 AM	0	0	0	0	0	8:15 AM	0	0	0	0	0
8:20 AM	0	0	3	0	3	8:20 AM	0	0	0	0	0	8:20 AM	0	0	0	0	0
8:25 AM	0	0	1	0	1	8:25 AM	0	0	0	0	0	8:25 AM	0	0	0	0	0
8:30 AM	1	0	0	0	1	8:30 AM	1	0	0	0	1	8:30 AM	0	0	0	0	0
8:35 AM	2	0	0	0	2	8:35 AM	0	0	0	0	0	8:35 AM	0	0	0	0	0
8:40 AM	0	0	0	0	0	8:40 AM	0	0	0	0	0	8:40 AM	0	0	0	0	0
8:45 AM	1	0	0	0	1	8:45 AM	1	0	0	0	1	8:45 AM	0	0	0	0	0
8:50 AM	1	0	0	0	1	8:50 AM	0	0	0	0	0	8:50 AM	0	0	0	0	0
8:55 AM	0	0	2	0	2	8:55 AM	0	0	0	0	0	8:55 AM	0	0	0	0	0
Count Total	15	0	12	1	28	Count Total	2	0	2	0	4	Count Total	0	0	0	0	0
Peak Hour	6	0	10	0	16	Peak Hour	2	0	0	0	2	Peak Hour	0	0	0	0	0

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

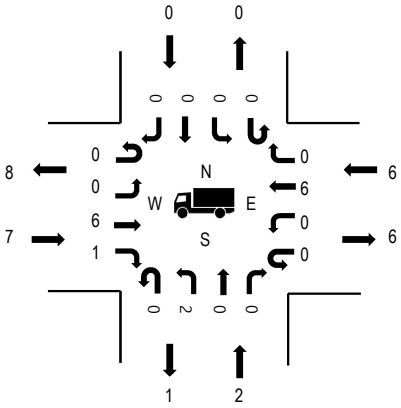
Location: 2 NE 232ND AVE & NE 28TH ST AM
Date: Wednesday, June 29, 2022
Peak Hour: 08:00 AM - 09:00 AM
Peak 15-Minutes: 08:45 AM - 09:00 AM

Peak Hour

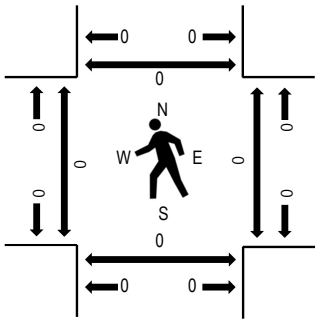
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	5.3%	0.80
WB	3.6%	0.84
NB	4.4%	0.75
SB	0.0%	0.44
All	4.3%	0.86

Traffic Counts - Motorized Vehicles

Interval Start Time	NE 28TH ST Eastbound				NE 28TH ST Westbound				NE 232ND AVE Northbound				NE 232ND AVE Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
7:00 AM	0	0	4	4	0	0	10	0	0	0	0	0	0	0	0	1	19	280
7:05 AM	0	0	7	1	0	1	13	0	0	1	0	1	0	0	0	0	24	281
7:10 AM	0	0	7	4	0	0	9	0	0	4	0	0	0	0	0	1	25	281
7:15 AM	0	0	7	1	0	0	11	0	0	2	0	0	0	0	0	0	21	281
7:20 AM	0	0	7	2	0	0	10	0	0	1	0	0	0	0	0	0	20	290
7:25 AM	0	0	7	1	0	1	12	0	0	1	0	0	0	0	0	0	22	301
7:30 AM	0	0	6	0	0	0	14	0	0	4	0	0	0	0	0	0	24	308
7:35 AM	0	0	8	5	0	1	19	1	0	1	0	0	0	0	0	1	36	318
7:40 AM	0	0	4	2	0	1	20	0	0	2	0	0	0	0	0	0	29	319
7:45 AM	0	0	6	2	0	0	12	0	0	1	0	0	0	0	0	0	21	310
7:50 AM	0	0	4	2	0	1	11	0	0	3	0	0	0	0	0	1	22	319
7:55 AM	0	0	9	3	0	1	4	0	0	0	0	0	0	0	0	0	17	337
8:00 AM	0	0	6	4	0	0	6	0	0	3	0	0	0	0	0	1	20	352
8:05 AM	0	0	8	2	0	0	12	1	0	1	0	0	0	0	0	0	24	
8:10 AM	0	0	7	2	0	1	7	0	0	5	0	0	0	1	0	2	25	
8:15 AM	0	0	7	0	0	0	21	0	0	1	0	0	0	1	0	0	30	
8:20 AM	0	0	5	7	0	0	15	0	0	4	0	0	0	0	0	0	31	
8:25 AM	0	0	8	3	0	0	14	0	0	3	0	1	0	0	0	0	29	
8:30 AM	0	0	8	5	0	1	18	0	0	2	0	0	0	0	0	0	34	
8:35 AM	0	0	11	7	0	0	15	0	0	4	0	0	0	0	0	0	37	
8:40 AM	0	0	2	4	0	0	7	0	0	5	0	2	0	0	0	0	20	
8:45 AM	0	0	6	5	0	0	15	0	0	3	0	1	0	0	0	0	30	
8:50 AM	0	1	8	7	0	1	20	0	0	3	0	0	0	0	0	0	40	
8:55 AM	0	0	6	4	0	0	14	0	0	7	0	0	0	0	0	1	32	
Count Total	0	1	158	77	0	9	309	2	0	61	0	5	0	2	0	8	632	
Peak Hour	0	1	82	50	0	3	164	1	0	41	0	4	0	2	0	4	352	

Location: 2 NE 232ND AVE & NE 28TH ST AM

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

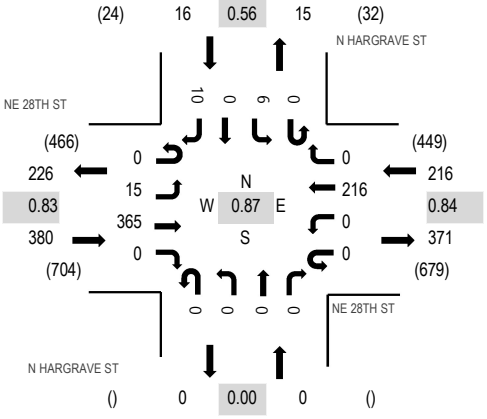
Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
7:00 AM	0	0	0	0	0	7:00 AM	0	0	0	0	0	7:00 AM	0	0	0	0	0
7:05 AM	1	0	0	0	1	7:05 AM	0	0	0	0	0	7:05 AM	0	0	0	0	0
7:10 AM	0	0	0	0	0	7:10 AM	0	0	1	0	1	7:10 AM	0	0	0	0	0
7:15 AM	1	0	0	0	1	7:15 AM	0	0	0	0	0	7:15 AM	0	0	0	0	0
7:20 AM	0	0	0	0	0	7:20 AM	0	0	0	0	0	7:20 AM	0	0	0	0	0
7:25 AM	1	0	0	0	1	7:25 AM	0	0	0	0	0	7:25 AM	0	0	0	0	0
7:30 AM	2	0	0	0	2	7:30 AM	0	0	1	0	1	7:30 AM	0	0	0	0	0
7:35 AM	2	0	0	0	2	7:35 AM	0	0	0	0	0	7:35 AM	0	0	0	0	0
7:40 AM	0	0	0	0	0	7:40 AM	0	0	0	0	0	7:40 AM	0	0	0	0	0
7:45 AM	1	0	0	0	1	7:45 AM	0	0	0	0	0	7:45 AM	0	0	0	0	0
7:50 AM	0	0	0	0	0	7:50 AM	0	0	0	0	0	7:50 AM	0	0	0	0	0
7:55 AM	1	0	0	0	1	7:55 AM	0	0	0	0	0	7:55 AM	0	0	0	0	0
8:00 AM	1	0	1	0	2	8:00 AM	0	0	0	0	0	8:00 AM	0	0	0	0	0
8:05 AM	1	0	0	0	1	8:05 AM	0	0	0	0	0	8:05 AM	0	0	0	0	0
8:10 AM	0	0	0	0	0	8:10 AM	0	0	0	0	0	8:10 AM	0	0	0	0	0
8:15 AM	0	0	2	0	2	8:15 AM	0	0	0	0	0	8:15 AM	0	0	0	0	0
8:20 AM	0	1	1	0	2	8:20 AM	0	0	0	0	0	8:20 AM	0	0	0	0	0
8:25 AM	0	0	2	0	2	8:25 AM	0	0	0	0	0	8:25 AM	0	0	0	0	0
8:30 AM	2	0	0	0	2	8:30 AM	0	0	0	0	0	8:30 AM	0	0	0	0	0
8:35 AM	1	0	0	0	1	8:35 AM	0	0	0	0	0	8:35 AM	0	0	0	0	0
8:40 AM	0	0	0	0	0	8:40 AM	0	1	0	0	1	8:40 AM	0	0	0	0	0
8:45 AM	2	0	0	0	2	8:45 AM	0	0	0	0	0	8:45 AM	0	0	0	0	0
8:50 AM	0	1	0	0	1	8:50 AM	1	0	0	0	1	8:50 AM	0	0	0	0	0
8:55 AM	0	0	0	0	0	8:55 AM	0	0	0	0	0	8:55 AM	0	0	0	0	0
Count Total	16	2	6	0	24	Count Total	1	1	2	0	4	Count Total	0	0	0	0	0
Peak Hour	7	2	6	0	15	Peak Hour	1	1	0	0	2	Peak Hour	0	0	0	0	0

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

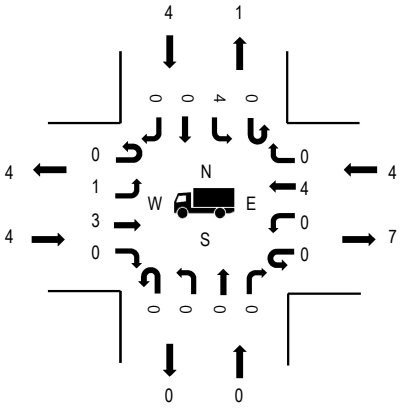
Location: 1 N HARGRAVE ST & NE 28TH ST PM
Date: Wednesday, June 29, 2022
Peak Hour: 05:00 PM - 06:00 PM
Peak 15-Minutes: 05:20 PM - 05:35 PM

Peak Hour

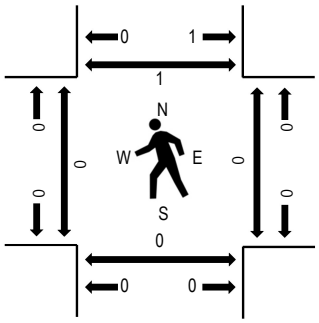
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	1.1%	0.83
WB	1.9%	0.84
NB	0.0%	0.00
SB	25.0%	0.56
All	2.0%	0.87

Traffic Counts - Motorized Vehicles

Interval Start Time	NE 28TH ST Eastbound				NE 28TH ST Westbound				N HARGRAVE ST Northbound				N HARGRAVE ST Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
4:00 PM	0	1	30	0	0	0	21	0	0	0	0	0	0	0	0	1	53	565
4:05 PM	0	0	28	0	0	0	22	0	0	0	0	0	0	0	0	0	50	560
4:10 PM	0	1	22	0	0	0	21	0	0	0	0	0	0	0	0	0	44	557
4:15 PM	0	2	30	0	0	0	25	0	0	0	0	0	0	0	0	0	57	558
4:20 PM	0	2	16	0	0	0	23	0	0	0	0	0	0	0	0	0	41	549
4:25 PM	0	2	31	0	0	0	15	0	0	0	0	0	0	0	0	1	49	571
4:30 PM	0	2	19	0	0	0	19	0	0	0	0	0	0	0	0	0	40	586
4:35 PM	0	1	24	0	0	0	10	0	0	0	0	0	0	0	0	2	37	595
4:40 PM	0	0	24	0	0	0	20	0	0	0	0	0	0	0	0	1	45	607
4:45 PM	0	1	24	0	0	0	31	0	0	0	0	0	0	0	0	1	57	605
4:50 PM	0	3	38	0	0	0	13	0	0	0	0	0	0	0	0	0	54	597
4:55 PM	0	2	21	0	0	0	13	0	0	0	0	0	0	1	0	1	38	604
5:00 PM	0	1	27	0	0	0	15	0	0	0	0	0	0	2	0	3	48	612
5:05 PM	0	1	31	0	0	0	14	0	0	0	0	0	0	1	0	0	47	
5:10 PM	0	1	26	0	0	0	16	0	0	0	0	0	0	0	0	2	45	
5:15 PM	0	1	24	0	0	0	22	0	0	0	0	0	0	0	0	1	48	
5:20 PM	0	0	37	0	0	0	24	0	0	0	0	0	0	1	0	1	63	
5:25 PM	0	1	40	0	0	0	22	0	0	0	0	0	0	0	0	1	64	
5:30 PM	0	2	35	0	0	0	12	0	0	0	0	0	0	0	0	0	49	
5:35 PM	0	2	34	0	0	0	13	0	0	0	0	0	0	0	0	0	49	
5:40 PM	0	0	25	0	0	0	17	0	0	0	0	0	0	1	0	0	43	
5:45 PM	0	2	29	0	0	0	18	0	0	0	0	0	0	0	0	0	49	
5:50 PM	0	2	37	0	0	0	21	0	0	0	0	0	0	1	0	0	61	
5:55 PM	0	2	20	0	0	0	22	0	0	0	0	0	0	0	0	2	46	
Count Total	0	32	672	0	0	0	449	0	0	0	0	0	0	7	0	17	1,177	
Peak Hour	0	15	365	0	0	0	216	0	0	0	0	0	0	6	0	10	612	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

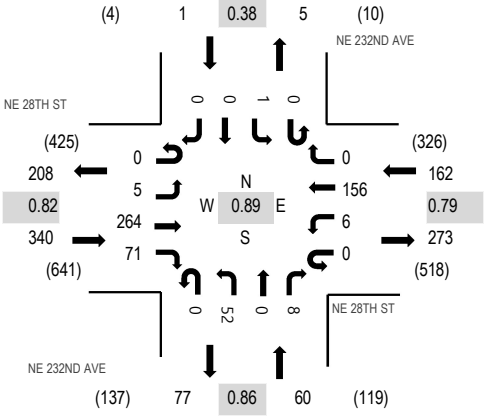
Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	1	0	0	0	1	4:00 PM	0	0	0	0	0	4:00 PM	0	0	0	0	0
4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0	0
4:10 PM	0	0	1	0	1	4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	0	0
4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	0	0
4:20 PM	1	0	1	0	2	4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	1	1
4:25 PM	1	0	0	0	1	4:25 PM	0	0	0	0	0	4:25 PM	0	0	0	0	0
4:30 PM	1	0	1	0	2	4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0	0
4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0
4:40 PM	0	0	1	0	1	4:40 PM	0	0	0	0	0	4:40 PM	0	0	2	0	2
4:45 PM	1	0	0	0	1	4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	0	0
4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0
4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0
5:00 PM	0	0	0	1	1	5:00 PM	0	0	1	0	1	5:00 PM	0	0	0	0	0
5:05 PM	0	0	2	0	2	5:05 PM	0	0	1	0	1	5:05 PM	0	0	0	0	0
5:10 PM	0	0	1	0	1	5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0
5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0
5:20 PM	0	0	0	1	1	5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0	0
5:25 PM	0	0	1	0	1	5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0	0
5:30 PM	1	0	0	0	1	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0
5:35 PM	1	0	0	0	1	5:35 PM	0	0	0	0	0	5:35 PM	0	0	0	3	3
5:40 PM	2	0	0	1	3	5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0
5:50 PM	0	0	0	1	1	5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0
5:55 PM	0	0	0	0	0	5:55 PM	0	0	1	0	1	5:55 PM	0	0	0	0	0
Count Total	9	0	8	4	21	Count Total	0	0	3	0	3	Count Total	0	0	2	4	6
Peak Hour	4	0	4	4	12	Peak Hour	0	0	3	0	3	Peak Hour	0	0	0	3	3

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

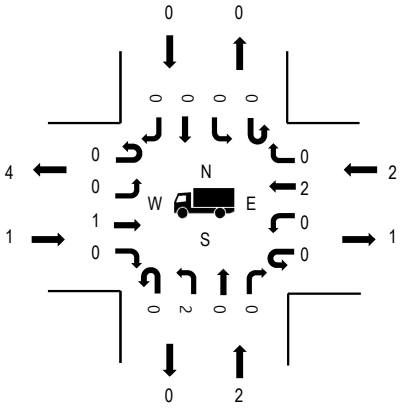
Location: 2 NE 232ND AVE & NE 28TH ST PM
Date: Wednesday, June 29, 2022
Peak Hour: 04:40 PM - 05:40 PM
Peak 15-Minutes: 05:15 PM - 05:30 PM

Peak Hour

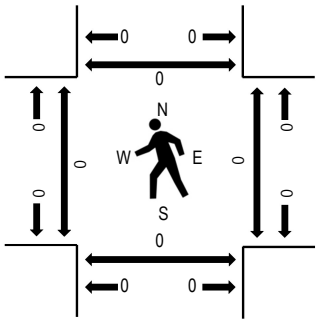
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	0.3%	0.82
WB	1.2%	0.79
NB	3.3%	0.86
SB	0.0%	0.38
All	0.9%	0.89

Traffic Counts - Motorized Vehicles

Interval Start Time	NE 28TH ST Eastbound				NE 28TH ST Westbound				NE 232ND AVE Northbound				NE 232ND AVE Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
4:00 PM	0	0	21	4	0	1	13	0	0	4	0	0	0	0	0	0	43	537
4:05 PM	0	0	31	2	0	0	14	0	0	8	0	0	0	0	0	0	55	531
4:10 PM	0	0	20	3	0	0	10	0	0	3	0	0	0	0	0	0	36	522
4:15 PM	0	0	22	4	0	0	17	0	0	7	0	0	0	0	0	1	51	526
4:20 PM	0	0	12	5	0	0	20	1	0	3	0	0	0	0	0	0	41	518
4:25 PM	0	1	23	2	0	0	7	0	0	6	0	3	0	0	0	0	42	531
4:30 PM	0	1	20	2	0	0	13	0	0	4	0	0	0	0	0	1	41	551
4:35 PM	0	0	17	6	0	0	10	0	0	4	0	1	0	0	0	0	38	550
4:40 PM	0	0	22	4	0	0	15	0	0	3	0	0	0	1	0	0	45	563
4:45 PM	0	0	17	5	0	2	27	0	0	5	0	1	0	0	0	0	57	560
4:50 PM	0	1	27	7	0	0	7	0	0	2	0	2	0	0	0	0	46	548
4:55 PM	0	1	18	4	0	1	12	0	0	6	0	0	0	0	0	0	42	558
5:00 PM	0	0	20	2	0	0	11	0	0	3	0	1	0	0	0	0	37	553
5:05 PM	0	0	27	3	0	2	9	0	0	4	0	1	0	0	0	0	46	
5:10 PM	0	0	17	9	0	0	10	0	0	4	0	0	0	0	0	0	40	
5:15 PM	0	0	16	5	0	0	16	0	0	6	0	0	0	0	0	0	43	
5:20 PM	0	1	19	9	0	0	16	0	0	7	0	2	0	0	0	0	54	
5:25 PM	0	0	33	9	0	0	14	0	0	6	0	0	0	0	0	0	62	
5:30 PM	0	1	25	4	0	0	8	0	0	2	0	0	0	0	0	0	40	
5:35 PM	0	1	23	10	0	1	11	0	0	4	0	1	0	0	0	0	51	
5:40 PM	0	0	18	6	0	0	14	0	0	3	0	1	0	0	0	0	42	
5:45 PM	0	0	17	14	0	0	11	0	0	2	0	1	0	0	0	0	45	
5:50 PM	0	2	23	6	0	0	17	0	0	7	0	0	0	0	0	1	56	
5:55 PM	0	0	15	4	0	1	15	0	0	2	0	0	0	0	0	0	37	
Count Total	0	9	503	129	0	8	317	1	0	105	0	14	0	1	0	3	1,090	
Peak Hour	0	5	264	71	0	6	156	0	0	52	0	8	0	1	0	0	563	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	1	0	1	0	2	4:00 PM	0	0	0	0	0	4:00 PM	0	0	0	0	0
4:05 PM	1	0	0	0	1	4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0	0
4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	0	0
4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	0	0
4:20 PM	1	0	1	0	2	4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	0	0
4:25 PM	1	1	1	0	3	4:25 PM	0	0	0	0	0	4:25 PM	0	0	0	1	1
4:30 PM	0	0	1	0	1	4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0	0
4:35 PM	1	0	0	0	1	4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	1	1
4:40 PM	0	1	0	0	1	4:40 PM	0	0	0	0	0	4:40 PM	0	0	0	0	0
4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	0	0
4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0
4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0
5:00 PM	0	0	0	0	0	5:00 PM	0	1	0	0	1	5:00 PM	0	0	0	0	0
5:05 PM	0	1	0	0	1	5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	0	0
5:10 PM	0	0	1	0	1	5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0
5:15 PM	0	0	0	0	0	5:15 PM	0	1	0	0	1	5:15 PM	0	0	0	0	0
5:20 PM	0	0	1	0	1	5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0	0
5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0	0
5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0
5:35 PM	1	0	0	0	1	5:35 PM	0	0	0	0	0	5:35 PM	0	0	0	0	0
5:40 PM	2	0	0	0	2	5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0
5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0
5:55 PM	0	0	0	0	0	5:55 PM	0	1	0	0	1	5:55 PM	0	0	0	0	0
Count Total	8	3	6	0	17	Count Total	0	3	0	0	3	Count Total	0	0	0	2	2
Peak Hour	1	2	2	0	5	Peak Hour	0	2	0	0	2	Peak Hour	0	0	0	0	0

Type of report: Tube Count - Volume Data

LOCATION: SC01316 - NE 28th St W of NE 232nd Ave
QC JOB #: 150604172
SPECIFIC LOCATION:
DIRECTION: EB, WB
CITY/STATE: Clark, WA
DATE: Sep 24 2019 - Sep 24 2019

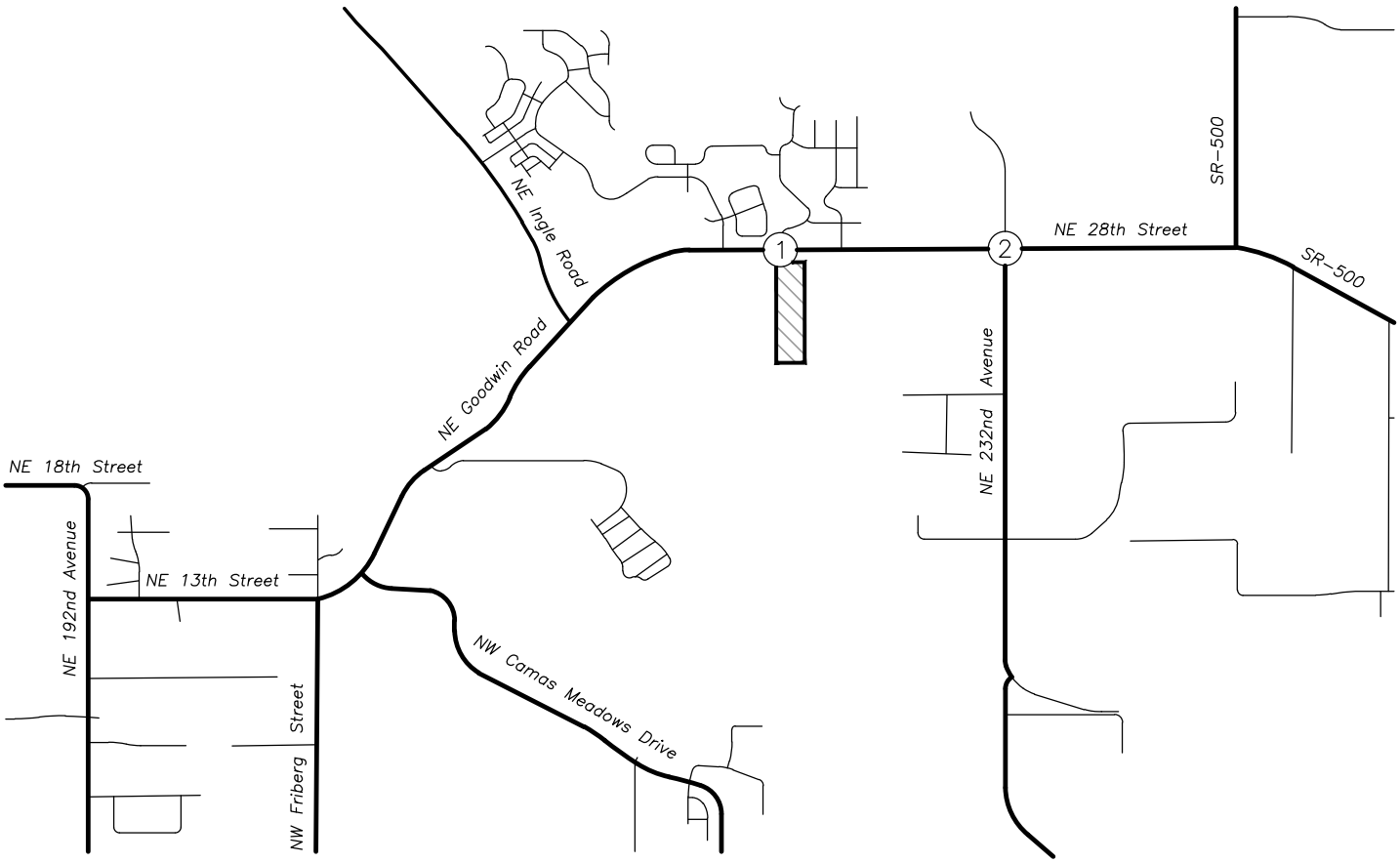
Start Time	Mon	Tue 24 Sep 19	Wed	Thu	Fri	Average Weekday Hourly Traffic	Sat	Sun	Average Week Hourly Traffic	Average Week Profile
12:00 AM		18				18			18	
01:00 AM		17				17			17	
02:00 AM		15				15			15	
03:00 AM		18				18			18	
04:00 AM		47				47			47	
05:00 AM		115				115			115	
06:00 AM		251				251			251	
07:00 AM		414				414			414	
08:00 AM		**472**				**472**			**472**	
09:00 AM		329				329			329	
10:00 AM		313				313			313	
11:00 AM		312				312			312	
12:00 PM		353				353			353	
01:00 PM		355				355			355	
02:00 PM		411				411			411	
03:00 PM		576				576			576	
04:00 PM		509				509			509	
05:00 PM		**586**				**586**			**586**	
06:00 PM		526				526			526	
07:00 PM		366				366			366	
08:00 PM		267				267			267	
09:00 PM		148				148			148	
10:00 PM		69				69			69	
11:00 PM		44				44			44	
Day Total		6531				6531			6531	
% Weekday Average		100%								
% Week Average		100%				100%				
AM Peak Volume		8:00 AM 472				8:00 AM 472			8:00 AM 472	
PM Peak Volume		5:00 PM 586				5:00 PM 586			5:00 PM 586	

Comments:

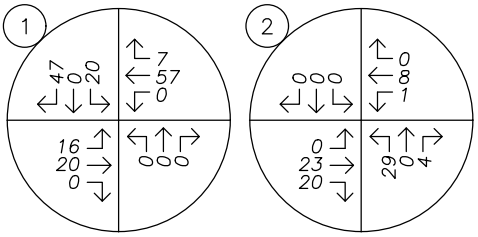
Report generated on 10/3/2019 7:35 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

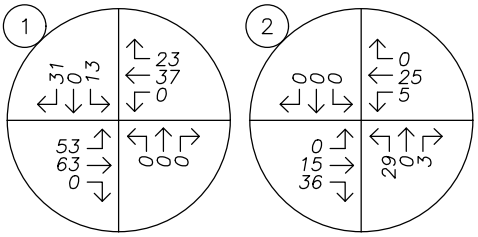
Quality Counts
DATA THAT DRIVES COMMUNITIES



AM PEAK HOUR



PM PEAK HOUR



no scale

TRAFFIC VOLUMES
In-Process Development Trips
AM & PM Peak Hours

Figure A

Appendix D – Safety Analysis

Crash History Data

Left-turn Lane Warrant Analysis

All-Way Stop-Control Warrant Analysis

Traffic Signal Warrant Analysis

OFFICER REPORTED CRASHES THAT OCCURRED AT THE FOLLOWING INTERSECTIONS IN THE CITY OF CAMAS & CLARK COUNTY

222ND AVE / HARGRAVE ST @ 28TH ST

01/01/2017 - 12/31/2021

Under 23 U.S. Code § 148 and 23 U.S. Code § 407, safety data, reports, surveys, schedules, lists compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential crash sites, hazardous roadway conditions, or railway-highway crossings are not subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

JURISDICTION	COUNTY	CITY	PRIMARY TRAFFICWAY	MILEPOST	A / B	BLOCK NUMBER	INTERSECTING TRAFFICWAY	CO ONLY Intersecting County Road MP	DIST FROM REF POINT	MI or FT	COMP DIR FROM REF POINT	REFERENCE POINT NAME	SR ONLY HISTORY/ SUSPENSE	REPORT NUMBER	DATE	TIME	MOST SEVERE INJURY TYPE	# INJ	# FAT	# VEH	# PEDS	# BIKES	VEHICLE 1 TYPE	VEHICLE 2 TYPE	JUNCTION RELATIONSHIP	WEATHER	ROADWAY SURFACE CONDITION	LIGHTING CONDITION	FIRST COLLISION TYPE / OBJECT STRUCK
City Street	Clark	Camas	NE 28TH ST			22100			166	F	W	NE 222ND AVE	No	E711830	09/14/2017	19:12	Possible Injury	1	0	2	0	0	Passenger Car	Passenger Car	At Driveway	Clear or Partly Cloudy	Dry	Dusk	From same direction - both going straight - one stopped - rear-end

OFFICER REPORTED CRASHES THAT OCCURRED AT THE FOLLOWING INTERSECTIONS IN THE CITY OF CAMAS & CLARK COUNTY

222ND AVE / HARGRAVE ST @ 28TH ST

01/01/2017 - 12/31/2021

Under 23 U.S. Code § 148 and 23 U.S. Code § 407, safety data, reports, surveys, schedules, lists compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential crash sites, hazardous roadway conditions, or railway-highway crossings are not subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

VEHICLE 1 ACTION	VEHICLE 2 ACTION	VEHICLE 1 COMPASS DIRECTION FROM	VEHICLE 1 COMPASS DIRECTION TO	VEHICLE 2 COMPASS DIRECTION FROM	VEHICLE 2 COMPASS DIRECTION TO	MV DRIVER CONTRIBUTING CIRCUMSTANCE 1 (UNIT 1)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 2 (UNIT 1)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 3 (UNIT 1)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 1 (UNIT 2)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 2 (UNIT 2)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 3 (UNIT 2)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 1 (UNIT 1)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 2 (UNIT 1)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 3 (UNIT 1)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 1 (UNIT 2)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 2 (UNIT 2)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 3 (UNIT 2)	FIRST IMPACT LOCATION (City, County & Misc Trafficways - 2010 forward)	WA STATE PLANE SOUTH - X 2010 - FORWARD	WA STATE PLANE SOUTH - Y 2010 - FORWARD
Going Straight Ahead	Stopped in Roadway	East	West	Vehicle Stopped	Vehicle Stopped	Operating Defective Equipment	Inattention		None									Lane of Primary Trafficway	1142797.53	119144.89

OFFICER REPORTED CRASHES THAT OCCURRED AT THE FOLLOWING INTERSECTIONS IN THE CITY OF CAMAS & CLARK COUNTY

232ND AVE (CO RD #30950, MP 2.870 - 2.890) @ 28TH ST (CO RD #93350, MP 3.070 - 3.110)

01/01/2017 - 12/31/2021

Under 23 U.S. Code § 148 and 23 U.S. Code § 407, safety data, reports, surveys, schedules, lists compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential crash sites, hazardous roadway conditions, or railway-highway crossings are not subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

JURISDICTION	COUNTY	CITY	PRIMARY TRAFFICWAY	MILEPOST	A / B	BLOCK NUMBER	INTERSECTING TRAFFICWAY	CO ONLY Intersecting County Road MP	DIST FROM REF POINT	MI or FT	COMP DIR FROM REF POINT	REFERENCE POINT NAME	SR ONLY HISTORY/ SUSPENSE	REPORT NUMBER	DATE	TIME	MOST SEVERE INJURY TYPE	# INJ	# FAT	# VEH	# PEDS	# BIKES	VEHICLE 1 TYPE	VEHICLE 2 TYPE	JUNCTION RELATIONSHIP	WEATHER	ROADWAY SURFACE CONDITION	LIGHTING CONDITION	FIRST COLLISION TYPE / OBJECT STRUCK
County Road	Clark		93350	3.090			30950	2.890					No	EB69640	09/01/2021	11:59	No Apparent Injury	0	0	1	0	0	Pickup,Panel Truck or Vanette under 10,000 lb		At Intersection and Related	Clear	Dry	Daylight	Utility Pole
County Road	Clark		93350	3.090			30950	2.890					No	EA02765	12/20/2019	09:12	No Apparent Injury	0	0	2	0	0	Passenger Car	Pickup,Panel Truck or Vanette under 10,000 lb	At Intersection and Related	Raining	Wet	Daylight	From same direction - one left turn - one straight
County Road	Clark		93350	3.090			30950	2.890					No	E681299	06/11/2017	15:58	Possible Injury	2	0	3	0	0	Passenger Car	Pickup,Panel Truck or Vanette under 10,000 lb	Intersection Related but Not at Intersection	Clear or Partly Cloudy	Dry	Daylight	From same direction - both going straight - one stopped - rear-end
County Road	Clark		93350	3.090			30950	2.890					No	EB10619	02/28/2021	16:35	No Apparent Injury	0	0	1	0	1	Pickup,Panel Truck or Vanette under 10,000 lb		At Intersection and Related	Clear	Dry	Daylight	Vehicle Strikes Pedalcyclist
County Road	Clark		93350	3.090			30950	2.890					No	EB42601	06/15/2021	18:31	No Apparent Injury	0	0	2	0	0	Pickup,Panel Truck or Vanette under 10,000 lb	Pickup,Panel Truck or Vanette under 10,000 lb	At Intersection and Related	Raining	Wet	Daylight	Entering at angle
County Road	Clark		93350	3.090			30950	2.890					No	E923671	05/23/2019	16:54	No Apparent Injury	0	0	2	0	0	Passenger Car	Pickup,Panel Truck or Vanette under 10,000 lb	At Intersection and Related	Clear or Partly Cloudy	Dry	Daylight	From same direction - one left turn - one straight
County Road	Clark		93350	3.090			30950	2.890					No	EB53840	07/20/2021	15:10	Suspected Minor Injury	3	0	2	0	0	Passenger Car	Pickup,Panel Truck or Vanette under 10,000 lb	At Intersection and Related	Clear	Dry	Daylight	Entering at angle
County Road	Clark		93350	3.090									No	EA84265	11/24/2020	15:25	Possible Injury	2	0	2	0	0	Pickup,Panel Truck or Vanette under 10,000 lb	Pickup,Panel Truck or Vanette under 10,000 lb	Driveway Related but Not at Driveway	Overcast	Dry	Daylight	From same direction - both going straight - one stopped - rear-end

OFFICER REPORTED CRASHES THAT OCCURRED AT THE FOLLOWING INTERSECTIONS IN THE CITY OF CAMAS & CLARK COUNTY

232ND AVE (CO RD #30950, MP 2.870 - 2.890) @ 28TH ST (CO RD #93350, MP 3.070 - 3.110)

01/01/2017 - 12/31/2021

Under 23 U.S. Code § 148 and 23 U.S. Code § 407, safety data, reports, surveys, schedules, lists compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential crash sites, hazardous roadway conditions, or railway-highway crossings are not subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

VEHICLE 1 ACTION	VEHICLE 2 ACTION	VEHICLE 1 COMPASS DIRECTION FROM	VEHICLE 1 COMPASS DIRECTION TO	VEHICLE 2 COMPASS DIRECTION FROM	VEHICLE 2 COMPASS DIRECTION TO	MV DRIVER CONTRIBUTING CIRCUMSTANCE 1 (UNIT 1)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 2 (UNIT 1)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 3 (UNIT 1)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 1 (UNIT 2)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 2 (UNIT 2)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 3 (UNIT 2)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 1 (UNIT 1)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 2 (UNIT 1)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 3 (UNIT 1)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 1 (UNIT 2)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 2 (UNIT 2)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 3 (UNIT 2)	FIRST IMPACT LOCATION (City, County & Misc Trafficways - 2010 forward)	WA STATE PLANE SOUTH - X 2010 - FORWARD	WA STATE PLANE SOUTH - Y 2010 - FORWARD
Going Straight Ahead		East	West			Other Contributing Circ Not Listed												Past the Outside Shoulder of Primary Trafficway	1145581.94	119082.99
Going Straight Ahead	Making Left Turn	East	West	East	South	Follow Too Closely			None									Lane of Primary Trafficway	1145581.43	119082.28
Going Straight Ahead	Stopped for Traffic	East	West	Vehicle Stopped	Vehicle Stopped	Inattention			None									Lane of Primary Trafficway	1145655.84	119081.2
Going Straight Ahead		East	West			None									Improper Turn/Merge			Lane of Primary Trafficway	1145581.94	119082.99
Making Right Turn	Stopped at Signal or Stop Sign	West	South	South	West	Exceeding Reas. Safe Speed			None									Intersecting Trafficway	1145581.94	119082.99
Going Straight Ahead	Making Left Turn	East	West	East	South	Inattention	Follow Too Closely		None									Lane of Primary Trafficway	1145581.43	119082.29
Making Left Turn	Going Straight Ahead	South	West	East	West	Did Not Grant RW to Vehicle	Unknown Distraction		None									Lane of Primary Trafficway	1145581.94	119082.99
Going Straight Ahead	Stopped for Traffic	East	West	Vehicle Stopped	Vehicle Stopped	Follow Too Closely			None									Lane of Primary Trafficway	1145581.94	119082.99

Left-Turn Lane Warrant Analysis

Project: Monte Verde Subdivision
Intersection: 2. NE 232nd Avenue at NE 28th Street
Date: 7/11/2022
Scenario: 2024 Buildout - AM Peak Hour (EB)

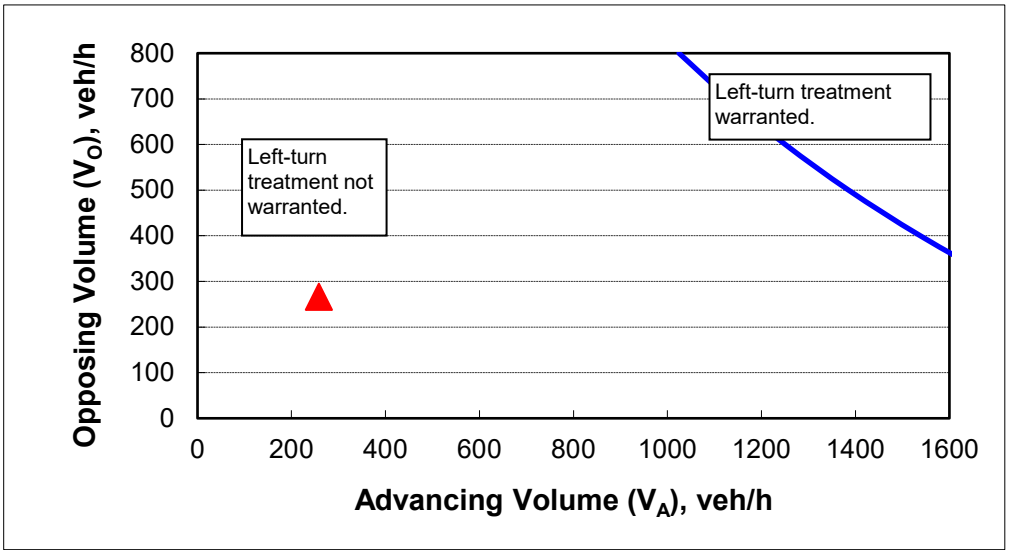
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	50
Percent of left-turns in advancing volume (V_A), %:	0%
Advancing volume (V_A), veh/h:	258
Opposing volume (V_O), veh/h:	266

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	1778
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Left-Turn Lane Warrant Analysis

Project: Monte Verde Subdivision
Intersection: 2. NE 232nd Avenue at NE 28th Street
Date: 7/11/2022
Scenario: 2024 Buildout - AM Peak Hour (WB)

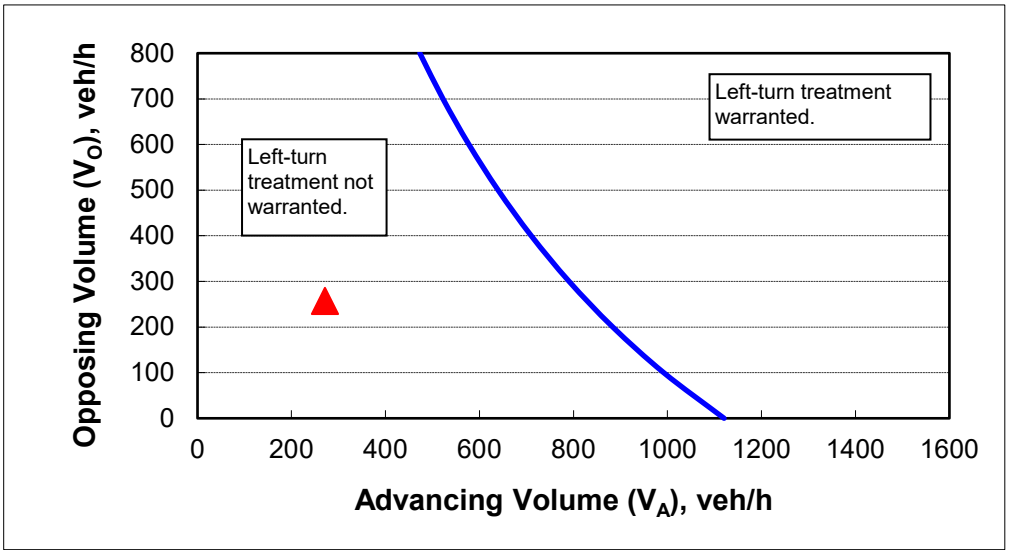
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	50
Percent of left-turns in advancing volume (V_A), %:	2%
Advancing volume (V_A), veh/h:	271
Opposing volume (V_O), veh/h:	257

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	829
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Left-Turn Lane Warrant Analysis

Project: Monte Verde Subdivision
Intersection: 2. NE 232nd Avenue at NE 28th Street
Date: 7/11/2022
Scenario: 2024 Buildout - PM Peak Hour (EB)

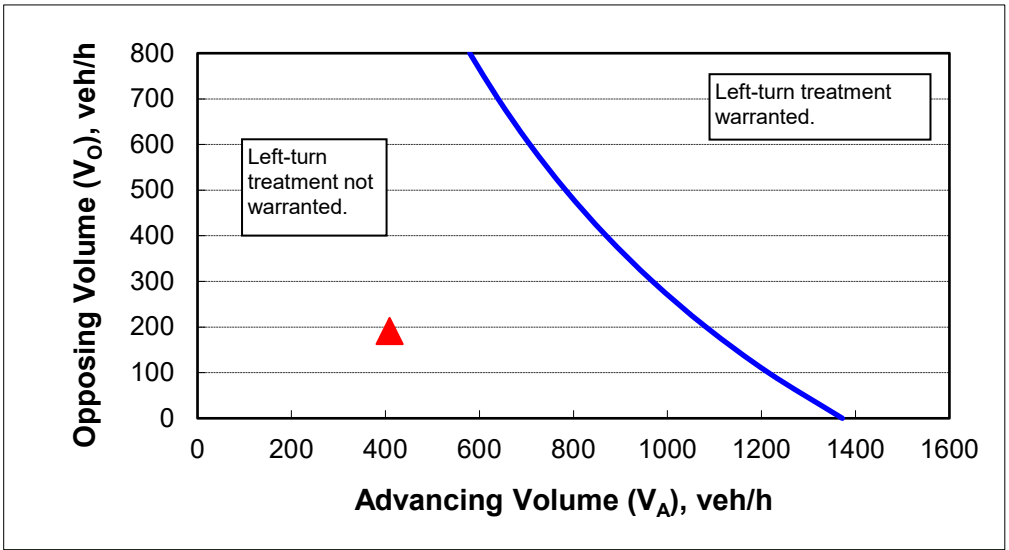
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	50
Percent of left-turns in advancing volume (V_A), %:	1%
Advancing volume (V_A), veh/h:	409
Opposing volume (V_O), veh/h:	191

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	1093
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Left-Turn Lane Warrant Analysis

Project: Monte Verde Subdivision
Intersection: 2. NE 232nd Avenue at NE 28th Street
Date: 7/11/2022
Scenario: 2024 Buildout - PM Peak Hour (WB)

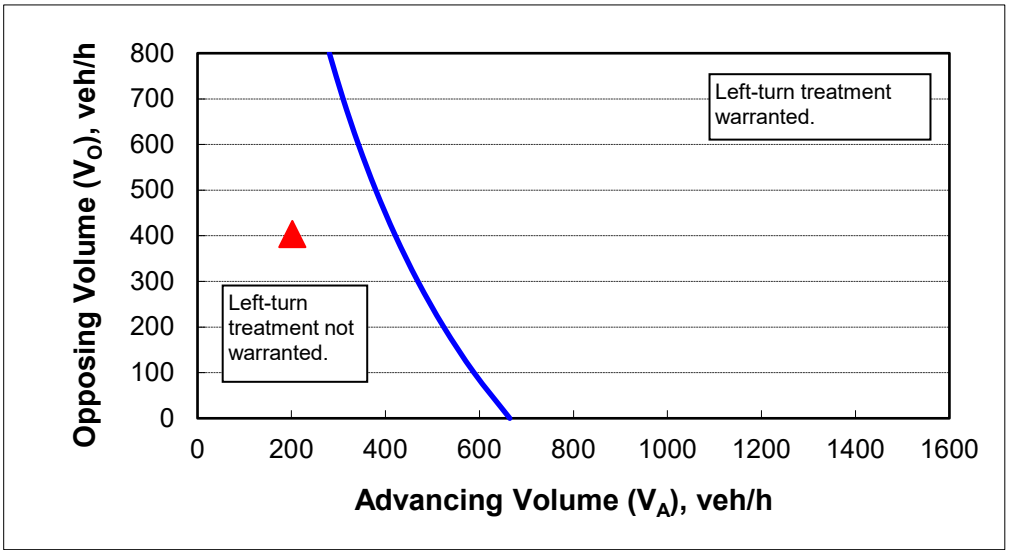
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	50
Percent of left-turns in advancing volume (V_A), %:	5%
Advancing volume (V_A), veh/h:	202
Opposing volume (V_O), veh/h:	404

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	419
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Multi-Way Stop Warrant Analysis

Project: Monte Verde Subdivision
Date: 7/11/2022
Scenario: Year 2024 Buildout Conditions

Major Street:	NE 28th Street	Minor Street:	NE Hargrave Street
PM Peak Hour Volumes:	816	PM Peak Hour Volumes:	78

Warrant Used:

X 100 percent of standard warrants used

_____ 70 percent of standard warrants used due to 85th percentile speed in excess of 40 mph.

ADT on Major St. (total of both approaches)		ADT on Minor St. (total of both approaches)	
100% Warrants	70% Warrants	100% Warrants	70% Warrants
5,310	3,717	3,540	2,478

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Multi-Way Stop Warrant Met?
Section 2B.07.C			
Major Street	8,160	5,310	
Minor Street	780	3,540	**No**

Note: Minor Street includes the total of vehicular, pedestrian, and bicycle traffic.

Multi-Way Stop Warrant Analysis

Project: Monte Verde Subdivision
Date: 7/11/2022
Scenario: Year 2024 Buildout Conditions

Major Street:	NE 28th Street	Minor Street:	NE 232nd Avenue
PM Peak Hour Volumes:	611	PM Peak Hour Volumes:	101

Warrant Used:

	100 percent of standard warrants used
X	70 percent of standard warrants used due to 85th percentile speed in excess of 40 mph.

ADT on Major St. (total of both approaches)		ADT on Minor St. (total of both approaches)	
100% Warrants	70% Warrants	100% Warrants	70% Warrants
5,310	3,717	3,540	2,478

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Multi-Way Stop Warrant Met?
Section 2B.07.C			
Major Street	6,110	3,717	
Minor Street	1,010	2,478	**No**

Note: Minor Street includes the total of vehicular, pedestrian, and bicycle traffic.

Traffic Signal Warrant Analysis

Project: Monte Verde Subdivision
Date: 7/11/2022
Scenario: 2024 Buildout Conditions

Major Street:	NE 28th Street	Minor Street:	N Hargrave Street
Number of Lanes:	1	Number of Lanes:	1
PM Peak Hour Volumes:	816	PM Peak Hour Volumes:	50

Warrant Used:

X 100 percent of standard warrants used

_____ 70 percent of standard warrants used due to 85th percentile speed in excess of 40 mph or isolated community with population less than 10,000.

Number of Lanes for Moving Traffic on Each Approach:		ADT on Major St. (total of both approaches)		ADT on Minor St. (higher-volume approach)	
WARRANT 1, CONDITION A		100%	70%	100%	70%
Major St.	Minor St.	Warrants	Warrants	Warrants	Warrants
1	1	8,850	6,200	2,650	1,850
2 or more	1	10,600	7,400	2,650	1,850
2 or more	2 or more	10,600	7,400	3,550	2,500
1	2 or more	8,850	6,200	3,550	2,500
WARRANT 1, CONDITION B					
1	1	13,300	9,300	1,350	950
2 or more	1	15,900	11,100	1,350	950
2 or more	2 or more	15,900	11,100	1,750	1,250
1	2 or more	13,300	9,300	1,750	1,250

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
Warrant 1			
Condition A: Minimum Vehicular Volume			
Major Street	8,160	8,850	
Minor Street*	500	2,650	**No**
Condition B: Interruption of Continuous Traffic			
Major Street	8,160	13,300	
Minor Street*	500	1,350	**No**
Combination Warrant			
Major Street	8,160	10,640	
Minor Street*	500	2,120	**No**

Note: Minor street right-turning traffic volumes reduced by 25%.

Traffic Signal Warrant Analysis

Project: Monte Verde Subdivision
Date: 7/11/2022
Scenario: 2024 Buildout Conditions

Major Street:	NE 28th Street	Minor Street:	NE 232nd Avenue
Number of Lanes:	1	Number of Lanes:	1
PM Peak Hour Volumes:	611	PM Peak Hour Volumes:	95

Warrant Used:

X 100 percent of standard warrants used

_____ 70 percent of standard warrants used due to 85th percentile speed in excess of 40 mph or isolated community with population less than 10,000.

Number of Lanes for Moving Traffic on Each Approach:		ADT on Major St. (total of both approaches)		ADT on Minor St. (higher-volume approach)	
WARRANT 1, CONDITION A		100%	70%	100%	70%
Major St.	Minor St.	Warrants	Warrants	Warrants	Warrants
1	1	8,850	6,200	2,650	1,850
2 or more	1	10,600	7,400	2,650	1,850
2 or more	2 or more	10,600	7,400	3,550	2,500
1	2 or more	8,850	6,200	3,550	2,500
WARRANT 1, CONDITION B					
1	1	13,300	9,300	1,350	950
2 or more	1	15,900	11,100	1,350	950
2 or more	2 or more	15,900	11,100	1,750	1,250
1	2 or more	13,300	9,300	1,750	1,250

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
Warrant 1			
Condition A: Minimum Vehicular Volume			
Major Street	6,110	8,850	
Minor Street*	950	2,650	**No**
Condition B: Interruption of Continuous Traffic			
Major Street	6,110	13,300	
Minor Street*	950	1,350	**No**
Combination Warrant			
Major Street	6,110	10,640	
Minor Street*	950	2,120	**No**

Note: Minor street right-turning traffic volumes reduced by 25%.

Appendix E – Operation Analysis

Level of Service Descriptions

Capacity Reports

Queuing Reports

LEVEL OF SERVICE

Level of service is used to describe the quality of traffic flow. Levels of service A to C are considered good, and rural roads are usually designed for level of service C. Urban streets and signalized intersections are typically designed for level of service D. Level of service E is considered to be the limit of acceptable delay. For unsignalized intersections, level of service E is generally considered acceptable. Here is a more complete description of levels of service:

Level of service A: Very low delay at intersections, with all traffic signal cycles clearing and no vehicles waiting through more than one signal cycle. On highways, low volume and high speeds, with speeds not restricted by other vehicles.

Level of service B: Operating speeds beginning to be affected by other traffic; short traffic delays at intersections. Higher average intersection delay than for level of service A resulting from more vehicles stopping.

Level of service C: Operating speeds and maneuverability closely controlled by other traffic; higher delays at intersections than for level of service B due to a significant number of vehicles stopping. Not all signal cycles clear the waiting vehicles. This is the recommended design standard for rural highways.

Level of service D: Tolerable operating speeds; long traffic delays occur at intersections. The influence of congestion is noticeable. At traffic signals many vehicles stop, and the proportion of vehicles not stopping declines. The number of signal cycle failures, for which vehicles must wait through more than one signal cycle, are noticeable. This is typically the design level for urban signalized intersections.

Level of service E: Restricted speeds, very long traffic delays at traffic signals, and traffic volumes near capacity. Flow is unstable so that any interruption, no matter how minor, will cause queues to form and service to deteriorate to level of service F. Traffic signal cycle failures are frequent occurrences. For unsignalized intersections, level of service E or better is generally considered acceptable.

Level of service F: Extreme delays, resulting in long queues which may interfere with other traffic movements. There may be stoppages of long duration, and speeds may drop to zero. There may be frequent signal cycle failures. Level of service F will typically result when vehicle arrival rates are greater than capacity. It is considered unacceptable by most drivers.

LEVEL OF SERVICE CRITERIA FOR SIGNALIZED INTERSECTIONS

LEVEL OF SERVICE	CONTROL DELAY PER VEHICLE (Seconds)
A	<10
B	10-20
C	20-35
D	35-55
E	55-80
F	>80

LEVEL OF SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS

LEVEL OF SERVICE	CONTROL DELAY PER VEHICLE (Seconds)
A	<10
B	10-15
C	15-25
D	25-35
E	35-50
F	>50

HCM 6th TWSC
1: N Hargrave Street & NE 28th Street

07/11/2022

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	202	0	0	322	1	0	0	0	0	0	13
Future Vol, veh/h	7	202	0	0	322	1	0	0	0	0	0	13
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	4	4	4	5	5	5	2	2	2	0	0	0
Mvmt Flow	8	238	0	0	379	1	0	0	0	0	0	15

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	380	0	0	238	0	0	641	634	238	634	634	380
Stage 1	-	-	-	-	-	-	254	254	-	380	380	-
Stage 2	-	-	-	-	-	-	387	380	-	254	254	-
Critical Hdwy	4.14	-	-	4.15	-	-	7.12	6.52	6.22	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.1	5.5	-
Follow-up Hdwy	2.236	-	-	2.245	-	-	3.518	4.018	3.318	3.5	4	3.3
Pot Cap-1 Maneuver	1168	-	-	1311	-	-	388	397	801	395	399	671
Stage 1	-	-	-	-	-	-	750	697	-	646	617	-
Stage 2	-	-	-	-	-	-	637	614	-	755	701	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1168	-	-	1311	-	-	377	394	801	393	396	671
Mov Cap-2 Maneuver	-	-	-	-	-	-	537	529	-	556	536	-
Stage 1	-	-	-	-	-	-	745	692	-	641	617	-
Stage 2	-	-	-	-	-	-	622	614	-	750	696	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	0	0	10.5
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	1168	-	-	1311	-	-	671
HCM Lane V/C Ratio	-	0.007	-	-	-	-	-	0.023
HCM Control Delay (s)	0	8.1	-	-	0	-	-	10.5
HCM Lane LOS	A	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	-	0	-	-	0	-	-	0.1

HCM 6th TWSC
2: NE 232nd Avenue & NE 28th Street

07/11/2022

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	1	123	75	4	246	1	61	0	6	3	0	6
Future Vol, veh/h	1	123	75	4	246	1	61	0	6	3	0	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	5	5	5	4	4	4	4	4	4	0	0	0
Mvmt Flow	1	143	87	5	286	1	71	0	7	3	0	7

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	287	0	0	230	0	0	489	486	187	489	529	287
Stage 1	-	-	-	-	-	-	189	189	-	297	297	-
Stage 2	-	-	-	-	-	-	300	297	-	192	232	-
Critical Hdwy	4.15	-	-	4.14	-	-	7.14	6.54	6.24	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.54	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.54	-	6.1	5.5	-
Follow-up Hdwy	2.245	-	-	2.236	-	-	3.536	4.036	3.336	3.5	4	3.3
Pot Cap-1 Maneuver	1258	-	-	1326	-	-	486	478	850	493	458	757
Stage 1	-	-	-	-	-	-	808	740	-	716	671	-
Stage 2	-	-	-	-	-	-	705	664	-	814	716	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1258	-	-	1326	-	-	480	476	850	487	456	757
Mov Cap-2 Maneuver	-	-	-	-	-	-	480	476	-	487	456	-
Stage 1	-	-	-	-	-	-	807	739	-	715	668	-
Stage 2	-	-	-	-	-	-	696	661	-	807	715	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.1	13.5	10.7
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	499	1258	-	-	1326	-	-	639
HCM Lane V/C Ratio	0.156	0.001	-	-	0.004	-	-	0.016
HCM Control Delay (s)	13.5	7.9	0	-	7.7	0	-	10.7
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.5	0	-	-	0	-	-	0.1

HCM 6th TWSC
1: N Hargrave Street & NE 28th Street

07/11/2022

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	15	365	0	0	216	0	0	0	0	6	0	10
Future Vol, veh/h	15	365	0	0	216	0	0	0	0	6	0	10
Conflicting Peds, #/hr	1	0	0	0	0	1	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	1	1	1	2	2	2	2	2	2	25	25	25
Mvmt Flow	17	420	0	0	248	0	0	0	0	7	0	11

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	249	0	0	420	0	0	708	703	420	703	703	249
Stage 1	-	-	-	-	-	-	454	454	-	249	249	-
Stage 2	-	-	-	-	-	-	254	249	-	454	454	-
Critical Hdwy	4.11	-	-	4.12	-	-	7.12	6.52	6.22	7.35	6.75	6.45
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.35	5.75	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.35	5.75	-
Follow-up Hdwy	2.209	-	-	2.218	-	-	3.518	4.018	3.318	3.725	4.225	3.525
Pot Cap-1 Maneuver	1323	-	-	1139	-	-	350	362	633	324	335	737
Stage 1	-	-	-	-	-	-	586	569	-	707	660	-
Stage 2	-	-	-	-	-	-	750	701	-	544	532	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1322	-	-	1139	-	-	341	357	633	320	330	736
Mov Cap-2 Maneuver	-	-	-	-	-	-	505	495	-	474	465	-
Stage 1	-	-	-	-	-	-	578	562	-	697	659	-
Stage 2	-	-	-	-	-	-	738	700	-	537	525	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	0	0	11.1
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	1322	-	-	1139	-	-	610
HCM Lane V/C Ratio	-	0.013	-	-	-	-	-	0.03
HCM Control Delay (s)	0	7.8	-	-	0	-	-	11.1
HCM Lane LOS	A	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	-	0	-	-	0	-	-	0.1

HCM 6th TWSC
2: NE 232nd Avenue & NE 28th Street

07/11/2022

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	5	264	71	6	156	0	52	0	8	1	0	0
Future Vol, veh/h	5	264	71	6	156	0	52	0	8	1	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	0	0	0	1	1	1	3	3	3	0	0	0
Mvmt Flow	6	297	80	7	175	0	58	0	9	1	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	175	0	0	377	0	0	538	538	337	543	578	175
Stage 1	-	-	-	-	-	-	349	349	-	189	189	-
Stage 2	-	-	-	-	-	-	189	189	-	354	389	-
Critical Hdwy	4.1	-	-	4.11	-	-	7.13	6.53	6.23	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.209	-	-	3.527	4.027	3.327	3.5	4	3.3
Pot Cap-1 Maneuver	1414	-	-	1187	-	-	452	448	703	454	430	874
Stage 1	-	-	-	-	-	-	665	632	-	817	748	-
Stage 2	-	-	-	-	-	-	810	742	-	667	612	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1414	-	-	1187	-	-	448	443	703	444	425	874
Mov Cap-2 Maneuver	-	-	-	-	-	-	448	443	-	444	425	-
Stage 1	-	-	-	-	-	-	662	629	-	813	743	-
Stage 2	-	-	-	-	-	-	804	737	-	655	609	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.3	13.9	13.1
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	471	1414	-	-	1187	-	-	444
HCM Lane V/C Ratio	0.143	0.004	-	-	0.006	-	-	0.003
HCM Control Delay (s)	13.9	7.6	0	-	8.1	0	-	13.1
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.5	0	-	-	0	-	-	0

HCM 6th TWSC
1: N Hargrave Street & NE 28th Street

07/11/2022

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	23	230	0	0	392	8	0	0	0	20	0	61
Future Vol, veh/h	23	230	0	0	392	8	0	0	0	20	0	61
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	4	4	4	5	5	5	2	2	2	0	0	0
Mvmt Flow	27	271	0	0	461	9	0	0	0	24	0	72

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	470	0	0	271	0	0	827	795	271	791	791	466
Stage 1	-	-	-	-	-	-	325	325	-	466	466	-
Stage 2	-	-	-	-	-	-	502	470	-	325	325	-
Critical Hdwy	4.14	-	-	4.15	-	-	7.12	6.52	6.22	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.1	5.5	-
Follow-up Hdwy	2.236	-	-	2.245	-	-	3.518	4.018	3.318	3.5	4	3.3
Pot Cap-1 Maneuver	1081	-	-	1275	-	-	291	320	768	310	324	601
Stage 1	-	-	-	-	-	-	687	649	-	581	566	-
Stage 2	-	-	-	-	-	-	552	560	-	692	653	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1081	-	-	1275	-	-	251	312	768	304	316	601
Mov Cap-2 Maneuver	-	-	-	-	-	-	408	460	-	481	477	-
Stage 1	-	-	-	-	-	-	670	633	-	566	566	-
Stage 2	-	-	-	-	-	-	486	560	-	675	637	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.8	0	0	12.6
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	1081	-	-	1275	-	-	566
HCM Lane V/C Ratio	-	0.025	-	-	-	-	-	0.168
HCM Control Delay (s)	0	8.4	-	-	0	-	-	12.6
HCM Lane LOS	A	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	-	0.1	-	-	0	-	-	0.6

Intersection	
Int Delay, s/veh	2.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	1	151	98	5	264	1	92	0	10	3	0	6
Future Vol, veh/h	1	151	98	5	264	1	92	0	10	3	0	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	5	5	5	4	4	4	4	4	4	0	0	0
Mvmt Flow	1	176	114	6	307	1	107	0	12	3	0	7

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	308	0	0	290	0	0	558	555	233	561	612	308
Stage 1	-	-	-	-	-	-	235	235	-	320	320	-
Stage 2	-	-	-	-	-	-	323	320	-	241	292	-
Critical Hdwy	4.15	-	-	4.14	-	-	7.14	6.54	6.24	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.54	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.54	-	6.1	5.5	-
Follow-up Hdwy	2.245	-	-	2.236	-	-	3.536	4.036	3.336	3.5	4	3.3
Pot Cap-1 Maneuver	1236	-	-	1260	-	-	437	437	801	441	411	737
Stage 1	-	-	-	-	-	-	764	707	-	696	656	-
Stage 2	-	-	-	-	-	-	685	649	-	767	675	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1236	-	-	1260	-	-	430	434	801	432	408	737
Mov Cap-2 Maneuver	-	-	-	-	-	-	430	434	-	432	408	-
Stage 1	-	-	-	-	-	-	763	706	-	695	652	-
Stage 2	-	-	-	-	-	-	674	645	-	755	674	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.1	15.8	11.1
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	450	1236	-	-	1260	-	-	597
HCM Lane V/C Ratio	0.264	0.001	-	-	0.005	-	-	0.018
HCM Control Delay (s)	15.8	7.9	0	-	7.9	0	-	11.1
HCM Lane LOS	C	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	1	0	-	-	0	-	-	0.1

HCM 6th TWSC
1: N Hargrave Street & NE 28th Street

07/11/2022

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	69	443	0	0	262	23	0	0	0	19	0	41
Future Vol, veh/h	69	443	0	0	262	23	0	0	0	19	0	41
Conflicting Peds, #/hr	1	0	0	0	0	1	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	1	1	1	2	2	2	2	2	2	25	25	25
Mvmt Flow	79	509	0	0	301	26	0	0	0	22	0	47

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	328	0	0	509	0	0	1005	995	509	982	982	315
Stage 1	-	-	-	-	-	-	667	667	-	315	315	-
Stage 2	-	-	-	-	-	-	338	328	-	667	667	-
Critical Hdwy	4.11	-	-	4.12	-	-	7.12	6.52	6.22	7.35	6.75	6.45
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.35	5.75	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.35	5.75	-
Follow-up Hdwy	2.209	-	-	2.218	-	-	3.518	4.018	3.318	3.725	4.225	3.525
Pot Cap-1 Maneuver	1237	-	-	1056	-	-	220	245	564	207	228	675
Stage 1	-	-	-	-	-	-	448	457	-	650	616	-
Stage 2	-	-	-	-	-	-	676	647	-	413	423	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1236	-	-	1056	-	-	195	229	564	197	213	674
Mov Cap-2 Maneuver	-	-	-	-	-	-	356	372	-	344	354	-
Stage 1	-	-	-	-	-	-	419	428	-	608	615	-
Stage 2	-	-	-	-	-	-	629	646	-	387	396	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.1	0	0	13
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	1236	-	-	1056	-	-	517
HCM Lane V/C Ratio	-	0.064	-	-	-	-	-	0.133
HCM Control Delay (s)	0	8.1	-	-	0	-	-	13
HCM Lane LOS	A	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	-	0.2	-	-	0	-	-	0.5

HCM 6th TWSC
2: NE 232nd Avenue & NE 28th Street

07/11/2022

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	5	290	110	11	187	0	83	0	11	1	0	0
Future Vol, veh/h	5	290	110	11	187	0	83	0	11	1	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	0	0	0	1	1	1	3	3	3	0	0	0
Mvmt Flow	6	326	124	12	210	0	93	0	12	1	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	210	0	0	450	0	0	634	634	388	640	696	210
Stage 1	-	-	-	-	-	-	400	400	-	234	234	-
Stage 2	-	-	-	-	-	-	234	234	-	406	462	-
Critical Hdwy	4.1	-	-	4.11	-	-	7.13	6.53	6.23	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.209	-	-	3.527	4.027	3.327	3.5	4	3.3
Pot Cap-1 Maneuver	1373	-	-	1116	-	-	390	395	658	391	368	835
Stage 1	-	-	-	-	-	-	624	600	-	774	715	-
Stage 2	-	-	-	-	-	-	767	709	-	626	568	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1373	-	-	1116	-	-	385	388	658	378	361	835
Mov Cap-2 Maneuver	-	-	-	-	-	-	385	388	-	378	361	-
Stage 1	-	-	-	-	-	-	620	596	-	769	706	-
Stage 2	-	-	-	-	-	-	758	700	-	611	565	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.5	17	14.6
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	405	1373	-	-	1116	-	-	378
HCM Lane V/C Ratio	0.261	0.004	-	-	0.011	-	-	0.003
HCM Control Delay (s)	17	7.6	0	-	8.3	0	-	14.6
HCM Lane LOS	C	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	1	0	-	-	0	-	-	0

HCM 6th TWSC
1: N Hargrave Street & NE 28th Street

07/11/2022

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	23	230	4	2	392	8	9	0	8	20	0	61
Future Vol, veh/h	23	230	4	2	392	8	9	0	8	20	0	61
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	4	4	4	5	5	5	2	2	2	0	0	0
Mvmt Flow	27	271	5	2	461	9	11	0	9	24	0	72

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	470	0	0	276	0	0	834	802	274	802	800	466
Stage 1	-	-	-	-	-	-	328	328	-	470	470	-
Stage 2	-	-	-	-	-	-	506	474	-	332	330	-
Critical Hdwy	4.14	-	-	4.15	-	-	7.12	6.52	6.22	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.1	5.5	-
Follow-up Hdwy	2.236	-	-	2.245	-	-	3.518	4.018	3.318	3.5	4	3.3
Pot Cap-1 Maneuver	1081	-	-	1270	-	-	288	317	765	305	320	601
Stage 1	-	-	-	-	-	-	685	647	-	578	563	-
Stage 2	-	-	-	-	-	-	549	558	-	686	649	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1081	-	-	1270	-	-	249	308	765	295	311	601
Mov Cap-2 Maneuver	-	-	-	-	-	-	405	457	-	474	472	-
Stage 1	-	-	-	-	-	-	668	631	-	564	562	-
Stage 2	-	-	-	-	-	-	483	557	-	661	633	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.8	0	12.2	12.7
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	520	1081	-	-	1270	-	-	564
HCM Lane V/C Ratio	0.038	0.025	-	-	0.002	-	-	0.169
HCM Control Delay (s)	12.2	8.4	-	-	7.8	-	-	12.7
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.1	0.1	-	-	0	-	-	0.6

Intersection	
Int Delay, s/veh	2.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	1	155	102	5	265	1	93	0	10	3	0	6
Future Vol, veh/h	1	155	102	5	265	1	93	0	10	3	0	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	5	5	5	4	4	4	4	4	4	0	0	0
Mvmt Flow	1	180	119	6	308	1	108	0	12	3	0	7

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	309	0	0	299	0	0	566	563	240	569	622	309
Stage 1	-	-	-	-	-	-	242	242	-	321	321	-
Stage 2	-	-	-	-	-	-	324	321	-	248	301	-
Critical Hdwy	4.15	-	-	4.14	-	-	7.14	6.54	6.24	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.54	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.54	-	6.1	5.5	-
Follow-up Hdwy	2.245	-	-	2.236	-	-	3.536	4.036	3.336	3.5	4	3.3
Pot Cap-1 Maneuver	1235	-	-	1251	-	-	432	433	794	436	405	736
Stage 1	-	-	-	-	-	-	757	702	-	695	655	-
Stage 2	-	-	-	-	-	-	684	648	-	760	669	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1235	-	-	1251	-	-	426	430	794	427	402	736
Mov Cap-2 Maneuver	-	-	-	-	-	-	426	430	-	427	402	-
Stage 1	-	-	-	-	-	-	756	701	-	694	651	-
Stage 2	-	-	-	-	-	-	673	644	-	748	668	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.1	16	11.2
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	446	1235	-	-	1251	-	-	593
HCM Lane V/C Ratio	0.269	0.001	-	-	0.005	-	-	0.018
HCM Control Delay (s)	16	7.9	0	-	7.9	0	-	11.2
HCM Lane LOS	C	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	1.1	0	-	-	0	-	-	0.1

HCM 6th TWSC
1: N Hargrave Street & NE 28th Street

07/11/2022

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	69	443	11	8	262	23	8	0	4	19	0	41
Future Vol, veh/h	69	443	11	8	262	23	8	0	4	19	0	41
Conflicting Peds, #/hr	1	0	0	0	0	1	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	1	1	1	2	2	2	2	2	2	25	25	25
Mvmt Flow	79	509	13	9	301	26	9	0	5	22	0	47

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	328	0	0	522	0	0	1030	1020	516	1009	1013	315
Stage 1	-	-	-	-	-	-	674	674	-	333	333	-
Stage 2	-	-	-	-	-	-	356	346	-	676	680	-
Critical Hdwy	4.11	-	-	4.12	-	-	7.12	6.52	6.22	7.35	6.75	6.45
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.35	5.75	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.35	5.75	-
Follow-up Hdwy	2.209	-	-	2.218	-	-	3.518	4.018	3.318	3.725	4.225	3.525
Pot Cap-1 Maneuver	1237	-	-	1044	-	-	212	237	559	198	218	675
Stage 1	-	-	-	-	-	-	444	454	-	635	605	-
Stage 2	-	-	-	-	-	-	661	635	-	408	417	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1236	-	-	1044	-	-	186	220	559	185	202	674
Mov Cap-2 Maneuver	-	-	-	-	-	-	349	366	-	329	341	-
Stage 1	-	-	-	-	-	-	416	425	-	594	599	-
Stage 2	-	-	-	-	-	-	609	629	-	379	390	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.1	0.2	14.3	13.2
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	399	1236	-	-	1044	-	-	506
HCM Lane V/C Ratio	0.035	0.064	-	-	0.009	-	-	0.136
HCM Control Delay (s)	14.3	8.1	-	-	8.5	-	-	13.2
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.1	0.2	-	-	0	-	-	0.5

HCM 6th TWSC
2: NE 232nd Avenue & NE 28th Street

07/11/2022

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	5	292	112	11	191	0	87	0	11	1	0	0
Future Vol, veh/h	5	292	112	11	191	0	87	0	11	1	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	0	0	0	1	1	1	3	3	3	0	0	0
Mvmt Flow	6	328	126	12	215	0	98	0	12	1	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	215	0	0	454	0	0	642	642	391	648	705	215
Stage 1	-	-	-	-	-	-	403	403	-	239	239	-
Stage 2	-	-	-	-	-	-	239	239	-	409	466	-
Critical Hdwy	4.1	-	-	4.11	-	-	7.13	6.53	6.23	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.209	-	-	3.527	4.027	3.327	3.5	4	3.3
Pot Cap-1 Maneuver	1367	-	-	1112	-	-	386	391	655	386	363	830
Stage 1	-	-	-	-	-	-	622	598	-	769	711	-
Stage 2	-	-	-	-	-	-	762	706	-	623	566	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1367	-	-	1112	-	-	381	384	655	374	356	830
Mov Cap-2 Maneuver	-	-	-	-	-	-	381	384	-	374	356	-
Stage 1	-	-	-	-	-	-	618	594	-	764	702	-
Stage 2	-	-	-	-	-	-	753	698	-	608	563	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.5	17.4	14.7
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	400	1367	-	-	1112	-	-	374
HCM Lane V/C Ratio	0.275	0.004	-	-	0.011	-	-	0.003
HCM Control Delay (s)	17.4	7.6	0	-	8.3	0	-	14.7
HCM Lane LOS	C	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	1.1	0	-	-	0	-	-	0

Queuing and Blocking Report
2022 Existing Conditions - AM Peak Hour

07/11/2022

Intersection: 1: N Hargrave Street & NE 28th Street

Movement	EB	SB
Directions Served	L	LTR
Maximum Queue (ft)	22	37
Average Queue (ft)	2	10
95th Queue (ft)	13	34
Link Distance (ft)		502
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	100	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: NE 232nd Avenue & NE 28th Street

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	6	18	66	35
Average Queue (ft)	0	1	28	9
95th Queue (ft)	5	10	52	32
Link Distance (ft)	1832	929	811	188
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 0

Queuing and Blocking Report
2022 Existing Conditions - PM Peak Hour

07/11/2022

Intersection: 1: N Hargrave Street & NE 28th Street

Movement	EB	SB
Directions Served	L	LTR
Maximum Queue (ft)	24	69
Average Queue (ft)	1	15
95th Queue (ft)	11	50
Link Distance (ft)		502
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	100	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: NE 232nd Avenue & NE 28th Street

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	14	39	58	21
Average Queue (ft)	1	3	26	1
95th Queue (ft)	7	19	48	10
Link Distance (ft)	1832	929	811	188
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 0

Queuing and Blocking Report
2024 Background Conditions - AM Peak Hour

07/11/2022

Intersection: 1: N Hargrave Street & NE 28th Street

Movement	EB	SB
Directions Served	L	LTR
Maximum Queue (ft)	30	70
Average Queue (ft)	7	33
95th Queue (ft)	26	57
Link Distance (ft)		502
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	100	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: NE 232nd Avenue & NE 28th Street

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	2	24	72	35
Average Queue (ft)	0	1	33	9
95th Queue (ft)	2	12	56	31
Link Distance (ft)	1832	929	811	188
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 0

Queuing and Blocking Report
2024 Background Conditions - PM Peak Hour

07/11/2022

Intersection: 1: N Hargrave Street & NE 28th Street

Movement	EB	SB
Directions Served	L	LTR
Maximum Queue (ft)	38	84
Average Queue (ft)	13	38
95th Queue (ft)	37	74
Link Distance (ft)		502
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	100	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: NE 232nd Avenue & NE 28th Street

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	17	34	68	27
Average Queue (ft)	1	3	35	1
95th Queue (ft)	10	17	60	12
Link Distance (ft)	1832	929	811	188
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 0

Queuing and Blocking Report
2024 Buildout Conditions - AM Peak Hour

07/11/2022

Intersection: 1: N Hargrave Street & NE 28th Street

Movement	EB	WB	NB	SB
Directions Served	L	L	LTR	LTR
Maximum Queue (ft)	36	17	34	64
Average Queue (ft)	6	1	13	33
95th Queue (ft)	27	7	38	55
Link Distance (ft)			800	502
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	100	100		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 2: NE 232nd Avenue & NE 28th Street

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	2	23	79	33
Average Queue (ft)	0	1	36	9
95th Queue (ft)	3	12	63	32
Link Distance (ft)	1832	929	811	188
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 0

Queuing and Blocking Report
2024 Buildout Conditions - PM Peak Hour

07/11/2022

Intersection: 1: N Hargrave Street & NE 28th Street

Movement	EB	WB	NB	SB
Directions Served	L	L	LTR	LTR
Maximum Queue (ft)	38	30	35	93
Average Queue (ft)	12	3	10	39
95th Queue (ft)	36	17	34	78
Link Distance (ft)			800	502
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	100	100		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 2: NE 232nd Avenue & NE 28th Street

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	22	39	82	18
Average Queue (ft)	1	5	34	1
95th Queue (ft)	11	23	62	9
Link Distance (ft)	1832	929	811	188
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 0

PRELIMINARY TECHNICAL INFORMATION REPORT

Monte Verde

City of Camas, Washington

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- **Critical Areas Map**
- **Basin Maps**

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Appendix D: Operations and Maintenance Manual

Appendix E: Construction Stormwater Pollution Prevention Plan (SWPPP)

Appendix F: Environmental Documentation

CERTIFICATE OF ENGINEER

Monte Verde

Technical Information Report

The technical information and data contained in this report was prepared under the direction and supervision of the undersigned, whose seal, as a professional engineer licensed to practice as such, is affixed below.

This document was prepared by:

Scott W. Gilliland, PE

Section A – Project Overview

Section A.1 – Site Information

This project will comply with current City of Camas Standards for Stormwater and Erosion Control per CMC Title 14. The Final Grading / Erosion Control / Drainage Plans have been prepared by the project civil engineer, PLS Engineering, Inc. The site will be served by public sewer and water provided by the City of Camas. This project phase proposes construction of 35 single-family residential lots with associated structures, access, paved storage areas, sewer, water, and storm drain connections. Access to the site is from NE 28th Street.

The physical address of the site is currently 22205 NE 28th Street, but the postal office may change that prior to the completion of this project. The parcel serial number is 173184000. The property is located in the southeast and southwest quarter of Section 21, T2N, R3E of the Willamette Meridian. The property is bordered by NE 28th Street on the north side, 5 acre single family lots to the East and West, and Clark County Parks to the South. A narrow access easement to Clark County Parks immediately abuts the property to the East. The cumulative property area contains a total of 374,941.64 square feet (8.61 acres), with 89,290.53 square feet (2.06 acres) of right of way dedication, resulting in 285,290.53 square feet (6.55 acres) of developed area. This technical information report will address the stormwater runoff associated with the construction which will take place.

The topography of the site is moderately sloped from NE to SW, with elevations ranging from 289' to no greater than 232'. Slopes are generally between 3% and 10%, with some isolated steeper slopes at the South end of the site at around 20%. The site slopes down from relative high point in the NE corner towards the SW property corner. The site contains a 1,900 square-foot house, a 1,200 square-foot shop, and a 3,080 square-foot chicken coop. Each of these structures along with the existing impervious surfaces on-site are planned to be removed. There is an existing BPA easement along with some electrical power line towers that support the power lines that cross the site. This easement and associated structures will remain. The remainder of the site is filled with grass, weeds, and a variety of trees. There are potential wetlands mapped on Clark County Maps at the SW corner of the site. Otherwise, there are no known water courses, areas prone to flooding, floodplains, shoreline areas, water bodies, unstable slopes, landslide hazard areas, habitat, critical areas, or historic sites located on the site. Site drainage follows the slope of the land going from the NE corner to the SW corner. Some of the runoff will be infiltrated on site, and site discharge will not exceed historic rates.

After construction, the site will contain approximately 177,879 square feet of landscaped area. The remainder of the site is anticipated to be covered with impervious surfaces. This will include 95,200 square feet of roof area, 15,240 square feet of sidewalk, and 92,340 square feet of concrete and asphalt for driveways and drive aisles. Site stormwater will be routed to underground infiltration trenches and a detention pond that will release the runoff at rates less than existing in accordance with the SWMMWW. Frontage stormwater will be routed to a bioretention facility for treatment and infiltration. Site stormwater runoff treatment for the site's pollution generating impervious surfaces will be accomplished with media filter treatment cartridges located in stormwater structures throughout the site.

Section B – Minimum Requirements

Section B.2 – Determination of Applicable Minimum Requirements

After site development, disturbed impervious surfaces will cover approximately 202,776 square feet, or 53% of the disturbed project area; projects resulting in more than 5,000 square foot of hard surface area must meet all nine Minimum Requirements of the stormwater manual. The entirety of the developed site will all discharge to infiltration facilities, acting as one TDA, and will all be required to meet Minimum Requirements #6 and #7. The stormwater system is designed to comply with all City requirements for stormwater treatment and quantity control. The treatment regulations require treatment of 91% of the total runoff volume from pollution generating impervious surfaces while the quantity control regulations require that post-development discharges shall match pre-developed durations for the range of pre-developed discharge rates from 50% of the 2-year peak flow up to the full 50-year peak flow.

Existing hard surface	23,115 ft^2
New hard surface	181,639 ft^2
Replaced hard	20,804 ft^2
Native vegetation converted to lawn or landscaping	175,900 ft^2
Native vegetation converted to pasture	0 ft^2
Total land-disturbing activity	8.74 acre
Pollution-generating hard surface	90,982 ft^2
Pollution-generating pervious surface	0 ft^2
Total pollution-generating surfaces	92,338 ft^2
Total non-pollution-generating surfaces	289,673 ft^2

MR #1) Preparation of Stormwater Site Plans

All Stormwater System designs meet City of Camas Requirements for conveyance, quality control and quantity. See final construction documents for more details.

MR #2) Construction Stormwater Pollution Prevention

A Stormwater Pollution Prevention Plan is being included with this report and will be onsite for the duration of the project's construction.

MR #3) Source Control of Pollution

See Section D

MR #4) Preservation of Natural Drainage Systems and Outfalls

Site runoff flows to the SW corner of the site. The proposed development will capture the existing runoff and infiltrate some and releasing the rest at rates that are incompliance with the SWMMWW. This will maintain and preserve the natural drainage systems.

MR #5) Onsite Stormwater Management

See Section E

MR #6) Runoff Treatment
See Section F

MR #7) Flow Control
See Section G

MR #8) Wetland Protection
Clark County maps show the potential for a Wetland located in the SW corner of the site. See Appendix F for documentation showing that there are not any wetlands on the site.

MR #9) Operations and Maintenance
See Appendix D

Section C – Soils Evaluation

The soils are mapped by the NRCS as Lauren gravelly loam (LgB) in the North and SW corner of the sit, and Lauren loam (LeB) in the middle and South end of the site. The geotechnical soil investigation found surface soils generally consistent with that soil mapping. The geotechnical report has been included in Appendix C and a soil map is included in Appendix A.

True North Geotechnical, Inc. completed a geotechnical review of the site, dated July 2022. Infiltration testing was performed on the site in two locations. One location was in shallow silty soils and resulted in a coefficient of permeability of less than 0.3 in/hr. The other infiltration test was deeper and in an area with less silt and a higher content of gravel and sand. It resulted in a coefficient of permeability of 42.2 in/hr. Based on the boar logs for the site, it appears that the majority of the site contains dense gray-brown sandy gravel (4% fines) at deeper depths ranging from 5’ to 9’ and extending deeper. In most cases, this would indicate that the entire site can be infiltrated. Unfortunately, we have groundwater issues at the South end of the site, where the groundwater depth is higher than the sandy gravel soils. Consequently, based on the observed groundwater elevations, infiltration is not feasible on the South end of the site.

Section D – Source Control

The pollution risks involved with this project mainly include the sediment accumulation involved with construction. The Stormwater Pollution Prevention Plan is a document that notes our certain Best Management Practice's (BMP’s) that will help prevent sediment laden water from leaving the site during construction. The Erosion Control Plan located in the final construction drawings will provide protection measures involved with minimizing the chance that sediment from the site could enter downstream waterways. After construction is complete, this project does not necessitate any special source control measures due to abnormal risks associated with the project. As this is a single family home development, appropriate source control responsibilities will fall primarily on property owner(s). The SWPPP is provided in Appendix E.

Section E – On-site Stormwater Management BMPs

Minimum Requirement 5 requires the applicant to employ On-site Stormwater Management BMPs in accordance with the following project thresholds, standards, and lists to infiltrate, disperse, and retain stormwater runoff on-site to the maximum extent feasible without causing flooding or erosion impacts. Based on section I-2.5.1 of the Western Washington Stormwater Manual the development is within the UGA on a parcel that is less than 5 acres therefore Low Impact Development Performance Standards and BMP T5.13; or List #2 will apply (applicant option).

This site has a unique situation. As discussed in section C, the site accommodates infiltration if the infiltration trenches are deep enough. Unfortunately, the ground water is too shallow on the south end of the site. This means that for the Northern and Middle portions of the site infiltration is a viable solution, but on the south end of the site it is not.

To meet Minimum Requirement 5, the applicant proposes a hybrid solution. The North and Mid portions of the site will comply with the LID performance standards and BMP T5.13. The south end of the site will meet List #2 as outlined below. All requirements that will be applied to this project are noted below and shown in the final construction drawings. If certain BMP's are infeasible; infeasibility criteria per the 2019 Stormwater Management Manual for Western Washington are also noted.

List #2 (for the south end of the site only):
Lawn and Landscape areas:
BMP T5.13 Post-Construction Soil Quality and Depth:
This requirement will be met during final design and shown on final construction drawings.

Roofs:
BMPT5.30A or T5.30B Full Dispersion:
There is insufficient area and length to provide a 100' flow path to meet the requirements of full dispersion while still maintaining sufficient spacing to prevent overlap.

BMPT5.14A or BMPT5.14B Rain Gardens and Bioretention:
The soil permeability factor above groundwater is less than 0.3 inches per hour (measured by the Geotech at less than 0.06 inches per hours). Because the site soils don't accommodate infiltration, this is not a feasible BMP as part of Minimum requirement #5.

BMPT5.10C Downspout Dispersion Systems:
There is insufficient space to meet the required dispersion lengths and setbacks from the structures and the property lines.

BMP T5.10D Perforated Stub-out Connections
There is insufficient space to meet the required setback of 10' away from the structures and property lines, and infiltration rates are less than 0.3 inches per hour.

Other Hard Surfaces:
BMPT5.30A or T5.30B Full Dispersion:

There is insufficient area and length to provide a 100' flow path to meet the requirements of full dispersion while still maintaining sufficient spacing to prevent overlap.

BMPT5.15 Permeable Pavement:
Permeable pavement is insufficient due to soil infiltration above the groundwater table being less than 0.3 in/hr.

BMPT5.14A or BMPT5.14B Rain Gardens and Bioretention:
The soil permeability above the groundwater table is less than 0.3 inches per hour. This is not a feasible solution.

BMPT5.12 Sheet Flow Dispersion:
There is insufficient area and length to provide a 100' flow path to meet the requirements of full dispersion while still maintaining sufficient spacing to prevent overlap.

None of the List 2 requirements can be met by the southern portion of this project. Consequently, stormwater on the South end of the project will be treated and detained prior to discharge as described in Sections F and G of this report.

The following BMPs will be implemented to meet the minimum 5 requirements:

- **BMP T5.13: Post-Construction Soil Quality and Depth** for lawn and landscaped areas.
- **BMP T7.20: Infiltration Trenches** for runoff from the Northern portion of the site.

Section F – Runoff Treatment Analysis and Design

Treatment for the site will be accomplished via media filter cartridges that will be placed in catch basins and manholes throughout the site. The filter system will treat the pollution generating surface runoff that is conveyed to it. Runoff from the building roofs and other non-pollution generating areas will be piped to bypass the filter cartridges when possible. The cartridge units will be sized to treat all of the runoff that is routed to them.

For this preliminary phase it is assumed that all of the site will be treated. The Treatment Analysis WWHM model contained in Appendix B identifies an off-line WQ flow of 0.661CFS. Per Table 1 below, 18" ZPG cartridges are designed to treat 0.017 CFS each. So, the most 18" ZPG cartridges that would be used for this project will be 39 cartridges distributed throughout the site in catch basins and Manholes. The final design will evaluate sub-basin flows to each catch basin and identify where each of the cartridges are located.

Table 1-Contech Sizing Chart

	Perlite 2 GPM/ft²			ZPG 1 GPM/ft²			PhosphoSorb 1.67 GPM/ft²		
StormFilter	Flow (GPM)	Flow (CFS)	Color	Flow (GPM)	Flow (CFS)	Color	Flow (GPM)	Flow (CFS)	Color
LowDrop	10	0.022	Gray (GRY)	5.00	0.011	Blue (BLU)	8.35	0.019	Yellow (YLW)
18"	15	0.033	Black (BLK)	7.50	0.017	Blue (BLU)	12.53	0.028	Red (RED)
27"	22.5	0.05	Gold (GLD)	11.50	0.025	Pink (PNK)	18.79	0.042	White (WHT)

Section G - Flow Control Analysis and Design

The stormwater quantity control system for this site has been designed based on the current stormwater quantity control requirements of the City of Camas. The quantity control standards require that stormwater discharges shall match developed discharge durations to pre-developed durations for the range of pre-developed discharge rates from 50% of the 2-year peak flow up to the full 50-year peak flow.

The infiltration trenches mentioned in Section F were modelled in WWHM and successfully infiltrate most of the stormwater runoff from the site using an infiltration rate of 42.2 in/hr with a factor of safety of 2 resulting in a design infiltration rate of 21.1 in/hr. The infiltration trenches are designed to be located in the sandy gravel layers identified in the geotechnical report. Modeling basins were calculated as a developed site using Soil Group 4 as the underlying soils per the geotechnical recommendation contained in Appendix C. Calculations and values can be seen in Appendix B.

The infiltration trench design for Basin 1 is 100' long by 8' wide by 3' deep. The infiltration trench for Basin 2 is also 100' long by 8' wide by 3' deep. The Basin 1 infiltration trench is designed to overflow into the trench for Basin 2, which will over flow to a detention pond at the SW corner of the site. Basin 3 runoff areas can't be infiltrated and are directly discharged to the detention facility. The WWHM design model in Appendix B shows that the combined facilities exceed the SWMMWW requirements and can be reduced in size. This preliminary TIR is showing that stormwater for the site can meet the requirements of SWMMWW. The sizes of these facilities will be fine tuned in the final design.

Infiltration does not work if the groundwater is too shallow. Consequently, groundwater depth is a significant issue for this project. The geotechnical investigation discovered ground water in the 2 most southerly test pits. Given the gravel/sand soil conditions at deeper depths, and the fact that groundwater was not discovered in any other test pits, the water table is assumed to be flatter than the existing ground, and increase in depth as the site elevations rise to the North.

Section H – Wetland Protection

There are not any wetlands on the site. See appendix F.

Section I – Other Permits

The project will be required to obtain preliminary site plan approval, final site plan approval, construction drawing approval, an NPDES construction stormwater permit, and building permit approval prior to construction.

Section J – Conveyance Systems Analysis and Design

Conveyance will be provided with the Final TIR.

Section K – Special Reports and Studies

A Geotechnical Report for the site was prepared by True North, Inc. and is included in Appendix C. A Critical Areas report is included in Appendix F. No other special studies are anticipated to be needed.

Section L –Operations and Maintenance Manual

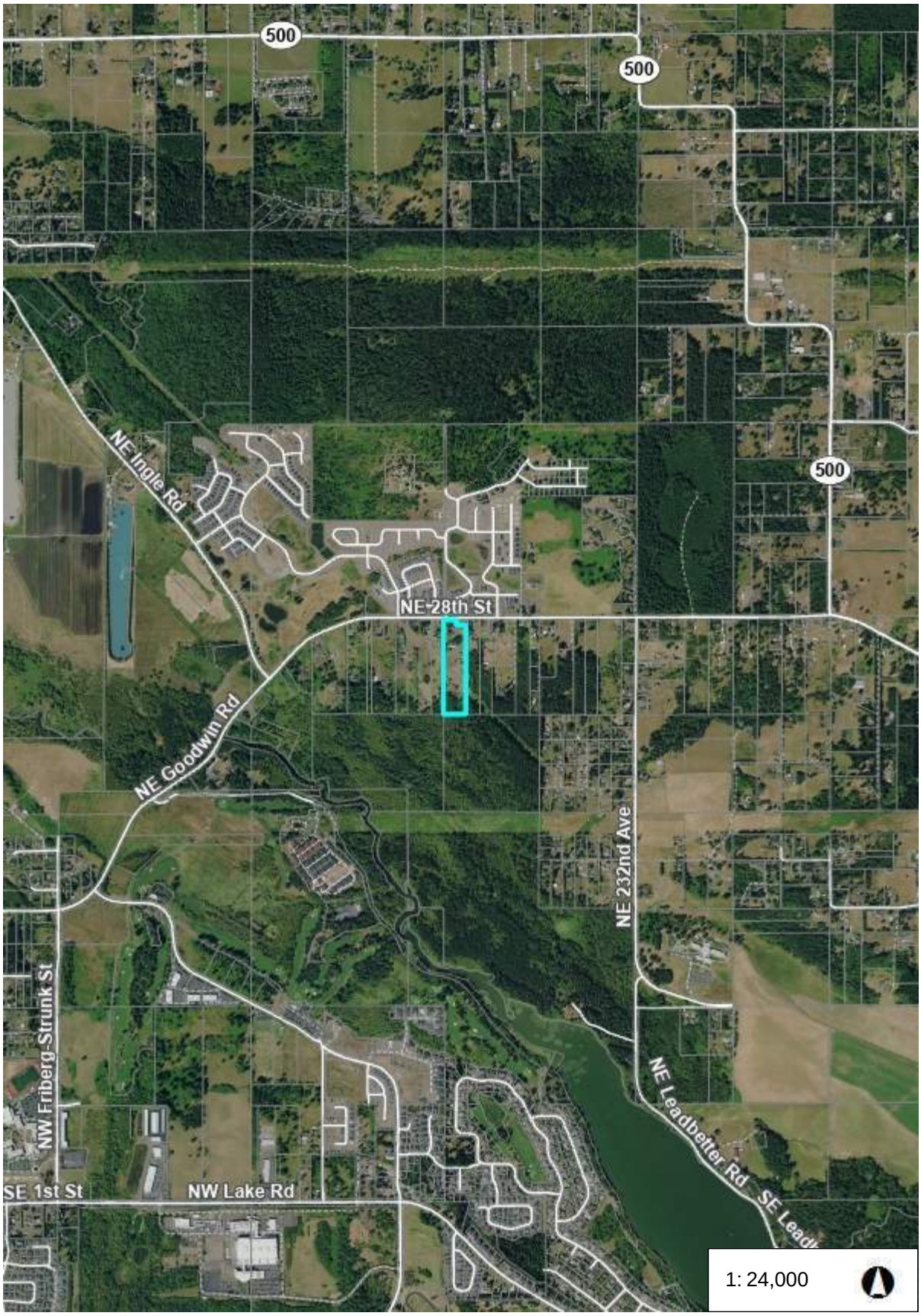
The stormwater facility located on-site will be maintained by the site owner. An Operations and Maintenance Manual is included as Appendix D of this report.

SEPARATOR SHEET

APPENDIX A

Maps

Vicinity Map



Legend

- Taxlots
- All Roads
  - Interstate or State Route
  - Arterial
  - Collector
  - Private or Other

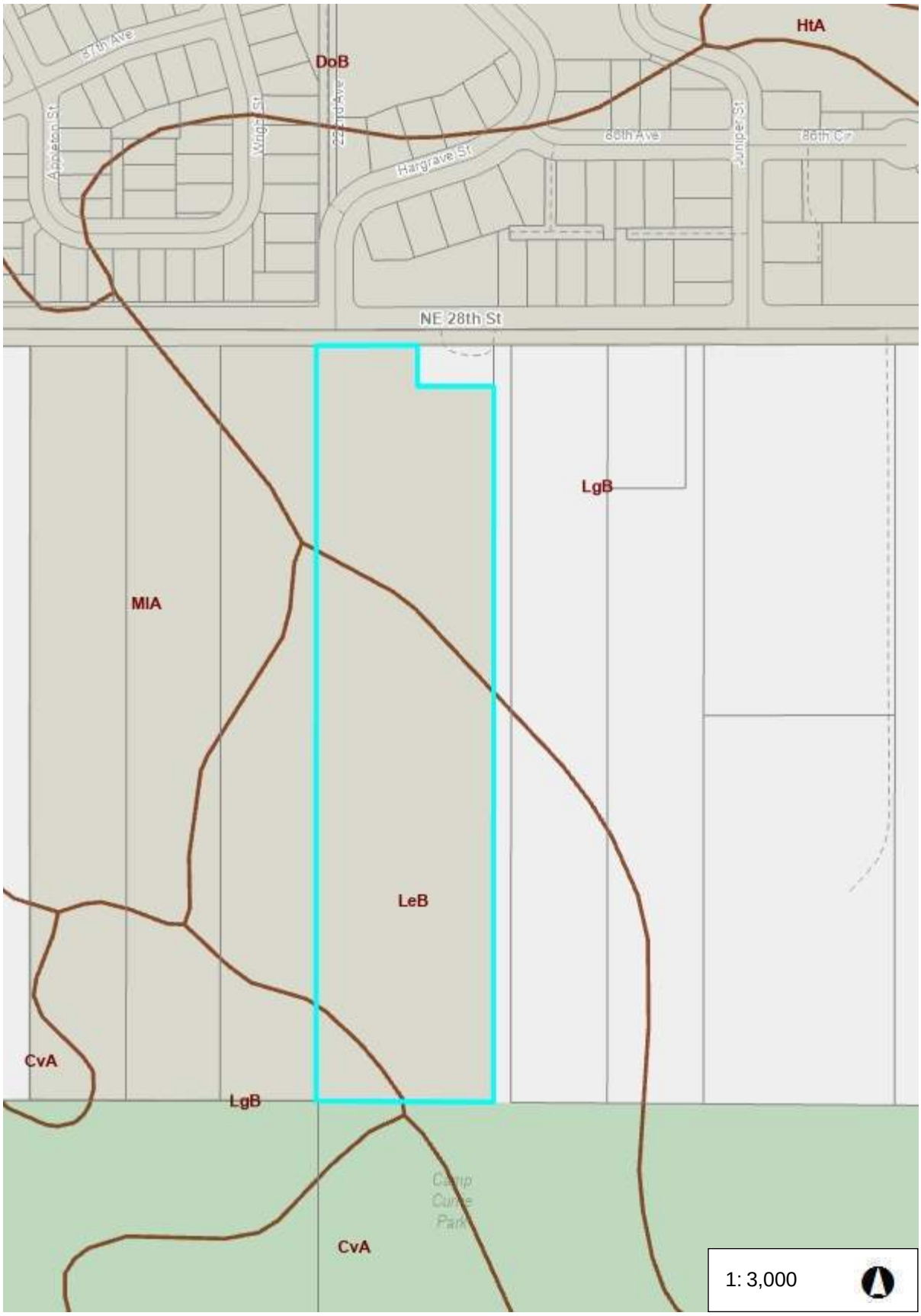
Notes:

4,000.0 0 2,000.00 4,000.0 Feet

WGS_1984_Web_Mercator_Auxiliary_Sphere
Clark County, WA. GIS - http://gis.clark.wa.gov

This map was generated by Clark County's "MapsOnline" website. Clark County does not warrant the accuracy, reliability or timeliness of any information on this map, and shall n held liable for losses caused by using this information.

Soils Map



Legend

- Taxlots
- Soil Type
- Critical Aquifer Recharge Area

Notes:

500.0 0 250.00 500.0 Feet

WGS_1984_Web_Mercator_Auxiliary_Sphere
Clark County, WA. GIS - http://gis.clark.wa.gov

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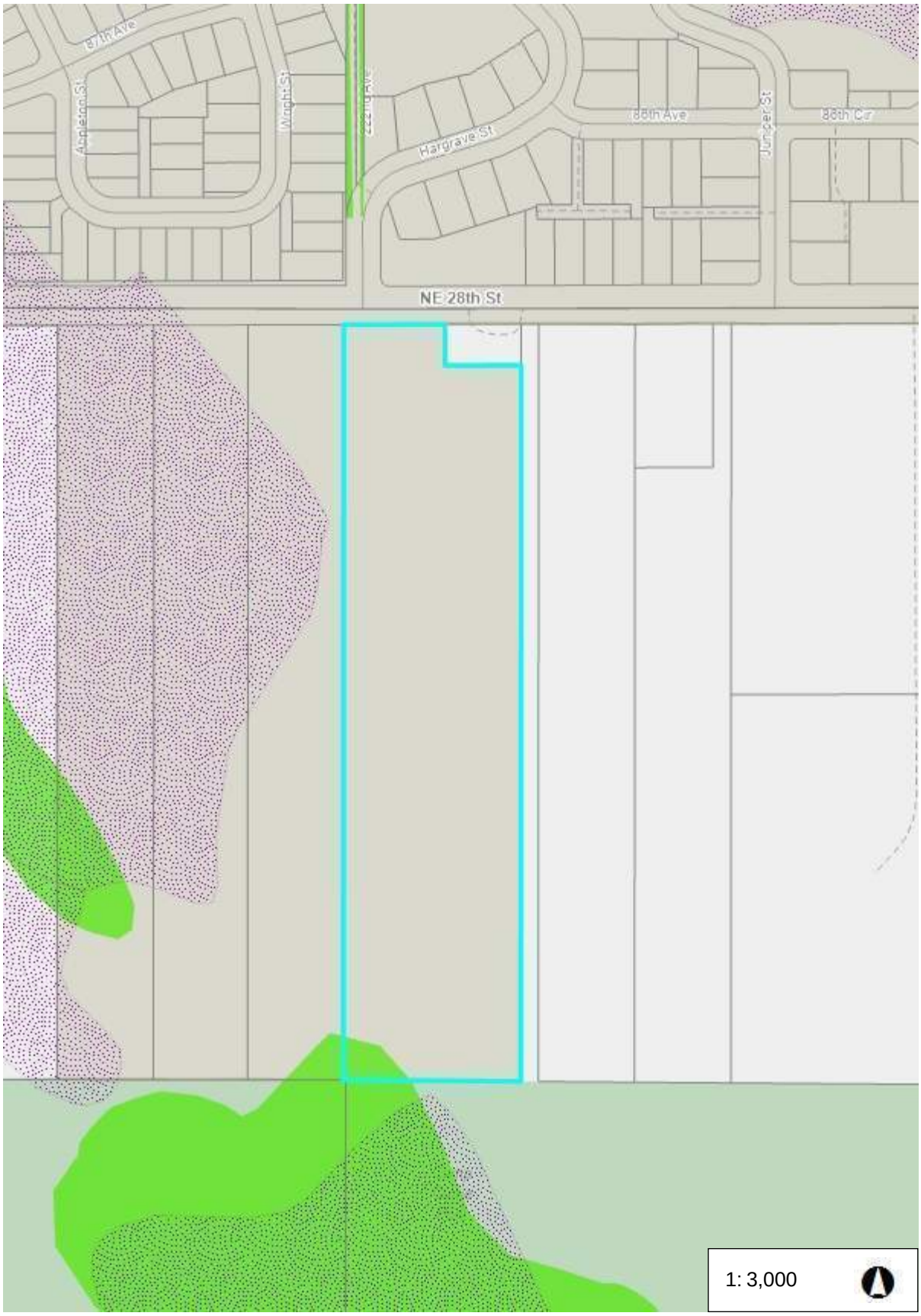
Critical Areas Map



Legend

- Taxlots
- Species
  - Species Area
  - Adjacent to Species Area
- Riparian Habitat
- Severe Erosion Hazard Areas
- Steep Slopes and Landslide H
  - Areas of Historic or Active Landslid
  - Areas of Potential Instability
  - Areas of Older Landslide Debris
  - Slopes > 15%
  - Slopes > 25%
- Hydric Soils
- Potential Wetlands Presence
- Flood Zone Designation
  - Floodway
  - Floodway Fringe
  - 500 Year Flood Area
  - Area Not Studied
- Stream
- Shoreline Designations
  - Aquatic
  - Natural
  - Urban Conservancy
  - Medium Intensity
  - High Intensity
  - Rural Conservancy Residential
  - Rural Conservancy Resource Land
- Critical Aquifer Recharge Area

Notes:

500.0 0 250.00 500.0 Feet

WGS_1984_Web_Mercator_Auxiliary_Sphere
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This map was generated by Clark County's "MapsOnline" website. Clark County does not warrant the accuracy, reliability or timeliness of any information on this map, and shall n held liable for losses caused by using this information.

Monte Verde

Located in the SE ¼ of Section 21, T2N, R3E and in
the SW ¼ of Section 21, T2N, R3E, W.M.
Camas, Washington

Sheet Index	
1.	Predevelopment Basin Map
2.	Postdevelopment Basin Map

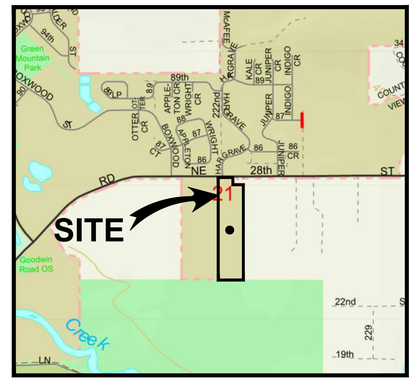
GENERAL NOTES

Applicant:
Pacific Lifestyle Homes
Ryan Stygar
11815 NE 99th Street
Vancouver, WA 98682
Office (360) 304-9901

OWNER:
Dwight Southern
22205 NE 28th Street
Camas, WA 98607

CIVIL ENGINEER:
PLS Engineering
Contact: Travis Johnson, PE
604 W Evergreen Blvd
Vancouver, WA 98660
PH: (360) 944-6519
pm@plsengineering.com

SITE ADDRESS:
Parcel # 173184-000
22205 NE 28th Street
Camas, WA 98607



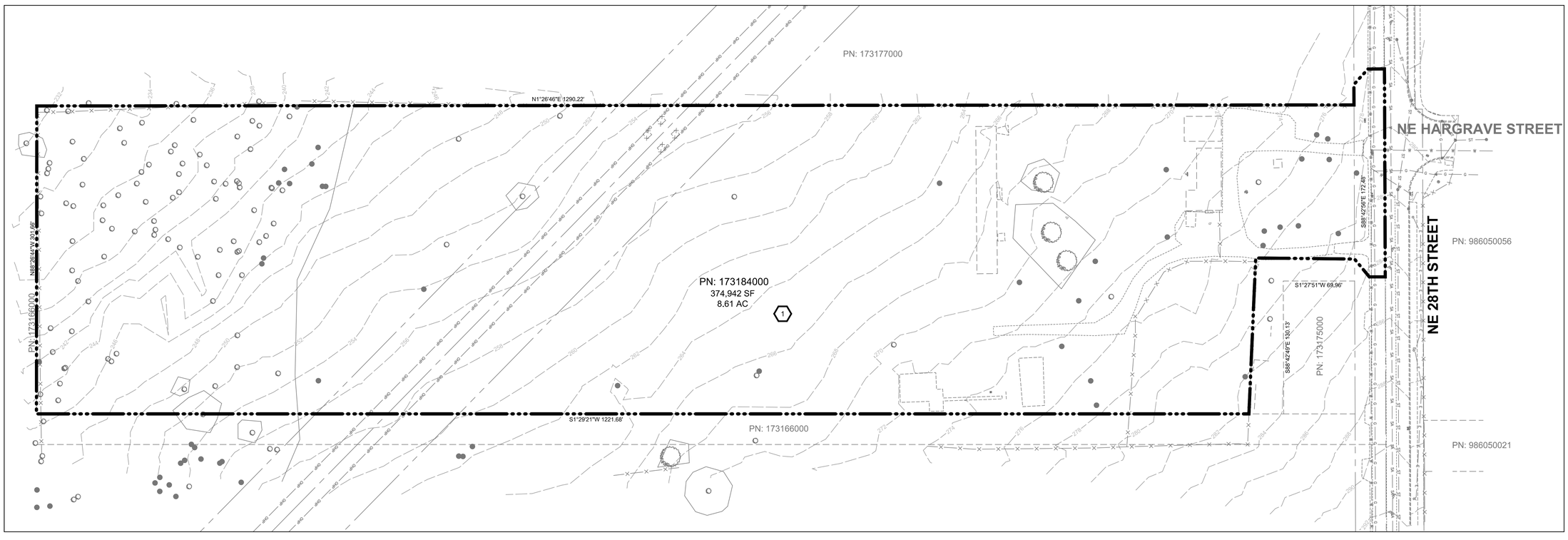
VICINITY MAP
NOT TO SCALE

① Point of Compliance 1: Pre-Development Basin Area
Basin 1 Areas:
Forested: 8.74 ac
Total: 8.74 ac

Total POC 1 Area: 8.74 ac

Drainage Basin Legend	
POC Line	
Basin Line	
Subcatchment Area ID	#

Scale 1" = 50'
50 25 0 50



PLS ENGINEERING

604 W. Evergreen Blvd., Vancouver, WA 98660 | PH (360) 944-6519 | Fax (360) 944-6539
Engineering - Surveying - Planning

Existing Conditions Plan For:
Monte Verde
A Subdivision Located In The City Of Camas, Washington

Revisions						
1	2	3	4	5	6	

Project No.	3382
SCALE:	H: 1" = 50' V: N/A
DESIGNED BY:	SWG
DRAFTED BY:	JSV
REVIEWED BY:	SWG

1
2

Monte Verde

Located in the SE ¼ of Section 21, T2N, R3E and in
the SW ¼ of Section 21, T2N, R3E, W.M.
Camas, Washington

Sheet Index	
1.	Predevelopment Basin Map
2.	Postdevelopment Basin Map

Point of Compliance 1: Post-Development Basin Area

1	Basin 1 Areas:	
	Road:	0.87 ac
	Sidewalk:	0.19 ac
	Roof:	1.03 ac
	Driveway:	0.29 ac
	Landscape:	1.42 ac
	Total:	3.80 ac
2	Basin 2 Areas:	
	Road:	0.36 ac
	Sidewalk:	0.09 ac
	Roof:	0.54 ac
	Driveway:	0.18 ac
	Landscape:	1.51 ac
	Total:	2.67 ac
3	Basin 3 Areas:	
	Road:	0.21 ac
	Sidewalk:	0.07 ac
	Roof:	0.64 ac
	Driveway:	0.18 ac
	Landscape:	1.17 ac
	Total:	2.27 ac
	Total POC 1 Area:	8.74 ac

Drainage Basin Legend	
POC Line	
Basin Line	
Subcatchment Area ID	#

GENERAL NOTES

Applicant:
Pacific Lifestyle Homes
Ryan Stygar
11815 NE 99th Street
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OWNER:
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CIVIL ENGINEER:
PLS Engineering
Contact: Travis Johnson, PE
604 W Evergreen Blvd
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pm@plsengineering.com

SITE ADDRESS:
Parcel # 173184-000
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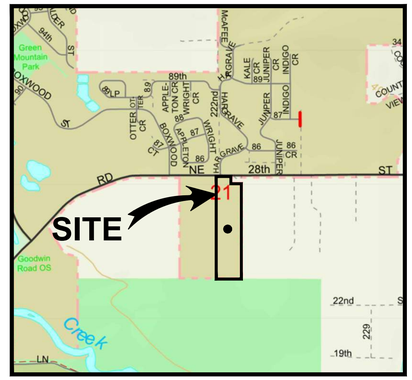
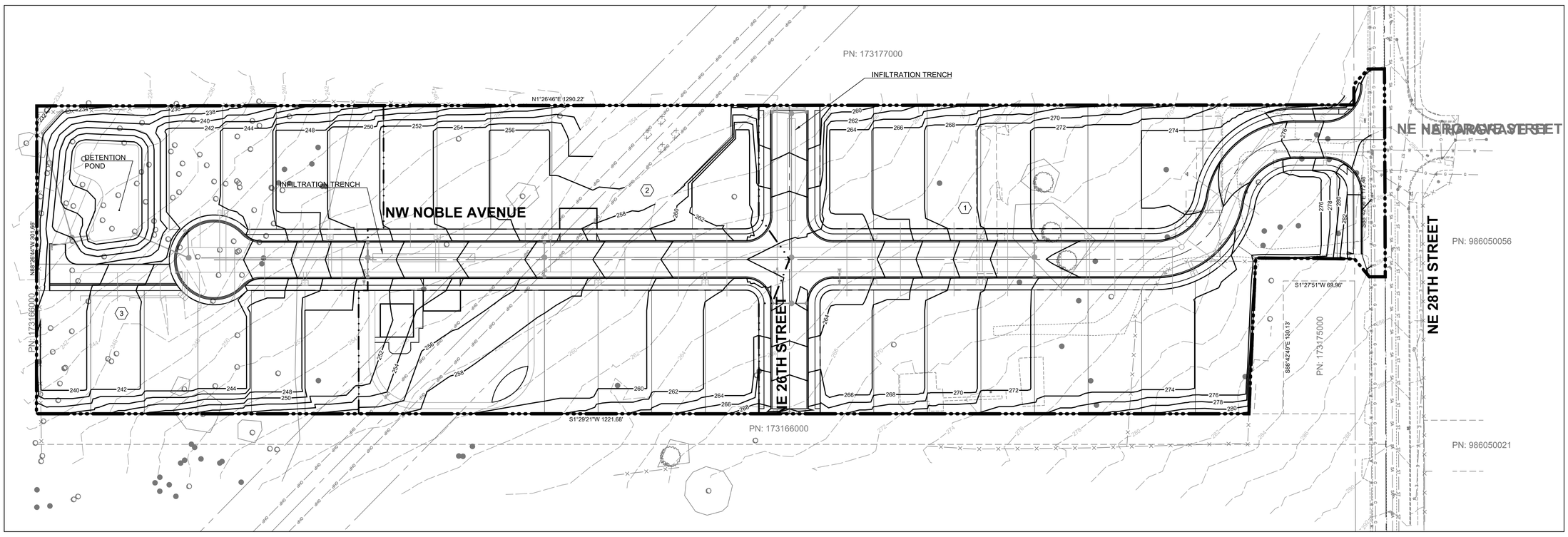


VICINITY MAP
NOT TO SCALE

Scale 1" = 50'
50 25 0 50



Post-Development Basin Map For:

Monte Verde

A Subdivision Located In The City Of Camas, Washington

Engineering - Surveying - Planning | 604 W. Evergreen Blvd., Vancouver, WA 98660 | PH (360) 944-6519 | Fax (360) 944-6539

PLS ENGINEERING

Revisions

1	2	3	4	5	6

Project No.	3382
SCALE:	H: 1" = 50' V: N/A
DESIGNED BY:	SWG
DRAFTED BY:	JSV
REVIEWED BY:	SWG

2
2

SEPARATOR SHEET

APPENDIX B

Design Calculations and Modeling

Design Point of Compliance 1		
	sqft	acre
Total Basin	**380,654.32**	**8.7386**
Road	62,261.52	1.4293
Sidewalk	15,237.54	0.3498
Roof	96,224.00	2.2090
Driveway	28,720.00	0.6593
Landscape	178,211.26	4.0912
Impervious Area	202,443.06	4.6475
Pervious Area	178,211.26	4.0912
Pollution Generating Impervious Area	90,981.52	2.0886
Total Site	380,654.32	8.7386

Extg Point of Compliance 1		
	sqft	acre
Total Basin	**380,654.32**	**8.7386**
Modeled Existing Basin Area as Forested	**380,654.32**	**8.7386**

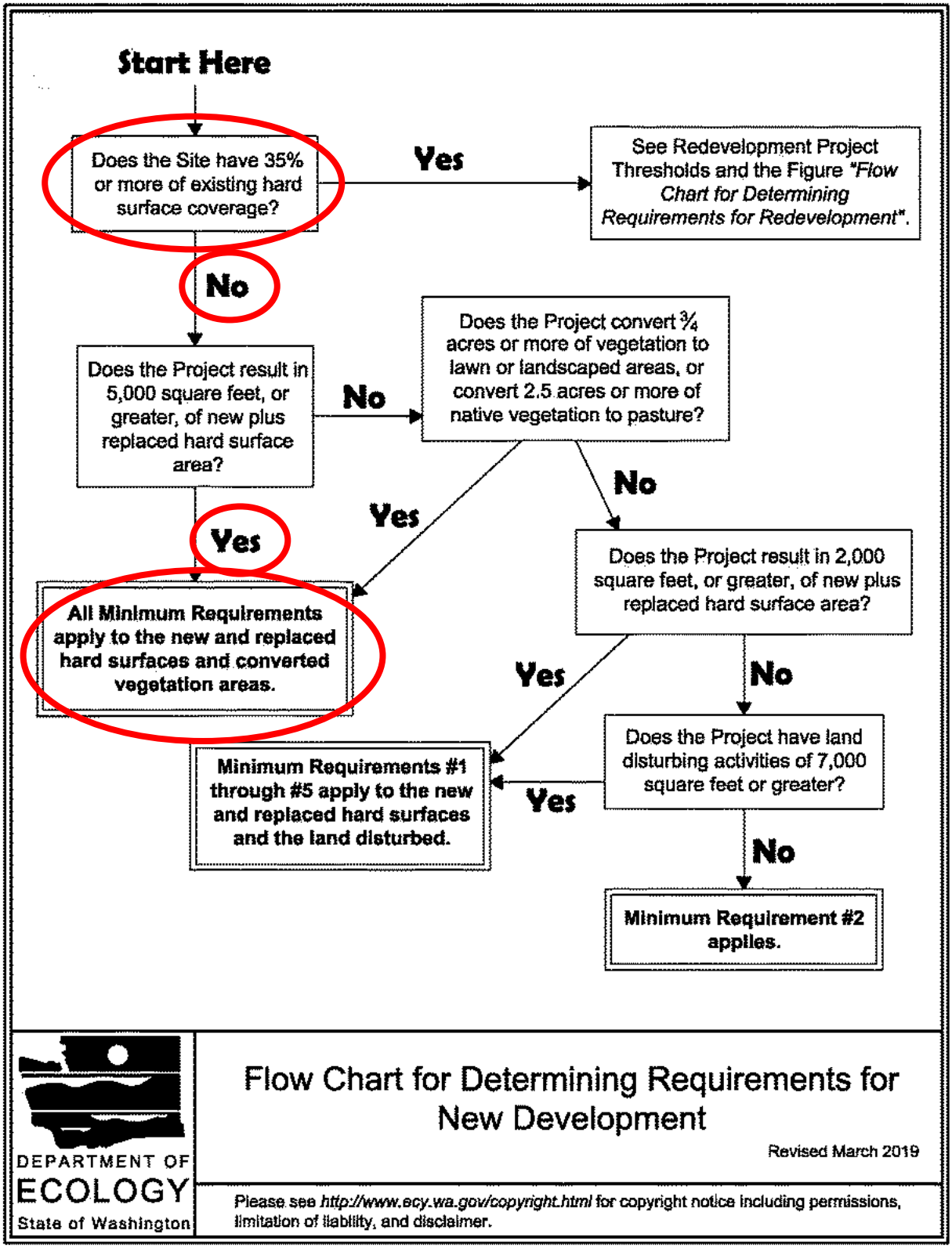
Basin Areas (sqft)						
Basin	**Road**	**SW**	**Roof**	**Driveway**	**Landscape**	**Total**
Basin 1 Site North	37,753.69	8,477.14	44,800.00	12,800.00	61,680.97	165,511.80
Basin 2 Site Mid	15,512.35	3,928.49	23,424.00	7,920.00	65,686.40	116,471.23
Basin 3 Site South	8,995.49	2,831.90	28,000.00	8,000.00	50,843.89	98,671.28
Total	62,261.52	15,237.54	96,224.00	28,720.00	178,211.26	380,654.32

Basin Areas (acre)						
	Road	**SW**	**Roof**	**Driveway**	**Landscape**	**Total**
Basin 1 Site North	0.8667	0.1946	1.0285	0.2938	1.4160	3.7996
Basin 2 Site Mid	0.3561	0.0902	0.5377	0.1818	1.5080	2.6738
Basin 3 Site South	0.2065	0.0650	0.6428	0.1837	1.1672	2.2652
	-	-	-	-	-	-
	-	-	-	-	-	-
	-	-	-	-	-	-
Total	1.4293	0.3498	2.2090	0.6593	4.0912	8.7386

WWHM Basin Treatment Flow Analysis (cfs)						
	WQ	**2-yr**	**10-yr**	**25-yr**	**50-yr**	**100-yr**
Total Site Treatment	0.6610	3.953092	6.020908	7.085902	7.892261	8.704543

SEPARATOR SHEET

Figure I-3.1: Flow Chart for Determining Requirements for New Development



Not Redevelopment. See New Development Flow Chart.

Figure I-3.2: Flow Chart for Determining Requirements for Redevelopment

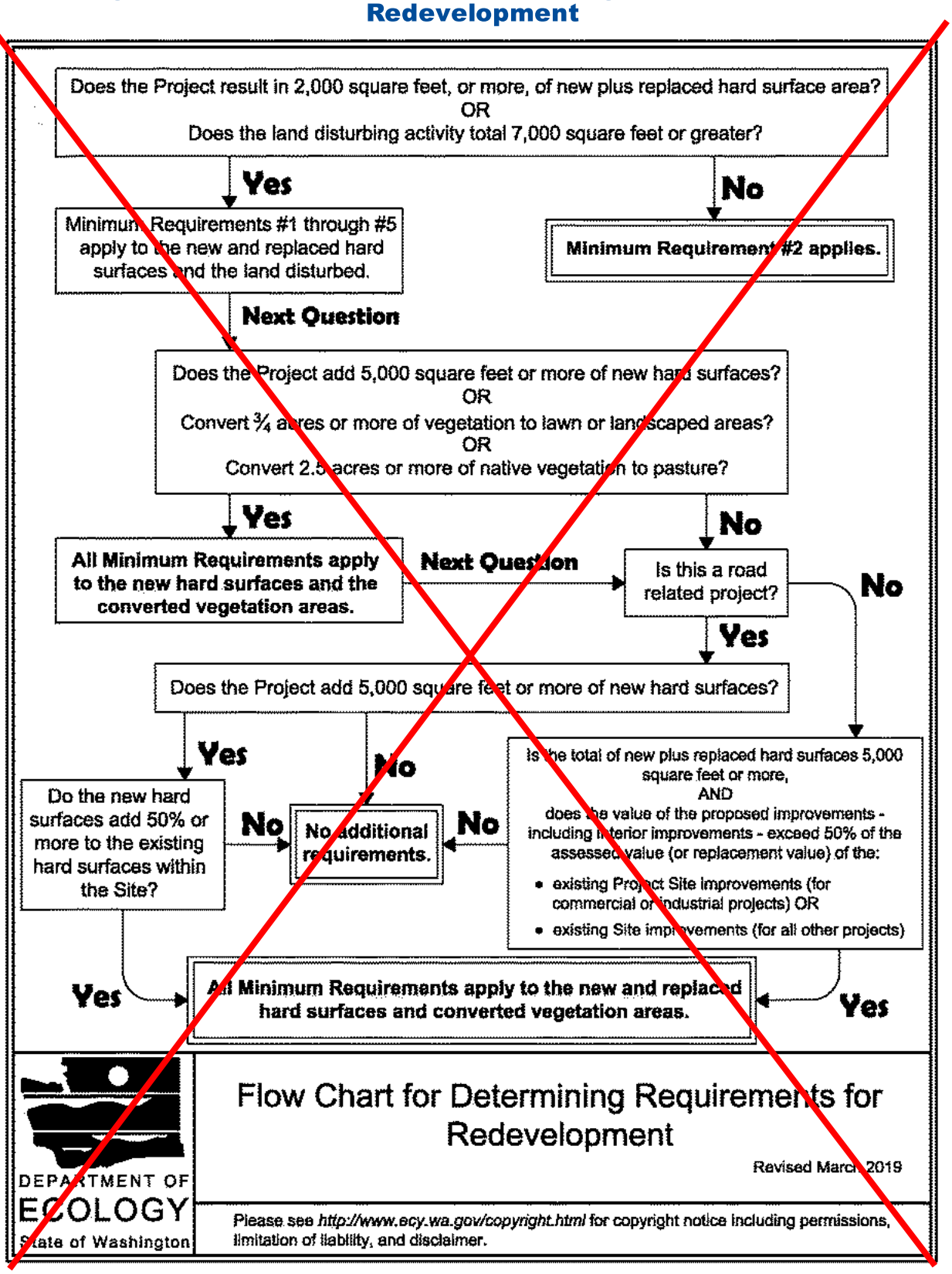
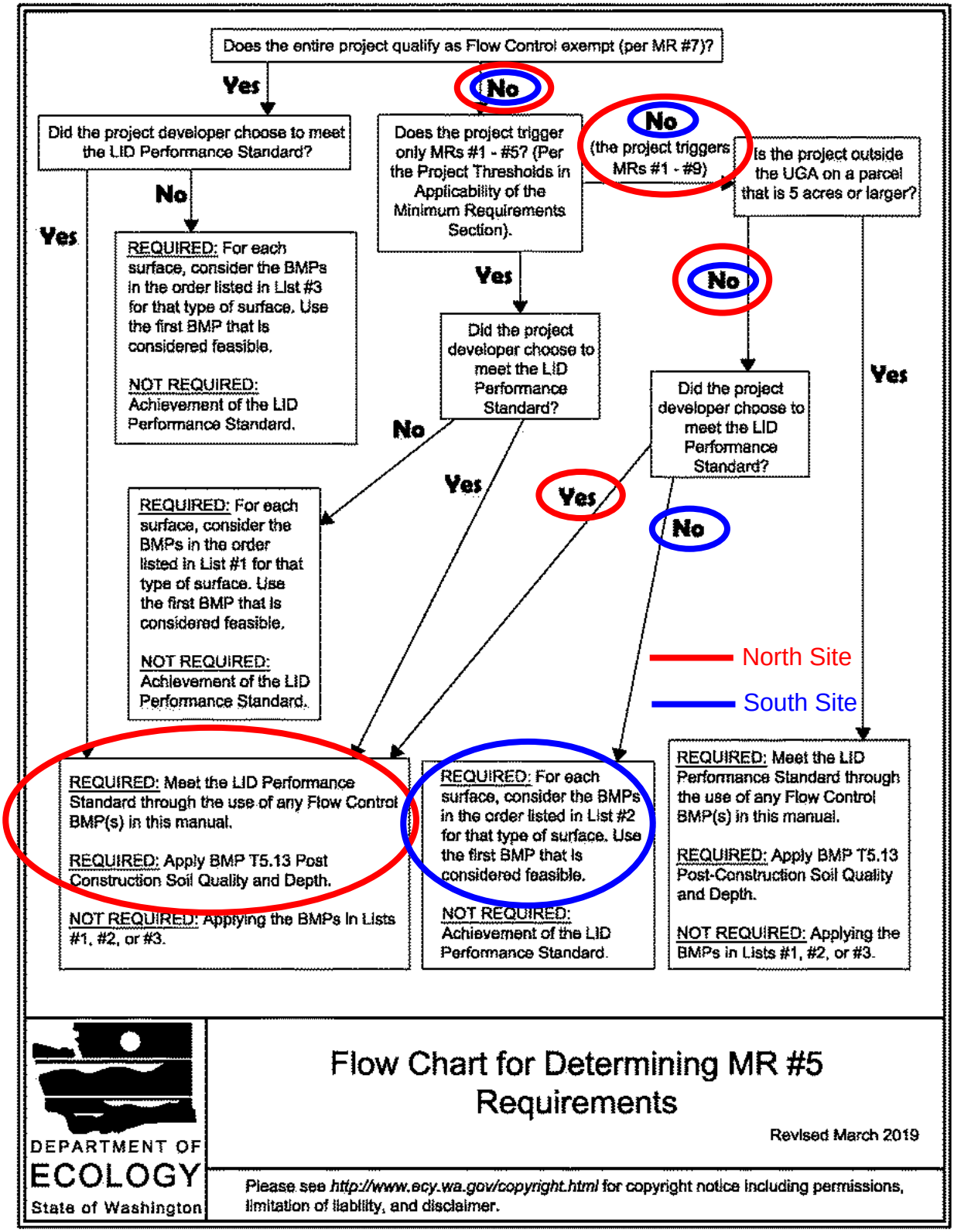


Figure I-3.3: Flow Chart for Determining MR #5 Requirements



NO WETLANDS ON SITE AND NOT DISCHARGING TO WETLANDS

Figure I-3.5: Flow Chart for Determining Wetland Protection Level Requirements

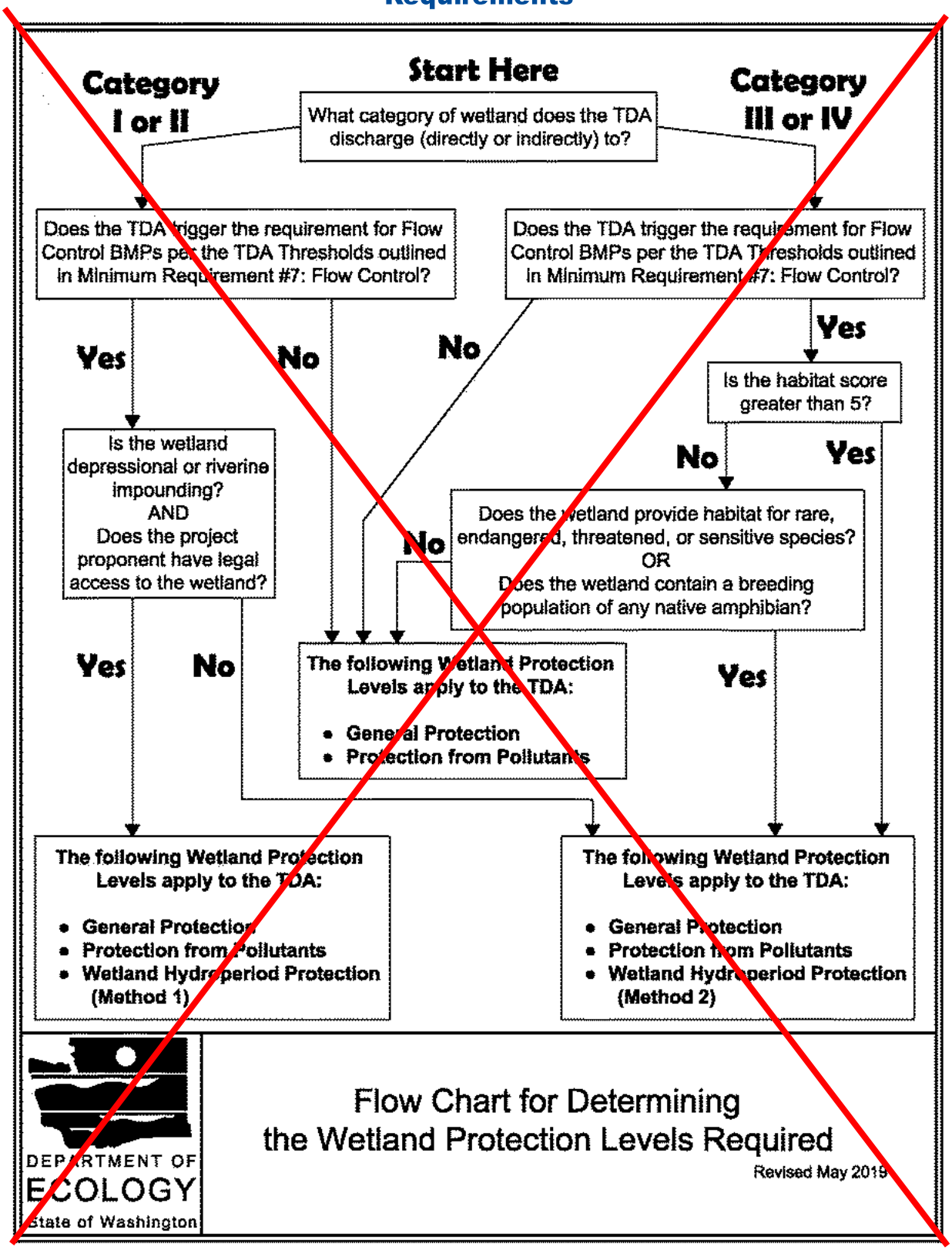
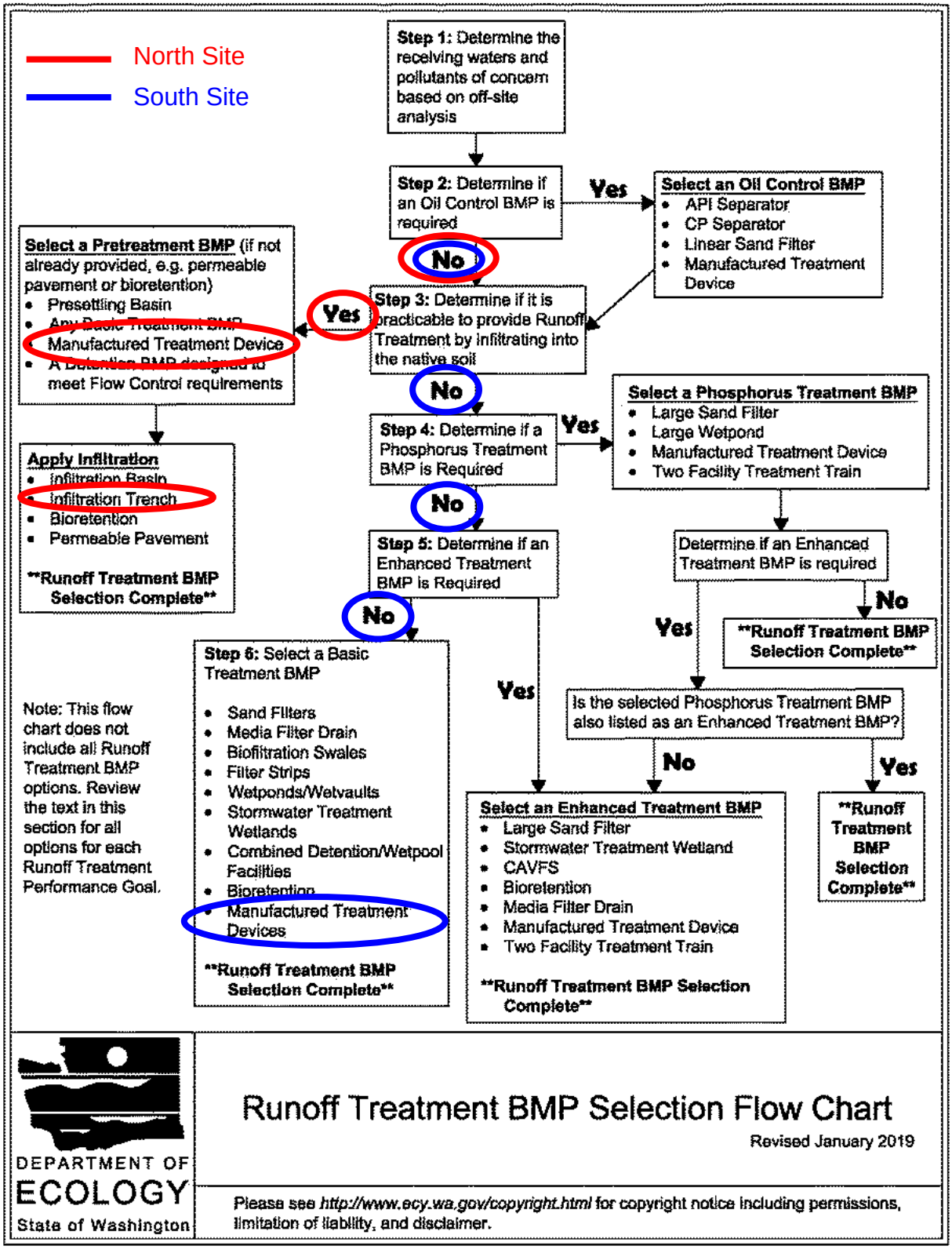


Figure III-1.1: Runoff Treatment BMP Selection Flow Chart



SEPARATOR SHEET

WWHM2012

PROJECT REPORT

This WWHM Model shows that the site meets the SWMMWW discharge requirements.

General Model Information

Project Name:	Prelim Storm Ananysis
Site Name:	Monte Verde
Site Address:	
City:	
Report Date:	7/28/2022
Gage:	Lacamas
Data Start:	1948/10/01
Data End:	2008/09/30
Timestep:	15 Minute
Precip Scale:	1.300
Version Date:	2018/10/10
Version:	4.2.16

POC Thresholds

Low Flow Threshold for POC1:	50 Percent of the 2 Year
High Flow Threshold for POC1:	50 Year

Landuse Basin Data

Predeveloped Land Use

Extg

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
SG4, Forest, Mod	8.7386
Pervious Total	8.7386

Impervious Land Use	acre
Impervious Total	0
Basin Total	8.7386

Element Flows To:

Surface	Interflow	Groundwater

Mitigated Land Use

Basin 1-North

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
SG4, Lawn, Flat	0.708
SG4, Lawn, Mod	0.708
Pervious Total	1.416

Impervious Land Use	acre
ROADS FLAT	0.8667
ROOF TOPS FLAT	1.0285
DRIVEWAYS MOD	0.2938
SIDEWALKS FLAT	0.1946
Impervious Total	2.3836
Basin Total	3.7996

Element Flows To:

Surface	Interflow	Groundwater
Gravel Trench Bed 1	Gravel Trench Bed 1	

Basin 2-Mid

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
SG4, Lawn, Flat	0.754
SG4, Lawn, Mod	0.754
Pervious Total	1.508

Impervious Land Use	acre
ROADS FLAT	0.3561
ROOF TOPS FLAT	0.5377
DRIVEWAYS MOD	0.1818
SIDEWALKS FLAT	0.0902
Impervious Total	1.1658
Basin Total	2.6738

Element Flows To:

Surface	Interflow	Groundwater
Gravel Trench Bed 2	Gravel Trench Bed 2	

Basin 3-South

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
SG4, Lawn, Flat	0.5836
SG4, Lawn, Mod	0.5836
Pervious Total	1.1672

Impervious Land Use	acre
ROADS FLAT	0.2065
ROOF TOPS FLAT	0.6428
DRIVEWAYS MOD	0.1837
SIDEWALKS FLAT	0.065
Impervious Total	1.098
Basin Total	2.2652

Element Flows To:

Surface	Interflow	Groundwater
Trapezoidal Pond 1	Trapezoidal Pond 1	

Routing Elements
Predeveloped Routing

Mitigated Routing

Trapezoidal Pond 1

Bottom Length: 90.00 ft.
Bottom Width: 50.00 ft.
Depth: 4 ft.
Volume at riser head: 0.4079 acre-feet.
Side slope 1: 3 To 1
Side slope 2: 3 To 1
Side slope 3: 3 To 1
Side slope 4: 3 To 1
Discharge Structure
Riser Height: 3 ft.
Riser Diameter: 18 in.
Notch Type: Rectangular
Notch Width: 0.330 ft.
Notch Height: 0.500 ft.
Orifice 1 Diameter: 4 in. Elevation:0 ft.
Element Flows To:
Outlet 1 Outlet 2

Pond Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.103	0.000	0.000	0.000
0.0444	0.104	0.004	0.091	0.000
0.0889	0.105	0.009	0.129	0.000
0.1333	0.105	0.013	0.158	0.000
0.1778	0.106	0.018	0.183	0.000
0.2222	0.107	0.023	0.204	0.000
0.2667	0.108	0.028	0.224	0.000
0.3111	0.109	0.033	0.242	0.000
0.3556	0.110	0.038	0.258	0.000
0.4000	0.111	0.042	0.274	0.000
0.4444	0.112	0.047	0.289	0.000
0.4889	0.112	0.052	0.303	0.000
0.5333	0.113	0.057	0.317	0.000
0.5778	0.114	0.063	0.330	0.000
0.6222	0.115	0.068	0.342	0.000
0.6667	0.116	0.073	0.354	0.000
0.7111	0.117	0.078	0.366	0.000
0.7556	0.118	0.083	0.377	0.000
0.8000	0.119	0.089	0.388	0.000
0.8444	0.120	0.094	0.399	0.000
0.8889	0.121	0.099	0.409	0.000
0.9333	0.122	0.105	0.419	0.000
0.9778	0.123	0.110	0.429	0.000
1.0222	0.123	0.116	0.439	0.000
1.0667	0.124	0.121	0.448	0.000
1.1111	0.125	0.127	0.457	0.000
1.1556	0.126	0.132	0.466	0.000
1.2000	0.127	0.138	0.475	0.000
1.2444	0.128	0.144	0.484	0.000
1.2889	0.129	0.149	0.492	0.000
1.3333	0.130	0.155	0.501	0.000
1.3778	0.131	0.161	0.509	0.000

1.4222	0.132	0.167	0.517	0.000
1.4667	0.133	0.173	0.525	0.000
1.5111	0.134	0.179	0.533	0.000
1.5556	0.135	0.185	0.541	0.000
1.6000	0.136	0.191	0.549	0.000
1.6444	0.137	0.197	0.556	0.000
1.6889	0.138	0.203	0.564	0.000
1.7333	0.139	0.209	0.571	0.000
1.7778	0.140	0.215	0.578	0.000
1.8222	0.141	0.221	0.586	0.000
1.8667	0.142	0.228	0.593	0.000
1.9111	0.143	0.234	0.600	0.000
1.9556	0.144	0.241	0.607	0.000
2.0000	0.145	0.247	0.614	0.000
2.0444	0.146	0.253	0.620	0.000
2.0889	0.147	0.260	0.627	0.000
2.1333	0.148	0.266	0.634	0.000
2.1778	0.149	0.273	0.640	0.000
2.2222	0.150	0.280	0.647	0.000
2.2667	0.151	0.286	0.653	0.000
2.3111	0.152	0.293	0.660	0.000
2.3556	0.153	0.300	0.666	0.000
2.4000	0.154	0.307	0.672	0.000
2.4444	0.155	0.314	0.678	0.000
2.4889	0.156	0.321	0.685	0.000
2.5333	0.157	0.328	0.697	0.000
2.5778	0.158	0.335	0.720	0.000
2.6222	0.159	0.342	0.750	0.000
2.6667	0.160	0.349	0.783	0.000
2.7111	0.161	0.356	0.821	0.000
2.7556	0.162	0.363	0.862	0.000
2.8000	0.163	0.370	0.907	0.000
2.8444	0.164	0.378	0.954	0.000
2.8889	0.165	0.385	1.004	0.000
2.9333	0.167	0.392	1.057	0.000
2.9778	0.168	0.400	1.112	0.000
3.0222	0.169	0.407	1.196	0.000
3.0667	0.170	0.415	1.422	0.000
3.1111	0.171	0.423	1.742	0.000
3.1556	0.172	0.430	2.129	0.000
3.2000	0.173	0.438	2.569	0.000
3.2444	0.174	0.446	3.047	0.000
3.2889	0.175	0.453	3.550	0.000
3.3333	0.176	0.461	4.063	0.000
3.3778	0.177	0.469	4.572	0.000
3.4222	0.179	0.477	5.063	0.000
3.4667	0.180	0.485	5.523	0.000
3.5111	0.181	0.493	5.939	0.000
3.5556	0.182	0.501	6.304	0.000
3.6000	0.183	0.509	6.613	0.000
3.6444	0.184	0.517	6.866	0.000
3.6889	0.185	0.526	7.071	0.000
3.7333	0.186	0.534	7.241	0.000
3.7778	0.188	0.542	7.482	0.000
3.8222	0.189	0.551	7.663	0.000
3.8667	0.190	0.559	7.839	0.000
3.9111	0.191	0.568	8.011	0.000
3.9556	0.192	0.576	8.179	0.000

4.0000	0.193	0.585	8.343	0.000
4.0444	0.194	0.593	8.504	0.000

Gravel Trench Bed 1

Bottom Length:	100.00 ft.
Bottom Width:	8.00 ft.
Trench bottom slope 1:	0 To 1
Trench Left side slope 0:	0 To 1
Trench right side slope 2:	0 To 1
Material thickness of first layer:	3
Pour Space of material for first layer:	0.33
Material thickness of second layer:	0
Pour Space of material for second layer:	0
Material thickness of third layer:	0
Pour Space of material for third layer:	0
Infiltration On	
Infiltration rate:	42.2
Infiltration safety factor:	0.5
Total Volume Infiltrated (ac-ft.):	559.48
Total Volume Through Riser (ac-ft.):	71.214
Total Volume Through Facility (ac-ft.):	630.694
Percent Infiltrated:	88.71
Total Precip Applied to Facility:	0
Total Evap From Facility:	0

Discharge Structure

Riser Height:	2.5 ft.	
Riser Diameter:	18 in.	
Orifice 1 Diameter:	2 in.	Elevation:0 ft.

Element Flows To:

Outlet 1 Outlet 2

Gravel Trench Bed 2

Gravel Trench Bed Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.018	0.000	0.000	0.000
0.0333	0.018	0.000	0.019	0.390
0.0667	0.018	0.000	0.028	0.390
0.1000	0.018	0.000	0.034	0.390
0.1333	0.018	0.000	0.039	0.390
0.1667	0.018	0.001	0.044	0.390
0.2000	0.018	0.001	0.048	0.390
0.2333	0.018	0.001	0.052	0.390
0.2667	0.018	0.001	0.056	0.390
0.3000	0.018	0.001	0.059	0.390
0.3333	0.018	0.002	0.062	0.390
0.3667	0.018	0.002	0.065	0.390
0.4000	0.018	0.002	0.068	0.390
0.4333	0.018	0.002	0.071	0.390
0.4667	0.018	0.002	0.074	0.390
0.5000	0.018	0.003	0.076	0.390
0.5333	0.018	0.003	0.079	0.390
0.5667	0.018	0.003	0.081	0.390
0.6000	0.018	0.003	0.084	0.390
0.6333	0.018	0.003	0.086	0.390
0.6667	0.018	0.004	0.088	0.390
0.7000	0.018	0.004	0.090	0.390
0.7333	0.018	0.004	0.093	0.390
0.7667	0.018	0.004	0.095	0.390
0.8000	0.018	0.004	0.097	0.390

0.8333	0.018	0.005	0.099	0.390
0.8667	0.018	0.005	0.101	0.390
0.9000	0.018	0.005	0.103	0.390
0.9333	0.018	0.005	0.104	0.390
0.9667	0.018	0.005	0.106	0.390
1.0000	0.018	0.006	0.108	0.390
1.0333	0.018	0.006	0.110	0.390
1.0667	0.018	0.006	0.112	0.390
1.1000	0.018	0.006	0.113	0.390
1.1333	0.018	0.006	0.115	0.390
1.1667	0.018	0.007	0.117	0.390
1.2000	0.018	0.007	0.118	0.390
1.2333	0.018	0.007	0.120	0.390
1.2667	0.018	0.007	0.122	0.390
1.3000	0.018	0.007	0.123	0.390
1.3333	0.018	0.008	0.125	0.390
1.3667	0.018	0.008	0.126	0.390
1.4000	0.018	0.008	0.128	0.390
1.4333	0.018	0.008	0.130	0.390
1.4667	0.018	0.008	0.131	0.390
1.5000	0.018	0.009	0.132	0.390
1.5333	0.018	0.009	0.134	0.390
1.5667	0.018	0.009	0.135	0.390
1.6000	0.018	0.009	0.137	0.390
1.6333	0.018	0.009	0.138	0.390
1.6667	0.018	0.010	0.140	0.390
1.7000	0.018	0.010	0.141	0.390
1.7333	0.018	0.010	0.142	0.390
1.7667	0.018	0.010	0.144	0.390
1.8000	0.018	0.010	0.145	0.390
1.8333	0.018	0.011	0.147	0.390
1.8667	0.018	0.011	0.148	0.390
1.9000	0.018	0.011	0.149	0.390
1.9333	0.018	0.011	0.150	0.390
1.9667	0.018	0.011	0.152	0.390
2.0000	0.018	0.012	0.153	0.390
2.0333	0.018	0.012	0.154	0.390
2.0667	0.018	0.012	0.156	0.390
2.1000	0.018	0.012	0.157	0.390
2.1333	0.018	0.012	0.158	0.390
2.1667	0.018	0.013	0.159	0.390
2.2000	0.018	0.013	0.161	0.390
2.2333	0.018	0.013	0.162	0.390
2.2667	0.018	0.013	0.163	0.390
2.3000	0.018	0.013	0.164	0.390
2.3333	0.018	0.014	0.165	0.390
2.3667	0.018	0.014	0.167	0.390
2.4000	0.018	0.014	0.168	0.390
2.4333	0.018	0.014	0.169	0.390
2.4667	0.018	0.014	0.170	0.390
2.5000	0.018	0.015	0.171	0.390
2.5333	0.018	0.015	0.269	0.390
2.5667	0.018	0.015	0.447	0.390
2.6000	0.018	0.015	0.677	0.390
2.6333	0.018	0.016	0.947	0.390
2.6667	0.018	0.016	1.251	0.390
2.7000	0.018	0.016	1.582	0.390
2.7333	0.018	0.016	1.935	0.390

2.7667	0.018	0.016	2.304	0.390
2.8000	0.018	0.017	2.682	0.390
2.8333	0.018	0.017	3.065	0.390
2.8667	0.018	0.017	3.445	0.390
2.9000	0.018	0.017	3.817	0.390
2.9333	0.018	0.017	4.174	0.390
2.9667	0.018	0.018	4.513	0.390
3.0000	0.018	0.018	4.827	0.390

Gravel Trench Bed 2

Bottom Length:	100.00 ft.
Bottom Width:	8.00 ft.
Trench bottom slope 1:	0 To 1
Trench Left side slope 0:	0 To 1
Trench right side slope 2:	0 To 1
Material thickness of first layer:	3
Pour Space of material for first layer:	0.33
Material thickness of second layer:	0
Pour Space of material for second layer:	0
Material thickness of third layer:	0
Pour Space of material for third layer:	0
Infiltration On	
Infiltration rate:	42.2
Infiltration safety factor:	0.5
Total Volume Infiltrated (ac-ft.):	407.34
Total Volume Through Riser (ac-ft.):	63.856
Total Volume Through Facility (ac-ft.):	471.197
Percent Infiltrated:	86.45
Total Precip Applied to Facility:	0
Total Evap From Facility:	0

Discharge Structure

Riser Height:	2.5 ft.	
Riser Diameter:	18 in.	
Orifice 1 Diameter:	2 in.	Elevation:0 ft.

Element Flows To:

Outlet 1	Outlet 2
Trapezoidal Pond 1	

Gravel Trench Bed Hydraulic Table

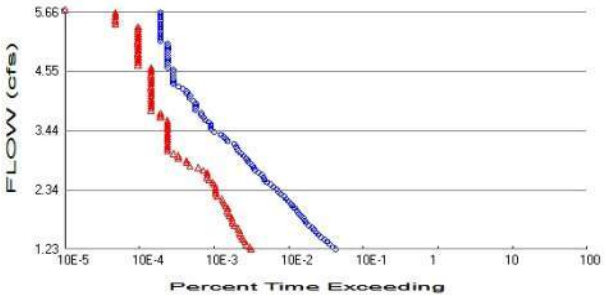
Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.018	0.000	0.000	0.000
0.0333	0.018	0.000	0.019	0.390
0.0667	0.018	0.000	0.028	0.390
0.1000	0.018	0.000	0.034	0.390
0.1333	0.018	0.000	0.039	0.390
0.1667	0.018	0.001	0.044	0.390
0.2000	0.018	0.001	0.048	0.390
0.2333	0.018	0.001	0.052	0.390
0.2667	0.018	0.001	0.056	0.390
0.3000	0.018	0.001	0.059	0.390
0.3333	0.018	0.002	0.062	0.390
0.3667	0.018	0.002	0.065	0.390
0.4000	0.018	0.002	0.068	0.390
0.4333	0.018	0.002	0.071	0.390
0.4667	0.018	0.002	0.074	0.390
0.5000	0.018	0.003	0.076	0.390
0.5333	0.018	0.003	0.079	0.390
0.5667	0.018	0.003	0.081	0.390
0.6000	0.018	0.003	0.084	0.390
0.6333	0.018	0.003	0.086	0.390
0.6667	0.018	0.004	0.088	0.390
0.7000	0.018	0.004	0.090	0.390
0.7333	0.018	0.004	0.093	0.390
0.7667	0.018	0.004	0.095	0.390
0.8000	0.018	0.004	0.097	0.390

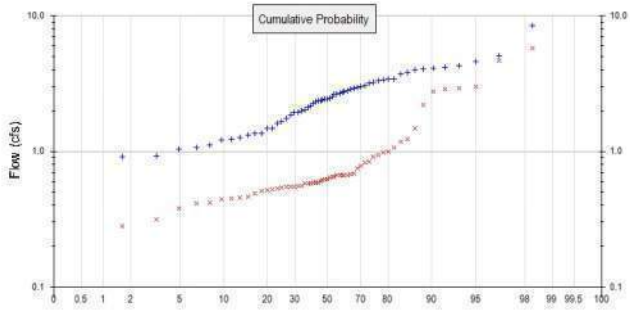
0.8333	0.018	0.005	0.099	0.390
0.8667	0.018	0.005	0.101	0.390
0.9000	0.018	0.005	0.103	0.390
0.9333	0.018	0.005	0.104	0.390
0.9667	0.018	0.005	0.106	0.390
1.0000	0.018	0.006	0.108	0.390
1.0333	0.018	0.006	0.110	0.390
1.0667	0.018	0.006	0.112	0.390
1.1000	0.018	0.006	0.113	0.390
1.1333	0.018	0.006	0.115	0.390
1.1667	0.018	0.007	0.117	0.390
1.2000	0.018	0.007	0.118	0.390
1.2333	0.018	0.007	0.120	0.390
1.2667	0.018	0.007	0.122	0.390
1.3000	0.018	0.007	0.123	0.390
1.3333	0.018	0.008	0.125	0.390
1.3667	0.018	0.008	0.126	0.390
1.4000	0.018	0.008	0.128	0.390
1.4333	0.018	0.008	0.130	0.390
1.4667	0.018	0.008	0.131	0.390
1.5000	0.018	0.009	0.132	0.390
1.5333	0.018	0.009	0.134	0.390
1.5667	0.018	0.009	0.135	0.390
1.6000	0.018	0.009	0.137	0.390
1.6333	0.018	0.009	0.138	0.390
1.6667	0.018	0.010	0.140	0.390
1.7000	0.018	0.010	0.141	0.390
1.7333	0.018	0.010	0.142	0.390
1.7667	0.018	0.010	0.144	0.390
1.8000	0.018	0.010	0.145	0.390
1.8333	0.018	0.011	0.147	0.390
1.8667	0.018	0.011	0.148	0.390
1.9000	0.018	0.011	0.149	0.390
1.9333	0.018	0.011	0.150	0.390
1.9667	0.018	0.011	0.152	0.390
2.0000	0.018	0.012	0.153	0.390
2.0333	0.018	0.012	0.154	0.390
2.0667	0.018	0.012	0.156	0.390
2.1000	0.018	0.012	0.157	0.390
2.1333	0.018	0.012	0.158	0.390
2.1667	0.018	0.013	0.159	0.390
2.2000	0.018	0.013	0.161	0.390
2.2333	0.018	0.013	0.162	0.390
2.2667	0.018	0.013	0.163	0.390
2.3000	0.018	0.013	0.164	0.390
2.3333	0.018	0.014	0.165	0.390
2.3667	0.018	0.014	0.167	0.390
2.4000	0.018	0.014	0.168	0.390
2.4333	0.018	0.014	0.169	0.390
2.4667	0.018	0.014	0.170	0.390
2.5000	0.018	0.015	0.171	0.390
2.5333	0.018	0.015	0.269	0.390
2.5667	0.018	0.015	0.447	0.390
2.6000	0.018	0.015	0.677	0.390
2.6333	0.018	0.016	0.947	0.390
2.6667	0.018	0.016	1.251	0.390
2.7000	0.018	0.016	1.582	0.390
2.7333	0.018	0.016	1.935	0.390

2.7667	0.018	0.016	2.304	0.390
2.8000	0.018	0.017	2.682	0.390
2.8333	0.018	0.017	3.065	0.390
2.8667	0.018	0.017	3.445	0.390
2.9000	0.018	0.017	3.817	0.390
2.9333	0.018	0.017	4.174	0.390
2.9667	0.018	0.018	4.513	0.390
3.0000	0.018	0.018	4.827	0.390

Analysis Results

POC 1





\+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #1
Total Pervious Area: 8.7386
Total Impervious Area: 0

Mitigated Landuse Totals for POC #1
Total Pervious Area: 4.0912
Total Impervious Area: 4.6474

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	**Flow(cfs)**
2 year	2.458123
5 year	3.785611
10 year	4.502037
25 year	5.228488
50 year	5.659129
100 year	6.012664

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	**Flow(cfs)**
2 year	0.689244
5 year	1.232363
10 year	1.74583
25 year	2.62148
50 year	3.476668
100 year	4.542692

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #1

Year	**Predeveloped**	**Mitigated**
1949	1.848	0.581
1950	2.383	0.610
1951	3.230	0.519
1952	1.940	0.782
1953	2.642	0.531
1954	4.043	0.577
1955	2.031	0.463
1956	3.726	2.986
1957	3.294	0.644
1958	2.445	2.196

1959	1.479	0.379
1960	1.358	0.546
1961	3.399	0.670
1962	2.377	0.624
1963	2.660	0.591
1964	2.468	0.554
1965	2.116	0.649
1966	2.960	0.651
1967	2.675	0.552
1968	3.201	0.825
1969	3.064	2.758
1970	8.476	5.763
1971	1.353	0.449
1972	2.161	0.549
1973	2.248	0.674
1974	3.403	2.887
1975	1.935	0.545
1976	2.922	0.667
1977	0.087	0.250
1978	4.256	1.228
1979	2.776	1.474
1980	1.607	0.490
1981	3.811	1.069
1982	2.521	0.935
1983	4.610	0.835
1984	1.488	0.454
1985	1.072	0.580
1986	1.328	0.587
1987	2.344	0.589
1988	1.120	0.443
1989	1.211	0.527
1990	1.031	0.417
1991	2.722	0.604
1992	2.815	0.539
1993	3.342	1.176
1994	2.412	0.672
1995	1.992	0.908
1996	4.190	4.632
1997	5.107	2.923
1998	4.127	0.669
1999	2.878	0.689
2000	1.647	0.313
2001	0.909	0.282
2002	3.970	0.663
2003	3.023	0.744
2004	0.923	0.412
2005	1.229	0.513
2006	2.330	0.620
2007	1.269	0.997
2008	1.754	0.974

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	8.4759	5.7629
2	5.1066	4.6324
3	4.6099	2.9856
4	4.2556	2.9225

5	4.1898	2.8871
6	4.1265	2.7581
7	4.0428	2.1961
8	3.9703	1.4744
9	3.8114	1.2284
10	3.7262	1.1756
11	3.4034	1.0693
12	3.3989	0.9972
13	3.3419	0.9743
14	3.2944	0.9346
15	3.2304	0.9082
16	3.2006	0.8347
17	3.0637	0.8246
18	3.0231	0.7824
19	2.9603	0.7436
20	2.9221	0.6894
21	2.8780	0.6743
22	2.8153	0.6718
23	2.7758	0.6697
24	2.7219	0.6691
25	2.6751	0.6672
26	2.6597	0.6635
27	2.6425	0.6506
28	2.5211	0.6488
29	2.4679	0.6438
30	2.4450	0.6241
31	2.4121	0.6200
32	2.3834	0.6105
33	2.3766	0.6044
34	2.3441	0.5913
35	2.3296	0.5889
36	2.2481	0.5867
37	2.1612	0.5808
38	2.1162	0.5801
39	2.0305	0.5766
40	1.9916	0.5542
41	1.9397	0.5517
42	1.9355	0.5492
43	1.8480	0.5463
44	1.7540	0.5447
45	1.6466	0.5391
46	1.6075	0.5306
47	1.4877	0.5272
48	1.4786	0.5193
49	1.3582	0.5129
50	1.3529	0.4902
51	1.3278	0.4626
52	1.2693	0.4545
53	1.2291	0.4494
54	1.2106	0.4435
55	1.1196	0.4167
56	1.0719	0.4122
57	1.0308	0.3790
58	0.9234	0.3133
59	0.9087	0.2817
60	0.0872	0.2499

Duration Flows

The Facility PASSED

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
1.2291	894	66	7	Pass
1.2738	823	63	7	Pass
1.3186	756	57	7	Pass
1.3633	687	54	7	Pass
1.4081	626	51	8	Pass
1.4528	576	50	8	Pass
1.4976	536	48	8	Pass
1.5423	492	46	9	Pass
1.5870	455	45	9	Pass
1.6318	431	44	10	Pass
1.6765	392	39	9	Pass
1.7213	364	38	10	Pass
1.7660	346	37	10	Pass
1.8108	324	36	11	Pass
1.8555	305	34	11	Pass
1.9003	287	33	11	Pass
1.9450	271	32	11	Pass
1.9898	253	32	12	Pass
2.0345	237	30	12	Pass
2.0793	226	29	12	Pass
2.1240	211	28	13	Pass
2.1688	193	27	13	Pass
2.2135	182	23	12	Pass
2.2583	165	22	13	Pass
2.3030	152	22	14	Pass
2.3478	145	22	15	Pass
2.3925	131	22	16	Pass
2.4373	120	21	17	Pass
2.4820	107	20	18	Pass
2.5268	100	18	18	Pass
2.5715	96	17	17	Pass
2.6163	91	17	18	Pass
2.6610	83	17	20	Pass
2.7058	75	15	20	Pass
2.7505	71	13	18	Pass
2.7952	69	10	14	Pass
2.8400	62	9	14	Pass
2.8847	59	9	15	Pass
2.9295	56	7	12	Pass
2.9742	52	7	13	Pass
3.0190	49	6	12	Pass
3.0637	44	5	11	Pass
3.1085	43	5	11	Pass
3.1532	41	5	12	Pass
3.1980	39	5	12	Pass
3.2427	32	5	15	Pass
3.2875	30	5	16	Pass
3.3322	28	5	17	Pass
3.3770	26	5	19	Pass
3.4217	21	5	23	Pass
3.4665	19	5	26	Pass
3.5112	19	5	26	Pass
3.5560	19	5	26	Pass

3.6007	18	5	27	Pass
3.6455	16	5	31	Pass
3.6902	15	4	26	Pass
3.7350	14	4	28	Pass
3.7797	14	4	28	Pass
3.8245	12	3	25	Pass
3.8692	12	3	25	Pass
3.9140	12	3	25	Pass
3.9587	12	3	25	Pass
4.0034	11	3	27	Pass
4.0482	10	3	30	Pass
4.0929	10	3	30	Pass
4.1377	9	3	33	Pass
4.1824	9	3	33	Pass
4.2272	8	3	37	Pass
4.2719	7	3	42	Pass
4.3167	6	3	50	Pass
4.3614	6	3	50	Pass
4.4062	6	3	50	Pass
4.4509	6	3	50	Pass
4.4957	6	3	50	Pass
4.5404	6	3	50	Pass
4.5852	6	3	50	Pass
4.6299	5	3	60	Pass
4.6747	5	2	40	Pass
4.7194	5	2	40	Pass
4.7642	5	2	40	Pass
4.8089	5	2	40	Pass
4.8537	5	2	40	Pass
4.8984	5	2	40	Pass
4.9432	5	2	40	Pass
4.9879	5	2	40	Pass
5.0327	5	2	40	Pass
5.0774	5	2	40	Pass
5.1222	4	2	50	Pass
5.1669	4	2	50	Pass
5.2116	4	2	50	Pass
5.2564	4	2	50	Pass
5.3011	4	2	50	Pass
5.3459	4	2	50	Pass
5.3906	4	2	50	Pass
5.4354	4	1	25	Pass
5.4801	4	1	25	Pass
5.5249	4	1	25	Pass
5.5696	4	1	25	Pass
5.6144	4	1	25	Pass
5.6591	4	1	25	Pass

Water Quality

Water Quality BMP Flow and Volume for POC #1

On-line facility volume:	0.9279 acre-feet
On-line facility target flow:	1.223 cfs.
Adjusted for 15 min:	1.223 cfs.
Off-line facility target flow:	0.661 cfs.
Adjusted for 15 min:	0.661 cfs.

LID Report

LID Technique	Used for Treatment ?	Total Volume Needs Treatment (ac-ft)	Volume Through Facility (ac-ft)	Infiltration Volume (ac-ft)	Cumulative Volume Infiltration Credit	Percent Volume Infiltrated	Water Quality	Percent Water Quality Treated	Comment
Trapezoidal Pond 1 POC	☐	394.02			☐	0.00			
Gravel Trench Bed 2	☐	428.79			☐	86.45			
Gravel Trench Bed 1	☐	573.93			☐	88.71			
Total Volume Infiltrated		1396.74	0.00	0.00		62.99	0.00	0%	No Treat. Credit
Compliance with LID Standard 8% of 2-yr to 50% of 2-yr									Duration Analysis Result = Passed

Model Default Modifications

Total of 0 changes have been made.

PERLND Changes

No PERLND changes have been made.

IMPLND Changes

No IMPLND changes have been made.

Appendix

Predeveloped Schematic

Mitigated Schematic

Predeveloped UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1948 10 01        END    2008 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                   UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                              ***
WDM         26   Prelim Storm Ananysis.wdm
MESSU       25   PrePrelim Storm Ananysis.MES
            27   PrePrelim Storm Ananysis.L61
            28   PrePrelim Storm Ananysis.L62
            30   POCPrelim Storm Ananysis1.dat
END FILES

OPN SEQUENCE
    INGRP              INDELT 00:15
      PERLND      29
      COPY       501
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title---------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Extg                       MAX                    1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                         User  t-series Engl Metr ***
                                      in  out           ***
   29     SG4, Forest, Mod        1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************ Active Sections ****************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
   29         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags **************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
   29         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO
```

```
  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
   29         0    0    0    0    0    0    0    0    0    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
   29             0         6      0.04       400       0.1         0      0.96
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
   29             0         0         3         2         0         0         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                              ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
   29          0.2       0.4      0.35         2       0.4       0.7
  END PWAT-PARM4

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
             ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS      GWVS
   29             0         0         0         0       2.5         1         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                     in  out           ***
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************* Active Sections ******************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
  END IWAT-STATE1
```

```
END IMPLND

SCHEMATIC
<-Source->                  <--Area-->     <-Target->   MBLK   ***
<Name>   #                  <-factor->     <Name>   #   Tbl#   ***
Extg***
PERLND  29                      8.7386     COPY   501     12
PERLND  29                      8.7386     COPY   501     13

******Routing******
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   48.4        DISPLY   1     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                ***
    # -  #<------------------><---> User T-series  Engl Metr LKFG           ***
                                       in  out                              ***
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************ Active Sections ****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ******************* PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                  ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
            FG FG FG FG  possible  exit  *** possible  exit      possible  exit
             *  *  *  *    *  *  *  *  *      *  *  *  *  *        ***
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><--------><--------> ***
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                     ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
          *** ac-ft     for each possible exit        for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><--->
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1.3            PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1.3            IMPLND   1 999 EXTNL  PREC
```

```
WDM      1 EVAP     ENGL    0.8            PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    0.8            IMPLND   1 999 EXTNL  PETINP

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    501 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>            <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13


END MASS-LINK

END RUN
```

Mitigated UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1948 10 01        END    2008 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                    UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                              ***
WDM         26   Prelim Storm Ananysis.wdm
MESSU       25   MitPrelim Storm Ananysis.MES
            27   MitPrelim Storm Ananysis.L61
            28   MitPrelim Storm Ananysis.L62
            30   POCPrelim Storm Ananysis1.dat
END FILES

OPN SEQUENCE
    INGRP               INDELT 00:15
      PERLND      34
      PERLND      35
      IMPLND       1
      IMPLND       4
      IMPLND       6
      IMPLND       8
      RCHRES       1
      RCHRES       2
      RCHRES       3
      COPY         1
      COPY       501
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Trapezoidal Pond  1         MAX                    1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                          in  out           ***
   34     SG4, Lawn, Flat         1    1    1    1   27    0
   35     SG4, Lawn, Mod          1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************* Active Sections ****************************
```

```
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
   34         0    0    1    0    0    0    0    0    0    0    0    0
   35         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags **************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
   34         0    0    4    0    0    0    0    0    0    0    0    0    1    9
   35         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
   34         0    0    0    0    0    0    0    0    0    0    0
   35         0    0    0    0    0    0    0    0    0    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2          ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
   34              0         6      0.02       400      0.05         0      0.96
   35              0         6      0.02       400       0.1         0      0.96
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3          ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
   34              0         0         3         2         0         0         0
   35              0         0         3         2         0         0         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                              ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
   34            0.1       0.2      0.25         2       0.4      0.25
   35            0.1       0.2      0.25         2       0.4      0.25
  END PWAT-PARM4

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
               ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS       AGWS      GWVS
   34              0         0         0         0       2.5          1         0
   35              0         0         0         0       2.5          1         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                     in  out           ***
    1      ROADS/FLAT              1    1    1   27    0
    4      ROOF TOPS/FLAT          1    1    1   27    0
    6      DRIVEWAYS/MOD           1    1    1   27    0
    8      SIDEWALKS/FLAT          1    1    1   27    0
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************ Active Sections ******************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
    1         0    0    1    0    0    0
    4         0    0    1    0    0    0
    6         0    0    1    0    0    0
    8         0    0    1    0    0    0
  END ACTIVITY
```

```
  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
    1         0    0    4    0    0    0    1    9
    4         0    0    4    0    0    0    1    9
    6         0    0    4    0    0    0    1    9
    8         0    0    4    0    0    0    1    9
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
    1         0    0    0    0    0
    4         0    0    0    0    0
    6         0    0    0    0    0
    8         0    0    0    0    0
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
    1            400      0.01       0.1       0.1
    4            400      0.01       0.1       0.1
    6            400      0.05       0.1      0.08
    8            400      0.01       0.1       0.1
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
    1              0         0
    4              0         0
    6              0         0
    8              0         0
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
    1              0         0
    4              0         0
    6              0         0
    8              0         0
  END IWAT-STATE1

END IMPLND

SCHEMATIC
<-Source->                 <--Area-->     <-Target->   MBLK   ***
<Name>   #                 <-factor->     <Name>   #   Tbl#   ***
Basin  1-North***
PERLND  34                      0.708     RCHRES   1      2
PERLND  34                      0.708     RCHRES   1      3
PERLND  35                      0.708     RCHRES   1      2
PERLND  35                      0.708     RCHRES   1      3
IMPLND   1                     0.8667     RCHRES   1      5
IMPLND   4                     1.0285     RCHRES   1      5
IMPLND   6                     0.2938     RCHRES   1      5
IMPLND   8                     0.1946     RCHRES   1      5
Basin  2-Mid***
PERLND  34                      0.754     RCHRES   2      2
PERLND  34                      0.754     RCHRES   2      3
PERLND  35                      0.754     RCHRES   2      2
PERLND  35                      0.754     RCHRES   2      3
IMPLND   1                     0.3561     RCHRES   2      5
IMPLND   4                     0.5377     RCHRES   2      5
IMPLND   6                     0.1818     RCHRES   2      5
IMPLND   8                     0.0902     RCHRES   2      5
Basin  3-South***
PERLND  34                      0.5836     RCHRES   3      2
```

```
PERLND  34                      0.5836     RCHRES   3      3
PERLND  35                      0.5836     RCHRES   3      2
PERLND  35                      0.5836     RCHRES   3      3
IMPLND   1                      0.2065     RCHRES   3      5
IMPLND   4                      0.6428     RCHRES   3      5
IMPLND   6                      0.1837     RCHRES   3      5
IMPLND   8                       0.065     RCHRES   3      5

******Routing******
PERLND  34                      0.5836     COPY     1     12
PERLND  35                      0.5836     COPY     1     12
IMPLND   1                      0.2065     COPY     1     15
IMPLND   4                      0.6428     COPY     1     15
IMPLND   6                      0.1837     COPY     1     15
IMPLND   8                       0.065     COPY     1     15
PERLND  34                      0.5836     COPY     1     13
PERLND  35                      0.5836     COPY     1     13
RCHRES   1                           1     RCHRES   2      7
RCHRES   2                           1     RCHRES   3      7
RCHRES   2                                 COPY     1     17
RCHRES   3                           1     COPY   501     16
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   48.4        DISPLY   1     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                ***
    # -  #<------------------><---> User T-series  Engl Metr LKFG           ***
                                       in  out                              ***
    1     Gravel Trench Be-009    2    1    1    1   28    0    1
    2     Gravel Trench Be-010    2    1    1    1   28    0    1
    3     Trapezoidal Pond-005    1    1    1    1   28    0    1
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************ Active Sections ******************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
    1         1    0    0    0    0    0    0    0    0    0
    2         1    0    0    0    0    0    0    0    0    0
    3         1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ****************** PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
    1         4    0    0    0    0    0    0    0    0    0    1    9
    2         4    0    0    0    0    0    0    0    0    0    1    9
    3         4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                  ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
          FG FG FG FG  possible  exit  *** possible  exit      possible  exit
           *  *  *  *    *  *  *  *  *      *  *  *  *  *         ***
    1      0  1  0  0    4  5  0  0  0       0  0  0  0  0        2  2  2  2  2
    2      0  1  0  0    4  5  0  0  0       0  0  0  0  0        2  2  2  2  2
    3      0  1  0  0    4  0  0  0  0       0  0  0  0  0        2  2  2  2  2
  END HYDR-PARM1
```

```
  HYDR-PARM2
    # -  #    FTABNO       LEN      DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><--------><-------->       ***
    1              1      0.02       0.0       0.0       0.5       0.0
    2              2      0.02       0.0       0.0       0.5       0.0
    3              3      0.02       0.0       0.0       0.5       0.0
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                          ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
           *** ac-ft     for each possible exit        for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><--->
    1            0         4.0  5.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
    2            0         4.0  5.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
    3            0         4.0  0.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
  FTABLE      3
   91    4
     Depth      Area    Volume  Outflow1 Velocity  Travel Time***
      (ft)   (acres) (acre-ft)   (cfs)   (ft/sec)    (Minutes)***
  0.000000  0.103306  0.000000  0.000000
  0.044444  0.104164  0.004610  0.091535
  0.088889  0.105026  0.009259  0.129450
  0.133333  0.105892  0.013946  0.158543
  0.177778  0.106760  0.018672  0.183070
  0.222222  0.107632  0.023436  0.204679
  0.266667  0.108507  0.028239  0.224214
  0.311111  0.109385  0.033081  0.242179
  0.355556  0.110267  0.037962  0.258900
  0.400000  0.111152  0.042883  0.274605
  0.444444  0.112040  0.047843  0.289459
  0.488889  0.112931  0.052842  0.303587
  0.533333  0.113826  0.057881  0.317087
  0.577778  0.114723  0.062960  0.330034
  0.622222  0.115625  0.068079  0.342493
  0.666667  0.116529  0.073238  0.354514
  0.711111  0.117437  0.078437  0.366140
  0.755556  0.118348  0.083676  0.377409
  0.800000  0.119262  0.088957  0.388350
  0.844444  0.120179  0.094278  0.398992
  0.888889  0.121100  0.099639  0.409357
  0.933333  0.122024  0.105042  0.419466
  0.977778  0.122951  0.110486  0.429337
  1.022222  0.123882  0.115971  0.438987
  1.066667  0.124815  0.121498  0.448428
  1.111111  0.125752  0.127066  0.457675
  1.155556  0.126693  0.132676  0.466739
  1.200000  0.127636  0.138328  0.475630
  1.244444  0.128583  0.144021  0.484358
  1.288889  0.129533  0.149757  0.492931
  1.333333  0.130487  0.155536  0.501358
  1.377778  0.131443  0.161356  0.509646
  1.422222  0.132403  0.167219  0.517800
  1.466667  0.133366  0.173125  0.525829
  1.511111  0.134333  0.179074  0.533737
  1.555556  0.135303  0.185066  0.541529
  1.600000  0.136275  0.191101  0.549210
  1.644444  0.137252  0.197180  0.556786
  1.688889  0.138231  0.203301  0.564260
  1.733333  0.139214  0.209467  0.571636
  1.777778  0.140200  0.215676  0.578919
  1.822222  0.141189  0.221929  0.586110
  1.866667  0.142182  0.228226  0.593215
  1.911111  0.143178  0.234568  0.600235
```

```
1.955556  0.144177  0.240953  0.607175
2.000000  0.145179  0.247383  0.614036
2.044444  0.146185  0.253858  0.620821
2.088889  0.147194  0.260378  0.627533
2.133333  0.148206  0.266942  0.634173
2.177778  0.149221  0.273552  0.640745
2.222222  0.150240  0.280206  0.647251
2.266667  0.151262  0.286906  0.653691
2.311111  0.152287  0.293652  0.660069
2.355556  0.153315  0.300443  0.666385
2.400000  0.154347  0.307280  0.672643
2.444444  0.155382  0.314163  0.678842
2.488889  0.156420  0.321092  0.684986
2.533333  0.157462  0.328067  0.697762
2.577778  0.158507  0.335088  0.720947
2.622222  0.159555  0.342157  0.750049
2.666667  0.160606  0.349271  0.783798
2.711111  0.161661  0.356433  0.821504
2.755556  0.162718  0.363641  0.862714
2.800000  0.163780  0.370897  0.907105
2.844444  0.164844  0.378199  0.954426
2.888889  0.165912  0.385550  1.004479
2.933333  0.166983  0.392947  1.057101
2.977778  0.168057  0.400392  1.112155
3.022222  0.169134  0.407886  1.196074
3.066667  0.170215  0.415427  1.422563
3.111111  0.171299  0.423016  1.742162
3.155556  0.172386  0.430653  2.129808
3.200000  0.173477  0.438339  2.569685
3.244444  0.174570  0.446074  3.047905
3.288889  0.175667  0.453857  3.550658
3.333333  0.176768  0.461688  4.063756
3.377778  0.177871  0.469569  4.572787
3.422222  0.178978  0.477499  5.063593
3.466667  0.180088  0.485479  5.522962
3.511111  0.181202  0.493507  5.939493
3.555556  0.182318  0.501585  6.304588
3.600000  0.183438  0.509713  6.613556
3.644444  0.184561  0.517891  6.866825
3.688889  0.185688  0.526119  7.071238
3.733333  0.186817  0.534397  7.241442
3.777778  0.187950  0.542725  7.482285
3.822222  0.189086  0.551104  7.663321
3.866667  0.190226  0.559533  7.839630
3.911111  0.191369  0.568013  8.011571
3.955556  0.192515  0.576543  8.179456
4.000000  0.193664  0.585125  8.343565
END FTABLE  3
FTABLE      1
 92    5
   Depth      Area    Volume  Outflow1  Outflow2  Velocity  Travel Time***
    (ft)   (acres) (acre-ft)   (cfs)     (cfs)   (ft/sec)    (Minutes)***
0.000000  0.018365  0.000000  0.000000  0.000000
0.033333  0.018365  0.000202  0.019818  0.390741
0.066667  0.018365  0.000404  0.028027  0.390741
0.100000  0.018365  0.000606  0.034326  0.390741
0.133333  0.018365  0.000808  0.039636  0.390741
0.166667  0.018365  0.001010  0.044314  0.390741
0.200000  0.018365  0.001212  0.048544  0.390741
0.233333  0.018365  0.001414  0.052433  0.390741
0.266667  0.018365  0.001616  0.056054  0.390741
0.300000  0.018365  0.001818  0.059454  0.390741
0.333333  0.018365  0.002020  0.062670  0.390741
0.366667  0.018365  0.002222  0.065729  0.390741
0.400000  0.018365  0.002424  0.068651  0.390741
0.433333  0.018365  0.002626  0.071455  0.390741
0.466667  0.018365  0.002828  0.074152  0.390741
0.500000  0.018365  0.003030  0.076754  0.390741
0.533333  0.018365  0.003232  0.079272  0.390741
0.566667  0.018365  0.003434  0.081711  0.390741
```

0.600000	0.018365	0.003636	0.084080	0.390741
0.633333	0.018365	0.003838	0.086384	0.390741
0.666667	0.018365	0.004040	0.088628	0.390741
0.700000	0.018365	0.004242	0.090817	0.390741
0.733333	0.018365	0.004444	0.092954	0.390741
0.766667	0.018365	0.004646	0.095043	0.390741
0.800000	0.018365	0.004848	0.097088	0.390741
0.833333	0.018365	0.005051	0.099090	0.390741
0.866667	0.018365	0.005253	0.101052	0.390741
0.900000	0.018365	0.005455	0.102977	0.390741
0.933333	0.018365	0.005657	0.104867	0.390741
0.966667	0.018365	0.005859	0.106723	0.390741
1.000000	0.018365	0.006061	0.108547	0.390741
1.033333	0.018365	0.006263	0.110342	0.390741
1.066667	0.018365	0.006465	0.112107	0.390741
1.100000	0.018365	0.006667	0.113845	0.390741
1.133333	0.018365	0.006869	0.115557	0.390741
1.166667	0.018365	0.007071	0.117244	0.390741
1.200000	0.018365	0.007273	0.118908	0.390741
1.233333	0.018365	0.007475	0.120548	0.390741
1.266667	0.018365	0.007677	0.122166	0.390741
1.300000	0.018365	0.007879	0.123763	0.390741
1.333333	0.018365	0.008081	0.125340	0.390741
1.366667	0.018365	0.008283	0.126897	0.390741
1.400000	0.018365	0.008485	0.128435	0.390741
1.433333	0.018365	0.008687	0.129955	0.390741
1.466667	0.018365	0.008889	0.131457	0.390741
1.500000	0.018365	0.009091	0.132943	0.390741
1.533333	0.018365	0.009293	0.134412	0.390741
1.566667	0.018365	0.009495	0.135865	0.390741
1.600000	0.018365	0.009697	0.137303	0.390741
1.633333	0.018365	0.009899	0.138725	0.390741
1.666667	0.018365	0.010101	0.140134	0.390741
1.700000	0.018365	0.010303	0.141528	0.390741
1.733333	0.018365	0.010505	0.142909	0.390741
1.766667	0.018365	0.010707	0.144277	0.390741
1.800000	0.018365	0.010909	0.145631	0.390741
1.833333	0.018365	0.011111	0.146974	0.390741
1.866667	0.018365	0.011313	0.148304	0.390741
1.900000	0.018365	0.011515	0.149622	0.390741
1.933333	0.018365	0.011717	0.150929	0.390741
1.966667	0.018365	0.011919	0.152224	0.390741
2.000000	0.018365	0.012121	0.153509	0.390741
2.033333	0.018365	0.012323	0.154783	0.390741
2.066667	0.018365	0.012525	0.156046	0.390741
2.100000	0.018365	0.012727	0.157300	0.390741
2.133333	0.018365	0.012929	0.158543	0.390741
2.166667	0.018365	0.013131	0.159777	0.390741
2.200000	0.018365	0.013333	0.161002	0.390741
2.233333	0.018365	0.013535	0.162217	0.390741
2.266667	0.018365	0.013737	0.163423	0.390741
2.300000	0.018365	0.013939	0.164620	0.390741
2.333333	0.018365	0.014141	0.165809	0.390741
2.366667	0.018365	0.014343	0.166989	0.390741
2.400000	0.018365	0.014545	0.168161	0.390741
2.433333	0.018365	0.014747	0.169324	0.390741
2.466667	0.018365	0.014949	0.170480	0.390741
2.500000	0.018365	0.015152	0.171628	0.390741
2.533333	0.018365	0.015354	0.269621	0.390741
2.566667	0.018365	0.015556	0.447597	0.390741
2.600000	0.018365	0.015758	0.677205	0.390741
2.633333	0.018365	0.015960	0.947610	0.390741
2.666667	0.018365	0.016162	1.251526	0.390741
2.700000	0.018365	0.016364	1.582825	0.390741
2.733333	0.018365	0.016566	1.935709	0.390741
2.766667	0.018365	0.016768	2.304373	0.390741
2.800000	0.018365	0.016970	2.682896	0.390741
2.833333	0.018365	0.017172	3.065232	0.390741
2.866667	0.018365	0.017374	3.445289	0.390741
2.900000	0.018365	0.017576	3.817050	0.390741

```
2.933333  0.018365  0.017778  4.174735  0.390741
2.966667  0.018365  0.017980  4.512988  0.390741
3.000000  0.018365  0.018182  4.827101  0.390741
3.033333  0.018365  0.018794  5.113248  0.390741
END FTABLE  1
FTABLE      2
 92    5
   Depth      Area    Volume  Outflow1  Outflow2  Velocity  Travel Time***
    (ft)   (acres) (acre-ft)   (cfs)     (cfs)   (ft/sec)    (Minutes)***
0.000000  0.018365  0.000000  0.000000  0.000000
0.033333  0.018365  0.000202  0.019818  0.390741
0.066667  0.018365  0.000404  0.028027  0.390741
0.100000  0.018365  0.000606  0.034326  0.390741
0.133333  0.018365  0.000808  0.039636  0.390741
0.166667  0.018365  0.001010  0.044314  0.390741
0.200000  0.018365  0.001212  0.048544  0.390741
0.233333  0.018365  0.001414  0.052433  0.390741
0.266667  0.018365  0.001616  0.056054  0.390741
0.300000  0.018365  0.001818  0.059454  0.390741
0.333333  0.018365  0.002020  0.062670  0.390741
0.366667  0.018365  0.002222  0.065729  0.390741
0.400000  0.018365  0.002424  0.068651  0.390741
0.433333  0.018365  0.002626  0.071455  0.390741
0.466667  0.018365  0.002828  0.074152  0.390741
0.500000  0.018365  0.003030  0.076754  0.390741
0.533333  0.018365  0.003232  0.079272  0.390741
0.566667  0.018365  0.003434  0.081711  0.390741
0.600000  0.018365  0.003636  0.084080  0.390741
0.633333  0.018365  0.003838  0.086384  0.390741
0.666667  0.018365  0.004040  0.088628  0.390741
0.700000  0.018365  0.004242  0.090817  0.390741
0.733333  0.018365  0.004444  0.092954  0.390741
0.766667  0.018365  0.004646  0.095043  0.390741
0.800000  0.018365  0.004848  0.097088  0.390741
0.833333  0.018365  0.005051  0.099090  0.390741
0.866667  0.018365  0.005253  0.101052  0.390741
0.900000  0.018365  0.005455  0.102977  0.390741
0.933333  0.018365  0.005657  0.104867  0.390741
0.966667  0.018365  0.005859  0.106723  0.390741
1.000000  0.018365  0.006061  0.108547  0.390741
1.033333  0.018365  0.006263  0.110342  0.390741
1.066667  0.018365  0.006465  0.112107  0.390741
1.100000  0.018365  0.006667  0.113845  0.390741
1.133333  0.018365  0.006869  0.115557  0.390741
1.166667  0.018365  0.007071  0.117244  0.390741
1.200000  0.018365  0.007273  0.118908  0.390741
1.233333  0.018365  0.007475  0.120548  0.390741
1.266667  0.018365  0.007677  0.122166  0.390741
1.300000  0.018365  0.007879  0.123763  0.390741
1.333333  0.018365  0.008081  0.125340  0.390741
1.366667  0.018365  0.008283  0.126897  0.390741
1.400000  0.018365  0.008485  0.128435  0.390741
1.433333  0.018365  0.008687  0.129955  0.390741
1.466667  0.018365  0.008889  0.131457  0.390741
1.500000  0.018365  0.009091  0.132943  0.390741
1.533333  0.018365  0.009293  0.134412  0.390741
1.566667  0.018365  0.009495  0.135865  0.390741
1.600000  0.018365  0.009697  0.137303  0.390741
1.633333  0.018365  0.009899  0.138725  0.390741
1.666667  0.018365  0.010101  0.140134  0.390741
1.700000  0.018365  0.010303  0.141528  0.390741
1.733333  0.018365  0.010505  0.142909  0.390741
1.766667  0.018365  0.010707  0.144277  0.390741
1.800000  0.018365  0.010909  0.145631  0.390741
1.833333  0.018365  0.011111  0.146974  0.390741
1.866667  0.018365  0.011313  0.148304  0.390741
1.900000  0.018365  0.011515  0.149622  0.390741
1.933333  0.018365  0.011717  0.150929  0.390741
1.966667  0.018365  0.011919  0.152224  0.390741
2.000000  0.018365  0.012121  0.153509  0.390741
```

```
  2.033333  0.018365  0.012323  0.154783  0.390741
  2.066667  0.018365  0.012525  0.156046  0.390741
  2.100000  0.018365  0.012727  0.157300  0.390741
  2.133333  0.018365  0.012929  0.158543  0.390741
  2.166667  0.018365  0.013131  0.159777  0.390741
  2.200000  0.018365  0.013333  0.161002  0.390741
  2.233333  0.018365  0.013535  0.162217  0.390741
  2.266667  0.018365  0.013737  0.163423  0.390741
  2.300000  0.018365  0.013939  0.164620  0.390741
  2.333333  0.018365  0.014141  0.165809  0.390741
  2.366667  0.018365  0.014343  0.166989  0.390741
  2.400000  0.018365  0.014545  0.168161  0.390741
  2.433333  0.018365  0.014747  0.169324  0.390741
  2.466667  0.018365  0.014949  0.170480  0.390741
  2.500000  0.018365  0.015152  0.171628  0.390741
  2.533333  0.018365  0.015354  0.269621  0.390741
  2.566667  0.018365  0.015556  0.447597  0.390741
  2.600000  0.018365  0.015758  0.677205  0.390741
  2.633333  0.018365  0.015960  0.947610  0.390741
  2.666667  0.018365  0.016162  1.251526  0.390741
  2.700000  0.018365  0.016364  1.582825  0.390741
  2.733333  0.018365  0.016566  1.935709  0.390741
  2.766667  0.018365  0.016768  2.304373  0.390741
  2.800000  0.018365  0.016970  2.682896  0.390741
  2.833333  0.018365  0.017172  3.065232  0.390741
  2.866667  0.018365  0.017374  3.445289  0.390741
  2.900000  0.018365  0.017576  3.817050  0.390741
  2.933333  0.018365  0.017778  4.174735  0.390741
  2.966667  0.018365  0.017980  4.512988  0.390741
  3.000000  0.018365  0.018182  4.827101  0.390741
  3.033333  0.018365  0.018794  5.113248  0.390741
  END FTABLE  2
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1.3            PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1.3            IMPLND   1 999 EXTNL  PREC
WDM      1 EVAP     ENGL    0.8            PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    0.8            IMPLND   1 999 EXTNL  PETINP
WDM      2 PREC     ENGL    1.3            RCHRES   3     EXTNL  PREC
WDM      1 EVAP     ENGL    0.8            RCHRES   3     EXTNL  POTEV

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
RCHRES   3 HYDR   RO     1 1        1      WDM   1000 FLOW     ENGL      REPL
RCHRES   3 HYDR   STAGE  1 1        1      WDM   1001 STAG     ENGL      REPL
COPY     1 OUTPUT MEAN   1 1     48.4      WDM    701 FLOW     ENGL      REPL
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    801 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>             <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK        2
PERLND     PWATER SURO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    2

  MASS-LINK        3
PERLND     PWATER IFWO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    3

  MASS-LINK        5
IMPLND     IWATER SURO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    5
```

```
  MASS-LINK        7
RCHRES     OFLOW  OVOL   1                RCHRES          INFLOW IVOL
  END MASS-LINK    7

  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY            INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY            INPUT  MEAN
  END MASS-LINK   13

  MASS-LINK       15
IMPLND     IWATER SURO       0.083333      COPY            INPUT  MEAN
  END MASS-LINK   15

  MASS-LINK       16
RCHRES     ROFLOW                          COPY            INPUT  MEAN
  END MASS-LINK   16

  MASS-LINK       17
RCHRES     OFLOW  OVOL   1                 COPY            INPUT  MEAN
  END MASS-LINK   17


END MASS-LINK

END RUN
```

Predeveloped HSPF Message File

Mitigated HSPF Message File

```
ERROR/WARNING ID:   341   6

DATE/TIME: 1953/12/ 9 13:45

RCHRES:     2

The volume of water in this reach/mixed reservoir is greater than the value
in the "volume" column of the last row of RCHTAB().  To continue the
simulation the table has been extrapolated, based on information contained
in the last two rows.  This will usually result in some loss of accuracy.
If depth is being calculated it will also cause an error condition.
Relevant data are:

NROWS         V1         V2        VOL
92  792.01     818.67     851.70
```

```
ERROR/WARNING ID:   341   5

DATE/TIME: 1953/12/ 9 13:45

RCHRES:     2

Calculation of relative depth, using Newton's method of successive
approximations, converged to an invalid value (not in range 0.0 to 1.0).
Probably ftable was extrapolated.  If extrapolation was small, no problem.
Remedy; extend ftable.  Relevant data are:

A          B          C      RDEP1      RDEP2  COUNT
0.0000E+00 1600.0     -3.583E+03    2.2392     2.2392       2
```

```
ERROR/WARNING ID:   341   6

DATE/TIME: 1968/ 8/19 16: 0

RCHRES:     2

The volume of water in this reach/mixed reservoir is greater than the value
in the "volume" column of the last row of RCHTAB().  To continue the
simulation the table has been extrapolated, based on information contained
in the last two rows.  This will usually result in some loss of accuracy.
If depth is being calculated it will also cause an error condition.
Relevant data are:

NROWS         V1         V2        VOL
92  792.01     818.67     872.25
```

```
ERROR/WARNING ID:   341   5

DATE/TIME: 1968/ 8/19 16: 0

RCHRES:     2

Calculation of relative depth, using Newton's method of successive
approximations, converged to an invalid value (not in range 0.0 to 1.0).
Probably ftable was extrapolated.  If extrapolation was small, no problem.
Remedy; extend ftable.  Relevant data are:

A          B          C      RDEP1      RDEP2  COUNT
0.0000E+00 1600.0     -4.816E+03    3.0098     3.0098       2
```

```
ERROR/WARNING ID:   341   6

DATE/TIME: 1969/ 9/17 21:30

RCHRES:     2
```

The volume of water in this reach/mixed reservoir is greater than the value
in the "volume" column of the last row of RCHTAB(). To continue the
simulation the table has been extrapolated, based on information contained
in the last two rows. This will usually result in some loss of accuracy.
If depth is being calculated it will also cause an error condition.
Relevant data are:

NROWS	V1	V2	VOL
92	792.01	818.67	958.98

ERROR/WARNING ID: 341 5

DATE/TIME: 1969/ 9/17 21:30

RCHRES: 2

Calculation of relative depth, using Newton's method of successive
approximations, converged to an invalid value (not in range 0.0 to 1.0).
Probably ftable was extrapolated. If extrapolation was small, no problem.
Remedy; extend ftable. Relevant data are:

A	B	C	RDEP1	RDEP2	COUNT
0.0000E+00	1600.0	-1.002E+04	6.2632	6.2632E+00	2

ERROR/WARNING ID: 341 6

DATE/TIME: 1970/ 1/22 16:15

RCHRES: 2

The volume of water in this reach/mixed reservoir is greater than the value
in the "volume" column of the last row of RCHTAB(). To continue the
simulation the table has been extrapolated, based on information contained
in the last two rows. This will usually result in some loss of accuracy.
If depth is being calculated it will also cause an error condition.
Relevant data are:

NROWS	V1	V2	VOL
92	7.9201E+02	818.67	1020.8

ERROR/WARNING ID: 341 5

DATE/TIME: 1970/ 1/22 16:15

RCHRES: 2

Calculation of relative depth, using Newton's method of successive
approximations, converged to an invalid value (not in range 0.0 to 1.0).
Probably ftable was extrapolated. If extrapolation was small, no problem.
Remedy; extend ftable. Relevant data are:

A	B	C	RDEP1	RDEP2	COUNT
0.0000E+00	1600.0	-1.373E+04	8.5835	8.5835E+00	2

ERROR/WARNING ID: 341 6

DATE/TIME: 1970/ 1/22 16:30

RCHRES: 2

The volume of water in this reach/mixed reservoir is greater than the value
in the "volume" column of the last row of RCHTAB(). To continue the
simulation the table has been extrapolated, based on information contained
in the last two rows. This will usually result in some loss of accuracy.
If depth is being calculated it will also cause an error condition.
Relevant data are:

NROWS	V1	V2	VOL
92	7.9201E+02	818.67	832.70

ERROR/WARNING ID: 341 5

DATE/TIME: 1970/ 1/22 16:30

RCHRES: 2

Calculation of relative depth, using Newton's method of successive approximations, converged to an invalid value (not in range 0.0 to 1.0). Probably ftable was extrapolated. If extrapolation was small, no problem. Remedy; extend ftable. Relevant data are:

A	B	C	RDEP1	RDEP2	COUNT
0.0000E+00	1600.0	-2.442E+03	1.5266	1.5266E+00	2

ERROR/WARNING ID: 341 6

DATE/TIME: 1970/ 1/22 16:45

RCHRES: 2

The volume of water in this reach/mixed reservoir is greater than the value in the "volume" column of the last row of RCHTAB(). To continue the simulation the table has been extrapolated, based on information contained in the last two rows. This will usually result in some loss of accuracy. If depth is being calculated it will also cause an error condition. Relevant data are:

NROWS	V1	V2	VOL
92	7.9201E+02	818.67	878.12

ERROR/WARNING ID: 341 5

DATE/TIME: 1970/ 1/22 16:45

RCHRES: 2

Calculation of relative depth, using Newton's method of successive approximations, converged to an invalid value (not in range 0.0 to 1.0). Probably ftable was extrapolated. If extrapolation was small, no problem. Remedy; extend ftable. Relevant data are:

A	B	C	RDEP1	RDEP2	COUNT
0.0000E+00	1600.0	-5.168E+03	3.2301	3.2301	2

ERROR/WARNING ID: 341 6

DATE/TIME: 1970/ 1/22 17: 0

RCHRES: 2

The volume of water in this reach/mixed reservoir is greater than the value in the "volume" column of the last row of RCHTAB(). To continue the simulation the table has been extrapolated, based on information contained in the last two rows. This will usually result in some loss of accuracy. If depth is being calculated it will also cause an error condition. Relevant data are:

NROWS	V1	V2	VOL
92	792.01	818.67	827.66

ERROR/WARNING ID: 341 5

DATE/TIME: 1970/ 1/22 17: 0

RCHRES: 2

Calculation of relative depth, using Newton's method of successive approximations, converged to an invalid value (not in range 0.0 to 1.0).

Probably ftable was extrapolated. If extrapolation was small, no problem.
Remedy; extend ftable. Relevant data are:

A	B	C	RDEP1	RDEP2	COUNT
0.0000E+00	1600.0	-2.140E+03	1.3372	1.3372E+00	2

ERROR/WARNING ID: 341 6

DATE/TIME: 1979/ 1/10 5: 0

RCHRES: 2

The volume of water in this reach/mixed reservoir is greater than the value
in the "volume" column of the last row of RCHTAB(). To continue the
simulation the table has been extrapolated, based on information contained
in the last two rows. This will usually result in some loss of accuracy.
If depth is being calculated it will also cause an error condition.
Relevant data are:

NROWS	V1	V2	VOL
92	7.9201E+02	818.67	838.57

ERROR/WARNING ID: 341 5

DATE/TIME: 1979/ 1/10 5: 0

RCHRES: 2

Calculation of relative depth, using Newton's method of successive
approximations, converged to an invalid value (not in range 0.0 to 1.0).
Probably ftable was extrapolated. If extrapolation was small, no problem.
Remedy; extend ftable. Relevant data are:

A	B	C	RDEP1	RDEP2	COUNT
0.0000E+00	1600.0	-2.795E+03	1.7468	1.7468E+00	2

ERROR/WARNING ID: 341 6

DATE/TIME: 1992/12/10 6: 0

RCHRES: 2

The volume of water in this reach/mixed reservoir is greater than the value
in the "volume" column of the last row of RCHTAB(). To continue the
simulation the table has been extrapolated, based on information contained
in the last two rows. This will usually result in some loss of accuracy.
If depth is being calculated it will also cause an error condition.
Relevant data are:

NROWS	V1	V2	VOL
92	7.9201E+02	818.67	832.67

ERROR/WARNING ID: 341 5

DATE/TIME: 1992/12/10 6: 0

RCHRES: 2

Calculation of relative depth, using Newton's method of successive
approximations, converged to an invalid value (not in range 0.0 to 1.0).
Probably ftable was extrapolated. If extrapolation was small, no problem.
Remedy; extend ftable. Relevant data are:

A	B	C	RDEP1	RDEP2	COUNT
0.0000E+00	1600.0	-2.440E+03	1.5252	1.5252E+00	2

ERROR/WARNING ID: 341 6

DATE/TIME: 1997/ 5/31 5: 0

RCHRES: 2

The volume of water in this reach/mixed reservoir is greater than the value
in the "volume" column of the last row of RCHTAB(). To continue the
simulation the table has been extrapolated, based on information contained
in the last two rows. This will usually result in some loss of accuracy.
If depth is being calculated it will also cause an error condition.
Relevant data are:

NROWS	V1	V2	VOL
92	7.9201E+02	818.67	881.95

ERROR/WARNING ID: 341 5

DATE/TIME: 1997/ 5/31 5: 0

RCHRES: 2

Calculation of relative depth, using Newton's method of successive
approximations, converged to an invalid value (not in range 0.0 to 1.0).
Probably ftable was extrapolated. If extrapolation was small, no problem.
Remedy; extend ftable. Relevant data are:

A	B	C	RDEP1	RDEP2	COUNT
0.0000E+00	1600.0	-5.398E+03	3.3739	3.3739E+00	2

ERROR/WARNING ID: 341 6

DATE/TIME: 1997/10/29 7:30

RCHRES: 2

The volume of water in this reach/mixed reservoir is greater than the value
in the "volume" column of the last row of RCHTAB(). To continue the
simulation the table has been extrapolated, based on information contained
in the last two rows. This will usually result in some loss of accuracy.
If depth is being calculated it will also cause an error condition.
Relevant data are:

NROWS	V1	V2	VOL
92	7.9201E+02	818.67	959.26

ERROR/WARNING ID: 341 5

DATE/TIME: 1997/10/29 7:30

RCHRES: 2

Calculation of relative depth, using Newton's method of successive
approximations, converged to an invalid value (not in range 0.0 to 1.0).
Probably ftable was extrapolated. If extrapolation was small, no problem.
Remedy; extend ftable. Relevant data are:

A	B	C	RDEP1	RDEP2	COUNT
0.0000E+00	1600.0	-1.004E+04	6.2737	6.2737E+00	2

ERROR/WARNING ID: 341 6

DATE/TIME: 2002/ 2/23 1:45

RCHRES: 2

The volume of water in this reach/mixed reservoir is greater than the value
in the "volume" column of the last row of RCHTAB(). To continue the
simulation the table has been extrapolated, based on information contained
in the last two rows. This will usually result in some loss of accuracy.
If depth is being calculated it will also cause an error condition.
Relevant data are:

```
NROWS         V1         V2        VOL
92 7.9201E+02  818.67     832.44
```

```
ERROR/WARNING ID:   341   5

DATE/TIME: 2002/ 2/23  1:45

RCHRES:     2

Calculation of relative depth, using Newton's method of successive
approximations, converged to an invalid value (not in range 0.0 to 1.0).
Probably ftable was extrapolated.  If extrapolation was small, no problem.
Remedy; extend ftable.  Relevant data are:

A          B          C      RDEP1      RDEP2  COUNT
0.0000E+00 1600.0     -2.426E+03    1.5166  1.5166E+00      2
```

```
ERROR/WARNING ID:   341   6

DATE/TIME: 2008/ 5/24 21:15

RCHRES:     2

The volume of water in this reach/mixed reservoir is greater than the value
in the "volume" column of the last row of RCHTAB().  To continue the
simulation the table has been extrapolated, based on information contained
in the last two rows.  This will usually result in some loss of accuracy.
If depth is being calculated it will also cause an error condition.
Relevant data are:

NROWS         V1         V2        VOL
92 7.9201E+02  818.67     884.15
```

```
ERROR/WARNING ID:   341   5

DATE/TIME: 2008/ 5/24 21:15

RCHRES:     2

Calculation of relative depth, using Newton's method of successive
approximations, converged to an invalid value (not in range 0.0 to 1.0).
Probably ftable was extrapolated.  If extrapolation was small, no problem.
Remedy; extend ftable.  Relevant data are:

A          B          C      RDEP1      RDEP2  COUNT
0.0000E+00 1600.0     -5.530E+03    3.4564  3.4564E+00      2
```

```
ERROR/WARNING ID:   341   6

DATE/TIME: 2008/ 5/24 22: 0

RCHRES:     2

The volume of water in this reach/mixed reservoir is greater than the value
in the "volume" column of the last row of RCHTAB().  To continue the
simulation the table has been extrapolated, based on information contained
in the last two rows.  This will usually result in some loss of accuracy.
If depth is being calculated it will also cause an error condition.
Relevant data are:

NROWS         V1         V2        VOL
92 7.9201E+02  818.67     992.51
```

```
ERROR/WARNING ID:   341   5

DATE/TIME: 2008/ 5/24 22: 0

RCHRES:     2
```

Calculation of relative depth, using Newton's method of successive approximations, converged to an invalid value (not in range 0.0 to 1.0). Probably ftable was extrapolated. If extrapolation was small, no problem. Remedy; extend ftable. Relevant data are:

A	B	C	RDEP1	RDEP2	COUNT
0.0000E+00	1600.0	-1.203E+04	7.5209	7.5209	2

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SEPARATOR SHEET

WWHM2012

PROJECT REPORT

This WWHM Model identifies the WQ flow rate for sizing cartridges. The failed flow duration is unrelated and can be ignored.

General Model Information

Project Name:	TreatmentAnalysis
Site Name:	
Site Address:	
City:	
Report Date:	7/28/2022
Gage:	Lacamas
Data Start:	1948/10/01
Data End:	2008/09/30
Timestep:	15 Minute
Precip Scale:	1.300
Version Date:	2018/10/10
Version:	4.2.16

POC Thresholds

Low Flow Threshold for POC1:	50 Percent of the 2 Year
High Flow Threshold for POC1:	50 Year

Landuse Basin Data

Predeveloped Land Use

Extg

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
SG4, Forest, Mod	8.7386
Pervious Total	8.7386
Impervious Land Use	acre
Impervious Total	0
Basin Total	8.7386

Element Flows To:

Surface	Interflow	Groundwater

Mitigated Land Use

Treatment Area

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
SG4, Lawn, Flat	2.0912
SG4, Lawn, Mod	2
Pervious Total	4.0912

Impervious Land Use	acre
ROADS FLAT	1.4293
ROOF TOPS FLAT	2.209
DRIVEWAYS MOD	0.6593
SIDEWALKS FLAT	0.3498
Impervious Total	4.6474
Basin Total	8.7386

Element Flows To:

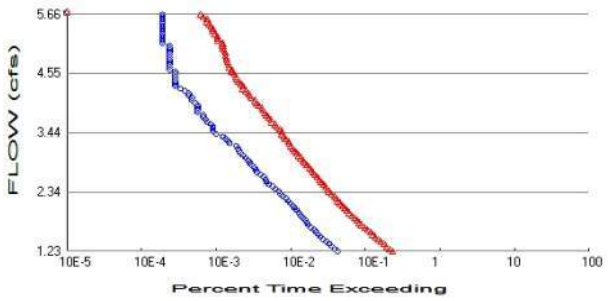
Surface	Interflow	Groundwater

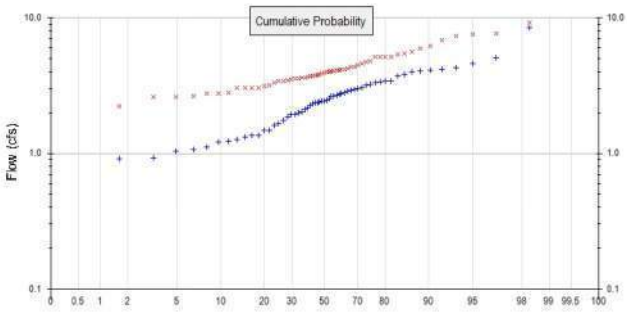
Routing Elements
Predeveloped Routing

Mitigated Routing

Analysis Results

POC 1





\+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #1
Total Pervious Area: 8.7386
Total Impervious Area: 0

Mitigated Landuse Totals for POC #1
Total Pervious Area: 4.0912
Total Impervious Area: 4.6474

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	**Flow(cfs)**
2 year	2.458123
5 year	3.785611
10 year	4.502037
25 year	5.228488
50 year	5.659129
100 year	6.012664

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	**Flow(cfs)**
2 year	3.953092
5 year	5.190564
10 year	6.020908
25 year	7.085902
50 year	7.892261
100 year	8.710693

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #1

Year	**Predeveloped**	**Mitigated**
1949	1.848	4.077
1950	2.383	3.606
1951	3.230	3.998
1952	1.940	4.067
1953	2.642	3.751
1954	4.043	5.402
1955	2.031	2.758
1956	3.726	4.356
1957	3.294	4.584
1958	2.445	5.146

1959	1.479	3.043
1960	1.358	3.031
1961	3.399	4.076
1962	2.377	3.582
1963	2.660	4.248
1964	2.468	3.057
1965	2.116	3.397
1966	2.960	3.954
1967	2.675	4.063
1968	3.201	7.549
1969	3.064	6.230
1970	8.476	9.174
1971	1.353	2.746
1972	2.161	3.838
1973	2.248	3.394
1974	3.403	3.992
1975	1.935	2.600
1976	2.922	3.488
1977	0.087	1.648
1978	4.256	5.123
1979	2.776	5.570
1980	1.607	3.033
1981	3.811	4.724
1982	2.521	4.445
1983	4.610	5.437
1984	1.488	2.640
1985	1.072	3.326
1986	1.328	4.787
1987	2.344	3.185
1988	1.120	3.696
1989	1.211	3.773
1990	1.031	3.545
1991	2.722	4.346
1992	2.815	4.182
1993	3.342	5.165
1994	2.412	3.154
1995	1.992	4.184
1996	4.190	5.912
1997	5.107	7.321
1998	4.127	7.656
1999	2.878	3.473
2000	1.647	2.601
2001	0.909	2.236
2002	3.970	5.127
2003	3.023	3.883
2004	0.923	2.806
2005	1.229	3.652
2006	2.330	3.696
2007	1.269	3.620
2008	1.754	6.873

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	8.4759	9.1745
2	5.1066	7.6560
3	4.6099	7.5495
4	4.2556	7.3209

5	4.1898	6.8728
6	4.1265	6.2301
7	4.0428	5.9122
8	3.9703	5.5696
9	3.8114	5.4367
10	3.7262	5.4020
11	3.4034	5.1652
12	3.3989	5.1457
13	3.3419	5.1268
14	3.2944	5.1232
15	3.2304	4.7870
16	3.2006	4.7236
17	3.0637	4.5844
18	3.0231	4.4453
19	2.9603	4.3564
20	2.9221	4.3458
21	2.8780	4.2478
22	2.8153	4.1839
23	2.7758	4.1824
24	2.7219	4.0774
25	2.6751	4.0763
26	2.6597	4.0667
27	2.6425	4.0631
28	2.5211	3.9979
29	2.4679	3.9921
30	2.4450	3.9542
31	2.4121	3.8829
32	2.3834	3.8382
33	2.3766	3.7731
34	2.3441	3.7508
35	2.3296	3.6958
36	2.2481	3.6957
37	2.1612	3.6515
38	2.1162	3.6202
39	2.0305	3.6062
40	1.9916	3.5823
41	1.9397	3.5449
42	1.9355	3.4884
43	1.8480	3.4727
44	1.7540	3.3969
45	1.6466	3.3944
46	1.6075	3.3263
47	1.4877	3.1854
48	1.4786	3.1540
49	1.3582	3.0574
50	1.3529	3.0434
51	1.3278	3.0334
52	1.2693	3.0308
53	1.2291	2.8065
54	1.2106	2.7584
55	1.1196	2.7458
56	1.0719	2.6402
57	1.0308	2.6012
58	0.9234	2.6005
59	0.9087	2.2364
60	0.0872	1.6477

Duration Flows

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
1.2291	894	4877	545	Fail
1.2738	823	4454	541	Fail
1.3186	756	4073	538	Fail
1.3633	687	3743	544	Fail
1.4081	626	3421	546	Fail
1.4528	576	3154	547	Fail
1.4976	536	2884	538	Fail
1.5423	492	2647	538	Fail
1.5870	455	2430	534	Fail
1.6318	431	2249	521	Fail
1.6765	392	2062	526	Fail
1.7213	364	1874	514	Fail
1.7660	346	1738	502	Fail
1.8108	324	1622	500	Fail
1.8555	305	1500	491	Fail
1.9003	287	1393	485	Fail
1.9450	271	1283	473	Fail
1.9898	253	1191	470	Fail
2.0345	237	1112	469	Fail
2.0793	226	1041	460	Fail
2.1240	211	977	463	Fail
2.1688	193	912	472	Fail
2.2135	182	859	471	Fail
2.2583	165	805	487	Fail
2.3030	152	745	490	Fail
2.3478	145	688	474	Fail
2.3925	131	651	496	Fail
2.4373	120	617	514	Fail
2.4820	107	579	541	Fail
2.5268	100	540	540	Fail
2.5715	96	508	529	Fail
2.6163	91	478	525	Fail
2.6610	83	444	534	Fail
2.7058	75	421	561	Fail
2.7505	71	399	561	Fail
2.7952	69	375	543	Fail
2.8400	62	347	559	Fail
2.8847	59	321	544	Fail
2.9295	56	306	546	Fail
2.9742	52	291	559	Fail
3.0190	49	269	548	Fail
3.0637	44	254	577	Fail
3.1085	43	237	551	Fail
3.1532	41	223	543	Fail
3.1980	39	210	538	Fail
3.2427	32	202	631	Fail
3.2875	30	196	653	Fail
3.3322	28	179	639	Fail
3.3770	26	170	653	Fail
3.4217	21	162	771	Fail
3.4665	19	160	842	Fail
3.5112	19	151	794	Fail
3.5560	19	138	726	Fail
3.6007	18	129	716	Fail

3.6455	16	118	737	Fail
3.6902	15	113	753	Fail
3.7350	14	105	750	Fail
3.7797	14	99	707	Fail
3.8245	12	94	783	Fail
3.8692	12	89	741	Fail
3.9140	12	86	716	Fail
3.9587	12	78	650	Fail
4.0034	11	73	663	Fail
4.0482	10	70	700	Fail
4.0929	10	62	620	Fail
4.1377	9	60	666	Fail
4.1824	9	57	633	Fail
4.2272	8	53	662	Fail
4.2719	7	48	685	Fail
4.3167	6	48	800	Fail
4.3614	6	45	750	Fail
4.4062	6	42	700	Fail
4.4509	6	40	666	Fail
4.4957	6	39	650	Fail
4.5404	6	37	616	Fail
4.5852	6	34	566	Fail
4.6299	5	34	680	Fail
4.6747	5	32	640	Fail
4.7194	5	31	620	Fail
4.7642	5	30	600	Fail
4.8089	5	29	580	Fail
4.8537	5	29	580	Fail
4.8984	5	28	560	Fail
4.9432	5	28	560	Fail
4.9879	5	27	540	Fail
5.0327	5	26	520	Fail
5.0774	5	26	520	Fail
5.1222	4	26	650	Fail
5.1669	4	22	550	Fail
5.2116	4	22	550	Fail
5.2564	4	22	550	Fail
5.3011	4	20	500	Fail
5.3459	4	19	475	Fail
5.3906	4	19	475	Fail
5.4354	4	18	450	Fail
5.4801	4	17	425	Fail
5.5249	4	16	400	Fail
5.5696	4	16	400	Fail
5.6144	4	14	350	Fail
5.6591	4	13	325	Fail

The development has an increase in flow durations from 1/2 Predeveloped 2 year flow to the 2 year flow or more than a 10% increase from the 2 year to the 50 year flow.
The development has an increase in flow durations for more than 50% of the flows for the range of the duration analysis.

Water Quality

Water Quality BMP Flow and Volume for POC #1

On-line facility volume:	0.9279 acre-feet
On-line facility target flow:	1.223 cfs.
Adjusted for 15 min:	1.223 cfs.
Off-line facility target flow:	0.661 cfs.
Adjusted for 15 min:	0.661 cfs.

LID Report

LID Technique	Used for Treatment ?	Total Volume Needs Treatment (ac-ft)	Volume Through Facility (ac-ft)	Infiltration Volume (ac-ft)	Cumulative Volume Infiltration Credit	Percent Volume Infiltrated	Water Quality	Percent Water Quality Treated	Comment
Total Volume Infiltrated		0.00	0.00	0.00		0.00	0.00	0%	No Treat. Credit
Compliance with LID Standard 8% of 2-yr to 50% of 2-yr									Duration Analysis Result = Failed

Model Default Modifications

Total of 0 changes have been made.

PERLND Changes

No PERLND changes have been made.

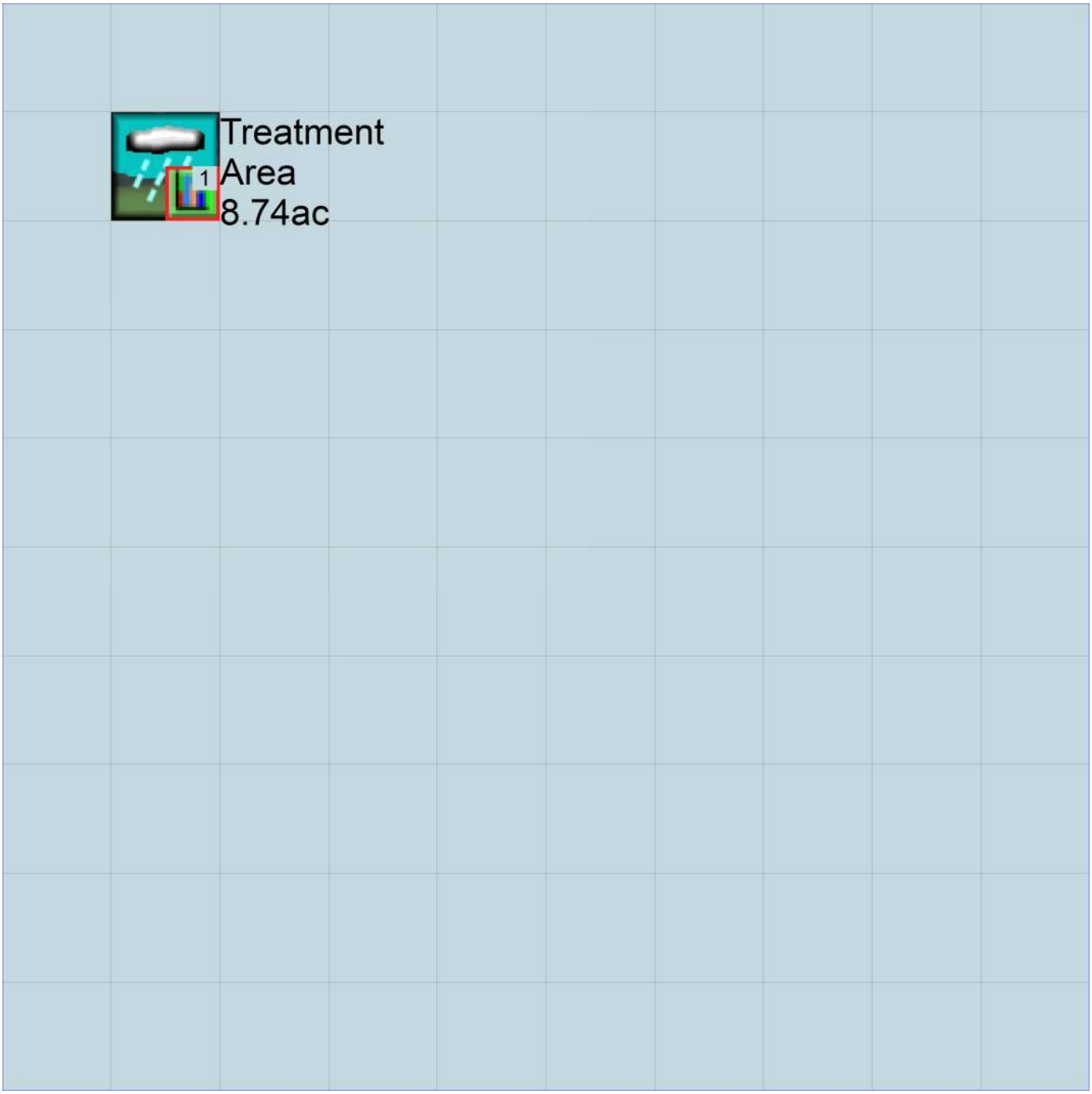
IMPLND Changes

No IMPLND changes have been made.

Appendix

Predeveloped Schematic

Mitigated Schematic



Predeveloped UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1948 10 01        END    2008 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                    UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                              ***
WDM         26   TreatmentAnalysis.wdm
MESSU       25   PreTreatmentAnalysis.MES
            27   PreTreatmentAnalysis.L61
            28   PreTreatmentAnalysis.L62
            30   POCTreatmentAnalysis1.dat
END FILES

OPN SEQUENCE
    INGRP               INDELT 00:15
      PERLND      29
      COPY       501
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title---------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Extg                       MAX                    1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                         User  t-series Engl Metr ***
                                      in  out           ***
   29     SG4, Forest, Mod        1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************ Active Sections ******************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
   29         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags **************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
   29         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO
```

```
  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
   29         0    0    0    0    0    0    0    0    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
   29             0         6      0.04       400       0.1         0      0.96
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
   29             0         0         3         2         0         0         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                              ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
   29          0.2       0.4      0.35         2       0.4       0.7
  END PWAT-PARM4

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
             ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS      GWVS
   29             0         0         0         0       2.5         1         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                     in  out           ***
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************ Active Sections ******************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
  END IWAT-STATE1
```

```
END IMPLND

SCHEMATIC
<-Source->                  <--Area-->     <-Target->   MBLK   ***
<Name>   #                  <-factor->     <Name>   #   Tbl#   ***
Extg***
PERLND  29                      8.7386     COPY   501     12
PERLND  29                      8.7386     COPY   501     13

******Routing******
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   48.4        DISPLY   1     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                ***
    # -  #<------------------><---> User T-series  Engl Metr LKFG           ***
                                       in  out                              ***
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************ Active Sections ****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ******************* PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                  ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
            FG FG FG FG  possible  exit  *** possible  exit      possible  exit
             *  *  *  *    *  *  *  *  *      *  *  *  *  *        ***
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><--------><--------> ***
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                     ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
          *** ac-ft     for each possible exit        for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><--->
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1.3            PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1.3            IMPLND   1 999 EXTNL  PREC
```

```
WDM      1 EVAP     ENGL    0.8            PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    0.8            IMPLND   1 999 EXTNL  PETINP

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    501 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>            <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13


END MASS-LINK

END RUN
```

Mitigated UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1948 10 01        END    2008 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                    UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                              ***
WDM         26   TreatmentAnalysis.wdm
MESSU       25   MitTreatmentAnalysis.MES
            27   MitTreatmentAnalysis.L61
            28   MitTreatmentAnalysis.L62
            30   POCTreatmentAnalysis1.dat
END FILES

OPN SEQUENCE
    INGRP               INDELT 00:15
      PERLND      34
      PERLND      35
      IMPLND       1
      IMPLND       4
      IMPLND       6
      IMPLND       8
      COPY       501
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title---------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Treatment Area              MAX                    1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                          in  out           ***
   34     SG4, Lawn, Flat         1    1    1    1   27    0
   35     SG4, Lawn, Mod          1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************ Active Sections ******************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
   34         0    0    1    0    0    0    0    0    0    0    0    0
   35         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY
```

```
  PRINT-INFO
    <PLS > ***************** Print-flags **************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
   34         0    0    4    0    0    0    0    0    0    0    0    0    1    9
   35         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
   34         0    0    0    0    0    0    0    0    0    0    0
   35         0    0    0    0    0    0    0    0    0    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
   34              0         6      0.02       400      0.05         0      0.96
   35              0         6      0.02       400       0.1         0      0.96
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
   34              0         0         3         2         0         0         0
   35              0         0         3         2         0         0         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                          ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
   34            0.1       0.2      0.25         2       0.4      0.25
   35            0.1       0.2      0.25         2       0.4      0.25
  END PWAT-PARM4

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
               ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS      GWVS
   34              0         0         0         0       2.5         1         0
   35              0         0         0         0       2.5         1         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                     in  out           ***
    1      ROADS/FLAT             1    1    1   27    0
    4      ROOF TOPS/FLAT         1    1    1   27    0
    6      DRIVEWAYS/MOD          1    1    1   27    0
    8      SIDEWALKS/FLAT         1    1    1   27    0
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************* Active Sections ******************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
    1         0    0    1    0    0    0
    4         0    0    1    0    0    0
    6         0    0    1    0    0    0
    8         0    0    1    0    0    0
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
    1         0    0    4    0    0    0    1    9
```

```
    4         0    0    4    0    0    0    1    9
    6         0    0    4    0    0    0    1    9
    8         0    0    4    0    0    0    1    9
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
    1         0    0    0    0    0
    4         0    0    0    0    0
    6         0    0    0    0    0
    8         0    0    0    0    0
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
    1            400      0.01       0.1       0.1
    4            400      0.01       0.1       0.1
    6            400      0.05       0.1      0.08
    8            400      0.01       0.1       0.1
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
    1              0         0
    4              0         0
    6              0         0
    8              0         0
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
    1              0         0
    4              0         0
    6              0         0
    8              0         0
  END IWAT-STATE1

END IMPLND

SCHEMATIC
<-Source->                 <--Area-->     <-Target->   MBLK   ***
<Name>   #                 <-factor->     <Name>   #   Tbl#   ***
Treatment Area***
PERLND  34                     2.0912     COPY   501     12
PERLND  34                     2.0912     COPY   501     13
PERLND  35                          2     COPY   501     12
PERLND  35                          2     COPY   501     13
IMPLND   1                     1.4293     COPY   501     15
IMPLND   4                      2.209     COPY   501     15
IMPLND   6                     0.6593     COPY   501     15
IMPLND   8                     0.3498     COPY   501     15

******Routing******
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   48.4        DISPLY   1     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK
```

```
RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                ***
    # -  #<----------------><---> User T-series  Engl Metr LKFG            ***
                                      in  out                               ***
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************ Active Sections ****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ****************** PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                 ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
            FG FG FG FG  possible  exit  *** possible  exit      possible  exit
             *  *  *  *    *  *  *  *  *       *  *  *  *  *         ***
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><-------->       ***
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                    ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
          *** ac-ft     for each possible exit        for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><--->
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1.3            PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1.3            IMPLND   1 999 EXTNL  PREC
WDM      1 EVAP     ENGL    0.8            PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    0.8            IMPLND   1 999 EXTNL  PETINP

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
COPY     1 OUTPUT MEAN   1 1     48.4      WDM    701 FLOW     ENGL      REPL
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    801 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>            <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13
```

```
  MASS-LINK       15
IMPLND     IWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   15


END MASS-LINK

END RUN
```

Predeveloped HSPF Message File

Mitigated HSPF Message File

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SEPARATOR SHEET

WASHINGTON STATE DEPARTMENT OF ECOLOGY

April 2017

GENERAL USE LEVEL DESIGNATION FOR BASIC (TSS) TREATMENT

For

CONTECH Engineered Solutions
Stormwater Management StormFilter®
With ZPG Media at 1 gpm/sq ft media surface area

Ecology's Decision:

Based on the CONTECH Engineered Solutions' (CONTECH) application submissions, Ecology hereby issues a General Use Level Designation (GULD) for the Stormwater Management StormFilter® (StormFilter):

1. **As a basic stormwater treatment practice for total suspended solids (TSS) removal,**
   - **Using ZPG™ media (zeolite/perlite/granular activated carbon), with the size distribution described below,**
   - **Sized at a hydraulic loading rate of 1 gpm/ft^2 of media surface area, per Table 1, and**
   - **Internal bypassing needs to be consistent with the design guidelines in CONTECH's current product design manual.**

Table 1. StormFilter Design Flow Rates per Cartridge

Effective Cartridge Height (inches)	12	18	27
Cartridge Flow Rate (gpm/cartridge)	5	7.5	11.3

2. **Ecology approves StormFilter systems containing ZPG™ media for treatment at the hydraulic loading rates shown in Table 1, and sized based on the water quality design flow rate for an off-line system when using an external bypass vault or a treatment vault with an internal bypass. Contech designs their StormFilter systems to maintain treatment of the water quality design flow while routing excess flows around the treatment chamber during periods of peak bypass. The water quality design flow rates are calculated using the following procedures:**
   - **Western Washington: For treatment installed upstream of detention or retention, the water quality design flow rate is the peak 15-minute flow rate as calculated using the latest version of the Western Washington Hydrology Model or other Ecology-approved continuous runoff model.**

- **Eastern Washington: For treatment installed upstream of detention or retention, the water quality design flow rate is the peak 15-minute flow rate as calculated using one of the three methods described in Chapter 2.2.5 of the Stormwater Management Manual for Eastern Washington (SWMMEW) or local manual.**
- **Entire State: For treatment installed downstream of detention, the water quality design flow rate is the full 2-year release rate of the detention facility.**

3. **This designation has no expiration date, but Ecology may amend or revoke it.**

<u>Ecology's Conditions of Use</u>:

The StormFilter with ZPG media shall comply with the following conditions:

1. **Design, install, operate, and maintain the StormFilter with ZPG media in accordance with applicable Contech Engineered Solutions manuals, documents, and the Ecology Decision.**

2. **Install StormFilter systems to bypass flows exceeding the water quality treatment rate. Additionally, high flows will not re-suspend captured sediments. Design StormFilter systems in accordance with the performance goals in Ecology's most recent Stormwater Manual and CONTECH's *Product Design Manual Version 4.1 (April 2006)*, or most current version, unless otherwise specified.**

3. **Owners must follow the design, pretreatment, land use application, and maintenance criteria in CONTECH's Design Manual.**

4. **Pretreatment of TSS and oil and grease may be necessary, and designers shall provide pre-treatment in accordance with the most current versions of the CONTECH's *Product Design Manual (April 2006)* or the applicable Ecology Stormwater Manual. Design pre-treatment using the performance criteria and pretreatment practices provided on Ecology's "Evaluation of Emerging Stormwater Treatment Technologies" website.**

5. **Maintenance: The required maintenance interval for stormwater treatment devices is often dependent upon the degree of pollutant loading from a particular drainage basin. Therefore, Ecology does not endorse or recommend a "one size fits all" maintenance cycle for a particular model/size of manufactured filter treatment device.**

    - **Typically, CONTECH designs StormFilter systems for a target filter media replacement interval of 12 months. Maintenance includes removing accumulated sediment from the vault, and replacing spent cartridges with recharged cartridges.**

- **Indications of the need for maintenance include effluent flow decreasing to below the design flow rate, as indicated by the scumline above the shoulder of the cartridge.**
- **Owners/operators must inspect StormFilter with ZPG media for a minimum of twelve months from the start of post-construction operation to determine site-specific maintenance schedules and requirements. You must conduct inspections monthly during the wet season, and every other month during the dry season. (According to the SWMMWW, the wet season in western Washington is October 1 to April 30. According to SWMMEW, the wet season in eastern Washington is October 1 to June 30). After the first year of operation, owners/operators must conduct inspections based on the findings during the first year of inspections.**
- **Conduct inspections by qualified personnel, follow manufacturer's guidelines, and use methods capable of determining either a decrease in treated effluent flowrate and/or a decrease in pollutant removal ability.**
- **When inspections are performed, the following findings typically serve as maintenance triggers:**
    - **Accumulated vault sediment depths exceed an average of 2 inches, or**
    - **Accumulated sediment depths on the tops of the cartridges exceed an average of 0.5 inches, or**
    - **Standing water remains in the vault between rain events, or**
    - **Bypass occurs during storms smaller than the design storm.**
- **Note: If excessive floatables (trash and debris) are present, perform a minor maintenance consisting of gross solids removal, not cartridge replacement.**

6. **CONTECH shall maintain readily available reports listed under "Application Documents" (above) as public, as well as the documentation submitted with its previous conditional use designation application. CONTECH shall provide links to this information from its corporate website, and make this information available upon request, at no cost and in a timely manner.**

7. **ZPG™ media used shall conform with the following specifications:**

- **Each cartridge contains a total of approximately 2.6 cubic feet of media. The ZPG™ cartridge consists of an outer layer of perlite that is approximately 1.3 cubic feet in volume and an inner layer, consisting of a mixture of 90% zeolite and 10% granular activated carbon, which is approximately 1.3 cubic feet in volume.**
- **Perlite Media: Perlite media shall be made of natural siliceous volcanic rock free of any debris or foreign matter. The expanded perlite shall**

have a bulk density ranging from 6.5 to 8.5 lbs per cubic foot and particle sizes ranging from 0.09" (#8 mesh) to 0.38" (3/8" mesh).

- **Zeolite Media: Zeolite media shall be made of naturally occurring clinoptilolite. The zeolite media shall have a bulk density ranging from 44 to 50 lbs per cubic foot and particle sizes ranging from 0.13" (#6 mesh) to 0.19" (#4 mesh). Additionally, the cation exchange capacity (CEC) of zeolite shall range from approximately 1.0 to 2.2 meq/g.**

- **Granular Activated Carbon: Granular activated carbon (GAC) shall be made of lignite coal that has been steam-activated. The GAC media shall have a bulk density ranging from 28 to 31 lbs per cubic foot and particle sizes ranging from a 0.09" (#8 mesh) to 0.19" (#4 mesh).**

Approved Alternate Configurations

Peak Diversion StormFilter

1. The Peak Diversion StormFilter allows for off-line bypass within the StormFilter structure. Design capture flows and peak flows enter the inlet bay which contains an internal weir. The internal weir allows design flows to enter the cartridge bay through a transfer hole located at the bottom of the inlet bay while the unit routs higher flows around the cartridge bay.
2. To select the size of the Peak Diversion StormFilter unit, the designer must determine the number of cartridges required and size of the standard StormFilter using the site-specific water quality design flow and the **StormFilter Design Flow Rates per Cartridge** as described above.
3. New owners may not install the Peak Diversion StormFilter at an elevation or in a location where backwatering may occur.

Applicant: Contech Engineered Solutions

Applicant's Address: 11835 NE Glenn Widing Dr.
Portland, OR 97220

Application Documents:

The applicant's master report, titled, "The Stormwater Management StormFilter Basic Treatment Application for General Use Level Designation in Washington", Stormwater Management, Inc., November 1, 2004, includes the following reports:

- (Public) *Evaluation of the Stormwater Management StormFilter Treatment System: Data Validation Report and Summary of the Technical Evaluation Engineering Report (TEER) by Stormwater Management Inc.,* October 29, 2004
  Ecology's technology assessment protocol requires the applicant to hire an independent consultant to complete the following work:

1. Complete the data validation report.
2. Prepare a TEER summary, including a testing summary and conclusions compared with the supplier's performance claims.
3. Provide a recommendation of the appropriate technology use level.
4. Work with Ecology to post recommend relevant information on Ecology's website.
5. Provide additional testing recommendations, if needed."
6. This report, authored by Dr. Gary Minton, Ph. D., P.E., Resource Planning Associates, satisfies the Ecology requirement.

- (Public) "Performance of the Stormwater Management StormFilter Relative to the Washington State Department of Ecology Performance Goals for Basic Treatment," is a summary of StormFilter performance that strictly adheres to the criteria listed in the Guidance for Evaluating Emerging Stormwater Treatment Technologies, Technology Assessment Protocol – Ecology (TAPE).
- "Heritage Marketplace Field Evaluation: Stormwater Management StormFilter with ZPG™ Media," is a report showing all of the information collected at Site A as stated in the SMI Quality Assurance Project Plan (QAPP). This document contains detailed information regarding each storm event collected at this site, and it provided a detailed overview of the data and project.
- "Lake Stevens Field Evaluation: Stormwater Management StormFilter with ZPG™ Media," is a report that corresponds to Site E as stated in the SMI QAPP. This document contains detailed information regarding each storm collected at this site, and includes a detailed overview of the data and project.
- (Public) "Evaluation of the Stormwater Management StormFilter for the removal of SIL-CO-SIL 106, a standardized silica product: ZPG™ at 7.5 GPM" is a report that describes laboratory testing at full design flow.
- "Factors Other Than Treatment Performance."
- "State of Washington Installations."
- "Peak Diversion StormFilter" is a technical document demonstrating the Peak Diversion StormFilter system complies with the Stormwater Management Manual for Western Washington Volume V Section 4.5.1.

Above-listed documents noted as "public" are available by contacting CONTECH.

Applicant's Use Level Request:

That Ecology grant a General Use Level Designation for Basic Treatment for the StormFilter using ZPG™ media (zeolite/perlite/granular activated carbon) at a hydraulic loading rate of 1 gpm/ft^2 of media surface area in accordance with Ecology's 2011 *Technical Guidance Manual for Evaluating Emerging Stormwater Treatment Technologies Technology Assessment Protocol – Ecology (TAPE).*

Applicant's Performance Claim:

The combined data from the two field sites reported in the TER (Heritage Marketplace and Lake Stevens) indicate that the performance of a StormFilter system configured for inline bypass with ZPG™ media and a hydraulic loading rate of 1 gpm/ft^2 of media surface area meets Ecology performance goals for Basic Treatment.

Ecology's Recommendations:

Based on the weight of the evidence and using its best professional judgment, Ecology finds that:

- StormFilter, using ZPG™ media and operating at a hydraulic loading rate of no more than 1 gpm/ft^2 of media surface area, is expected to provide effective stormwater treatment achieving Ecology's Basic Treatment (TSS removal) performance goals. Contech demonstrated this is through field and laboratory testing performed in accordance with the approved protocol. StormFilter is deemed satisfactory with respect to factors other than treatment performance (e.g., maintenance; see the protocol's Appendix B for complete list).

Findings of Fact:

- Influent TSS concentrations and particle size distributions were generally within the range of what Ecology considers "typical" for western Washington (silt-to-silt loam).
- Contech sampled thirty-two (32) storm events at two sites for storms from April 2003 to March 2004, of which Contech deemed twenty-two (22) as "qualified" and were therefore included in the data analysis set.
- Statistical analysis of these 22 storm events verifies the data set's adequacy.
- Analyzing all 22 qualifying events, the average influent and effluent concentrations and aggregate pollutant load reduction are 114 mg/L, 25 mg/L, and 82%, respectively.
- Analyzing all 22 qualifying events based on the *estimated average* flow rate during the event (versus the *measured peak* flow rate), and more heavily weighting those events near the design rate (versus events either far above or well below the design rate) does not significantly affect the reported results.
- For the 7 qualifying events with influent TSS concentrations greater than 100 mg/L, the average influent and effluent concentrations and aggregate pollutant load reduction are 241 mg/L, 34 mg/L, and 89%, respectively. If we exclude the 2 of 7 events that exceed the maximum 300 mg/L specified in Ecology's guidelines, the average influent and effluent concentrations and aggregate pollutant load reduction are 158 mg/L, 35 mg/L, and 78%, respectively.
- For the 15 qualifying events with influent TSS concentrations less than 100 mg/L, the average influent and effluent concentrations and aggregate pollutant load reduction are 55 mg/L, 20 mg/L, and 61%, respectively. If the 6 of 15 events that fall below the minimum 33 mg/L TSS specified in Ecology's guidelines are excluded, the average

influent and effluent concentrations and aggregate pollutant load reduction are 78 mg/L, 26 mg/L, and 67%, respectively.

- For the 8 qualifying events with peak discharge exceeding design flow (ranging from 120 to 257% of the design rate), results ranged from 52% to 96% TSS removal, with an average of 72%.
- Due to the characteristics of the hydrographs, the field results generally reflect flows below (ranging between 20 and 60 percent of) the tested facilities' design rate. During these sub-design flow rate periods, some of the cartridges operate at or near their *individual* full design flow rate (generally between 4 and 7.5 GPM for an 18" cartridge effective height) because their float valves have opened. Float valves remain closed on the remaining cartridges, which operate at their base "trickle" rate of 1 to 1.5 GPM.
- Laboratory testing using U.S. Silica's Sil-Co-Sil 106 fine silica product showed an average 87% TSS removal for testing at 7.5 GPM per cartridge (100% design flow rate).
- Other relevant testing at I-5 Lake Union, Greenville Yards (New Jersey), and Ski Run Marina (Lake Tahoe) facilities shows consistent TSS removals in the 75 to 85% range. *Note that the evaluators operated the I-5 Lake Union at 50%, 100%, and 125% of design flow*.
- SMI's application included a satisfactory "Factors other than treatment performance" discussion.

Note: Ecology's 80% TSS removal goal applies to 100 mg/l and greater influent TSS. Below 100 mg/L influent TSS, the goal is 20 mg/L effluent TSS.

Technology Description:

The Stormwater Management StormFilter® (StormFilter), a flow-through stormwater filtration system, improves the quality of stormwater runoff from the urban environment by removing pollutants. The StormFilter can treat runoff from a wide variety of sites including, but not limited to: retail and commercial development, residential streets, urban roadways, freeways, and industrial sites such as shipyards, foundries, etc.

Operation:

The StormFilter is typically comprised of a vault that houses rechargeable, media-filled, filter cartridges. Various media may be used, but this designation covers only the zeolite-perlite-granulated activated carbon (ZPG™) medium. Stormwater from storm drains percolates through these media-filled cartridges, which trap particulates and may remove pollutants such as dissolved metals, nutrients, and hydrocarbons. During the filtering process, the StormFilter system also removes surface scum and floating oil and grease. Once filtered through the media, the treated stormwater is directed to a collection pipe or discharged to an open channel drainage way.

This document includes a bypass schematic for flow rates exceeding the water quality design flow rate on page 8.

StormFilter Configurations:

Contech offers the StormFilter in multiple configurations: precast, high flow, catch basin, curb inlet, linear, volume, corrugated metal pipe, drywell, and CON/Span form. Most configurations use pre-manufactured units to ease the design and installation process. Systems may be either uncovered or covered underground units.

The typical precast StormFilter unit is composed of three sections: the energy dissipater, the filtration bay, and the outlet sump. As Stormwater enters the inlet of the StormFilter vault through the inlet pipe, piping directs stormwater through the energy dissipater into the filtration bay where treatment will take place. Once in the filtration bay, the stormwater ponds and percolates horizontally through the media contained in the StormFilter cartridges. After passing through the media, the treated water in each cartridge collects in the cartridge's center tube from where piping directs it into the outlet sump by a High Flow Conduit under-drain manifold. The treated water in the outlet sump discharges through the single outlet pipe to a collection pipe or to an open channel drainage way. In some applications where you anticipate heavy grit loads, pretreatment by settling may be necessary.

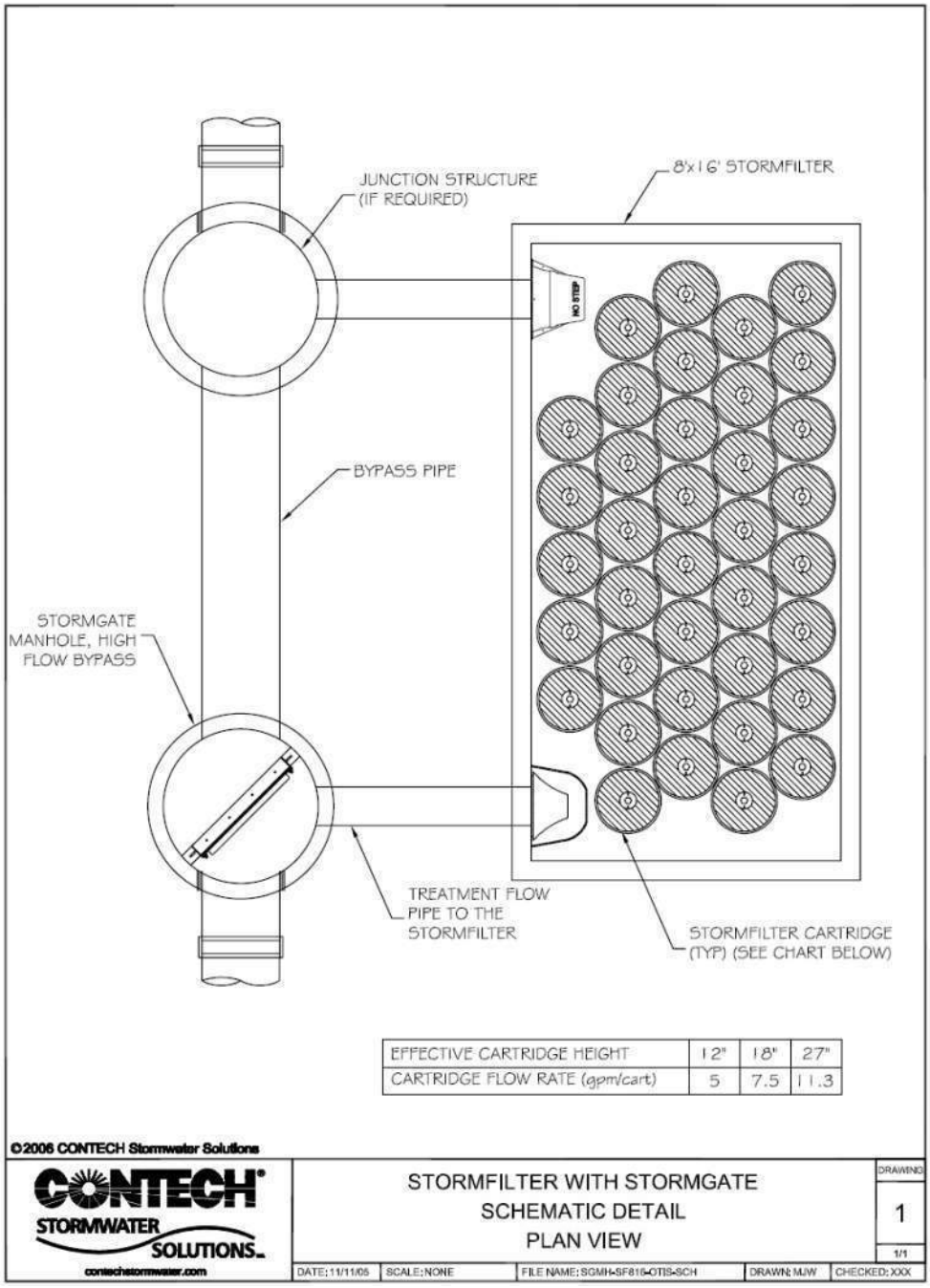

Figure 1. Stormwater Management StormFilter Configuration with Bypass

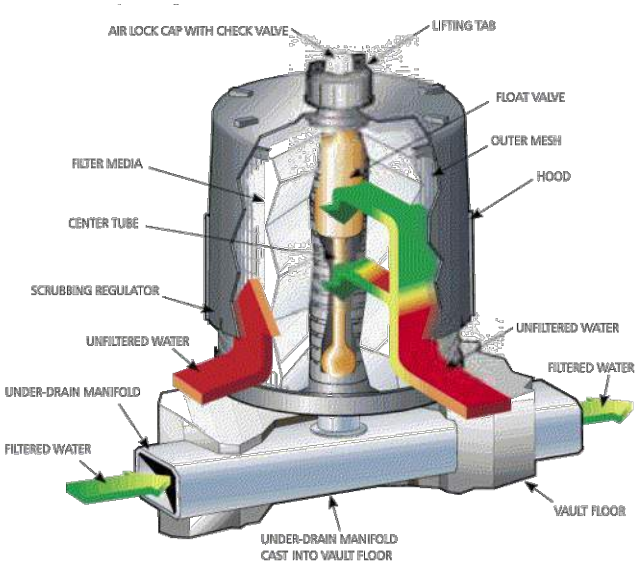

Figure 2. The StormFilter Cartridge

Cartridge Operation:

As the water level in the filtration bay begins to rise, stormwater enters the StormFilter cartridge. Stormwater in the cartridge percolates horizontally through the filter media and passes into the cartridge's center tube, where the float in the cartridge is in a closed (downward) position. As the water level in the filtration bay continues to rise, more water passes through the filter media and into the cartridge's center tube. Water displaces the air in the cartridge and it purges from beneath the filter hood through the one-way check valve located in the cap. Once water fills the center tube there is enough buoyant force on the float to open the float valve and allow the treated water to flow into the under-drain manifold. As the treated water drains, it tries to pull in air behind it. This causes the check valve to close, initiating a siphon that draws polluted water throughout the full surface area and volume of the filter. Thus, water filters through the entire filter cartridge throughout the duration of the storm, regardless of the water surface elevation in the filtration bay. This continues until the water surface elevation drops to the elevation of the scrubbing regulators. At this point, the siphon begins to break and air quickly flows beneath the hood through the scrubbing regulators, causing energetic bubbling between the inner surface of the hood and the outer surface of the filter. This bubbling agitates and cleans the surface of the filter, releasing accumulated sediments on the surface, flushing them from beneath the hood, and allowing them to settle to the vault floor.

Adjustable cartridge flow rate:

Inherent to the design of the StormFilter is the ability to control the individual cartridge flow rate with an orifice-control disc placed at the base of the cartridge. Depending on the treatment requirements and on the pollutant characteristics of the influent stream as

specified in the CONTECH *Product Design Manual*, operators may adjust the flow rate through the filter cartridges. By decreasing the flow rate through the filter cartridges, the influent contact time with the media is increased and the water velocity through the system is decreased, thus increasing both the level of treatment and the solids removal efficiencies of the filters, respectively (de Ridder, 2002).

Recommended research and development:

Ecology encourages CONTECH to pursue continuous improvements to the StormFilter. To that end, CONTECH recommends the following actions:

- Determine, through laboratory testing, the relationship between accumulated solids and flow rate through the cartridge containing the ZPG™ media. **Completed 11/05.**
- Determine the system's capabilities to meet Ecology's enhanced, phosphorus, and oil treatment goals.
- Develop easy-to-implement methods of determining that a StormFilter facility requires maintenance (cleaning and filter replacement).

Contact Information:

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Applicant Web link http://www.conteches.com/

Ecology web link: http://www.ecy.wa.gov/programs/wq/stormwater/newtech/index.html

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Water Quality Program
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Revision History

Date	Revision
Jan 2005	Original Use Level Designation
Dec 2007	Revision
May 2012	Maintenance requirements updated
November 2012	Design Storm and Maintenance requirements updated
January 2013	Updated format to match Ecology standard format
September 2014	Added Peak Diversion StormFilter Alternate Configuration
November 2016	Revised Contech contact information
April 2017	Revised sizing language to note sizing based on Off-line calculations

SEPARATOR SHEET

APPENDIX C

Geotechnical Report

Pacific Lifestyle Homes, Inc.
Geotechnical Engineering Evaluation

Monte Verde Subdivision
22205 NE 28th St, Camas WA 98607
Camas, Washington 98607

True North Project No. 22-0111-1
July 2022 (revised July 2022)

July 12, 2022 (revised July 31, 2022)

Pacific Lifestyle Homes, Inc
11815 NE 99th Street, Suite 1200
Vancouver, WA 98682

Attn: Mr. Nick Peets

Subject: Geotechnical Engineering Evaluation
Monte Verde Subdivision
22205 NE 28th St, Camas, WA 98607
Clark County Parcel No. 173184000
True North Project # 22-0111-1

Dear Mr. Peets:

At your request, True North Geotechnical Services (True North) is providing you with this report summarizing our geotechnical services for the proposed new Monte Verde Subdivision residential development to be located at the above-mentioned address in Camas, Washington (site). The purpose of our services was to provide a geotechnical evaluation of the site as it pertains to the proposed new development.

We have endeavored to prepare this report in accordance with generally accepted geotechnical engineering practices at the time we prepared it, for the exclusive use of Pacific Lifestyle Homes, Inc. (PLH), the owner, and their agents, for specific application to this project. Use or reliance upon this report by a third party is at their own risk. True North does not make any representation or warranty, express or implied, to such other parties as to the accuracy or completeness of this report or the suitability of its use by such other parties for any purpose whatever, known or unknown, to True North.

Based on the results of our study, development of the site with the proposed buildings and associated parking and utilities is feasible provided the recommendations in this report are included in the project design and implemented during construction. The chief geotechnical concerns of note associated with the project are ensuring foundations are bearing on dense, competent native soils and designing a stormwater system that meets the needs of the site while taking into account the depth of groundwater within the lower, southern portion of the site.

The attached report includes a summary of our project understanding, geologic site reconnaissance, subsurface explorations, and our conclusions regarding the expected effect that the proposed lot development will have on the site.

PURPOSE AND SCOPE OF WORK

The purpose of our services was to provide a geotechnical evaluation of the site as it pertains to the proposed new development. This report includes a summary of our project understanding, geologic site reconnaissance, subsurface exploration, our conclusions regarding the effects of the proposed lot development on the site, and recommendations for design and construction.
The following describes our specific scope of work that was completed:

- **Geologic Map and Literature Review**: We reviewed published geologic and geologic hazard mapping for the site.
- **Test Pit Excavations:** We completed eight (8) test pit excavations on the property. The test pit excavations extended to depths ranging from about 6 to 12 feet below the ground surface (bgs).
- **Laboratory Testing:** Samples collected from the borings were returned to our office for further examination including classification in general accordance with the Unified Soil Classification, Visual-Manual Procedure. Select samples were subjected to laboratory testing, including natural moisture content analysis, and fines content analysis.
- **Analysis:** Data collected during the literature research, subsurface explorations, and laboratory testing were used to develop site-specific geotechnical design parameters and construction recommendations.
- **Report Preparation:** This Geotechnical Engineering Evaluation summarizes the results of our explorations and analyses, including information relating to the following:
    - Exploration logs and site plan with exploration locations
    - Laboratory test results
    - Summary of interpreted surface and subsurface conditions
    - Shallow foundation design recommendations
        - Minimum embedment and allowable bearing pressure
        - Estimated settlement
        - Sliding coefficient and passive earth pressure
    - Subsurface drainage requirements
    - Earthwork recommendations
        - Temporary and permanent slope inclinations
        - Structural fill materials and preparation
        - Suitability of native and on-site soils for reuse as structural fill
        - Wet weather/conditions consideration
    - Foundation, slab and pavement subgrade preparation recommendations
    - Flexible and rigid pavement design recommendations
    - Utility trench excavation and backfill recommendations for associated utilities
    - Seismic design criteria and design considerations

PROJECT UNDERSTANDING

True North understands that you are planning to subdivide an existing City of Camas/Clark County Tax Parcel, No. 173184000, comprising approximately 8.84 acres.

True North's understanding of the proposed development is based on a review of a "Preliminary Plat" for the project, prepared by PLS Engineering, dated October 6, 2021. We understand that the proposed project consists of the subdivision of the existing lot into 34 new lots. The new lots will range in size from approximately to 5900 to 8300 square-feet, and will each accommodate one single-family home. An existing Bonneville Power Administration (BPA) transmission line easement bisects the site, where we understand no new lots will be developed, and instead a shared park area will be constructed. We understand that one new private roadway, NW Noble Ave, is planned to provide access to the lots from NE 28th Street, where some frontage improvements to NE 28th Street will be also be completed. In general, we understand that utilities are planned below the new roadways. The site with respect to existing nearby features is shown in the attached Vicinity Map, Figure 1. The location of our explorations with respect to existing site conditions and boundaries is shown on the attached Figure 2, Site and Exploration Plan.

We anticipate the future homes at all lots will have relatively short driveways to the new private roadway and will be supported by conventional concrete spread footings. We also understand that the stormwater management is planned for the lots at a planned storm facility tract located at the southwest corner of the site. Based on our understanding of proposed development, we anticipate cuts and fills of less than 4 feet across the site. The purpose of our explorations was to evaluate subsurface conditions and provide geotechnical recommendations for design and construction, including site preparation and support of the proposed new development.

SITE CONDITIONS

Geologic Setting

The site is located in the eastern margin of the Portland Basin, a structural basin with basalt bedrock overlain by sediment associated with repeated glacial outburst flooding of the Columbia River and its tributaries. The last of these outburst flooding events, known as the Missoula Floods, occurred about 10,000 years ago. The flood deposits include layers of clay, silt, sand, and gravel. Some layers may include boulders up to 8 feet in diameter.

In the immediate vicinity of the site, the near surface soils are mapped as Pliocene-age gravel facies (Qfg), consisting of unconsolidated bouldery pebble to cobble gravel, underlain at depth by Pleistocene- or Pliocene-age unconsolidated to semi-consolidated pebble to boulder conglomerate (QTc).

Surface Conditions

The site consists of the above-mentioned parcel, which comprises approximately 8.84 acres located on the south side of NE 28th Street. There is a 0.37 acre parcel currently developed with a

manufactured home at the northeastern extent of the site, which includes a driveway. The parcel to the west of the site is developed with a single family home, detached garage, and two outbuildings, including a driveway. The parcel to the east of the site is undeveloped and owned by Clark County Parks.

The ground surface at the site slopes gently towards the south at a gradient of approximately 0 to 10 percent. The site ranges in elevation from about 286 feet above mean sea level (AMSL) at the northern end of the property to about 238 feet AMSL at the southern extent. The majority of the site is open pasture and the southernmost quarter of the site is lightly wooded, consisting of undergrowth, shrubs, and tall deciduous and evergreen trees.

Subsurface Conditions

On May 6th, 2022, we visited the site to excavate eight test pits and to perform two infiltration tests (see attached Site Plan, Figure 2). The test pit explorations, designated TP-1 through TP-8, were excavated to maximum depths between about 6 and 12 feet bgs. The approximate test pit locations are shown on Figure 2. Descriptions of field and laboratory procedures and the interpreted exploration logs are included in Attachment A. The following is a generalized description of the subsurface units encountered in our explorations:

TOPSOIL: Dark brown silty topsoil with varying amounts of organics and tree roots was observed at the surface in all our test pits, extending to depths ranging from about 6 to 24 inches bgs.

Silty/Clayey SAND: Dark brown to light brown silty/clayey Sand (SM) with gravel was encountered just below the topsoil in all the test pits, extending to depths of about 4 to 9 feet below grade. Samples from TP-7 and TP-8 contained more clay and silt. Generally, the relative density of this layer was medium dense, with the density increasing with depth, and becoming consistently coarser with depth. The moisture content of eight samples tested from this layer ranged from about 27 to 36 percent. The fines content of one sample from this layer in TP-7 was measured to be about 14 percent.

Sandy GRAVEL: Gray-brown to brown Sandy Gravel (GP) with silt and cobbles was encountered below the sand layer in all test pits extending to the termination depth in all, at about 6 to 12 feet bgs. In general, the relative density of this layer was dense to very dense, and soil particles were observed to consistently increase in size with depth. The moisture content of samples tested from this layer ranged from about 18 to 58 percent. The fines content of one sample from this layer in TP-3 was about 4 percent.

Groundwater

Groundwater was encountered at three of the eight test pit explorations, TP-1, TP-2, and TP-4. At each of these locations, moderate seepage was observed at about 4 feet bgs and heavy seepage was encountered at approximately 5 to 7 feet bgs. These three test pits were all located within the lower, southern portion of the site. Groundwater was not encountered in the remaining five test pits, which were excavated to depths of up to 12 feet bgs. Generally, we expect the depth to groundwater to increase as one moves north and to higher elevations within the property. Based on a review of nearby well logs as well as Clark County data, the static groundwater level at the property is mapped at about 10 to 20 feet bgs, although zones of isolated restrictive layers may occur, resulting in seasonally higher perched water levels at times.

Infiltration Testing

Infiltration testing was completed in TP-3 and TP-7 at depths of about 5 and 2 feet bgs, respectively. The infiltration tests were conducted within 6-inch outside diameter PVC pipes embedded into the underlying soils using the single-ring falling head method, in general accordance with the 2015 Clark County Stormwater Manual. Water was placed into each pipe to achieve a minimum 6-inch-high column of water (head). After a period of saturation, the height of the water column in each pipe was measured initially and at regular timed intervals to determine the rate of water infiltration into the soil. Results of the field infiltration testing are presented in Table 1.

Table 1. Infiltration Testing Results

Location	Depth of Test (feet bgs)	Coefficient of Permeability, k (inches/hour)	Fines Content (percent)	Soil Classifiction[2]
TP-3	5	42.2	14.4	Brown Silty GRAVEL with Sand and Cobbles, moist
TP-7	2	0.26	32.3	Brown Silty SAND with Gravel, damp

[1] Average rate after saturation. [2] Based on visual-manual classification and limited lab testing

The recommended coefficients of permeability, k, presented in Table 1 have been determined using the guidelines presented in CCSM. It is recommended that the designer also include correction factors to account for the level of maintenance, type of system, vegetation, siltation, etc., as necessary.

Hydrologic Soil Properties

According to the USDA Web Soil Survey, the near-surface soils at the site are generally identified as Lauren Loam, which generally consists of soils classified as gravelly loamy coarse sand at the approximate test depths and are assigned the hydrologic soil group “B” based on drainage and other properties, indicating the soils have a moderately high to high capacity to transmit water.

For the purposes of the stormwater system design using the Western Washington Hydrologic Model (WWHM), it is our opinion, based on the results of our explorations, infiltration testing, and

laboratory testing, that the native near-surface soil conditions observed in our explorations can generally be classified as Soil Group 4 (SG4).

Geologic Hazards

The following provides a geologic hazard review for the subject site. The geologic hazard review as based on our site reconnaissance and explorations, as well as a review of publicly available published literature and maps.

Slope and Landslide Hazards:

For the most part the site is relatively level, with no slopes exceeding 15 percent within the site boundaries, or at adjacent lots. As a result, slope and landslide hazards are not a concern at the property.

Seismic Hazards:

The following seismic hazards have been considered as part of our geologic hazards review for the project site:

Ground Motion Amplification: Based on a review of Clark County Maps Online, the site is designated as seismic Site Class "C". Based on the presence of dense cobbly/gravelly soils at shallow depths in our explorations, it is our opinion that Site Class "C" is indeed appropriate for use at the site. The seismic design parameters, in accordance with the 2018 IBC (with Washington State amendments), are summarized in Table 2.

Table 2. 2018 IBC Seismic Design Parameters

Location	Short Period	1-Second
Maximum Credible Earthquake Spectral Acceleration	S_s = 0.793 g	S_1 = 0.350 g
Site Class	C	
Site Coefficient	F_a = 1.2	F_v = 1.5
Adjusted Spectral Acceleration	S_{MS} = 0.951 g	S_{M1} = 0.524 g
Design Spectral Response Acceleration Parameters	S_{DS} = 0.634 g	S_{D1} = 0.350 g

g – acceleration due to gravity

Liquefaction: While relatively shallow groundwater was encountered at the site, based on the relative density and grain size of the soils encountered in our explorations, we consider the potential for liquefaction settlement within the site boundaries to be low. Indeed, site is mapped as having a "very low" liquefaction susceptibility based on the Liquefaction Susceptibility Map of Clark County.

CONCLUSIONS AND RECOMMENDATIONS

Geotechnical Design and Construction Considerations

Based on the results of our site reconnaissance, subsurface explorations, and geologic map review, it is our opinion that the planned single-family residential development of the site within the proposed new lots and the associated utilities, access roads and driveways are feasible provided the recommendations in this report are included in the project design and implemented during construction. The chief geotechnical concerns of note associated with the project are ensuring foundations are bearing on competent dense native soils and designing a stormwater system that meets the needs of the site while taking into account the depth of groundwater within the lower portion of the site. Our opinion is based on field observations and subsurface explorations completed by True North and review of the following documents and information sources: County soils and groundwater mapping, a published geologic map, and our understanding of the proposed development plans.

Site Preparation

After any surface and near surface water sources have been controlled, the construction areas should be cleared and stripped of organic matter, and other deleterious materials. Silt fences, hay bales, buffer zones of natural growth, sedimentation ponds, and granular haul roads should be used as required to reduce sediment transport during construction to acceptable levels.

Where present, existing topsoil, buried structures, and other disturbed surface materials should be stripped and removed from proposed development locations and for a five-foot-margin around such areas. Based on our explorations, the depth of stripping may range from 6 to up to 24 inches, although greater stripping depths may be required if loose or soft materials are encountered, abandoned utilities or other embedded structures, or where mature trees and their associated roots are removed. Deleterious materials encountered during site preparation should be removed from the subgrade soils and hauled off site for disposal. Stripped material should be transported off site for disposal or stockpiled for use in landscaped areas. If stripping operations occur during wet weather, a generally greater stripping depth might be required in order to remove disturbed moisture sensitive soils; therefore, stripping is best performed during a period of dry weather.

Subgrade Verification

Following site preparation, including removal of all topsoil/till zone and compaction of the exposed subgrade and prior to placing aggregate base for the foundations, building pad, or pavement section, the exposed subgrade should be evaluated. The subgrades should be evaluated by qualified True North personnel using a steel foundation probe, proofroll, or other acceptable method. Unsuitable areas identified during the field evaluation should be re-compacted to or be excavated to firm ground and replaced with structural fill.

Wet/Freezing-Weather/Wet-Soil Conditions

Due to the presence of fine-grained silt and clay in the near-surface materials at the site, construction equipment may have difficulty operating on the near-surface soils when the moisture content of the surface soil is more than a few percentage points above the optimum moisture required for compaction. Soils that have been disturbed during site preparation activities, or unsuitable areas identified during proofrolling or probing, should be removed and replaced with compacted structural fill.

Site earthwork and subgrade preparation should not be completed during freezing conditions.

Protection of the subgrade is the responsibility of the contractor. Construction of granular haul roads may help reduce further damage to the pavement and disturbance of site soils. The thickness of the granular material for haul roads and staging areas will depend on the amount and type of construction traffic. The actual thickness of haul roads and staging areas should be based on the contractors' approach to site development, and the amount and type of construction traffic. The imported granular material should be placed in one lift over the prepared, undisturbed subgrade and compacted using a smooth-drum, non-vibratory roller. A geotextile fabric should be used to separate the subgrade from the imported granular material in areas of repeated construction traffic.

Excavations

Where required, temporary soil cuts associated with site excavations or regrading activities should be adequately sloped back to prevent sloughing and collapse, unless a shoring box or other suitable excavation side wall bracing is provided. It is the responsibility of the contractor to ensure that excavations are properly sloped or braced for worker safety protection, in accordance with OSHA safety guidelines.

Structural Fill

Structural fill includes any fill materials placed under footings, pavements, or driveways and backfill over the embedded mat foundation. Typical materials used for structural fill include: clean, well-graded sand and gravel; clean sand; crushed rock; controlled-density fill (CDF); lean-mix concrete; and various soil mixtures of silt, sand, and gravel. Use of the on-site soils as structural fill may be feasible, provided they are properly moisture conditioned prior to placement and compaction.

Imported granular structural fill should consist of angular pit or quarry run rock, crushed rock, or crushed gravel and sand that is fairly well graded between coarse and fine particle sizes. The fill should contain no organic matter or other deleterious materials, have a maximum particle size of one inch, and have less than 5 percent passing the U.S. No. 200 Sieve. In deep excavations, or where subgrade soils require stabilization, the particle size may be increased to four inches. The percentage of fines can be increased to 12 percent of the material passing the U.S. No. 200 Sieve

if placed during dry weather and provided the fill material is moisture-conditioned, as necessary, for proper compaction. The material should be placed in lifts with a maximum uncompacted thickness of 12 inches and be compacted to not less than 95 percent of the maximum dry density, as determined by ASTM D 1557. During the wet season or when wet subgrade conditions exist, the initial lift thickness may be increased to 24 inches and should be compacted by rolling with a smooth-drum, nonvibratory roller.

Foundations

Continuous-wall and isolated-spread footings should be at least 12 and 24 inches wide, respectively. For frost protection, the footings should be founded at least 12 inches below the lowest adjacent grades or deeper if required by local building code. The footings should be founded below an imaginary line project at a 1H:1V slope from the base of any adjacent, parallel utility trenches.

Footings should bear on the near-surface silt or gravelly clay or structural fill placed in accordance with our recommendations. Footings should be sized for an allowable bearing capacity of 1,500 psf. We estimate post construction settlements will be less than one inch for our recommended allowable bearing capacity. We estimate that the differential settlement will be approximately half of the total settlement. Our recommended bearing capacity is based on limiting settlements and includes a minimum factor of safety of 3 against ultimate bearing failure.

Lateral loads acting on the foundations can be resisted by passive earth pressures on the sides of the foundation and by friction along the soil-rock-concrete interface at the base of the foundation. We recommend using an allowable passive earth pressure of 250 pounds per cubic foot (pcf) for foundations confined by the near-surface silty sand or structural fill placed in accordance with our recommendations. We recommend an allowable coefficient of friction of 0.35 for foundations. In order to develop these capacities, concrete must be poured neat in excavations, the adjacent grade must be level, and the static ground water level must remain below the base of the footing throughout the year. The passive pressure within the upper foot of embedment should be neglected. These allowable lateral resistance values include a factor of safety of 1.5.

Slab-on-grade Floors

Satisfactory subgrade support for lightly-loaded building floor slabs can be obtained on the undisturbed native soil or on engineered structural fill. A subgrade modulus of 125 pounds per cubic inch may be used to design floor slabs.

A minimum 6-inch-thick layer of drain rock should be placed and compacted over the prepared subgrade to assist as a capillary break and blanket drain. The drain rock may include a capping layer of clean ¾ inch minus crushed rock that contains no more than 5% fines. The drain rock

and capping rock should be placed in one lift and compacted until well-keyed, about 90% of the maximum dry density as determined by ASTM D698.

A vapor retarder manufactured for use beneath floor slabs should be installed according to the manufacturer's recommendations. Careful attention should be made during construction to prevent perforating the retarder, and to seal edges and utility penetrations. We recommend following ACI 302.1, Chapter 3 with regard to installing a vapor retarder.

Pavement Design

The following pavement design recommendations are based on our experience with similar facilities and subgrade conditions.

For automobile parking areas, we recommend a pavement section consisting of 3 inches of asphaltic concrete (AC) over 8 inches of crushed rock base (CRB) or 5 inches of Portland Cement concrete (PCC) over 5 inches of crushed rock base (CRB). For truck traffic areas, the pavement section should consist of 4 inches of AC over 12 inches of CRB or 6 inches of PCC over 8 inches of CRB. These recommended pavement sections are based on the assumption that the subgrade consists of firm structural fill or compacted native subgrade and that the pavement will be constructed during the dry summer months. Proofrolling should be used to evaluate pavement subgrade. Any soft areas disclosed by proofrolling will likely need to be reworked. Some contingency should be provided for the repair of any soft areas. If pavement construction is scheduled for the wet season, it will be necessary to increase the above-recommended base course sections.

AC and CRB materials should conform to WSDOT specifications. All CRB should be compacted to at least 95 percent of the modified proctor ASTM D-1557 laboratory test standard.

Permanent, properly installed drainage is also an essential aspect of pavement design and construction. All paved areas should have positive drainage to prevent ponding of surface water and saturation of the base course. This is particularly important in cut sections or at low points within the paved areas, such as around stormwater catch basins.

Drainage

The Contractor should be made responsible for temporary drainage of surface water and groundwater as necessary during construction to prevent standing water and/or erosion at the site.

As a matter of good construction practice, we recommend that perimeter drains be installed for all buildings. Perimeter drains should consist of perforated drainpipe embedded in a zone of free draining fill that is wrapped in a non-woven geotextile filter. The pipe should be connected to a tightline drainpipe leading to storm drain facilities. Foundation and crawl space drainage should

be sloped to drain to a sump or low point drain outlet. Water should not be allowed to pond within crawl spaces. Roof drains should be connected to a tightline drainpipe leading to storm drain outlet facilities.

Water should not be allowed to "pond" or collect anywhere on the site. The ground surface around structures should be sloped to drain away from building foundations for a distance of at least 5 feet. Surface water should be directed away from all buildings into drainage swales or other approved drainage areas. "Trapped" planting areas should not be created next to any buildings without providing means for drainage.

Soil Erosion

Site-specific erosion control measures should be implemented to address the maintenance of slopes or exposed areas. This may include silt fence, bio-filter bags, straw wattles, or other suitable methods. During construction, all exposed areas should be well compacted and protected from erosion. Temporary slopes or expose areas may be covered with straw, crushed aggregate, or rip in localized areas to minimize erosion.

Finished slopes should be vegetated as soon as possible with erosion-resistant native grasses and plants. Once established, slope vegetation should be properly maintained. Concentrated water should be prevented from flowing over slope faces.

CONSTRUCTION OBSERVATIONS

Satisfactory earthwork performance depends on the quality of construction. Sufficient monitoring of the contractor's activities is a key part in ensuring that work is completed in accordance with the construction drawings and specifications. We recommend that True North observe that the subsurface conditions observed during our site investigation are consistent with those encountered during construction, and that foundation subgrades are suitable for placement of structural fill, rebar, or concrete for the new structures.

The City of Camas and/or Clark County may require a final letter of geotechnical compliance before they will finalize a permit. If such a letter is required, a representative from True North MUST observe foundation subgrades PRIOR to concrete being poured for the foundation. If True North does not perform this observation, we cannot provide a final letter of geotechnical compliance, and a permit will not be eligible for final sign-off. It is the owner's responsibility to ensure that True North be notified in a timely manner (i.e., at least 48 hours prior to the required site observation) of the need for our services on site during construction.

LIMITATIONS

We have prepared this report for use by the owner/developer and other members of the design and construction team for the proposed Monte Verde Subdivision. The opinions and recommendations contained within this report are not intended to be construed as a warranty of

subsurface conditions, but are forwarded to assist in the planning and design process. The conclusions and recommendations contained in this report are based on our understanding of the currently proposed project, as derived from written and verbal information supplied to us by you.

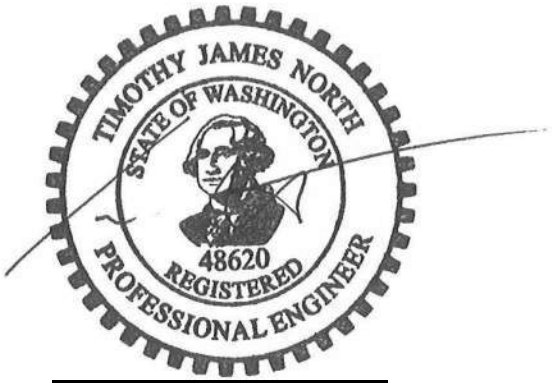
The conclusions and recommendations contained in this report are based on our understanding of the currently proposed project and potential future development, as derived from written and verbal information supplied to us by you. When the design has been finalized, we recommend that we review the design and specifications to see that our recommendations have been interpreted and implemented as intended. If design changes are made, we request that we be retained to review our conclusions and recommendations and to provide a written modification or verification.

Within the limitations of scope, schedule, and budget, our services have been executed in accordance with the generally accepted practices in this area at the time this report was prepared. No warranty or other conditions, express or implied, should be understood.

CLOSING

We appreciate the opportunity to be of service to you. If you have any questions, or if we can be of further assistance to you, please contact us at (360) 984-6584.

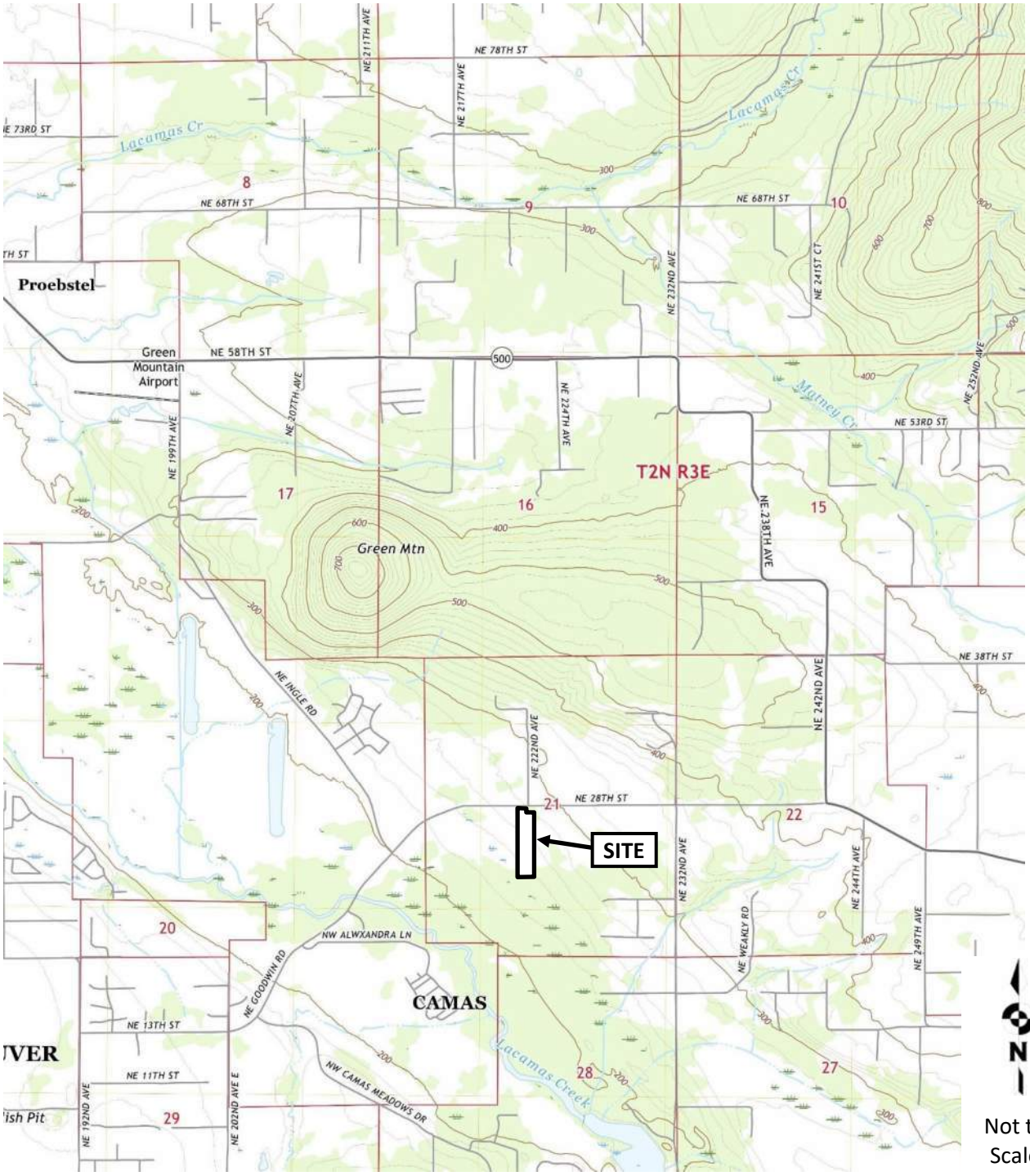
Respectfully Submitted,



Timothy J. North, P.E.
Geotechnical Engineer

Attachment: Figure 1 – Vicinity Map
Figure 2 – Site Plan
Figure 3 – Site Photographs
Appendix A – Field and Laboratory Procedures
Test Pit Logs TP-1 through TP-8

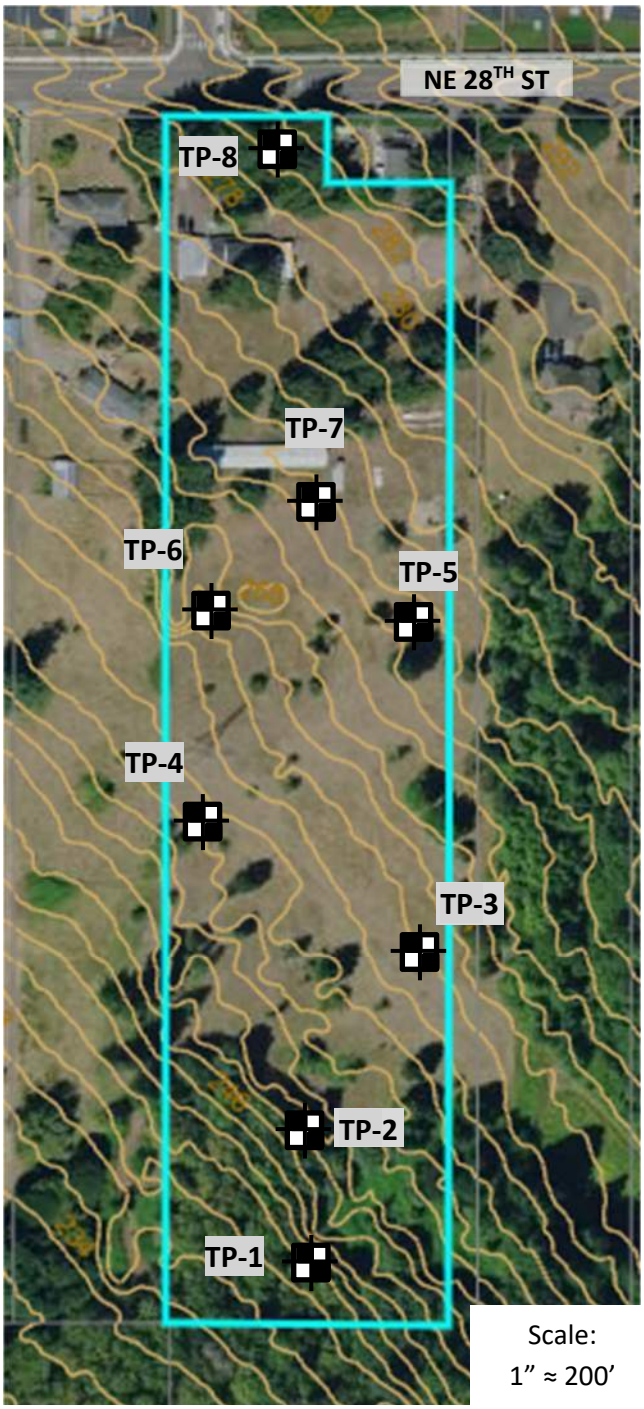
FIGURES



Not to Scale

Source: "Topographic Map of the Lacamas Creek Quadrangle, 7.5 minute series" 2020, United States Geological Survey (USGS).

TRUE NORTH GEOTECHNICAL	Pacific Lifestyle Homes Monte Verde Subdivision Camas, WA	Project # 22-0111-1
202 E Evergreen St, Suite B Vancouver, WA 98660 360-984-6584	July 2022	Figure 1 – Vicinity Map



Scale:
1” ≈ 200’

TP-1 Approximate Exploratory Test Pit Locations, May 6, 2022.

Source: Aerial & Topo – Clark County MapsOnline, accessed July 05, 2022.

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TRUE NORTH GEOTECHNICAL	Pacific Lifestyle Homes Monte Verde Subdivision Camas WA	Project # 22-0111-1
202 E. Evergreen Blvd Suite B Vancouver, WA 98660 360-984-6584	July 2022	Figure 2 –Site Plan

Photo 1. Seepage observed at TP-1.

Photo 2. Seepage ponding at TP-2 during backfill operations.

TRUE NORTH GEOTECHNICAL	Pacific Lifestyle Homes Monte Verde Subdivision Camas, WA	Project # 22-0111-1
202 E Evergreen Blvd, Suite B Vancouver, WA 98660 360-984-6584	July 2022	Figure 3A – Site Photographs (1 of 2)

Photo 3. Cobbles and gravel evident at TP-3.

Photo 4. Infiltration testing at TP-7.

TRUE NORTH GEOTECHNICAL	Pacific Lifestyle Homes Monte Verde Subdivision Camas, WA	Project # 22-0111-1
202 E Evergreen Blvd, Suite B Vancouver, WA 98660 360-984-6584	July 2022	Figure 3B – Site Photographs (2 of 2)

APPENDIX A

Field Exploration Procedures
Laboratory Testing Procedures
Exploration Test Pit Logs

FIELD EXPLORATION PROCEDURES

General

We explored subsurface conditions at the site by excavating eight test pits, designated TP-1 through TP-8, to depths ranging from about 6.0 to 12.0 feet bgs. The test pit explorations were excavated on May 6, 2022 with Deere 75G tracked excavator, owned and operated by Dan Tapani Excavating of Battle Ground, Washington. Upon completion, the test pits were backfilled with excavated soils tamped into place as best possible.

Soil Sampling

A True North representative observed subsurface explorations to record the soil, rock, and groundwater conditions encountered, and to obtain soil samples. Disturbed soil samples were obtained from the sidewalls of the excavation and the excavator bucket at selected depths throughout the explorations. Soil samples were sealed to retain moisture and returned to our laboratory for additional examination and testing.

Field Classification

The observed soils were classified initially on site in general accordance with ASTM D 2488 Description and Identification of Soils (Visual-Manual Procedure). Consistency, color, relative moisture, degree of plasticity, peculiar odors, and other distinguishing characteristics of the soil samples were noted. The terminology used is described in the key and glossary that follow.

Summary Exploration Logs

Results from the test pits are shown in the summary exploration logs. The left-hand portion of a log provides our interpretation of the soil encountered, sample depths, and groundwater information. The right-hand portion of a log shows the results of field and laboratory testing. Soil descriptions and interfaces between soil types shown in summary logs are interpretive, and actual transitions may be gradual.

LABORATORY TESTING PROCEDURES

Soil samples obtained during field explorations are examined in a laboratory, and representative samples may be selected for further testing. The testing program included visual-manual classification and natural moisture content testing.

Visual Manual Classification

Soil samples are classified in general accordance with guidelines presented in ASTM D2488, Standard Practice for Description and Identification of Soils (Visual-Manual Procedure). The physical characteristics of the samples are noted and the field classifications are modified, where necessary, in accordance with ASTM terminology, though certain terminology that incorporates current local engineering practice may be used. The term which best described the major portion of the sample is used to describe the soil type.

Natural Moisture Content

Natural moisture content is determined in general accordance with guidelines presented in ASTM D2216, Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass. The natural moisture content is the ratio, expressed as a percentage, of the weight of water in a given amount of soil to the weight of solid particles.

Fines Content

Fines content testing is performed in general accordance with guidelines presented in ASTM D1140, *Standard Test Methods for Determining the Amount of Material Finer than 75-µm (No.200) Sieve in Soils by Washing*. The fines content is the fraction of soil that passes the U.S. Standard Number 200 Sieve. This sieve differentiates fines (silt and clay) from sand and gravel. Soil material that remains on the Number 200 sieve is sand and gravel. Material that passes the sieve is fines. The test is used to refine soil type.

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TABLE A1
Key to Test Pit and Boring Terminology and Symbols

MAJOR DIVISIONS			SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTION
Coarse Grained Soils: More Than 50% Material Retained on No. 200 Sieve	Gravel and Gravelly Soils: More Than 50% Coarse Fraction Retained on No. 4 Sieve	Clean Gravels (Little or No Fines)		GW	Well-graded Gravels, Gravel-Sand Mixtures, Little or No Fines
				GP	Poorly-graded Gravels, Gravel-Sand Mixtures, Little or No Fines
		Gravels with Fines (Significant Percentage of FIne)		GM	Silty Gravels, Gravel-Sand-Silt Mixtures
				GC	Clayey Gravels, Gravel-Sand-Clay Mixtures
	Sand and Sandy Soils: More Than 50% Coarse Fraction Passing No. 4 Sieve	Clean Sands (Little or No Fines)		SW	Well-graded Sands, Gravelly Sands, Little or No Fines
				SP	Poorly-graded Sands, Gravelly Sands, Little or No Fines
		Sands with Fines (Significant Percentage of FIne)		SM	Silty Sands, Sand-Silt Mixtures
				SC	Clayey Sands, Sand-Clay Mixtures
Fine Grained Soils: More Than 50% Material Passing No. 200 Sieve	Silts and Clays	Liquid Limit Less than 50 percent		ML	Inorganic Silts and Very Fine Sands, Rock Flour, Silty-Clayey Fine Sands, Clayey Silts
				CL	Inorganic Clays of Low to Medium Plasticity, Gravelly Clays, Sandy Clays, Silty Clays
				OL	Organic Silts and Organic Silty Clays of Low Plasticity
	Silts and Clays	Liquid Limit Greater than 50 percent		MH	Inorganic Silts Micaceous or Diatomaceous Fine Sand or Silty Soils
				CH	Inorganic Clays of High Plasticity, Fat Clays
				OH	Organic Clays of Medium to High Plasticity, Organic Silts
				PT	Peat, Humus, Swamp Soils
Topsoil					Humus and Duff Layer
Fill					Highly Variable Constituents

Relative Density of Coarse-Grained Soils	
Relative Density	**N - Blows per Foot**
Very Loose	0 - 4
Loose	4 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	50+

Consistency of Fine-Grained Soils	
Relative Density	**N - Blows per Foot**
Very Soft	0 - 2
Soft	2 - 4
Medium Stiff	4 -8
Stiff	8 - 15
Very Stiff	15 - 30
Hard	30 - 50
Very Hard	50+

Key to Sampler Type Symbols

G				
Grab	SPT	Shelby Tube	Dames & Moore	Rock Core

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Project Name: PLH - Monte Verde Subdivision		TEST PIT LOG TP-1
Project Location: 22205 NE 28th St, Camas, WA 98607		Project No.: 22-0111-1
Operator: Dan Tapani Excavating	Equipment: Deere 75G with 2 ft bucket	Date Started: 05/6/22
Logged By: LS	Checked By: TJN	Date Completed: 05/6/22

Depth (feet)	Sample Type	Sample No.	Graphic Log	USCS Symbol	Soil Description	Water Content, %	Field Testing	Notes and Lab Data
0	G	S-1			Soft to medium stiff, dark brown silty TOPSOIL with roots and other organics; moist.	37		
1–4				SC	Medium dense, light brown Clayey SAND with gravel; moist.			
4	G	S-2				33		
7	G	S-3		SM	Medium dense, gray-brown Silty SAND with clay; wet.	24		
10	G	S-4		GP	Dense to very dense, gray-brown Sandy GRAVEL with clay; wet.	39		
10.5					Excavation terminated at 10.5 feet bgs. Groundwater encountered at about 7 feet bgs during excavation. Backfilled with excavated soils.			

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Project Name: PLH - Monte Verde Subdivision		TEST PIT LOG TP-2
Project Location: 22205 NE 28th St, Camas, WA 98607		Project No.: 22-0111-1
Operator: Dan Tapani Excavating	Equipment: Deere 75G with 2 ft bucket	Date Started: 05/6/22
Logged By: LS	Checked By: TJN	Date Completed: 05/6/22

Depth (feet)	Sample Type	Sample No.	Graphic Log	USCS Symbol	Soil Description	Water Content, %	Field Testing	Notes and Lab Data
1	G	S-1			Soft to medium stiff, dark brown silty TOPSOIL with roots and other organics; moist.	32		
2				SC	Medium dense, light brown Clayey SAND with gravel; moist.		PP = 0.5	
3								
4	G	S-2				36		
5								
6	G	S-3		GP	Dense, gray-brown Sandy GRAVEL with cobbles; wet.	37		
7					increasing sand with depth, increasing cobble size with depth			
8	G	S-4				28		
9					Excavation terminated at 8.5 feet bgs. Groundwater encountered at about 6 feet bgs during excavation. Backfilled with excavated soils.			
10								
11								
12								
13								
14								
15								

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Project Name: PLH - Monte Verde Subdivision			TEST PIT LOG TP-3
Project Location: 22205 NE 28th St, Camas, WA 98607			Project No.: 22-0111-1
Operator: Dan Tapani Excavating	Equipment: Deere 75G with 2 ft bucket		Date Started: 05/6/22
Logged By: LS	Checked By: TJN		Date Completed: 05/6/22

Depth (feet)	Sample Type	Sample No.	Graphic Log	USCS Symbol	Soil Description	Water Content, %	Field Testing	Notes and Lab Data
					Soft to medium stiff, dark brown silty TOPSOIL with organics; moist.			
1	G	S-1		SC	Medium dense, light brown Clayey SAND with gravel; moist.	22	PP = 0.5	
2								
3								
4	G	S-2			increasing gravel and cobble content with depth	27	PP = 0.5	
5	G	S-3		GP	Dense, gray-brown Sandy GRAVEL with cobbles; moist.			Fines content = 4%
6								
7	G	S-4				18		
8								
9					increasing cobble size with depth			
10								
11					Excavation terminated at 11 feet bgs. Groundwater not encountered. Backfilled with excavated soils.			
12								
13								
14								
15								

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Project Name: PLH - Monte Verde Subdivision		TEST PIT LOG TP-4
Project Location: 22205 NE 28th St, Camas, WA 98607		Project No.: 22-0111-1
Operator: Dan Tapani Excavating	Equipment: Deere 75G with 2 ft bucket	Date Started: 05/6/22
Logged By: LS	Checked By: TJN	Date Completed: 05/6/22

Depth (feet)	Sample Type	Sample No.	Graphic Log	USCS Symbol	Soil Description	Water Content, %	Field Testing	Notes and Lab Data
					Soft to medium stiff, dark brown silty TOPSOIL with organics; moist.			
1	G	S-1		SC	Medium dense, light brown Clayey SAND with gravel; moist.	25	PP = 0.5	
2							PP = 0.5	
3								
4	G	S-2				30	PP = 1.0	
5				GP	Dense, gray-brown Sandy GRAVEL with cobbles; moist.			
6	G	S-3				30		
					Excavation terminated at 6 feet bgs. Groundwater not encountered. Backfilled with excavated soils.			
7								
8								
9								
10								
11								
12								
13								
14								
15								

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Project Name: PLH - Monte Verde Subdivision		TEST PIT LOG TP-5
Project Location: 22205 NE 28th St, Camas, WA 98607		Project No.: 22-0111-1
Operator: Dan Tapani Excavating	Equipment: Deere 75G with 2 ft bucket	Date Started: 05/6/22
Logged By: LS	Checked By: TJN	Date Completed: 05/6/22

Depth (feet)	Sample Type	Sample No.	Graphic Log	USCS Symbol	Soil Description	Water Content, %	Field Testing	Notes and Lab Data
					Soft to medium stiff, dark brown silty TOPSOIL with organics; moist.			
1	G	S-1		SC	Medium dense, brown Clayey SAND; moist.	33	PP = 0.5	
2	G	S-2				27	PP = 0.5	
3								
4	G	S-3			Medium dense, brown Clayey SAND with gravel and cobbles; moist.	26	PP = 0.75	
5								
6				SC				
7								
8								
9	G	S-4		GP	Dense, yellow-gray GRAVEL with sand and clay; moist to wet.	58		
10								
11					Excavation terminated at 10.5 feet bgs. Groundwater not encountered. Backfilled with excavated soils.			
12								
13								
14								
15								

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Project Name: PLH - Monte Verde Subdivision		TEST PIT LOG TP-6
Project Location: 22205 NE 28th St, Camas, WA 98607		Project No.: 22-0111-1
Operator: Dan Tapani Excavating	Equipment: Deere 75G with 2 ft bucket	Date Started: 05/6/22
Logged By: LS	Checked By: TJN	Date Completed: 05/6/22

Depth (feet)	Sample Type	Sample No.	Graphic Log	USCS Symbol	Soil Description	Water Content, %	Field Testing	Notes and Lab Data
0					Soft to medium stiff, dark brown silty TOPSOIL with organics; moist.	29	PP = 0.5	
1	G	S-1						
2				ML/CL	Medium stiff, brown Clayey SILT with sand; moist.		PP = 1.0	
3	G	S-2				26	PP = 1.25	
4								
5								
6								
7				SP	Dense, gray-brown Gravelly SAND with cobbles; moist.			
8								
9					increasing cobble content and size with depth			
10								
11	G	S-3				30		
12					Excavation terminated at 12 feet bgs. Groundwater not encountered. Backfilled with excavated soils.			
13								
14								
15								

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Project Name: PLH - Monte Verde Subdivision		TEST PIT LOG TP-7
Project Location: 22205 NE 28th St, Camas, WA 98607		Project No.: 22-0111-1
Operator: Dan Tapani Excavating	Equipment: Deere 75G with 2 ft bucket	Date Started: 05/6/22
Logged By: LS	Checked By: TJN	Date Completed: 05/6/22

Depth (feet)	Sample Type	Sample No.	Graphic Log	USCS Symbol	Soil Description	Water Content, %	Field Testing	Notes and Lab Data
0	G	S-1			Soft to medium stiff, dark brown silty TOPSOIL with organics; moist.	23	PP = 0.25	Infiltration Testing at 2.0 feet bgs Fines content = 14%
2				SM	Medium dense, brown Clayey SAND with gravel and cobbles; moist.			
3	G	S-2				33	PP = 1.5	
4					increasing gravel and cobble content with depth			
11	G	S-3		GP	Dense, yellow-gray Sandy GRAVEL with clay; moist to wet.	57		
12					Excavation terminated at 12 feet bgs. Groundwater not encountered. Backfilled with excavated soils.			

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Project Name: PLH - Monte Verde Subdivision		TEST PIT LOG TP-8
Project Location: 22205 NE 28th St, Camas, WA 98607		Project No.: 22-0111-1
Operator: Dan Tapani Excavating	Equipment: Deere 75G with 2 ft bucket	Date Started: 05/6/22
Logged By: LS	Checked By: TJN	Date Completed: 05/6/22

Depth (feet)	Sample Type	Sample No.	Graphic Log	USCS Symbol	Soil Description	Water Content, %	Field Testing	Notes and Lab Data
1	G	S-1			Soft to medium stiff, dark brown silty TOPSOIL with organics; moist.	29	PP = 1.0	
2							PP = 0.5	
3	G	S-2			Medium dense, orange-brown Silty SAND with gravel and cobbles; moist.	31	PP = 0.5	
4					increasing gravel and cobble content with depth			
5								
6				SM				
7								
8								
9	G	S-3				25		
					Excavation terminated at 9 feet bgs. Groundwater not encountered. Backfilled with excavated soils.			
10								
11								
12								
13								
14								
15								

SEPARATOR SHEET

APPENDIX D

Operations and Maintenance Manual

Exhibit 7 SUB22-05

Catch Basin

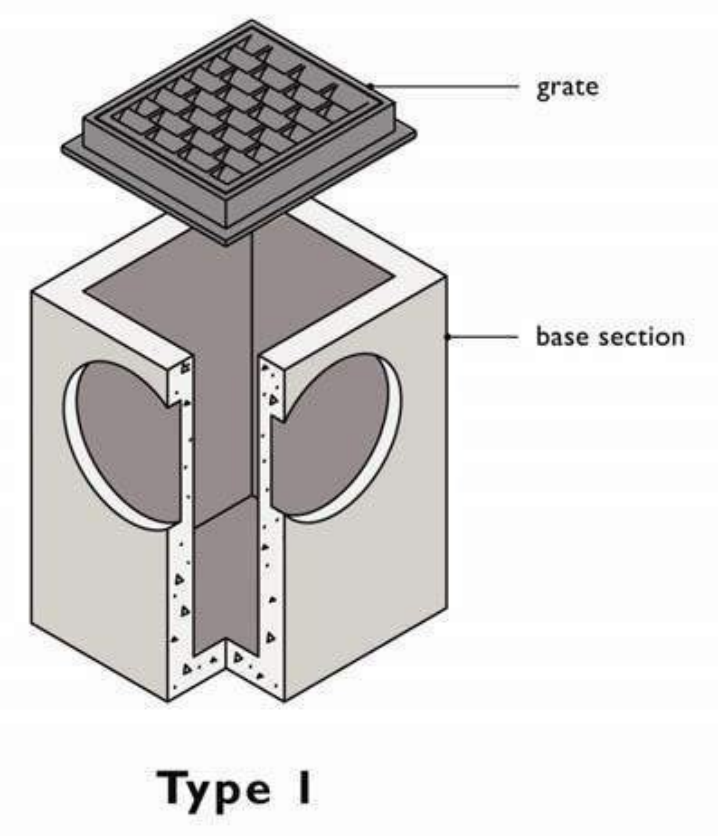
A catch basin is an underground concrete structure typically fitted with a slotted grate to collect stormwater runoff and route it through underground pipes. Catch basins can also be used as a junction in a pipe system and may have a solid lid. There are two types.

A Type 1 catch basin is a rectangular box with approximate dimensions of 3'x2'x5'. Type 1 catch basins are utilized when the connected conveyance pipes are less than 18 inches in diameter and the depth from the gate to the bottom of the pipe is less than 5 feet.

A Type 2 catch basin, also commonly referred to as a storm manhole, is listed separately under "Manhole" in this book.

Catch basins typically provide a storage volume (sump) below the outlet pipe to allow sediments and debris to settle out of the stormwater runoff. Some catch basins are also fitted with a spill control device (inverted elbow on outlet pipe) intended to contain large quantities of grease or debris.

Catch basins are frequently associated with all stormwater facilities.



Key Operations and Maintenance Considerations

- The most common tool for cleaning catch basins is an industrial vacuum truck with a tank and vacuum hose (e.g. Vactor® truck) to remove sediment and debris from the sump.
- A catch basin may be an enclosed space where harmful chemicals and vapors can accumulate. Therefore, if the inspection and maintenance requires entering a catch basin, it should be conducted by an individual trained and certified to work in hazardous confined spaces.

Catch Basin			
Drainage System Feature	Potential Defect	Conditions When Maintenance Is Needed	Minimum Performance Standard
			Note: table spans multiple pages.
General	Trash and Debris	Trash or debris which is located immediately in front of the catch basin opening or is blocking inletting capacity of the basin by more than 10%.	No trash or debris located immediately in front of catch basin or on grate opening.
		Trash or debris (in the basin) that exceeds 60 percent of the sump depth as measured from the bottom of basin to invert of the lowest pipe into or out of the basin, but in no case less than a minimum of six inches clearance from the debris surface to the invert of the lowest pipe.	No trash or debris in the catch basin.
		Trash or debris in any inlet or outlet pipe blocking more than 1/3 of its height.	Inlet and outlet pipes free of trash or debris.
		Dead animals or vegetation that could generate odors that could cause complaints or dangerous gases (e.g., methane).	No dead animals or vegetation present within the catch basin.
	Sediment	Sediment (in the basin) that exceeds 60 percent of the sump depth as measured from the bottom of basin to invert of the lowest pipe into or out of the basin, but in no case less than a minimum of 6 inches clearance from the sediment surface to the invert of the lowest pipe.	No sediment in the catch basin.
	Structure Damage to Frame and/or Top Slab	Top slab has holes larger than 2 square inches or cracks wider than 1/4 inch. (Intent is to make sure no material is running into basin.)	Top slab is free of holes and cracks.
		Frame not sitting flush on top slab, i.e., separation of more than 3/4 inch of the frame from the top slab. Frame not securely attached.	Frame is sitting flush on the riser rings or top slab and firmly attached.
	Fractures or Cracks in	Maintenance person judges that structure is unsound.	Basin replaced or repaired to design standards.

	Basin Walls/ Bottom	Grout fillet has separated or cracked wider than 1/2 inch and longer than 1 foot at the joint of any inlet/outlet pipe or any evidence of soil particles entering catch basin through cracks.	Pipe is regrouted and secure at basin wall.
	Settlement/ Misalignment	If failure of basin has created a safety, function, or design problem.	Basin replaced or repaired to design standards.
	Vegetation Inhibiting System	Vegetation growing across and blocking more than 10% of the basin opening.	No vegetation blocking opening to basin.
		Vegetation growing in inlet/outlet pipe joints that is more than six inches tall and less than six inches apart.	No vegetation or root growth present.
	Contaminants and Pollution	Any evidence of oil, gasoline, contaminants or other pollutants. Sheen, obvious oil or other contaminants present. • Identify and remove source, AND • Report to Clark County Clean Water Program.	No contaminants or pollutants present.
Catch Basin Cover	Cover Not in Place	Cover is missing or only partially in place. Any open catch basin requires maintenance.	Catch basin cover is closed.
	Locking Mechanism Not Working	Mechanism cannot be opened by one maintenance person with proper tools. Bolts into frame have less than 1/2 inch of thread.	Mechanism opens with proper tools.
	Cover Difficult to Remove	One maintenance person cannot remove lid after applying normal lifting pressure (Intent is to keep cover from sealing off access to maintenance).	Cover can be removed by one maintenance person.
Metal Grates (If Applicable)	Grate Opening Unsafe	Grate with opening wider than 7/8 inch.	Grate opening meets design standards.
	Trash and Debris	Trash and debris that is blocking more than 20% of grate surface inletting capacity.	Grate free of trash and debris.
	Damaged or Missing	Grate missing or broken member(s) of the grate.	Grate is in place and meets design standards.
Oil/Debris Trap (If Applicable)	Dislodged	Oil or debris trap is misaligned with or dislodged from the outlet pipe.	Trap is connected to and aligned with outlet pipe.

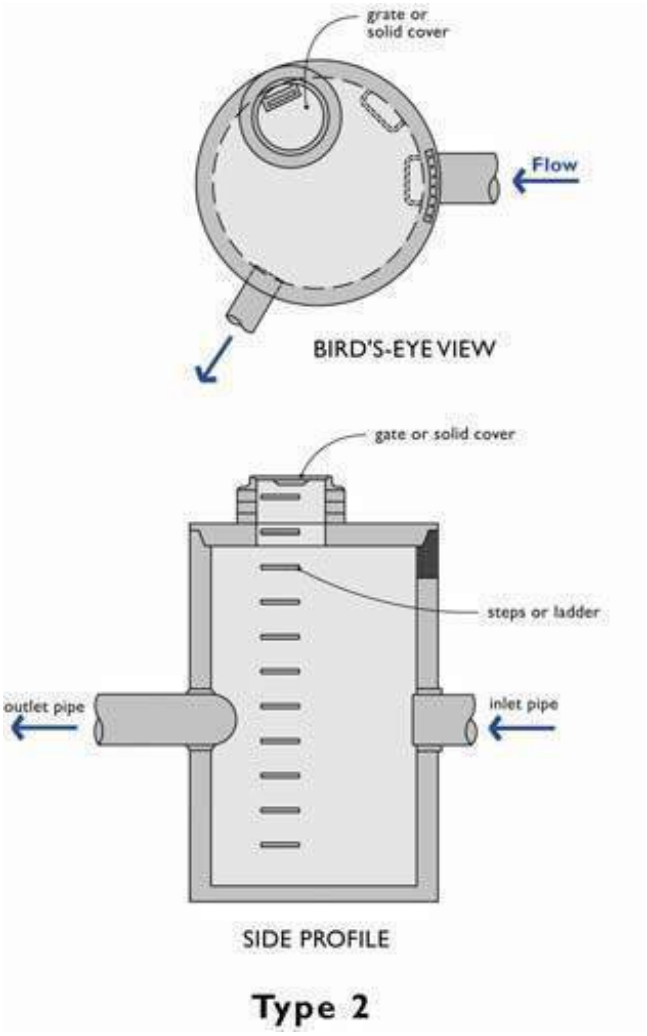
Manhole

A manhole is an underground concrete structure typically fitted with a slotted grate to collect stormwater runoff and route it through underground pipes. Manholes can also be used as a junction in a pipe system and may have a solid lid. A manhole is also known as a Type 2 catch basin.

Manholes are round concrete structures ranging in diameter from 4 feet to 8 feet. They are used when the connecting conveyance pipe is 18 inches or greater or the depth from grate to pipe bottom exceeds 5 feet. Manholes typically have steps mounted on the side of the structure to allow access.

Manholes typically provide a storage volume (sump) below the outlet pipe to allow sediments and debris to settle out of the stormwater runoff. Some manholes are also fitted with a spill control device (inverted elbow on outlet pipe) intended to contain large quantities of grease or oils.

Manholes are often associated with other stormwater facilities.



Key Operations and Maintenance Considerations

- The most common tool for cleaning manholes is a truck with a tank and vacuum hose (Vactor® truck) to remove sediment and debris from the sump.
- A manhole may be an enclosed space where harmful chemicals and vapors can accumulate. Therefore, if the inspection and maintenance requires entering a manhole, it should be conducted by an individual trained and certified to work in hazardous confined spaces.

Manhole			
Drainage System Feature	Potential Defect	Conditions When Maintenance Is Needed	Minimum Performance Standard
			Note: table spans multiple pages.
General	Trash and Debris	Trash or debris which is located immediately in front of the opening or is blocking inletting capacity of the basin by more than 10%.	No trash or debris located immediately in front of manhole or on grate opening.
		Trash or debris (in the basin) that exceeds 60 percent of the sump depth as measured from the bottom of basin to invert of the lowest pipe into or out of the basin, but in no case less than a minimum of six inches clearance from the debris surface to the invert of the lowest pipe.	No trash or debris in the basin.
		Trash or debris in any inlet or outlet pipe blocking more than 1/3 of its height.	Inlet and outlet pipes free of trash or debris.
		Dead animals or vegetation that could generate odors that could cause complaints or dangerous gases (e.g., methane).	No dead animals or vegetation present within the catch basin.
	Sediment	Sediment (in the basin) that exceeds 60 percent of the sump depth as measured from the bottom of basin to invert of the lowest pipe into or out of the basin, but in no case less than a minimum of 6 inches clearance from the sediment surface to the invert of the lowest pipe.	No sediment in the basin.
	Structure Damage to Frame and/or Top Slab	Top slab has holes larger than 2 square inches or cracks wider than 1/4 inch. (Intent is to make sure no material is running into manhole.)	Top slab is free of holes and cracks.
		Frame not sitting flush on top slab, i.e., separation of more than 3/4 inch of the frame from the top slab. Frame not securely attached.	Frame is sitting flush on the riser rings or top slab and firmly attached.
	Fractures or Cracks in Basin Walls/ Bottom	Maintenance person judges that structure is unsound.	Basin replaced or repaired to design standards.
		Grout fillet has separated or cracked wider than 1/2 inch and longer than 1 foot at the joint of any inlet/outlet pipe or any evidence of soil particles entering manhole through cracks.	Pipe is regrouted and secure at basin wall.

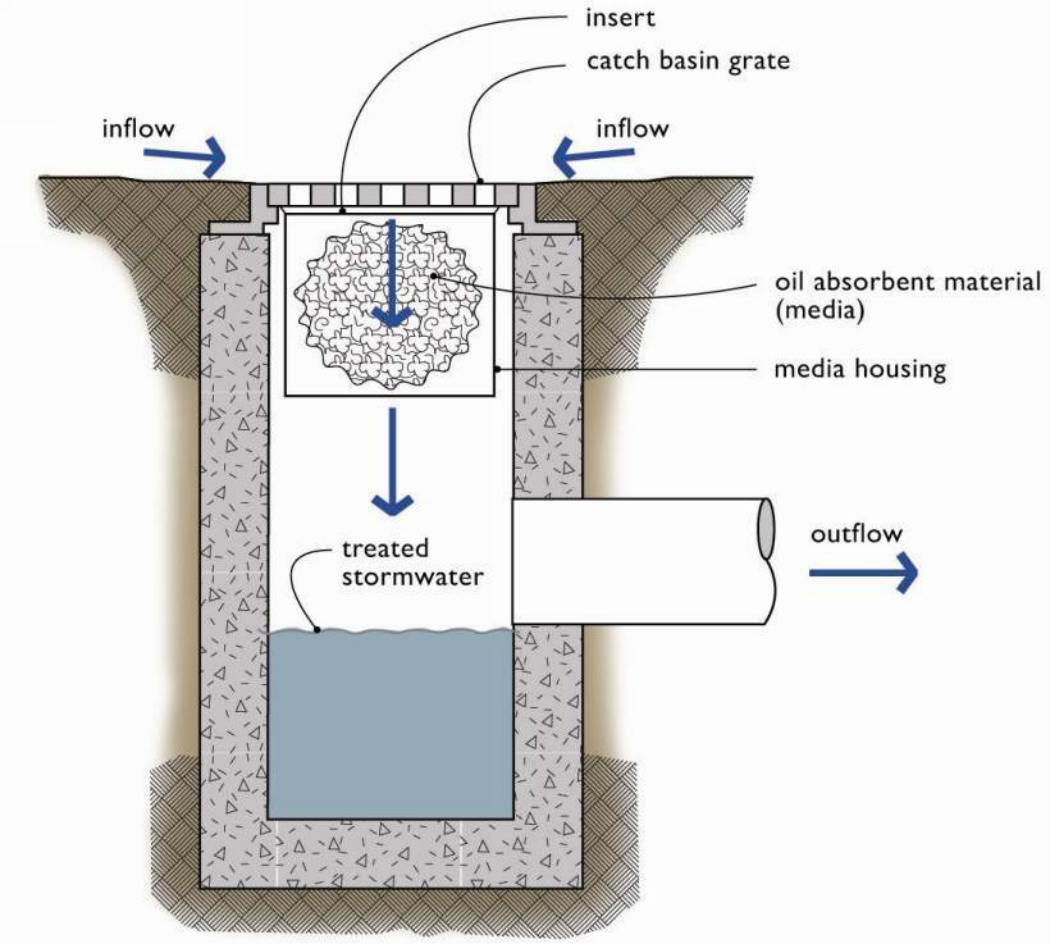
	Settlement/ Misalignment	If failure of manhole has created a safety, function, or design problem.	Manhole replaced or repaired to design standards.
	Vegetation Inhibiting System	Vegetation growing across and blocking more than 10% of the opening.	No vegetation blocking opening to manhole.
		Vegetation growing in inlet/outlet pipe joints that is more than six inches tall and less than six inches apart.	No vegetation or root growth present.
	Contaminants and Pollution	Any evidence of oil, gasoline, contaminants or other pollutants. Sheen, obvious oil or other contaminants present. • Identify and remove source, AND • Report to Clark County Clean Water Program.	No contaminants or pollutants present.
Manhole Cover	Cover Not in Place	Cover is missing or only partially in place. Any open manhole is a safety hazard and requires immediate maintenance.	Manhole cover is closed.
	Locking Mechanism Not Working	Mechanism cannot be opened by one maintenance person with proper tools. Bolts into frame have less than 1/2 inch of thread.	Mechanism opens with proper tools.
	Cover Difficult to Remove	One maintenance person cannot remove lid after applying normal lifting pressure (Intent is to keep cover from sealing off access to maintenance).	Cover can be removed by one maintenance person.
Ladder	Ladder Rungs Unsafe	Ladder is unsafe due to missing rungs, not securely attached to manhole wall, misalignment, rust, cracks, or sharp edges.	Ladder meets design standards and allows maintenance person safe access.
Metal Grates (If Applicable)	Grate Opening Unsafe	Grate with opening wider than 7/8 inch.	Grate opening meets design standards.
	Trash and Debris	Trash and debris that is blocking more than 20% of grate surface inletting capacity.	Grate free of trash and debris.
	Damaged or Missing	Grate missing or broken member(s) of the grate.	Grate is in place and meets design standards.

Catch Basin Insert

Catch basin inserts are used to trap sediment and oil entering catch basins. Most involve some type of filter media and oil-absorbent pads. Filters avoid flooding by overflowing when they become clogged or when there are high storm flows.

Catch basin inserts typically consist of the following components:

- A structure (screened box, brackets, etc.) which contains a pollutant removal medium
- A means of suspending the structure in a catch basin
- A filter medium such as sand, carbon, fabric, etc.
- A primary inlet and outlet for the stormwater
- A secondary outlet for bypassing flows that exceed design flow



Key Operations and Maintenance Considerations

- Catch basin inserts are proprietary; refer to the manufacturer's instructions for inspection and maintenance.
- Some catch basin inserts do not require specialized tools and can be removed and replaced by hand.
- See Catch Basins for additional considerations.

Catch Basin Insert			
Drainage System Feature	Potential Defect	Conditions When Maintenance Is Needed	Minimum Performance Standard
General	Sediment Accumulation	When sediment forms a cap over the insert media of the insert and/or unit.	No sediment cap on the insert media and its unit.
	Trash and Debris Accumulation	Trash and debris accumulates on insert unit creating a blockage/restriction.	Trash and debris removed from insert unit. Runoff freely flows into catch basin.
	Media Insert Not Removing Oil	Effluent water from media insert has a visible sheen.	Effluent water from media insert is free of oils and has no visible sheen.
	Media Insert Water Saturated	Catch basin insert is saturated with water and no longer has the capacity to absorb.	Media insert has been replaced.
	Media Insert Oil Saturated	Media oil saturated due to petroleum spill that drains into catch basin.	Media insert has been replaced.
	Media Insert Use Beyond Normal Product Life	Media has been used beyond the typical average life of media insert product.	Media removed and replaced at regular intervals (frequency depending on insert product).

Key Operations and Maintenance Considerations

- The most common tool for cleaning hydrodynamic separators is a truck with a tank and vacuum hose (Vactor® truck) to remove sediment and debris from the sediment chamber / sump.
- See manufacturer's publications for additional maintenance information.

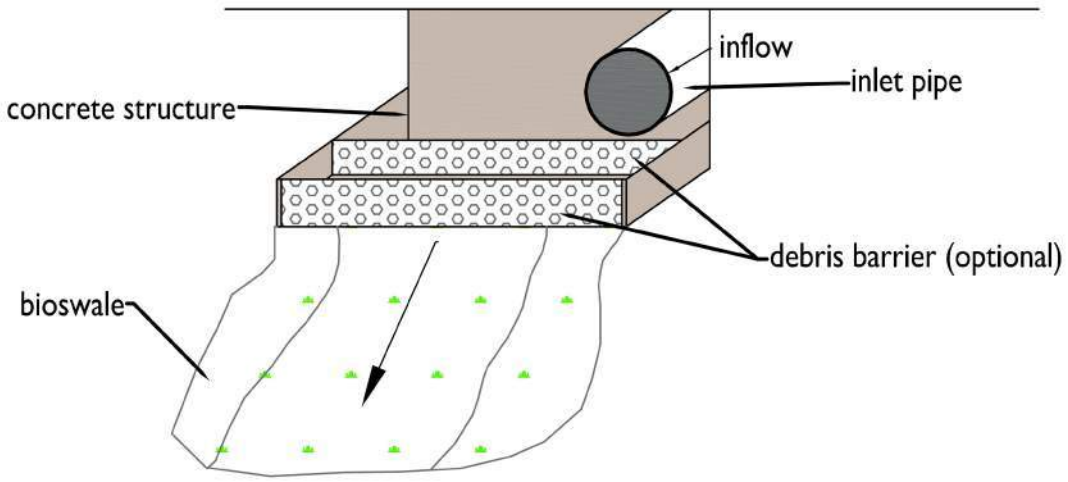
Hydrodynamic Separator System			
Drainage System Feature	Potential Defect	Conditions When Maintenance Is Needed	Minimum Performance Standard
General	Sediment Accumulation	Sediment depth is within 12 through 18" of dry weather water surface elevation.	Accumulated sediment has been removed.
	Trash and Debris Accumulation	Trash and debris accumulated in vault, or pipe inlet/outlet, floatables and non-floatables.	Trash and debris has been removed from vault, and inlet/outlet piping.
	Oil Accumulation	Oil accumulation that exceeds 1- inch at the water surface.	Oil has been extracted from vault. Coalescing plates have been cleaned. No visible oil depth on water.
	Damaged Pipes	Inlet or outlet piping damaged or broken and in need of repair.	Pipe has been repaired and / or replaced.
	Defects in Baffles	Baffles corroding, cracking, warping and/or showing signs of failure as determined by maintenance/inspection person.	Baffles repaired or replaced to design specifications.
	Vault Structure Damage - Includes Cracks in Walls, Bottom, Damage to Frame and/or Top Slab	Cracks wider than 1/2-inch or evidence of soil particles entering the structure through the cracks, or maintenance/inspection personnel determine that the vault is not structurally sound.	Vault replaced or repairs made so that vault meets design specifications and is structurally sound.
		Cracks wider than 1/2-inch at the joint of any inlet/ outlet pipe or evidence of soil particles entering through the cracks.	Vault repaired so that no cracks exist wider than 1/4-inch at the joint of the inlet/ outlet pipe.
	Sediment in Drain Pipes/Clean-Outs	When drain pipes, clean-outs, become full with sediment and/or debris.	Sediment and debris removed.
	Access Ladder Damaged	Ladder is corroded or deteriorated, not functioning properly, not securely attached to structure wall, missing rungs, cracks, and misaligned.	Ladder replaced or repaired, meets design specifications, and is safe to use as determined by inspection personnel.

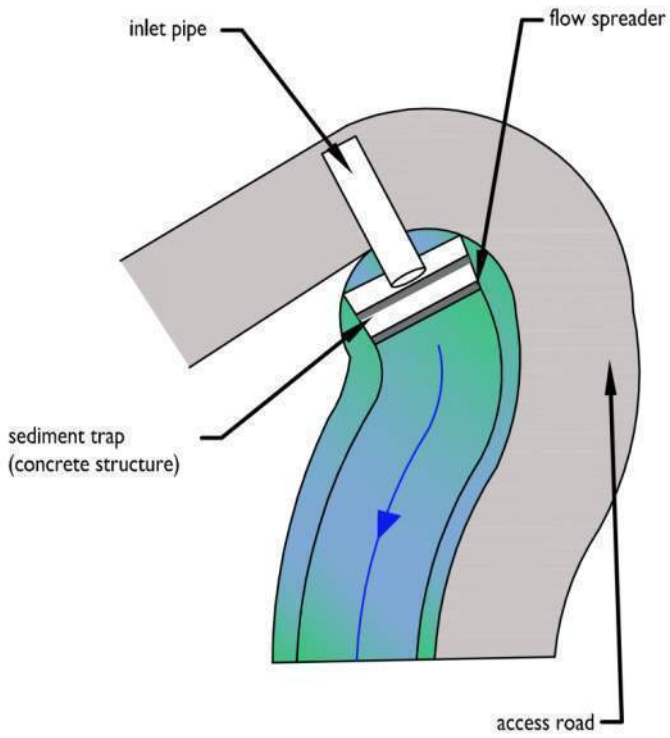
Sediment Trap

A sediment trap is a concrete structure typically fitted with a slotted grate or multiple slotted grates (debris barriers). The concrete structure provides a storage volume (sump) below the outlet pipe to allow sediments and debris to settle out of the stormwater runoff. Some sediment traps are fitted with a spill control device (elbow on outlet pipe) intended to help direct and dissipate flow. The slotted grate (debris barrier) prevents larger debris from exiting the level spreader.

Facility objects that are often associated with a sediment trap include:

- access road or easement
- fence, gate, and water quality sign
- typical bioswale
- wet bioswale





Sediment Trap with Accumulated Sediment

Key Operations and Maintenance Considerations

- The most common tool for cleaning sediment traps is a truck with a tank and vacuum hose (Vactor® truck) to remove sediment and debris from the sump area. Hand tools (e.g. rake, broom, square shovel) are also commonly used for cleaning.

Sediment Trap			
Drainage System Feature	Potential Defect	Conditions When Maintenance is Needed	Minimum Performance Standard
			Note: table spans multiple pages.
General	Trash and Debris	Trash or debris which is located immediately in front of the sediment trap opening or is blocking inletting capacity of the basin by more than 10%.	No trash or debris located immediately in front of sediment trap or on grate opening.
		Trash or debris (in the basin) that exceeds 60 percent of the sump depth as measured from the bottom of basin to invert of the lowest pipe into or out of the basin.	No trash or debris in the sediment trap.
		Trash or debris in any inlet or outlet pipe blocking more than 1/3 of its height.	Inlet and outlet pipes free of trash or debris.
		Dead animals or vegetation that could generate odors that could cause complaints or dangerous gases (e.g., methane).	No dead animals or vegetation present within the sediment trap.
	Sediment	Sediment (in the basin) that exceeds 60 percent of the sump depth as measured from the bottom of basin to invert of the lowest pipe into or out of the basin .	No sediment in the sediment trap.
	Structure Damage to Frame and/or Top Slab	Slab has holes larger than 2 square inches or cracks wider than 1/4 inch. (Intent is to make sure no material is running into basin.)	Structure is free of holes and cracks.
	Fractures or Cracks in Basin Walls/ Bottom	Maintenance person judges that structure is unsound.	Sediment trap replaced or repaired to meet design specifications.
		Grout fillet has separated or cracked wider than 1/2 inch and longer than 1 foot at the joint of any inlet/outlet pipe or any evidence of soil particles entering catch basin through cracks.	Pipe is regrouted and secure at basin wall.
	Settlement/ Misalignment	If failure of basin has created a safety, function, or design problem.	Sediment trap replaced or repaired to design specifications.

Sediment Trap			
Drainage System Feature	Potential Defect	Conditions When Maintenance is Needed	Minimum Performance Standard
			Note: table spans multiple pages.
	Vegetation	Vegetation growing across and blocking more than 10% of the basin opening.	No vegetation blocking opening to sediment trap.
	Contaminants and Pollution	Any evidence of oil, gasoline, contaminants or other pollutants. (Coordinate removal/cleanup with local water quality response agency.)	No contaminants or pollutants present.
Debris Barrier (optional)	Trash and Debris	Trash and debris that is blocking more than 20% of grate surface inletting capacity.	Grate free of trash and debris.
	Damaged or Missing	Grate missing or broken member(s) of the grate.	Grate is in place and meets design standards.

Media Cartridge Filters

Media cartridge filters are passive, flow-through, stormwater treatment systems. They are comprised of one or more vaults that house rechargeable, media-filled filter cartridges. Stormwater passes through a filtering medium, which traps particulates and/or adsorb pollutants such as dissolved metals and hydrocarbons. Once filtered through the media, the treated stormwater is directed to a collection pipe or discharged into an open channel drainage way.

The filter media can be housed in cartridge filters enclosed in concrete vaults or catch basins. Structures will have vault doors or manhole lids (older designs) for maintenance access. Various types of filter media are available from system manufacturers.

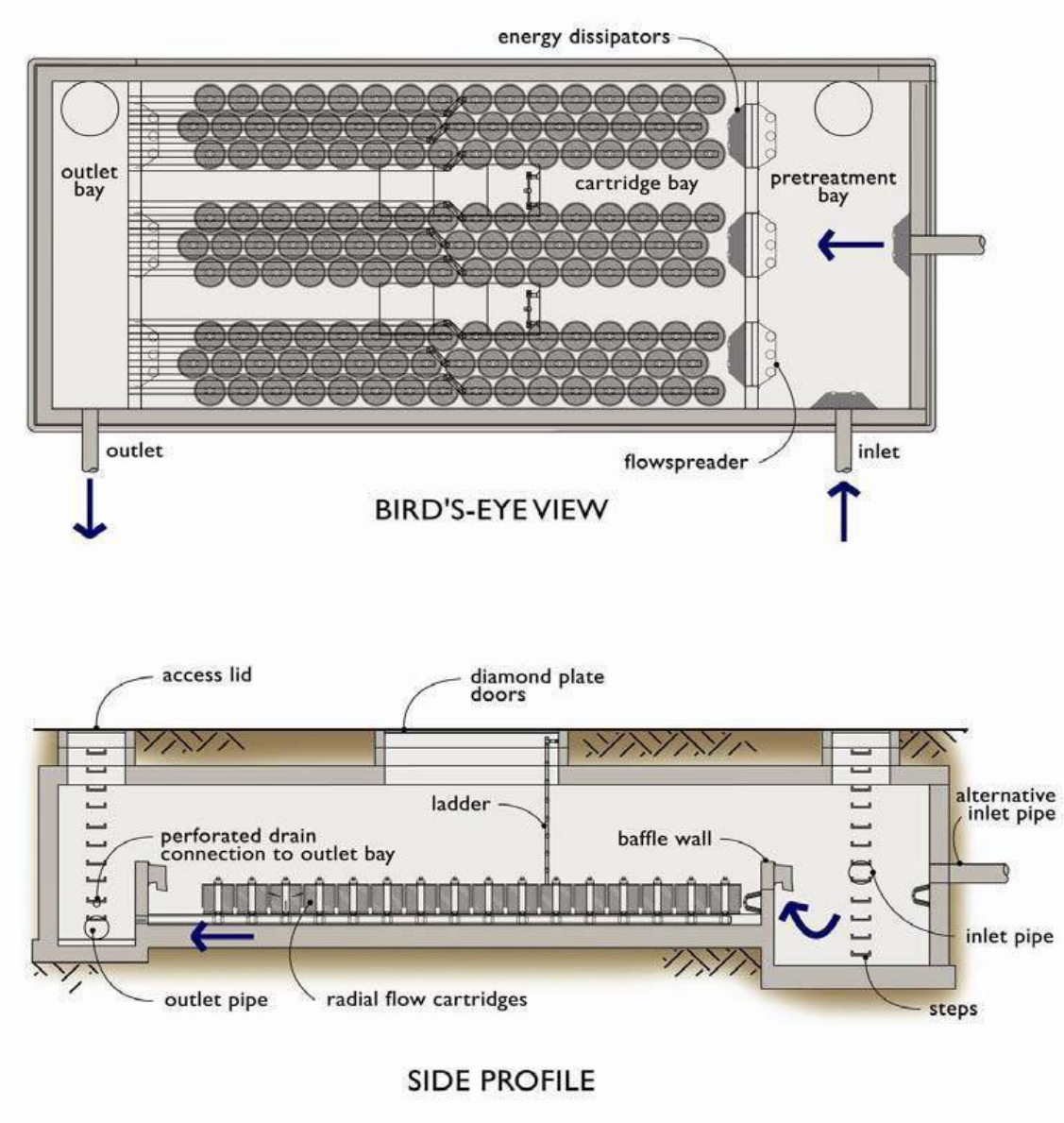
StormFilter® units are an example of a proprietary manufactured media cartridge filter system that is common in Clark County. See manufacturer's publications for additional maintenance information.

Facility objects that are typically associated with a manufactured media filter system include:

- access road or easement
- control structure/flow restrictor
- conveyance stormwater pipe

Media Cartridge Filter Vault with Accumulated Sediment

Exhibit 7 SUB22-05



Key Operations and Maintenance Considerations

- The most common tool for cleaning media cartridge filters is a truck with a tank and vacuum hose (e.g.Vactor® truck) to remove sediment and debris from the vault.
- Media cartridge filters are enclosed spaces where harmful chemicals and vapors can accumulate. Therefore, the inspection and maintenance of these facilities should be conducted by an individual trained and certified to work in hazardous confined spaces.
- Cartridges require replacement when the individual cartridges no longer meet the specifications for pollutant removal.

Media Cartridge Filters			
Drainage System Feature	Potential Defect	Conditions When Maintenance Is Needed	Minimum Performance Standard
			Note: table spans multiple pages.
Forebay	Sediment Accumulation	Sediment accumulation exceeds 6 inches or 1/3 of available sump.	Sediment accumulation less than 6 inches.
Media Filter Vault	Sediment Accumulation on Top Media Filters (Cartridges)	Sediment depth exceeds 0.25-inches (on top of filter cartridges).	No sediment deposits which would impede permeability of the compost media. No sediment deposits on top of cartridges. (Sediment on cartridges likely indicates that cartridges are plugged and require maintenance.)
	Sediment Accumulation in Vault	Sediment depth exceeds 4 inches in chamber. Look for other indicators of clogged cartridges or overflow.	No sediment deposits in vault bottom of first chamber. Cartridges have been checked and replaced or serviced as needed.
	Trash and Debris Accumulation	Trash and debris accumulated in vault.	No trash or debris in vault.
	Sediment in Drain Pipes/Clean-Outs	When drain pipes, clean-outs, become full with sediment and/or debris.	Sediment and debris has been removed.
	Damaged Pipes	Any part of the pipes that are crushed or damaged due to corrosion and/or settlement.	Pipe repaired and/or replaced to design specifications.
	Access Cover Damaged/Not Working	Cover cannot be opened; one person cannot open the cover using normal lifting pressure; corrosion/deformation of cover.	Cover repaired or replaced to design specifications.
	Vault Structure Includes Cracks in Wall, Bottom, Damage to Frame and/or Top Slab	Cracks wider than 1/2 inch or evidence of soil particles entering the structure through the cracks, or maintenance/inspection personnel determine that the vault is not structurally sound.	Vault replaced or repairs made so that vault meets design specifications and is structurally sound.
		Cracks wider than 1/2 inch at the joint of any inlet/outlet pipe or evidence of soil particles entering through the cracks.	Vault repaired so that no cracks exist wider than 1/4 inch at the joint of the inlet/outlet pipe.
	Baffles Damaged	Baffles corroding, cracking, warping, and/or showing signs of failure as determined by maintenance/inspection person.	Baffles repaired or replaced to design specifications.
	Access Ladder Damaged	Ladder is corroded or deteriorated, not functioning properly, not securely attached to structure wall, missing rungs, cracks, and misaligned.	Ladder replaced or repaired and meets design specifications, and is safe to use as determined by inspection personnel.
Below Ground Cartridge Type	Compost Media Clogging	Drawdown of water through the media takes longer than 1 hour, and/or overflow occurs frequently.	Media cartridges have been replaced and drawdown time and overflow frequency are per design standards.

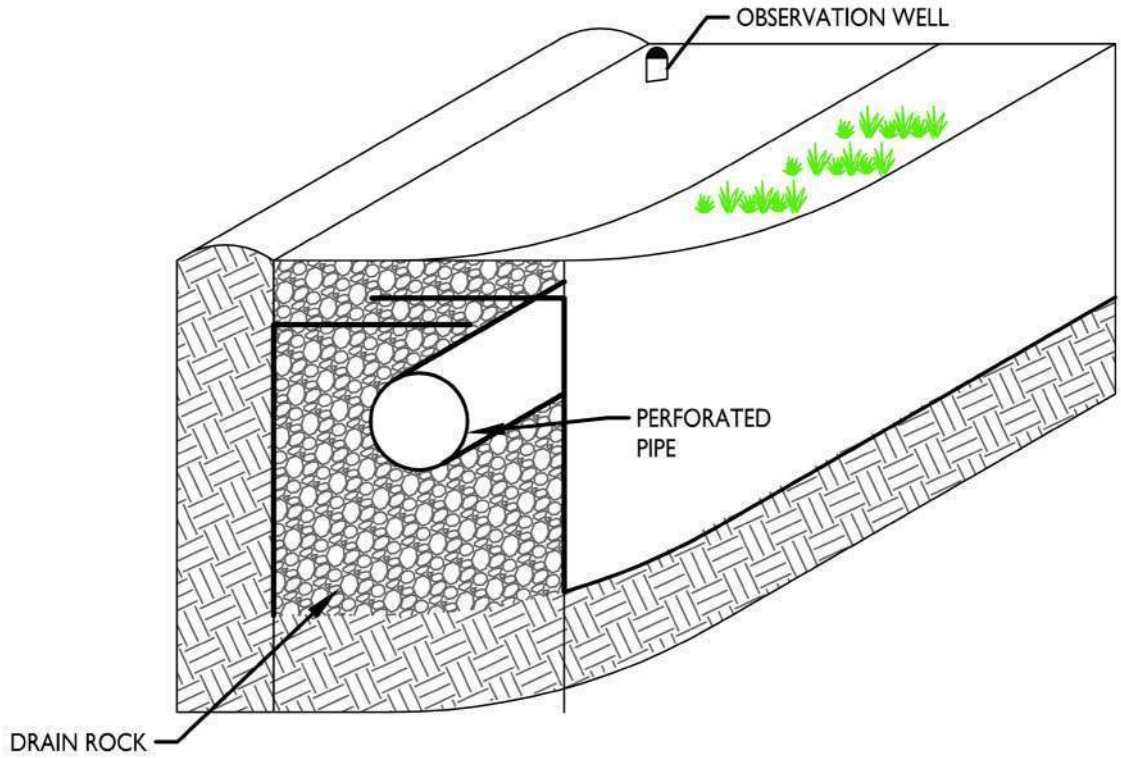
Media Cartridge Filters			
Drainage System Feature	Potential Defect	Conditions When Maintenance Is Needed	Minimum Performance Standard
			Note: table spans multiple pages.
	Short Circuiting	Flows do not properly enter filter cartridges.	Flows are properly entering filter cartridges. Cartridges have been replaced if necessary.
	Filter Cartridges Submerged	Filter vault does not drain within 24 hours following storm. Look for evidence of submergence due to backwater or excessive hydrocarbon loading.	Filter media have been checked and replaced if needed and vault drains down within 24 of a storm event. (If cartridges are plugged with oil, additional treatment or source control BMP may be needed.)

Infiltration Trench

A stormwater infiltration trench is a closed basin or an open-topped trench built by excavating below existing ground. Infiltration trenches temporarily store stormwater runoff during rain events. Infiltration trenches do not discharge to a downstream conveyance system or nearby surface water. Instead, infiltration trenches rely on the ability of the site's soils to infiltrate the stormwater into the ground.

Facility objects that are typically associated with an infiltration trench include:

- access road or easement
- fence, gate, and water quality sign
- bioswale
- sediment trap
- field inlet
- drywell



Key Operations and Maintenance Considerations

- Maintenance should be performed as indicated by routine inspections. The principal maintenance objective is to prevent clogging, which may lead to trench failure.
- Infiltration trenches and any pretreatment BMPs should be inspected after large storm events and any accumulated debris or material removed. A more thorough inspection of the trench should be conducted at least annually. Annual inspection should include monitoring the observation well (if one exists) to confirm that the trench is draining within the specified time.
- Monitor sediment buildup in the top foot of stone aggregate or the surface inlet on the same schedule as the observation well.
- Trenches with filter fabric should be inspected for sediment deposits by removing a small section of the top layer. If inspection indicates that the trench is partially or completely clogged, it should be restored to its design condition.
- The most common tools for cleaning infiltration trenches are hand tools to remove built-up sediments and the tops layers of clogged infiltration media from the trench.

Infiltration Trench			
Drainage System Feature	Potential Defect	Conditions When Maintenance Is Needed	Minimum Performance Standard
General	Contaminants and Pollution	Any evidence of oil, gasoline, contaminants or other pollutants. Sheen, obvious oil or other contaminants present. • Identify and remove source, AND • Report to Clark County Clean Water Program.	No contaminants or pollutants present.
	Sediment Depth (via Surface/ Observation Well Inspection)	Sediment depth greater than one foot above stone aggregate or the surface inlet.	No sediment in infiltration trench.
	Drainage Slow	Decreased capacity that indicates slow drainage. Does not meet facility design infiltration rate. The Water Quality Design Storm Volume does not infiltrate within 48 hours. Water remains in the trench for greater than 24 hours after the end of most moderate rainfall events.	Perforated drain pipe has been cleaned and drainage rates are per design specifications. (Do not allow removed sediment and water to discharge back into the storm sewer.)

Exhibit 7 SUB22-05

On-site Stormwater Management

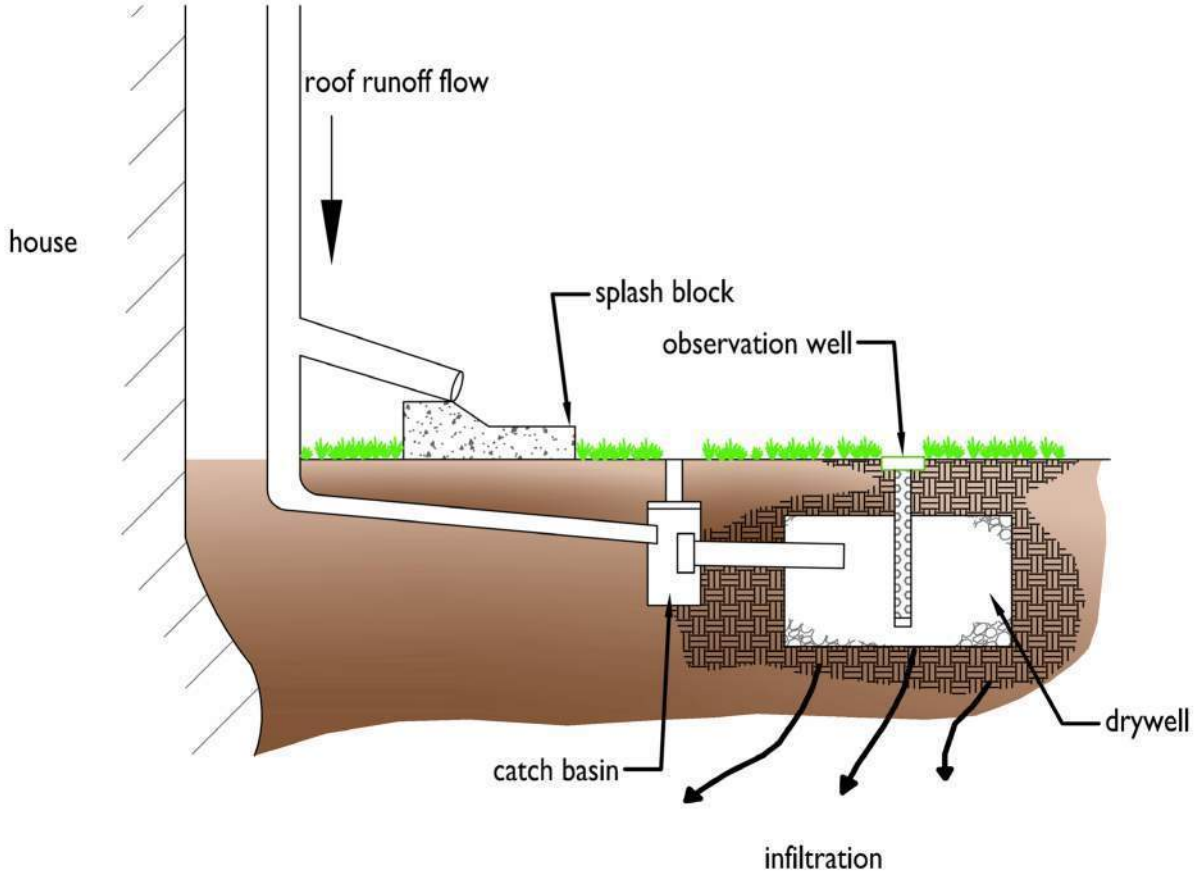
The BMPs in this section are generally located on residential sites and landscaped areas. This section does not include maintenance criteria for all types of on-site stormwater management BMPs because some are also considered treatment and flow control facilities, and therefore are described in the previous section, and others will be rare or absent in Clark County.

Downspout Infiltration

Roof downspout infiltration systems are simple pre-engineered designs for infiltrating roof runoff in residential yards.

Facility objects that are typically associated with downspout infiltration include:

- Downspout drywell
- Downspout infiltration trench



Downspout Drywell

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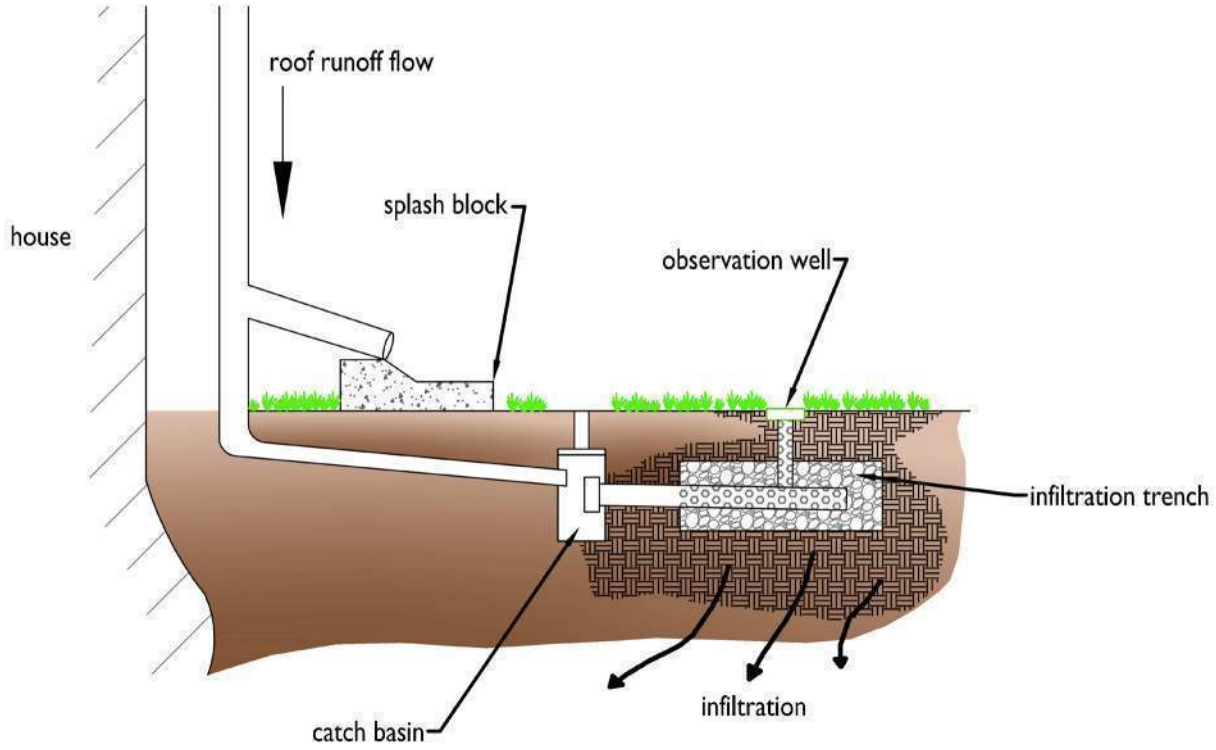


Downspout Infiltration Trench

Key Operations and Maintenance Considerations

- Keep gutters free of debris and sediment or use a downspout insert to prevent debris or sediment from entering the downspout from the gutter while still allowing water to pass into the downspout.
- The most common tool for cleaning these systems is a hose to flush downspouts.

Downspout Infiltration			
Drainage System Feature	Potential Defect	Conditions When Maintenance Is Needed	Minimum Performance Standard
Infiltration Trench	Drainage Slow	Decreased capacity that indicates slow drainage.	Perforated drain pipe has been cleaned and drainage rates are per design specifications. (Do not allow removed sediment and water to discharge back into the storm sewer.)
	Damage to or Trash/Sediment Accumulation Around Pipes	Accumulation of trash, debris, or sediment in roof drains and gutters. Pipe from sump to trench has accumulated sediment or is plugged. Cracked, collapsed, broken, or misaligned drain pipes.	Trash, debris, and sediment is cleared from dispersion trench components (gutters, pipes, etc.). Pipes are free of damage or defects that hinder system from functioning according to design.
Downspout Drywell	Drainage Slow	Decreased capacity that indicates slow drainage. Does not meet facility design infiltration rate.	Drywell has been cleaned and drainage rates are per design specifications. (Do not allow removed sediment and water to discharge back into the storm sewer.)
	Standing Water	Standing water indicates the drywell is into the water table.	Rebuild drywell to prevent stormwater from going directly into groundwater.
	Sediment	Sediment in drywell exceeds 60 percent of the depth below the inlet pipe.	No sediment in drywell.

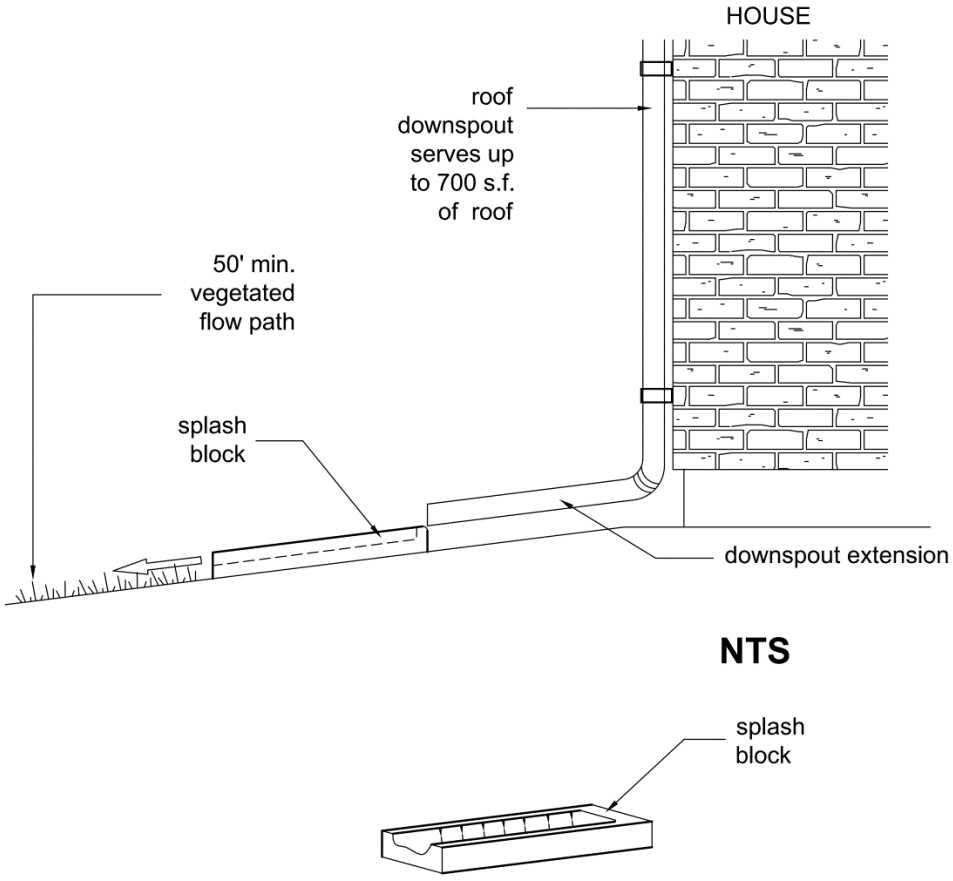
Exhibit 7 SUB22-05

Downspout Dispersion

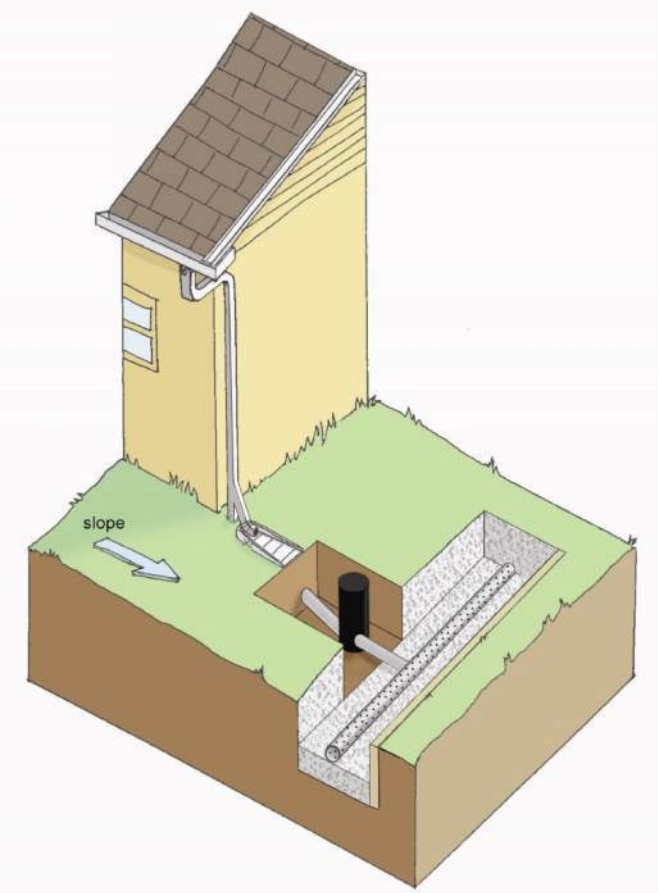
Downspout dispersion systems consist of splash blocks or gravel-filled trenches, which serve to spread roof runoff over vegetated pervious areas.

Facility objects that are typically associated with downspout dispersion include:

- Splash block
- Downspout extension
- Dispersion trench: Gravel-filled trenches used to spread stormwater runoff from a downspout drain over a vegetated pervious area. Downspout drains are routed to a trench via a perforated or slotted pipe. The trench typically includes a notched grade board or other device to distribute flow equally along the length of the trench.
- Dispersal area: Stormwater is dispersed to an area vegetated with well-established lawn or pasture, landscaping with well-established groundcover, or native vegetation with natural groundcover. The required vegetated flow path is 50 feet for splash blocks and concentrated dispersion, 25 feet when using a dispersion trench and varies for sheet flow dispersion.



Downspout Dispersion using Splash Blocks



Schematic Downspout Dispersion using Dispersion Trench

Key Operations and Maintenance Considerations

- For dispersion practices to be effective, the dispersion area must remain covered with dense, well-established vegetation. Site uses should protect vegetation and avoid compaction.
- A notched grade board at a dispersion trench must be maintained at a level grade to prevent concentrated flow. Downspout drains are directed to the trench via a storage sump that must be maintained to remove accumulated sediment.
- The groundcover for the extent of the flow in any dispersal area must be maintained to be dense enough to help disperse and infiltrate flows and to prevent erosion.
- The most common tools for cleaning these systems are hand tools to redistribute material disturbed by concentrated flows and a hose to flush downspouts.

Downspout Dispersion			
Drainage System Feature	Potential Defect	Conditions When Maintenance Is Needed	Minimum Performance Standard
			Note: table spans multiple pages.
General	Pests	Signs of pest infestations (IPM protocol threshold(s) are exceeded), including rodent holes or mounds that disturb dispersion flow paths.	Pests are not present or engaged in activities that present a significant public health risk or compromise to the intended design function of the facility. Pests that have exceeded acceptable thresholds have been addressed using appropriate IPM measures.
Splash Block	Water Directed Towards Building	Water is being directed towards building structure.	Water is directed away from foundations and other building structures.
	Erosion	Water disrupts soil media.	Water is dispersed into soil/mulch/plantings in a manner that does not create erosion or other issues due to concentrated flows.
Dispersion Trench	Concentrated Discharge	Visual evidence of water discharging at concentrated points along trench (normal condition is a "sheet flow" from edge of trench; intent is to prevent erosion damage).	Water is discharging as a sheet flow and any disruptive material (e.g. trash, debris, sediment accumulation) has been removed from trench surface.
	Surface of Trench	Accumulated trash, debris, or sediment on drain rock surface impedes sheet flow from facility. Vegetation/moss present on drain rock surface impedes sheet flow from facility.	Surface of drain rock is free of trash, debris, and sediment accumulation. Rock surface is open, free of vegetation buildup, and drains freely.
	Damage to or Trash/Sediment Accumulation Around Pipes	Accumulation of trash, debris, or sediment in roof drains, gutters, driveway drains, area drains, etc. Pipe from sump to trench or drywell has accumulated sediment or is plugged. Cracked, collapsed, broken, or misaligned drain pipes.	Trash, debris, and sediment is cleared from dispersion trench components (gutters, pipes, etc.). Pipes are free of damage or defects that hinder system from functioning according to design.
Storage Sump	Sediment in Sump	Sediment in the sump.	Sediment not present in sump. Sediment has also been removed from adjacent components (inlet/outlet pipes, etc.) to prevent immediate re-accumulation.
	Access Lid Not Working	Cannot be easily opened; buried; or cover missing.	Access lid present and functioning per design standards.
	Erosion	Erosion of the pond's side slopes and/or scouring of the pond bottom, which exceeds 6-inches, or where continued erosion is prevalent.	Slopes stabilized using proper erosion control measures and repair methods.
Rock Pad	General	Only one layer of rock exists above native soil in area 6 square feet or larger, or any exposure of native soil. Soil erosion in or adjacent to rock pad.	Rock pad has been repaired or replaced to meet design standards.

Downspout Dispersion			
Drainage System Feature	Potential Defect	Conditions When Maintenance Is Needed	Minimum Performance Standard
			Note: table spans multiple pages.
Dispersal Area	Erosion or Sediment Accumulation	Erosion (gullies/ rills) greater than 2 inches deep in dispersal area. Accumulated sediment or debris to extent that blocks or channelizes flow path.	Cause of erosion has been eliminated and the damaged area has been repaired and stabilized.
	Standing Water After Storm Event	Standing surface water in dispersion area remains for more than 3 days after the end of a storm event.	Standing water drains within 72 hours of a storm event.
	Transition Zone Erosion and Sizing	Adjacent soil erosion; uneven surface creating concentrated flow discharge; or less than two feet of width.	Transition zone meets design criteria and does not exhibit erosion or other evidence of concentrated flows.
	Poor Vegetation Cover	Poor vegetation cover such that erosion is occurring.	Vegetation has been properly watered and established to meet facility design specifications.
	Excessive Vegetation Cover	Vegetation inhibits dispersed flow along flow path.	Vegetation has been weeded, trimmed, pruned, or thinned to meet facility design criteria.

SEPARATOR SHEET

SEPARATOR SHEET

APPENDIX E

Stormwater Pollution Prevention Plan

Stormwater Pollution Prevention Plan

For
NE 26th Street Townhomes

Prepared For
Ginn Group, LLC
502 NE 72nd Street
Vancouver, WA 98665

Owner	Developer	Operator/Contractor
Ginn Group LLC 502 NE 72nd Street Vancouver, WA 98665	Same as Owner	Unknown

Project Site Location
22205 NE 28th Street
Camas, WA 98607
Parcel #173184000

SWPPP Prepared By
PLS Engineering, Inc.
604 W Evergreen Blvd
Vancouver, WA 98660
(360) 944-6519

SWPPP Preparation Date
July 2022

Approximate Project Construction Dates
October 2022

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Appendix A Site plans

- Vicinity map (with all discharge points)
- Site plan with TESC measures

Appendix B Construction BMPs

- Possibly reference in BMPs, but likely it will be a consolidated list so that the applicant can photocopy from the list from the SWMMWW.

Appendix C Alternative Construction BMP list

- List of BMPs not selected, but can be referenced if needed in each of the 12 elements

Appendix D General Permit

Appendix E Site Log and Inspection Forms

Appendix F Engineering Calculations

1.0 Introduction

This Stormwater Pollution Prevention Plan (SWPPP) has been prepared for the Monte Verde construction project in Camas, Washington. The site is located on Parcel 173184000. Current address for the site is 22205 NE 28th Street, Camas, WA 98607 and the existing site is approximately 8.61 acres. Current proposed development associated with this SWPPP includes the construction of 34 single family lots along with the associated infrastructure. The stormwater plan associated with this project provides for stormwater management of all runoff from the site using two private infiltration trenches, and one stormwater detention facility. Stormwater runoff from the pollution generating surfaces will be treated by a ConTech media cartridge before being infiltrated.

Construction activities will include excavation, grading, construction of paving and sidewalk to serve the site, construction of an infiltration trench to mitigate for impacts to stormwater runoff from the new paving, and installation of utilities to serve the site including sanitary sewer, storm sewer, potable water, electrical, phone, and cable TV. The purpose of this SWPPP is to describe the proposed construction activities and all temporary and permanent erosion and sediment control (TESC) measures, pollution prevention measures, inspection/monitoring activities, and recordkeeping that will be implemented during the proposed construction project. The objectives of the SWPPP are to:

1. Implement Best Management Practices (BMPs) to prevent erosion and sedimentation, and to identify, reduce, eliminate or prevent stormwater contamination and water pollution from construction activity.

2. Prevent violations of surface water quality, ground water quality, or sediment management standards.

3. Prevent, during the construction phase, adverse water quality impacts including impacts on beneficial uses of the receiving water by controlling peak flow rates and volumes of stormwater runoff at the Permittee's outfalls and downstream of the outfalls.

This SWPPP was prepared using the Ecology SWPPP Template downloaded from the Ecology website. This SWPPP was prepared based on the requirements set forth in the Construction Stormwater General Permit and the *Stormwater Management Manual for Western Washington* (SWMMWW). The report is divided into seven main sections with several appendices that include stormwater related reference materials. The topics presented in the each of the main sections are:

- Section 1 – INTRODUCTION. This section provides a summary description of the project, and the organization of the SWPPP document.

- Section 2 – SITE DESCRIPTION. This section provides a detailed description of the existing site conditions, proposed construction activities, and calculated stormwater flow rates for existing conditions and post–construction conditions.

- Section 3 – CONSTRUCTION BMPs. This section provides a detailed description of the BMPs to be implemented based on the 12 required elements of the SWPPP (SWMMEW 2004).

- Section 4 – CONSTRUCTION PHASING AND BMP IMPLEMENTATION. This section provides a description of the timing of the BMP implementation in relation to the project schedule.

- Section 5 – POLLUTION PREVENTION TEAM. This section identifies the appropriate contact names (emergency and non-emergency), monitoring personnel, and the onsite temporary erosion and sedimentation control inspector

- Section 6 – INSPECTION AND MONITORING. This section provides a description of the inspection and monitoring requirements such as the parameters of concern to be monitored, sample locations, sample frequencies, and sampling methods for all stormwater discharge locations from the site.

- Section 7 – RECORDKEEPING. This section describes the requirements for documentation of the BMP implementation, site inspections, monitoring results, and changes to the implementation of certain BMPs due to site factors experienced during construction.

Supporting documentation and standard forms are provided in the following Appendices:

Appendix A – Site plans
Appendix B – Construction BMPs
Appendix C – Alternative Construction BMP list
Appendix D – General Permit
Appendix E – Site Log and Inspection Forms
Appendix F – Engineering Calculations

2.0 Site Description

2.1 Existing Conditions

Current Addresses for the site is 22205 NE 28th Street, Camas, WA 98607. The site is approximately 8.61 acres. The property's topography is moderately sloped from a high point at the NE corner of the site to a low point at the SW corner of the site. The site has an existing house, shop, and Chickein coop which will be removed. The remaining area consists of grass, trees, and brush.

The soils are mapped by the NRCS as Lauren gravelly loam (LgB) in the North and SW corner of the sit, and Lauren loam (LeB) in the middle and South end of the site.

2.2 Proposed Construction Activities

The project proposes to develop the parcel into 34 single family lots and associated access. Construction activities will include excavation, grading, construction of paving and sidewalk to serve the site, construction of an infiltration trench to mitigate for impacts to stormwater runoff from the new paving, and installation of utilities to serve the site including sanitary sewer, storm sewer, potable water, electrical, phone, and cable TV.

Temporary erosion and sediment control facilities will be installed prior to site construction to handle construction-phase stormwater runoff. The schedule and phasing of BMPs during construction is provided in Section 4.0.

Stormwater runoff has been calculated using Western Washington Hydrology Model (WWHM). The infiltration trenches were designed to infiltrate the runoff generated by the site. ConTech™ catch basins will be used to treat runoff before conveying it to the infiltration trenches.

After the site has been graded and all new utilities are installed, the building construction will commence. Trees will also be planted in the landscape areas noted in the Landscape Plan. Temporary seeding will occur over the lots to establish vegetative cover until such time as individual buildings are developed and permanent landscaping occurs.

3.0 Construction Stormwater BMPs

3.1 The 13 BMP Elements

3.1.1 Element #1 – Mark Clearing Limits

To protect adjacent properties and to reduce the area of soil exposed to construction, the limits of construction will be clearly marked before land-disturbing activities begin. Trees that are to be preserved, as well as all sensitive areas and their buffers, shall be clearly delineated, both in the field and on the plans. In general, natural vegetation and native topsoil shall be retained in an undisturbed state to the maximum extent possible. The BMPs relevant to marking the clearing limits that will be applied for this project include:

- Preserving Native Vegetation (BMP C101)
- Silt Fence (BMP C233)

Alternate BMPs for marking clearing limits are included in Appendix C as a quick reference tool for the onsite inspector in the event the BMP(s) listed above are deemed ineffective or inappropriate during construction to satisfy the requirements set forth in the General NPDES Permit (Appendix D). To avoid potential erosion and sediment control issues that may cause a violation(s) of the NPDES Construction Stormwater permit (as provided in Appendix D), the Certified Erosion and Sediment Control Lead will promptly initiate the implementation of one or more of the alternative BMPs listed in Appendix C after the first sign that existing BMPs are ineffective or failing.

3.1.2 Element #2 – Establish Construction Access

Construction access or activities occurring on unpaved areas shall be minimized, yet where necessary, access points shall be stabilized to minimize the tracking of sediment onto public roads, and wheel washing, street sweeping, and street cleaning shall be employed to prevent sediment from entering state waters. All wash wastewater shall be controlled on site. The specific BMPs related to establishing construction access that will be used on this project include:

- Stabilized Construction Entrance (BMP C105)

Alternate construction access BMPs are included in Appendix C as a quick reference tool for the onsite inspector in the event the BMP(s) listed above are deemed ineffective or inappropriate during construction to satisfy the requirements set forth in the General NPDES Permit (Appendix D). To avoid potential erosion and sediment control issues that may cause a violation(s) of the NPDES Construction Stormwater permit (as provided in Appendix D), the Certified Erosion and Sediment Control Lead will promptly initiate the implementation of one or more of the alternative BMPs listed in Appendix C after the first sign that existing BMPs are ineffective or failing.

3.1.3 Element #3 – Control Flow Rates

In order to protect the properties and waterways downstream of the project site, stormwater discharges from the site will be controlled. The specific BMPs for flow control that shall be used on this project include:

- Downspout Full Infiltration - Infiltration Trenches (BMP T5.10B).
- Infiltration Trenches (BMP R5.11).

Alternate flow control BMPs are included in Appendix C as a quick reference tool for the onsite inspector in the event the BMP(s) listed above are deemed ineffective or inappropriate during construction to satisfy the requirements set forth in the General NPDES Permit (Appendix D). To avoid potential erosion and sediment control issues that may cause a violation(s) of the NPDES Construction Stormwater permit (as provided in Appendix D), the Certified Erosion and Sediment Control Lead will promptly initiate the implementation of one or more of the alternative BMPs listed in Appendix C after the first sign that existing BMPs are ineffective or failing.

The project site is located west of the Cascade Mountain Crest. As such, the project must comply with Minimum Requirement 7 (Ecology 2005).

In general, discharge rates of stormwater from the site will be controlled where increases in impervious area or soil compaction during construction could lead to downstream erosion, or where necessary to meet local agency stormwater discharge requirements (e.g. discharge to combined sewer systems).

3.1.4 Element #4 – Install Sediment Controls

All stormwater runoff from disturbed areas shall pass through an appropriate sediment removal BMP before leaving the construction site or prior to being discharged to an infiltration facility. The specific BMPs to be used for controlling sediment on this project include:

- Silt Fence (BMP C233)
- Storm Drain Inlet Protection (BMP C220)

Silt fencing and storm drain inlet protection will be adequate for sediment control during summer months. Alternate sediment control BMPs are included in Appendix C as a quick reference tool for the onsite inspector in the event the BMP(s) listed above are deemed ineffective or inappropriate during construction to satisfy the requirements set forth in the General NPDES Permit (Appendix D). To avoid potential erosion and sediment control issues that may cause a violation(s) of the NPDES Construction Stormwater permit (as provided in Appendix D), the Certified Erosion and Sediment Control Lead will promptly initiate the implementation of one or more of the alternative BMPs listed in Appendix C after the first sign that existing BMPs are ineffective or failing.

In addition, sediment will be removed from paved areas in and adjacent to construction work areas manually or using mechanical sweepers, as needed, to minimize tracking of sediments on vehicle tires away from the site and to minimize washoff of sediments from adjacent streets in runoff.

Whenever possible, sediment laden water shall be discharged into onsite, relatively level, vegetated areas (BMP C240 paragraph 5, page 4-102).

In some cases, sediment discharge in concentrated runoff can be controlled using permanent stormwater BMPs (e.g., infiltration swales, ponds, trenches). Sediment loads can limit the effectiveness of some permanent stormwater BMPs, such as those used for infiltration or biofiltration; however, those BMPs designed to remove solids by settling (wet ponds or detention ponds) can be used during the construction phase. When permanent stormwater BMPs will be used to control sediment discharge during construction, the structure will be protected from excessive sedimentation with adequate erosion and sediment control BMPs. Any accumulated sediment shall be removed after construction is complete and the permanent stormwater BMP will be restabilized with vegetation per applicable design requirements once the remainder of the site has been stabilized.

The following BMPs will be implemented as end-of-pipe sediment controls as required to meet permitted turbidity limits in the site discharge(s). Prior to the implementation of these technologies, sediment sources and erosion control and soil stabilization BMP efforts will be maximized to reduce the need for end-of-pipe sedimentation controls.

- Construction Stormwater Filtration (BMP C251)
- Construction Stormwater Chemical Treatment (BMP C 250) (implemented only with prior written approval from Ecology).

3.1.5 Element #5 – Stabilize Soils

Exposed and unworked soils shall be stabilized with the application of effective BMPs to prevent erosion throughout the life of the project. The specific BMPs for soil stabilization that shall be used on this project include:

- Temporary and Permanent Seeding (BMP C120)
- Mulching (BMP C121)
- Nets and Blankets (BMP C122)
- Plastic Covering (BMP C123)
- Topsoiling (BMP C125)
- Surface Roughening (BMP C130)
- Dust Control (BMP C140)
- Early application of gravel base on areas to be paved

Alternate soil stabilization BMPs are included in Appendix C as a quick reference tool for the onsite inspector in the event the BMP(s) listed above are deemed ineffective or inappropriate during construction to satisfy the requirements set forth in the General NPDES Permit (Appendix D). To avoid potential erosion and sediment control issues that may cause a violation(s) of the NPDES Construction Stormwater permit (as provided in Appendix D), the Certified Erosion and Sediment Control Lead will promptly initiate the implementation of one or more of the alternative BMPs listed in Appendix C after the first sign that existing BMPs are ineffective or failing.

The project site is located west of the Cascade Mountain Crest. As such, no soils shall remain exposed and unworked for more than 7 days during the dry season (May 1 to September 30) and 2 days during the wet season (October 1 to April 30). Regardless of the time of year, all soils shall be stabilized at the end of the shift before a holiday or weekend if needed based on weather forecasts.

In general, cut and fill slopes will be stabilized as soon as possible and soil stockpiles will be temporarily covered with plastic sheeting. All stockpiled soils shall be stabilized from erosion, protected with sediment trapping measures, and where possible, be located away from storm drain inlets, waterways, and drainage channels.

3.1.6 Element #6 – Protect Slopes

All cut and fill slopes will be designed, constructed, and protected in a manner that minimizes erosion. The following specific BMPs will be used to protect slopes for this project:

- Temporary and Permanent Seeding (BMP C120)

Alternate slope protection BMPs are included in Appendix C as a quick reference tool for the onsite inspector in the event the BMP(s) listed above are deemed ineffective or inappropriate during construction to satisfy the requirements set forth in the General NPDES Permit (Appendix D). To avoid potential erosion and sediment control issues that may cause a violation(s) of the NPDES Construction Stormwater permit (as provided in Appendix D), the Certified Erosion and Sediment Control Lead will promptly initiate the implementation of one or more of the alternative BMPs listed in Appendix C after the first sign that existing BMPs are ineffective or failing.

3.1.7 Element #7 – Protect Drain Inlets

All storm drain inlets and culverts made operable during construction or inlets near the site that could potentially receive surface runoff from the construction site shall be protected to prevent unfiltered or untreated water from entering the drainage conveyance system. However, the first priority is to keep all access roads clean of sediment and keep street wash water separate from entering storm drains until treatment can be provided. Storm Drain Inlet Protection (BMP C220) will be implemented for all drainage inlets and culverts that could potentially be impacted by sediment-laden runoff on and near the project site. The following inlet protection measures will be applied on this project:

Drop Inlet Protection

- Block and Gravel Drop Inlet Protection
- Gravel and Wire Drop Inlet Protection
- Catch Basin Filter

If the BMP options listed above are deemed ineffective or inappropriate during construction to satisfy the requirements set forth in the General NPDES Permit (Appendix D), or if no BMPs are listed above but deemed necessary during construction, the Certified Erosion and Sediment Control Lead shall implement one or more of the alternative BMP inlet protection options listed in Appendix C.

3.1.8 Element #8 – Stabilize Channels and Outlets

Where site runoff is to be conveyed in channels or discharged to a stream or some other natural drainage point, efforts will be taken to prevent downstream erosion. The specific BMPs for channel and outlet stabilization that shall be used on this project include:

- Outlet Protection (BMP C209)

Alternate channel and outlet stabilization BMPs are included in Appendix C as a quick reference tool for the onsite inspector in the event the BMP(s) listed above are deemed ineffective or inappropriate during construction to satisfy the requirements set forth in the General NPDES Permit (Appendix D). To avoid potential erosion and sediment control issues that may cause a violation(s) of the NPDES Construction Stormwater permit (as provided in Appendix D), the Certified Erosion and Sediment Control Lead will promptly initiate the implementation of one or more of the alternative BMPs listed in Appendix C after the first sign that existing BMPs are ineffective or failing.

The project site is located west of the Cascade Mountain Crest. As such, all temporary on-site conveyance channels shall be designed, constructed, and stabilized to prevent erosion from the expected peak 10-minute velocity of flow from a Type 1A, 10-year, 24-hour recurrence interval storm for the developed condition. Alternatively, the 10-year, 1-hour peak flow rate indicated by an approved continuous runoff simulation model, increased by a factor of 1.6, shall be used. Stabilization, including armoring material, adequate to prevent erosion of outlets, adjacent streambanks, slopes, and downstream reaches shall be provided at the outlets of all conveyance systems.

3.1.9 Element #9 – Control Pollutants

All pollutants, including waste materials and demolition debris, that occur onsite shall be handled and disposed of in a manner that does not cause contamination of stormwater. Good housekeeping and preventative measures will be taken to ensure that the site will be kept clean, well organized, and free of debris. If required, BMPs to be implemented to control specific sources of pollutants are discussed below.

Vehicles, construction equipment, and/or petroleum product storage/dispensing:

- All vehicles, equipment, and petroleum product storage/dispensing areas will be inspected regularly to detect any leaks or spills, and to identify maintenance needs to prevent leaks or spills.
- On-site fueling tanks and petroleum product storage containers shall include secondary containment.
- Spill prevention measures, such as drip pans, will be used when conducting maintenance and repair of vehicles or equipment.
- In order to perform emergency repairs on site, temporary plastic will be placed beneath and, if raining, over the vehicle.
- Contaminated surfaces shall be cleaned immediately following any discharge or spill incident.

Chemical storage:

- Any chemicals stored in the construction areas will conform to the appropriate source control BMPs listed in Volume IV of the Ecology stormwater manual. In Western WA, all chemicals shall have cover, containment, and protection provided on site, per BMPC153 for Material Delivery, Storage and Containment in SWMMWW 2005
- Application of agricultural chemicals, including fertilizers and pesticides, shall be conducted in a manner and at application rates that will not result in loss of chemical to stormwater runoff. Manufacturers' recommendations for application procedures and rates shall be followed.

Excavation and tunneling spoils dewatering waste:

- Dewatering BMPs and BMPs specific to the excavation and tunneling (including handling of contaminated soils) are discussed under Element 10.

Demolition:

- Dust released from demolished sidewalks, buildings, or structures will be controlled using Dust Control measures (BMP C140).
- Storm drain inlets vulnerable to stormwater discharge carrying dust, soil, or debris will be protected using Storm Drain Inlet Protection (BMP C220 as described above for Element 7).
- Process water and slurry resulting from sawcutting and surfacing operations will be prevented from entering the waters of the State by implementing Sawcutting and Surfacing Pollution Prevention measures (BMP C152).

Concrete and grout:

- Process water and slurry resulting from concrete work will be prevented from entering the waters of the State by implementing Concrete Handling measures (BMP C151).

Sanitary wastewater:

- Portable sanitation facilities will be firmly secured, regularly maintained, and emptied when necessary.
- Wheel wash or tire bath wastewater shall be discharged to a separate on-site treatment system or to the sanitary sewer as part of Wheel Wash implementation (BMP C106).

Solid Waste:

- Solid waste will be stored in secure, clearly marked containers.

Other:

- Other BMPs will be administered as necessary to address any additional pollutant sources on site.

The facility does not require a Spill Prevention, Control, and Countermeasure (SPCC) Plan under the Federal regulations of the Clean Water Act (CWA).

3.1.10 Element #10 – Control Dewatering

3.1.13 Element #13 – Protect Low Impact Development BMPs

- Protect all bioretention and rain garden BMP's from sedimentation through installation and maintenance of erosion control BMP's on portions of the site that drain into them. Restore the BMP's to their fully functioning condition if they accumulate sediment during construction. Restoring the BMP must include removal of sediment and any sediment-laden bioretention/ rain garden soils, and replacing the removed soils with soils meeting the design specification.
- Prevent compacting bioretention and rain garden BMP's by excluding construction equipment and foot traffic. Protect completed lawn and landscaped areas from compaction by construction equipment.
- Control erosion and avoid introducing sediment from surrounding land uses onto permeable pavements. Do not allow muddy construction equipment on the base material or pavement. Do not allow sediment-laden runoff into permeable pavements or base materials.
- Pavements fouled with sediments or no longer passing an initial infiltration test must be cleaned using procedures from Book 4 of the manufacturer's procedures.
- Keep all heavy equipment off existing soils under LID facilities that have been excavated to final grade to retain the infiltration rate of the soils

3.2 Site Specific BMPs

Site specific BMPs are shown on the TESC Plan Sheets and Details in Appendix A. These site-specific plan sheets will be updated annually.

3.3 Additional Advanced BMPs

- The following BMPs are advanced and are only recommended if construction activities are complex enough to warrant them; or if the site has the potential for significant impacts to water quality. The following BMPs are directed at "end-of-pipe" treatment for sedimentation issues related to turbid runoff from construction sites. Effective BMPs are most often the simple BMPs and focus on the minimization of erosion before sedimentation is an issue. The following BMPs will most likely be implemented only after other BMP options are exhausted, or if the construction activity is large and off-site sedimentation or turbid runoff occurs or is inevitable.
- For BMP 250, written pre-approval, through Ecology is required (see SWMMWW 2005):
- BMP C250: Construction Stormwater Chemical Treatment
- BMP C251: Construction Stormwater Filtration.

4.0 Construction Phasing and BMP Implementation

The BMP implementation schedule will be driven by the construction schedule. The following provides a sequential list of the proposed construction schedule milestones and the corresponding BMP implementation schedule. The list contains key milestones such as wet season construction.

The BMP implementation schedule listed below is keyed to proposed phases of the construction project and reflects differences in BMP installations and inspections that relate to wet season construction. The project site is located west of the Cascade Mountain Crest. As such, the dry season is considered to be from May 1 to September 30 and the wet season is considered to be from October 1 to April 30.

- Estimate of Construction start date: 10/01/22
- Estimate of Construction finish date: 9/06/25
- Mobilize equipment on site: 10/01/22
- Mobilize and store all ESC and soil stabilization products: 10/01/22
- Install ESC measures: 10/01/22
- Install stabilized construction entrance: 10/01/22
- Begin clearing and grubbing: 10/01/22
- Demolish existing structures: 10/01/22
- Begin site grading 10/01/22
- Site grading ends 10/30/22
- Excavate and install new utilities and services: 11/01/22
- Excavation for building foundations 10/06/22
- Begin building construction: 10/06/22
- Complete utility construction 10/06/22
- Begin implementing soil stabilization and sediment control BMPs throughout the site in preparation for wet season: 10/06/22
- Wet Season starts: 11/01/22
- Site inspections and monitoring conducted weekly and for applicable rain events as detailed in Section 6 of this SWPPP: 10/01/22
- Implement Element #12 BMPs and manage site to minimize soil disturbance during the wet season: 10/01/22
- Complete road paving 11/30/22
- Building construction complete: 9/06/24
- Dry Season starts: 5/01/23

5.0 Pollution Prevention Team

5.1 Roles and Responsibilities

The pollution prevention team consists of personnel responsible for implementation of the SWPPP, including the following:

- Certified Erosion and Sediment Control Lead (CESCL) – primary contractor contact, responsible for site inspections (BMPs, visual monitoring, sampling, etc.); to be called upon in case of failure of any ESC measures.
- Resident Engineer – For projects with engineered structures only (sediment ponds/traps, sand filters, etc.): site representative for the owner that is the project's supervising engineer responsible for inspections and issuing instructions and drawings to the contractor's site supervisor or representative
- Emergency Ecology Contact – individual to be contacted at Ecology in case of emergency.
- Emergency Owner Contact – individual that is the site owner or representative of the site owner to be contacted in the case of an emergency.
- Non-Emergency Ecology Contact – individual that is the site owner or representative of the site owner than can be contacted if required.
- Monitoring Personnel – personnel responsible for conducting water quality monitoring; for most sites this person is also the Certified Erosion and Sediment Control Lead.

5.2 Team Members

Names and contact information for those identified as members of the pollution prevention team are provided in the following table.

Title	Name(s)	Phone Number
Certified Erosion and Sediment Control Lead (CESCL)	Unknown	
Resident Engineer	Travis Johnson	(360)944-6519
Emergency Ecology Contact	Unknown	
Emergency Owner Contact	Unknown	
Non-Emergency Ecology Contact	Unknown	
Monitoring Personnel	Unknown	

Exhibit 7 SUB22-05

6.0 Site Inspections and Monitoring

Monitoring includes visual inspection, monitoring for water quality parameters of concern, and documentation of the inspection and monitoring findings in a site log book. A site log book will be maintained for all on-site construction activities and will include:

- A record of the implementation of the SWPPP and other permit requirements;
- Site inspections; and,
- Stormwater quality monitoring.

For convenience, the inspection form and water quality monitoring forms included in this SWPPP include the required information for the site log book. This SWPPP may function as the site log book if desired, or the forms may be separated and included in a separate site log book. However, if separated, the site log book but must be maintained on-site or within reasonable access to the site and be made available upon request to Ecology or the local jurisdiction.

6.1 Site Inspection

All BMPs will be inspected, maintained, and repaired as needed to assure continued performance of their intended function. The inspector will be a Certified Erosion and Sediment Control Lead (CESCL) per BMP C160. The name and contact information for the CESCL is provided in Section 5 of this SWPPP.

Site inspection will occur in all areas disturbed by construction activities and at all stormwater discharge points. Stormwater will be examined for the presence of suspended sediment, turbidity, discoloration, and oily sheen. The site inspector will evaluate and document the effectiveness of the installed BMPs and determine if it is necessary to repair or replace any of the BMPs to improve the quality of stormwater discharges. All maintenance and repairs will be documented in the site log book or forms provided in this document. All new BMPs or design changes will be documented in the SWPPP as soon as possible.

6.1.1 Site Inspection Frequency

Site inspections will be conducted at least once a week and within 24 hours following any discharge from the site. For sites with temporary stabilization measures, the site inspection frequency can be reduced to once every month.

6.1.2 Site Inspection Documentation

The site inspector will record each site inspection using the site log inspection forms provided in Appendix E. The site inspection log forms may be separated from this SWPPP document, but will be maintained on-site or within reasonable access to the site and be made available upon request to Ecology or the local jurisdiction.

6.2 Stormwater Quality Monitoring

The construction site will comply with the requirements set forth in the 2015 Construction Stormwater General Permit (revised 2017) seen in Appendix D. A Certified Erosion and Sediment Control Lead shall be on-site or on-call at all times.

The following text describes the monitoring for the proposed development.

6.2.1 Turbidity Sampling

The receiving water body, Lacamas Creek Watershed, is impaired for turbidity. Mandatory BMPs (Best Management Practices) and erosion control practices put in place by the permit will appropriately minimize the turbidity of the stormwater discharge. Monitoring requirements for the proposed project will include weekly turbidity sampling to monitor site discharges for water quality compliance as required by the NPDES Construction Stormwater General Permit, provided that site discharges occur. It should be noted that the site is designed such that all site runoff will be infiltrated so it is likely that discharges will be rare or may not occur at all. Sampling will be conducted at all discharge points at least once per calendar week.

Turbidity sampling during construction will be completed weekly in order to confirm that erosion control measures are meeting the water quality standards for turbidity (Where an applicable TMDL has not specified a waste load allocation for construction stormwater discharge, but has not excluded these discharges, compliance with special Conditions S4 (monitoring) and S9 (SWPPPs) will constitute compliance with the approved TMDL (S8.E.1.c)). Special Conditions S4 establishes that the key benchmark values that require action are 25 NTU for turbidity (equivalent to 32 cm transparency) and 250 NTU for turbidity (equivalent to 6 cm transparency). If the 25 NTU benchmark for turbidity (equivalent to 32 cm transparency) is exceeded, the following steps will be conducted:

1. Ensure all BMPs specified in this SWPPP are installed and functioning as intended.
2. Assess whether additional BMPs should be implemented, and document revisions to the SWPPP as necessary.
3. Sample discharge location daily until the analysis results are less than 25 NTU (turbidity) or greater than 32 cm (transparency).

If the turbidity is greater than 25 NTU (or transparency is less than 32 cm) but less than 250 NTU (transparency greater than 6 cm) for more than 3 days, additional treatment BMPs will be implemented within 24 hours of the third consecutive sample that exceeded the benchmark value. Additional treatment BMPs to be considered will include, but are not limited to, off-site treatment, infiltration, filtration and chemical treatment.

If the 250 NTU benchmark for turbidity (or less than 6 cm transparency) is exceeded at any time, the following steps will be conducted:

1. Notify Ecology by phone within 24 hours of analysis (see Section 5.0 of this SWPPP for contact information).
2. Continue daily sampling until the turbidity is less than 25 NTU (or transparency is greater than 32 cm).

3. Initiate additional treatment BMPs such as off-site treatment, infiltration, filtration and chemical treatment within 24 hours of the first 250 NTU exceedance.
4. Implement additional treatment BMPs as soon as possible, but within 7 days of the first 250 NTU exceedance.
5. Describe inspection results and remedial actions taken in the site log book and in monthly discharge monitoring reports as described in Section 7.0 of this SWPPP.

In the event that Turbidity results are greater than 25 NTUs, or the site is determined to be out of compliance with surface water quality standards for turbidity, the following BMPs should be established, re-established or implemented as determined necessary by the Certified Erosion and Sediment Control lead (CESCL) in order to bring the site back into compliance:

BMP C105: Stabilized Construction Entrance / Exit (repair construction entrance as necessary)

BMP C106: Wheel Wash (repair wheel wash as necessary)

BMP C120: Temporary and permanent Seeding

BMP C124: Sodding

BMP C140: Dust Control

BMP C209: Outlet Protection

BMP C220: Storm Drain Inlet Protection (add more inlet protection, as necessary

BMP C233: Silt Fence (add more silt fencing as necessary)

7.0 Reporting and Recordkeeping

7.1 Recordkeeping

7.1.1 Site Log Book

A site log book will be maintained for all on-site construction activities and will include:

- A record of the implementation of the SWPPP and other permit requirements;
- Site inspections; and,
- Stormwater quality monitoring.

For convenience, the inspection form and water quality monitoring forms included in this SWPPP include the required information for the site log book.

7.1.2 Records Retention

Records of all monitoring information (site log book, inspection reports/checklists, etc.), this Stormwater Pollution Prevention Plan, and any other documentation of compliance with permit requirements will be retained during the life of the construction project and for a minimum of three years following the termination of permit coverage in accordance with permit condition S5.C.

7.1.3 Access to Plans and Records

The SWPPP, General Permit, Notice of Authorization letter, and Site Log Book will be retained on site or within reasonable access to the site and will be made immediately available upon request to Ecology or the local jurisdiction. A copy of this SWPPP will be provided to Ecology within 14 days of receipt of a written request for the SWPPP from Ecology. Any other information requested by Ecology will be submitted within a reasonable time. A copy of the SWPPP or access to the SWPPP will be provided to the public when requested in writing in accordance with permit condition S5.G.

7.1.4 Updating the SWPPP

In accordance with Conditions S3, S4.B, and S9.B.3 of the General Permit, this SWPPP will be modified if the SWPPP is ineffective in eliminating or significantly minimizing pollutants in stormwater discharges from the site or there has been a change in design, construction, operation, or maintenance at the site that has a significant effect on the discharge, or potential for discharge, of pollutants to the waters of the State. The SWPPP will be modified within seven days of determination based on inspection(s) that additional or modified BMPs are necessary to correct problems identified, and an updated timeline for BMP implementation will be prepared.

7.2 Reporting

7.2.1 Discharge Monitoring Reports

Discharge Monitoring Reports (DMRs) will be submitted to Ecology monthly. If there was no discharge during a given monitoring period, the Permittee shall submit the form as required, with the words "No discharge" entered in the place of monitoring results. The DMR due date is 15 days following the end of each month.

Water quality sampling results will be submitted to Ecology monthly on Discharge Monitoring Report (DMR) forms in accordance with permit condition S5.B. If there was no discharge during a given monitoring period, the form will be submitted with the words "no discharge" entered in place of the monitoring results. If a benchmark was exceeded, a brief summary of inspection results and remedial actions taken will be included. If sampling could not be performed during a monitoring period, a DMR will be submitted with an explanation of why sampling could not be performed.

7.2.2 Notification of Noncompliance

If any of the terms and conditions of the permit are not met, and it causes a threat to human health or the environment, the following steps will be taken in accordance with permit section S5.F:

1. Ecology will be immediately notified of the failure to comply.
2. Immediate action will be taken to control the noncompliance issue and to correct the problem. If applicable, sampling and analysis of any noncompliance will be repeated immediately and the results submitted to Ecology within five (5) days of becoming aware of the violation.
3. A detailed written report describing the noncompliance will be submitted to Ecology within five (5) days, unless requested earlier by Ecology.

Any time turbidity sampling indicates turbidity is 250 nephelometric turbidity units (NTU) or greater or water transparency is 6 centimeters or less, the Ecology regional office will be notified by phone within 24 hours of analysis as required by permit condition S5.A (see Section 5.0 of this SWPPP for contact information).

In accordance with permit condition S2.A, a complete application form will be submitted to Ecology and the appropriate local jurisdiction (if applicable) to be covered by the General Permit.

Appendix A – Site Plans

Appendix B – Construction BMPs

Stabilized Construction Entrance (BMP C105)

Silt Fence (BMP C233)

Storm Drain Inlet Protection (BMP C220)

Infiltration Trench (BMP T7.20)

Temporary and Permanent Seeding (BMP C120)

Mulching (BMP C121)

Nets and Blankets (BMP C122)

Plastic Covering (BMP C123)

Topsoiling (BMP C125)

Dust Control (BMP C140)

Early application of gravel base on areas to be paved

Outlet Protection (BMP C209)

Appendix C – Alternative BMPs

The following includes a list of possible alternative BMPs for each of the 12 elements not described in the main SWPPP text. This list can be referenced in the event a BMP for a specific element is not functioning as designed and an alternative BMP needs to be implemented.

Element #1 - Mark Clearing Limits
High Visibility Plastic or Metal Fence (BMP C103)
Stake and Wire Fence (BMP C104)
Element #2 - Establish Construction Access
Wheel Wash (BMP C106)
Water Bars (BMP C203)
Element #3 - Control Flow Rates
Wattles (BMP C235)

Element #4 - Install Sediment Controls
Straw Bale Barrier (BMP C230)
Gravel Filter Berm (BMP C232)
Straw Wattles (BMP C235)
Portable Water Storage Tanks (Baker Tanks)
Construction Stormwater Chemical Treatment (BMP C250)
Construction Stormwater Filtration (BMP C251)

Element #5 - Stabilize Soils
Polyacrylamide (BMP C126)

Element #6 - Protect Slopes
Straw Wattles (BMP C235)
Surface Roughening (BMP C240)

Element #8 - Stabilize Channels and Outlets
Level Spreader (BMP C206)
Check Dams (BMP C207)

Element #9 – Control Pollutants
Concrete Handling (BMP C151)
Construction Stormwater Chemical Treatment (BMP C250)
Construction Stormwater Filtration (BMP C251)

Element #10 - Control Dewatering
Vegetated Filtration (BMP C236)
Additional Advanced BMPs to Control Dewatering:

Appendix D – General Permit

Appendix E – Site Inspection Forms (and Site Log)

The results of each inspection shall be summarized in an inspection report or checklist that is entered into or attached to the site log book. It is suggested that the inspection report or checklist be included in this appendix to keep monitoring and inspection information in one document, but this is optional. However, it is mandatory that this SWPPP and the site inspection forms be kept onsite at all times during construction, and that inspections be performed and documented as outlined below.

At a minimum, each inspection report or checklist shall include:

a. Inspection date/times

b. Weather information: general conditions during inspection, approximate amount of precipitation since the last inspection, and approximate amount of precipitation within the last 24 hours.

c. A summary or list of all BMPs that have been implemented, including observations of all erosion/sediment control structures or practices.

d. The following shall be noted:

   i. locations of BMPs inspected,

   ii. locations of BMPs that need maintenance,

   iii. the reason maintenance is needed,

   iv. locations of BMPs that failed to operate as designed or intended, and

   v. locations where additional or different BMPs are needed, and the reason(s) why

e. A description of stormwater discharged from the site. The presence of suspended sediment, turbid water, discoloration, and/or oil sheen shall be noted, as applicable.

f. A description of any water quality monitoring performed during inspection, and the results of that monitoring.

g. General comments and notes, including a brief description of any BMP repairs, maintenance or installations made as a result of the inspection.

h. A statement that, in the judgment of the person conducting the site inspection, the site is either in compliance or out of compliance with the terms and conditions of the SWPPP and the NPDES permit. If the site inspection indicates that the site is out of compliance, the inspection report shall include a summary of the remedial actions required to bring the site back into compliance, as well as a schedule of implementation.

i. Name, title, and signature of person conducting the site inspection; and the following statement: "I certify under penalty of law that this report is true, accurate, and complete, to the best of my knowledge and belief".

When the site inspection indicates that the site is not in compliance with any terms and conditions of the NPDES permit, the Permittee shall take immediate action(s) to: stop, contain, and clean up the unauthorized discharges, or otherwise stop the noncompliance; correct the problem(s); implement appropriate Best Management Practices (BMPs), and/or conduct maintenance of existing BMPs; and achieve compliance with all applicable standards and permit conditions. In addition, if the noncompliance causes a threat to human health or the environment, the Permittee shall comply with the Noncompliance Notification requirements in Special Condition S5.F of the permit.

Site Inspection Form

General Information			
Project Name:			
Inspector Name:		**Title:** **CESCL # :**	
Date:		**Time:**	
Inspection Type:	□ After a rain event □ Weekly □ Turbidity/transparency benchmark exceedance □ Other		
Weather			
Precipitation	Since last inspection	In last 24 hours	
Description of General Site Conditions:			

Inspection of BMPs							
Element 1: Mark Clearing Limits							
BMP:							
Location	Inspected			Functioning			Problem/Corrective Action
	Y	N		Y	N	NIP	
BMP:							
Location	Inspected			Functioning			Problem/Corrective Action
	Y	N		Y	N	NIP	
Element 2: Establish Construction Access							
BMP:							
Location	Inspected			Functioning			Problem/Corrective Action
	Y	N		Y	N	NIP	
BMP:							
Location	Inspected			Functioning			Problem/Corrective Action
	Y	N		Y	N	NIP	

Element 3: Control Flow Rates							
BMP:							
Location	Inspected		Functioning			Problem/Corrective Action	
	Y	N	Y	N	NIP		
BMP:							
Location	Inspected		Functioning			Problem/Corrective Action	
	Y	N	Y	N	NIP		

Element 4: Install Sediment Controls							
BMP:							
Location	Inspected		Functioning			Problem/Corrective Action	
	Y	N	Y	N	NIP		
BMP:							
Location	Inspected		Functioning			Problem/Corrective Action	
	Y	N	Y	N	NIP		
BMP:							
Location	Inspected		Functioning			Problem/Corrective Action	
	Y	N	Y	N	NIP		
BMP:							
Location	Inspected		Functioning			Problem/Corrective Action	
	Y	N	Y	N	NIP		
BMP:							
Location	Inspected		Functioning			Problem/Corrective Action	
	Y	N	Y	N	NIP		

Element 5: Stabilize Soils						
BMP:						
Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	
BMP:						
Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	
BMP:						
Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	
BMP:						
Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	
Element 6: Protect Slopes						
BMP:						
Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	
BMP:						
Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	
BMP:						
Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

Element 7: Protect Drain Inlets						
BMP:						
Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	
BMP:						
Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	
BMP:						
Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	
Element 8: Stabilize Channels and Outlets						
BMP:						
Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	
BMP:						
Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	
BMP:						
Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	
BMP:						
Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

Element 9: Control Pollutants						
BMP:						
Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	
BMP:						
Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	
Element 10: Control Dewatering						
BMP:						
Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	
BMP:						
Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	
BMP:						
Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

Stormwater Discharges From the Site		
	Observed?	Problem/Corrective Action

	Y	N
Location		
Turbidity		
Discoloration		
Sheen		
Location		
Turbidity		
Discoloration		
Sheen		

Water Quality Monitoring
Was any water quality monitoring conducted? □ Yes □ No
If water quality monitoring was conducted, record results here:
If water quality monitoring indicated turbidity 250 NTU or greater; or transparency 6 cm or less, was Ecology notified by phone within 24 hrs? □ Yes □ No
If Ecology was notified, indicate the date, time, contact name and phone number below:
Date:
Time:
Contact Name:
Phone #:
General Comments and Notes
Include BMP repairs, maintenance, or installations made as a result of the inspection.
Were Photos Taken? □ Yes □ No
If photos taken, describe photos below:

SEPARATOR SHEET

APPENDIX F

Environmental Documentation

Owner Name	Mailing Address
AXMAKER ANDREW & AXMAKER HOLLY	8616 N WRIGHT ST, CAMAS, WA, 98607
BAKKER JOEL	8510 N HARGRAVE ST, CAMAS, WA, 98607
BARROW ANSON DAVID & BARROW LAUNIE RAE	4331 SE 179TH CT, VANCOUVER, WA, 98683
BOUCHER RICHARD D & BOUCHER KAREN M	8522 N HARGRAVE ST, CAMAS, WA, 98607
BRILEY DUANE A & BRILEY NORLEEN	5932 N 86TH AVE, CAMAS, WA, 98607
BULLIS KENNETH R & BULLINGER EILEEN P	5920 N 86TH ST, CAMAS, WA, 98607
CARRILLO MARIBEL & SANCHEZ TIMOTEO	22401 NE 28TH ST, CAMAS, WA, 98607
CLARK COUNTY PARKS	4700 NE 78TH ST, VANCOUVER, WA, 98665
DAHAL BIDHYA GURUNG & DAHAL LAXMI RAMAN	8602 N WRIGHT ST, CAMAS, WA, 98607
DOAN KHOA DANG & SAING STEPHANY SANPHILAY	8638 N WRIGHT ST, CAMAS, WA, 98607
DOYLE KYLE JAMES & MCCALL BRITTANY DAWN	20281 BEECHWOOD TERRACE UNIT 301, ASHBURN, VA, 20147
EMMERT FAMILY III LLC	10470 SE HILLCREST DR, HAPPY VALLEY, OR, 97086
EMMERT TERRY W	11811 SE HWY 212, CLACKAMAS, OR, 97015
GME DEVELOPMENT LLC	1300 ESTHER ST STE 200, VANCOUVER, WA, 98660
GOTTSCHALK DREW H & GOTTSCHALK CASEY L	8544 N HARGRAVE ST, CAMAS, WA, 98607
GREEN ERICA M & NUSSER RYAN A	8545 N JUNIPER ST, CAMAS, WA, 98607
GREEN MOUNTAIN ESTATES HOA	604 EVERGREEN BLVD, VANCOUVER, WA, 98660
GREEN MOUNTAIN PH2 SOUTH HOA	11807 NE 99TH ST STE 1170, VANCOUVER, WA, 98682
HOANG ALEXANDER TUNG & HIROMOTO KELBY AKEMI	6124 N 86TH AVE, CAMAS, WA, 98607
HOLLINGSWORTH JAMES MICHAEL JR & HOLLINGSWORTH ROBIN	22421 NE 28TH ST, CAMAS, WA, 98607
JOHNSON GLEN C & JOHNSON THERESA M	22307 NE 28TH ST, CAMAS, WA, 98607
KUMMERMAN MICHAEL J & KUMMERMAN PAULINE VERONICA	6150 N 86TH AVE, CAMAS, WA, 98607
MERRITT GWENNA E	3602 NE 222ND AVE, CAMAS, WA, 98607
MERRITT ROCQUE & MERRITT SUE	3602 NE 222ND AVE, CAMAS, WA, 98607
MIDDAGH LINDA	22015 NE 28TH STREET, CAMAS, WA, 98607
MITTELSTAEDT PAUL E JR & MITTELSTAEDT ELIZABETH	6202 N 86TH AVE, CAMAS, WA, 98607
MOY JOHN C JR	8538 N HARGRAVE ST, CAMAS, WA, 98607
PHILLIPS WILLIAM CHRISTOPHER & PHILLIPS KATRINA MARIE	8556 N HARGRAVE ST, CAMAS, WA, 98607
RILER DANIEL JOSEPH & RILER MELINDA CATHERINE	8624 N WRIGHT ST, CAMAS, WA, 98607
RUTTER TROY EUGENE & RUTTER STEPHANIE DENISE	6138 N 86TH AVE, CAMAS, WA, 98607
SONG JIE & ZHU HAIQING	5944 N 86TH ST, CAMAS, WA, 98607
SOUTHERN DWIGHT A ETAL	22205 NE 28TH ST, CAMAS, WA, 98607
WALKER CANDICE R	8533 N JUNIPER ST, CAMAS, WA, 98607
WALKER PHERNELL CLARENCE II	5968 N 86TH AVE, CAMAS, WA, 98607
XU JIAN & LIANG YUEHAI TRUSTEES	12462 NW WAKER DR, PORTLAND, OR, 97229
YOUNG-PALMER NICKI L & PALMER GREGORY A	512 NE 81ST ST STE F, VANCOUVER , WA, 98665

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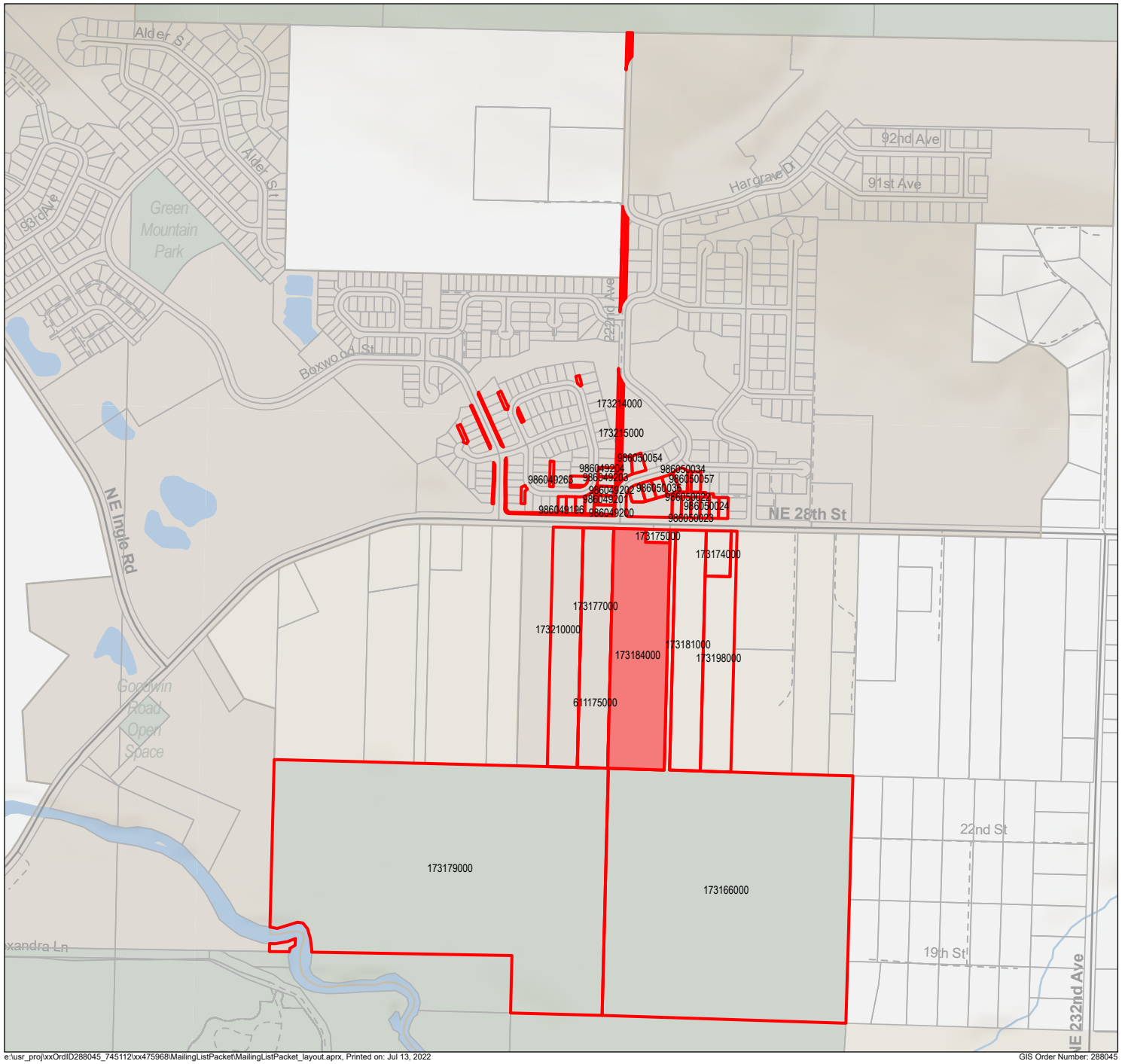
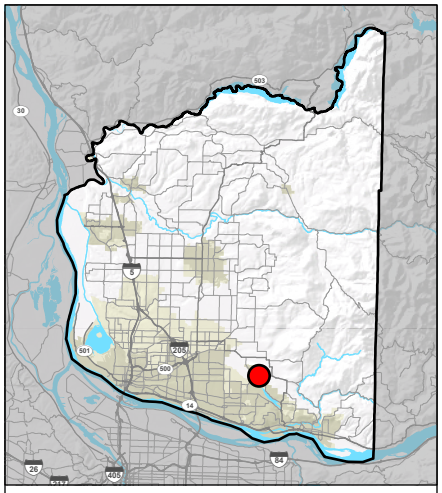
Employee Name Bob Pool





PID(s): 173184000, 300-Foot Buffer

KEY

- Subject Property
- Buffer Selection
- Parcels

CLARK COUNTY, WASHINGTON

N

NOTE: *Information shown on this map was collected from several sources. Clark County accepts no responsibility for any inaccuracies that may be present.*

0 390 780 1,170 Feet

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GIS Order Number: 288045

CLARK COUNTY PARKS
4700 NE 78TH ST
VANCOUVER, WA 98665

CARRILLO MARIBEL & SANCHEZ TIMOTEO
22401 NE 28TH ST
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VANCOUVER, WA 98660

GREEN MOUNTAIN ESTATES HOA
604 EVERGREEN BLVD
VANCOUVER, WA 98660

CRITICAL AREAS REPORT & OREGON WHITE OAK MITIGATION PLAN

Project:

Monte Verde Subdivision

Applicant:

Pacific Lifestyle Homes
11815 NE 99th Street,
Vancouver WA, 98682

Prepared By:

Ash ECO SOLUTIONS, LLC

August 5, 2022

The information in this report was compiled to meet the requirements of the City of Camas Municipal Code (CMC) Sections 16.53 Wetlands and 16.61 Fish and Wildlife Habitat Conservation Areas. This report has been prepared under the supervision and direction of the undersigned, a qualified professional following CMC Section 16.61.020.A.

Andrea W. Aberle, Sr. Biologist
AshEco Solutions, LLC

Mackenzie Stamey, Biologist
AshEco Solutions, LLC

SITE INFORMATION:

Parcel No(s):	173184000
Acreage:	8.84 acres
Local Jurisdiction:	City of Camas, Washington
Section/Township/Range:	SE ¼, S21, T2N, R3E, W.M.
Site Address:	22205 NE 28th Street, Camas, WA 98607
Legal Landowner:	Southern Dwight A ETAL *(Per Current GIS Parcel Info)*

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Figure 3 – Soils and Wetlands Map
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APPENDICES

Appendix A – Site Photos
Appendix B – Test Plot Datasheets
Appendix C – Tree Survey

INTRODUCTION

Project Description

AshEco Solutions, LLC (AES) was contracted by Pacific Lifestyle Homes (PLH) to assess the potential critical areas present within the subject parcel and develop a mitigation plan to offset project impacts. This Critical Areas Report and Oak Mitigation Plan follows the City of Camas Municipal Code (CMC) Sections 16.53 Wetlands and 16.61 Fish and Wildlife Habitat Conservation Areas. PLH proposes construction of 34-lot subdivision within the 8.84-acre parcel.

Project Location and Background Information

The subject site is under the jurisdiction of the City of Camas and is assigned Parcel Number 173184000. The site is located at 22205 NE 28th Street, Camas, Washington. The site is surrounded to the east and west by large lot residential and agricultural lots. North of the property is urban residential lots and south of the property is forest land owned by Clark County.

EXISTING CONDITIONS

A single-family residence, shop, and large barn are present within the northern section of the property. South of the barn the property is fenced and used as horse pasture. The subject site is generally open and has been used for agricultural purposes since at least the 1970s. Native and non-native trees are scattered throughout the property with most concentrated in the north and southwestern corner of the parcel. Little native understory exists within the property due to a history of horse grazing. A maintained overhead BPA powerline easement 100 feet wide crosses the subject property diagonally east/west, Figure 4.

CRITICAL AREAS MAP RESEARCH

Topography

The site generally consists of a southwest facing slope. Topography maps show that the site drops approximately forty-eight feet in elevation from NE 28th Street to the southwest corner of the parcel, Figure 2.

Soil Survey

Soils within the study area are mapped as non-hydric Lauren gravelly loam, 0 to 8 percent slopes (LgB) and non-hydric Lauren loam 0 to 8 percent slopes (LeB) by the NRCS USDA Soil Conservation Service, Soil Survey of Clark County (1972), Washington, Figure 3.

The Lauren series consists of deep, somewhat excessively drained, nearly level to gently sloping soils on terraces 50 to 300 feet above the Columbia River. In a few places, on terrace fronts, the soils are steep to very steep. These are very gravelly soils that formed in mixed Columbia River alluvium that contained some volcanic ash. Lauren soils are in the southwestern part of the county, in the vicinity of Mill Plain, Orchards, and Fourth Plain. The original vegetation was Douglas-fir, grand fir, bigleaf maple, vine maple, salal, and ferns. The average annual precipitation is about 48-inches.

Lauren gravelly loam, 0 to 8 percent slopes (LgB) occurs on terraces. The slopes are generally less than 4 percent and approach 8 percent only along the terrace breaks. In a typical profile the surface layer is very dark brown gravelly and very gravelly loam about 20-inches thick. Below the surface layer is friable, dark-brown very gravelly loam about 13-inches thick. The next layer is dark-brown very gravelly coarse sandy loam about 11-inches thick. The underlying material, to a depth of 70-inches, is dark-brown very gravelly

loamy coarse sand. Included in mapping were a few small areas where very gravelly loamy coarse sand is within 30-inches of the surface. Permeability generally is moderately rapid, but it is rapid in the substratum. The available water capacity is moderate. Surface runoff is slow, and the erosion hazard is slight. The LgB soil type is not listed on the Washington State Hydric Soils List for Clark County (NRCS 2022).

Lauren loam, 0 to 8 percent slopes (LeB) is similar to Lauren gravelly loam, 0 to 8 percent slopes, except that the surface layer is free of gravel. Surface runoff is slow, and the erosion hazard is slight. Included in mapping were a few small gravelly areas. The LeB soil type is not listed on the Washington State Hydric Soils List for Clark County (NRCS 2022).

Mapped hydric soils do not necessarily mean that the area is a wetland; hydrology and wetland vegetation must be present to classify an area as a wetland. The same is true for soils that are not mapped as hydric. Wetlands can be found in areas without mapped hydric soils. The onsite wetlands were identified within areas of the non-hydric mapped soil type LgB.

Wetlands

A wetland was mapped within the southwest corner of the parcel by the Clark County GIS MapsOnline software under the "potential wetland presence" layer. The National Wetland Inventory also maps a PFOA wetland within the same general location, Figure 3. Site reconnaissance by AshEco Solutions (AES) identified that the mapped wetland was actually located over 300-feet south of the subject parcel. No wetlands were identified within the subject parcel by AES.

WDFW Priority Habitat

The Washington Department of Fish and Wildlife (WDFW) maps "Cave or Cave-rich Areas" within the general area, though no evidence of caves or rock outcroppings were identified onsite by AES during site reconnaissance. AES did identify Oregon white oak habitat onsite. This oak habitat was not previously mapped by WDFW.

METHODOLOGY

Wetlands

The study area was evaluated for the presence of wetlands using the Routine Determination Method per the U.S. Army Corps of Engineers' (USACE's) *Wetland Delineation Manual* (1987), the *Washington State Wetlands Identification and Delineation Manual* (1997), and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region, Version 2.0* (USACE 2010). The Routine Determination Method examines three parameters to determine if wetlands exist in a given area: vegetation, hydrology, and soils. The presence of hydrology is critical in identifying wetlands; however, since hydrologic conditions can change periodically (hourly, daily, or seasonally), it is necessary to determine if hydrophytic vegetation and hydric soils are also present. By definition, wetlands are those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands are regulated as "Waters of the United States" by the USACE, "Waters of the State" by Washington State Department of Ecology (ECY), and locally by CMC section 16.53 Wetlands. No wetlands were identified onsite.

See Appendix B for formal test plot data collected onsite by AES. The data supports the findings of uplands located within the southwest corner of the property. The wetlands identified by GIS within the subject parcel were determined to be offsite, over 300 feet further south.

WDFW Priority Habitat
The subject site was evaluated for the presence of Priority Habitats as defined by WDFW Priority Habitats and Species (PHS) List 2008. "Cave or Cave-rich Areas" were mapped onsite by the WDFW PHS online mapping system. Oregon white oak trees were identified within the subject parcel by AES.

WDFW defines Caves as, *"A naturally occurring cavity, recess, void, or system of interconnected passages (including associated dendritic tubes, cracks, and fissures) which occurs under the earth in soils, rock, ice, or other geological formations, and is large enough to contain a human. Mine shafts (a human-made excavation in the earth usually used to extract minerals) may mimic caves and abandoned mine shafts with actual or suspected occurrences of priority species should be treated in a manner similar to caves."*

WDFW defines Oregon White Oak Woodlands as, "*stands of oak or oak/conifer associations where canopy coverage of the oak component of the stand is 25%; or where total canopy coverage of the stand is <25%, but oak accounts for at least 50% of the canopy coverage. The latter is often referred to as oak savanna. In non-urbanized areas west of the Cascades, priority oak habitat consists of stands > 0.4 ha (1.0 ac) in size. East of the Cascades, priority oak habitat consists of stands > 2 ha (5 ac) in size. In urban or urbanizing areas, single oaks or stands < 0.4 ha (1 ac) may also be considered a priority when found to be particularly valuable to fish and wildlife (i.e., they contain many cavities, have a large diameter at breast height [dbh]* (generally 20-inches dbh and greater), *are used by priority species, or have a large canopy). Oak woodlands in western Washington may contain understory plants indicative of Prairie*."

No caves were identified onsite or immediately offsite near the subject parcel. Eleven individual Oregon white oak trees were identified within or immediately adjacent to the subject parcel. The subject site is within an incorporated city and is urban, therefore the onsite Oregon white oak trees are considered Priority Habitat by WDFW.

Habitats of Local Importance
Following CMC Chapter 16.61 - Fish And Wildlife Habitat Conservation Areas, Section: 16.61.010.A.3.a, individual Oregon white oak trees with a twenty-inch diameter at breast height (20-inches dbh), stands of Oregon white oak trees greater than one acre when they are found to be valuable to fish and wildlife (i.e., may include trees with cavities, large diameter breast height (twelve inches dbh), are used by priority species, or have a large canopy), and all Oregon white oak snags unless determined by an arborist to be a hazard, are considered Habitats of Local Importance and therefore are regulated by CMC.

DOCUMENTED VEGETATION

The vegetation onsite has been disturbed through years of grazing by horses. The majority of the site was dominated in heavily grazed pasture grasses and herbs. Scattered trees and shrubs present in the onsite included, Douglas-fir (*Pseudotsuga menzisii* FACU), big leaf maple (*Acer macrophyllum* FACU), Oregon white oak (*Quercus garryana* FACU) Oregon ash (*Fraxinus latifolia* FACW), black cottonwood (*Populus trichocarpa* FAC), grand fir (*Abies grandis* FAC), bitter cherry (*Prunus emarginata* FACU), Pacific crabapple(*Malus fusca* FACW), sword fern (*Polystichum munitum* FACU), trailing blackberry (*Rubus ursinus* FACU), vine maple (*Acer circinatum* FAC), Indian plum (*Oemleria cerasiformis* FACU), beaked hazelnut (*Corylus cornuta* FACU), piggy-back plant (*Tolmiea menzisii* FAC), lanceleaf spring beauty (*Claytonia lanceolata* FAC), dovefoot geranium (*Geranium mole* FACU), curly dock (*Rumex crispus* FAC), large leaf avens (*Geum macrophyllum* FACW), and snowberry (*Symphoricarpos albus* FACU). Non-native or invasive

plants observed onsite included Himalayan blackberry (*Rubus armeniacus* FAC) and English holly (*Ilex aquifolium* FACU).

South of the subject parcel is a forested area owned by Clark County. This area is much more biologically diverse. Vegetation identified in this area and the associated offsite wetland buffer included tall Oregon grape (*Mahonia aquifolium* FACU), Pacific ninebark (*Physocarpus capitatus* FACW), red osier dogwood (*Cornus sericea* FACW), California false hellebore (*Veratrum californicum* FAC), small bedstraw (*Galium trifidum* FACW), prickly currant (*Ribes lacustre* FAC), salmonberry (*Rubus spectabilis* FAC), slough sedge (*Carex obnupta* OBL), and ocean spray (*Holodiscus discolor* FACU).

The indicator categories following the common and scientific name of each vegetation species indicate the likelihood of the species to be found in wetlands. Listed from most-likely to least-likely to be found in wetlands, the indicator categories are:

- **OBL (obligate wetland) –** Occur almost always under natural conditions in wetlands.
- **FACW (facultative wetland) –** Usually occur in wetlands but occasionally found in non-wetlands.
- **FAC (facultative) –** Equally likely to occur in wetlands or non-wetlands.
- **FACU (facultative upland) –** Usually occur in non-wetlands but occasionally found in wetlands.
- **UPL (obligate upland) –** Occur almost always under natural conditions in non-wetlands.
- **NI (no indicator) –** Insufficient data to assign to an indicator category.

CRITICAL AREA CONCLUSIONS

WDFW Priority Habitat

Eleven individual Oregon white oak trees were identified onsite or immediately offsite and numbered by the tree survey, Appendix C.. Three oaks with over 20-inch dbhs were documented onsite north of the existing barn (Oak #s 14, 15, and 16). Two non-jurisdictional oaks are located centrally onsite (Oak #s 27 and 32). Three oaks are located along parcel boundaries with partial canopies encroaching into the subject parcel (Oak #s 76, 79, and 126). The remaining three oaks identified were determined to be entirely offsite (Oak #s 31, 38, and 127). See Figure 4 and Appendix C. Six of the oak trees inventoried by the tree survey are jurisdictional and meet the WDFW criteria for "individual oak" Priority Habitats as they are have dbh measurements of 20-inches or larger. Oregon white oak Priority Habitat is protected by WDFW and also jurisdictional under the local CMC habitat code. The understory and herbaceous layer associated with the onsite oak habitat is highly disturbed due to grazing or dominated by Himalayan blackberry.

Habitats of Local Importance

Six Oregon white oak trees identified as onsite or immediately offsite (Oak #s 14, 15, 16, 31, 38, and 76) are over 20-inches dbh and therefore meet the criteria listed under CMC 16.61.010.A.3.a that defines Oregon white oak habitat of local importance:

i. Individual Oregon White Oak trees with a twenty-inch diameter at breast height (twenty inches dbh).
ii. Stands of Oregon White Oak trees greater than one acre, when they are found to be valuable to fish and wildlife (i.e., may include trees with cavities, large diameter breast height (twelve inches dbh), are used by priority species, or have a large canopy.
iii. All Oregon White Oak snags unless determined by an arborist to be a hazard.

However, only four of the above six trees are located onsite or have driplines that extend onsite, Figure 4. The project proposes the removal of three of these jurisdictional Oregon white oak trees (Oaks #14, 15,

and 16). Therefore, mitigation to offset the removal of these jurisdictional trees under CMC is required. The following mitigation plan section details the mitigation measures proposed.

Table 1. Oregon White Oak Summary.

Oak Tree #	DBH	On-Site	Jurisdictional per WDFW PHS &/or CMC Local Habitatsof Importance Criteria *(Individual oak tree >20" dbh)*	Proposed for Removal	Requires Mitigation
14	**20"**	**YES**	**YES**	**YES**	**YES**
15	**36"**	**YES**	**YES**	**YES**	**YES**
16	**30"**	**YES**	**YES**	**YES**	**YES**
27	10" (dead)	YES	NO[1] (hazard tree)	YES	NO
31	21"	NO	YES	NO	NO
32	10"	YES	N/A[2] (see note)	NO	NO
38	30"	NO	YES	NO	NO
76	20"	YES (dripline)	YES	NO	NO
79	19"	YES (dripline)	NO	NO	NO
126	14"	YES (partial)	NO	NO	NO
127	14"	NO	NO	NO	NO
Tree #					
39	20'	YES	NO[3]	YES	NO

[1]This oak was noted by the arborist to have >90% dieback, is leaning, and has a poor taper. Due to proposed construction, grading requirements where it is located, and the condition of the tree, it meets hazard tree criteria. According to CMC 16.61.010.A.3.a.iii. Hazard oak snags are not jurisdictional or considered oak habitat of local importance.

[2] This oak "tree" consists of a trunk cut just above the ground surface with suckered "co-dominant growth, and was noted to be in poor condition with cracks, visible decay" by the arborist report. The trunk is located directly on the southern boundary of the BPA utility easement onsite. Therefore, it is assumed that the tree canopy historically extended into the overhead powerline easement and it has been historically cut under standard maintenance activities implemented by BPA.

[3]Tree #39 is an on-site snag determined to be an apple tree species by the arborist/tree survey. This snag is 20 inches in DBH and does not meet the WDFW definition for Priority Habitat (which requires it to be > 20-inches dbh). The snag is non-jurisdictional and does not require mitigation for its removal.

MITIGATION PLAN

The below mitigation plan was developed following Camas Municipal Code (CMC) Section 16.61 Fish and Wildlife Habitat Conservation Areas. The project will offset the impacts proposed to allow for no net loss of habitat functions onsite.

The proposed subdivision will retain and protect three Oregon white oak trees present along western, southern, and eastern parcel boundaries. The three jurisdictional Oregon white oak located within the northern portion of the subject site will be removed (Oak #s 14, 15, and 16).

Avoidance and Minimization

The project has been designed to avoid direct impacts to three Oregon white oak trees with driplines present onsite (Oak #s 126, 76, and 79). These three trees are located along the property lines and have critical root zones that extend into the subject parcel. The dripline of each tree will be located, staked, and fenced prior to construction to protect them during grading and site construction.

Oak #32 consists of a trunk cut just above the ground surface with suckered "co-dominant growth, and was noted to be in poor condition with cracks, visible decay" by the arborist report, Appendix C. The trunk is located directly on the southern boundary of the BPA utility easement onsite. Therefore, it is assumed that the tree canopy historically extended into the overhead powerline easement and it has been cut under standard maintenance activities implemented by BPA. The largest stem of the new growth is 10-inches. This oak is considered non-jurisdictional and does not require mitigation.

Oak # 27 was noted by the arborist to have >90% dieback, is leaning, and has a poor taper. Due to proposed construction, grading requirements where it is located, and the condition of the tree, it meets hazard tree criteria, Appendix C. According to CMC 16.61.010.A.3.a.iii. Hazard oak snags are not jurisdictional or considered oak habitat of local importance. It is proposed for removal and does not require mitigation.

Jurisdictional Oak #s 15, and 16 are located within the proposed site access road and sidewalk. Alternate access road options into the subdivision were proposed by the applicant, but the City has required that the proposed access be located directly south of the existing North Hargrave Street and NE 28th Street intersection. Oak # 14 is within the construction limits of the northwestern lots making avoidance infeasible. Three feet of fill is required within this area by the grading plan. This amount of fill would be detrimental to the health of the tree, with mortality in the near future imminent. Therefore, removal of Oak #14 is also proposed. These three oaks are individual trees (not part of a larger oak grove/woodland) and are located within the northern section of the subject parcel, just north of the existing barn.

The majority of the subject parcel is historically disturbed due to horse grazing. Little native habitat in good health exists onsite. There is no native understory present within the area of the three oaks proposed for removal. The project will take advantage of these disturbed areas within the subject site, and no significant habitat outside of Oaks #14, 15, and 16 will be impacted.

Oregon White Oak Impacts and Mitigation

Three jurisdictional Oregon white oaks (Oak #s 14, 15, and 16, over 20-inch dbh) will be removed by the proposed project. According to CMC Section 16.51.125(B) jurisdictional Oregon white oak trees removed are to be mitigated for at a ratio of 2:1 with the mitigation tree stock 2-inches in caliper size. The project proposes to mitigate for the removal of the three (3) oaks by installing six (6) Oregon white oak trees of 2-inch caliper size within project limits, see Figure 5. These spaces are open and will offer plenty of sunlight and adequate area for future canopy growth post project completion. Protection will be put in place around the perimeter of the oak planting area during site grading and construction activities and after.

Oak #s 126, 76 and 79 within the south section of the property will be retained. The project will not impact the root system or damage these trees. The dripline of all three oaks will be located, staked, and fenced prior to site grading and construction activities. Compensatory measures will need to be implemented if during construction the critical root mass of the trees are impacted.

The mitigation proposed will offset the Oregon white oak Priority Habitat impacts onsite for no net loss of priority function or area following the CMC guidelines.

Table 2. Oak Impacts & Mitigation Summary.

Oak Label	Impact	Mitigation
Oak #s 14, 15, and 26	Oregon White Oak (over 20-inch dbh)	Oregon white oak installed onsite at a 2:1 Ratio (Two, 2-inch Caliper Oaks)

PLANTING PLAN

Site Preparation

1. Demarcate the on-site "Protected Oak Habitat" (Oregon white oak retention and mitigation area boundaries) and install tree protection fencing along the proposed planting areas and the perimeter of the existing oak canopy dripline, See Figure 4.
2. Maintain this tree protective fencing for the full duration of the project construction.
3. Mow grasses, herbaceous vegetation and invasive species present within mitigation areas prior to tree installation.

   Note: Excavation, fill or compaction of the native soils is not to take place within the protected oak habitat. No lawn or ornamental landscaping is to be located within the protected oak habitat.

Planting Methods

Plant in fall through early spring (October-April) at specified spacing following the planting plan.
Container/Ball and Burlap Stock

1. Dig hole using a tree shovel/auger/mini-excavator or comparable tool 16-inches wide and 4-inches deeper than the root system, scarify sides of hole to 4-inches. Remove plant from container and loosen roots with hand or score vertically on sides and bottom with knife. Set plant upright and plumb in hole so the crown is just above the finish grade. Ensure that roots are extended down entirely and do not bend upward.
2. Replace loose soil around plant and firmly compact the soil around the plant to eliminate air spaces. Do not use frozen soil for backfilling.
3. Firmly compact the soil around the planted species to eliminate air spaces.
4. Install woody mulch around the base of planted and retained Oregon white oak trees to insulate plantings, maintain moisture content of soil and reduce invasive plant competition.
5. Irrigate according to performance standards for the first three summers after planting or as site and weather conditions warrant.

Planting Specifications

Planting will begin in Winter/Spring of 2023 while onsite soils are more saturated (and stock is dormant). The following tables summarize the native plant selection, spacing, size, and quantity for the on-site mitigation area:

Table 3. Mitigation Planting Plan.

Common Name	*Scientific Name*	*Stock*	*Spacing*	*Quantity*
Oregon White Oak, FACU	*Quercus garryana*	2-inch caliper	20 ft.	6

Protective Signage
Post construction, install permanent signs along the boundary of a "Protected Oak Habitat" meeting city standards or conditions outlined under the permit. See Objective 3, Performance Standard 3b below.

Maintenance Plan
Maintenance at the on-site mitigation area covers a minimum of 5-years and will involve removing persisting invasive plant species in addition to watering and re-installing failed species as necessary. The maintenance will include the following activities when necessary:

1. Remove and control non-native/noxious vegetation around all newly installed plants. During years 1 through 5 invasive species will be removed and suppressed as often as necessary to meet a performance standard of no greater than 20 percent cover by invasive species, measured by monitoring plots.
2. Irrigate planted species as necessary during the dry season, approximately July 1 through October 15. Irrigation is recommended to occur on a two-week cycle (minimum) during the dry season for the first three years. Water will be provided by a temporary above-ground irrigation system or a water truck.
3. Replace dead or failed plants as described for the original installation to meet the minimum annual performance standard of 100% survival over the 5-year monitoring period.

Monitoring Plan
The mitigation site will be monitored for a 5-year period following project construction; monitoring will take place in years 1, 2, 3 and 5. Monitoring reports will be submitted to the City of Camas by the end of each monitored year. The goal of monitoring is to determine if the previously stated performance standards are being met. The mitigation area will be monitored once during the growing season, preferably during the same two-week period each year to better compare the data.

During the first annual monitoring and maintenance event, two representative photo plots will be selected in the mitigation area permanently marked with metal posts. Monitoring photo plot locations will be placed on an as-built drawing and included in the annual monitoring reports.

<u>Monitoring Report Contents</u>
The annual monitoring reports will contain at least the following:

- Location map and as-built drawing of Oregon white oak mitigation and retention areas.
- Photographs from permanent photo points (x2 minimum).
- Historic description of project, including dates of Oregon white oak tree installation, current year of monitoring, and restatement of mitigation goal.
- Documentation of plant survival, cover, and overall development of the plant community.
- Assessment of non-native, invasive plant species and recommendations for management.
- Summary of maintenance and contingency measures proposed for the next season and completed for the past season.

Contingency Plan
If the performance standards are not met by the fifth year following project completion, or at an earlier time if specified above, a contingency plan will be developed and implemented. All contingency actions will be undertaken only after consulting and gaining approval from the City of Camas. The applicant will be required to complete a contingency plan that describes (1) the causes of failure, (2) proposed corrective

actions, (3) a schedule for completing corrective actions, and (4) whether additional maintenance and monitoring are necessary.

Site Protection

The on-site mitigation area will be owned and managed by the applicant or assignee. AshEco Solutions, LLC or similar entity will be responsible for supervising the maintenance and conducting the monitoring of the on-site mitigation area for the 5-year period at expense of the applicant. The applicant will establish and record a permanent and irrevocable conservation covenant on the mitigation property.

MITIGATION GOALS, OBJECTIVES AND PERFORMANCE STANDARDS

The mitigation goal of protecting the onsite Oregon white oak habitat for no net loss of functional habitat onsite will be met when the below objectives and performance standards are met.

Objective 1: Replace the loss of three jurisdictional Oregon white oak trees with six large stock (2-inch caliper) Oregon white oak trees onsite.

Performance Standard 1a. Document the installation of the native Oregon white oak trees as specified by Table 3. Submit As-built documenting planting locations, plant species, and plant quantities.

Performance Standard 1b. In Years 1-5, planted species are to achieve 100 percent (100%) survival after the site is planted. (If dead plants are replaced to achieve the 100 percent survival rate, this performance standard will be met).

Performance Standard 1c. In All Years, non-native/invasive plant species will not exceed 20-percent (20%) aerial cover across the onsite mitigation area.

Objective 2: Retain and provide long-term protection for Oak #s 126, 76, and 79.

Performance Standard 2a. Document the installation of tree protection fencing around Oak #s 126, 76, and 79 before construction begins onsite.

Performance Standard 2b. Document the installation of mulch and other soil amendments/BMPs post construction activities.

Objective 3: Provide long-term protection for the onsite mitigation area.

Performance Standard 3a. Record a conservation covenant with the City of Camas. This performance standard will be met when the Year 1 monitoring report is submitted that includes a copy of the conservation covenant.

Performance Standard 3b. Post permanent signage along the outer boundaries of the "Protected Oak Habitat" (oak mitigation and retention areas) *or as otherwise determined by the City of Camas permit conditions*. Signs are to read:

"Critical Area– Please Retain in a Natural State"

Signage will remain in legible condition; if they are missing or illegible, they will be replaced. This performance standard will be met when signs are reported to be in place in the final monitoring report.

CONCLUSIONS

The above sections outline how the proposed project will meet the Habitat Conservation Areas requirements of the CMC. All but three of the Oregon White Oaks trees will be retained. The oaks proposed for removal (Oak #s 14, 15, and 16) will be mitigated for onsite for no net loss of Oregon white oak habitat following CMC guidance and criteria. With issuance of the approved critical areas permits, the proposed Oregon white oak mitigation plantings will be implemented, and a conservation covenant recorded to protect the onsite critical areas under the applicant's ownership in perpetuity.

DISCLAIMER

This report documents the investigation, best professional judgment, and conclusions of the investigator. It is correct and complete to the best of our knowledge. It should be considered a preliminary mitigation plan and used at your own risk until it has been reviewed and approved in writing by the local agency with jurisdiction over the site. AES personnel base the above listed conclusions on standard scientific methodology and best professional judgment.

REFERENCES

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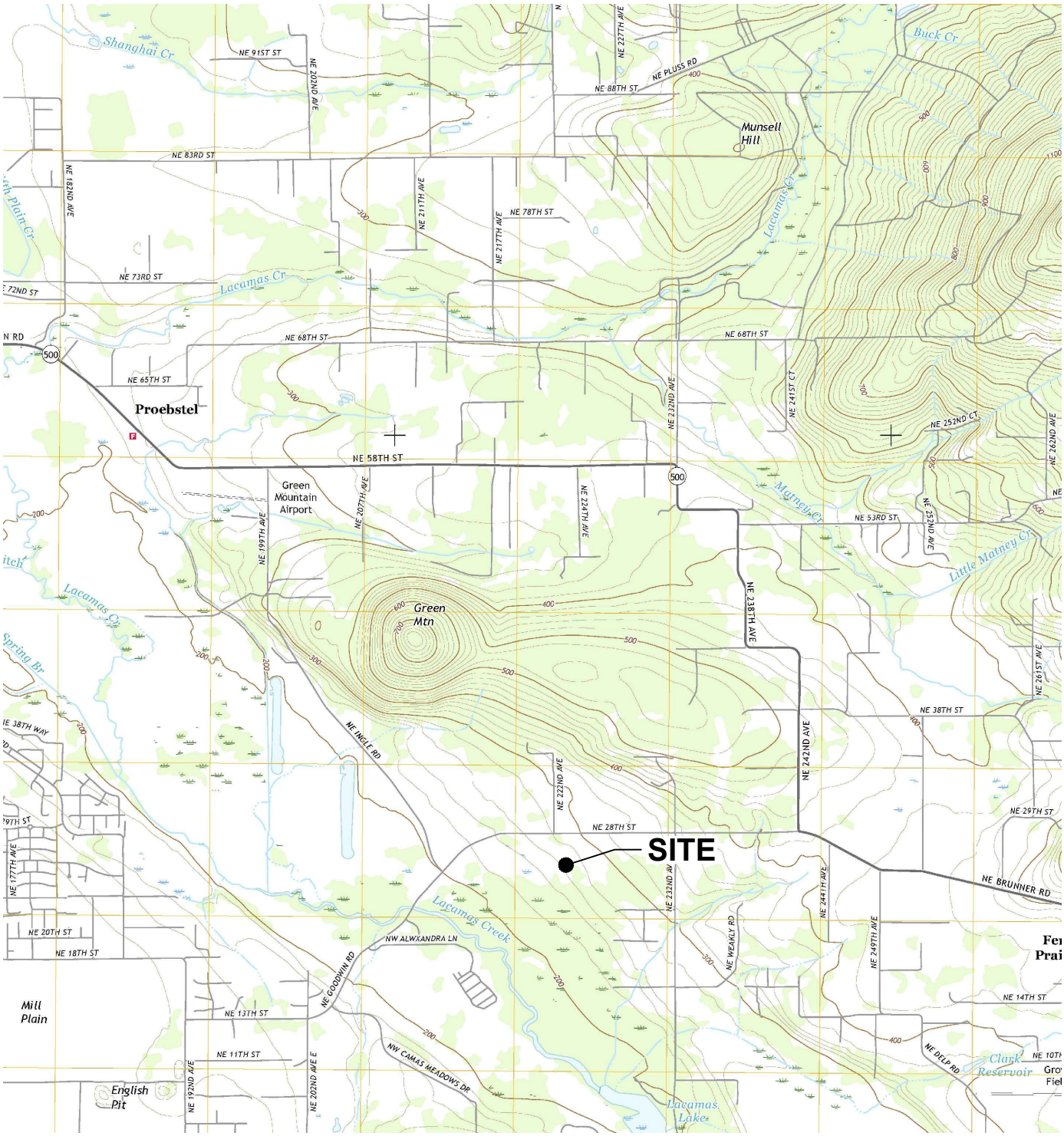

NOTE(S):
USGS, LACAMAS CREEK QUADRANGLE
WASHINGTON-CLARK CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)

PURPOSE: XX Line 1 Line 2 **DATUM:** NAVD 88 **ADJACENT PROPERTY OWNERS:** Adj 1 Adj 2	VICINITY MAP **APPLICANT:** Pacific Lifestyle Homes **PROJECT NAME:** Critical Areas Feasibility Map **PARCEL #:** 173184000 **SITE LOCATION ADDRESS:** 22205 NE 28th St.	**PROPOSED:** Monte Verde Subdivision **IN:** Camas **NEAR:** Lacamas Creek **COUNTY:** Clark **STATE:** WA **FIGURE:** 1 **DATE:** 7-8-22

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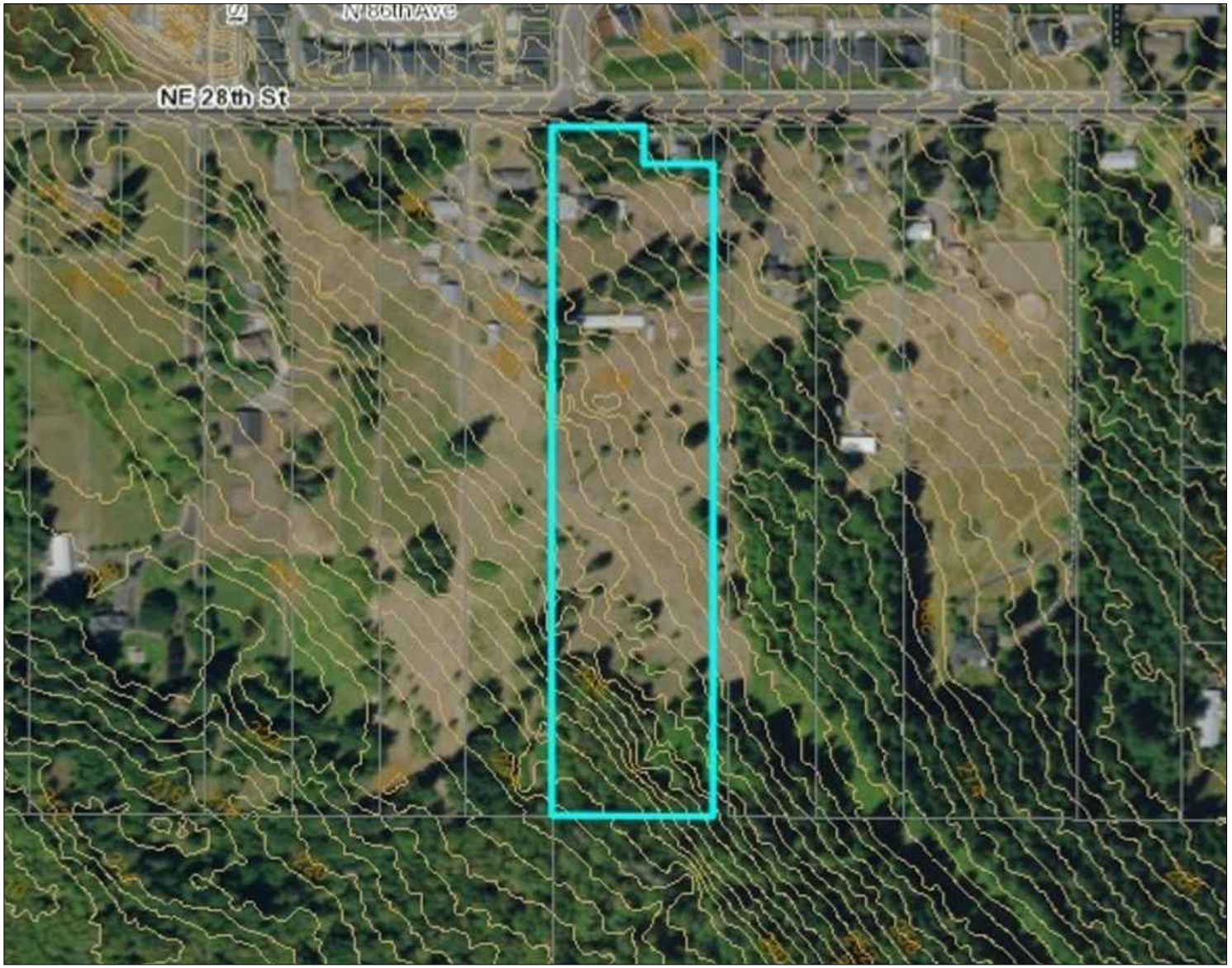

Legend

- Taxlots
- Contours Lines - 2 ft
- All Roads
  - Interstate
  - State Route
  - Arterial
  - Forest Arterial
  - Minor Collector
  - Forest Collector
  - Private or Other
- Cities Boundaries
- Urban Growth Boundaries

N

0 300 600

SCALE IN FEET
1" = 300'

Ash ECO SOLUTIONS, LLC

PURPOSE: XX
Line 1
Line 2
DATUM: NAVD 88
ADJACENT PROPERTY OWNERS:
Adj 1
Adj 2

AERIAL PHOTO & TOPO MAP

APPLICANT: Pacific Lifestyle Homes
PROJECT NAME: Critical Areas Feasibility Map
PARCEL #: 173184000
SITE LOCATION ADDRESS:
22205 NE 28th St.

PROPOSED: Monte Verde Subdivision
IN: Camas
NEAR: Lacamas Creek
COUNTY: Clark **STATE:** WA
FIGURE: 2
DATE: 3-1-22

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Legend

- Taxlots
- Soil Type
- Hydric Soils
- NWI Wetland
- All Roads
  - Interstate
  - State Route
  - Arterial
  - Forest Arterial
  - Minor Collector
  - Forest Collector
  - Private or Other

LgB - Lauren gravelly loam, 0-8% slopes. Non-hydric

LeB - Lauren loam, 0-8% slopes. Non hydric

N

0 300 600

SCALE IN FEET
1" = 300'

Ash ECO SOLUTIONS, LLC

PURPOSE: XX
Line 1
Line 2
DATUM: NAVD 88
ADJACENT PROPERTY OWNERS:
Adj 1
Adj 2

AERIAL PHOTO & TOPO MAP

APPLICANT: Pacific Lifestyle Homes
PROJECT NAME: Critical Areas Feasibility Map
PARCEL #: 173184000
SITE LOCATION ADDRESS:
22205 NE 28th St.

PROPOSED: Monte Verde Subdivision
IN: Camas
NEAR: Lacamas Creek
COUNTY: Clark **STATE:** WA
FIGURE: 3
DATE: 3-1-22

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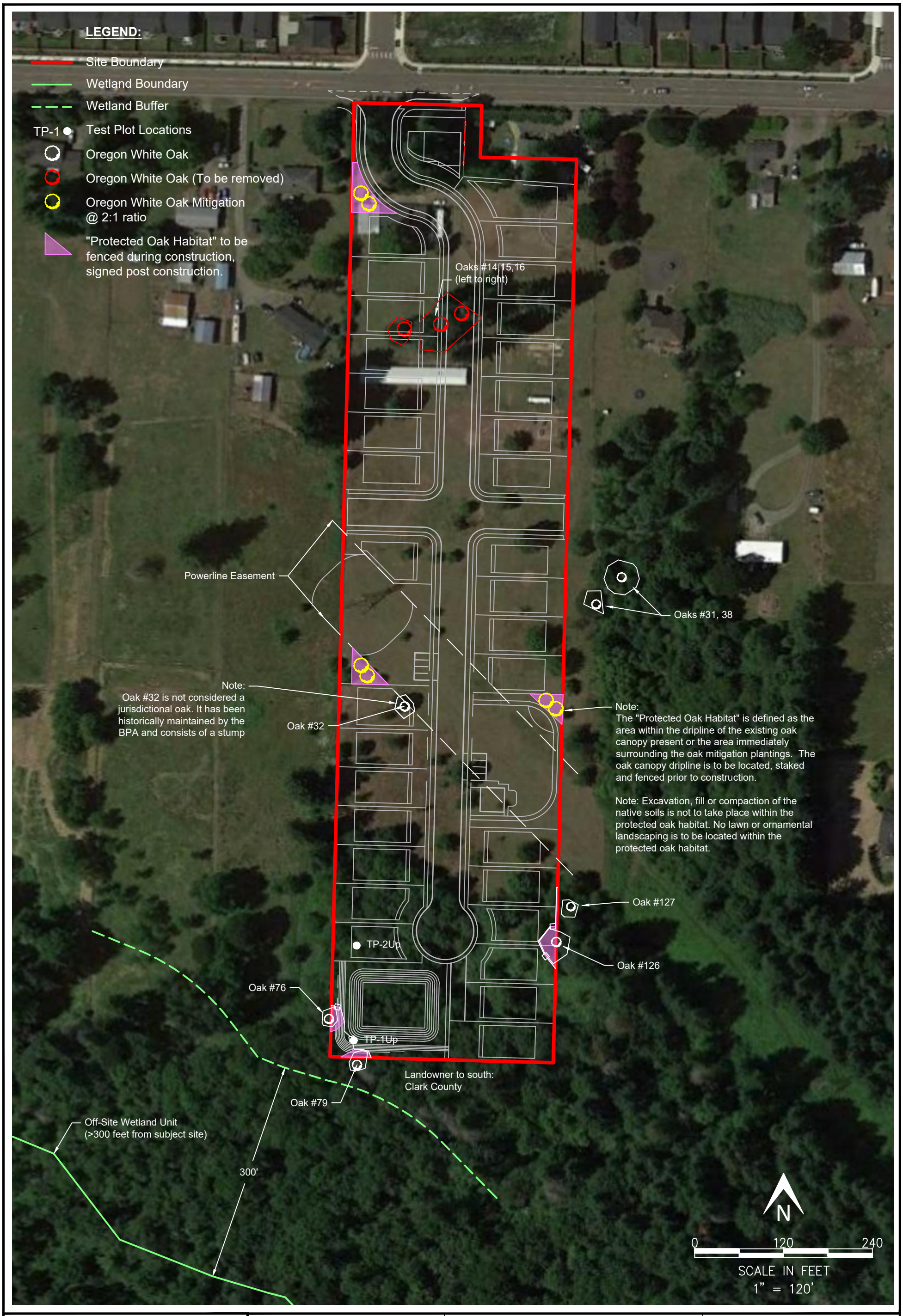

Ash ECO SOLUTIONS, LLC	**PURPOSE:** XX Line 1 Line 2 **DATUM:** NAVD 88 **ADJACENT PROPERTY OWNERS:** Adj 1 Adj 2	EXISTING CONDITIONS AND PROPOSED SITE PLAN **APPLICANT:** Pacific Lifestyle Homes **PROJECT NAME:** Critical Areas Feasibility Map **PARCEL #:** 173184000 **SITE LOCATION ADDRESS:** 22205 NE 28th St.	**PROPOSED:** Monte Verde Subdivision **IN:** Camas **NEAR:** XX **COUNTY:** Clark **STATE:** WA **FIGURE:** 4 **DATE:** 6-28-22

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Appendix A

Site Photos

Monte Verde CAR & Oregon White Oak Mitigation Plan- Site Photos
Parcel: 173184000

Photo 1.
February 22, 2022 – View of the northwest corner of the subject site and the proposed site access from NE 28th Street. The three oaks (#s 14, 15, and 16) which will be removed are located just north of the white shed visible in this photo.

Photo 2.
February 22, 2022 – View south across the subject site. The site is highly impacted from years of animal grazing. Few native trees are present within the central portion of the property and it is dominated by grazed herbaceous cover.

Photo 3.
February 22, 2022 – View north across the central area of the subject site. Few native trees are present within the central portion of the property and there is no understory due to grazing. An overhead powerline tower located within the powerline easement onsite is visible at far right in this photo.

Monte Verde CAR & Oregon White Oak Mitigation Plan- Site Photos
Parcel: 173184000

Photo 4.
February 22, 2022 – View north from the southwest corner of the property. The area is forested, but with little native understory or herbaceous layer due to grazing. Oak #76 is visible in this photo along the western parcel boundary. This tree will be retained and protected.

Photo 5.
February 22, 2022 – View east from the southwest corner of the property. The area is highly disturbed due to animal grazing. Test plot #1 was within this location. The area was determined to be an upland with non-hydric soils and no hydrology indicators.

Photo 6.
February 22, 2022 – Photo of the offsite wetland over 300-feet south of the subject parcel. The county owned property located south of the subject property is more biologically diverse and dominated in native vegetation.

Photo 7.
February 22, 2022 – View of Oak #127 along the eastern parcel boundary. The 3-trunk Oregon white oak is just offsite and will be retained.

Photo 8.
February 22, 2022 – View of Oak #126 along the eastern parcel boundary. The 3-trunk Oregon white oak will be retained and protected.

Appendix B

Test Plot Datasheets

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys and Coast Region

Project/Site: Monte Verde Subdivision City/County: Clark Sampling Date: 2/22/2022
Applicant/Owner: Pacific Lifestyle Homes State: WA Sampling Point: TP-1
Investigator(s): Andrea Aberle Section, Township, Range: SW 1/4, S21, T2N, R3E
Landform (hillslope, terrace, etc.): terrace Local relief: Concave Slope (%): 2%
Subregion (LRR): LRR A Lat: 45.640939 Long: 122.444567 Datum: NAD 83
Soil Map Unit Name: Hydric / CvA, Non-Hydric / LeB, Non-Hydric / LgB NWI classification: PFOA - South of subject site
Are climatic / hydrologic conditions on the site typical for this time of year? Yes☒ No☐ (If no, explain Remarks.)
Are Vegetation ☒, Soil☐, or Hydrology☐ significantly disturbed? Are "Normal Circumstances" present? Yes☒ No☐
Are Vegetation ☐, Soil☐, or Hydrology☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐ No ☒	**Is the Sampled Area**
Hydric Soils Present?	Yes ☐ No ☒	**within a Wetland?** **Yes☐ No☒**
Wetland Hydrology Present?	Yes ☐ No ☒	

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Fraxinus latifolia*	50%	yes	FACW
2. *Acer macrophyllum*	10%	no	FACU
3. *Quercus garryana*	5%	no	FACU
4.	%		
Total Cover:	65%		
Sapling/Shrub Stratum			
1. *Symphoricarpos albus*	25%	yes	FACU
2. *Corylus cornuta*	10%	yes	FACU
3. *Acer circinatum*	5%	yes	FAC
4.	%		
5.	%		
Total Cover:	40%		
Herb Stratum			
1. *Tolmiea menziesii*	15%	yes	FAC
2. *Rubus ursinus*	5%	yes	FACU
3.	%		
4.	%		
5.	%		
6.	%		
7.	%		
8.	%		
Total Cover:	20%		
Woody Vine Stratum			
1.	%		
2.	%		
Total Cover:	%		

% Bare Ground in Herb Stratum 80%

Dominance Test Worksheet

Number of Dominant Species That Are OBL, FACW, or FAC: **3** (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC 50% (A/B)

Prevalence Index worksheet

Total % Cover of:		Multiply by:	
OBL species		x 1=	
FACW species	50	x 2=	100
FAC species	20	x 3=	60
FACU species	55	x 4=	220
UPL species		x 5=	
Column Totals:	125 (A)		380 (B)

Prevalence Index = B/A= 3.04

Hydrophytic Vegetation Indicators:

- ☐ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Providing supporting data In Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes☐ No☒**

Remarks:

SOIL

Sampling Point: TP-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 3/1	100%		%			L	
12-16	10YR 4/2	98%	10YR 4/6	2%	C	PL	L	
		%		%				
		%		%				
		%		%				
		%		%				
		%		%				
		%		%				

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosal
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Minerals (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present

Restrictive Layer (if present):

Type: _____

Depth (inches):_____

Hydric Soil Present? Yes☐ No☒

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9) (**except NW coast**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizoshperes along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Stained Leaves
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D2)
- ☐ Frost-Heave Hummocks (D4)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (Inches): _____

Water Table Present? Yes ☐ No ☒ Depth (Inches): _____

Saturation Present? Yes ☐ No ☒ Depth (Inches): _____

(Includes capillary fringe)

Wetland Hydrology Present? Yes ☐ No ☒

Describe Recorded Data (Stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

The three wetland criteria have NOT been met.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys and Coast Region

Project/Site: Monte Verde Subdivision City/County: Clark Sampling Date: 2/22/2022
Applicant/Owner: Pacific Lifestyle Homes State: WA Sampling Point: TP-2
Investigator(s): Andrea Aberle Section, Township, Range: SW 1/4, S21, T2N, R3E
Landform (hillslope, terrace, etc.): terrace Local relief: Concave Slope (%): 2%
Subregion (LRR): LRR A Lat: 45.640939 Long: 122.444567 Datum: NAD 83
Soil Map Unit Name: Hydric / CvA, Non-Hydric / LeB, Non-Hydric / LgB NWI classification: PFOA - South of subject site
Are climatic / hydrologic conditions on the site typical for this time of year? Yes☒ No☐ (If no, explain Remarks.)
Are Vegetation ☒, Soil☐, or Hydrology☐ significantly disturbed? Are "Normal Circumstances" present? Yes☒ No☐
Are Vegetation ☐, Soil☐, or Hydrology☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☒ No ☐	**Is the Sampled Area**
Hydric Soils Present?	Yes ☐ No ☒	**within a Wetland?** **Yes☐ No☒**
Wetland Hydrology Present?	Yes ☐ No ☒	

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Fraxinus latifolia*	50%	yes	FACW
2.	%		
3.	%		
4.	%		
Total Cover:	50%		
Sapling/Shrub Stratum			
1. *Symphoricarpos albus*	20%	yes	FACU
2. *Malus fusca*	15%	yes	FACW
3. *Corylus cornuta*	5%	yes	FACU
4. *Salix sitchensis*	5%	yes	FACW
5.	%		
Total Cover:	45%		
Herb Stratum			
1. *Tolmiea menziesii*	10%	yes	FAC
2.	%		
3.	%		
4.	%		
5.	%		
6.	%		
7.	%		
8.	%		
Total Cover:	10%		
Woody Vine Stratum			
1. *Rubus armeniacus*	20%	yes	FAC
2.	%		
Total Cover:	20%		

% Bare Ground in Herb Stratum 70%

Dominance Test Worksheet

Number of Dominant Species That Are OBL, FACW, or FAC: **5** (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 71% (A/B)

Prevalence Index worksheet

Total % Cover of:	Multiply by:
OBL species	x 1=
FACW species	x 2=
FAC species	x 3=
FACU species	x 4=
UPL species	x 5=
Column Totals: (A)	(B)

Prevalence Index = B/A=

Hydrophytic Vegetation Indicators:

- ☒ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Providing supporting data In Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes☒ No☐**

Remarks:

SOIL

Sampling Point: TP-2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 2/2	100%		%			L	
10-16	10YR 3/2	100%		%			L	
		%		%				
		%		%				
		%		%				
		%		%				
		%		%				
		%		%				

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosal
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Minerals (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present

Restrictive Layer (if present):

Type: _____

Depth (inches):_____

Hydric Soil Present? Yes☐ No☒

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9) (**except NW coast**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizoshperes along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Stained Leaves
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D2)
- ☐ Frost-Heave Hummocks (D4)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (Inches): _____

Water Table Present? Yes ☐ No ☒ Depth (Inches): _____

Saturation Present? Yes ☐ No ☒ Depth (Inches): _____

(Includes capillary fringe)

Wetland Hydrology Present? Yes ☐ No ☒

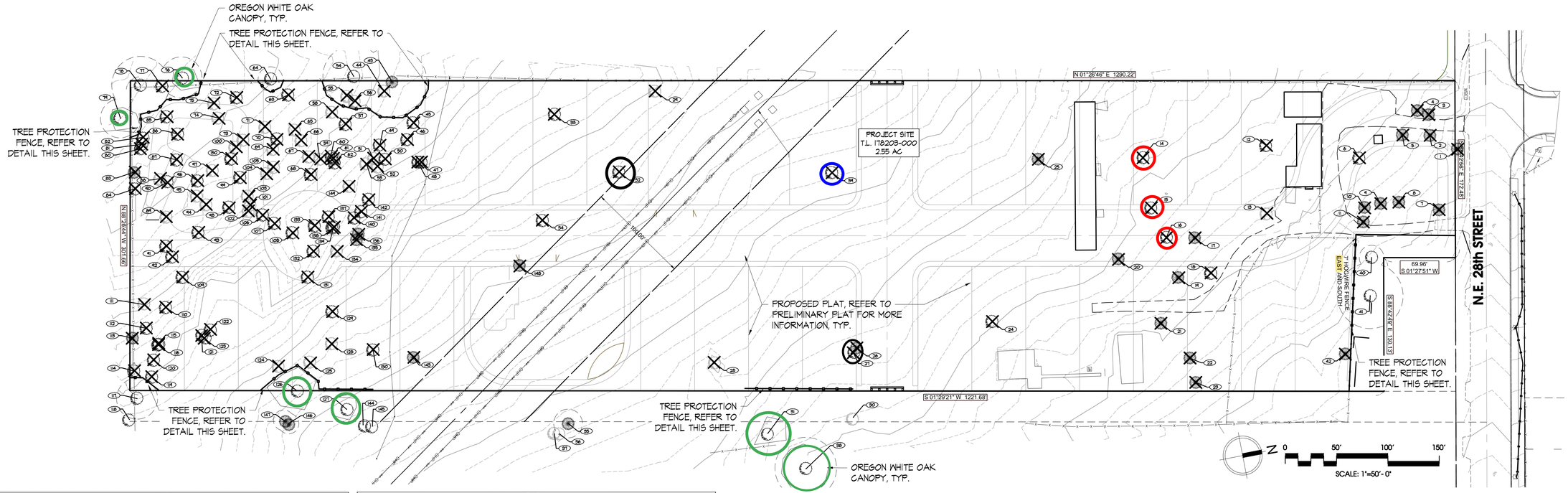
Describe Recorded Data (Stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

The three wetland criteria have NOT been met.

Appendix C

Tree Survey



Tree Data							
Tree No.	Species	DBH	RPZ	Tree Condition	Retain (R) Remove (X)	Units (retained only)	Condition Notes
1	Pseudotsuga menziesii (Douglas Fir)	11"	11'	poor	X		Branches Suppressed
2	Pseudotsuga menziesii (Douglas Fir)	43"	43'	fair	X		
3	Pseudotsuga menziesii (Douglas Fir)	42"	42'	fair	X		
4	Pseudotsuga menziesii (Douglas Fir)	36"	36'	fair	X		
5	Pseudotsuga menziesii (Douglas Fir)	44'	44'	fair	X		
6	Acer saccharinum (Silver Maple)	22"	22'	fair	X		
7	Pseudotsuga menziesii (Douglas Fir)	36"	36'	fair	X		
8	Pseudotsuga menziesii (Douglas Fir)	44'	44'	fair	X		
9	Pseudotsuga menziesii (Douglas Fir)	29"	29'	fair	X		
10	Pseudotsuga menziesii (Douglas Fir)	26"	26'	fair	X		
11	Pseudotsuga menziesii (Douglas Fir)	36"	36'	fair	X		
12	Ailanthus altissima (Tree-Of-Heaven)	34"	34'	fair	X		
13	Crataegus douglasii (Douglas Hawthorn)	10"	10'	poor	X		Co-dominant
14	Quercus garryana (Oregon White Oak)	20"	20'	fair	X		
15	Quercus garryana (Oregon White Oak)	36"	36'	fair	X		
16	Quercus garryana (Oregon White Oak)	30"	30'	fair	X		
17	Pseudotsuga menziesii (Douglas Fir)	38"	38'	fair	X		
18	Alnus rubra (Red Alder)	25"	25'	poor	X		Deback 30% - 60%, Leaning
19	Pseudotsuga menziesii (Douglas Fir)	42"	42'	fair	X		
20	Pseudotsuga menziesii (Douglas Fir)	36"	36'	fair	X		
21	Pseudotsuga menziesii (Douglas Fir)	34"	34'	fair	X		
22	Pseudotsuga menziesii (Douglas Fir)	36"	36'	fair	X		
23	Pseudotsuga menziesii (Douglas Fir)	30"	30'	fair	X		
24	Prunus spp. (Apple)	18"	18'	fair	X		
25	Pseudotsuga menziesii (Douglas Fir)	20"	20'	fair	X		
26	Pseudotsuga menziesii (Douglas Fir)	16"	16'	fair	X		Co-dominant
27	Quercus garryana (Oregon White Oak)	14"	14'	dead	X		Deback ~90%, Leaning, Poor Taper
28	Prunus spp. (Apple)	10"	10'	fair	X		Co-dominant
29	Prunus spp. (Apple)	10"	10'	fair	X		Branch Failures, Co-dominant, Cracks, Leaning
30	Prunus spp. (Apple)	10"	10'	poor	X		Co-dominant, Deback 30% - 60%
31	Quercus garryana (Oregon White Oak)	21"	21'	fair	R	offsite	
32	Quercus garryana (Oregon White Oak)	10"	10'	poor	X		Co-dominant, Cracks, Visible Decay
33	Alnus rhombifolia (White Alder)	14"	14'	fair	X		Missing Bark, Poor Taper
34	Pyrus spp. (Apple)	25"	25'	poor	X		
35	Pseudotsuga menziesii (Douglas Fir)	14'	14'	fair	R	offsite	
36	Acer macrophyllum (Bigleaf Maple)	10"	10'	dead	R	offsite	
37	Acer macrophyllum (Bigleaf Maple)	10"	10'	dead	R	offsite	
38	Quercus garryana (Oregon White Oak)	10"	10'	fair	R	offsite	
39	Pyrus spp. (Apple)	20"	20'	dead	X		
40	Acer rubrum (Red Maple)	12"	12'	fair	R	offsite	Co-dominant
41	Acer rubrum (Red Maple)	32"	32'	fair	R	offsite	
42	Pseudotsuga menziesii (Douglas Fir)	30"	30'	fair	X		
43	Pseudotsuga menziesii (Douglas Fir)	34'	34'	fair	R	13	Deback 30% - 60%
44	Fraxinus latifolia (Oregon Ash)	10"	10'	poor	X		Co-dominant
45	Acer macrophyllum (Bigleaf Maple)	17"	17'	fair	X		
46	Acer macrophyllum (Bigleaf Maple)	17"	17'	poor	X		Deback 30% - 60%, Leaning
47	Frangula purshiana (Cascara)	12"	12'	poor	X		
48	Acer macrophyllum (Bigleaf Maple)	20"	20'	fair	X		Deback 30% - 60%
49	Acer macrophyllum (Bigleaf Maple)	17"	17'	poor	X		Leaning
50	Alnus rubra (Red Alder)	15"	15'	fair	X		
51	Alnus rubra (Red Alder)	10"	10'	poor	X		Co-dominant
52	Alnus rubra (Red Alder)	10"	10'	poor	X		Poor Taper
53	Alnus rubra (Red Alder)	8"	8'	poor	X		Co-dominant
54	Salix scouleriana (Scouler's Willow)	30"	30'	fair	R	offsite	
55	Fraxinus latifolia (Oregon Ash)	10"	10'	poor	X		Co-dominant
56	Fraxinus latifolia (Oregon Ash)	9"	9'	poor	X		Co-dominant, Leaning
57	Acer macrophyllum (Bigleaf Maple)	14'	14'	poor	X		Deback 30% - 60%
58	Acer macrophyllum (Bigleaf Maple)	9"	9'	poor	X		Deback 30% - 60%, Leaning
59	Acer macrophyllum (Bigleaf Maple)	8"	8'	poor	X		Co-dominant, Deback 30% - 60%
60	Acer macrophyllum (Bigleaf Maple)	13"	13'	poor	X		Co-dominant, Deback 30% - 60%, Overextended Branches
61	Acer macrophyllum (Bigleaf Maple)	12"	12'	poor	X		Co-dominant, Deback 30% - 60%
62	Acer macrophyllum (Bigleaf Maple)	14'	14'	poor	X		Co-dominant, Deback 30% - 60%
63	Acer macrophyllum (Bigleaf Maple)	34"	34'	poor	X		Deback 60%-90%
64	Salix scouleriana (Scouler's Willow)	12"	12'	poor	R	offsite	Deback 30% - 60%, Multi-Stemmed
65	Fraxinus latifolia (Oregon Ash)	10"	10'	poor	X		Deback 60%-90%
66	Fraxinus latifolia (Oregon Ash)	8"	8'	poor	X		Co-dominant, Deback 60%-90%
67	Acer macrophyllum (Bigleaf Maple)	8"	8'	poor	X		Co-dominant, Deback 60%-90%
68	Acer macrophyllum (Bigleaf Maple)	12"	12'	poor	X		Deback 30% - 60%, Multi-Stemmed, Overextended Branches
69	Fraxinus latifolia (Oregon Ash)	8"	8'	poor	X		Co-dominant, Deback 30% - 60%
70	Fraxinus latifolia (Oregon Ash)	12"	12'	poor	X		Deback 60%-90%
71	Fraxinus latifolia (Oregon Ash)	10"	10'	poor	X		Co-dominant
72	Fraxinus latifolia (Oregon Ash)	17"	17'	fair	X		Deback 30% - 60%
73	Fraxinus latifolia (Oregon Ash)	10"	10'	poor	X		Deback 30% - 60%, Poor Taper
74	Acer macrophyllum (Bigleaf Maple)	10"	10'	poor	X		Co-dominant
75	Acer macrophyllum (Bigleaf Maple)	11"	11'	poor	X		Branch Failures, Branches Suppressed, Deback 30% - 60%
76	Quercus garryana (Oregon White Oak)	20"	20'	fair	R	offsite	Deback 30% - 60%
77	Fraxinus latifolia (Oregon Ash)	26"	26'	poor	X		Deback 60%-90%, Missing Bark
78	Fraxinus latifolia (Oregon Ash)	28"	28'	fair	R	10	Deback 30% - 60%
79	Quercus garryana (Oregon White Oak)	19"	19'	fair	R	offsite	
80	Acer macrophyllum (Bigleaf Maple)	13"	13'	poor	X		Branches Suppressed, Deback 30% - 60%
81	Acer macrophyllum (Bigleaf Maple)	14'	14'	poor	X		Branches Suppressed, Deback 30% - 60%
82	Acer macrophyllum (Bigleaf Maple)	15"	15'	poor	X		Branches Suppressed, Deback 30% - 60%
83	Pseudotsuga menziesii (Douglas Fir)	28"	28'	fair	X		Branches Suppressed, Deback 30% - 60%
84	Acer macrophyllum (Bigleaf Maple)	24'	24'	poor	X		Branches Suppressed, Deback 30% - 60%, Leaning
85	Fraxinus latifolia (Oregon Ash)	15"	15'	fair	X		Branches Suppressed
86	Acer macrophyllum (Bigleaf Maple)	18"	18'	fair	X		Branches Suppressed, Deback 30% - 60%
87	Fraxinus latifolia (Oregon Ash)	12"	12'	poor	X		Deback 30% - 60%, Leaning
88	Acer macrophyllum (Bigleaf Maple)	10"	10'	poor	X		Co-dominant, Deback 30% - 60%
89	Acer macrophyllum (Bigleaf Maple)	10"	10'	poor	X		Deback 30% - 60%
90	Acer macrophyllum (Bigleaf Maple)	12"	12'	poor	X		
91	Acer macrophyllum (Bigleaf Maple)	12"	12'	poor	X		Branches Suppressed, Co-dominant
92	Acer macrophyllum (Bigleaf Maple)	14'	14'	fair	X		Co-dominant
93	Acer macrophyllum (Bigleaf Maple)	13"	13'	poor	X		Branches Suppressed, Deback 30% - 60%
94	Acer macrophyllum (Bigleaf Maple)	11"	11'	poor	X		Branches Suppressed, Deback 30% - 60%
95	Acer macrophyllum (Bigleaf Maple)	10"	10'	poor	X		Branches Suppressed, Deback 30% - 60%
96	Fraxinus latifolia (Oregon Ash)	12"	12'	poor	X		Co-dominant, Deback 30% - 60%
97	Fraxinus latifolia (Oregon Ash)	10"	10'	poor	X		Co-dominant, Deback 30% - 60%
98	Fraxinus latifolia (Oregon Ash)	12"	12'	fair	X		Co-dominant
99	Fraxinus latifolia (Oregon Ash)	12"	12'	fair	X		Branches Suppressed
100	Fraxinus latifolia (Oregon Ash)	8"	8'	poor	X		Co-dominant
101	Acer macrophyllum (Bigleaf Maple)	10"	10'	fair	X		Co-dominant
102	Acer macrophyllum (Bigleaf Maple)	8"	8'	fair	X		Co-dominant
103	Acer macrophyllum (Bigleaf Maple)	8"	8'	fair	X		Branches Suppressed, Co-dominant

Tree Data							
Tree No.	Species	DBH	RPZ	Tree Condition	Retain (R) Remove (X)	Units (retained only)	Condition Notes
104	Fraxinus latifolia (Oregon Ash)	8"	8'	poor	X		Branches Suppressed, Co-dominant
105	Fraxinus latifolia (Oregon Ash)	8"	8'	poor	X		Branch Failures, Branches Suppressed, Co-dominant, Dieback 30% - 60%
106	Acer macrophyllum (Bigleaf Maple)	12"	12'	poor	X		Branches Suppressed, Dieback 30% - 60%
107	Acer macrophyllum (Bigleaf Maple)	12"	12'	fair	X		
108	Fraxinus latifolia (Oregon Ash)	14'	14'	poor	X		Branch Failures, Co-dominant, Dieback 30% - 60%
109	Acer macrophyllum (Bigleaf Maple)	14'	14'	poor	X		Branch Failures, Co-dominant, Leaning
110	Fraxinus latifolia (Oregon Ash)	13"	13'	poor	X		Branch Failures, Branches Suppressed, Dieback 30% - 60%
111	Alnus rubra (Red Alder)	10"	10'	poor	X		Co-dominant, Leaning
112	Acer macrophyllum (Bigleaf Maple)	12"	12'	poor	X		Branches Suppressed, Leaning
113	Pseudotsuga menziesii (Douglas Fir)	14'	14'	poor	X		Branch Failures, Branches Suppressed, Deback 30% - 60%
114	Acer macrophyllum (Bigleaf Maple)	17"	17'	fair	X		Branches Suppressed, Deback 30% - 60%
115	Acer macrophyllum (Bigleaf Maple)	15'	15'	fair	X		Branches Suppressed, Deback 30% - 60%
116	Acer macrophyllum (Bigleaf Maple)	17"	17'	poor	X		Branch Failures, Branches Suppressed, Deback 30% - 60%
117	Acer macrophyllum (Bigleaf Maple)	20"	20'	fair	R	offsite	Dieback 30% - 60%
118	Acer macrophyllum (Bigleaf Maple)	12"	12'	poor	R	offsite	Co-dominant, Dieback 30% - 60%
119	Acer macrophyllum (Bigleaf Maple)	12"	12'	fair	X		Branches Suppressed, Dieback 30% - 60%
120	Acer macrophyllum (Bigleaf Maple)	12"	12'	poor	X		Branch Failures, Branches Suppressed, Deback 30% - 60%
121	Fraxinus latifolia (Oregon Ash)	12"	12'	poor	X		Branches Suppressed, Deback 30% - 60%, Heavy Leaning (>60%)
122	Fraxinus latifolia (Oregon Ash)	14'	14'	poor	X		Branch Failures, Co-dominant, Deback 30% - 60%
123	Fraxinus latifolia (Oregon Ash)	12"	12'	poor	X		Branches Suppressed, Co-dominant, Dieback 30% - 60%, Missing Bark
124	Acer macrophyllum (Bigleaf Maple)	10"	10'	fair	X		Dieback 30% - 60%
125	Acer macrophyllum (Bigleaf Maple)	10"	10'	fair	X		Dieback 30% - 60%
126	Quercus garryana (Oregon White Oak)	14"	14'	fair	R	1	Branch Failures, Co-dominant
127	Quercus garryana (Oregon White Oak)	14"	14'	fair	R	offsite	Co-dominant
128	Acer macrophyllum (Bigleaf Maple)	10"	10'	poor	X		Co-dominant, Dieback 30% - 60%
129	Acer macrophyllum (Bigleaf Maple)	12"	12'	fair	X		Co-dominant, Dieback 30% - 60%, Multi-Stemmed
130	Acer saccharum (Sugar Maple)	20"	20'	poor	X		Branch Failures, Deback 60%-90%, Missing Bark
131	Acer macrophyllum (Bigleaf Maple)	14'	14'	fair	X		Dieback 30% - 60%
132	Acer macrophyllum (Bigleaf Maple)	12"	12'	fair	X		
133	Acer macrophyllum (Bigleaf Maple)	12"	12'	fair	X		Branches Suppressed
134	Alnus rubra (Red Alder)	8"	8'	fair	X		Co-dominant
135	Pseudotsuga menziesii (Douglas Fir)	16'	16'	fair	X		Branches Suppressed
136	Pseudotsuga menziesii (Douglas Fir)	12"	12'	fair	X		Branches Suppressed
137	Acer macrophyllum (Bigleaf Maple)	12"	12'	fair	X		Branches Suppressed
138	Acer macrophyllum (Bigleaf Maple)	12"	12'	fair	X		Branches Suppressed
139	Acer macrophyllum (Bigleaf Maple)	12"	12'	fair	X		Branches Suppressed, Deback 30% - 60%
140	Acer macrophyllum (Bigleaf Maple)	12"	12'	fair	X		Branches Suppressed
141	Alnus rubra (Red Alder)	12"	12'	poor	X		Co-dominant, Deback 30% - 60%
142	Alnus rubra (Red Alder)	12"	12'	fair	X		Branches Suppressed
143	Pseudotsuga menziesii (Douglas Fir)	15'	15'	good	X		
144	Salix scouleriana (Scouler'S Willow)	13"	13'	poor	R	offsite	Branch Failures, Branches Suppressed, Deback 30% - 60%
145	Salix scouleriana (Scouler'S Willow)	13"	13'	poor	R	offsite	Co-dominant, Missing Bark, Multi-Stemmed
146	Pseudotsuga menziesii (Douglas Fir)	10"	10'	fair	R	offsite	
147	Pseudotsuga menziesii (Douglas Fir)	10"	10'	fair	R	offsite	
148	Pseudotsuga menziesii (Douglas Fir)	17"	17'	dead	X		Co-dominant
149	Fraxinus latifolia (Oregon Ash)	10"	10'	poor	X		Deback 30% - 60%
150	Acer macrophyllum (Bigleaf Maple)	17"	17'	poor	X		Deback 30% - 60%

AshEco Solutions Oregon White Oak Summary:

Tree #	DBH	Jurisdictional (20" DBH)	On-site	Proposed for Removal	Requires Mitigation
14	20"	YES	YES	YES	YES
15	36"	YES	YES	YES	YES
16	30"	YES	YES	YES	YES
27	10" (dead)	NO (hazard tree)	YES	YES	NO
31	21"	YES	NO	NO	NO
32	10"	N/A* (see note)	YES	NO	NO
38	30"	YES	NO	NO	NO
76	20"	YES	YES (dripline)	NO	NO
79	19"	NO	YES (dripline)	NO	NO
126	14"	NO	YES (partial)	NO	NO
127	14"	NO	NO	NO	NO

Note: Oak #32 consists of a trunk cut just above the ground surface with suckered "co-dominant growth, and was noted to be in poor condition with cracks, visible decay" by the arborist report. The trunk is located directly on the southern boundary of the BPA utility easement onsite. Therefore, it is assumed that the tree canopy historically extended into the overhead powerline easement and it has been cut under standard maintenance activities implemented by BPA.

Note: Oak #27 was noted by the arborist to have >90% dieback, is leaning, and has a poor taper. Due to proposed construction, grading requirements where it is located, and the condition of the tree, it meets hazard tree criteria. According to CMC 16.61.010.A.3.a.iii. Hazard oak snags are not jurisdictional or considered oak habitat of local importance.

Note: Tree #39 is considered a "snag", and was recorded as an apple tree species. This snag is 20 inches in DBH and does not meet the WDFW definition for Priority Habitat., as it needs to be > 20 inches The snag is non-jurisdictional and does not require mitigation for its removal.

SITE STATISTICS

8.84± AC	SITE AREA
177	TREE UNITS REQUIRED (20 / ACRE)
26	TREE UNITS RETAINED

SYMBOL LEGEND

SYMBOL	DESCRIPTION
	EXISTING SIGNIFICANT DECIDUOUS TREE (12" CAL. OR GREATER)
	EXISTING SIGNIFICANT EVERGREEN TREE (8" CAL. OR GREATER)
	EXISTING DECIDUOUS (LESS THAN 12" CAL.) TO BE REMOVED
	EXISTING SIGNIFICANT TREE TO BE REMOVED
	ROOT PROTECTION ZONE AREA (RPZ)
	TREE PROTECTION FENCE LOCATION (4' CHAIN LINK, ORANGE PVC FENCE OR SILT FENCE) (ALSO DENOTES AREA WHERE NO IMPACTS TO THE ROOT PROTECTION ZONE SHALL OCCUR). SEE DETAIL THIS SHEET.

TREE PROTECTION TIME LINE & NARRATIVE

EXISTING ON-SITE AND OFF-SITE TREE LOCATIONS AND SIZES HAVE BEEN OBTAINED VIA SURVEY INFORMATION AND SITE OBSERVATIONS.

129 EXISTING TREES WITHIN THE PROJECT BOUNDARIES ARE PROPOSED TO BE REMOVED DUE TO CONFLICTS WITH THE PROPOSED SITE GRADING.

TREE PROTECTION FENCING SHALL BE PLACED AS SHOWN TO PROTECT THE TREES TO BE RETAINED.

TREE PROTECTION / EROSION CONTROL FENCING SHALL BE ESTABLISHED PRIOR TO EXCAVATION. IT IS RECOMMENDED TO BE INSTALLED AT THE SAME TIME EROSION CONTROL MEASURES ARE INSTALLED. WHERE TREE FENCE AND EROSION CONTROL FENCE ARE LOCATED AT THE SAME LOCATION, EROSION FENCE THEN SERVES AS TREE PROTECTION FENCE. SEE DETAIL THIS SHEET.

TREES DETERMINED TO BE A SAFETY HAZARD AT THE TIME OF CONSTRUCTION MAY BE REMOVED. THE SITE WILL MAINTAIN A MINIMUM TREE UNIT COUNT OF 20 TREES PER ACRE IN ACCORDANCE WITH CITY OF CAMAS MUNICIPAL CODE CC 18.13.051.

TREE PROTECTION NOTES

1) NO PERSON MAY CONDUCT ANY OF THE FOLLOWING ACTIVITIES WITHIN THE DRIP LINE OF THE TREES DESIGNATED TO REMAIN INCLUDING, BUT NOT LIMITED TO: PARKING EQUIPMENT, FUELING, SERVICING EQUIPMENT, PLACING SOLVENTS, STORING BUILDING MATERIAL AND SOIL DEPOSITS, DUMPING CONCRETE WASHOUT AND LOCATING BURN HOLES.
2) DURING CONSTRUCTION, NO PERSON SHALL ATTACH ANY OBJECT TO THE TREES DESIGNATED FOR PROTECTION.
3) THE CONTRACTOR SHALL FOLLOW THE GRADING PLAN PROVIDED BY THE PROJECT CIVIL ENGINEER. GRADING ACTIVITIES SHALL BE CONDUCTED IN A MANNER TO MINIMIZE THE IMPACTS TO THE TREES MARKED FOR PRESERVATION.
4) THE EXCAVATOR SHALL KEEP A SHARP PAIR OF LOPPERS AND A SHARP 12" PRUNING SAW ACCESSIBLE ON-SITE DURING GRADING OPERATIONS. ANY ROOTS LARGER THAN ½" SHALL BE PRUNED TO THE FACE OF THE CUT (USING A SHARP PAIR OF LOPPERS OR A SHARP 12" PRUNING SAW) AND SHALL NOT BE TORN FROM THE GROUND BY MECHANICAL EXCAVATION.
5) SPECIAL CARE SHALL BE EXERCISED IN WORKING NEAR THE TREES TO BE RETAINED. THIS INCLUDES HAND EXCAVATING THE ROOTS AT THE EDGE OF THE EXCAVATION AND CUTTING ROOTS WITH A LOPPER OR PRUNING SAW. PRUNING THE ROOTS AT THE EDGE OF EXCAVATION WILL MINIMIZE BREAKAGE OF HEALTHY ROOTS BEYOND THE EDGE OF THE PROPOSED EXCAVATION.
6) EXCEPT FOR THE PROPOSED IMPROVEMENTS SHOWN WITHIN THE DRIP LINES OF THE TREES NOTED TO BE RETAINED THE GRADE SHALL NOT BE ELEVATED OR REDUCED FROM EXISTING GRADE.
7) IF THE GRADE ADJACENT TO A PRESERVED TREE IS RAISED SUCH THAT IT COULD SLOUGH OR ERODE INTO THE TREE'S DRIP LINE, IT SHALL BE PERMANENTLY STABILIZED.
8) THE TREES NOTED TO RETAINED SHALL BE PROTECTED FROM EROSION AND SEDIMENTATION. CLEARING OPERATIONS SHALL BE CONDUCTED SO AS TO EXPOSE THE SMALLEST PRACTICAL AREA OF SOIL TO EROSION FOR THE LEAST POSSIBLE TIME. REFER TO THE PROJECT'S EROSION CONTROL PLAN FOR MORE INFORMATION.
9) THE PROJECT SHALL NOT INSTALL AN IMPERVIOUS SURFACE OTHER THAN THOSE SPECIFICALLY SHOWN ON THE PLANS WITHIN THE DRIP LINE OF THE TREES TO BE RETAINED.
10) UTILITY TRENCHES SHALL BE LOCATED OUTSIDE OF THE DRIP LINE OF THE TREES TO BE RETAINED.
11) ONGOING TREE MAINTENANCE SHALL BE THE RESPONSIBILITY OF THE LAND OWNER. TREES SHALL BE MAINTAINED IN ACCORDANCE WITH ANSI AMERICAN NATIONAL STANDARDS INSTITUTE'S AS WELL AS OTHER APPLICABLE FEDERAL, STATE AND LOCAL STANDARDS PERTAINING TO TREE CARE OPERATIONS.

- ANSI Z133 ARBORICULTURAL OPERATIONS: SAFETY REQUIREMENTS
- ANSI A300 PART 1 PRUNING

STATE OF WASHINGTON · ROBERT W. PHIPPS · EXP. 02/07/2023 NO. 161 · LANDSCAPE ARCHITECT
7-29-2022

CERTIFIED ARBORIST · ISA
Robert Phipps, PN-8715A
7-29-2022

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PRELIMINARY
NOT FOR CONSTRUCTION
SUBJECT TO APPROVAL
PBS ENGINEERING ENVIRONMENTAL SURVEYING PBSUSA.COM

MONTE VERDE SUBDIVISION

22205 NE 28TH Street
Camas, Washington

DRAWN: GB/RP | CHECKED: GB
SCALE: 1" = 50'-0" | DATE: 07.29.22
JOB #: 22-1719
ISSUED FOR: PLR
REVISIONS:
1
2
3
4
5
6

SHEET NAME: **EXISTING TREE SURVEY**

SHEET #: TP

SHEET 1 OF 2

825

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D:\OneDrive - Planning Solutions Inc\Project Folder\2022 Projects\1719 Monte Verde Subdivision\2-10 LD\1719_PLR (Current)\[R&S (-5.22)]PLR-S1 Plans\1719 PLR S1 TP 50.dwg, 7/28/2022 4:44:13 PM

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Community Development
616 NE Fourth Avenue • Camas, WA 98607
(360) 817-1568
http://www.cityofcamas.us

SEPA ENVIRONMENTAL CHECKLIST

UPDATED 2016

Purpose of checklist:

Governmental agencies use this checklist to help determine whether the environmental impacts of your proposal are significant. This information is also helpful to determine if available avoidance, minimization or compensatory mitigation measures will address the probable significant impacts or if an environmental impact statement will be prepared to further analyze the proposal.

***Instructions for applicants*:**

This environmental checklist asks you to describe some basic information about your proposal. Please answer each question accurately and carefully, to the best of your knowledge. You may need to consult with an agency specialist or private consultant for some questions. You may use "not applicable" or "does not apply" only when you can explain why it does not apply and not when the answer is unknown. You may also attach or incorporate by reference additional studies reports. Complete and accurate answers to these questions often avoid delays with the SEPA process as well as later in the decision-making process.

The checklist questions apply to all parts of your proposal, even if you plan to do them over a period of time or on different parcels of land. Attach any additional information that will help describe your proposal or its environmental effects. The agency to which you submit this checklist may ask you to explain your answers or provide additional information reasonably related to determining if there may be significant adverse impact.

Instructions for Lead Agencies:

Please adjust the format of this template as needed. Additional information may be necessary to evaluate the existing environment, all interrelated aspects of the proposal and an analysis of adverse impacts. The checklist is considered the first but not necessarily the only source of information needed to make an adequate threshold determination. Once a threshold determination is made, the lead agency is responsible for the completeness and accuracy of the checklist and other supporting documents.

Use of checklist for nonproject proposals: [help]

For nonproject proposals (such as ordinances, regulations, plans and programs), complete the applicable parts of sections A and B plus the SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS (part D). Please completely answer all questions that apply and note that the words "project," "applicant," and "property or site" should be read as "proposal," "proponent," and "affected geographic area," respectively. The lead agency may exclude (for non-projects) questions in Part B - Environmental Elements –that do not contribute meaningfully to the analysis of the proposal.

A. Background [help]

1. Name of proposed project, if applicable: [help]

Monte Verde Subdivision

2. Name of applicant: [help]

Pacific Lifestyle Homes - Ryan Stygar

3. Address and phone number of applicant and contact person: [help]

11815 NE 99th Street Suite 1200 Vancouver, WA 98682 360-304-9901

4. Date checklist prepared: [help]

July 2022

5. Agency requesting checklist: [help]

City of Camas

6. Proposed timing or schedule (including phasing, if applicable): [help]

Development is expected to start at the time of final construction drawing approval in early 2023, no phasing is proposed.

7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain. [help]

No, not at this time.

8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal. [help]

SEPA Checklist, Archaeological Predetermination, Geotechnical Report, Critical areas report and Mitigation plan

9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain. [help]

No

10. List any government approvals or permits that will be needed for your proposal, if known.

- *Preliminary Type III Subdivision Review*
- *Public notification and staff report publications*
- *Hearing Examiner's Decision*
- *Final engineering plan review and approval*
- *Final Plat Approval*
- *SEPA*
- *SWPPP – Stormwater Pollution Prevention Plan*

11. Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.) [help]

The applicant proposes a 34 lot single family residential subdivision in the R-7.5 zone. A public road will be constructed that will connect into NE 28th Street and end in a cul-de-sac at the south end of the site.

12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist. [help]

The site is located at 22205 NE 28th Street, Camas, WA 98607, in the SE ¼ of SW 1/4 of Section 21, Township 2 North, Range 3 East of the Willamette Meridian. Parcel 173184-000. See the proposed development plans for a preliminary plat, grading plan, vicinity map and topographical data.

B. ENVIRONMENTAL ELEMENTS [help]

1. Earth [help]

a. General description of the site: [help]

(circle one): Flat, (rolling), hilly, steep slopes, mountainous, other _____

b. What is the steepest slope on the site (approximate percent slope)?

13%

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any agricultural land of long-term commercial significance and whether the proposal results in removing any of these soils. [help]

This site consists of Lauren Loam and Lauren Gravelly Loam. It is unknown if these soils are classified as agricultural or if the site contains prime farmland.

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe. [help]

There are no known surface indications or history of unstable soils in the immediate area.

e. Describe the purpose, type, total area, and approximate quantities and total affected area of any filling, excavation, and grading proposed. Indicate source of fill. [help]

There will be grading for the construction of a public roads, private roads, driveways, the installation of utilities, and the preparation of the site for single family residential housing.

Surplus material may be required to be hauled from the site to an approved dump site or offsite fill may be required. Quantities and source are unknown at this time.

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe. [help]

Standard erosion control measures will be followed during grading construction on the site. A final erosion control plan will be reviewed and approved by City of Camas.

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)? [help]

Approximately 50%

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any: [help]

Proposed measures to reduce and control erosion include providing an erosion control plan for review and approval prior to starting construction on the site and following the conditions of the approved grading and erosion control plan during all phases of construction.

2. Air [help]

a. What types of emissions to the air would result from the proposal during construction, operation, and maintenance when the project is completed? If any, generally describe and give approximate quantities if known. [help]

Construction equipment emissions and dust on the short term. Long-term emissions will be produced by automobile traffic and normal household activities, possibly including wood burning stoves and fireplaces.

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe. [help]

There are no known off-site sources of emissions or odor that may affect the proposal.

c. Proposed measures to reduce or control emissions or other impacts to air, if any: [help]

Dust from construction can be mitigated by sprinkling the site with water during construction as needed.

3. Water [help]

a. Surface Water:

1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into. [help]

Per the Critical Areas Report for the site, "A wetland was mapped within the southwest corner of the parcel by the Clark County GIS MapsOnline software under the "potential wetland presence" layer. The National Wetland Inventory also maps a PFOA wetland within the same general location…Site reconnaissance by AshEco Solutions (AES) identified that the mapped wetland was actually located over 300-feet south of the subject parcel. No

wetlands were identified within the subject parcel by AES."

2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans. [help]

No, there is no work that will take place within 200' of any water bodies.

3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material. [help]

Not applicable – there are no wetlands onsite.

4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known. [help]

The proposal will not require surface water withdrawals or diversions.

5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan. [help]

No, the site does not lie within a 100-year floodplain.

6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge. [help]

No, there will be no discharge of waste material to surface waters.

b. Ground Water:

1) Will groundwater be withdrawn from a well for drinking water or other purposes? If so, give a general description of the well, proposed uses and approximate quantities withdrawn from the well. Will water be discharged to groundwater? Give general description, purpose, and approximate quantities if known. [help]

No ground water will be withdrawn with this proposal. A stormwater infiltration trench is proposed with the site development that will discharge stormwater into the ground. Stormwater from pollution generating surfaces will be treated prior to being routed to the infiltration trench.

2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals. . . ; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve. [help]

No waste material is proposed to be discharged into the ground.

c. Water runoff (including stormwater):

1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe. [help]

The main source of runoff is from stormwater. There will runoff from impervious roof area,

driveways, roadways, and landscaped areas. Street catch basins, yard drains, and roof drains will connect to a pipe network that leads to an infiltration trench or a detention pond.

2) Could waste materials enter ground or surface waters? If so, generally describe. [help]

Yes, if waste materials were somehow released or dumped into surface runoff flows, substances associated with the source material could enter ground or other surface waters. There is no proposal to release waste material to the ground or to surface waters.

3) Does the proposal alter or otherwise affect drainage patterns in the vicinity of the site? If so, describe. [help]

Not anticipated.

d. Proposed measures to reduce or control surface, ground, and runoff water, and drainage pattern impacts, if any: [help]

Use of approved erosion control measures during all phases of development.

4. Plants [help]

a. Check the types of vegetation found on the site: [help]

x deciduous tree: alder, **maple**, aspen, **other: Oregon white oak, ash, cottonwood, cherry**
x evergreen tree: **fir**, cedar, pine, other
x shrubs
____ grass
x pasture
____ crop or grain
____ Orchards, vineyards or other permanent crops.
____ wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other
____ water plants: water lily, eelgrass, milfoil, other
x other types of vegetation: **blackberry**

b. What kind and amount of vegetation will be removed or altered? [help]

Much of the site vegetation will be stripped for site preparation. Trees along the property line are proposed to be retained.

c. List threatened and endangered species known to be on or near the site. [help]

There are 6 priority habitat Oregon white oaks onsite or immediately off-site.

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any: [help]

Street trees and landscaping will be provided throughout the park and open space areas. 3 Oregon white oaks will be preserved while 3 will be removed and mitigated at a 2:1 ratio.

e. List all noxious weeds and invasive species known to be on or near the site. [help]

None known.

5. Animals [help]

a. List any birds and other animals which have been observed on or near the site or are known to be on or near the site. [help]

Examples include:
birds: hawk, heron, eagle, **songbirds, other:** mammals: deer, bear, elk, beaver, other:
fish: bass, salmon, trout, herring, shellfish, other _____

Small mammals, such as mice, voles, and rabbits are located on and near the site. This site is also in an area where larger mammals, such as raccoons, opossum, and mammals indigenous to the Clark County area are sometimes located.

b. List any threatened and endangered species known to be on or near the site. [help]

There are no known threatened or endangered species on or near the site.

c. Is the site part of a migration route? If so, explain. help]

This site is part of the Pacific Flyway for migratory waterfowl.

d. Proposed measures to preserve or enhance wildlife, if any: [help]

The future homes will likely be landscaped with grass lawns and appealing native shrubs and trees.

e. List any invasive animal species known to be on or near the site. [help]

None known

6. Energy and Natural Resources [help]

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc. [help]

The new homes on the site will be served primarily by electricity and natural gas. Wood stoves might be used for heating. Other forms of energy will depend on homeowners.

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe. [help]

No.

c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any: [help]

The new homes will have energy efficient windows and comply with the state building codes which includes conservation measures.

7. Environmental Health [help]

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal? If so, describe. [help]

There are no known environmental health hazards that could occur as a result of this proposal.

1) Describe any known or possible contamination at the site from present or past uses. [help]

Utilizing the "What's in My Neighborhood" section of DOE's database shows that there are no cleanup sites or known hazards within 0.5 miles of the site.

2) Describe existing hazardous chemicals/conditions that might affect project development and design. This includes underground hazardous liquid and gas transmission pipelines located within the project area and in the vicinity. [help]

None known

3) Describe any toxic or hazardous chemicals that might be stored, used, or produced during the project's development or construction, or at any time during the operating life of the project. [help]

None known

4) Describe special emergency services that might be required. [help]

No special emergency services outside those normally expected in a residential area are anticipated to be required in association with this proposal.

5) Proposed measures to reduce or control environmental health hazards, if any: [help]

None

b. Noise [help]

1) What types of noise exist in the area which may affect your project (for example:traffic, equipment, operation, other)? [help]

Light traffic noise from surrounding areas/roads along with typical home use noises. None of these will affect the proposal.

2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indi- cate what hours noise would come from the site. [help]

Short term noises would include construction noises which would occur during approved hours as mandated by City of Camas and Washington State. Long term noises could include slight increase in traffic noise and normal household noises.

3) Proposed measures to reduce or control noise impacts, if any: [help]

Construction on the site will take place during normal working hours as allowed by the City.

8. Land and Shoreline Use [help]

a. What is the current use of the site and adjacent properties? Will the proposal affect current land uses on nearby or adjacent properties? If so, describe. [help]

The proposed site has an existing single-family residence and two outbuildings. To the south is land owned by Clark Coutny, to the east and the west of the site are single family homes on larger lots. To the north is a developed residential subdivision.

b. Has the project site been used as working farmlands or working forest lands? If so, describe. How much agricultural or forest land of long-term commercial significance will be converted to other uses as a result of the proposal, if any? If resource lands have not been designated, how many acres in farmland or forest land tax status will be converted to nonfarm or nonforest use? [help]

The Critical Areas Report for the site states that the site has been used for agricultural purposes since at least the 1970's and has a history of horse grazing.

1) Will the proposal affect or be affected by surrounding working farm or forest land normal business operations, such as oversize equipment access, the application of pesticides, tilling, and harvesting? If so, how: [help]

No, the proposal will not be affected by, nor will it affect, any surrounding working farm or forest land business.

c. Describe any structures on the site. [help]

Single family residences and two outbuildings.

d. Will any structures be demolished? If so, what? [help]

All structures will be demolished.

e. What is the current zoning classification of the site? [help]

R7.5 – Residential

f. What is the current comprehensive plan designation of the site? [help]

SFM

g. If applicable, what is the current shoreline master program designation of the site? [help]

The site does not lie within the shoreline master program

h. Has any part of the site been classified as a critical area by the city or county? If so, specify. [help]

There are Oregon white oaks on site.

i. Approximately how many people would reside or work in the completed project? [help]

It is currently planned that this development will contain 34 lots/homes. At 2.8 people per household, there would be a total of approximately 95 people residing within this development at the time of full buildout.

j. Approximately how many people would the completed project displace? [help]

The removal of one single-family residence has the potential to displace up to 3 people.

k. Proposed measures to avoid or reduce displacement impacts, if any: [help]

The proposal will provide 34 new homes to offset displacement.

L. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any: [help]

By complying with the zoning designation, the comprehensive plan, and the City of Camas Development Code, the proposal will be compatible with the existing and projected land uses.

m. Proposed measures to reduce or control impacts to agricultural and forest lands of long-term commercial significance, if any: [help]

None proposed

9. Housing [help]

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing. [help]

34 new homes, the type of housing is unknown.

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing. [help]

One existing residence will be eliminated. The income level housing type is unknown.

c. Proposed measures to reduce or control housing impacts, if any: [help]

The applicant will pay all impact fees associated with the development at the time of building permit.

10. Aesthetics [help]

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed? [help]

All new home construction will meet City of Camas building codes for residential housing development and not exceed height limits of 35'. Exterior building materials are unknown.

b. What views in the immediate vicinity would be altered or obstructed? [help]

The site will change from a large-lot single family residence to a development with 34 single family homes.

c. Proposed measures to reduce or control aesthetic impacts, if any: [help]

The single-family homes will be landscaped with grass lawns and other appealing landscaping. The main roadway frontage will be landscaped with trees per the City of Camas roadway standards.

11. Light and Glare [help]

a. What type of light or glare will the proposal produce? What time of day would it mainly occur? [help]

When homes are constructed on the proposed lots, there will most likely be light produced from houses, yards, and street lights during evenings and early mornings.

b. Could light or glare from the finished project be a safety hazard or interfere with views? [help]

No, light or glare from the finished project will not be a safety hazard or interfere with views.

c. What existing off-site sources of light or glare may affect your proposal? [help]

There are existing off-site sources of light from adjacent homes and roads, but they will not affect the proposal.

d. Proposed measures to reduce or control light and glare impacts, if any: [help]

Shielding of porch lights and streetlights will reduce light and glare impacts offsite.

12. Recreation [help]

a. What designated and informal recreational opportunities are in the immediate vicinity? [help]

Camp Currie park is adjacent to the south, Lacamas Heritage Trail and Lacamas Creek are to the southwest.

b. Would the proposed project displace any existing recreational uses? If so, describe. [help]

There will be no recreational uses displaced with this proposal.

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any: [help]

The applicant proposes to pay all park impact fees associated with building permits. A 0.5-acre park area is proposed with this development that will provide recreation opportunities onsite.

13. Historic and cultural preservation [help]

a. Are there any buildings, structures, or sites, located on or near the site that are over 45 years old listed

in or eligible for listing in national, state, or local preservation registers ? If so, specifically describe. [help]

The existing single family home is older than 45 years old, but it is unlikely that it would be eligible for national, state, or local preservation registers per the predetermination report.

b. Are there any landmarks, features, or other evidence of Indian or historic use or occupation? This may include human burials or old cemeteries. Are there any material evidence, artifacts, or areas of cultural importance on or near the site? Please list any professional studies conducted at the site to identify such resources. [help]

There are no known landmarks or evidence of historic, archaeological, scientific, or cultural importance known to be on or next to the site. An Archaeological Predetermination Survey was performed by Archaeological Services, LLC for onsite work. The onsite study found no cultural materials.

c. Describe the methods used to assess the potential impacts to cultural and historic resources on or near the project site. Examples include consultation with tribes and the department of archeology and historic preservation, archaeological surveys, historic maps, GIS data, etc. [help]

The report utilized surface surveys and excavation of test pits, as well as reviewing historical maps and records on file at the Washington State Department of Archaeology and Historic Preservation.

d. Proposed measures to avoid, minimize, or compensate for loss, changes to, and disturbance to resources. Please include plans for the above and any permits that may be required. [help]

Based on the findings of the Archaeological Predetermination, no further archaeological work is needed. If during the course of construction any artifacts are discovered, all work will cease, and proper notification shall be given to City of Camas and DAHP.

14. Transportation [help]

a. Identify public streets and highways serving the site or affected geographic area and describe proposed access to the existing street system. Show on site plans, if any. [help]

Access to the site will be from NE 28th Street abutting the north side of the site. New residential roads will be constructed to serve the development. Proposed street layouts are shown on the preliminary plat.

b. Is the site or affected geographic area currently served by public transit? If so, generally describe. If not, what is the approximate distance to the nearest transit stop? [help]

C-tran does not operate in close proximity to the site. The nearest stop is the Fishers Landing Transit Center approximately 6 miles to the southwest.

c. How many additional parking spaces would the completed project or non-project proposal have? How many would the project or proposal eliminate? [help]

Approximately 2-4 parking spaces per single-family home are proposed. This project will eliminate approximately 4 parking spaces with the removal of the existing home. Street parking will be allowed on both sides of the proposed residential roadway.

d. Will the proposal require any new or improvements to existing roads, streets, pedestrian, bicycle or state transportation facilities, not including driveways? If so, generally describe (indicate whether public or private). [help]

Frontage improvements are proposed to bring NE 28th Street up to half-width roadway standards. The construction of this project also proposes to construct NW Noble Avenue as a public roadway that runs north/south terminating in a cul-de-sac and NE 26th Street as a public roadway that runs east/west.

e. Will the project or proposal use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe. [help].

No

f. How many vehicular trips per day would be generated by the completed project or proposal? If known, indicate when peak volumes would occur and what percentage of the volume would be trucks (such as commercial and nonpassenger vehicles). What data or transportation models were used to make these estimates? [help]

It is anticipated that 310 trips per day would be generated by the project. It is expected that 23 trips will occur in the AM peak hour (7:00 – 9:00 AM) and 31 trips will occur in the PM peak hour (4:00 – 6:00).

g. Will the proposal interfere with, affect or be affected by the movement of agricultural and forest products on roads or streets in the area? If so, generally describe. [help]

Not anticipated

h. Proposed measures to reduce or control transportation impacts, if any: [help]

The applicant will pay transportation impact fees.

15. Public Services [help]

a. Would the project result in an increased need for public services (for example: fire protection, police protection, public transit, health care, schools, other)? If so, generally describe. [help]

Yes. The completion of this development and the construction of new homes will increase the need for public services in the area.

b. Proposed measures to reduce or control direct impacts on public services, if any. [help]

This project will pay impact fees for schools, traffic, and parks at the time of building permit.

16. Utilities [help]

a. Circle utilities currently available at the site: [help]
electricity, natural gas, water, refuse service, telephone, sanitary sewer

b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed. [help]

- *Electricity: Clark Public Utilities*
- *Water: City of Camas*
- *Telephone: Century Link, Comcast*
- *Sanitary Sewer: City of Camas*
- *Natural Gas: NW Natural*

C. Signature [help]

Under the penalty of perjury, the above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

DocuSigned by:
Signature: _____
DC05C[illegible]34[illegible]
Name of signee Ryan Styger
Position and Agency/Organization VP of Land Acquisition Pacific Lifestyle Homes
Date Submitted: 8/8/2022

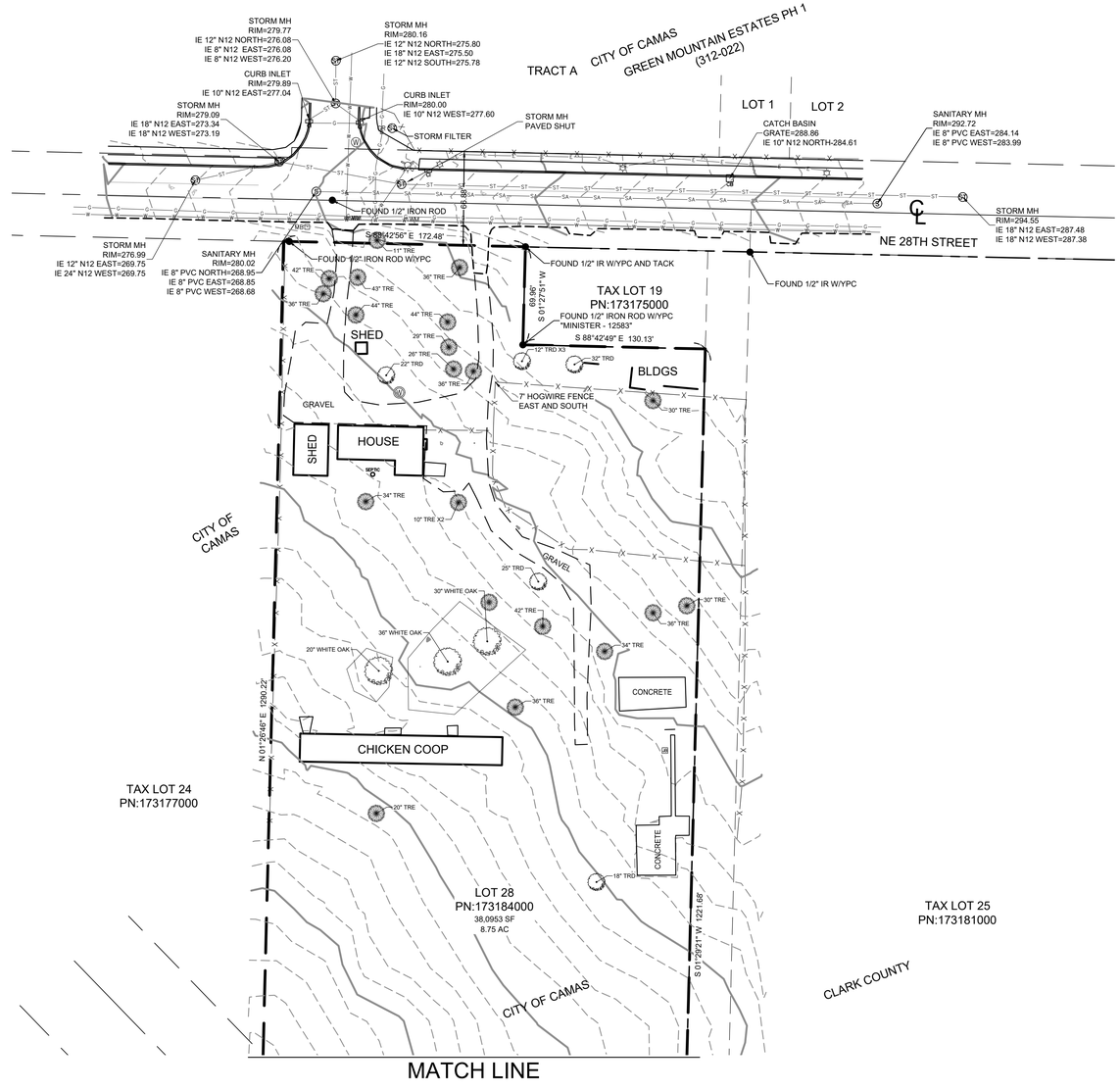
EXISTING CONDITIONS SURVEY

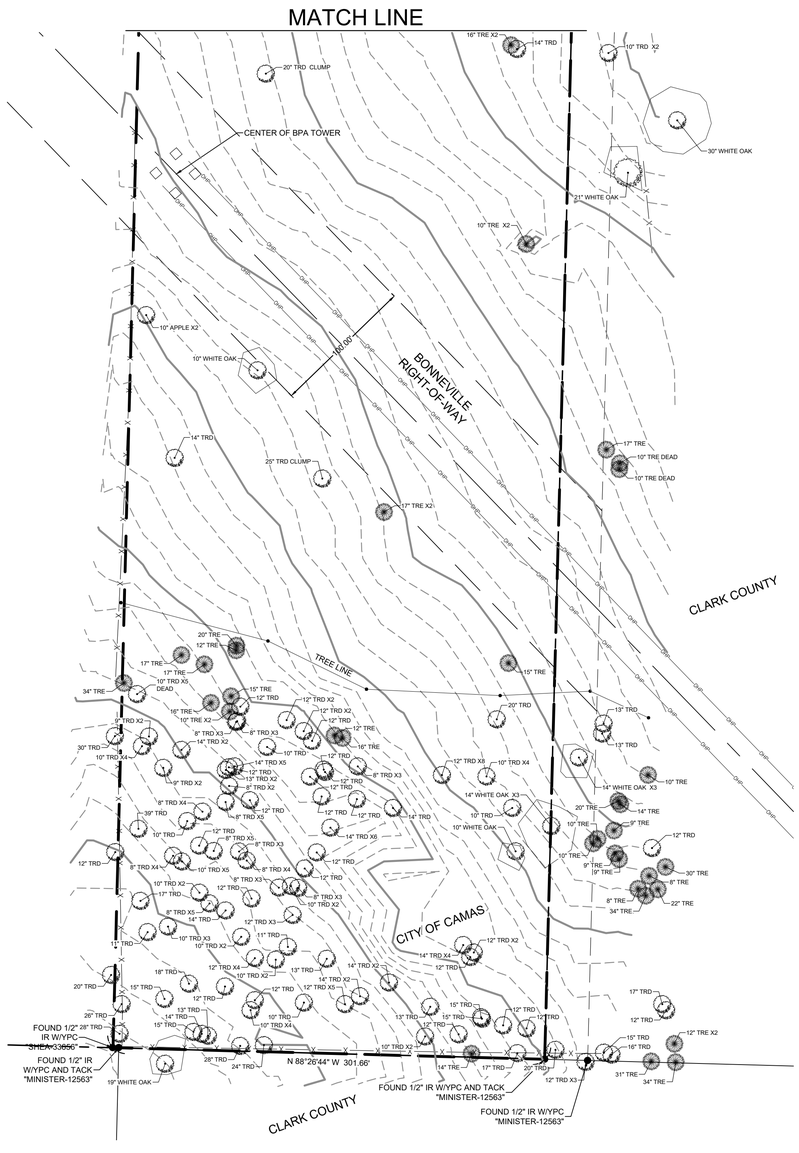
IN THE NW 1/4 OF THE SE 1/4
SECTION 21, T. 2 N., R. 3 E., W.M.
CITY OF CAMAS
CLARK COUNTY WASHINGTON

JOB NO.:3382
DATA COLLECT: 03-01-2022
DRAWING DATE: 07-20-2022
SHEET 1 OF 9

Sheet Index

1. **Existing Conditions Survey**
2. **Preliminary Plat - South**
3. **Preliminary Plat - North**
4. **Preliminary Utility Plan - South**
5. **Preliminary Utility Plan - North**
6. **Preliminary Grading Plan - South**
7. **Preliminary Grading Plan - North**
8. **Landscape Plan**
9. **Tree Plan**





SURVEYOR'S CERTIFICATE:

THIS MAP CORRECTLY REPRESENTS A SURVEY MADE BY ME OR UNDER MY DIRECTION IN CONFORMANCE WITH THE REQUIREMENTS OF THE SURVEY RECORDING ACT AT THE REQUEST OF MONTE VERDE IN 2022.

MICHAEL A. WEISENBORN, PROFESSIONAL LAND SURVEYOR
PLS NO. 42700

6/15/22
DATE

HORIZONTAL DATUM:

NAD 83 (2011)
WASHINGTON STATE PLANE COORDINATE SYSTEM, SOUTH ZONE, INTERNATIONAL FEET. BASED ON REAL TIME KINEMATIC CORRECTIONS FROM THE WASHINGTON STATE REFERENCE NETWORK.

VERTICAL DATUM:

NGVD29(47) CLARK COUNTY DATUM

NOTES:

1. BOUNDARIES WERE DRAWN PER PLAT, SURVEY RECORDS AND MONUMENTS FOUND. THIS IS NOT INTENDED TO BE A BOUNDARY SURVEY. NO PROPERTY CORNERS WERE SET IN THIS SURVEY.

2. NO WARRANTIES ARE MADE AS TO MATTERS OF UNWRITTEN TITLE, SUCH AS ADVERSE POSSESSION, ESTOPPEL, ACQUIESCENCE, ETC.

3. PRIVATE UTILITY LOCATES WERE CALLED FOR ON 2-28-22. THE UNDERGROUND UTILITIES AS SHOWN HEREON ARE AS MARKED AT THE TIME OF THIS SURVEY. UNDERGROUND UTILITY LOCATIONS SHOWN ARE APPROXIMATE ONLY. UNDERGROUND CONNECTIONS ARE SHOWN AS STRAIGHT LINES BETWEEN SURFACE LOCATIONS BUT MAY CONTAIN BENDS OR CURVES NOT SHOWN. SOME UNDERGROUND LOCATIONS HEREON MAY HAVE BEEN TAKEN FROM PUBLIC RECORDS. P.L.S. ASSUMES NO LIABILITY FOR THE ACCURACY OF PUBLIC RECORDS.

LEGEND:

- INDICATES FIRE HYDRANT
- WM INDICATES WATER METER
- INDICATES WATER MANHOLE
- INDICATES WELL
- INDICATES STORM SEWER MANHOLE
- INDICATES CURB INLET
- INDICATES CATCH BASIN
- INDICATES SANITARY SEWER MANHOLE
- SEPTIC INDICATES APPROXIMATE LOCATION OF SEPTIC SYSTEM LID
- INDICATES LIGHT POLE
- INDICATES JUNCTION BOX
- MB INDICATES MAIL BOX
- INDICATES DECIDUOUS TREE WITH TRUNK DIAMETER AND TYPE
- INDICATES BOUNDARY
- INDICATES EDGE OF ASPHALT
- INDICATES EDGE OF CONCRETE
- INDICATES EDGE OF GRAVEL
- INDICATES 5 FOOT INTERVAL CONTOUR
- INDICATES 1 FOOT INTERVAL CONTOUR
- INDICATES FENCE LINE
- INDICATES PAINT STRIPE
- INDICATES ELECTRIC LOCATE
- INDICATES GAS LOCATE
- INDICATES SANITARY LOCATE
- INDICATES STORM LOCATE
- INDICATES WATER LOCATE

MICHAEL A. WEISENBORN
STATE OF WASHINGTON
42700
REGISTERED
PROFESSIONAL LAND SURVEYOR
6/10/22

50 25 0 50 75 100
SCALE 1 INCH = 50 FEET

PLS ENGINEERING
Engineering - Surveying - Planning
604 W. Evergreen Blvd., Vancouver, WA 98660
PH: (360) 944-6519 Fax: (360) 944-6539

GENERAL NOTES

Applicant:
Pacific Lifestyle Homes
Ryan Stygar
11815 NE 99th Street
Vancouver, WA 98682
Office (360) 304-9901

OWNER:
Dwight Southern
22205 NE 28th Street
Camas, WA 98607

CIVIL ENGINEER:
PLS Engineering
Contact: Travis Johnson, PE
604 W Evergreen Blvd
Vancouver, WA 98660
PH: (360) 944-6519
pm@plsengineering.com

SITE ADDRESS:
Parcel # 173184-000
22205 NE 28th Street
Camas, WA 98607

LAND USE:
The applicant is proposing a 34 lot subdivision in the R7.5 zone.

Per Municipal Code section 18.09.060, density transfer is proposed with the inclusion of an improved park area. The proposed park tract includes at least 0.5 acres of contiguous area. We are requesting additional flexibility in the minimum lot width standards with the proposed park area.

Existing Lot Area = 8.6 Acres
Proposed open space = 0.93 Acre
Minimum Proposed Lot Area = 5,821 sq-ft
Maximum Proposed Lot Area = 8,265 sq-ft
Average Lot Area = 6,415 sq-ft
Min. Lot Width = 52.5'

Maximum Density = 5.8 d.u./net acre (44 lots)
Proposed Density = 4.4 d.u./net acre (34 lots)

ENVIRONMENTAL CONSTRAINTS:
There are multiple Oregon white oak trees located on or near the site. There are no known water courses or water bodies, no areas within 100-year floodplain, no designated shoreline areas, no landslide or erosion hazard areas, no wetlands, and no known significant historic resources.

SURVEYOR'S CERTIFICATE:

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MICHAEL A. WEISENBORN, PROFESSIONAL LAND SURVEYOR
PLS NO. 42700

6/10/22
DATE

Monte Verde

Located in the SE ¼ of Section 21, T2N, R3E and in the SW ¼ of Section 21, T2N, R3E, W.M.
Camas, Washington

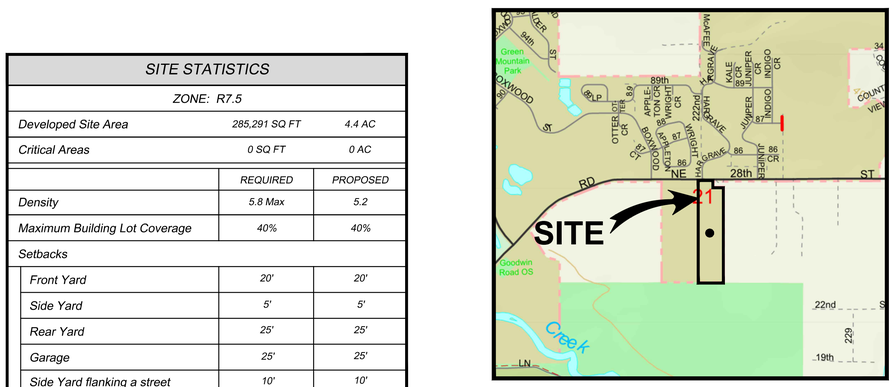
TRANSPORTATION:
For primary access to the site the applicant is proposing to construct a roadway connection to NE 28th Street that aligns with NE Hargrave Street. NE 28th Street is classified as a 3-lane collector/arterial. Half width improvements are proposed for this public roadway. Internal public roadways will consist of local access roadways with circulation provided to the east and west.

UTILITIES:
Stormwater runoff is proposed to be collected and routed to an infiltration trench or a detention facility located on the south end of the site, runoff generated from pollution generating surfaces will be treated using filter cartridges prior to entering the stormwater facilities.

The site will be served by public water and sanitary sewer provided by the City of Camas. The connection point for both water and sewer are within NE 28th Street. Due to the existing grade of the site that slopes away from NE 28th Street, a majority of the lots will need to utilize a grinder pump system.

There is an existing well and septic system located on the site that will be removed/abandoned in accordance with Clark County Health Department requirements.

SITE STATISTICS		
ZONE: R7.5		
Developed Site Area	285,291 SQ FT	4.4 AC
Critical Areas	0 SQ FT	0 AC
	REQUIRED	PROPOSED
Density	5.8 Max	5.2
Maximum Building Lot Coverage	40%	40%
Setbacks		
Front Yard	20'	20'
Side Yard	5'	5'
Rear Yard	25'	25'
Garage	25'	25'
Side Yard flanking a street	10'	10'



VICINITY MAP
NOT TO SCALE

Scale 1" = 30'
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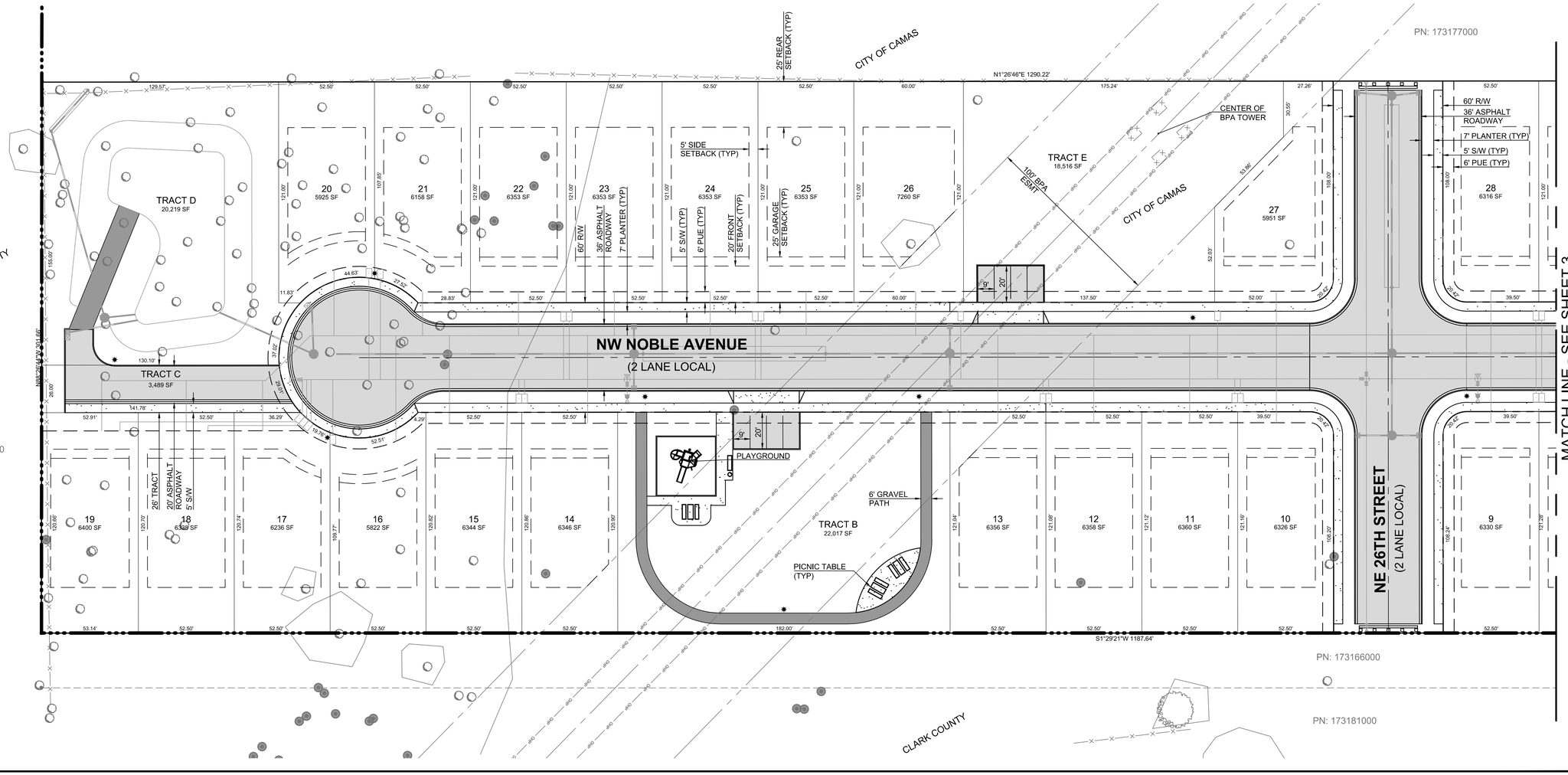
Legend	
Proposed Asphalt Concrete	
Proposed Cement Concrete	
Proposed Gravel	
Proposed Retaining Wall	



Preliminary Plat - South For:

Monte Verde

A Subdivision Located In The City Of Camas, Washington

Engineering - Surveying - Planning | 604 W. Evergreen Blvd., Vancouver, WA 98660 | PH (360) 944-6519 | Fax (360) 944-6539

ENGINEERING | PLS

Revisions

1	2	3	4	5	6

SCOTT W. GILLILAND — STATE OF WASHINGTON — 42773 — REGISTERED PROFESSIONAL ENGINEER — 7/25/22

Project No.	3382
SCALE:	H: 1" = 30' V: N/A
DESIGNED BY:	SWG
DRAFTED BY:	JSV
REVIEWED BY:	SWG

2
9

GENERAL NOTES

Applicant:
Pacific Lifestyle Homes
Ryan Stygar
11815 NE 99th Street
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MICHAEL A. WEISENBORN, PROFESSIONAL LAND SURVEYOR
PLS NO. 42700

8/10/22
DATE

Monte Verde

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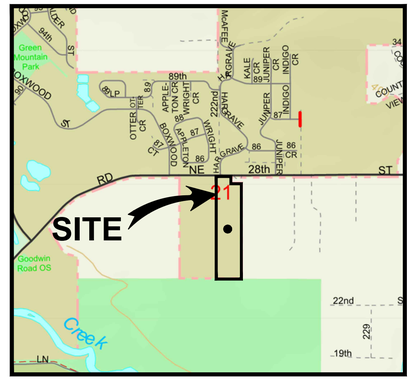

VICINITY MAP
NOT TO SCALE

MICHAEL A. WEISENBORN STATE OF WASHINGTON REGISTERED PROFESSIONAL LAND SURVEYOR 42700 8/10/22

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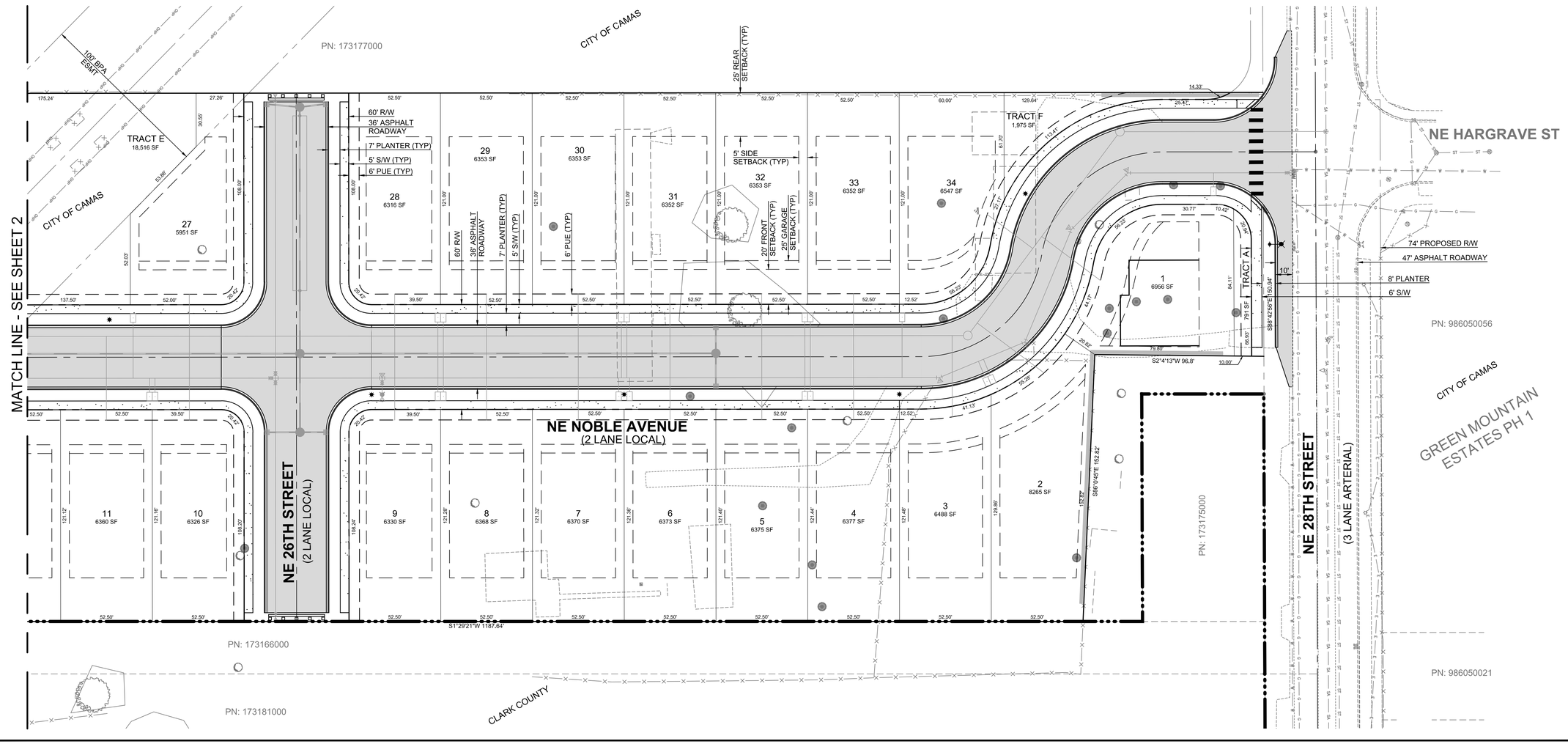
Legend	
Proposed Asphalt Concrete	
Proposed Cement Concrete	
Proposed Gravel	
Proposed Retaining Wall	



Preliminary Plat - North For:

Monte Verde

A Subdivision Located In The City Of Camas, Washington

Engineering - Surveying - Planning | 604 W. Evergreen Blvd., Vancouver, WA 98660 | PH (360) 944-6519 | Fax (360) 944-6539

ENGINEERING
PLS

Revisions

1	2	3	4	5	6

SCOTT W. GILLILAND STATE OF WASHINGTON 42773 REGISTERED PROFESSIONAL ENGINEER 7/25/22

Project No.	3382
SCALE:	H: 1" = 50' V: N/A
DESIGNED BY:	SWG
DRAFTED BY:	JSV
REVIEWED BY:	SWG

3
9

Scale 1" = 30'

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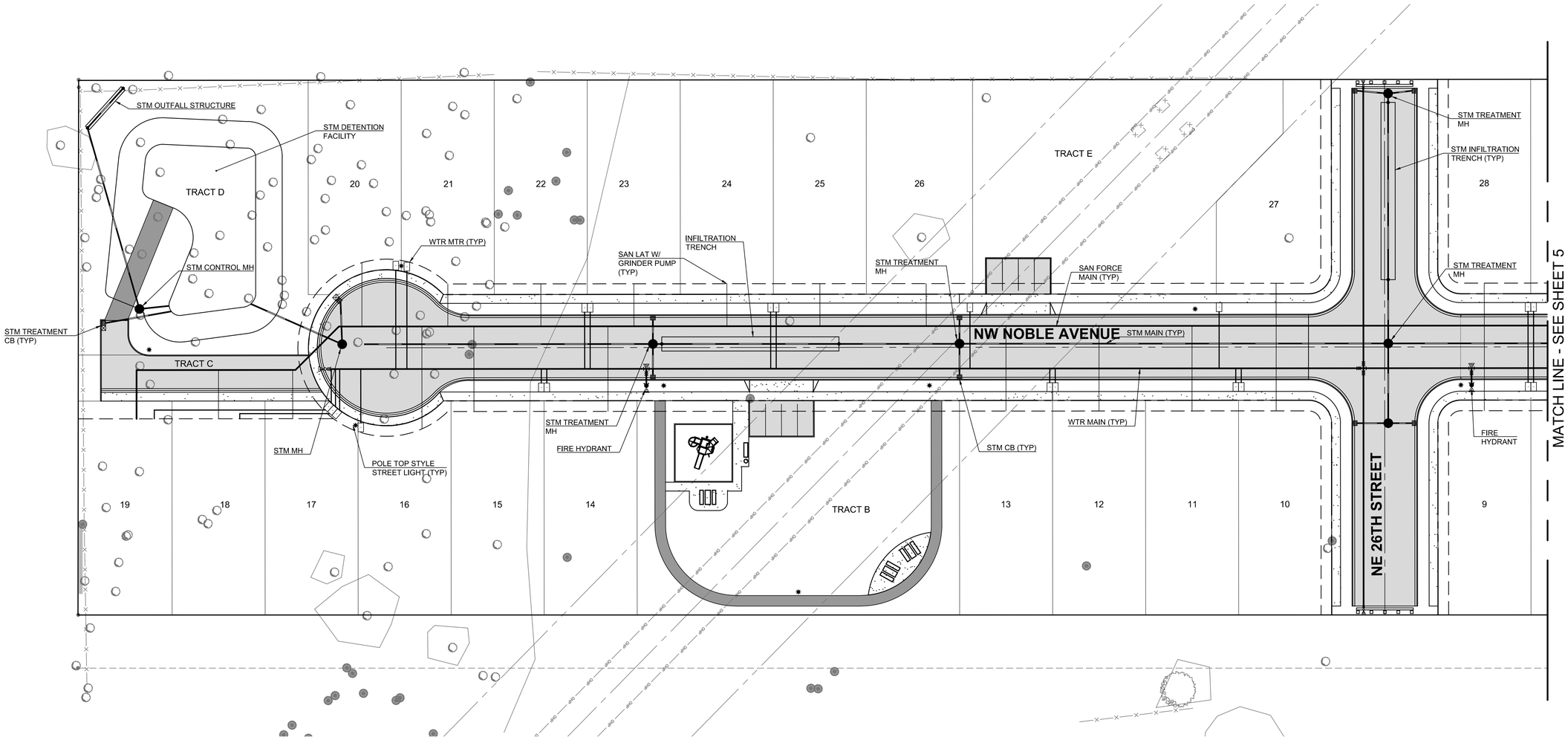
Legend	
Proposed Asphalt Concrete	
Proposed Cement Concrete	
Proposed Gravel	
Proposed Retaining Wall	



PLS ENGINEERING

Preliminary Utility Plan - South For:

Monte Verde

A Subdivision Located In The City Of Camas, Washington

Engineering - Surveying - Planning | 604 W. Evergreen Blvd., Vancouver, WA 98660 | PH (360) 944-6519 | Fax (360) 944-6539

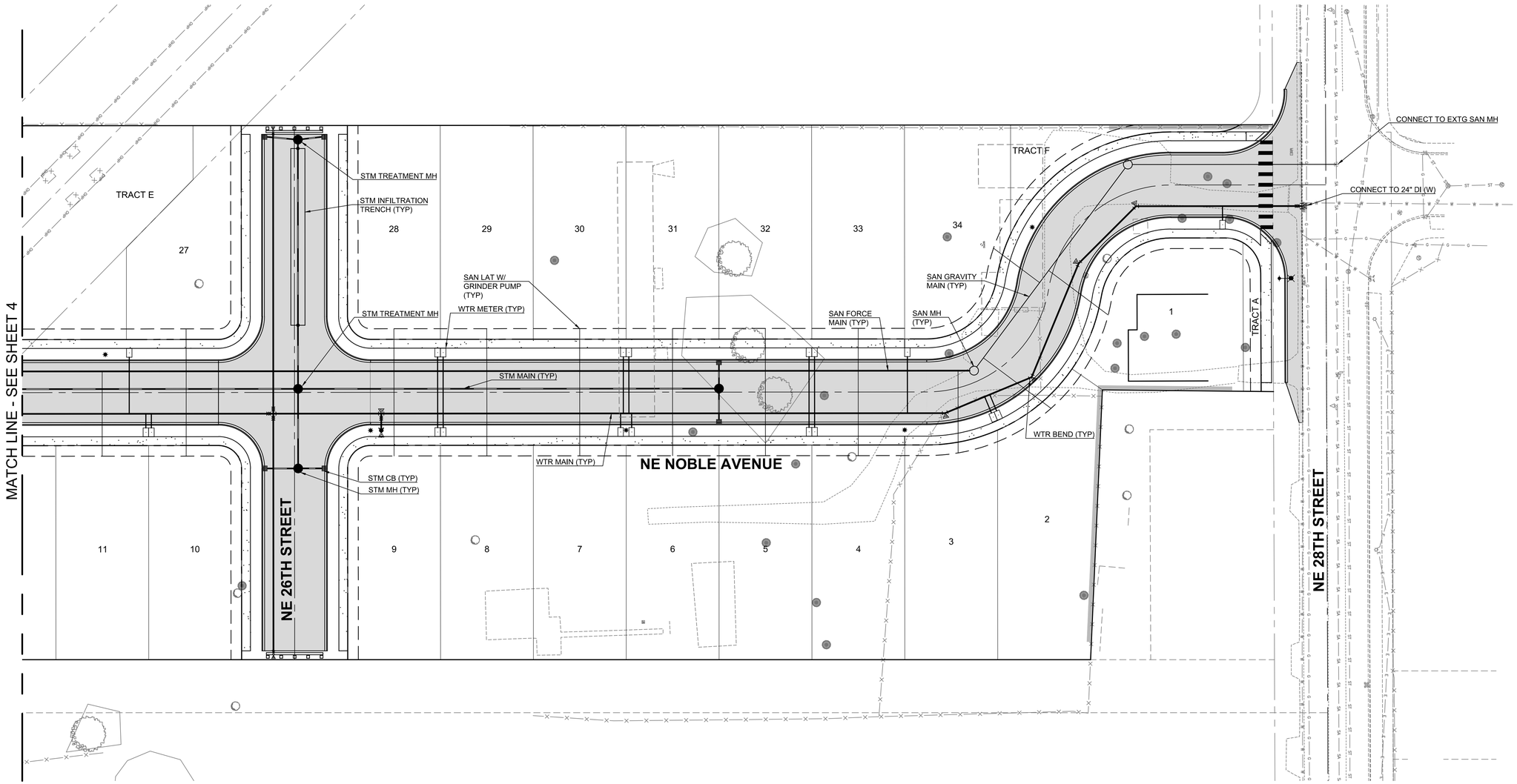
Revisions

1	2	3	4	5	6

SCOTT W. GILLILAND
STATE OF WASHINGTON
42773
REGISTERED PROFESSIONAL ENGINEER
7/25/22

Project No. 3382	
SCALE:	H: 1" = 30' V: N/A
DESIGNED BY:	SWG
DRAFTED BY:	JSV
REVIEWED BY:	SWG

4
9



Scale 1" = 30'

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N

Legend	
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Proposed Cement Concrete	
Proposed Gravel	
Proposed Retaining Wall	

Preliminary Utility Plan - North For:

Monte Verde

A Subdivision Located In The City Of Camas, Washington

Engineering - Surveying - Planning | 604 W. Evergreen Blvd., Vancouver, WA 98660 | PH (360) 944-6519 | Fax (360) 944-6539

PLS ENGINEERING

Revisions

1	2	3	4	5	6

SCOTT W. GILLILAND — STATE OF WASHINGTON — 42773 — REGISTERED PROFESSIONAL ENGINEER

7/25/22

Project No. 3382	
SCALE:	H: 1" = 30' V: N/A
DESIGNED BY:	SWG
DRAFTED BY:	JSV
REVIEWED BY:	SWG

5

9

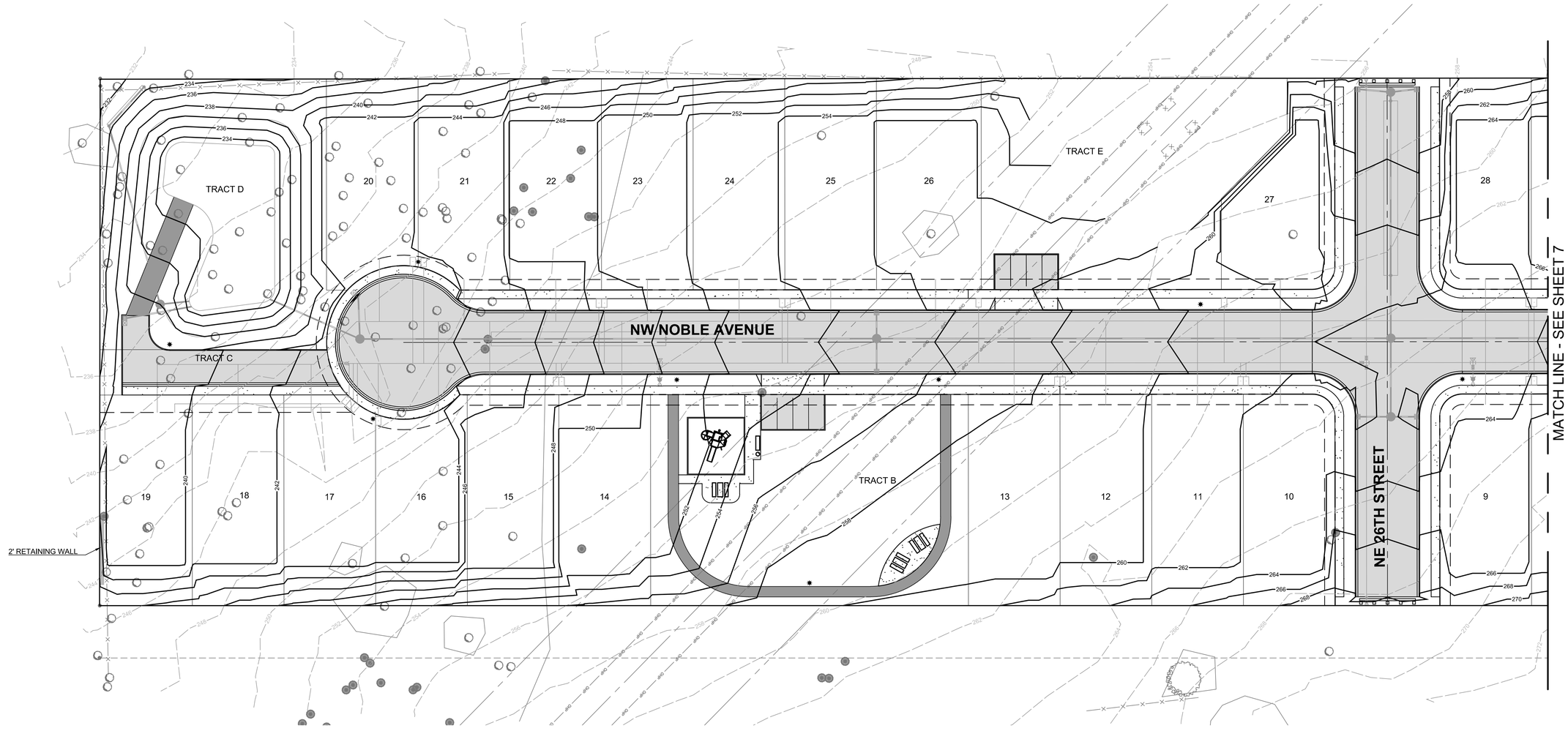
UNADJUSTED VOLUMES	
CUT	18,000 CY
FILL	16,000 CY

Scale 1" = 30'

30 15 0 30

N

Legend	
Proposed Asphalt Concrete	
Proposed Cement Concrete	
Proposed Gravel	



PLS ENGINEERING

Preliminary Grading Plan - South For:

Monte Verde

A Subdivision Located In The City Of Camas, Washington

Engineering - Surveying - Planning | 604 W. Evergreen Blvd., Vancouver, WA 98660 | PH (360) 944-6519 | Fax (360) 944-6539

Revisions

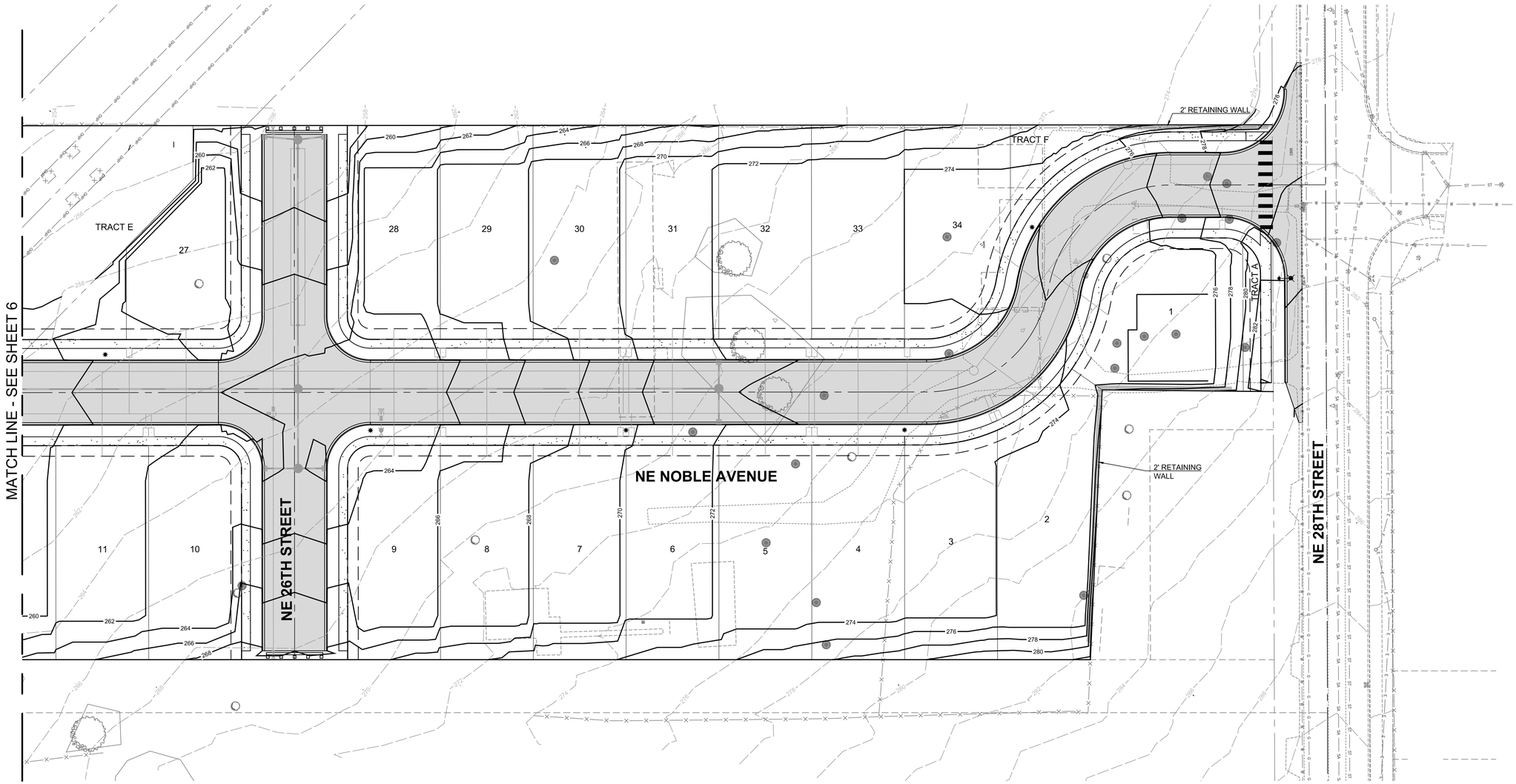
1	
2	
3	
4	
5	
6	

SCOTT W. GILLILAND
STATE OF WASHINGTON
42773
REGISTERED
PROFESSIONAL ENGINEER
7.25.22

Project No.	3382
SCALE:	H: 1" = 30' V: N/A
DESIGNED BY:	SWG
DRAFTED BY:	JSV
REVIEWED BY:	SWG

6
9

UNADJUSTED VOLUMES	
CUT	18,000 CY
FILL	16,000 CY



Scale 1" = 30'

30 15 0 30

N

Legend	
Proposed Asphalt Concrete	
Proposed Cement Concrete	
Proposed Gravel	
Proposed Retaining Wall	

PLS ENGINEERING

Preliminary Grading Plan - North For:

Monte Verde

A Subdivision Located In The City Of Camas, Washington

Engineering - Surveying - Planning | 604 W. Evergreen Blvd., Vancouver, WA 98660 | PH (360) 944-6519 | Fax (360) 944-6539

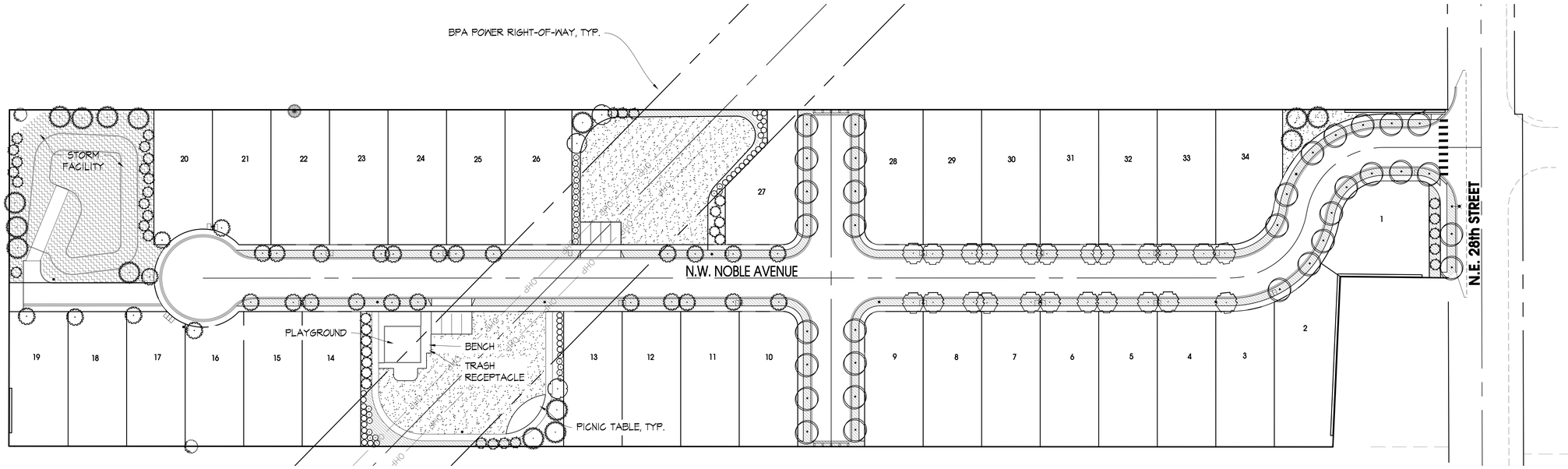
Revisions

1	2	3	4	5	6

SCOTT W. GILLILAND
STATE OF WASHINGTON
42773
REGISTERED
PROFESSIONAL ENGINEER
7/25/22

Project No.	3382
SCALE:	H: 1" = 30' V: N/A
DESIGNED BY:	SWG
DRAFTED BY:	JSV
REVIEWED BY:	SWG

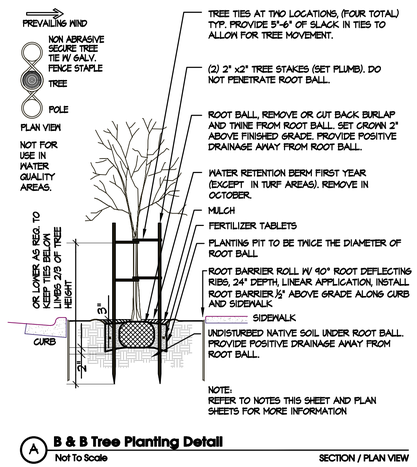
7
9



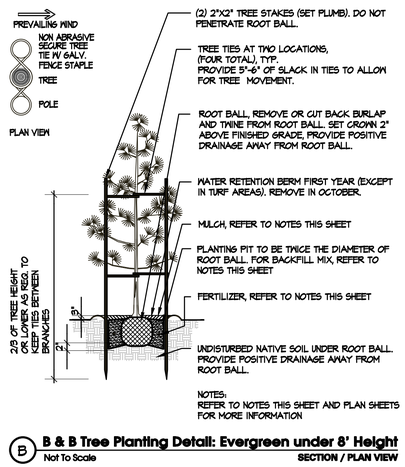
N 0 50' 100' 150'

SCALE: 1"=50'-0"

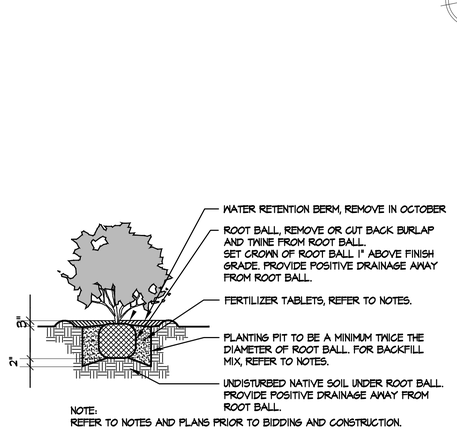
Trees and Shrubs in Sight Distance Triangles, Typ.
All shrubs within sight distance triangles shall be maintained so that foliage height above pavement does not exceed 2.5 feet. Street trees within sight distance triangles shall be limbed up to a height of 10 feet consistent with ANSI A300 standards to provide for sight distance visibility.



A B & B Tree Planting Detail
Not To Scale — SECTION / PLAN VIEW



B B & B Tree Planting Detail: Evergreen under 8' Height
Not To Scale — SECTION / PLAN VIEW

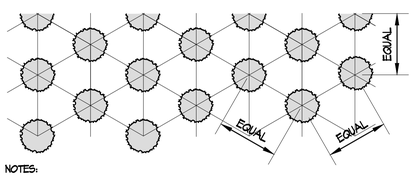


NOTE:
REFER TO NOTES AND PLANS PRIOR TO BIDDING AND CONSTRUCTION.

C B & B Shrub Planting Detail
Not To Scale — SECTION

PLANTING NOTES

1. ALL BOUNDARIES, EASEMENTS, UTILITIES AND LEGAL ENCUMBRANCES TO BE CONFIRMED WITH OWNER PRIOR TO BEGINNING WORK. PROPERTY LINES AND SURVEY INFORMATION PROVIDED BY PLS ENGINEERING.
2. IN NO WAY IS THIS PLAN TO BE INTERPRETED TO EXCEED THE LEGAL BOUNDARIES OF THE OWNER'S REAL PROPERTY.
3. THE LANDSCAPE DESIGNER ASSUMES NO RESPONSIBILITY FOR THE LOCATION OF BOUNDARIES, UTILITIES AND WETLANDS.
4. THIS PLAN SHALL BE INSTALLED TO MEET ALL APPLICABLE CITY, COUNTY, STATE AND FEDERAL CODES.
5. THIS PLAN SHALL BE CONSIDERED PRELIMINARY UNTIL APPROVED BY ALL GOVERNING AGENCIES. IMPLEMENTATION OF THIS PLAN SHALL NOT PROCEED UNTIL ISSUANCE OF ALL RELATED PERMITS.
6. PLANT QUANTITIES ARE FOR INFORMATION ONLY. IN CASE OF ANY DISCREPANCY, THE PLAN SHALL GOVERN.
7. ALL WORK IS TO BE PERFORMED BY LICENSED CONTRACTORS AND EXPERIENCED WORKERS.
8. THE CONTRACTOR IS TO VERIFY THE LOCATION OF EXISTING UNDERGROUND UTILITIES AND STRUCTURES PRIOR TO PERFORMING ANY EXCAVATION. CONTRACTOR SHALL REPAIR ANY DAMAGE TO UTILITIES CAUSED BY THE CONTRACTOR'S WORK, AT NO ADDITIONAL COST TO THE OWNER. CONTACT ALL UTILITY PROVIDERS SERVING THE SITE AREA 48 HOURS PRIOR TO ANY EXCAVATION.
9. ALL PLANT MATERIALS SHALL MATCH SPECIFICATIONS PER SPECIES AND SHALL COMPLY WITH ANSI Z60.1 'STANDARD FOR NURSERY STOCK'.
10. THE CONTRACTOR SHALL ADHERE TO THE WASHINGTON ASSOCIATION OF NURSERYMEN'S GUIDELINES FOR PLANTING PRACTICES.
11. THE CONTRACTOR SHALL REPAIR ANY DAMAGE TO EXISTING ELEMENTS ON AND OFF SITE, RESULTING FROM THE CONTRACTOR'S WORK.
12. THE CONTRACTOR IS RESPONSIBLE FOR THE VIABILITY OF ALL PLANT MATERIAL FOR 2 YEARS AFTER COMPLETION OF PLANTING. DISEASED, DYING, OR DEAD PLANT MATERIAL SHALL BE REPLACED BY THE CONTRACTOR DURING THE TWO YEAR PERIOD AND MAINTAINED FOR AN ADDITIONAL 2 YEAR PERIOD.
13. IMMEDIATELY UPON BID AWARD, CONTRACTOR SHALL SECURE THE PLANT MATERIALS AS SPECIFIED FROM AVAILABLE SOURCES. IN THE EVENT THAT PLANT MATERIALS ARE NOT AVAILABLE, CONTACT LANDSCAPE ARCHITECT FOR APPROVED SUBSTITUTIONS. NO SUBSTITUTION FOR PLANT MATERIAL WILL BE ALLOWED WITHOUT PRIOR WRITTEN APPROVAL OF THE LANDSCAPE ARCHITECT.
14. TOP DRESS ALL SHRUB AND GROUND COVER AREAS (NOT LAWN) WITH 3" OF FIR BARK MULCH. SUBMIT SAMPLE TO THE LANDSCAPE ARCHITECT FOR APPROVAL PRIOR TO CONSTRUCTION.
15. TREE LOCATIONS MAY BE ADJUSTED IN THE FIELD TO SUIT SITE REQUIREMENTS AS DIRECTED BY THE LANDSCAPE ARCHITECT.
16. THE CONTRACTOR SHALL ENSURE THAT ALL EXCAVATED PLANTING PITS HAVE POSITIVE DRAINAGE. PLANT PITS FULLY FLOODED WITH WATER SHALL DRAIN WITHIN (12) HOURS OF FILLING.
17. FINISH GRADE SHALL BE SET TO ALLOW POSITIVE DRAINAGE
18. ROTOTILL 2" OF COMPOST INTO ALL PLANTED AREAS.
19. INCORPORATE PEAT INTO THE ROOT ZONE OF RHODODENDRONS, AZALEAS AND OTHER ACID LOVING PLANTS.
20. INCORPORATE 10-20-20 FERTILIZER INTO THE ROOT ZONE OF ALL NEW PLANTINGS.
21. RONSTAR, OR APPROVED EQUAL, PREEMERGENT HERBICIDE TO BE APPLIED TO ALL PLANTED AREAS PER MANUFACTURERS INSTRUCTIONS.
22. EXISTING VEGETATION TO BE SPRAYED WITH ROUNDUP, OR APPROVED EQUAL, PER MANUFACTURERS INSTRUCTIONS. SUFFICIENT TIME SHALL BE GIVEN TO ALLOW EXISTING MATERIAL TO DIE. REMOVE EXISTING 27. THE PROPERTY OWNER IS RESPONSIBLE FOR MAINTAINING TURF PLANTED WITHIN THE RIGHT OF WAY.
23. CROWN LAWN AREAS AND GRADE TO PROVIDE POSITIVE DRAINAGE.
24. ROLL LAWN AREA TO INSURE PROPER COMPACTION TO MINIMIZE SETTLING.
25. AMEND SOIL IN LAWN AREAS WITH 80 LBS. OF DOLOMITE LIME AND 40 LBS. OF 10-20-20 SLOW RELEASE FERTILIZER OR EQUIVALENT. PROVIDE A 3" LAYER OF SANDY LOAM TOPSOIL FOR LAWN AND BED AREA.
26. SEED LAWN AREAS WITH GRASS SEED MANUFACTURER'S RECOMMENDATIONS. COVER SEED WITH FINE MULCH APPLIED WITH ROLLER OR HYDROSEED.
27. THE PROPERTY OWNER IS RESPONSIBLE FOR MAINTAINING TURF PLANTED WITHIN THE RIGHT OF WAY.
28. PLANT MATERIAL SHALL BE PLANTED W/ ROOT CROWN 1" ABOVE FINISHED GRADE TO ALLOW POSITIVE DRAINAGE AWAY FROM CROWN.
29. STAKE ALL TREES OVER 6 FT. IN HEIGHT PER DETAILS ON THIS SHEET.
30. REFER TO DETAILS FOR ADDITIONAL INFORMATION.
31. ALL PLANTING SHALL BE IRRIGATED BY AN AUTOMATIC UNDERGROUND SPRINKLER SYSTEM.
32. ALL PLANT MATERIALS FURNISHED ARE TO BE HEALTHY, UNIFORMLY BRANCHED AND WITH WELL DEVELOPED FIBROUS ROOT SYSTEMS.
33. ALL PLANT MATERIALS FURNISHED ARE TO BE FREE FROM DEAD OR BROKEN BRANCHES, LICHENS, SCARS, BROKEN BARK OR WOUNDS. ALL PLANT MATERIALS WILL BE INSECT, WEED, AND DISEASE FREE ACCORDING TO THE REQUIREMENTS OF THE WASHINGTON STATE DEPARTMENT OF AGRICULTURE FOR NURSERY PLANT MATERIALS SOLD FOR WHOLESALE OR RETAIL. ALL PRUNING WOUNDS MUST BE WELL HEALED WITH NO EVIDENCE OF DECAY.
34. FIELD CONFIRM ALL SITE CONDITIONS, AREAS AND SIZES PRIOR TO BIDDING & CONSTRUCTION. DO NOT SCALE FROM PLANS.



NOTES:
ALL GROUND COVER SHALL BE PLANTED AT EQUAL TRIANGULAR SPACING AS SPECIFIED IN PLANTING LEGEND.

GROUND COVER TO BE LOCATED ONE HALF OF SPECIFIED SPACING DISTANCE FROM ANY HARD SURFACE, UNLESS OTHERWISE SPECIFIED.

D Ground Cover Planting Detail
Not To Scale — PLAN VIEW

PLANT LEGEND

SYMBOL	BOTANICAL / COMMON NAME	SIZE	QUANTITY	TREE UNITS
TREES				
	EXISITNG TREES - RETAIN & PROTECT PER PLANS.	SEE SHT. T1	3	26
	ACER TRUNC. X A. PLAT.'WARREN RED' PACIFIC SUNSET MAPLE	2" cal.	33	33
	CALOCEDRUS DECURRENS INCENSE CEDAR	5' Ht.	40	40
	CARPINUS CAROLINIANA AMERICAN HORNBEAM	2" cal.	23	23
	PARROTIA PERSICA 'VANESSA' VANESSA PERSIAN PARROTIA	2" cal.	3	3
	PSEUDOTSUGA MENZIESII DOUGLAS FIR	5' Ht.	15	15
	ZELKOVA SERRATA 'CITY SPRITE' CITY SPRITE ZELKOVA	2" cal.	37	37
		TOTAL TREES PLANTED	151	
		TOTAL TREE UNITS		177
SHRUBS				
	MYRICA CALIFORNICA PACIFIC WAX MYRTLE	5 GAL.	36	
	ILEX GLABRA INKBERRY HOLLY	5 GAL.	30	
GROUNDCOVER				
	ARCTOSTAPHYLOS UVA URSI / KINNIKINNICK	1 GAL.	36" O.C.	
	TURF, DROUGHT RESISTANT, SUN & SHADE MIX (ALL NON SHRUB OR GC AREAS)			
STORMWATER DETENTION FACILITY				
	GRASS SEED PER CIVIL PLANS			

REQUIRED TREE DENSITY

	SITE AREA	REQUIRED TREE UNITS / ACRE DISTURBED	TOTAL REQUIRED TREE UNITS
	2.84± AC	20	177

TREE DENSITY SUMMARY

EXISTING TREE UNITS RETAINED	26
TREE UNITS PROPOSED TO PLANT	151
TREE UNITS PROVIDED	177

IRRIGATION NOTE

ALL LANDSCAPE AREAS SHALL BE IRRIGATED WITH AN AUTOMATIC DRIP AND/OR SPRAY IRRIGATION SYSTEM. REFER TO CIVIL ENGINEERING PLANS FOR WATER SOURCE.

Planning Solutions, Inc.
Creating Solutions to Complex Issues
4400 NE 77th Avenue
Suite 275
VANCOUVER, WA 98662
VOICE: 360-750-9000 FAX: 360-713-6102
www.planningsolutionsinc.com

PRELIMINARY NOT FOR CONSTRUCTION SUBJECT TO APPROVAL

STATE OF WASHINGTON — CHRISTOPHER A. BAUMAN — REGISTERED LANDSCAPE ARCHITECT — EXP. 10-20-2023

MONTE VERDE SUBDIVISION

22205 NE 28TH Street
Camas, Washington

DRAWN: VH | CHECKED: CB
SCALE: 1" = 50'-0" | DATE: 07.29.22
JOB #: 22-1719
ISSUED FOR: PLR
REVISIONS:
1
2
3
4
5
6

SHEET NAME:
PRELIMINARY LANDSCAPE PLAN

SHEET #:
L1
SHEET 8 OF 9

848

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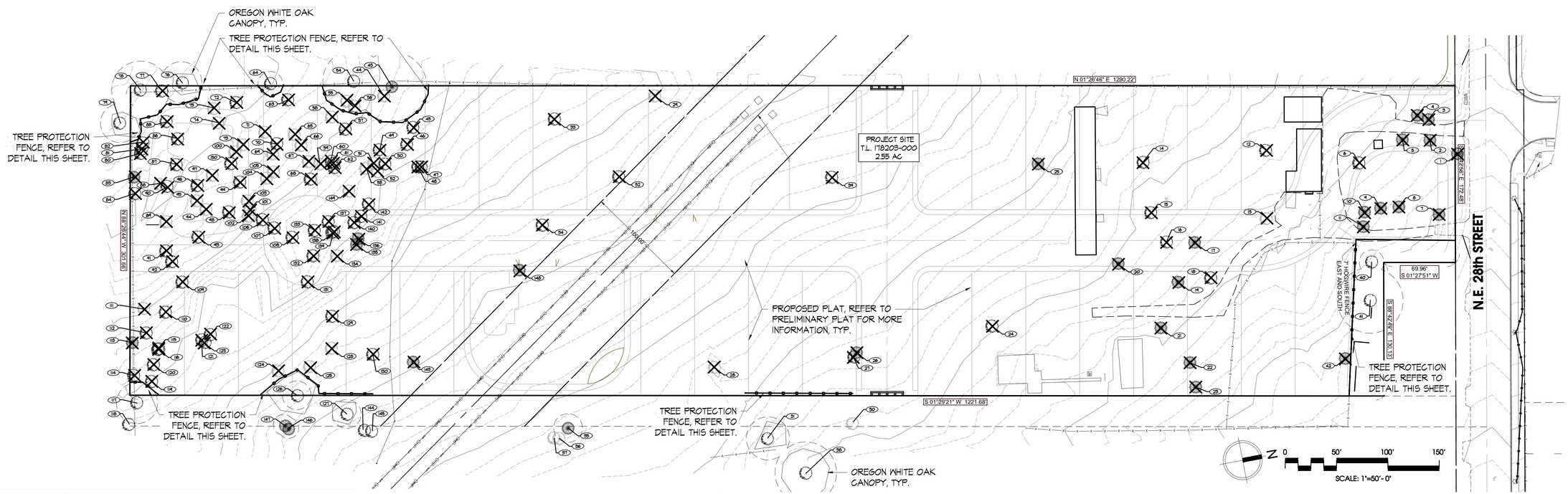
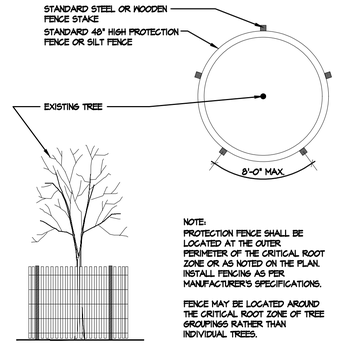


Tree Data							
Tree No.	Species	DBH	RPZ	Tree Condition	Retain (R) Remove (X)	Units (retained only)	Condition Notes
1	Pseudotsuga menziesii (Douglas Fir)	11"	11'	poor	X		Branches Suppressed
2	Pseudotsuga menziesii (Douglas Fir)	43"	43'	fair	X		
3	Pseudotsuga menziesii (Douglas Fir)	42"	42'	fair	X		
4	Pseudotsuga menziesii (Douglas Fir)	36"	36'	fair	X		
5	Pseudotsuga menziesii (Douglas Fir)	44'	44'	fair	X		
6	Acer saccharinum (Silver Maple)	22"	22'	fair	X		
7	Pseudotsuga menziesii (Douglas Fir)	36"	36'	fair	X		
8	Pseudotsuga menziesii (Douglas Fir)	44"	44'	fair	X		
9	Pseudotsuga menziesii (Douglas Fir)	29"	29'	fair	X		
10	Pseudotsuga menziesii (Douglas Fir)	26"	26'	fair	X		
11	Pseudotsuga menziesii (Douglas Fir)	36"	36'	fair	X		
12	Ailanthus altissima (Tree Of Heaven)	34"	34'	fair	X		
13	Crataegus douglasii (Douglas Hawthorn)	10"	10'	poor	X		Co-dominant
14	Quercus garryana (Oregon White Oak)	20"	20'	fair	X		
15	Quercus garryana (Oregon White Oak)	36"	36'	fair	X		
16	Quercus garryana (Oregon White Oak)	30"	30'	fair	X		
17	Pseudotsuga menziesii (Douglas Fir)	38"	38'	fair	X		
18	Alnus rubra (Red Alder)	25"	25'	poor	X		Dieback 30% - 60%, Leaning
19	Pseudotsuga menziesii (Douglas Fir)	42"	42'	fair	X		
20	Pseudotsuga menziesii (Douglas Fir)	36"	36'	fair	X		
21	Pseudotsuga menziesii (Douglas Fir)	34"	34'	fair	X		
22	Pseudotsuga menziesii (Douglas Fir)	36"	36'	fair	X		
23	Pseudotsuga menziesii (Douglas Fir)	30"	30'	fair	X		
24	Pyrus spp. (Apple)	18"	18'	fair	X		
25	Pseudotsuga menziesii (Douglas Fir)	20"	20'	fair	X		
26	Pseudotsuga menziesii (Douglas Fir)	16"	16'	fair	X		Co-dominant
27	Quercus garryana (Oregon White Oak)	14"	14'	dead	X		Dieback >90%, Leaning, Poor Taper
28	Pyrus spp. (Apple)	10"	10'	fair	X		Co-dominant
29	Pyrus spp. (Apple)	10"	10'	fair	X		Branch Failures, Co-dominant, Cracks, Leaning
30	Pyrus spp. (Apple)	10"	10'	poor	X		Co-dominant, Dieback 30% - 60%
31	Quercus garryana (Oregon White Oak)	21"	21'	fair	R	offsite	Co-dominant
32	Quercus garryana (Oregon White Oak)	31"	31'	poor	X		Co-dominant, Cracks, Visible Decay
33	Alnus rhombifolia (White Alder)	14"	14'	fair	X		Missing Bark, Poor Taper
34	Pyrus spp. (Apple)	25"	25'	poor	X		
35	Pseudotsuga menziesii (Douglas Fir)	14"	14'	fair	R	offsite	
36	Acer macrophyllum (Bigleaf Maple)	10"	10'	dead	R	offsite	
37	Acer macrophyllum (Bigleaf Maple)	10"	10'	dead	R	offsite	
38	Quercus garryana (Oregon White Oak)	30"	30'	fair	R	offsite	
39	Pyrus spp. (Apple)	20"	20'	dead	X		
40	Acer rubrum (Red Maple)	12"	12'	fair	R	offsite	Co-dominant
41	Acer rubrum (Red Maple)	32"	32'	fair	R	offsite	
42	Pseudotsuga menziesii (Douglas Fir)	30"	30'	fair	X		
43	Pseudotsuga menziesii (Douglas Fir)	34"	34'	fair	R	13	Dieback 30% - 60%
44	Fraxinus latifolia (Oregon Ash)	10"	10'	poor	X		Co-dominant
45	Acer macrophyllum (Bigleaf Maple)	17"	17'	fair	X		
46	Acer macrophyllum (Bigleaf Maple)	17"	17'	poor	X		Dieback 30% - 60%, Leaning
47	Frangula purshiana (Cascara)	12"	12'	poor	X		
48	Acer macrophyllum (Bigleaf Maple)	20"	20'	fair	X		Dieback 30% - 60%
49	Acer macrophyllum (Bigleaf Maple)	17"	17'	poor	X		Leaning
50	Alnus rubra (Red Alder)	15"	15'	fair	X		
51	Alnus rubra (Red Alder)	10"	10'	poor	X		Co-dominant
52	Alnus rubra (Red Alder)	10"	10'	poor	X		Poor Taper
53	Alnus rubra (Red Alder)	8"	8'	poor	X		Co-dominant
54	Salix scouleriana (Scouler's Willow)	30"	30'	fair	R	offsite	
55	Fraxinus latifolia (Oregon Ash)	10"	10'	poor	X		Co-dominant
56	Fraxinus latifolia (Oregon Ash)	9"	9'	poor	X		Co-dominant, Leaning
57	Acer macrophyllum (Bigleaf Maple)	14"	14'	poor	X		Dieback 30% - 60%
58	Acer macrophyllum (Bigleaf Maple)	9"	9'	poor	X		Dieback 30% - 60%, Leaning
59	Acer macrophyllum (Bigleaf Maple)	8"	8'	poor	X		Co-dominant, Dieback 30% - 60%
60	Acer macrophyllum (Bigleaf Maple)	13"	13'	poor	X		Co-dominant, Dieback 30% - 60%, Overextended Branches
61	Acer macrophyllum (Bigleaf Maple)	12"	12'	poor	X		Co-dominant, Dieback 30% - 60%
62	Acer macrophyllum (Bigleaf Maple)	14"	14'	poor	X		Co-dominant, Dieback 30% - 60%
63	Acer macrophyllum (Bigleaf Maple)	34"	34'	poor	X		Dieback 60%-90%
64	Salix scouleriana (Scouler's Willow)	12"	12'	poor	R	offsite	Dieback 30% - 60%, Multi-Stemmed
65	Fraxinus latifolia (Oregon Ash)	10"	10'	poor	X		Dieback 60%-90%
66	Fraxinus latifolia (Oregon Ash)	8"	8'	poor	X		Co-dominant, Dieback 60%-90%
67	Acer macrophyllum (Bigleaf Maple)	8"	8'	poor	X		Co-dominant, Dieback 60%-90%
68	Acer macrophyllum (Bigleaf Maple)	12"	12'	poor	X		Dieback 30% - 60%, Multi-Stemmed, Overextended Branches
69	Fraxinus latifolia (Oregon Ash)	8"	8'	poor	X		Co-dominant, Dieback 30% - 60%
70	Fraxinus latifolia (Oregon Ash)	12"	12'	poor	X		Dieback 60%-90%
71	Fraxinus latifolia (Oregon Ash)	10"	10'	poor	X		Co-dominant
72	Fraxinus latifolia (Oregon Ash)	17"	17'	fair	X		Dieback 30% - 60%
73	Fraxinus latifolia (Oregon Ash)	10"	10'	poor	X		Dieback 30% - 60%, Poor Taper
74	Acer macrophyllum (Bigleaf Maple)	10"	10'	poor	X		Co-dominant
75	Acer macrophyllum (Bigleaf Maple)	11"	11'	poor	X		Branch Failures, Branches Suppressed, Dieback 30% - 60%
76	Quercus garryana (Oregon White Oak)	20"	20'	fair	R	offsite	Dieback 30% - 60%
77	Fraxinus latifolia (Oregon Ash)	26"	26'	poor	X		Dieback 60%-90%, Missing Bark
78	Fraxinus latifolia (Oregon Ash)	28"	28'	fair	R	10	Dieback 30% - 60%
79	Quercus garryana (Oregon White Oak)	19"	19'	fair	R	offsite	
80	Acer macrophyllum (Bigleaf Maple)	13"	13'	poor	X		Branches Suppressed, Dieback 30% - 60%
81	Acer macrophyllum (Bigleaf Maple)	14"	14'	poor	X		Branches Suppressed, Dieback 30% - 60%
82	Acer macrophyllum (Bigleaf Maple)	15"	15'	poor	X		Branches Suppressed, Dieback 30% - 60%
83	Pseudotsuga menziesii (Douglas Fir)	28"	28'	fair	X		Branches Suppressed, Dieback 30% - 60%
84	Acer macrophyllum (Bigleaf Maple)	24"	24'	poor	X		Branches Suppressed, Dieback 30% - 60%, Leaning
85	Fraxinus latifolia (Oregon Ash)	15"	15'	fair	X		Branches Suppressed
86	Acer macrophyllum (Bigleaf Maple)	18"	18'	fair	X		Branches Suppressed, Dieback 30% - 60%
87	Fraxinus latifolia (Oregon Ash)	12"	12'	poor	X		Dieback 30% - 60%, Leaning
88	Acer macrophyllum (Bigleaf Maple)	10"	10'	poor	X		Co-dominant, Dieback 30% - 60%
89	Acer macrophyllum (Bigleaf Maple)	10"	10'	poor	X		Dieback 30% - 60%
90	Acer macrophyllum (Bigleaf Maple)	12"	12'	poor	X		
91	Acer macrophyllum (Bigleaf Maple)	12"	12'	poor	X		Branches Suppressed, Co-dominant
92	Acer macrophyllum (Bigleaf Maple)	14"	14'	fair	X		Co-dominant
93	Acer macrophyllum (Bigleaf Maple)	13"	13'	poor	X		Branches Suppressed, Dieback 30% - 60%
94	Acer macrophyllum (Bigleaf Maple)	11"	11'	poor	X		Branches Suppressed, Dieback 30% - 60%
95	Acer macrophyllum (Bigleaf Maple)	10"	10'	poor	X		Branches Suppressed, Dieback 30% - 60%
96	Fraxinus latifolia (Oregon Ash)	12"	12'	poor	X		Co-dominant, Dieback 30% - 60%
97	Fraxinus latifolia (Oregon Ash)	10"	10'	poor	X		Co-dominant, Dieback 30% - 60%
98	Fraxinus latifolia (Oregon Ash)	12"	12'	fair	X		Co-dominant
99	Fraxinus latifolia (Oregon Ash)	12"	12'	fair	X		Branches Suppressed
100	Fraxinus latifolia (Oregon Ash)	8"	8'	poor	X		Co-dominant
101	Acer macrophyllum (Bigleaf Maple)	10"	10'	fair	X		Co-dominant
102	Acer macrophyllum (Bigleaf Maple)	8"	8'	fair	X		Co-dominant
103	Acer macrophyllum (Bigleaf Maple)	8"	8'	fair	X		Branches Suppressed, Co-dominant

Tree Data							
Tree No.	Species	DBH	RPZ	Tree Condition	Retain (R) Remove (X)	Units (retained only)	Condition Notes
104	Fraxinus latifolia (Oregon Ash)	8"	8'	poor	X		Branches Suppressed, Co-dominant
105	Fraxinus latifolia (Oregon Ash)	8"	8'	poor	X		Branch Failures, Branches Suppressed, Co-dominant, Dieback 30% - 60%
106	Acer macrophyllum (Bigleaf Maple)	12"	12'	poor	X		Branches Suppressed, Dieback 30% - 60%
107	Acer macrophyllum (Bigleaf Maple)	12"	12'	fair	X		
108	Fraxinus latifolia (Oregon Ash)	14'	14'	poor	X		Branch Failures, Co-dominant, Dieback 30% - 60%
109	Acer macrophyllum (Bigleaf Maple)	14"	14'	poor	X		Branch Failures, Co-dominant, Leaning
110	Fraxinus latifolia (Oregon Ash)	11"	11'	poor	X		Branch Failures, Branches Suppressed, Dieback 30% - 60%
111	Alnus rubra (Red Alder)	10"	10'	poor	X		Co-dominant, Leaning
112	Acer macrophyllum (Bigleaf Maple)	12"	12'	poor	X		Branches Suppressed, Leaning
113	Pseudotsuga menziesii (Douglas Fir)	14"	14'	poor	X		Branch Failures, Branches Suppressed, Dieback 30% - 60%
114	Acer macrophyllum (Bigleaf Maple)	17"	17'	fair	X		Branches Suppressed, Dieback 30% - 60%
115	Acer macrophyllum (Bigleaf Maple)	15"	15'	fair	X		Branches Suppressed, Dieback 30% - 60%
116	Acer macrophyllum (Bigleaf Maple)	17"	17'	poor	X		Branch Failures, Branches Suppressed, Dieback 30% - 60%
117	Acer macrophyllum (Bigleaf Maple)	20"	20'	fair	R	offsite	Dieback 30% - 60%
118	Acer macrophyllum (Bigleaf Maple)	12"	12'	poor	R	offsite	Co-dominant, Dieback 30% - 60%
119	Acer macrophyllum (Bigleaf Maple)	12"	12'	fair	X		Branches Suppressed, Dieback 30% - 60%
120	Acer macrophyllum (Bigleaf Maple)	12"	12'	poor	X		Branch Failures, Branches Suppressed, Dieback 30% - 60%
121	Fraxinus latifolia (Oregon Ash)	12"	12'	poor	X		Branches Suppressed, Dieback 30% - 60%, Heavy Leaning (>60%)
122	Fraxinus latifolia (Oregon Ash)	14"	14'	poor	X		Branch Failures, Co-dominant, Dieback 30% - 60%
123	Fraxinus latifolia (Oregon Ash)	12"	12'	poor	X		Branches Suppressed, Co-dominant, Dieback 30% - 60%, Missing Bark
124	Acer macrophyllum (Bigleaf Maple)	10"	10'	fair	X		Dieback 30% - 60%
125	Acer macrophyllum (Bigleaf Maple)	10"	10'	fair	X		Dieback 30% - 60%
126	Quercus garryana (Oregon White Oak)	14"	14'	fair	R	3	Branch Failures, Co-dominant
127	Quercus garryana (Oregon White Oak)	14"	14'	fair	R	offsite	Co-dominant
128	Acer macrophyllum (Bigleaf Maple)	10"	10'	poor	X		Co-dominant, Dieback 30% - 60%
129	Acer macrophyllum (Bigleaf Maple)	12"	12'	fair	X		Co-dominant, Dieback 30% - 60%, Multi-Stemmed
130	Acer saccharum (Sugar Maple)	20"	20'	poor	X		Branch Failures, Dieback 60%-90%, Missing Bark
131	Acer macrophyllum (Bigleaf Maple)	14"	14'	fair	X		Dieback 30% - 60%
132	Acer macrophyllum (Bigleaf Maple)	12"	12'	fair	X		
133	Acer macrophyllum (Bigleaf Maple)	12"	12'	fair	X		Branches Suppressed
134	Alnus rubra (Red Alder)	8"	8'	fair	X		Co-dominant
135	Pseudotsuga menziesii (Douglas Fir)	16"	16'	fair	X		Branches Suppressed
136	Pseudotsuga menziesii (Douglas Fir)	12"	12'	fair	X		Branches Suppressed
137	Acer macrophyllum (Bigleaf Maple)	12"	12'	fair	X		Branches Suppressed
138	Acer macrophyllum (Bigleaf Maple)	12"	12'	fair	X		Branches Suppressed
139	Acer macrophyllum (Bigleaf Maple)	12"	12'	fair	X		Branches Suppressed, Dieback 30% - 60%
140	Acer macrophyllum (Bigleaf Maple)	12"	12'	fair	X		Branches Suppressed
141	Alnus rubra (Red Alder)	12"	12'	poor	X		Co-dominant, Dieback 30% - 60%
142	Alnus rubra (Red Alder)	12"	12'	fair	X		Branches Suppressed
143	Pseudotsuga menziesii (Douglas Fir)	15'	15'	good	X		
144	Salix scouleriana (Scouler's Willow)	13"	13'	poor	R	offsite	Branch Failures, Branches Suppressed, Dieback 30% - 60%
145	Salix scouleriana (Scouler's Willow)	13"	13'	poor	R	offsite	Co-dominant, Missing Bark, Multi-Stemmed
146	Pseudotsuga menziesii (Douglas Fir)	10"	10'	fair	R	offsite	
147	Pseudotsuga menziesii (Douglas Fir)	10"	10'	fair	R	offsite	
148	Pseudotsuga menziesii (Douglas Fir)	17"	17'	dead	X		Co-dominant
149	Fraxinus latifolia (Oregon Ash)	10"	10'	poor	X		Dieback 30% - 60%
150	Acer macrophyllum (Bigleaf Maple)	17'	17'	poor	X		Dieback 30% - 60%



NOTE:
PROTECTION FENCE SHALL BE LOCATED AT THE OUTER PERIMETER OF THE CRITICAL ROOT ZONE OR AS NOTED ON THE PLAN. INSTALL FENCING AS PER MANUFACTURER'S SPECIFICATIONS.

FENCE MAY BE LOCATED AROUND THE CRITICAL ROOT ZONE OF TREE GROUPINGS RATHER THAN INDIVIDUAL TREES.

A Tree Protection Fencing Detail
Not To Scale — SECTION / PLAN VIEW

SITE STATISTICS

8.84± AC	SITE AREA
177	TREE UNITS REQUIRED (20 / ACRE)
26	TREE UNITS RETAINED

SYMBOL LEGEND

SYMBOL	DESCRIPTION
	EXISTING SIGNIFICANT DECIDUOUS TREE (12" CAL. OR GREATER)
	EXISTING SIGNIFICANT EVERGREEN TREE (8" CAL. OR GREATER)
	EXISTING DECIDUOUS (LESS THAN 12" CAL.) TO BE REMOVED
X	EXISTING SIGNIFICANT TREE TO BE REMOVED
	ROOT PROTECTION ZONE AREA (RPZ)
	TREE PROTECTION FENCE LOCATION (4' CHAIN LINK, ORANGE PVC FENCE OR SILT FENCE) (ALSO DENOTES AREA WHERE NO IMPACTS TO THE ROOT PROTECTION ZONE SHALL OCCUR). SEE DETAIL THIS SHEET.

STATE OF WASHINGTON — ROBERT W. PHIPPS — EXP. 02/07/2023 — NO. 1861 — LANDSCAPE ARCHITECT
7-29-2022

CERTIFIED ARBORIST — ISA
Robert Phipps, PN-8715A
7-29-2022

TREE PROTECTION TIME LINE & NARRATIVE

EXISTING ON-SITE AND OFF-SITE TREE LOCATIONS AND SIZES HAVE BEEN OBTAINED VIA SURVEY INFORMATION AND SITE OBSERVATIONS.

129 EXISTING TREES WITHIN THE PROJECT BOUNDARIES ARE PROPOSED TO BE REMOVED DUE TO CONFLICTS WITH THE PROPOSED SITE GRADING.

TREE PROTECTION FENCING SHALL BE PLACED AS SHOWN TO PROTECT THE TREES TO BE RETAINED.

TREE PROTECTION / EROSION CONTROL FENCING SHALL BE ESTABLISHED PRIOR TO EXCAVATION. IT IS RECOMMENDED TO BE INSTALLED AT THE SAME TIME EROSION CONTROL MEASURES ARE INSTALLED. WHERE TREE FENCE AND EROSION CONTROL FENCE ARE LOCATED AT THE SAME LOCATION, EROSION FENCE THEN SERVES AS TREE PROTECTION FENCE. SEE DETAIL THIS SHEET.

TREES DETERMINED TO BE A SAFETY HAZARD AT THE TIME OF CONSTRUCTION MAY BE REMOVED. THE SITE WILL MAINTAIN A MINIMUM TREE UNIT COUNT OF 20 TREES PER ACRE IN ACCORDANCE WITH CITY OF CAMAS MUNICIPAL CODE CC 18.13.051.

TREE PROTECTION NOTES

1) NO PERSON MAY CONDUCT ANY OF THE FOLLOWING ACTIVITIES WITHIN THE DRIP LINE OF THE TREES DESIGNATED TO REMAIN INCLUDING, BUT NOT LIMITED TO: PARKING EQUIPMENT, FUELING, SERVICING EQUIPMENT, PLACING SOLVENTS, STORING BUILDING MATERIAL AND SOIL DEPOSITS, DUMPING CONCRETE WASHOUT AND LOCATING BURN HOLES.
2) DURING CONSTRUCTION, NO PERSON SHALL ATTACH ANY OBJECT TO THE TREES DESIGNATED FOR PROTECTION.
3) THE CONTRACTOR SHALL FOLLOW THE GRADING PLAN PROVIDED BY THE PROJECT CIVIL ENGINEER. GRADING ACTIVITIES SHALL BE CONDUCTED IN A MANNER TO MINIMIZE THE IMPACTS TO THE TREES MARKED FOR PRESERVATION.
4) THE EXCAVATOR SHALL KEEP A SHARP PAIR OF LOPPERS AND A SHARP 12" PRUNING SAW ACCESSIBLE ON-SITE DURING GRADING OPERATIONS. ANY ROOTS LARGER THAN ½" SHALL BE PRUNED TO THE FACE OF THE CUT (USING A SHARP PAIR OF LOPPERS OR A SHARP 12" PRUNING SAW) AND SHALL NOT BE TORN FROM THE GROUND BY MECHANICAL EXCAVATION.
5) SPECIAL CARE SHALL BE EXERCISED IN WORKING NEAR THE TREES TO BE RETAINED. THIS INCLUDES HAND EXCAVATING THE ROOTS AT THE EDGE OF THE EXCAVATION AND CUTTING ROOTS WITH A LOPPER OR PRUNING SAW. PRUNING THE ROOTS AT THE EDGE OF EXCAVATION WILL MINIMIZE BREAKAGE OF HEALTHY ROOTS BEYOND THE EDGE OF THE PROPOSED EXCAVATION.
6) EXCEPT FOR THE PROPOSED IMPROVEMENTS SHOWN WITHIN THE DRIP LINES OF THE TREES NOTED TO BE RETAINED THE GRADE SHALL NOT BE ELEVATED OR REDUCED FROM EXISTING GRADE.
7) IF THE GRADE ADJACENT TO A PRESERVED TREE IS RAISED SUCH THAT IT COULD SLOUGH OR ERODE INTO THE TREE'S DRIP LINE, IT SHALL BE PERMANENTLY STABILIZED.
8) THE TREES NOTED TO RETAINED SHALL BE PROTECTED FROM EROSION AND SEDIMENTATION. CLEARING OPERATIONS SHALL BE CONDUCTED SO AS TO EXPOSE THE SMALLEST PRACTICAL AREA OF SOIL TO EROSION FOR THE LEAST POSSIBLE TIME. REFER TO THE PROJECT'S EROSION CONTROL PLAN FOR MORE INFORMATION.
9) THE PROJECT SHALL NOT INSTALL AN IMPERVIOUS SURFACE OTHER THAN THOSE SPECIFICALLY SHOWN ON THE PLANS WITHIN THE DRIP LINE OF THE TREES TO BE RETAINED.
10) UTILITY TRENCHES SHALL BE LOCATED OUTSIDE OF THE DRIP LINE OF THE TREES TO BE RETAINED.
11) ONGOING TREE MAINTENANCE SHALL BE THE RESPONSIBILITY OF THE LAND OWNER. TREES SHALL BE MAINTAINED IN ACCORDANCE WITH ANSI AMERICAN NATIONAL STANDARDS INSTITUTE'S AS WELL AS OTHER APPLICABLE FEDERAL, STATE AND LOCAL STANDARDS PERTAINING TO TREE CARE OPERATIONS.

- ANSI Z133 ARBORICULTURAL OPERATIONS: SAFETY REQUIREMENTS
- ANSI A300 PART 1 PRUNING

Planning Solutions, Inc.
Creating Solutions to Complex Issues
4400 NE 77th Avenue
Suite 275
VANCOUVER, WA 98662
VOICE: 360-750-9000 FAX: 360-713-6102
www.planningsolutionsinc.com

PRELIMINARY NOT FOR CONSTRUCTION SUBJECT TO APPROVAL
PBS ENGINEERING ENVIRONMENTAL SURVEYING PBSUSA.COM

MONTE VERDE SUBDIVISION

22205 NE 28TH Street
Camas, Washington

DRAWN: CB/RP | CHECKED: CB
SCALE: 1" = 50'-0" | DATE: 07.29.22
JOB #: 22-1719
ISSUED FOR: PLR
REVISIONS:
1
2
3
4
5
6

SHEET NAME:
EXISTING TREE SURVEY

SHEET #: TP
SHEET 9 OF 9

849

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D:\OneDrive - Planning Solutions Inc\Project Folder\2022 Projects\1719-Monte Verde Subdivision\2.0 LUI\2.03 PLR (Current)\PLR-S1 (6.22)\PLR-S1 Plans\1719 PLR S1 TP R0.dwg, 7/28/2022 4:44:33 PM

Notice of Proposed Development
"Monte Verde Subdivision"

An application is on file with the City of Camas for review of a Preliminary Plat, SEPA, Critical Areas Review/Habitat, Archaeological Review, Fire Department Review, Building Permit and Plan Review and Engineering Review. For information regarding this project contact:

Public Hearing Schedule:

Hearing
Date/Time: __TBD____

Hearing
Location: __TBD_____

Applicant Contact:

Ryan Stygar
Pacific Lifestyle Homes
(360) 304-9901

City Contact:

Yvette Sennewald
(360) 817-1568

Notice of Proposed Development
"Monte Verde Subdivision"

An application is on file with the City of Camas for review of a Preliminary Plat, SEPA, Critical Areas Review/Habitat, Archaeological Review, Fire Department Review, Building Permit and Plan Review and Engineering Review. For information regarding this project contact:

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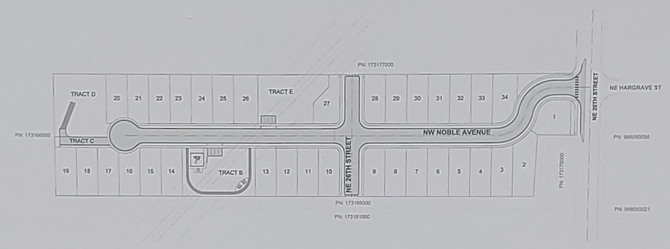


Public Hearing Schedule:

Hearing Date: 2/16/2023
Time: 5:00 PM

Hearing Location:
Council Chambers
616 NE 4th Ave.
Camas, WA 98607

COMMUNITY DEVELOPMENT DEPARTMENT
616 NE 4th Avenue
Camas, WA 98607
www.ci.camas.wa.us

September 7, 2022

Pacific Lifestyle Homes
Attn: Ryan Stygar
Sent via email: ryans@buildplh.com

RE: Application Completeness Review for Planning Case SUB22-05: Monte Verde Subdivision

Dear Mr. Stygar,

Thank you for your application submittal for the Monte Verde Subdivision (SUB22-05). I am the case planner assigned to this project. The purpose of this letter is to inform you that the application submitted on August 11, 2022, has been deemed incomplete in accordance with Camas Municipal Code (CMC) Section 18.55.130 and there are items that need to be addressed in order to move forward with the review process. Once the items below are submitted, staff will review the information to verify whether the application can be deemed complete. As a reminder, staff is not authorized to waive any requirement of the City Code. Any omission or failure by staff to recite applicable code requirements shall not constitute a waiver by the City of any standard or requirement.

Items necessary for completeness:

- 17.01.050.B2: Tracts to be dedicated to any public or private purpose shall be distinguished from lots intended for general development with notes stating their purpose and any limitations. Preliminary Plat shows Tracts A-F, some with unclear boundaries. Please provide narrative for proposed Tracts that includes purpose, square footage, and an illustration that shows defined boundaries.
- 17.01.050.B3: Building Envelopes. Lot 1 building envelopes are unclear. Please revise preliminary plat to include buildable area and show required setbacks.
- 17.01.050.B4: Land Inventory. Preliminary and final plats shall include the following:
    - d. Total infrastructure acreage (includes proposed storm ponds)
    - e. Total Tract Area
- 17.11.030.B6:
    - b. Owners of adjacent land and the names of any adjacent subdivisions. *Only one subdivision name references but missing adjacent property owners.*
    - d. Names, locations, widths, and dimension of existing and proposed public street rights-of-way and easements and private access easements, parks and other open spaces, reservations, and utilities. *Missing dimensions and callouts for existing right-of-way.*
    - k. Location of any proposed dedications. *Proposed dedications are not called out, dimensions are not noted.*
    - n. Description, location and size of existing and proposed utilities, storm drainage facilities and roads to service the lots. *Sizes of existing and proposed utilities are not shown.*
- 17.11.030.B10: Clark County assessor's maps which show the location of each property within three hundred feet of the subdivision. Properties shown on preliminary plat appear to be less

than 300-feet.

- 17.11.030.B12: Complete and submit a transportation impact study to determine the adequacy of the transportation system to serve a proposed development and to mitigate impacts of the proposal on the surrounding transportation system
    - Per City of Vancouver preliminary review of the TIA, COV is requesting additional trip distribution information. The applicant is to provide an addendum to the TIA, showing the total number of new PM peak hour trips that will be distributed to the following proportionate share intersections, and calculate the expected fees:

Project Location	**Unit Cost per Trip**
192nd Ave & SR-14 ramps	**$2,000** per PM peak hour trip
192nd Ave & SE 34th St	**$150** per PM peak hour trip

- Per CMC 18.55.110:
    - H. A development sign is required for a Type III subdivision application.

Comments related to Pre-Application Meeting Notes (PA22-05):

Planning

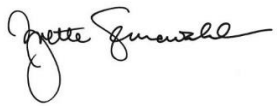
- Preliminary Plat:
    2. Density calculation is based on development/net acreage which is defined as the total land use development exclusive of open space and critical areas. *Please provide table showing breakdown of development/net area and proposed Tracts.*
    4. Building setback requirements found in CMC 18.09.040-Table 2, includes requirement for setbacks to be drawn on the plat. Per Note 2, "Garage setback is five feet behind the front of the dwelling." *Preliminary plat does not show garage setback.*
    8. Each dwelling unit within a new development shall be landscaped with at least one tree per CMC 17.19.030.F. *Preliminary plat does not show trees on Lots 13 and 26.*
    12. The location and height of any retaining walls shall be shown on the grading plan. Retaining wall height requirements are found in CMC 18.17.060. *While the preliminary grading plan shows location of three 2-foot retaining walls, the preliminary plat only calls out two. If there will be a retaining wall adjacent to Lot #19, please ensure that is reflected on the preliminary plat as well.*
- Critical Areas Report:
    - Clark County GIS mapping identifies wetlands on the subject property however; the Critical Areas Report indicates wetlands were found approximately 300 feet south of the project site. Staff will route the Critical Areas Report to the Army Corp of Engineers for a jurisdictional determination and concurrence. Any comments from them will be forwarded on to you.
    - The report submitted includes a Mitigation Plan, however it does not mention mitigation sequencing in accordance with CMC16.51.170. The Mitigation Plan is also missing required information regarding CMC16.51.180 – Mitigation plan requirements. The report should be revised to reflect the requirements as noted in these two sections of the Camas Municipal Code.
    - The site assessment also identified several Oregon White Oaks, and a mitigation plan was included in the Critical Areas Report however; preliminary comments have been received from Washington Department of Fish & Wildlife (WDFW) and further information is needed to determine whether or not the mitigation plan is

adequate for the proposed removal and loss of Oregon White Oaks on the project site. If necessary, a meeting with WDFW staff can be arranged to discuss their comments further. The initial comments are as follows:

- The mitigation plan proposes to replace three mature Oregon white oak trees with six 2-inch seedlings. Oregon white oaks are slow growing, and the proposal will lead to a net loss of habitat for years. WDFW is currently updating Best Management Practices for Oregon white oak mitigation and will not only be requesting mitigation for the physical loss of habitat but for the temporal loss as well.
- Additional information is needed to better assess the required mitigation, including, but not limited to, canopy size (sq. ft.), condition of crown, acorn production, galls, cavities, dead branches, fungi, etc.
- Page 6 of the Critical Area Report states that Oak #27 is a hazard tree based on, "proposed construction, grading requirements where it is located, and the condition of the tree". The interpretation is that this will become a hazard tree only after the construction takes place and is not a hazard tree at this time. Dead/dying oak trees provide valuable habitat to wildlife and because of that, this oak tree does not meet the PHS definition.
- If possible, the removed OWO trees, including the snag, should be left on site as habitat features on the landscape. On-site mitigation is the preferred option, but off-site mitigation options can be explored as well.

If you have any questions related to this project, please feel free to contact me by email: YSennewald@cityofcamas.us or by phone: (360) 817-7269.

Respectfully,



Yvette Sennewald
Senior Planner

From: Hahn, Eric
To: Anita Ashton
Cc: Curleigh (Jim) Carothers; David Jardin; Lopossa, Ryan; Patrick, Jennifer
Subject: RE: Concurrency Review for SUB22-05 Monte Verde Subdivision - Location: City of Camas
Date: Tuesday, September 6, 2022 4:45:25 PM
Attachments: image002.png
image003.png
image004.png
image005.png

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Anita,

As you know, traffic impacts on the 192nd Ave corridor are one of the City of Vancouver's primary concerns regarding most development projects in Camas. Before you deem this project complete, the City of Vancouver requests some additional trip distribution information. Please have the applicant provide an addendum to the TIA, showing the total number of new PM peak hour trips that will be distributed to the following proportionate share intersections, and calculate the expected fees:

Project Location	Unit Cost per Trip
192nd Ave & SR-14 ramps	**$2,000** per PM peak hour trip
192nd Ave & SE 34th St	**$150** per PM peak hour trip

Let me know if you have any questions.

Eric Hahn, PE | Senior Civil Engineer
CITY OF VANCOUVER, WASHINGTON
Public Works | *Streets & Transportation* | *TDRS*
Marine Park Engineering – 4500 SE Columbia Way
P.O. Box 1995 • Vancouver, WA, 98668-1995
P: (360) 487-7702 | Fax: (360) 487-7139 | TTY: (360) 487-8602
www.cityofvancouver.us

From: Anita Ashton <AAshton@cityofcamas.us>
Sent: Tuesday, September 6, 2022 11:31 AM
To: Hahn, Eric <Eric.Hahn@cityofvancouver.us>; David Jardin <David.Jardin@clark.wa.gov>
Cc: Curleigh (Jim) Carothers <jcarothers@cityofcamas.us>
Subject: Concurrency Review for SUB22-05 Monte Verde Subdivision - Location: City of Camas

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unless you recognize the sender and know the content is safe.

Good morning!

Hope you had a great 3-day weekend! Attached is the TIA for the above noted proposed development. The application has not been deemed technically complete, so you have a few weeks to review and get back to me with comments.

Thanks

Anita Ashton
Project Manager
Community Development Engineering
Desk 360-817-7231
www.cityofcamas.us | aashton@cityofcamas.us

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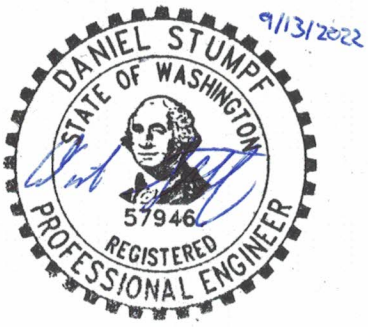
lancaster mobley

321 SW 4th Ave., Suite 400
Portland, OR 97204
503.248.0313
lancastermobley.com

Memorandum



To: **Ryan Stygar**
Pacific Lifestyle Homes

From: **Daniel Stumpf, PE**

Date: **September 13, 2022**

Subject: **Monte Verde Subdivision**
Transportation Impact Study Addendum – Proportionate Share Contributions

Introduction

This memorandum serves as an addendum to the *Monte Verde Subdivision Transportation Impact Study* (TIS), dated July 13, 2022. The purpose of this addendum is to update the originally prepared *Proportionate Share Contributions* section of the report in accordance with comments received in a completeness review memorandum from the City of Camas, dated September 7, 2022. The relevant incompleteness item is detailed below:

- *17.11.030.B12: Complete and submit a transportation impact study to determine the adequacy of the transportation system to serve a proposed development and to mitigate impacts of the proposal on the surrounding transportation system*
    - *Per City of Vancouver preliminary review of the TIA, COV is requesting additional trip distribution information. The applicant is to provide an addendum to the TIA, showing the total number of new PM peak hour trips that will be distributed to the following proportionate share intersections, and calculate the expected fees:*

Project Location	*Unit Cost per Trip*
192nd Ave & SR-14 ramps	*$2,000 per PM peak hour trip*
192nd Ave & SE 34th St	*$150 per PM peak hour trip*

Following narrative updates and supersedes the *Proportionate Share Contribution* section of the July 13, 2022, TIS.

Proportionate Share Contributions

Based on input provided by City of Vancouver staff, proportionate share fees are being collected at the following intersections in order to help fund planned intersection improvement projects within the City:

- NE 192nd Avenue at NE 13th Street
- SE 192nd Avenue at SE 34th Street
- SE 192nd Avenue at SR-14 ramps

As shown in Figure 3 of the TIS (included as an attachment for reference purposes), it is estimated that approximately 20 percent of site trips will impact the intersection of NE 192nd Avenue at NE 13th Street. Of the total estimated site trips expected to impact this intersection, approximately 15 percent of trips will travel to/from the south along NE/SE 192nd Avenue. For the purposes of this analysis, it is assumed all of the site trips traveling to/from the south along NE/SE 192nd Avenue will travel to/from SR-14. Therefore, approximately 15 percent of the total site trips generated by the proposed Monte Verde Subdivision will impact the intersections of SE 192nd Avenue at SE 34th Street and SE 192nd Avenue at the SR-14 ramps.

Table 4 below details this transportation improvement project and proportionate share fee contributions attributable to the proposed development.

Table 1: Proportionate Share Contributions

Project Location	Unit Cost Per Trip		Peak Hour Trip Impact		Proportionate Share Contribution
SE 192nd Ave at SR-14 Ramps	$2,000	PM	5	PM	$10,000
NE 192nd Avenue at NE 13th Street	$400	PM	6	PM	$2,400
SE 192nd Ave at SE 34th St	$150	PM	5	PM	$750
Total Proportionate Share Contribution					**$13,150**

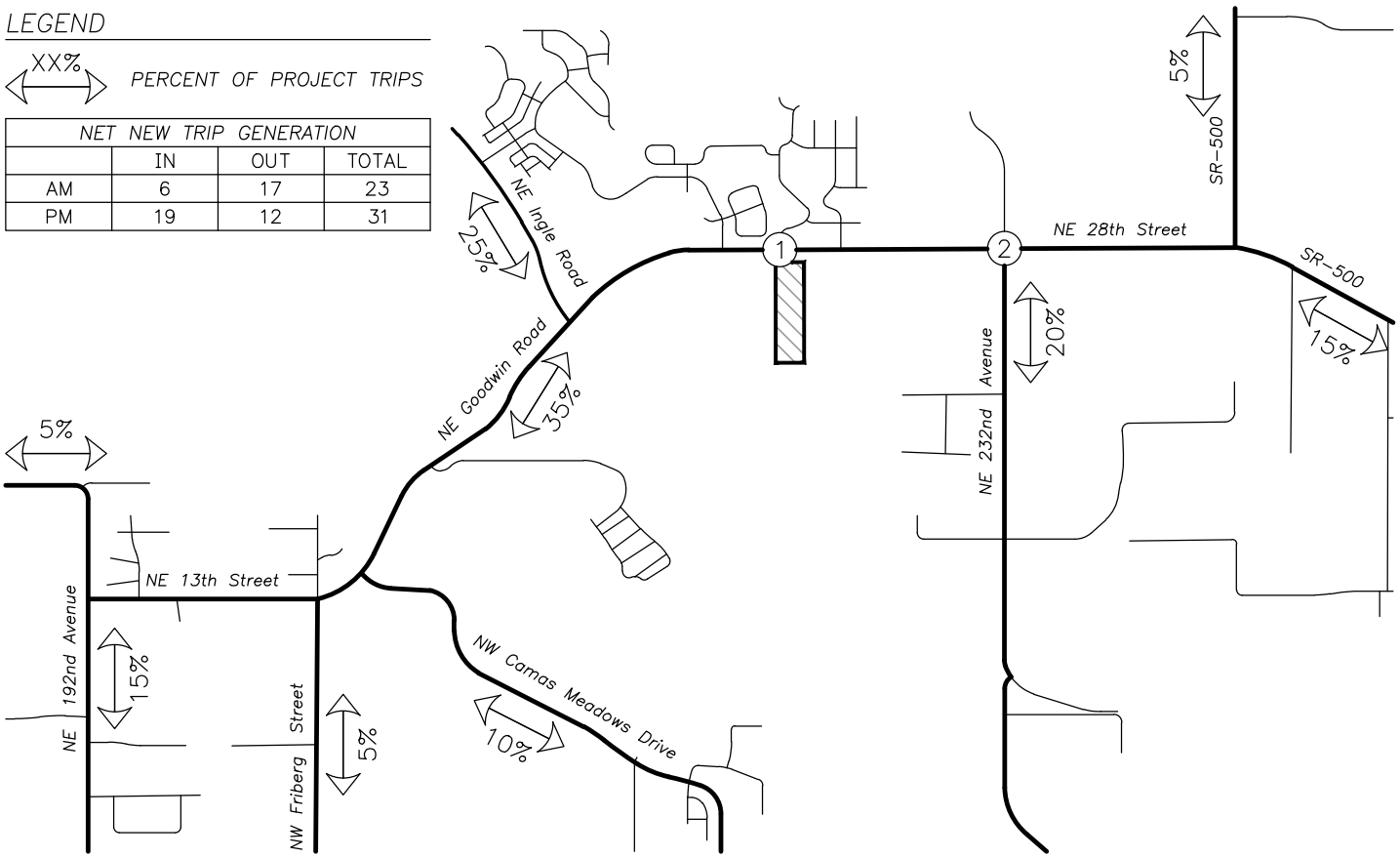
Based on the projected evening peak hour trip impacts to the transportation facilities detailed in Table 4, the proposed Monte Verde Subdivision is required to contribute approximately $13,150 toward these intersection improvement projects.

If you have any questions or concerns regarding this analysis or need further assistance, please don't hesitate to contact us.

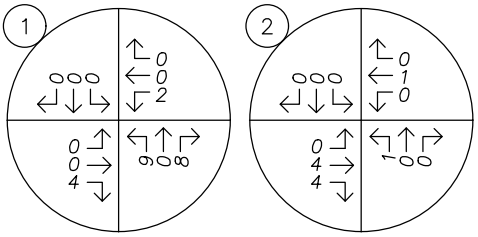
LEGEND

XX% PERCENT OF PROJECT TRIPS

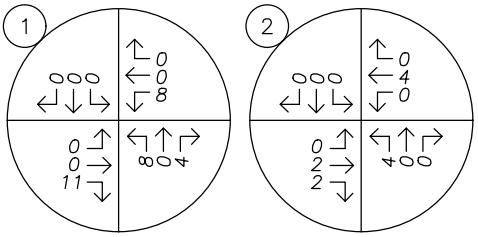
NET NEW TRIP GENERATION			
	IN	OUT	TOTAL
AM	6	17	23
PM	19	12	31



AM PEAK HOUR



PM PEAK HOUR



no scale

lancaster mobley

SITE TRIP DISTRIBUTION & ASSIGNMENT

Proposed Development Plan - Site Trips
AM & PM Peak Hours

Figure 3

PLS ENGINEERING

Engineering - Surveying - Planning * 604 W Evergreen Blvd, Vancouver, WA 98660 * P 360-944-6519 * F 360-944-6539 *

October 12, 2022

City of Camas
616 NE 4th Avenue
Camas, WA 98607

Attention: Yvette Sennewald

RE: Monte Verde Subdivision
Incomplete Application
SUB22-05

This letter is in response to the notice of incomplete application memo for Monte Verde Subdivision. The comments below are in reply to the memo dated 9/7/22 and will follow each comment in direct order of the letter.

• 17.01.050.B2: Tracts to be dedicated to any public or private purpose shall be distinguished from lots intended for general development with notes stating their purpose and any limitations. Preliminary Plat shows Tracts A-F, some with unclear boundaries. Please provide narrative for proposed Tracts that includes purpose, square footage, and an illustration that shows defined boundaries.

Response: Tract boundaries are shown and locations confirmed by Yvette. Narrative has been updated.

• 17.01.050.B3: Building Envelopes. Lot 1 building envelopes are unclear. Please revise preliminary plat to include buildable area and show required setbacks.

Response: Building envelopes shown and identified to Yvette.

• 17.01.050.B4: Land Inventory. Preliminary and final plats shall include the following:
  o d. Total infrastructure acreage (includes proposed storm ponds)
  o e. Total Tract Area

Response: Infrastructure acreage and tract area added to site statistics.

• 17.11.030.B6:
  o b. Owners of adjacent land and the names of any adjacent subdivisions. Only one subdivision name references but missing adjacent property owners.

  Response: Adjacent owners and subdivisions added.

  o d. Names, locations, widths, and dimension of existing and proposed public street rights-of-way and easements and private access easements, parks and other open spaces, reservations, and utilities. Missing dimensions and callouts for existing right-of-way.

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Response: Existing right-of-way is already labeled for 28th.

o k. Location of any proposed dedications. Proposed dedications are not called out, dimensions are not noted.

Response: The PUE is dimensioned.

o n. Description, location and size of existing and proposed utilities, storm drainage facilities and roads to service the lots. Sizes of existing and proposed utilities are not shown.

Response: This is a preliminary plan set. Utility sizes will be shown on final plans.

• 17.11.030.B10: Clark County assessor's maps which show the location of each property within three hundred feet of the subdivision. Properties shown on preliminary plat appear to be less than 300-feet.

Response: Properties 300' out don't fit on the plan views so a small scaled sketch is provided.

• 17.11.030.B12: Complete and submit a transportation impact study to determine the adequacy of the transportation system to serve a proposed development and to mitigate impacts of the proposal on the surrounding transportation system

o Per City of Vancouver preliminary review of the TIA, COV is requesting additional trip distribution information. The applicant is to provide an addendum to the TIA, showing the total number of new PM peak hour trips that will be distributed to the following proportionate share intersections, and calculate the expected fees:

Project Location	**Unit Cost per Trip**
192nd Ave & SR-14 ramps	$2,000 per PM peak hour trip
192nd Ave & SE 34th St	$150 per PM peak hour trip

Response: See attached TIA addendum.

• Per CMC 18.55.110:

o H. A development sign is required for a Type III subdivision application.

Response: A sign is installed.

Comments related to Pre-Application Meeting Notes (PA22-05):

Planning

• Preliminary Plat:

2. Density calculation is based on development/net acreage which is defined as the total land use development exclusive of open space and critical areas. Please provide table showing breakdown of development/net area and proposed Tracts.

Response: Density information is included in the table on the Preliminary Plat.

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4. Building setback requirements found in CMC 18.09.040-Table 2, includes requirement for setbacks to be drawn on the plat. Per Note 2, "Garage setback is five feet behind the front of the dwelling." Preliminary plat does not show garage setback.

Response: Garage setback is shown and listed in site statistics table on the Preliminary Plat.

8. Each dwelling unit within a new development shall be landscaped with at least one tree per CMC 17.19.030.F. Preliminary plat does not show trees on Lots 13 and 26.

Response: Trees have been added to lots 13 and 26.

12. The location and height of any retaining walls shall be shown on the grading plan. Retaining wall height requirements are found in CMC 18.17.060. While the preliminary grading plan shows location of three 2-foot retaining walls, the preliminary plat only calls out two. If there will be a retaining wall adjacent to Lot #19, please ensure that is reflected on the preliminary plat as well.

Response: Wall hatching has been removed from the plat. The walls are correctly identified on the grading plans.

• Critical Areas Report:

o Clark County GIS mapping identifies wetlands on the subject property however; the Critical Areas Report indicates wetlands were found approximately 300 feet south of the project site. Staff will route the Critical Areas Report to the Army Corp of Engineers for a jurisdictional determination and concurrence. Any comments from them will be forwarded on to you.

o The report submitted includes a Mitigation Plan, however it does not mention mitigation sequencing in accordance with CMC16.51.170. The Mitigation Plan is also missing required information regarding CMC16.51.180 – Mitigation plan requirements. The report should be revised to reflect the requirements as noted in these two sections of the Camas Municipal Code.

o The site assessment also identified several Oregon White Oaks, and a mitigation plan was included in the Critical Areas Report however; preliminary comments have been received from Washington Department of Fish & Wildlife (WDFW) and further information is needed to determine whether or not the mitigation plan is adequate for the proposed removal and loss of Oregon White Oaks on the project site. If necessary, a meeting with WDFW staff can be arranged to discuss their comments further. The initial comments are as follows:

▪ The mitigation plan proposes to replace three mature Oregon white oak trees with six 2-inch seedlings. Oregon white oaks are slow growing, and the proposal will lead to a net loss of habitat for years. WDFW is currently updating Best Management Practices for Oregon white oak mitigation and will not only be requesting mitigation for the physical loss of habitat but for the temporal loss as well.

▪ Additional information is needed to better assess the required mitigation, including, but not limited to, canopy size (sq. ft.), condition of crown, acorn production, galls, cavities, dead branches, fungi, etc.

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- Page 6 of the Critical Area Report states that Oak #27 is a hazard tree based on, "proposed construction, grading requirements where it is located, and the condition of the tree". The interpretation is that this will become a hazard tree only after the construction takes place and is not a hazard tree at this time. Dead/dying oak trees provide valuable habitat to wildlife and because of that, this oak tree does not meet the PHS definition.

- If possible, the removed OWO trees, including the snag, should be left on site as habitat features on the landscape. On-site mitigation is the preferred option, but off-site mitigation options can be explored as well.

Response: An updated Critical Areas Report and Mitigation Plan is provided that addresses the above listed critical areas issues. Please note that the report has updated sections in red text to aid in your review; a new version in black text can be provided after your review is complete.

Please review the included revised information and let us know if all issues are resolved or if additional information is needed.

Sincerely,

Nicolle Sicilia
Land Use Planner
PLS Engineering

CRITICAL AREAS REPORT & OREGON WHITE OAK MITIGATION PLAN

Project:

Monte Verde Subdivision

Applicant:

Pacific Lifestyle Homes
11815 NE 99th Street,
Vancouver WA, 98682

Prepared By:

Ash ECO SOLUTIONS, LLC

August 5, 2022

Updated October 12, 2022

The information in this report was compiled to meet the requirements of the City of Camas Municipal Code (CMC) Sections 16.53 Wetlands and 16.61 Fish and Wildlife Habitat Conservation Areas. This report has been prepared under the supervision and direction of the undersigned, a qualified professional following CMC Section 16.61.020.A.

Andrea W. Aberle, Sr. Biologist
AshEco Solutions, LLC

Mackenzie Stamey, Biologist
AshEco Solutions, LLC

SITE INFORMATION:

Parcel No(s):	173184000
Acreage:	8.84 acres
Local Jurisdiction:	City of Camas, Washington
Section/Township/Range:	SE ¼, S21, T2N, R3E, W.M.
Site Address:	22205 NE 28th Street, Camas, WA 98607
Legal Landowner:	Southern Dwight A ETAL *(Per Current GIS Parcel Info)*

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Appendix A – Site Photos
Appendix B – Test Plot Datasheets
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Appendix D – Oregon White Oak Impact Habitat Assessment

INTRODUCTION

Project Description

AshEco Solutions, LLC (AES) was contracted by Pacific Lifestyle Homes (PLH) to assess the potential critical areas present within the subject parcel and develop a mitigation plan to offset project impacts. This Critical Areas Report and Oak Mitigation Plan follows the City of Camas Municipal Code (CMC) Sections 16.53 Wetlands and 16.61 Fish and Wildlife Habitat Conservation Areas. PLH proposes construction of 34-lot subdivision within the 8.84-acre parcel.

After City of Camas preliminary review and collaboration with the Washington Department of Fish and Wildlife (WDFW), the proposed impacts and mitigation areas associated with this project have been updated. This report reflects the updated impact and mitigation area calculations and conclusions agreed to between City of Camas Community Development staff, WDFW, the client (PLH), and AES.

Project Location and Background Information

The subject site is under the jurisdiction of the City of Camas and is assigned Parcel Number 173184000. The site is located at 22205 NE 28th Street, Camas, Washington. The site is surrounded to the east and west by large lot residential and agricultural lots. North of the property is urban residential lots and south of the property is forest land owned by Clark County.

EXISTING CONDITIONS

A single-family residence, shop, and large barn are present within the northern section of the property. South of the barn the property is fenced and used as horse pasture. The subject site is generally open and has been used for agricultural purposes since at least the 1970s. Native and non-native trees are scattered throughout the property with most concentrated in the north and southwestern corner of the parcel. Little native understory exists within the property due to a history of horse grazing. A maintained overhead BPA powerline easement 100 feet wide crosses the subject property diagonally east/west, Figure 4.

CRITICAL AREAS MAP RESEARCH

Topography

The site generally consists of a southwest facing slope. Topography maps show that the site drops approximately forty-eight feet in elevation from NE 28th Street to the southwest corner of the parcel, Figure 2.

Soil Survey

Soils within the study area are mapped as non-hydric Lauren gravelly loam, 0 to 8 percent slopes (LgB) and non-hydric Lauren loam 0 to 8 percent slopes (LeB) by the NRCS USDA Soil Conservation Service, Soil Survey of Clark County (1972), Washington, Figure 3.

The Lauren series consists of deep, somewhat excessively drained, nearly level to gently sloping soils on terraces 50 to 300 feet above the Columbia River. In a few places, on terrace fronts, the soils are steep to very steep. These are very gravelly soils that formed in mixed Columbia River alluvium that contained some volcanic ash. Lauren soils are in the southwestern part of the county, in the vicinity of Mill Plain, Orchards, and Fourth Plain. The original vegetation was Douglas-fir, grand fir, bigleaf maple, vine maple, salal, and ferns. The average annual precipitation is about 48-inches.

Lauren gravelly loam, 0 to 8 percent slopes (LgB) occurs on terraces. The slopes are generally less than 4 percent and approach 8 percent only along the terrace breaks. In a typical profile the surface layer is very dark brown gravelly and very gravelly loam about 20-inches thick. Below the surface layer is friable, dark-brown very gravelly loam about 13-inches thick. The next layer is dark-brown very gravelly coarse sandy loam about 11-inches thick. The underlying material, to a depth of 70-inches, is dark-brown very gravelly loamy coarse sand. Included in mapping were a few small areas where very gravelly loamy coarse sand is within 30-inches of the surface. Permeability generally is moderately rapid, but it is rapid in the substratum. The available water capacity is moderate. Surface runoff is slow, and the erosion hazard is slight. The LgB soil type is not listed on the Washington State Hydric Soils List for Clark County (NRCS 2022).

Lauren loam, 0 to 8 percent slopes (LeB) is similar to Lauren gravelly loam, 0 to 8 percent slopes, except that the surface layer is free of gravel. Surface runoff is slow, and the erosion hazard is slight. Included in mapping were a few small gravelly areas. The LeB soil type is not listed on the Washington State Hydric Soils List for Clark County (NRCS 2022).

Mapped hydric soils do not necessarily mean that the area is a wetland; hydrology and wetland vegetation must be present to classify an area as a wetland. The same is true for soils that are not mapped as hydric. Wetlands can be found in areas without mapped hydric soils. The onsite wetlands were identified within areas of the non-hydric mapped soil type LgB.

Wetlands

A wetland was mapped within the southwest corner of the parcel by the Clark County GIS MapsOnline software under the "potential wetland presence" layer. The National Wetland Inventory also maps a PFOA wetland within the same general location, Figure 3. Site reconnaissance by AshEco Solutions (AES) identified that the mapped wetland was actually located over 300-feet south of the subject parcel. No wetlands were identified within the subject parcel by AES.

WDFW Priority Habitat

The Washington Department of Fish and Wildlife (WDFW) maps "Cave or Cave-rich Areas" within the general area, though no evidence of caves or rock outcroppings were identified onsite by AES during site reconnaissance. AES did identify Oregon white oak habitat onsite. This oak habitat was not previously mapped by WDFW.

METHODOLOGY

Wetlands

The study area was evaluated for the presence of wetlands using the Routine Determination Method per the U.S. Army Corps of Engineers' (USACE's) *Wetland Delineation Manual* (1987), the *Washington State Wetlands Identification and Delineation Manual* (1997), and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region, Version 2.0* (USACE 2010). The Routine Determination Method examines three parameters to determine if wetlands exist in a given area: vegetation, hydrology, and soils. The presence of hydrology is critical in identifying wetlands; however, since hydrologic conditions can change periodically (hourly, daily, or seasonally), it is necessary to determine if hydrophytic vegetation and hydric soils are also present. By definition, wetlands are those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands are regulated as "Waters of the United

States" by the USACE, "Waters of the State" by Washington State Department of Ecology (ECY), and locally by CMC section 16.53 Wetlands. No wetlands were identified onsite.

See Appendix B for formal test plot data collected onsite by AES. The data supports the findings of uplands located within the southwest corner of the property. The wetlands identified by GIS within the subject parcel were determined to be offsite, over 300 feet further south.

WDFW Priority Habitat

The subject site was evaluated for the presence of Priority Habitats as defined by WDFW Priority Habitats and Species (PHS) List 2008. "Cave or Cave-rich Areas" were mapped onsite by the WDFW PHS online mapping system. Oregon white oak trees were identified within the subject parcel by AES.

WDFW defines Caves as, *"A naturally occurring cavity, recess, void, or system of interconnected passages (including associated dendritic tubes, cracks, and fissures) which occurs under the earth in soils, rock, ice, or other geological formations, and is large enough to contain a human. Mine shafts (a human-made excavation in the earth usually used to extract minerals) may mimic caves and abandoned mine shafts with actual or suspected occurrences of priority species should be treated in a manner similar to caves."*

WDFW defines Oregon White Oak Woodlands as, "*stands of oak or oak/conifer associations where canopy coverage of the oak component of the stand is 25%; or where total canopy coverage of the stand is <25%, but oak accounts for at least 50% of the canopy coverage. The latter is often referred to as oak savanna. In non-urbanized areas west of the Cascades, priority oak habitat consists of stands > 0.4 ha (1.0 ac) in size. East of the Cascades, priority oak habitat consists of stands > 2 ha (5 ac) in size. In urban or urbanizing areas, single oaks or stands < 0.4 ha (1 ac) may also be considered a priority when found to be particularly valuable to fish and wildlife (i.e., they contain many cavities, have a large diameter at breast height [dbh]* (generally 20-inches dbh and greater), *are used by priority species, or have a large canopy). Oak woodlands in western Washington may contain understory plants indicative of Prairie*."

No caves were identified onsite or immediately offsite near the subject parcel. Eleven individual Oregon white oak trees were identified within or immediately adjacent to the subject parcel. The subject site is within an incorporated city and is urban, therefore the onsite Oregon white oak trees are considered Priority Habitat by WDFW.

Habitats of Local Importance

Following CMC Chapter 16.61 - Fish And Wildlife Habitat Conservation Areas, Section: 16.61.010.A.3.a, individual Oregon white oak trees with a twenty-inch diameter at breast height (20-inches dbh), stands of Oregon white oak trees greater than one acre when they are found to be valuable to fish and wildlife (i.e., may include trees with cavities, large diameter breast height (twelve inches dbh), are used by priority species, or have a large canopy), and all Oregon white oak snags unless determined by an arborist to be a hazard, are considered Habitats of Local Importance and therefore are regulated by CMC.

DOCUMENTED VEGETATION

The vegetation onsite has been disturbed through years of grazing by horses. The majority of the site was dominated in heavily grazed pasture grasses and herbs. Scattered trees and shrubs present in the onsite included, Douglas-fir (*Pseudotsuga menzisii* FACU), big leaf maple (*Acer macrophyllum* FACU), Oregon white oak (*Quercus garryana* FACU) Oregon ash (*Fraxinus latifolia* FACW), black cottonwood (*Populus trichocarpa* FAC), grand fir (*Abies grandis* FAC), bitter cherry (*Prunus emarginata* FACU), Pacific

crabapple(*Malus fusca* FACW), sword fern (*Polystichum munitum* FACU), trailing blackberry (*Rubus ursinus* FACU), vine maple (*Acer circinatum* FAC), Indian plum (*Oemleria cerasiformis* FACU), beaked hazelnut (*Corylus cornuta* FACU), piggy-back plant (*Tolmiea menzisii* FAC), lanceleaf spring beauty (*Claytonia lanceolata* FAC), dovefoot geranium (*Geranium mole* FACU), curly dock (*Rumex crispus* FAC), large leaf avens (*Geum macrophyllum* FACW), and snowberry (*Symphoricarpos albus* FACU). Non-native or invasive plants observed onsite included Himalayan blackberry (*Rubus armeniacus* FAC) and English holly (*Ilex aquifolium* FACU).

South of the subject parcel is a forested area owned by Clark County. This area is much more biologically diverse. Vegetation identified in this area and the associated offsite wetland buffer included tall Oregon grape (*Mahonia aquifolium* FACU), Pacific ninebark (*Physocarpus capitatus* FACW), red osier dogwood (*Cornus sericea* FACW), California false hellebore (*Veratrum californicum* FAC), small bedstraw (*Galium trifidum* FACW), prickly currant (*Ribes lacustre* FAC), salmonberry (*Rubus spectabilis* FAC), slough sedge (*Carex obnupta* OBL), and ocean spray (*Holodiscus discolor* FACU).

The indicator categories following the common and scientific name of each vegetation species indicate the likelihood of the species to be found in wetlands. Listed from most-likely to least-likely to be found in wetlands, the indicator categories are:

- **OBL (obligate wetland) –** Occur almost always under natural conditions in wetlands.
- **FACW (facultative wetland) –** Usually occur in wetlands but occasionally found in non-wetlands.
- **FAC (facultative) –** Equally likely to occur in wetlands or non-wetlands.
- **FACU (facultative upland) –** Usually occur in non-wetlands but occasionally found in wetlands.
- **UPL (obligate upland) –** Occur almost always under natural conditions in non-wetlands.
- **NI (no indicator) –** Insufficient data to assign to an indicator category.

CRITICAL AREA CONCLUSIONS

WDFW Priority Habitat

Eleven individual Oregon white oak trees were identified onsite or immediately offsite and numbered by the tree survey, Appendix C. Three oaks with over 20-inch dbhs were documented onsite north of the existing barn (Oak #s 14, 15, and 16). One non-jurisdictional oak is located centrally onsite (Oak #s 32). One oak is a hazard snag (Oak #27). Three oaks are located along parcel boundaries with partial canopies encroaching into the subject parcel (Oak #s 76, 79, and 126). The remaining three oaks identified were determined to be entirely offsite (Oak #s 31, 38, and 127). See Figure 4 and Appendix C. Six of the oak trees inventoried by the tree survey are jurisdictional and meet the WDFW criteria for "individual oak" Priority Habitats as they have dbh measurements of 20-inches or larger. Oregon white oak Priority Habitat is protected by WDFW and also jurisdictional under the local CMC habitat code. The understory and herbaceous layer associated with the onsite oak habitat is highly disturbed due to grazing or dominated by Himalayan blackberry.

Habitats of Local Importance

Six Oregon white oak trees identified as onsite or immediately offsite (Oak #s 14, 15, 16, 31, 38, and 76) are over 20-inches dbh and therefore meet the criteria listed under CMC 16.61.010.A.3.a that defines Oregon white oak habitat of local importance:

i. Individual Oregon White Oak trees with a twenty-inch diameter at breast height (twenty inches dbh).

ii. Stands of Oregon White Oak trees greater than one acre, when they are found to be valuable to fish and wildlife (i.e., may include trees with cavities, large diameter breast height (twelve inches dbh), are used by priority species, or have a large canopy.
iii. All Oregon White Oak snags unless determined by an arborist to be a hazard.

However, only four of the above six trees are located onsite or have driplines that extend onsite, Figure 4. The project proposes the removal of three of these jurisdictional Oregon white oak trees (Oaks #14, 15, and 16). Therefore, mitigation to offset the removal of these jurisdictional trees under CMC is required. The following mitigation plan section details the mitigation measures proposed.

Table 1. Oregon White Oak Summary.

Oak Tree #	DBH	On-Site	Jurisdictional per WDFW PHS &/or CMC Local Habitats of Importance Criteria *(Individual oak tree >20" dbh)*	Proposed for Removal	Requires Mitigation
14	**20"**	**YES**	**YES**	**YES**	**YES**
15	**36"**	**YES**	**YES**	**YES**	**YES**
16	**30"**	**YES**	**YES**	**YES**	**YES**
27	10" (dead)	YES	NO[1]	YES[4]	NO
31	21"	NO	YES	NO	NO
32	10"	YES	N/A[2] (see note)	NO	NO
38	30"	NO	YES	NO	NO
76	20"	YES (dripline)	YES	NO	NO
79	19"	YES (dripline)	NO	NO	NO
126	14"	YES (partial)	NO	NO	NO
127	14"	NO	NO	NO	NO
Tree #					
39	20'	YES	NO[3]	YES[4]	NO

[1]This oak was noted by the arborist to have >90% dieback, is leaning, and has a poor taper. This tree is considered a dead snag and will be repurposed within the onsite mitigation areas as a woody habitat element.
[2] This oak "tree" consists of a trunk cut just above the ground surface with suckered "co-dominant growth and was noted to be in poor condition with cracks, visible decay" by the arborist report. The trunk is located directly on the southern boundary of the BPA utility easement onsite. Therefore, it is assumed that the tree canopy historically extended into the overhead powerline easement and it has been historically cut under standard maintenance activities implemented by BPA.
[3]Tree #39 is an on-site snag determined to be an apple tree species by the arborist/tree survey. This snag is 20 inches in DBH and does not meet the WDFW definition for Priority Habitat (which requires it to be > 20-inches dbh). The snag is non-jurisdictional and does not require mitigation for its removal. This snag will be repurposed within the onsite mitigation areas.
[4]Both snag #27 and #39 will be repurposed as woody debris within the onsite mitigation area OMA6.

MITIGATION PLAN

The below mitigation plan was developed following Camas Municipal Code (CMC) Section 16.61 Fish and Wildlife Habitat Conservation Areas. The project will offset the impacts proposed to allow for no net loss of habitat functions onsite.

The proposed subdivision will retain and protect three Oregon white oak trees present along western, southern, and eastern parcel boundaries (Oak #s 76, 79 and 126). The understories of these oaks will be

restored by removing invasive species (Himalayan blackberry and English holly) and enhancement of native shrubs. Additionally, the removal of adjacent Douglas-fir and big leaf maple trees will provide additional oak habitat enhancement as there will be greater sunlight and area for canopy growth in the future.

The project also proposes oak tree and native shrub plantings within onsite mitigation areas to offset the removal of three jurisdictional Oregon white oak trees located within the northern portion of the subject site (Oak #s 14, 15, and 16). The design has incorporated oak mitigation and enhancement into the open space landscaping areas of the project as well as use of the BPA utility corridor for additional native landscaping using shrubs associated with oak woodland habitat.

Avoidance and Minimization

Following the mitigation sequencing requirements outlined under CMC 16.51.170, the project has avoided and minimized impacts to the full extent practicable while still meeting the required design elements for a subdivision of this size within the city limits of Camas. The unavoidable impacts have been quantified, and appropriate mitigation proposed onsite for no net loss of habitat area or function onsite.

The project has been designed to avoid direct impacts to three Oregon white oak trees with driplines present onsite (Oak #s 126, 76, and 79). These three trees are located along the property lines and have critical root zones that extend into the subject parcel. The dripline of each tree will be located, staked, and fenced prior to construction to protect them during grading and site construction. Native shrubs will be added as understory plants within the driplines of the retained oaks, connecting the proposed mitigation areas to offsite oak habitat.

Avoidance of Oak trees #14, 15 and 16 was originally attempted by the project, however it was determined in order to meet the required design elements for site access and lot configuration, that the site plan would need to be altered resulting in the unavoidable impact of the three Oregon white oak trees (#14, 15, and 16). Jurisdictional Oak #s 15, and 16 are located within the proposed site access road and sidewalk. Alternate access road options into the subdivision were proposed by the applicant, but the City requires that the proposed access be located directly south of the existing North Hargrave Street and NE 28th Street intersection. The unavoidable impact to these oaks was required to meet the appropriate turning radius by the entrance road and associated sidewalk from the required access point in the northwest corner of the property into the central area of the subdivision. Oak #14 is within the construction limits of the northwestern lots also making avoidance infeasible. Additionally, three feet of fill is required within this area by the grading plan. The retention of this oak was considered, however the quantity of fill required over this area immediately surrounding the oak tree would be detrimental to the health of the tree, with mortality in the near future imminent. Therefore, removal of Oak #14 is also proposed. These three oaks are individual trees (not part of a larger oak grove/woodland) and are located within the northern section of the subject parcel, just north of the existing barn.

Oak #32 consists of a trunk cut just above the ground surface with suckered "co-dominant growth, and was noted to be in poor condition with cracks, visible decay" by the arborist report, Appendix C. The trunk is located directly on the southern boundary of the BPA utility easement onsite. Therefore, it is assumed that the tree canopy historically extended into the overhead powerline easement and it has been cut under standard maintenance activities implemented by BPA. The largest stem of the new growth is 10-inches. This oak is considered non-jurisdictional and does not require mitigation.

Oak # 27 was noted by the arborist to have >90% dieback, is leaning, and has a poor taper. This tree is considered dead and a vertical snag. It is proposed for removal and it will be repurposed as a woody habitat element within one of the onsite oak mitigation areas, Figure 5.

The majority of the subject parcel is historically disturbed due to horse grazing with little to no native scrub-shrub understory habitat present onsite. There is no native understory present within the area of the three oaks proposed for removal. The project will take advantage of these disturbed areas within the subject site, and no significant habitat outside of Oaks #14, 15, and 16 will be impacted. The proposed impacts will be offset through the planting of oaks and native shrubs onsite within all open areas available within the proposed development. Portions of the BPA powerline easement will also be utilized to provide additional connectivity across the onsite oak habitat areas by the addition of a dense native shrub layer. The proposed mitigation areas will create habitat corridors onsite and connect to existing habitat corridors offsite.

Oregon White Oak Impacts and Mitigation

The removal of three jurisdictional Oregon white oaks (Oak #s 14, 15, and 16, over 20-inch dbh) is unavoidable by the proposed project to meet the City development code requirements. The original mitigation plan quantified the oak tree removal impact and mitigation following CMC Section 16.51.120.C.5.b.iii and proposed a replacement ratio of two, two-inch caliper trees for each tree removed. However, upon further coordination with WDFW staff the oak habitat impacts were calculated by quantifying the total oak canopy habitat and functions to be removed from the site. See Appendix D for the Oregon White Oak Habitat Assessment documented for the three trees proposed for removal. The Oregon White Oak Habitat Assessment included quantifying the existing condition of the crown, size of the oak canopy, diameter at breast height (dbh), presence of galls, acorns, dead branches, cavities and condition of the understory.

The updated oak habitat mitigation was designed to follow the requirements of CMC 16.51.180 and will sufficiently offset the loss of this specific oak habitat lost. The mitigation has further been designed to offset the temporal loss of the oak habitat onsite, enhance the functions of the oak habitat to be retained on site, provide greater connectivity to the oak habitat present directly offsite, and will be managed by the HOA for perpetuity to ensure maintenance and survival of the habitat into the future. Previously the onsite oak habitat was grazed by horses, which led to a decline in the overall habitat present. The oak habitat to be impacted has no native understory shrub component and the oak habitat present along the perimeter of the site is dominated by Himalayan blackberry. By removing the grazing impacts from the horses, creating, enhancing and restoring areas of the onsite habitat, the proposed mitigation will provide a higher functioning Oregon white oak habitat as the area matures than that present onsite today. Additionally, the Oregon white oaks and snag to be removed will be repurposed within the onsite mitigation areas to provide additional enhancement by the addition of oak habitat woody elements. The total oak habitat canopy loss is 4,769 square feet, with 23,845 square feet of onsite mitigation proposed, providing a 5:1 mitigation offset ratio, see Figure 5.

The proposed Oregon white oak mitigation areas have been divided up into ten areas onsite. These spaces are open and will offer plenty of sunlight and adequate canopy area for the oak trees and native shrub growth post project completion. The multiple mitigation locations onsite will also help to provide greater connectivity for wildlife habitat, by providing shade, shelter, and food sources within multiple locations onsite while also providing greater contiguous habitat corridor connections to the offsite forested and mixed oak canopy than currently present. Protection will be put in place around the perimeter of the

mitigation areas during site grading and construction activities and after. Compensatory measures will need to be implemented if during construction the critical root mass of the retained oak trees are inadvertently impacted.

The mitigation proposed will offset the Oregon white oak Priority Habitat impacts onsite for no net loss of priority function or area following the CMC guidelines.

Table 2. Oak Impacts & Mitigation Summary.

Oak Label	Impact	Mitigation
Oak #s 14, 15, and 26	Oregon White Oak (over 20-inch dbh) 4,769 sf Canopy Loss	Oregon white oak mitigation areas at a 5:1 Ratio (Oak tree and native shrub installation) 23,845 sf

PLANTING PLAN

Site Preparation

1. Demarcate the on-site "Protected Oak Habitat" (Oregon white oak retention and mitigation area boundaries) and install tree protection fencing along the proposed planting areas and the perimeter of the existing oak canopy dripline, See Figure 4.
2. Maintain this tree protective fencing for the full duration of the project construction.
3. Mow grasses, herbaceous vegetation and invasive species present within mitigation areas prior to tree installation.

   Note: Excavation, fill or compaction of the native soils is not to take place within the protected oak habitat. No lawn or ornamental landscaping is to be located within the protected oak habitat.

Planting Methods

Plant in fall through early spring (October-April) at specified spacing following the planting plan.
Container/Ball and Burlap Stock

1. Dig hole using a tree shovel/auger/mini-excavator or comparable tool 16-inches wide and 4-inches deeper than the root system, scarify sides of hole to 4-inches. Remove plant from container and loosen roots with hand or score vertically on sides and bottom with knife. Set plant upright and plumb in hole so the crown is just above the finish grade. Ensure that roots are extended down entirely and do not bend upward.
2. Replace loose soil around plant and firmly compact the soil around the plant to eliminate air spaces. Do not use frozen soil for backfilling.

3. Firmly compact the soil around the planted species to eliminate air spaces.
4. Install woody mulch around the base of planted and retained Oregon white oak trees to insulate plantings, maintain moisture content of soil and reduce invasive plant competition.
5. Irrigate according to performance standards for the first three summers after planting or as site and weather conditions warrant.

Planting Specifications

Planting will begin in Winter/Spring of 2023 while onsite soils are more saturated (and stock is dormant). The following tables summarize the native plant selection, spacing, size, and quantity for the on-site mitigation area:

Table 3. Oregon White Oak Habitat Mitigation Areas Planting Plan.

Common Name	*Scientific Name*	*Stock*	*Spacing*	*Quantity*
OMA1 (1,721 sq. ft.)				
Oregon white oak, FACU	***Quercus garryana***	**2-inch caliper**	**14 ft.**	**3**
Tall Oregon grape, FACU	*Mahonia aquifolium*	1-gallon or 24-36" bare-root	6 ft.	6
Nootka rose, FAC	*Rosa nutkana*	1-gallon or 24-36" bare-root	6 ft.	6
Snowberry, FACU	*Symphoricarpos albus*	1-gallon or 24-36" bare-root	6 ft.	6
			Total =	**21**
OMA2 (1,329 sq. ft.)				
Oregon white oak, FACU	***Quercus garryana***	**2-inch caliper**	**14 ft.**	**3**
Tall Oregon grape, FACU	*Mahonia aquifolium*	1-gallon or 24-36" bare-root	6 ft.	6
Snowberry, FACU	*Symphoricarpos albus*	1-gallon or 24-36" bare-root	6 ft.	6
Ocean spray, FACU	*Holodiscus discolor*	1-gallon or 24-36" bare-root	6 ft.	6
			Total =	**21**
OMA3 (2,155 sq. ft.)				
Oregon white oak, FACU	***Quercus garryana***	**2-inch caliper**	**14 ft.**	**4**
Tall Oregon grape, FACU	*Mahonia aquifolium*	1-gallon or 24-36" bare-root	6 ft.	10
Snowberry, FACU	*Symphoricarpos albus*	1-gallon or 24-36" bare-root	6 ft.	10
Nootka rose, FAC	*Rosa nutkana*	1-gallon or 24-36" bare-root	6 ft.	10
Ocean spray, FACU	*Holodiscus discolor*	1-gallon or 24-36" bare-root	6 ft.	10
Indian Plum, FACU	*Oemleria cerasiformis*	1-gallon or 24-36" bare-root	6 ft.	10
Beaked hazelnut, FACU	*Corylus cornuta*	1-gallon or 24-36" bare-root	10 ft.	10
			Total =	**60**
OMA4 (1,638 sq. ft.)				

Oregon white oak, FACU	***Quercus garryana***	**2-inch caliper**	**14 ft**	**3**
Snowberry, FACU	*Symphoricarpos albus*	1-gallon or 24-36" bare-root	6 ft.	6
Ocean spray, FACU	*Holodiscus discolor*	1-gallon or 24-36" bare-root	6 ft.	6
Vine maple, FAC	*Acer circinatum*	1-gallon or 24-36" bare-root	10 ft.	6
			Total =	20
OMA4-A (3,223 sq. ft.)				
Tall Oregon grape, FACU	*Mahonia aquifolium*	1-gallon or 24-36" bare-root	6 ft.	15
Snowberry, FACU	*Symphoricarpos albus*	1-gallon or 24-36" bare-root	6 ft.	15
Nootka rose, FAC	*Rosa nutkana*	1-gallon or 24-36" bare-root	6 ft.	15
Ocean spray, FACU	*Holodiscus discolor*	1-gallon or 24-36" bare-root	6 ft.	15
Vine maple, FAC	*Acer circinatum*	1-gallon or 24-36" bare-root	10 ft.	15
Beaked hazelnut, FACU	*Corylus cornuta*	1-gallon or 24-36" bare-root	10 ft.	15
			Total =	90
OMA4-B (406 sq. ft.)				
Tall Oregon grape, FACU	*Mahonia aquifolium*	1-gallon or 24-36" bare-root	6 ft.	4
Snowberry, FACU	*Symphoricarpos albus*	1-gallon or 24-36" bare-root	6 ft.	4
Nootka rose, FAC	*Rosa nutkana*	1-gallon or 24-36" bare-root	6 ft.	4
			Total =	12
OMA4-C (725 sq. ft.)				
Tall Oregon grape, FACU	*Mahonia aquifolium*	1-gallon or 24-36" bare-root	6 ft.	6
Snowberry, FACU	*Symphoricarpos albus*	1-gallon or 24-36" bare-root	6 ft.	6
Nootka rose, FAC	*Rosa nutkana*	1-gallon or 24-36" bare-root	6 ft.	6
			Total =	18
OMA4-D (2,104 sq. ft.)				
Tall Oregon grape, FACU	*Mahonia aquifolium*	1-gallon or 24-36" bare-root	6 ft.	10
Snowberry, FACU	*Symphoricarpos albus*	1-gallon or 24-36" bare-root	6 ft.	10
Nootka rose, FAC	*Rosa nutkana*	1-gallon or 24-36" bare-root	6 ft.	10
Ocean spray, FACU	*Holodiscus discolor*	1-gallon or 24-36" bare-root	6 ft.	10
Vine maple, FAC	*Acer circinatum*	1-gallon or 24-36" bare-root	10 ft.	10

Beaked hazelnut, FACU	*Corylus cornuta*	1-gallon or 24-36" bare-root	10 ft.	10
			Total =	**60**
OMA5 (928 sq. ft.)				
Tall Oregon grape, FACU	*Mahonia aquifolium*	1-gallon or 24-36" bare-root	6 ft.	8
Snowberry, FACU	*Symphoricarpos albus*	1-gallon or 24-36" bare-root	6 ft.	8
Nootka rose, FAC	*Rosa nutkana*	1-gallon or 24-36" bare-root	6 ft.	8
			Total =	**24**
OMA6 (9,606 sq. ft.)				
Oregon white oak, FACU	***Quercus garryana***	**2-inch caliper**	**14 ft**	**3**
Oregon white oak, FACU	***Quercus garryana***	**1-gallon or 24-36" bare-root**	**14 ft**	**7**
Nootka rose, FAC	*Rosa nutkana*	1-gallon or 24-36" bare-root	6 ft.	50
Snowberry, FACU	*Symphoricarpos albus*	1-gallon or 24-36" bare-root	6 ft.	50
Tall Oregon grape, FACU	*Mahonia aquifolium*	1-gallon or 24-36" bare-root	6 ft.	50
Ocean spray, FACU	*Holodiscus discolor*	1-gallon or 24-36" bare-root	6 ft.	50
Vine maple, FAC	*Acer circinatum*	1-gallon or 24-36" bare-root	10 ft.	50
Beaked hazelnut, FACU	*Corylus cornuta*	1-gallon or 24-36" bare-root	6 ft.	50
			Total =	**250**
			Grand Total of Oregon White Oak (2-inch caliper) =	**16**
			Grand Total of Oregon White Oak (1-gallon container) =	**7**
			Grand Total of Native Shrubs =	**571**

Protective Signage

Post construction, install permanent signs along the boundary of a "Protected Oak Habitat" meeting city standards or conditions outlined under the permit. See Objective 2, Performance Standard 2b below.

Maintenance Plan

Maintenance at the on-site mitigation area covers a minimum of 5-years and will involve removing persisting invasive plant species in addition to watering and re-installing failed species as necessary. The maintenance will include the following activities when necessary:

1. Remove and control non-native/noxious vegetation around all newly installed plants. During years 1 through 5 invasive species will be removed and suppressed as often as necessary to meet a performance standard of no greater than 20 percent cover by invasive species, measured by monitoring plots.

2. Irrigate planted species as necessary during the dry season, approximately July 1 through October 15. Irrigation is recommended to occur on a two-week cycle (minimum) during the dry season for the first three years. Water will be provided by a temporary above-ground irrigation system or a water truck.
3. Replace dead or failed Oregon white oak trees as described for the original installation to meet the minimum annual performance standard of 100% survival over the 5-year monitoring period. See Objective 1 for the full performance standards outlined by year.

Monitoring Plan

The mitigation site will be monitored for a 5-year period following project construction; monitoring will take place in years 1, 2, 3 and 5. Monitoring reports will be submitted to the City of Camas by the end of each monitored year. The goal of monitoring is to determine if the previously stated performance standards are being met. The mitigation area will be monitored once during the growing season, preferably during the same two-week period each year to better compare the data.

During the first annual monitoring event, representative monitoring plot locations and photo points will be selected within the mitigation areas and permanently marked with metal T-posts (or similar). Monitoring plot and photo point locations will be labeled on the As-built Map and included in the annual monitoring reports.

Monitoring Report Contents

The annual monitoring reports will contain at least the following:

- Location map and as-built drawing of Oregon white oak mitigation and retention areas as depicted on Figure 5 of this mitigation plan.
- Photographs from permanent photo points (10 minimum).
- Historic description of project, including dates of Oregon white oak tree installation, current year of monitoring, and restatement of mitigation goal.
- Documentation of plant survival, cover, and overall development of the plant community from the ten established monitoring plot locations.
- Photo evidence that the protective oak habitat signage is in place and legible along the outer perimeter of the mitigation areas onsite.
- Assessment of non-native, invasive plant species and recommendations for management.
- Summary of maintenance and contingency measures proposed for the next season and those completed over the past season.

Contingency Plan

If the performance standards are not met by the fifth year following project completion, a contingency plan will be developed and implemented. All contingency actions will be undertaken only after consulting and gaining approval from the City of Camas. The applicant will be required to complete a contingency plan that describes (1) the causes of failure, (2) proposed corrective actions, (3) a schedule for completing corrective actions, and (4) whether additional maintenance and monitoring are necessary.

Site Protection

The on-site mitigation area will be owned and managed by the future Home Owners Association (HOA) Associated with the subdivision. The HOA will be responsible for managing and contracting out the annual monitoring of the on-site mitigation area (to AshEco Solutions, LLC or similar entity) for the initial 5-year monitoring period. Additionally, the HOA will be responsible for managing and contracting out the seasonal maintenance required to maintain the onsite mitigation areas in perpetuity, to ensure the onsite

Oregon white oak habitat is allowed to thrive. The applicant will establish and record a permanent and irrevocable conservation covenant over the onsite mitigation areas to protect the established habitat in the future.

MITIGATION GOALS, OBJECTIVES AND PERFORMANCE STANDARDS

The mitigation goal of protecting the onsite Oregon white oak habitat for no net loss of functional habitat onsite will be met when the below objectives and performance standards are met.

Objective 1: Replace the loss of three jurisdictional Oregon white oak trees with sixteen (16) large stock (2-inch caliper size) and 7 small stock (1 gallon container size) Oregon white oak trees onsite and 22,414 square feet of associated Oregon white oak native shrub enhancement plantings.

Performance Standard 1a. Document the removal of invasive species within the retained Oregon white oak tree habitat onsite and the boundary protection installed prior to grading activities. Submit photos within the As-built to document the completion of this mitigation site preparation.

Performance Standard 1b. Document the installation of the native Oregon white oak trees, native shrub enhancement and repurposing of oak woody elements as specified by Table 3 and Figure 5 within the defined mitigation areas onsite. Within 60 days of project completion, submit As-built Map and documentation to show that the mitigation plan has been implemented according to this plan, or as conditioned by permit. As-built documentation is to include; planting locations on an As-built Map, native nursery receipt showing plant species and quantities, representative photos of the ten (10) mitigation areas from a minimum of ten (10) established photo point locations, photos of the ten (10) established monitoring plot locations (permanently staked and labeled) across the ten mitigation areas onsite, photos to document that the protective oak habitat signage is in place and legible along the outer perimeter of the onsite mitigation areas, and photos of the repurposed oak woody elements installed within the onsite mitigation areas.

Performance Standard 1c. In Years 1-5, the Oregon white oak mitigation trees are to achieve 100-percent (100%) survival. (If dead trees are replaced to achieve the 100 percent survival rate, this performance standard will be met).

Performance Standard 1d. By Year 2, native woody shrub species within the onsite mitigation areas are to achieve ninety-percent (90%) survival of. (Native volunteer growth will count towards this cover requirement, as will the installation of new plants to offset mortality.)

Performance Standard 1e. By Year 3, native woody shrub species within the onsite mitigation areas are to achieve eighty-percent (80%) survival of native woody shrub species. (Native volunteer growth will count towards this cover requirement, as will the installation of new plants to offset mortality.)

Performance Standard 1f. By Year 5, native woody shrub species within the onsite mitigation areas are to achieve thirty percent (30%) aerial cover of native woody shrub species, or eighty percent (80%) survival. (Native volunteer growth will count towards this cover requirement, as will the installation of new plants to offset mortality.)

Performance Standard 1g. In All Years, non-native/invasive plant species will not exceed 20-percent (20%) aerial cover across the onsite mitigation area.

Objective 2: Provide long-term protection for the onsite mitigation area.

Performance Standard 2a. Record a conservation covenant with the City of Camas. This performance standard will be met when a copy is submitted with the As-built documentation (or prior as conditioned by the approved permit) .

Performance Standard 2b. Post permanent signage along the outer boundaries of the "Protected Oak Habitat" (oak mitigation and retention areas) . Signs are to read:

"Critical Area– Please Retain in a Natural State"

or as otherwise determined by the City of Camas permit conditions.

Signage will remain in legible condition; if they are missing or illegible, they will be replaced. This performance standard will be met when signs are documented to be in place and of good condition within the final monitoring report.

CONCLUSIONS

The above sections outline how the proposed project will meet the Habitat Conservation Areas requirements of the CMC. All but three of the Oregon White Oaks trees will be retained. The oaks proposed for removal (Oak #s 14, 15, and 16) will be mitigated for onsite for no net loss of Oregon white oak habitat following CMC guidance and criteria. With issuance of the approved critical areas permits, the proposed Oregon white oak habitat mitigation plantings will be implemented, and a conservation covenant recorded to protect the onsite critical areas under the subdivision HOA into perpetuity.

DISCLAIMER

This report documents the investigation, best professional judgment, and conclusions of the investigator. It is correct and complete to the best of our knowledge. It should be considered a preliminary mitigation plan and used at your own risk until it has been reviewed and approved in writing by the local agency with jurisdiction over the site. AES personnel base the above listed conclusions on standard scientific methodology and best professional judgment.

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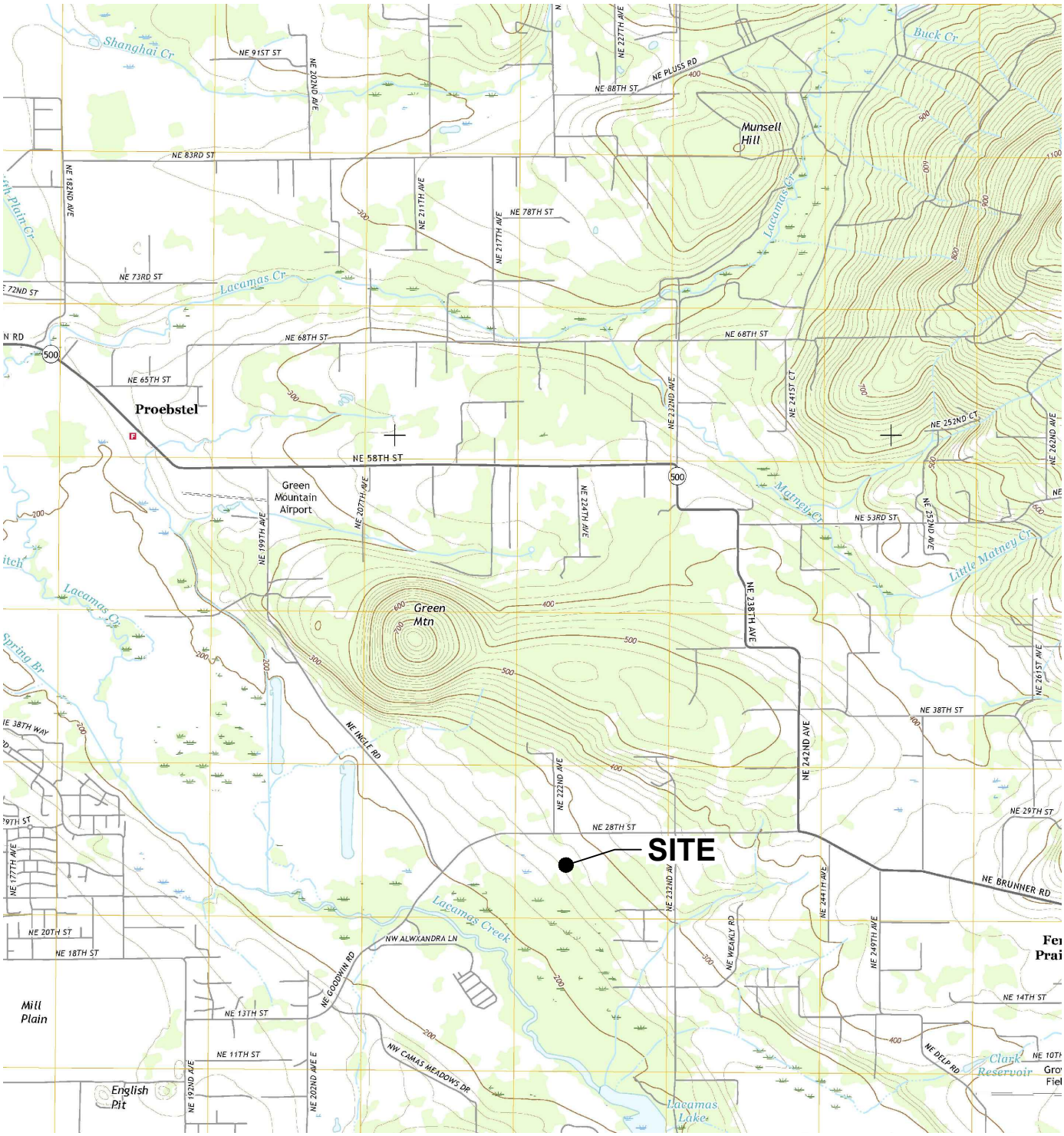

NOTE(S):
USGS, LACAMAS CREEK QUADRANGLE
WASHINGTON-CLARK CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)

PURPOSE: XX Line 1 Line 2 **DATUM:** NAVD 88 **ADJACENT PROPERTY OWNERS:** Adj 1 Adj 2	VICINITY MAP **APPLICANT:** Pacific Lifestyle Homes **PROJECT NAME:** Critical Areas Feasibility Map **PARCEL #:** 173184000 **SITE LOCATION ADDRESS:** 22205 NE 28th St.	**PROPOSED:** Monte Verde Subdivision **IN:** Camas **NEAR:** Lacamas Creek **COUNTY:** Clark **STATE:** WA **FIGURE:** 1 **DATE:** 7-8-22

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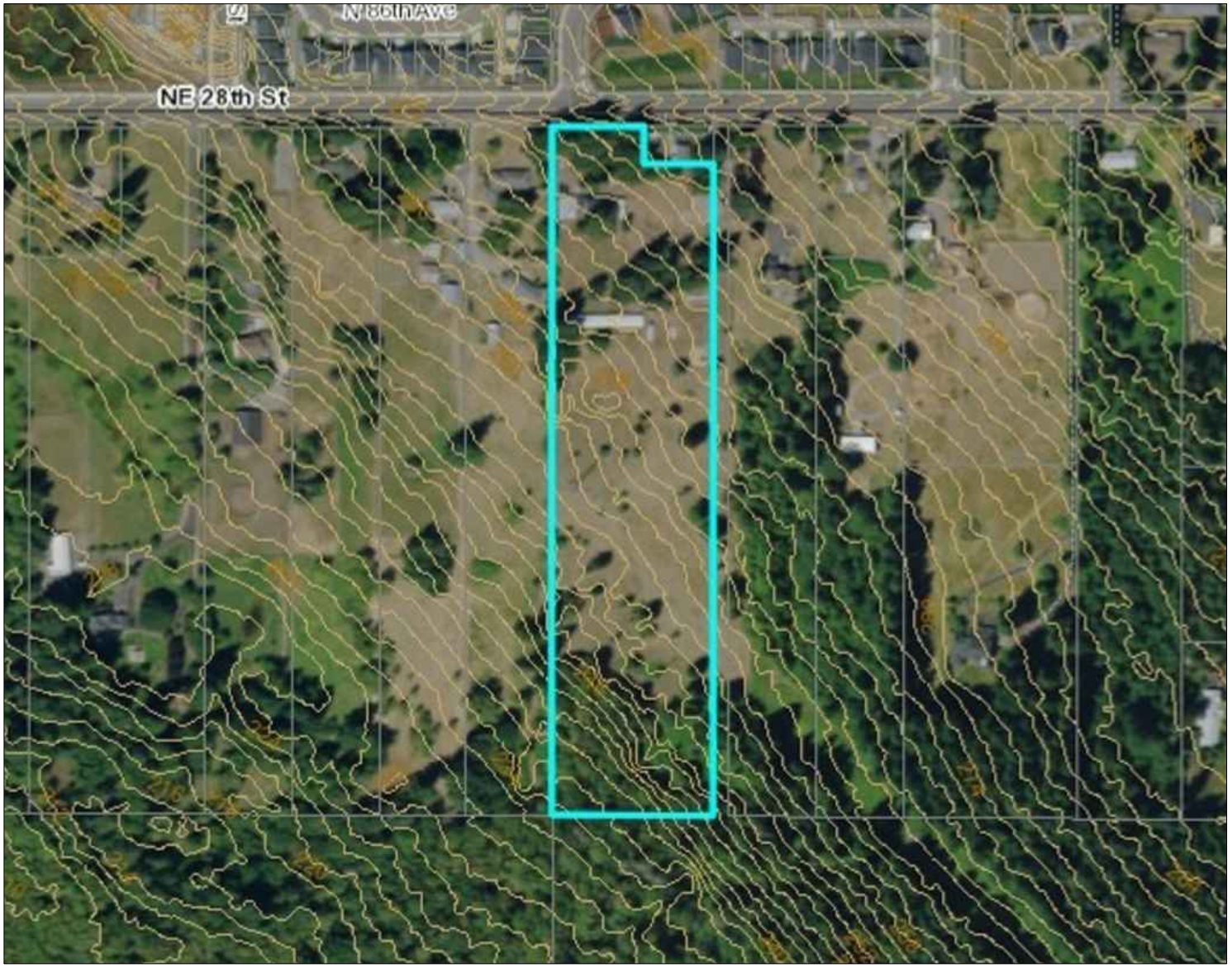

Legend

- Taxlots
- Contours Lines - 2 ft
- All Roads
  - Interstate
  - State Route
  - Arterial
  - Forest Arterial
  - Minor Collector
  - Forest Collector
  - Private or Other
- Cities Boundaries
- Urban Growth Boundaries

N

0 300 600

SCALE IN FEET
1" = 300'

AshECO SOLUTIONS, LLC

PURPOSE: XX
Line 1
Line 2
DATUM: NAVD 88
ADJACENT PROPERTY OWNERS:
Adj 1
Adj 2

AERIAL PHOTO & TOPO MAP

APPLICANT: Pacific Lifestyle Homes
PROJECT NAME: Critical Areas Feasibility Map
PARCEL #: 173184000
SITE LOCATION ADDRESS:
22205 NE 28th St.

PROPOSED: Monte Verde Subdivision
IN: Camas
NEAR: Lacamas Creek
COUNTY: Clark **STATE:** WA
FIGURE: 2
DATE: 3-1-22

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Legend

- Taxlots
- Soil Type
- Hydric Soils
- NWI Wetland
- All Roads
  - Interstate
  - State Route
  - Arterial
  - Forest Arterial
  - Minor Collector
  - Forest Collector
  - Private or Other

LgB - Lauren gravelly loam, 0-8% slopes. Non-hydric

LeB - Lauren loam, 0-8% slopes. Non hydric

N

0 300 600

SCALE IN FEET
1" = 300'

Ash ECO SOLUTIONS, LLC

PURPOSE: XX
Line 1
Line 2
DATUM: NAVD 88
ADJACENT PROPERTY OWNERS:
Adj 1
Adj 2

AERIAL PHOTO & TOPO MAP

APPLICANT: Pacific Lifestyle Homes
PROJECT NAME: Critical Areas Feasibility Map
PARCEL #: 173184000
SITE LOCATION ADDRESS:
22205 NE 28th St.

PROPOSED: Monte Verde Subdivision
IN: Camas
NEAR: Lacamas Creek
COUNTY: Clark **STATE:** WA
FIGURE: 3
DATE: 3-1-22

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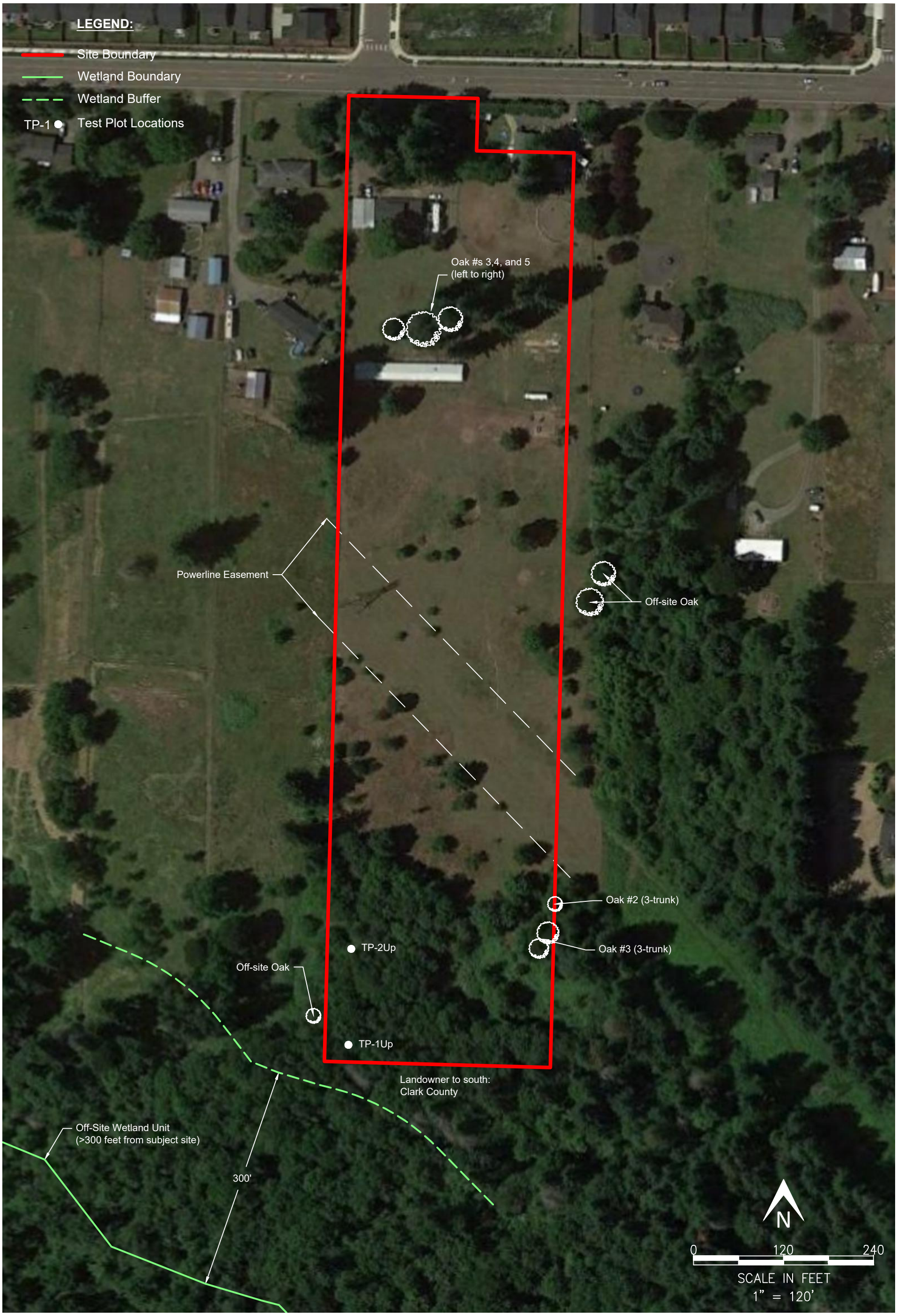

Ash ECO SOLUTIONS, LLC	**PURPOSE:** XX Line 1 Line 2 **DATUM:** NAVD 88 **ADJACENT PROPERTY OWNERS:** Adj 1 Adj 2	EXISTING CONDITIONS MAP **APPLICANT:** Pacific Lifestyle Homes **PROJECT NAME:** Critical Areas Feasibility Map **PARCEL #:** 173184000 **SITE LOCATION ADDRESS:** 22205 NE 28th St.	**PROPOSED:** Monte Verde Subdivision **IN:** Camas **NEAR:** XX **COUNTY:** Clark **STATE:** WA **FIGURE:** 4 **DATE:** 7-8-22

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AshECO SOLUTIONS, LLC	**PURPOSE:** XX Line 1 Line 2 **DATUM:** NAVD 88 **ADJACENT PROPERTY OWNERS:** Adj 1 Adj 2	PROPOSED PROJECT & OAK MITIGATION PLAN **APPLICANT:** Pacific Lifestyle Homes **PROJECT NAME:** Critical Areas Feasibility Map **PARCEL #:** 173184000 **SITE LOCATION ADDRESS:** 22205 NE 28th St.	**PROPOSED:** Monte Verde Subdivision **IN:** Camas **NEAR:** XX **COUNTY:** Clark **STATE:** WA **FIGURE:** 5 **DATE:** 10-11-22

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Appendix A

Site Photos

Monte Verde CAR & Oregon White Oak Mitigation Plan- Site Photos
Parcel: 173184000

Photo 1.
February 22, 2022 – View of the northwest corner of the subject site and the proposed site access from NE 28th Street. The three oaks (#s 14, 15, and 16) which will be removed are located just north of the white shed visible in this photo.

Photo 2.
February 22, 2022 – View south across the subject site. The site is highly impacted from years of animal grazing. Few native trees are present within the central portion of the property and it is dominated by grazed herbaceous cover.

Photo 3.
February 22, 2022 – View north across the central area of the subject site. Few native trees are present within the central portion of the property and there is no understory due to grazing. An overhead powerline tower located within the powerline easement onsite is visible at far right in this photo.

Photo 4.
February 22, 2022 – View north from the southwest corner of the property. The area is forested, but with little native understory or herbaceous layer due to grazing. Oak #76 is visible in this photo along the western parcel boundary. This tree will be retained and protected.

Photo 5.
February 22, 2022 – View east from the southwest corner of the property. The area is highly disturbed due to animal grazing. Test plot #1 was within this location. The area was determined to be an upland with non-hydric soils and no hydrology indicators.

Photo 6.
February 22, 2022 – Photo of the offsite wetland over 300-feet south of the subject parcel. The county owned property located south of the subject property is more biologically diverse and dominated in native vegetation.

Photo 7.
February 22, 2022 – View of Oak #127 along the eastern parcel boundary. The 3-trunk Oregon white oak is just offsite and will be retained.

Photo 8.
February 22, 2022 – View of Oak #126 along the eastern parcel boundary. The 3-trunk Oregon white oak will be retained and protected.

Appendix B

Test Plot Datasheets

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys and Coast Region

Project/Site: Monte Verde Subdivision City/County: Clark Sampling Date: 2/22/2022
Applicant/Owner: Pacific Lifestyle Homes State: WA Sampling Point: TP-1
Investigator(s): Andrea Aberle Section, Township, Range: SW 1/4, S21, T2N, R3E
Landform (hillslope, terrace, etc.): terrace Local relief: Concave Slope (%): 2%
Subregion (LRR): LRR A Lat: 45.640939 Long: 122.444567 Datum: NAD 83
Soil Map Unit Name: Hydric / CvA, Non-Hydric / LeB, Non-Hydric / LgB NWI classification: PFOA - South of subject site
Are climatic / hydrologic conditions on the site typical for this time of year? Yes☒ No☐ (If no, explain Remarks.)
Are Vegetation ☒, Soil☐, or Hydrology☐ significantly disturbed? Are "Normal Circumstances" present? Yes☒ No☐
Are Vegetation ☐, Soil☐, or Hydrology☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐ No ☒	**Is the Sampled Area**
Hydric Soils Present?	Yes ☐ No ☒	**within a Wetland?** **Yes☐ No☒**
Wetland Hydrology Present?	Yes ☐ No ☒	

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Fraxinus latifolia*	50%	yes	FACW
2. *Acer macrophyllum*	10%	no	FACU
3. *Quercus garryana*	5%	no	FACU
4.	%		
Total Cover:	65%		
Sapling/Shrub Stratum			
1. *Symphoricarpos albus*	25%	yes	FACU
2. *Corylus cornuta*	10%	yes	FACU
3. *Acer circinatum*	5%	yes	FAC
4.	%		
5.	%		
Total Cover:	40%		
Herb Stratum			
1. *Tolmiea menziesii*	15%	yes	FAC
2. *Rubus ursinus*	5%	yes	FACU
3.	%		
4.	%		
5.	%		
6.	%		
7.	%		
8.	%		
Total Cover:	20%		
Woody Vine Stratum			
1.	%		
2.	%		
Total Cover:	%		

% Bare Ground in Herb Stratum 80%

Dominance Test Worksheet

Number of Dominant Species That Are OBL, FACW, or FAC: **3** (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC 50% (A/B)

Prevalence Index worksheet

Total % Cover of:		Multiply by:	
OBL species		x 1=	
FACW species	50	x 2=	100
FAC species	20	x 3=	60
FACU species	55	x 4=	220
UPL species		x 5=	
Column Totals:	125 (A)		380 (B)

Prevalence Index = B/A= 3.04

Hydrophytic Vegetation Indicators:

- ☐ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Providing supporting data In Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes☐ No☒**

Remarks:

SOIL

Sampling Point: TP-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 3/1	100%		%			L	
12-16	10YR 4/2	98%	10YR 4/6	2%	C	PL	L	
		%		%				
		%		%				
		%		%				
		%		%				
		%		%				
		%		%				

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosal
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Minerals (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present

Restrictive Layer (if present):

Type: _____

Depth (inches):_____

Hydric Soil Present? Yes☐ No☒

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9) (**except NW coast**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizoshperes along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Stained Leaves
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D2)
- ☐ Frost-Heave Hummocks (D4)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (Inches): _____

Water Table Present? Yes ☐ No ☒ Depth (Inches): _____

Saturation Present? Yes ☐ No ☒ Depth (Inches): _____

(Includes capillary fringe)

Wetland Hydrology Present? Yes ☐ No ☒

Describe Recorded Data (Stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

The three wetland criteria have NOT been met.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys and Coast Region

Project/Site: Monte Verde Subdivision City/County: Clark Sampling Date: 2/22/2022
Applicant/Owner: Pacific Lifestyle Homes State: WA Sampling Point: TP-2
Investigator(s): Andrea Aberle Section, Township, Range: SW 1/4, S21, T2N, R3E
Landform (hillslope, terrace, etc.): terrace Local relief: Concave Slope (%): 2%
Subregion (LRR): LRR A Lat: 45.640939 Long: 122.444567 Datum: NAD 83
Soil Map Unit Name: Hydric / CvA, Non-Hydric / LeB, Non-Hydric / LgB NWI classification: PFOA - South of subject site
Are climatic / hydrologic conditions on the site typical for this time of year? Yes☒ No☐ (If no, explain Remarks.)
Are Vegetation ☒, Soil☐, or Hydrology☐ significantly disturbed? Are "Normal Circumstances" present? Yes☒ No☐
Are Vegetation ☐, Soil☐, or Hydrology☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☒ No ☐	**Is the Sampled Area**
Hydric Soils Present?	Yes ☐ No ☒	**within a Wetland?** **Yes☐ No☒**
Wetland Hydrology Present?	Yes ☐ No ☒	

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Fraxinus latifolia*	50%	yes	FACW
2.	%		
3.	%		
4.	%		
Total Cover:	50%		
Sapling/Shrub Stratum			
1. *Symphoricarpos albus*	20%	yes	FACU
2. *Malus fusca*	15%	yes	FACW
3. *Corylus cornuta*	5%	yes	FACU
4. *Salix sitchensis*	5%	yes	FACW
5.	%		
Total Cover:	45%		
Herb Stratum			
1. *Tolmiea menziesii*	10%	yes	FAC
2.	%		
3.	%		
4.	%		
5.	%		
6.	%		
7.	%		
8.	%		
Total Cover:	10%		
Woody Vine Stratum			
1. *Rubus armeniacus*	20%	yes	FAC
2.	%		
Total Cover:	20%		

% Bare Ground in Herb Stratum 70%

Dominance Test Worksheet

Number of Dominant Species That Are OBL, FACW, or FAC: **5** (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC 71% (A/B)

Prevalence Index worksheet

Total % Cover of:	Multiply by:
OBL species	x 1=
FACW species	x 2=
FAC species	x 3=
FACU species	x 4=
UPL species	x 5=
Column Totals: (A)	(B)

Prevalence Index = B/A=

Hydrophytic Vegetation Indicators:

- ☒ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Providing supporting data In Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes☒ No☐**

Remarks:

SOIL

Sampling Point: TP-2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 2/2	100%		%			L	
10-16	10YR 3/2	100%		%			L	
		%		%				
		%		%				
		%		%				
		%		%				
		%		%				
		%		%				

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosal
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- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Minerals (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present

Restrictive Layer (if present):

Type: _____

Depth (inches):_____

Hydric Soil Present? Yes☐ No☒

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9) (**except NW coast**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizoshperes along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Stained Leaves
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D2)
- ☐ Frost-Heave Hummocks (D4)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (Inches): _____

Water Table Present? Yes ☐ No ☒ Depth (Inches): _____

Saturation Present? Yes ☐ No ☒ Depth (Inches): _____

(Includes capillary fringe)

Wetland Hydrology Present? Yes ☐ No ☒

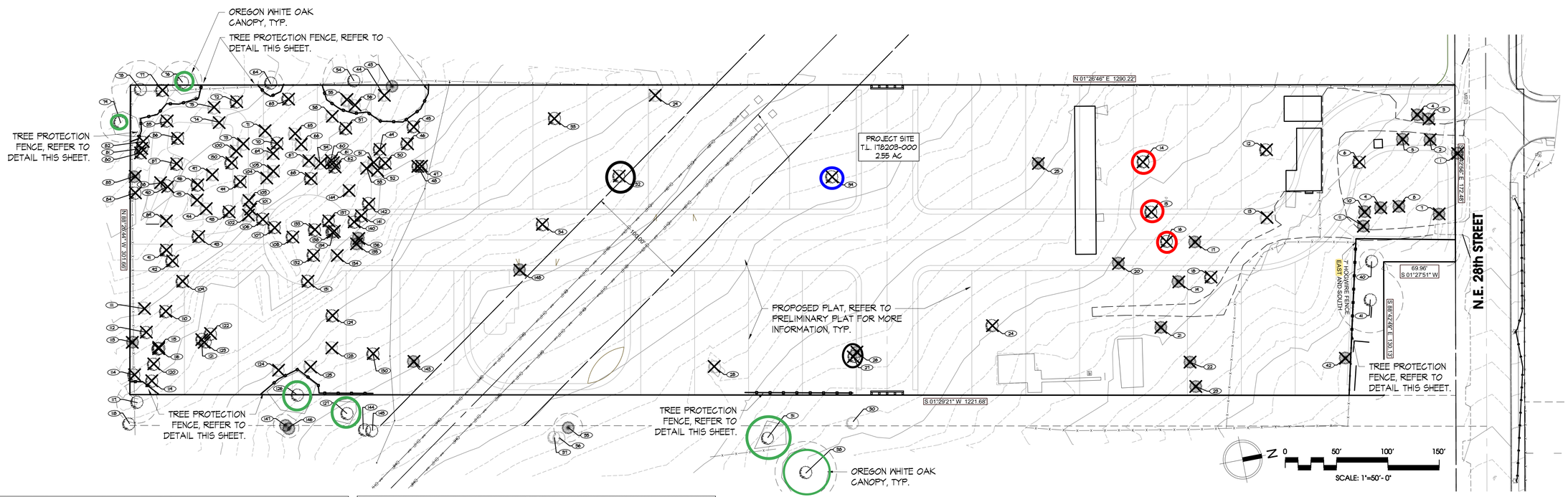
Describe Recorded Data (Stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

The three wetland criteria have NOT been met.

Appendix C

Tree Survey



Tree Data							
Tree No.	Species	DBH	RPZ	Tree Condition	Retain (R) Remove (X)	Units (retained only)	Condition Notes
1	Pseudotsuga menziesii (Douglas Fir)	11"	11'	poor	X		Branches Suppressed
2	Pseudotsuga menziesii (Douglas Fir)	43"	43'	fair	X		
3	Pseudotsuga menziesii (Douglas Fir)	42"	42'	fair	X		
4	Pseudotsuga menziesii (Douglas Fir)	36"	36'	fair	X		
5	Pseudotsuga menziesii (Douglas Fir)	44'	44'	fair	X		
6	Acer saccharinum (Silver Maple)	22"	22'	fair	X		
7	Pseudotsuga menziesii (Douglas Fir)	36"	36'	fair	X		
8	Pseudotsuga menziesii (Douglas Fir)	44"	44'	fair	X		
9	Pseudotsuga menziesii (Douglas Fir)	29"	29'	fair	X		
10	Pseudotsuga menziesii (Douglas Fir)	26"	26'	fair	X		
11	Pseudotsuga menziesii (Douglas Fir)	36"	36'	fair	X		
12	Ailanthus altissima (Tree-Of-Heaven)	34"	34'	fair	X		
13	Crataegus douglasii (Douglas Hawthorn)	10"	10'	poor	X		Co-dominant
14	Quercus garryana (Oregon White Oak)	20"	20'	fair	X		
15	Quercus garryana (Oregon White Oak)	36"	36'	fair	X		
16	Quercus garryana (Oregon White Oak)	30"	30'	fair	X		
17	Pseudotsuga menziesii (Douglas Fir)	38"	38'	fair	X		
18	Alnus rubra (Red Alder)	25"	25'	poor	X		Deback 30% - 60%, Leaning
19	Pseudotsuga menziesii (Douglas Fir)	42"	42'	fair	X		
20	Pseudotsuga menziesii (Douglas Fir)	36"	36'	fair	X		
21	Pseudotsuga menziesii (Douglas Fir)	34"	34'	fair	X		
22	Pseudotsuga menziesii (Douglas Fir)	36"	36'	fair	X		
23	Pseudotsuga menziesii (Douglas Fir)	30"	30'	fair	X		
24	Pyrus spp. (Apple)	18"	18'	fair	X		
25	Pseudotsuga menziesii (Douglas Fir)	20"	20'	fair	X		
26	Pseudotsuga menziesii (Douglas Fir)	16"	16'	fair	X		Co-dominant
27	Quercus garryana (Oregon White Oak)	14"	14'	dead	X		Deback ~90%, Leaning, Poor Taper
28	Pyrus spp. (Apple)	10"	10'	fair	X		Co-dominant
29	Pyrus spp. (Apple)	10"	10'	fair	X		Branch Failures, Co-dominant, Cracks, Leaning
30	Pyrus spp. (Apple)	10"	10'	poor	X		Co-dominant, Deback 30% - 60%
31	Quercus garryana (Oregon White Oak)	21"	21'	fair	R	offsite	
32	Quercus garryana (Oregon White Oak)	10"	10'	poor	X		Co-dominant, Cracks, Visible Decay
33	Alnus rhombifolia (White Alder)	14"	14'	fair	X		Missing Bark Poor Taper
34	Pyrus spp. (Apple)	25"	25'	poor	X		
35	Pseudotsuga menziesii (Douglas Fir)	14"	14'	fair	R	offsite	
36	Acer macrophyllum (Bigleaf Maple)	10"	10'	dead	R	offsite	
37	Acer macrophyllum (Bigleaf Maple)	10"	10'	dead	R	offsite	
38	Quercus garryana (Oregon White Oak)	30"	30'	fair	R	offsite	
39	Pyrus spp. (Apple)	20"	20'	dead	X		
40	Acer rubrum (Red Maple)	12"	12'	fair	R	offsite	Co-dominant
41	Acer rubrum (Red Maple)	32"	32'	fair	R	offsite	
42	Pseudotsuga menziesii (Douglas Fir)	30"	30'	fair	X		
43	Pseudotsuga menziesii (Douglas Fir)	34"	34'	fair	R	13	Deback 30% - 60%
44	Fraxinus latifolia (Oregon Ash)	10"	10'	poor	X		Co-dominant
45	Acer macrophyllum (Bigleaf Maple)	17"	17'	fair	X		
46	Acer macrophyllum (Bigleaf Maple)	17"	17'	poor	X		Deback 30% - 60%, Leaning
47	Frangula purshiana (Cascara)	12"	12'	poor	X		
48	Acer macrophyllum (Bigleaf Maple)	20"	20'	fair	X		Deback 30% - 60%
49	Acer macrophyllum (Bigleaf Maple)	17"	17'	poor	X		Leaning
50	Alnus rubra (Red Alder)	15"	15'	fair	X		
51	Alnus rubra (Red Alder)	10"	10'	poor	X		Co-dominant
52	Alnus rubra (Red Alder)	10"	10'	poor	X		Poor Taper
53	Alnus rubra (Red Alder)	8"	8'	poor	X		Co-dominant
54	Salix scouleriana (Scouler's Willow)	30"	30'	fair	R	offsite	
55	Fraxinus latifolia (Oregon Ash)	10"	10'	poor	X		Co-dominant
56	Fraxinus latifolia (Oregon Ash)	9"	9'	poor	X		Co-dominant, Leaning
57	Acer macrophyllum (Bigleaf Maple)	14"	14'	poor	X		Deback 30% - 60%
58	Acer macrophyllum (Bigleaf Maple)	9"	9'	poor	X		Deback 30% - 60%, Leaning
59	Acer macrophyllum (Bigleaf Maple)	8"	8'	poor	X		Co-dominant, Deback 30% - 60%
60	Acer macrophyllum (Bigleaf Maple)	13"	13'	poor	X		Co-dominant, Deback 30% - 60%, Overextended Branches
61	Acer macrophyllum (Bigleaf Maple)	12"	12'	poor	X		Co-dominant, Deback 30% - 60%
62	Acer macrophyllum (Bigleaf Maple)	14"	14'	poor	X		Co-dominant, Deback 30% - 60%
63	Acer macrophyllum (Bigleaf Maple)	34"	34'	poor	X		Deback 60%-90%
64	Salix scouleriana (Scouler's Willow)	12"	12'	poor	R	offsite	Deback 30% - 60%, Multi-Stemmed
65	Fraxinus latifolia (Oregon Ash)	10"	10'	poor	X		Deback 60%-90%
66	Fraxinus latifolia (Oregon Ash)	8"	8'	poor	X		Co-dominant, Deback 60%-90%
67	Acer macrophyllum (Bigleaf Maple)	8"	8'	poor	X		Co-dominant, Deback 60%-90%
68	Acer macrophyllum (Bigleaf Maple)	12"	12'	poor	X		Deback 30% - 60%, Multi-Stemmed, Overextended Branches
69	Fraxinus latifolia (Oregon Ash)	8"	8'	poor	X		Co-dominant, Deback 30% - 60%
70	Fraxinus latifolia (Oregon Ash)	12"	12'	poor	X		Deback 60%-90%
71	Fraxinus latifolia (Oregon Ash)	10"	10'	poor	X		Co-dominant
72	Fraxinus latifolia (Oregon Ash)	17"	17'	fair	X		Deback 30% - 60%
73	Fraxinus latifolia (Oregon Ash)	10"	10'	poor	X		Deback 30% - 60%, Poor Taper
74	Acer macrophyllum (Bigleaf Maple)	10"	10'	poor	X		Co-dominant
75	Acer macrophyllum (Bigleaf Maple)	11"	11'	poor	X		Branch Failures, Branches Suppressed, Deback 30% - 60%
76	Quercus garryana (Oregon White Oak)	20"	20'	fair	R	offsite	Deback 30% - 60%
77	Fraxinus latifolia (Oregon Ash)	26"	26'	poor	X		Deback 60%-90%, Missing Bark
78	Fraxinus latifolia (Oregon Ash)	28"	28'	fair	R	10	Deback 30% - 60%
79	Quercus garryana (Oregon White Oak)	19"	19'	fair	R	offsite	
80	Acer macrophyllum (Bigleaf Maple)	13"	13'	poor	X		Branches Suppressed, Deback 30% - 60%
81	Acer macrophyllum (Bigleaf Maple)	14"	14'	poor	X		Branches Suppressed, Deback 30% - 60%
82	Acer macrophyllum (Bigleaf Maple)	15"	15'	poor	X		Branches Suppressed, Deback 30% - 60%
83	Pseudotsuga menziesii (Douglas Fir)	28"	28'	fair	X		Branches Suppressed, Deback 30% - 60%
84	Acer macrophyllum (Bigleaf Maple)	24"	24'	poor	X		Branches Suppressed, Deback 30% - 60%, Leaning
85	Fraxinus latifolia (Oregon Ash)	15"	15'	fair	X		Branches Suppressed
86	Acer macrophyllum (Bigleaf Maple)	18"	18'	fair	X		Branches Suppressed, Deback 30% - 60%
87	Fraxinus latifolia (Oregon Ash)	12"	12'	poor	X		Deback 30% - 60%, Leaning
88	Acer macrophyllum (Bigleaf Maple)	10"	10'	poor	X		Co-dominant, Deback 30% - 60%
89	Acer macrophyllum (Bigleaf Maple)	10"	10'	poor	X		Deback 30% - 60%
90	Acer macrophyllum (Bigleaf Maple)	12"	12'	poor	X		
91	Acer macrophyllum (Bigleaf Maple)	12"	12'	poor	X		Branches Suppressed, Co-dominant
92	Acer macrophyllum (Bigleaf Maple)	14"	14'	fair	X		Co-dominant
93	Acer macrophyllum (Bigleaf Maple)	13"	13'	poor	X		Branches Suppressed, Deback 30% - 60%
94	Acer macrophyllum (Bigleaf Maple)	11"	11'	poor	X		Branches Suppressed, Deback 30% - 60%
95	Acer macrophyllum (Bigleaf Maple)	10"	10'	poor	X		Branches Suppressed, Deback 30% - 60%
96	Fraxinus latifolia (Oregon Ash)	12"	12'	poor	X		Co-dominant, Deback 30% - 60%
97	Fraxinus latifolia (Oregon Ash)	10"	10'	poor	X		Co-dominant, Deback 30% - 60%
98	Fraxinus latifolia (Oregon Ash)	12"	12'	fair	X		Co-dominant
99	Fraxinus latifolia (Oregon Ash)	12"	12'	fair	X		Branches Suppressed
100	Fraxinus latifolia (Oregon Ash)	8"	8'	poor	X		Co-dominant
101	Acer macrophyllum (Bigleaf Maple)	10"	10'	fair	X		Co-dominant
102	Acer macrophyllum (Bigleaf Maple)	8"	8'	fair	X		Co-dominant
103	Acer macrophyllum (Bigleaf Maple)	8"	8'	fair	X		Branches Suppressed, Co-dominant

Tree Data							
Tree No.	Species	DBH	RPZ	Tree Condition	Retain (R) Remove (X)	Units (retained only)	Condition Notes
104	Fraxinus latifolia (Oregon Ash)	8"	8'	poor	X		Branches Suppressed, Co-dominant
105	Fraxinus latifolia (Oregon Ash)	8"	8'	poor	X		Branch Failures, Branches Suppressed, Co-dominant, Dieback 30% - 60%
106	Acer macrophyllum (Bigleaf Maple)	12"	12'	poor	X		Branches Suppressed, Dieback 30% - 60%
107	Acer macrophyllum (Bigleaf Maple)	12"	12'	fair	X		
108	Fraxinus latifolia (Oregon Ash)	14"	14'	poor	X		Branch Failures, Co-dominant, Dieback 30% - 60%
109	Acer macrophyllum (Bigleaf Maple)	14"	14'	poor	X		Branch Failures, Co-dominant, Leaning
110	Fraxinus latifolia (Oregon Ash)	13"	13'	poor	X		Branch Failures, Branches Suppressed, Dieback 30% - 60%
111	Alnus rubra (Red Alder)	10"	10'	poor	X		Co-dominant, Leaning
112	Acer macrophyllum (Bigleaf Maple)	12"	12'	poor	X		Branches Suppressed, Leaning
113	Pseudotsuga menziesii (Douglas Fir)	14"	14'	poor	X		Branch Failures, Branches Suppressed, Dieback 30% - 60%
114	Acer macrophyllum (Bigleaf Maple)	17"	17'	fair	X		Branches Suppressed, Dieback 30% - 60%
115	Acer macrophyllum (Bigleaf Maple)	15"	15'	fair	X		Branches Suppressed, Dieback 30% - 60%
116	Acer macrophyllum (Bigleaf Maple)	17"	17'	poor	X		Branch Failures, Branches Suppressed, Dieback 30% - 60%
117	Acer macrophyllum (Bigleaf Maple)	20"	20'	fair	R	offsite	Dieback 30% - 60%
118	Acer macrophyllum (Bigleaf Maple)	12"	12'	poor	R	offsite	Co-dominant, Dieback 30% - 60%
119	Acer macrophyllum (Bigleaf Maple)	12"	12'	fair	X		Branches Suppressed, Dieback 30% - 60%
120	Acer macrophyllum (Bigleaf Maple)	12"	12'	poor	X		Branch Failures, Branches Suppressed, Dieback 30% - 60%
121	Fraxinus latifolia (Oregon Ash)	12"	12'	poor	X		Branches Suppressed, Dieback 30% - 60%, Heavy Leaning (>60%)
122	Fraxinus latifolia (Oregon Ash)	14"	14'	poor	X		Branch Failures, Co-dominant, Dieback 30% - 60%
123	Fraxinus latifolia (Oregon Ash)	12"	12'	poor	X		Branches Suppressed, Co-dominant, Dieback 30% - 60%, Missing Bark
124	Acer macrophyllum (Bigleaf Maple)	10"	10'	fair	X		Deback 30% - 60%
125	Acer macrophyllum (Bigleaf Maple)	10"	10'	fair	X		Dieback 30% - 60%
126	Quercus garryana (Oregon White Oak)	14"	14'	fair	R	1	Branch Failures, Co-dominant
127	Quercus garryana (Oregon White Oak)	14"	14'	fair	R	offsite	Co-dominant
128	Acer macrophyllum (Bigleaf Maple)	10"	10'	poor	X		Co-dominant, Deback 30% - 60%
129	Acer macrophyllum (Bigleaf Maple)	12"	12'	fair	X		Co-dominant, Dieback 30% - 60%, Multi-Stemmed
130	Acer saccharum (Sugar Maple)	20"	20'	poor	X		Branch Failures, Deback 60%-90%, Missing Bark
131	Acer macrophyllum (Bigleaf Maple)	14"	14'	fair	X		Dieback 30% - 60%
132	Acer macrophyllum (Bigleaf Maple)	12"	12'	fair	X		
133	Acer macrophyllum (Bigleaf Maple)	12"	12'	fair	X		Branches Suppressed
134	Alnus rubra (Red Alder)	8"	8'	fair	X		Co-dominant
135	Pseudotsuga menziesii (Douglas Fir)	16"	16'	fair	X		Branches Suppressed
136	Pseudotsuga menziesii (Douglas Fir)	12"	12'	fair	X		Branches Suppressed
137	Acer macrophyllum (Bigleaf Maple)	12"	12'	fair	X		Branches Suppressed
138	Acer macrophyllum (Bigleaf Maple)	12"	12'	fair	X		Branches Suppressed
139	Acer macrophyllum (Bigleaf Maple)	12"	12'	fair	X		Branches Suppressed, Dieback 30% - 60%
140	Acer macrophyllum (Bigleaf Maple)	12"	12'	fair	X		Branches Suppressed
141	Alnus rubra (Red Alder)	12"	12'	poor	X		Co-dominant, Deback 30% - 60%
142	Alnus rubra (Red Alder)	12"	12'	fair	X		Branches Suppressed
143	Pseudotsuga menziesii (Douglas Fir)	15"	15'	good	X		
144	Salix scouleriana (Scouler'S Willow)	13"	13'	poor	R	offsite	Branch Failures, Branches Suppressed, Dieback 30% - 60%
145	Salix scouleriana (Scouler'S Willow)	13"	13'	poor	R	offsite	Co-dominant, Missing Bark, Multi-Stemmed
146	Pseudotsuga menziesii (Douglas Fir)	10"	10'	fair	R	offsite	
147	Pseudotsuga menziesii (Douglas Fir)	10"	10'	fair	R	offsite	
148	Pseudotsuga menziesii (Douglas Fir)	17"	17'	dead	X		Co-dominant
149	Fraxinus latifolia (Oregon Ash)	10"	10'	poor	X		Deback 30% - 60%
150	Acer macrophyllum (Bigleaf Maple)	17"	17'	poor	X		Deback 30% - 60%

SITE STATISTICS

8.84± AC	SITE AREA
177	TREE UNITS REQUIRED (20 / ACRE)
26	TREE UNITS RETAINED

SYMBOL LEGEND

SYMBOL	DESCRIPTION
	EXISTING SIGNIFICANT DECIDUOUS TREE (12" CAL. OR GREATER)
	EXISTING SIGNIFICANT EVERGREEN TREE (8" CAL. OR GREATER)
	EXISTING DECIDUOUS (LESS THAN 12" CAL.) TO BE REMOVED
	EXISTING SIGNIFICANT TREE TO BE REMOVED
	ROOT PROTECTION ZONE AREA (RPZ)
	TREE PROTECTION FENCE LOCATION (4' CHAIN LINK, ORANGE PVC FENCE OR SILT FENCE) (ALSO DENOTES AREA WHERE NO IMPACTS TO THE ROOT PROTECTION ZONE SHALL OCCUR). SEE DETAIL THIS SHEET.

TREE PROTECTION TIME LINE & NARRATIVE

EXISTING ON-SITE AND OFF-SITE TREE LOCATIONS AND SIZES HAVE BEEN OBTAINED VIA SURVEY INFORMATION AND SITE OBSERVATIONS.

129 EXISTING TREES WITHIN THE PROJECT BOUNDARIES ARE PROPOSED TO BE REMOVED DUE TO CONFLICTS WITH THE PROPOSED SITE GRADING.

TREE PROTECTION FENCING SHALL BE PLACED AS SHOWN TO PROTECT THE TREES TO BE RETAINED.

TREE PROTECTION / EROSION CONTROL FENCING SHALL BE ESTABLISHED PRIOR TO EXCAVATION. IT IS RECOMMENDED TO BE INSTALLED AT THE SAME TIME EROSION CONTROL MEASURES ARE INSTALLED. WHERE TREE FENCE AND EROSION CONTROL FENCE ARE LOCATED AT THE SAME LOCATION, EROSION FENCE THEN SERVES AS TREE PROTECTION FENCE. SEE DETAIL THIS SHEET.

TREES DETERMINED TO BE A SAFETY HAZARD AT THE TIME OF CONSTRUCTION MAY BE REMOVED. THE SITE WILL MAINTAIN A MINIMUM TREE UNIT COUNT OF 20 TREES PER ACRE IN ACCORDANCE WITH CITY OF CAMAS MUNICIPAL CODE CC 18.13.051.

TREE PROTECTION NOTES

1) NO PERSON MAY CONDUCT ANY OF THE FOLLOWING ACTIVITIES WITHIN THE DRIP LINE OF THE TREES DESIGNATED TO REMAIN INCLUDING, BUT NOT LIMITED TO: PARKING EQUIPMENT, FUELING, SERVICING EQUIPMENT, PLACING SOLVENTS, STORING BUILDING MATERIAL AND SOIL DEPOSITS, DUMPING CONCRETE WASHOUT AND LOCATING BURN HOLES.
2) DURING CONSTRUCTION, NO PERSON SHALL ATTACH ANY OBJECT TO THE TREES DESIGNATED FOR PROTECTION.
3) THE CONTRACTOR SHALL FOLLOW THE GRADING PLAN PROVIDED BY THE PROJECT CIVIL ENGINEER. GRADING ACTIVITIES SHALL BE CONDUCTED IN A MANNER TO MINIMIZE THE IMPACTS TO THE TREES MARKED FOR PRESERVATION.
4) THE EXCAVATOR SHALL KEEP A SHARP PAIR OF LOPPERS AND A SHARP 12" PRUNING SAW ACCESSIBLE ON-SITE DURING GRADING OPERATIONS. ANY ROOTS LARGER THAN ½" SHALL BE PRUNED TO THE FACE OF THE CUT (USING A SHARP PAIR OF LOPPERS OR A SHARP 12" PRUNING SAW) AND SHALL NOT BE TORN FROM THE GROUND BY MECHANICAL EXCAVATION.
5) SPECIAL CARE SHALL BE EXERCISED IN WORKING NEAR THE TREES TO BE RETAINED. THIS INCLUDES HAND EXCAVATING THE ROOTS AT THE EDGE OF THE EXCAVATION AND CUTTING ROOTS WITH A LOPPER OR PRUNING SAW. PRUNING THE ROOTS AT THE EDGE OF EXCAVATION WILL MINIMIZE BREAKAGE OF HEALTHY ROOTS BEYOND THE EDGE OF THE PROPOSED EXCAVATION.
6) EXCEPT FOR THE PROPOSED IMPROVEMENTS SHOWN WITHIN THE DRIP LINES OF THE TREES NOTED TO BE RETAINED THE GRADE SHALL NOT BE ELEVATED OR REDUCED FROM EXISTING GRADE.
7) IF THE GRADE ADJACENT TO A PRESERVED TREE IS RAISED SUCH THAT IT COULD SLOUGH OR ERODE INTO THE TREE'S DRIP LINE, IT SHALL BE PERMANENTLY STABILIZED.
8) THE TREES NOTED TO RETAINED SHALL BE PROTECTED FROM EROSION AND SEDIMENTATION. CLEARING OPERATIONS SHALL BE CONDUCTED SO AS TO EXPOSE THE SMALLEST PRACTICAL AREA OF SOIL TO EROSION FOR THE LEAST POSSIBLE TIME. REFER TO THE PROJECT'S EROSION CONTROL PLAN FOR MORE INFORMATION.
9) THE PROJECT SHALL NOT INSTALL AN IMPERVIOUS SURFACE OTHER THAN THOSE SPECIFICALLY SHOWN ON THE PLANS WITHIN THE DRIP LINE OF THE TREES TO BE RETAINED.
10) UTILITY TRENCHES SHALL BE LOCATED OUTSIDE OF THE DRIP LINE OF THE TREES TO BE RETAINED.
11) ONGOING TREE MAINTENANCE SHALL BE THE RESPONSIBILITY OF THE LAND OWNER. TREES SHALL BE MAINTAINED IN ACCORDANCE WITH ANSI AMERICAN NATIONAL STANDARDS INSTITUTE'S AS WELL AS OTHER APPLICABLE FEDERAL, STATE AND LOCAL STANDARDS PERTAINING TO TREE CARE OPERATIONS.

- ANSI Z133 ARBORICULTURAL OPERATIONS: SAFETY REQUIREMENTS
- ANSI A300 PART 1 PRUNING

AshEco Solutions Oregon White Oak Summary:

Tree #	DBH	Jurisdictional (20" DBH)	On-site	Proposed for Removal	Requires Mitigation
14	20"	YES	YES	YES	YES
15	36"	YES	YES	YES	YES
16	30"	YES	YES	YES	YES
27	10" (dead)	NO	YES	YES	NO
31	21"	YES	NO	NO	NO
32	10"	N/A	YES	NO	NO
38	30"	YES	NO	NO	NO
76	20"	YES	YES (dripline)	NO	NO
79	19"	NO	YES (dripline)	NO	NO
126	14"	NO	YES (partial)	NO	NO
127	14"	NO	NO	NO	NO

See Table 1 of Mitigation Plan for the Oregon White Oak Summary details.
Dead or impacted oaks will be repurposed on site as woody habitat elements.

STATE OF WASHINGTON ROBERT W. PHIPPS LANDSCAPE ARCHITECT EXP. 02/07/2023 NO. 161
7-29-2022

CERTIFIED ARBORIST ISA
Robert Phipps, PN-8715A
7-29-2022

Planning Solutions, Inc.
Creating Solutions to Complex Issues
4400 NE 77th Avenue
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VANCOUVER, WA 98662
VOICE: 360-750-9000 FAX: 360-713-6102
www.planningsolutionsinc.com

PRELIMINARY
NOT FOR CONSTRUCTION
SUBJECT TO APPROVAL
PBS ENGINEERING ENVIRONMENTAL SURVEYING PBSUSA.COM

MONTE VERDE SUBDIVISION

22205 NE 28TH Street
Camas, Washington

DRAWN: GB/RP | CHECKED: GB
SCALE: 1" = 50'-0" | DATE: 07.29.22
JOB #: 22-1719
ISSUED FOR: PLR
REVISIONS:
1
2
3
4
5
6

SHEET NAME: **EXISTING TREE SURVEY**

SHEET #: TP

SHEET 1 OF 2

899

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D:\OneDrive - Planning Solutions Inc\Project Folder\2022 Projects\1719 Monte Verde Subdivision\2.0 LIO\2.03 PLR (Current)\PLR-S1 (6.22)\PLR-S1 Plans\1719 PLR-S1 TP 50.dwg, 7/28/2022 4:44:33 PM

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Appendix D

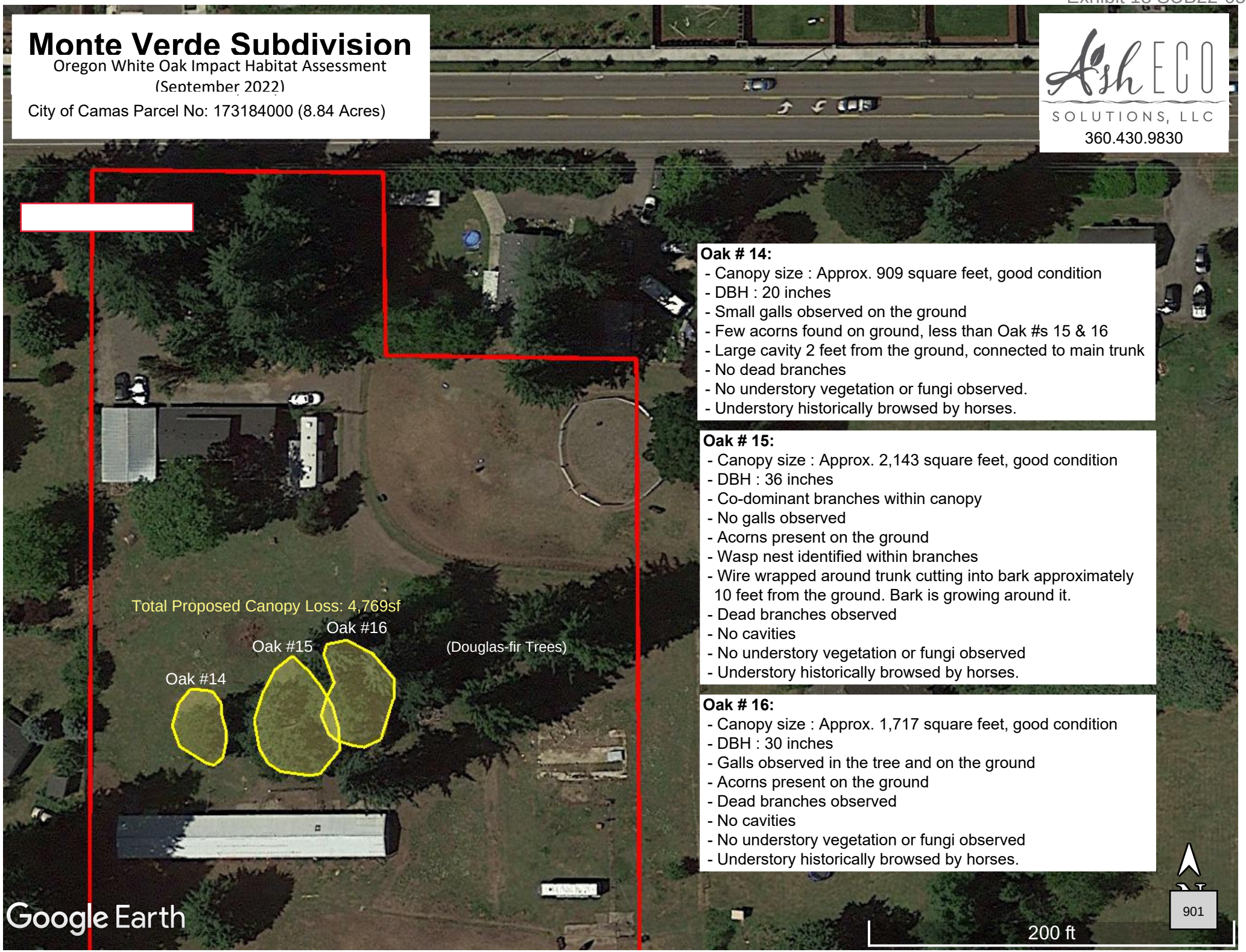
Oregon White Oak Habitat Assessment

Monte Verde Subdivision

Oregon White Oak Impact Habitat Assessment
(September 2022)

City of Camas Parcel No: 173184000 (8.84 Acres)

Ash ECO
SOLUTIONS, LLC
360.430.9830



Oak # 14:
- Canopy size : Approx. 909 square feet, good condition
- DBH : 20 inches
- Small galls observed on the ground
- Few acorns found on ground, less than Oak #s 15 & 16
- Large cavity 2 feet from the ground, connected to main trunk
- No dead branches
- No understory vegetation or fungi observed.
- Understory historically browsed by horses.

Oak # 15:
- Canopy size : Approx. 2,143 square feet, good condition
- DBH : 36 inches
- Co-dominant branches within canopy
- No galls observed
- Acorns present on the ground
- Wasp nest identified within branches
- Wire wrapped around trunk cutting into bark approximately 10 feet from the ground. Bark is growing around it.
- Dead branches observed
- No cavities
- No understory vegetation or fungi observed
- Understory historically browsed by horses.

Oak # 16:
- Canopy size : Approx. 1,717 square feet, good condition
- DBH : 30 inches
- Galls observed in the tree and on the ground
- Acorns present on the ground
- Dead branches observed
- No cavities
- No understory vegetation or fungi observed
- Understory historically browsed by horses.

Monte Verde CAR & Oak Mitigation Plan- Oak Photos
Parcel: 173184000

Photo 1.
September 14, 2022 – View of Oak #s 14, 15, and 16 within the northern section of the subject parcel. All three are proposed for removal.

Photos 2-4 (Oak #14).
September 14, 2022
- Canopy size : Approx. 909 square feet, good condition
- DBH : 20 inches
- Small galls observed on the ground
- Few acorns found on ground, less than Oak #s 15 & 16
- Large cavity 2 feet from the ground, connected to main trunk
- No dead branches
- No understory vegetation or fungi observed

Monte Verde CAR & Oak Mitigation Plan- Oak Photos
Parcel: 173184000

Photos 5-7 (Oak #15).
September 14, 2022
- Canopy size : Approx. 2,143 square feet, good condition
- DBH : 36 inches
- Co-dominant branches within canopy
- No galls observed
- Acorns present on the ground
- Wasp nest identified within branches
- Wire wrapped around trunk cutting into bark approximately 10 feet from the ground. Bark is growing around it.
- Dead branches observed
- No cavities
- No understory vegetation or fungi observed

Monte Verde CAR & Oak Mitigation Plan- Oak Photos
Parcel: 173184000

Photos 8-10 (Oak #16).
September 14, 2022
- Canopy size : Approx. 1,717 square feet, good condition
- DBH : 30 inches
- Galls observed in the tree and on the ground
- Acorns present on the ground
- Dead branches observed
- No cavities
- No understory vegetation or fungi observed

PLS ENGINEERING

Engineering - Surveying - Planning * 604 W Evergreen Blvd, Vancouver, WA 98660 * P 360-944-6519 * F 360-944-6539 *

Engineering review comments of the 9/16/2022 submittal.
AA 10-25-2022

October 12, 2022

City of Camas
616 NE 4th Avenue
Camas, WA 98607

Attention: Yvette Sennewald

RE: Monte Verde Subdivision
Incomplete Application
SUB22-05

This letter is in response to the notice of incomplete application memo for Monte Verde Subdivision. The comments below are in reply to the memo dated 9/7/22 and will follow each comment in direct order of the letter.

• 17.01.050.B2: Tracts to be dedicated to any public or private purpose shall be distinguished from lots intended for general development with notes stating their purpose and any limitations. Preliminary Plat shows Tracts A-F, some with unclear boundaries. Please provide narrative for proposed Tracts that includes purpose, square footage, and an illustration that shows defined boundaries.

Response: Tract boundaries are shown and locations confirmed by Yvette. Narrative has been updated.

• 17.01.050.B3: Building Envelopes. Lot 1 building envelopes are unclear. Please revise preliminary plat to include buildable area and show required setbacks.

Response: Building envelopes shown and identified to Yvette.

• 17.01.050.B4: Land Inventory. Preliminary and final plats shall include the following:
  o d. Total infrastructure acreage (includes proposed storm ponds)
  o e. Total Tract Area

Response: Infrastructure acreage and tract area added to site statistics.

• 17.11.030.B6:
  o b. Owners of adjacent land and the names of any adjacent subdivisions. Only one subdivision name references but missing adjacent property owners.

  Response: Adjacent owners and subdivisions added.

  o d. Names, locations, widths, and dimension of existing and proposed public street rights-of-way and easements and private access easements, parks and other open spaces, reservations, and utilities. Missing dimensions and callouts for existing right-of-way.

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Response: Existing right-of-way is already labeled for 28th.

Existing dimentsions are not shown on the 9/16/2022 plans. Only the dedicated dimensions are shown.

o k. Location of any proposed dedications. Proposed dedications are not called out, dimensions are not noted.

Response: The PUE is dimensioned.

The PUE is not a dedication. Dedications of the proposed Tracts are not noted on the preliminary plat from 9/16/2022.

o n. Description, location and size of existing and proposed utilities, storm drainage facilities and roads to service the lots. Sizes of existing and proposed utilities are not shown.

Response: This is a preliminary plan set. Utility sizes will be shown on final plans.

The sizes of the proposed utilities are required to be shown on the preliminary plans.

• 17.11.030.B10: Clark County assessor's maps which show the location of each property within three hundred feet of the subdivision. Properties shown on preliminary plat appear to be less than 300-feet.

Response: Properties 300' out don't fit on the plan views so a small scaled sketch is provided.

• 17.11.030.B12: Complete and submit a transportation impact study to determine the adequacy of the transportation system to serve a proposed development and to mitigate impacts of the proposal on the surrounding transportation system

o Per City of Vancouver preliminary review of the TIA, COV is requesting additional trip distribution information. The applicant is to provide an addendum to the TIA, showing the total number of new PM peak hour trips that will be distributed to the following proportionate share intersections, and calculate the expected fees:

Project Location	**Unit Cost per Trip**
192nd Ave & SR-14 ramps	$2,000 per PM peak hour trip
192nd Ave & SE 34th St	$150 per PM peak hour trip

Response: See attached TIA addendum. This requirement was met with the TIA addendum.

• Per CMC 18.55.110:

o H. A development sign is required for a Type III subdivision application.

Response: A sign is installed.

Comments related to Pre-Application Meeting Notes (PA22-05):

Planning

• Preliminary Plat:

2. Density calculation is based on development/net acreage which is defined as the total land use development exclusive of open space and critical areas. Please provide table showing breakdown of development/net area and proposed Tracts.

Response: Density information is included in the table on the Preliminary Plat.

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4. Building setback requirements found in CMC 18.09.040-Table 2, includes requirement for setbacks to be drawn on the plat. Per Note 2, "Garage setback is five feet behind the front of the dwelling." Preliminary plat does not show garage setback.

Response: Garage setback is shown and listed in site statistics table on the Preliminary Plat.

8. Each dwelling unit within a new development shall be landscaped with at least one tree per CMC 17.19.030.F. Preliminary plat does not show trees on Lots 13 and 26.

Response: Trees have been added to lots 13 and 26.

12. The location and height of any retaining walls shall be shown on the grading plan. Retaining wall height requirements are found in CMC 18.17.060. While the preliminary grading plan shows location of three 2-foot retaining walls, the preliminary plat only calls out two. If there will be a retaining wall adjacent to Lot #19, please ensure that is reflected on the preliminary plat as well.

Response: Wall hatching has been removed from the plat. The walls are correctly identified on the grading plans.

• Critical Areas Report:

o Clark County GIS mapping identifies wetlands on the subject property however; the Critical Areas Report indicates wetlands were found approximately 300 feet south of the project site. Staff will route the Critical Areas Report to the Army Corp of Engineers for a jurisdictional determination and concurrence. Any comments from them will be forwarded on to you.

o The report submitted includes a Mitigation Plan, however it does not mention mitigation sequencing in accordance with CMC16.51.170. The Mitigation Plan is also missing required information regarding CMC16.51.180 – Mitigation plan requirements. The report should be revised to reflect the requirements as noted in these two sections of the Camas Municipal Code.

o The site assessment also identified several Oregon White Oaks, and a mitigation plan was included in the Critical Areas Report however; preliminary comments have been received from Washington Department of Fish & Wildlife (WDFW) and further information is needed to determine whether or not the mitigation plan is adequate for the proposed removal and loss of Oregon White Oaks on the project site. If necessary, a meeting with WDFW staff can be arranged to discuss their comments further. The initial comments are as follows:

▪ The mitigation plan proposes to replace three mature Oregon white oak trees with six 2-inch seedlings. Oregon white oaks are slow growing, and the proposal will lead to a net loss of habitat for years. WDFW is currently updating Best Management Practices for Oregon white oak mitigation and will not only be requesting mitigation for the physical loss of habitat but for the temporal loss as well.

▪ Additional information is needed to better assess the required mitigation, including, but not limited to, canopy size (sq. ft.), condition of crown, acorn production, galls, cavities, dead branches, fungi, etc.

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- Page 6 of the Critical Area Report states that Oak #27 is a hazard tree based on, "proposed construction, grading requirements where it is located, and the condition of the tree". The interpretation is that this will become a hazard tree only after the construction takes place and is not a hazard tree at this time. Dead/dying oak trees provide valuable habitat to wildlife and because of that, this oak tree does not meet the PHS definition.

- If possible, the removed OWO trees, including the snag, should be left on site as habitat features on the landscape. On-site mitigation is the preferred option, but off-site mitigation options can be explored as well.

Response: An updated Critical Areas Report and Mitigation Plan is provided that addresses the above listed critical areas issues. Please note that the report has updated sections in red text to aid in your review; a new version in black text can be provided after your review is complete.

Please review the included revised information and let us know if all issues are resolved or if additional information is needed.

Sincerely,

Nicolle Sicilia
Land Use Planner
PLS Engineering

COMMUNITY DEVELOPMENT DEPARTMENT
616 NE 4th Avenue
Camas, WA 98607
www.ci.camas.wa.us

October 26, 2022

Pacific Lifestyle Homes
Attn: Ryan Stygar
Sent via email: ryans@buildplh.com

RE: 2nd Submittal Completeness Review for Planning Case SUB22-05: Monte Verde Subdivision

Dear Mr. Stygar,

Thank you for your recent submittal for the Monte Verde Subdivision (SUB22-05). There are still a few items that need to b addressed prior to moving forward with the review process. Once the items below are submitted, staff will review the information to verify whether the application can be deemed complete. As a reminder, staff is not authorized to waive any requirement of the City Code. Any omission or failure by staff to recite applicable code requirements shall not constitute a waiver by the City of any standard or requirement.

Items necessary for completeness:

- 17.11.030.B6:
  - d. Names, locations, widths, and dimension of existing and proposed public street rights-of-way and easements and private access easements, parks and other open spaces, reservations, and utilities.
    - ***Existing dimensions are not shown on the 9/16/22 plans. Only the dedicated dimensions are shown.***
  - k. Location of any proposed dedications.
    - ***The PUE is not a dedication. Dedications of the proposed Tracts are not noted on the preliminary plat from 9/16/22***.
  - n. Description, location and size of existing and proposed utilities, storm drainage facilities and roads to service the lots.
    - ***The sizes of proposed utilities are required to be shown on the preliminary plans.***

If you have any questions related to this project, please feel free to contact me by email: YSennewald@cityofcamas.us or by phone: (360) 817-7269.

Respectfully,

Yvette Sennewald
Senior Planner

Monte Verde

Located in the SE ¼ of Section 21, T2N, R3E and in the SW ¼ of Section 21, T2N, R3E, W.M.
Camas, Washington

GENERAL NOTES

Applicant:
Pacific Lifestyle Homes
Ryan Stygar
11815 NE 99th Street
Vancouver, WA 98682
Office (360) 304-9901

OWNER:
Dwight Southern
22205 NE 28th Street
Camas, WA 98607

CIVIL ENGINEER:
PLS Engineering
Contact: Travis Johnson, PE
604 W Evergreen Blvd
Vancouver, WA 98660
PH: (360) 944-6519
pm@plsengineering.com

SITE ADDRESS:
Parcel # 173184-000
22205 NE 28th Street
Camas, WA 98607

LAND USE:
The applicant is proposing a 34 lot subdivision in the R7.5 zone.

Per Municipal Code section 18.09.060, density transfer is proposed with the inclusion of an improved park area. The proposed park tract includes at least 0.5 acres of contiguous area. We are requesting additional flexibility in the minimum lot width standards with the proposed park area.

Existing Lot Area = 8.6 Acres
Proposed open space = 0.93 Acre
Minimum Proposed Lot Area = 5,821 sq-ft
Maximum Proposed Lot Area = 8,265 sq-ft
Average Lot Area = 6,415 sq-ft
Min. Lot Width = 52.5'

Maximum Density = 5.8 d.u./net acre (44 lots)
Proposed Density = 4.4 d.u./net acre (34 lots)

ENVIRONMENTAL CONSTRAINTS:
There are multiple Oregon white oak trees located on or near the site. There are no known water courses or water bodies, no areas within 100-year floodplain, no designated shoreline areas, no landslide or erosion hazard areas, no wetlands, and no known significant historic resources.

MICHAEL A. WEISENBORN — STATE OF WASHINGTON — 42700 — REGISTERED PROFESSIONAL LAND SURVEYOR — 8/10/22

SURVEYOR'S CERTIFICATE:

THIS MAP CORRECTLY REPRESENTS A SURVEY MADE BY ME OR UNDER MY DIRECTION IN CONFORMANCE WITH THE REQUIREMENTS OF THE SURVEY RECORDING ACT AT THE REQUEST OF MONTE VERDE IN 2022.

MICHAEL A. WEISENBORN, PROFESSIONAL LAND SURVEYOR — DATE 8/10/22
PLS NO. 42700

TRANSPORTATION:
For primary access to the site the applicant is proposing to construct a roadway connection to NE 28th Street that aligns with NE Hargrave Street. NE 28th Street is classified as a 3-lane collector/arterial. Half width improvements are proposed for this public roadway. Internal public roadways will consist of local access roadways with circulation provided to the east and west.

UTILITIES:
Stormwater runoff is proposed to be collected and routed to an infiltration trench or a detention facility located on the south end of the site, runoff generated from pollution generating surfaces will be treated using filter cartridges prior to entering the stormwater facilities.

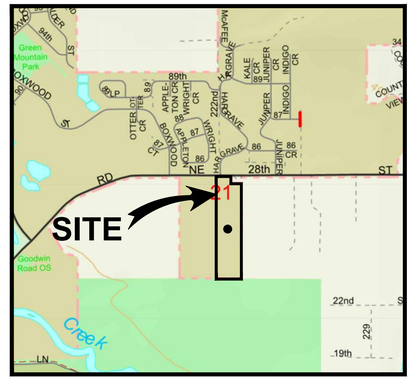
The site will be served by public water and sanitary sewer provided by the City of Camas. The connection point for both water and sewer are within NE 28th Street. Due to the existing grade of the site that slopes away from NE 28th Street, a majority of the lots will need to utilize a grinder pump system.

There is an existing well and septic system located on the site that will be removed/abandoned in accordance with Clark County Health Department requirements.

TRACT OWNERSHIP:
All tracts will be privately owned and maintained by the Homeowners Association (HOA) or individual homeowners, including the stormwater facility. The City will be granted an access easement to the storm facility for purposes of inspections.

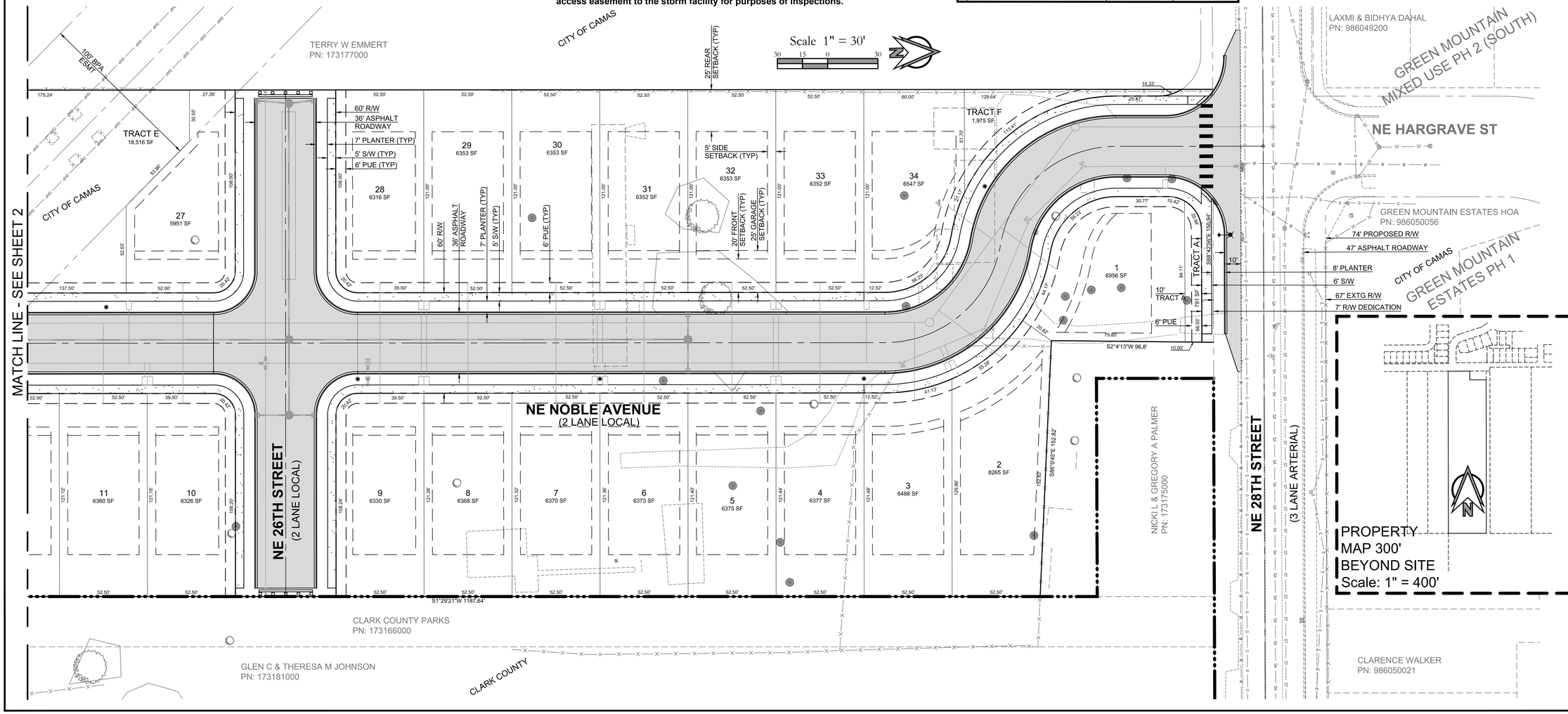
SITE STATISTICS		
ZONE: R7.5		
Site Area	374,775 SQ FT	8.60 AC
Infrastructure Area	116,127 SQ FT	2.67 AC
Right of Way Dedication	89,651 SQ FT	2.06 AC
Tract A	791 SQ FT	0.02 AC
Tract C	3,489 SQ FT	0.08 AC
Stormwater Facility Tract D	20,219 SQ FT	0.46 AC
Tract F	1,975 SQ FT	0.05 AC
Open Space	40,532 SQ FT	0.93 AC
Tract B	22,017 SQ FT	0.51 AC
Tract E	18,516 SQ FT	0.43 AC
Net Area (Site Area - Open Space)	334,243 SQ FT	7.67 AC
Total Lots	34	
Critical Areas	0 SQ FT	0 AC

	REQUIRED	PROPOSED
Density (Net Acreage/Total Lots)	5.8 Max	4.5
Maximum Building Lot Coverage	40%	40%
Setbacks		
Front Yard	20'	20'
Side Yard	5'	5'
Rear Yard	25'	25'
Garage	25'	25'
Side Yard flanking a street	10'	10'



VICINITY MAP
NOT TO SCALE

Legend	
Proposed Asphalt Concrete	
Proposed Cement Concrete	
Proposed Gravel	
Proposed Retaining Wall	



ENGINEERING | PLS
Preliminary Plat - North For:
Monte Verde
A Subdivision Located In The City Of Camas, Washington
Engineering - Surveying - Planning | 604 W. Evergreen Blvd., Vancouver, WA 98660 | PH (360) 944-6519 | Fax (360) 944-6539

Revisions

1	2	3	4	5	6

SCOTT W. GILLILAND — STATE OF WASHINGTON — 42773 — REGISTERED PROFESSIONAL ENGINEER — 7/25/22

Project No.	3382
SCALE:	H: 1" = 50' V: N/A
DESIGNED BY:	SWG
DRAFTED BY:	JSV
REVIEWED BY:	SWG

3
9

Monte Verde

Located in the SE ¼ of Section 21, T2N, R3E and in the SW ¼ of Section 21, T2N, R3E, W.M.
Camas, Washington

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MICHAEL A. WEISENBORN — STATE OF WASHINGTON — 42760 — REGISTERED PROFESSIONAL LAND SURVEYOR — 8/10/22

SURVEYOR'S CERTIFICATE:

THIS MAP CORRECTLY REPRESENTS A SURVEY MADE BY ME OR UNDER MY DIRECTION IN CONFORMANCE WITH THE REQUIREMENTS OF THE SURVEY RECORDING ACT AT THE REQUEST OF MONTE VERDE IN 2022.

MICHAEL A. WEISENBORN, PROFESSIONAL LAND SURVEYOR — 6/10/22 DATE
PLS NO. 42700

TRANSPORTATION:
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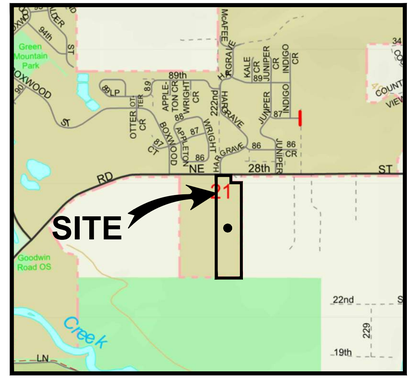

VICINITY MAP
NOT TO SCALE

Legend	
Proposed Asphalt Concrete	
Proposed Cement Concrete	
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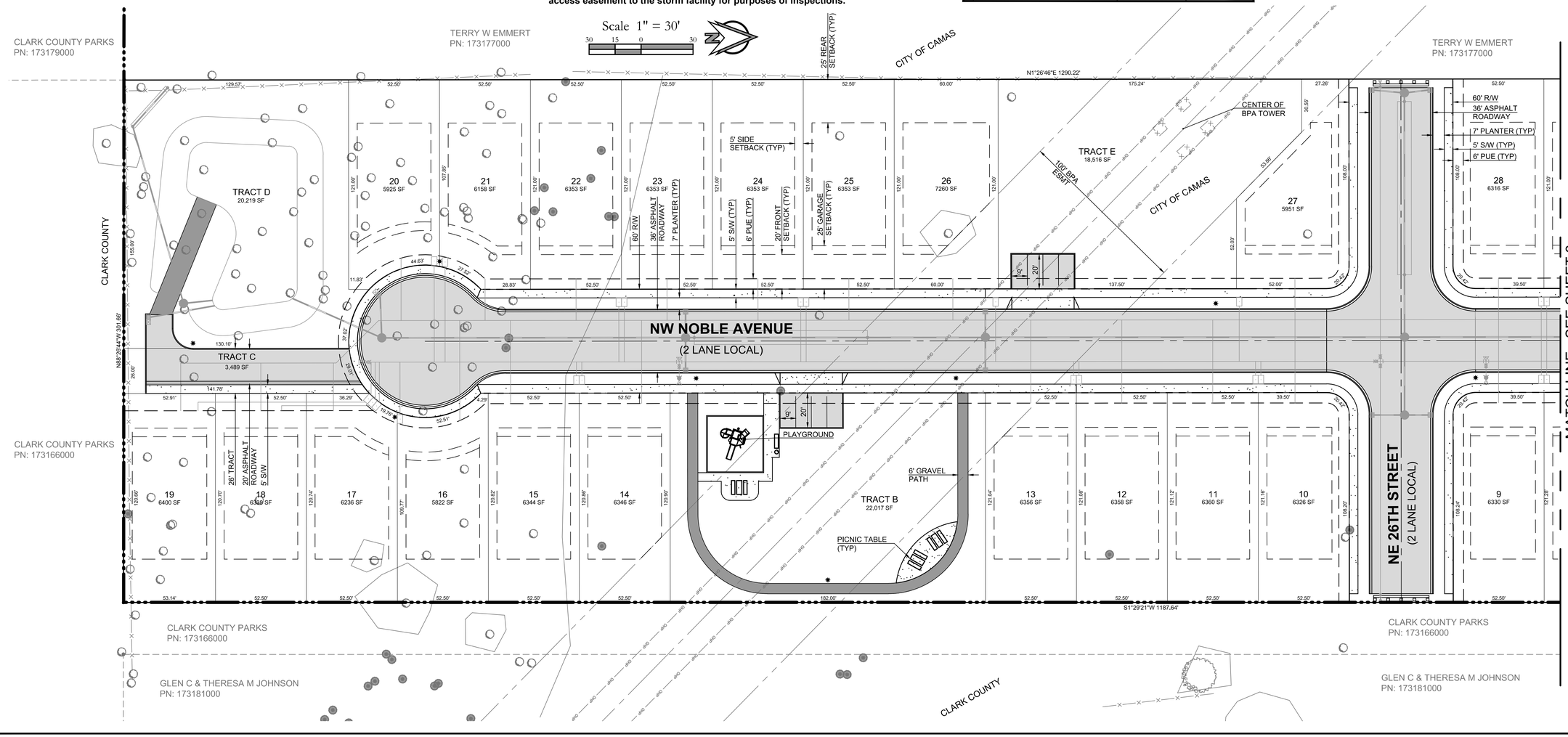
Proposed Retaining Wall	



ENGINEERING | PLS

Preliminary Plat - South For:

Monte Verde

A Subdivision Located In The City Of Camas, Washington

Engineering - Surveying - Planning | 604 W. Evergreen Blvd., Vancouver, WA 98660 | PH (360) 944-6519 | Fax (360) 944-6539

Revisions

1	2	3	4	5	6

SCOTT W. GILLILAND — STATE OF WASHINGTON — 42773 — REGISTERED PROFESSIONAL ENGINEER — 7/25/22

Project No.	3382
SCALE:	H: 1" = 30' V: N/A
DESIGNED BY:	SWG
DRAFTED BY:	JSV
REVIEWED BY:	SWG

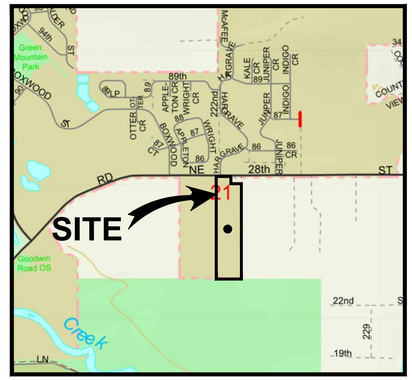
2
9

Monte Verde

Located in the SE ¼ of Section 21, T2N, R3E and in the SW ¼ of Section 21, T2N, R3E, W.M.
Camas, Washington

Sheet Index

1. ######################
2. Preliminary Plat - South
3. Preliminary Plat - North
4. Preliminary Utility Plan - South
5. Preliminary Utility Plan - North
6. Preliminary Grading Plan - South
7. Preliminary Grading Plan - North
8. Landscape Plan
9. Tree Plan



VICINITY MAP
NOT TO SCALE

GENERAL NOTES

Applicant:
Pacific Lifestyle Homes
Ryan Stygar
11815 NE 99th Street
Vancouver, WA 98682
Office (360) 304-9901

OWNER:
Dwight Southern
22205 NE 28th Street
Camas, WA 98607

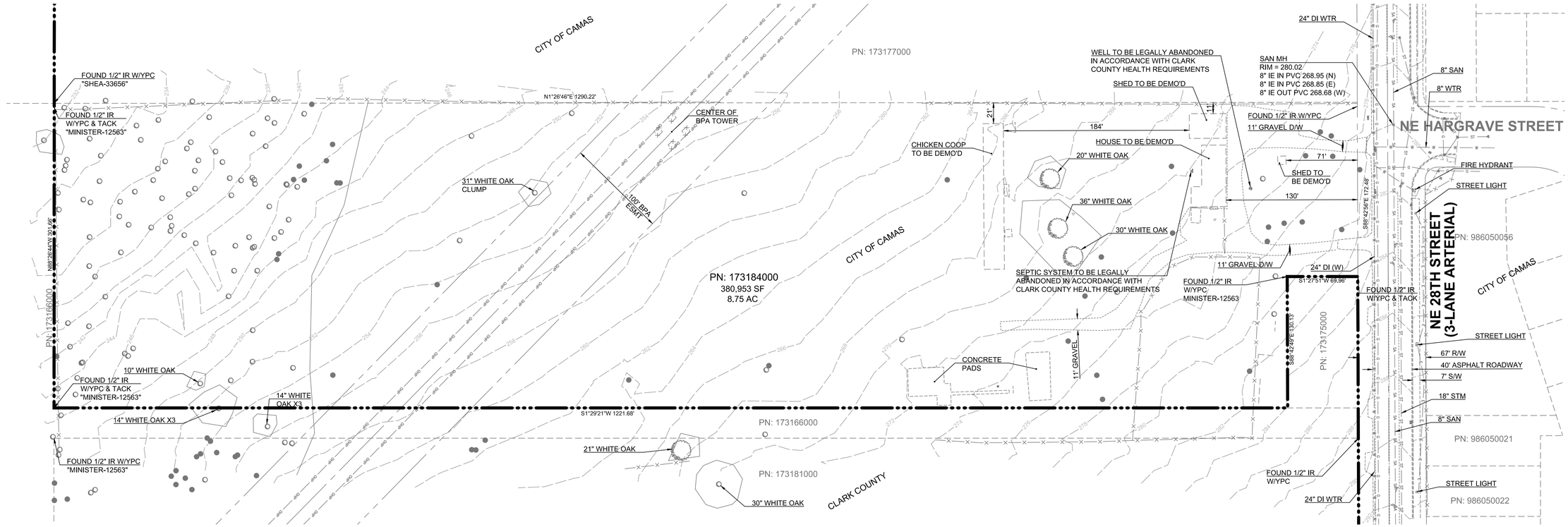
CIVIL ENGINEER:
PLS Engineering
Contact: Travis Johnson, PE
604 W Evergreen Blvd
Vancouver, WA 98660
PH: (360) 944-6519
pm@plsengineering.com

SITE ADDRESS:
Parcel # 173184-000
22205 NE 28th Street
Camas, WA 98607

HORIZONTAL DATUM:
NAD 83 (2011)
Oregon State plane coordinate system, North zone, International feet based on real time kinematic corrections from the Washington State reference network.

VERTICAL DATUM:
NGVD29(47) Clark County Datum

Scale 1" = 50'
50 25 0 50



PLS ENGINEERING

PLS Engineering | Engineering - Surveying - Planning | 604 W. Evergreen Blvd., Vancouver, WA 98660 | PH (360) 944-6519 | Fax (360) 944-6539

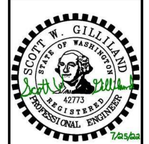
Existing Condtions Plan For:

Monte Verde

A Subdivision Located In The City Of Camas, Washington

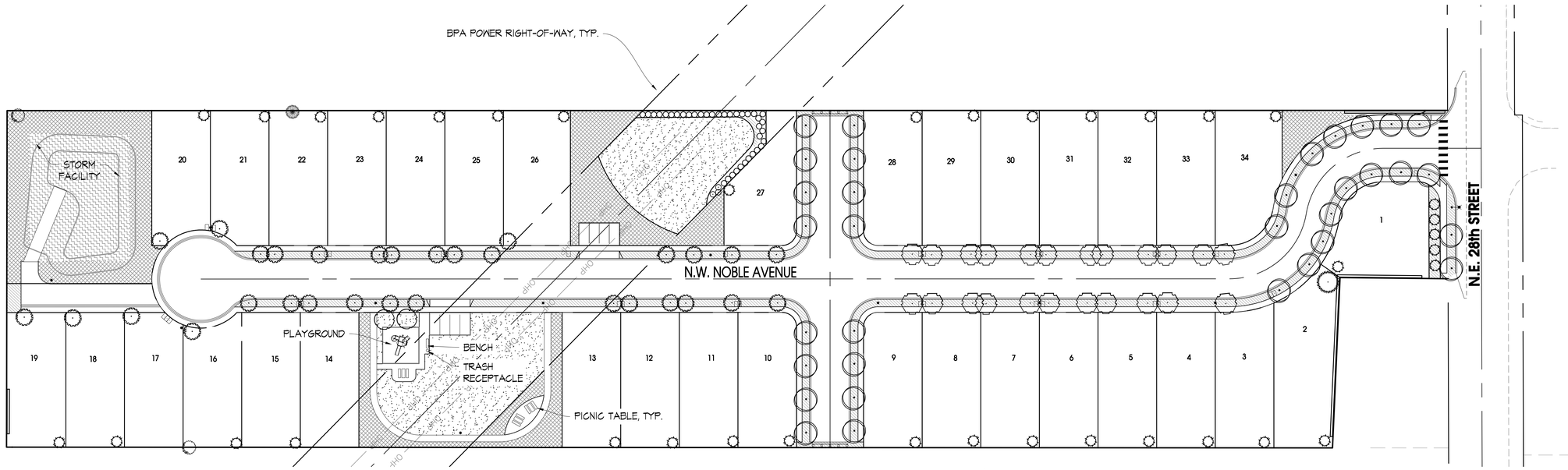
Revisions

1	2	3	4	5	6



Project No.	3382
SCALE:	H: 1" = 50' V: N/A
DESIGNED BY:	SWG
DRAFTED BY:	JSV
REVIEWED BY:	SWG

1
9

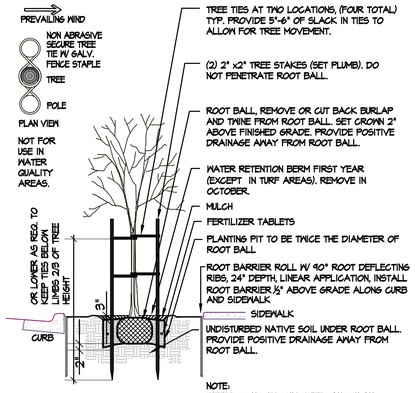


N 0 50' 100' 150'
SCALE: 1"=50'-0"

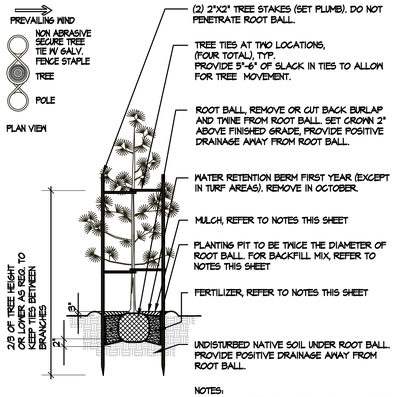
Trees and Shrubs in Sight Distance Triangles, Typ.
All shrubs within sight distance triangles shall be maintained so that foliage height above pavement does not exceed 2.5 feet. Street trees within sight distance triangles shall be limbed up to a height of 10 feet consistent with ANSI A300 standards to provide for sight distance visibility.

PLANT LEGEND

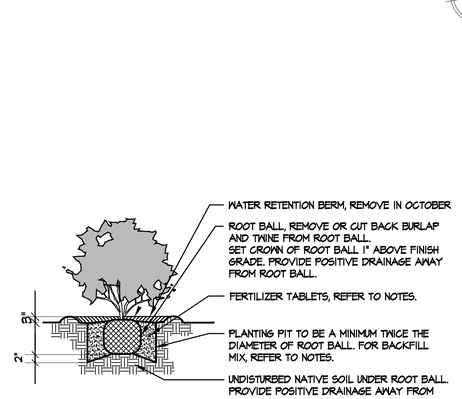
SYMBOL	BOTANICAL / COMMON NAME	SIZE	QUANTITY	TREE UNITS
TREES				
	EXISITNG TREES - RETAIN & PROTECT PER PLANS.	SEE SHT. T1	3	26
no symbol	OAK TREE PLANTINGS - REFER TO MITIGATION PLAN PREARED BY ASH ECO SOLUTIONS, INC.		23	16
	ACER TRUNC. X A. PLAT.'WARREN RED' PACIFIC SUNSET MAPLE	2" cal.	33	33
	CALOCEDRUS DECURRENS INCENSE CEDAR	5' Ht.	37	37
	CARPINUS CAROLINIANA AMERICAN HORNBEAM	2" cal.	23	23
	PARROTIA PERSICA 'VANESSA' VANESSA PERSIAN PARROTIA	2" cal.	2	2
	PSEUDOTSUGA MENZIESII DOUGLAS FIR	5' Ht.	1	1
	ZELKOVA SERRATA 'CITY SPRITE' CITY SPRITE ZELKOVA	2" cal.	38	34
	TOTAL TREES PLANTED		160	
	TOTAL TREE UNITS			177
SHRUBS				
	MYRICA CALIFORNICA PACIFIC WAX MYRTLE	5 GAL.	32	
	ILEX GLABRA INKBERRY HOLLY	5 GAL.	8	
GROUNDCOVER				
	ARCTOSTAPHYLOS UVA URSI / KINNIKINNICK	1 GAL.	36" O.C.	
	TURF, DROUGHT RESISTANT, SUN & SHADE MIX (ALL NON SHRUB OR GC AREAS)			
STORMWATER DETENTION FACILITY				
	GRASS SEED PER CIVIL PLANS			
CRITICAL AREAS MITIGATION				
	REFER TO MITIGATION PLAN PREPARED BY ASH ECO SOLUTIONS, INC.			



A B & B Tree Planting Detail
Not To Scale — SECTION / PLAN VIEW



B B & B Tree Planting Detail: Evergreen under 8' Height
Not To Scale — SECTION / PLAN VIEW



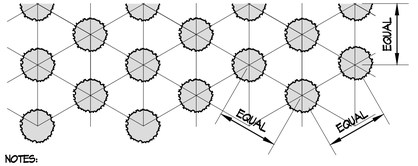
C B & B Shrub Planting Detail
Not To Scale — SECTION

PLANTING NOTES

1. ALL BOUNDARIES, EASEMENTS, UTILITIES AND LEGAL ENCUMBRANCES TO BE CONFIRMED WITH OWNER PRIOR TO BEGINNING WORK. PROPERTY LINES AND SURVEY INFORMATION PROVIDED BY PLS ENGINEERING.
2. IN NO WAY IS THIS PLAN TO BE INTERPRETED TO EXCEED THE LEGAL BOUNDARIES OF THE OWNER'S REAL PROPERTY.
3. THE LANDSCAPE DESIGNER ASSUMES NO RESPONSIBILITY FOR THE LOCATION OF BOUNDARIES, UTILITIES AND WETLANDS.
4. THIS PLAN SHALL BE INSTALLED TO MEET ALL APPLICABLE CITY, COUNTY, STATE AND FEDERAL CODES.
5. THIS PLAN SHALL BE CONSIDERED PRELIMINARY UNTIL APPROVED BY ALL GOVERNING AGENCIES. IMPLEMENTATION OF THIS PLAN SHALL NOT PROCEED UNTIL ISSUANCE OF ALL RELATED PERMITS.
6. PLANT QUANTITIES ARE FOR INFORMATION ONLY. IN CASE OF ANY DISCREPANCY, THE PLAN SHALL GOVERN.
7. ALL WORK IS TO BE PERFORMED BY LICENSED CONTRACTORS AND EXPERIENCED WORKERS.
8. THE CONTRACTOR IS TO VERIFY THE LOCATION OF EXISTING UNDERGROUND UTILITIES AND STRUCTURES PRIOR TO PERFORMING ANY EXCAVATION. CONTRACTOR SHALL REPAIR ANY DAMAGE TO UTILITIES CAUSED BY THE CONTRACTOR'S WORK, AT NO ADDITIONAL COST TO THE OWNER. CONTACT ALL UTILITY PROVIDERS SERVING THE SITE AREA 48 HOURS PRIOR TO ANY EXCAVATION.
9. ALL PLANT MATERIALS SHALL MATCH SPECIFICATIONS PER SPECIES AND SHALL COMPLY WITH ANSI Z60.1 'STANDARD FOR NURSERY STOCK'.
10. THE CONTRACTOR SHALL ADHERE TO THE WASHINGTON ASSOCIATION OF NURSERYMEN'S GUIDELINES FOR PLANTING PRACTICES.
11. THE CONTRACTOR SHALL REPAIR ANY DAMAGE TO EXISTING ELEMENTS ON AND OFF SITE, RESULTING FROM THE CONTRACTOR'S WORK.
12. THE CONTRACTOR IS RESPONSIBLE FOR THE VIABILITY OF ALL PLANT MATERIAL FOR 2 YEARS AFTER COMPLETION OF PLANTING. DISEASED, DYING, OR DEAD PLANT MATERIAL SHALL BE REPLACED BY THE CONTRACTOR DURING THE TWO YEAR PERIOD AND MAINTAINED FOR AN ADDITIONAL 2 YEAR PERIOD.
13. IMMEDIATELY UPON BID AWARD, CONTRACTOR SHALL SECURE THE PLANT MATERIALS AS SPECIFIED FROM AVAILABLE SOURCES. IN THE EVENT THAT PLANT MATERIALS ARE NOT AVAILABLE, CONTACT LANDSCAPE ARCHITECT FOR APPROVED SUBSTITUTIONS. NO SUBSTITUTION FOR PLANT MATERIAL WILL BE ALLOWED WITHOUT PRIOR WRITTEN APPROVAL OF THE LANDSCAPE ARCHITECT.
14. TOP DRESS ALL SHRUB AND GROUND COVER AREAS (NOT LAWN) WITH 3" OF FIR BARK MULCH. SUBMIT SAMPLE TO THE LANDSCAPE ARCHITECT FOR APPROVAL PRIOR TO CONSTRUCTION.
15. TREE LOCATIONS MAY BE ADJUSTED IN THE FIELD TO SUIT SITE REQUIREMENTS AS DIRECTED BY THE LANDSCAPE ARCHITECT.
16. THE CONTRACTOR SHALL ENSURE THAT ALL EXCAVATED PLANTING PITS HAVE POSITIVE DRAINAGE. PLANT PITS FULLY FLOODED WITH WATER SHALL DRAIN WITHIN (12) HOURS OF FILLING.
17. FINISH GRADE SHALL BE SET TO ALLOW POSITIVE DRAINAGE
18. ROTOTILL 2" OF COMPOST INTO ALL PLANTED AREAS.
19. INCORPORATE PEAT INTO THE ROOT ZONE OF RHODODENDRONS, AZALEAS AND OTHER ACID LOVING PLANTS.
20. INCORPORATE 10-20-20 FERTILIZER INTO THE ROOT ZONE OF ALL NEW PLANTINGS.
21. RONSTAR, OR APPROVED EQUAL, PREEMERGENT HERBICIDE TO BE APPLIED TO ALL PLANTED AREAS PER MANUFACTURERS INSTRUCTIONS.
22. EXISTING VEGETATION TO BE SPRAYED WITH ROUNDUP, OR APPROVED EQUAL, PER MANUFACTURERS INSTRUCTIONS. SUFFICIENT TIME SHALL BE GIVEN TO ALLOW EXISTING MATERIAL TO DIE. REMOVE EXISTING ZT. THE PROPERTY OWNER IS RESPONSIBLE FOR MAINTAINING TURF PLANTED WITHIN THE RIGHT OF WAY.
23. GROWN LAWN AREAS AND GRADE TO PROVIDE POSITIVE DRAINAGE.
24. ROLL LAWN AREA TO INSURE PROPER COMPACTION TO MINIMIZE SETTLING.
25. AMEND SOIL IN LAWN AREAS WITH 80 LBS. OF DOLOMITE LIME AND 40 LBS. OF 10-20-20 SLOW RELEASE FERTILIZER OR EQUIVALENT. PROVIDE A 3" LAYER OF SANDY LOAM TOPSOIL FOR LAWN AND BED AREA.
26. SEED LAWN AREAS WITH GRASS SEED MANUFACTURER'S RECOMMENDATIONS. COVER SEED WITH FINE MULCH APPLIED WITH ROLLER OR HYDROSEED.
27. THE PROPERTY OWNER IS RESPONSIBLE FOR MAINTAINING TURF PLANTED WITHIN THE RIGHT OF WAY.
28. PLANT MATERIAL SHALL BE PLANTED W/ ROOT CROWN 1" ABOVE FINISHED GRADE TO ALLOW POSITIVE DRAINAGE AWAY FROM CROWN.
29. STAKE ALL TREES OVER 6 FT. IN HEIGHT PER DETAILS ON THIS SHEET.
30. REFER TO DETAILS FOR ADDITIONAL INFORMATION.
31. ALL PLANTING SHALL BE IRRIGATED BY AN AUTOMATIC UNDERGROUND SPRINKLER SYSTEM.
32. ALL PLANT MATERIALS FURNISHED ARE TO BE HEALTHY, UNIFORMLY BRANCHED AND WITH WELL DEVELOPED FIBROUS ROOT SYSTEMS.
33. ALL PLANT MATERIALS FURNISHED ARE TO BE FREE FROM DEAD OR BROKEN BRANCHES, LICHENS, SCARS, BROKEN BARK OR WOUNDS. ALL PLANT MATERIALS WILL BE INSECT, WEED, AND DISEASE FREE ACCORDING TO THE REQUIREMENTS OF THE WASHINGTON STATE DEPARTMENT OF AGRICULTURE FOR NURSERY PLANT MATERIALS SOLD FOR WHOLESALE OR RETAIL. ALL PRUNING WOUNDS MUST BE WELL HEALED WITH NO EVIDENCE OF DECAY.
34. FIELD CONFIRM ALL SITE CONDITIONS, AREAS AND SIZES PRIOR TO BIDDING & CONSTRUCTION. DO NOT SCALE FROM PLANS.

IRRIGATION NOTE

ALL LANDSCAPE AREAS SHALL BE IRRIGATED WITH AN AUTOMATIC DRIP AND/OR SPRAY IRRIGATION SYSTEM. REFER TO CIVIL ENGINEERING PLANS FOR WATER SOURCE.



NOTES:

ALL GROUND COVER SHALL BE PLANTED AT EQUAL TRIANGULAR SPACING AS SPECIFIED IN PLANTING LEGEND.

GROUND COVER TO BE LOCATED ONE HALF OF SPECIFIED SPACING DISTANCE FROM ANY HARD SURFACE, UNLESS OTHERWISE SPECIFIED.

D Ground Cover Planting Detail
Not To Scale — PLAN VIEW

REQUIRED TREE DENSITY

SITE AREA	REQUIRED TREE UNITS / ACRE DISTURBED	TOTAL REQUIRED TREE UNITS
2.84± AC	20	177

TREE DENSITY SUMMARY

EXISTING TREE UNITS RETAINED	26
TREE UNITS PROPOSED TO PLANT	151
TREE UNITS PROVIDED	177

Planning Solutions, Inc.
Creating Solutions to Complex Issues
4400 NE 77th Avenue
Suite 275
VANCOUVER, WA 98662
VOICE: 360-750-9000 FAX: 360-713-6102
www.planningsolutionsinc.com

PRELIMINARY NOT FOR CONSTRUCTION SUBJECT TO APPROVAL

STATE OF WASHINGTON — CHRISTOPHER A. BAUMAN — REGISTERED LANDSCAPE ARCHITECT — EXP. 10-20-2023

MONTE VERDE SUBDIVISION

22205 NE 28TH Street
Camas, Washington

DRAWN: VH | CHECKED: CB
SCALE: 1" = 50'-0" | DATE: 07.29.22
JOB #: 22-1719
ISSUED FOR: PLR
REVISIONS:
1 Counter Complete 09-13-22
2 Native Plants 10-13-22
3
4
5
6

SHEET NAME: **PRELIMINARY LANDSCAPE PLAN**

SHEET #: L1
SHEET 2 OF 2

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D:\OneDrive\Planning Solutions Inc\Projects - Documents\2022 Projects\1719-Monte Verde Subdivision\2.0 LU\2.2.03 PLR (Current)\03 R2L_1719 PLR SUB R2.dwg, 10/13/2022 6:44:31 PM

COMMUNITY DEVELOPMENT DEPARTMENT
616 NE 4th Avenue
Camas, WA 98607
www.cityofcamas.us

November 7, 2022

Pacific Lifestyle Homes
Attn: Ryan Stygar
Sent via email: ryans@buildplh.com

RE: Technically Complete Letter for Planning Case SUB22-05: Monte Verde Subdivision

Dear Mr. Stygar,

The purpose of this letter is to inform you that the above application submitted on August 11, 2022, and resubmitted on October 21, 2022, has been deemed technically complete in accordance with Camas Municipal Code (CMC) Section 18.55.130.

Below are other preliminary project issues noted by staff, which are to be addressed, but are not completeness review items:

1. Stormwater treatment and detention structures are to be owned and maintained by the HOAs. Therefore, these structures are not to be located within city right-of-way.
2. The preliminary utility plans, sheets 4 and 5, are to be revised with the stormwater infiltration trenches and stormwater treatment manholes, located outside of the right-of-way.

Staff will begin reviewing the application and will contact you if there are any questions or comments. If you have any questions, please feel free to contact me by email: YSennewald@cityofcamas.us or by phone: (360) 817-7269.

Respectfully,

Yvette Sennewald, Senior Planner

In re: Monte Verde Subdivision

) NO. SEPA22-17
)
) AFFIDAVIT OF MAILING
)
)
)
)
)
Respondent.)

STATE OF WASHINGTON)
) ss.
CLARK COUNTY)

I, Carey Certo, on oath says:

I, Carey Certo, on December 14, 2022, I directed a true and correct copy of the SEPA Determination of Non-Significance, to be served upon the parties herein, in the above-entitled action, by depositing with the U.S. Post Office, Camas, Washington, a postage-prepaid envelope containing same addressed as follows: See attached list.

Carey Certo
SIGNATURE

SUBSCRIBED and SWORN to before me this 15th day of December, 2022.

AIREANNA BALDWIN NOTARY PUBLIC STATE OF WASHINGTON My Comm. Expires October 01, 2024 No. 183848

Aireanna Baldwin
Notary Public in and for the State of Washington, residing at Clark County
My appointment expires: 10/1/2024

CLARK COUNTY PARKS
4700 NE 78TH ST
VANCOUVER, WA 98665

CARRILLO MARIBEL & SANCHEZ TIMOTEO
22401 NE 28TH ST
CAMAS, WA 98607

YOUNG-PALMER NICKI L & PALMER GREGORY A
512 NE 81ST ST STE F
VANCOUVER , WA 98665

EMMERT FAMILY III LLC
10470 SE HILLCREST DR
HAPPY VALLEY, OR 97086

CLARK COUNTY PARKS
4700 NE 78TH ST
VANCOUVER, WA 98665

JOHNSON GLEN C & JOHNSON THERESA M
22307 NE 28TH ST
CAMAS, WA 98607

SOUTHERN DWIGHT A ETAL
22205 NE 28TH ST
CAMAS, WA 98607

HOLLINGSWORTH JAMES MICHAEL JR & HOLLINGSWORTH ROBIN RAYNA
22421 NE 28TH ST
CAMAS, WA 98607

MIDDAGH LINDA
22015 NE 28TH STREET
CAMAS, WA 98607

MERRITT ROCQUE & MERRITT SUE
3602 NE 222ND AVE
CAMAS, WA 98607

MERRITT GWENNA E
3602 NE 222ND AVE
CAMAS, WA 98607

EMMERT TERRY W
11811 SE HWY 212
CLACKAMAS, OR 97015

MITTELSTAEDT PAUL E JR & MITTELSTAEDT ELIZABETH
6202 N 86TH AVE
CAMAS, WA 98607

KUMMERMAN MICHAEL J & KUMMERMAN PAULINE VERONICA
6150 N 86TH AVE
CAMAS, WA 98607

RUTTER TROY EUGENE & RUTTER STEPHANIE DENISE
6138 N 86TH AVE
CAMAS, WA 98607

HOANG ALEXANDER TUNG & HIROMOTO KELBY AKEMI
6124 N 86TH AVE
CAMAS, WA 98607

DAHAL BIDHYA GURUNG & DAHAL LAXMI RAMAN
8602 N WRIGHT ST
CAMAS, WA 98607

BARROW ANSON DAVID & BARROW LAUNIE RAE
4331 SE 179TH CT
VANCOUVER, WA 98683

AXMAKER ANDREW & AXMAKER HOLLY
8616 N WRIGHT ST
CAMAS, WA 98607

RILER DANIEL JOSEPH & RILER MELINDA CATHERINE
8624 N WRIGHT ST
CAMAS, WA 98607

DOAN KHOA DANG & SAING STEPHANY SANPHILAY
8638 N WRIGHT ST
CAMAS, WA 98607

XU JIAN & LIANG YUEHAI TRUSTEES
12462 NW WAKER DR
PORTLAND, OR 97229

GREEN MOUNTAIN PH2 SOUTH HOA
11807 NE 99TH ST STE 1170
VANCOUVER, WA 98682

GREEN MOUNTAIN PH2 SOUTH HOA
11807 NE 99TH ST STE 1170
VANCOUVER, WA 98682

WALKER PHERNELL CLARENCE II
5968 N 86TH AVE
CAMAS, WA 98607

DOYLE KYLE JAMES & MCCALL BRITTANY DAWN
20281 BEECHWOOD TERRACE UNIT 301
ASHBURN, VA 20147

SONG JIE & ZHU HAIQING
5944 N 86TH ST
CAMAS, WA 98607

BRILEY DUANE A & BRILEY NORLEEN
5932 N 86TH AVE
CAMAS, WA 98607

GREEN ERICA M & NUSSER RYAN A
8545 N JUNIPER ST
CAMAS, WA 98607

WALKER CANDICE R
8533 N JUNIPER ST
CAMAS, WA 98607

BULLIS KENNETH R & BULLINGER EILEEN P
5920 N 86TH ST
CAMAS, WA 98607

PHILLIPS WILLIAM CHRISTOPHER & PHILLIPS KATRINA MARIE
8556 N HARGRAVE ST
CAMAS, WA 98607

GOTTSCHALK DREW H & GOTTSCHALK CASEY L
8544 N HARGRAVE ST
CAMAS, WA 98607

MOY JOHN C JR
8538 N HARGRAVE ST
CAMAS, WA 98607

BOUCHER RICHARD D & BOUCHER KAREN M
8522 N HARGRAVE ST
CAMAS, WA 98607

BAKKER JOEL
8510 N HARGRAVE ST
CAMAS, WA 98607

GME DEVELOPMENT LLC
1300 ESTHER ST STE 200
VANCOUVER, WA 98660

GME DEVELOPMENT LLC
1300 ESTHER ST STE 200
VANCOUVER, WA 98660

GREEN MOUNTAIN ESTATES HOA
604 EVERGREEN BLVD
VANCOUVER, WA 98660

GREEN MOUNTAIN ESTATES HOA
604 EVERGREEN BLVD
VANCOUVER, WA 98660

State Environmental Policy Act
Determination of Non-Significance

CASE NO: SEPA22-17 Monte Verde Subdivision

APPLICANT: Ryan Stygar
Pacific Lifestyle Homes
11815 NE 99th Street, Suite 1200
Vancouver, WA 98682

REQUEST: The applicant is proposing to subdivide approximately 8.6 acres into 34 single-family residential lots.

LOCATION: 22205 NE 28TH STREET, CAMAS, WA 98607
PARCEL NUMBER 173184000

LEGAL DESCRIPTION: THE PROJECT IS LOCATED IN THE CITY OF CAMAS IN THE SE & SW ¼ OF SECTION 21, TOWNSHIP 2 NORTH, RANGE 3 EAST OF THE WILLAMETTE MERIDIAN

SEPA DETERMINATION: DETERMINATION OF NON-SIGNIFICANCE (DNS)

COMMENT DEADLINE: **DECEMBER 29, 2022, AT 5:00 P.M.**

As lead agency under the State Environmental Policy Act (SEPA) Rules [Chapter 197-11, Washington Administrative Code (WAC)], the City of Camas must determine if there are possible significant adverse environmental impacts associated with this proposal. The options include the following:

- DS = Determination of Significance (The impacts cannot be mitigated through conditions of approval and, therefore, requiring the preparation of an Environmental Impact Statement (EIS).
- MDNS = Mitigated Determination of Non-Significance (The impacts can be addressed through conditions of approval), or;
- DNS = Determination of Non-Significance (The impacts can be addressed by applying the Camas Municipal Code).

Published in the Post Record on December 15, 2022 Legal Publication #762860
Posted on bulletin boards at Camas City Hall, Camas Library, and the City of Camas website at: http://www.cityofcamas.us
Mailed to property owners within 300-feet on December 14, 2022

Determination:

Determination of Non-Significance (DNS). The City of Camas, as lead agency for review of this proposal, has determined that this proposal does not have a probable significant adverse impact on the environment. An Environmental Impact Statement (EIS) is not required under RCW 43.21C.030(2)(e). This decision was made after review of a completed environmental checklist, and other information on file with the City of Camas.

Date of Publication & Comment Period:

Publication date of this DNS is **December 15, 2022**, and is issued under WAC 197-11-340. The lead agency will not act on this proposal until the close of the 14-day comment period which ends on **December 29, 2022**. Comments may be sent by email to communitydevelopment@cityofcamas.us or regular mail to:

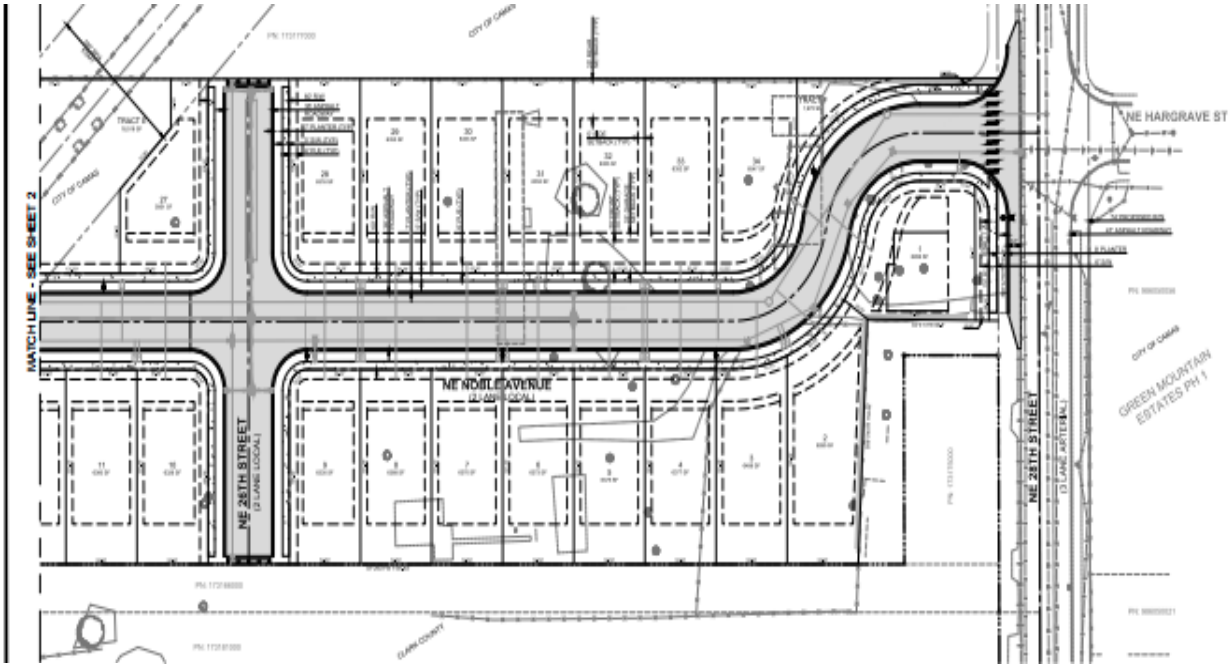
City of Camas SEPA Official
Community Development Department
616 NE Fourth Avenue
Camas, Washington 98607

Responsible Official: Robert Maul (360) 817-1568

Robert Maul, Planning Manager and Responsible Official

December 15, 2022
Date of publication

N 86th Ave
N 86th Ave N 86th Cir
NE 28th St
NE Hargrave St
Subject Site
NE Goodwin Rd
NE Goodwin Rd


MATCH LINE - SEE SHEET 2
NE HARGRAVE ST
NE NOBLE AVENUE
NE 28TH STREET
NE 28TH STREET
GREEN MOUNTAIN ESTATES PH 1
CLARK COUNTY

N

COMMUNITY DEVELOPMENT DEPARTMENT
616 NE 4th Avenue
Camas, WA 98607
www.cityofcamas.us

Date Published: December 15, 2022

To Whom It May Concern:

Please find enclosed a Determination of Non-Significance (DNS) for the **Monte Verde Subdivision (SEPA22-17)** that was issued pursuant to the State Environmental Policy Act (SEPA) Rules, Chapter 197-11, Washington Administrative Code. The enclosed review comments reflect evaluation of the environmental checklist by the lead agency as required by WAC 197-11-330(1)(a)(i).

The following materials were submitted with the initial application:

- List of Permit Approvals
- Application form and fees
- Pre-App Notes
- Narrative
- Public Health Review Letter
- SEPA Checklist
- Geotechnical Report
- Preliminary Stormwater Report
- Traffic Study
- Archeological Predetermination
- DAHP Confirmation
- Critical Areas Report
- Mailing Labels
- Engineers Cost Estimate
- Title Report
- Preliminary Plans

All application materials are available for review upon request from the Community Development Department. *Archaeological information is exempt from public disclosure, consistent with RCW 42.56.300.

Written comments may be submitted on this determination within fourteen (14) days of its issuance, after which the DNS will be reconsidered in light of the comments received.

Please address all correspondence to:
City of Camas, SEPA Official
Community Development Department
616 NE Fourth Avenue
Camas, Washington 98607
communitydevelopment@cityofcamas.us

Distribution:

Applicant
Bureau of Indian Affairs
C-Tran
Camas School District
Camas Building Official, Bob Cunningham
Camas Communications Director, Bryan Rachal
Camas Community Development Director, Phil Bourquin
Camas Engineering Department Managers and Staff
Camas Fire Department, Randy Miller
Camas Finance Director, Cathy Huber Nickerson
Camas Interim Mayor and City Council Members
Camas Parks and Recreation, Trang Lam
Camas Planning Manager and Staff
Camas Police Chief, Mitch Lackey
Camas Public Works Director, Steve Wall
Camas Public Library, Connie Urquhart
Camas-Washougal Post Record
Chinook Indian Nation
Cultural Resource Program, Cowlitz Indian Tribe
Cultural Resource Program, Yakama Indian Nation
Clark County Department of Environmental Services
Clark County Department of Transportation
Clark County Natural Resources Council
Clark Public Utilities
Department of Ecology
Department of Fish and Wildlife, Region 5
Department of Natural Resources, SEPA Center
Southwest Clean Air Agency
US Army Corps of Engineers
Vancouver- Clark Parks & Recreation
Washington Office of Archaeology & Historic Preservation
Washington State Department of Transportation
Washington State Parks and Recreation Commission, Environmental Program
Property Owners within 300 feet *(mailed the SEPA Determination & map)*

State Environmental Policy Act
Determination of Non-Significance

CASE NO: SEPA22-17 Monte Verde Subdivision

APPLICANT: Ryan Stygar
Pacific Lifestyle Homes
11815 NE 99th Street, Suite 1200
Vancouver, WA 98682

REQUEST: The applicant is proposing to subdivide approximately 8.6 acres into 34 single-family residential lots.

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SEPA DETERMINATION: DETERMINATION OF NON-SIGNIFICANCE (DNS)

COMMENT DEADLINE: **DECEMBER 29, 2022, AT 5:00 P.M.**

As lead agency under the State Environmental Policy Act (SEPA) Rules [Chapter 197-11, Washington Administrative Code (WAC)], the City of Camas must determine if there are possible significant adverse environmental impacts associated with this proposal. The options include the following:

- DS = Determination of Significance (The impacts cannot be mitigated through conditions of approval and, therefore, requiring the preparation of an Environmental Impact Statement (EIS).
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Published in the Post Record on December 15, 2022 Legal Publication #762860
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Determination:

Determination of Non-Significance (DNS). The City of Camas, as lead agency for review of this proposal, has determined that this proposal does not have a probable significant adverse impact on the environment. An Environmental Impact Statement (EIS) is not required under RCW 43.21C.030(2)(e). This decision was made after review of a completed environmental checklist, and other information on file with the City of Camas.

Date of Publication & Comment Period:

Publication date of this DNS is **December 15, 2022**, and is issued under WAC 197-11-340. The lead agency will not act on this proposal until the close of the 14-day comment period which ends on **December 29, 2022**. Comments may be sent by email to communitydevelopment@cityofcamas.us or regular mail to:

City of Camas SEPA Official
Community Development Department
616 NE Fourth Avenue
Camas, Washington 98607

Responsible Official: Robert Maul (360) 817-1568

Robert Maul, Planning Manager and Responsible Official

December 15, 2022
Date of publication

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N 86th Ave N 86th Cir
NE 28th St
NE Hargrave St
Subject Site
NE Goodwin Rd
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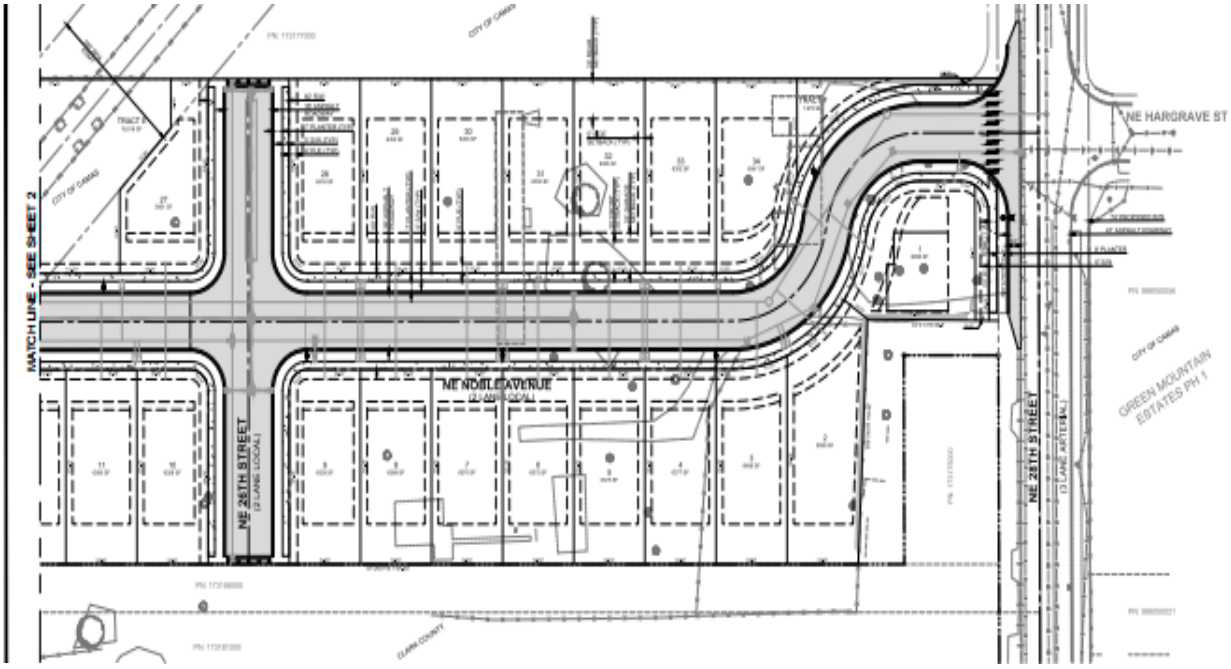
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GREEN MOUNTAIN ESTATES PH 1
CLARK COUNTY

N

Community Development
616 NE Fourth Avenue • Camas, WA 98607
(360) 817-1568
http://www.cityofcamas.us

SEPA ENVIRONMENTAL CHECKLIST

UPDATED 2016

Purpose of checklist:

Governmental agencies use this checklist to help determine whether the environmental impacts of your proposal are significant. This information is also helpful to determine if available avoidance, minimization or compensatory mitigation measures will address the probable significant impacts or if an environmental impact statement will be prepared to further analyze the proposal.

***Instructions for applicants*:**

This environmental checklist asks you to describe some basic information about your proposal. Please answer each question accurately and carefully, to the best of your knowledge. You may need to consult with an agency specialist or private consultant for some questions. You may use "not applicable" or "does not apply" only when you can explain why it does not apply and not when the answer is unknown. You may also attach or incorporate by reference additional studies reports. Complete and accurate answers to these questions often avoid delays with the SEPA process as well as later in the decision-making process.

The checklist questions apply to all parts of your proposal, even if you plan to do them over a period of time or on different parcels of land. Attach any additional information that will help describe your proposal or its environmental effects. The agency to which you submit this checklist may ask you to explain your answers or provide additional information reasonably related to determining if there may be significant adverse impact.

Instructions for Lead Agencies:

Please adjust the format of this template as needed. Additional information may be necessary to evaluate the existing environment, all interrelated aspects of the proposal and an analysis of adverse impacts. The checklist is considered the first but not necessarily the only source of information needed to make an adequate threshold determination. Once a threshold determination is made, the lead agency is responsible for the completeness and accuracy of the checklist and other supporting documents.

Use of checklist for nonproject proposals: [help]

For nonproject proposals (such as ordinances, regulations, plans and programs), complete the applicable parts of sections A and B plus the SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS (part D). Please completely answer all questions that apply and note that the words "project," "applicant," and "property or site" should be read as "proposal," "proponent," and "affected geographic area," respectively. The lead agency may exclude (for non-projects) questions in Part B - Environmental Elements –that do not contribute meaningfully to the analysis of the proposal.

A. Background [help]

1. Name of proposed project, if applicable: [help]

Monte Verde Subdivision

2. Name of applicant: [help]

Pacific Lifestyle Homes - Ryan Stygar

3. Address and phone number of applicant and contact person: [help]

11815 NE 99th Street Suite 1200 Vancouver, WA 98682 360-304-9901

4. Date checklist prepared: [help]

July 2022

5. Agency requesting checklist: [help]

City of Camas

6. Proposed timing or schedule (including phasing, if applicable): [help]

Development is expected to start at the time of final construction drawing approval in early 2023, no phasing is proposed.

7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain. [help]

No, not at this time.

8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal. [help]

SEPA Checklist, Archaeological Predetermination, Geotechnical Report, Critical areas report and Mitigation plan

9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain. [help]

No

10. List any government approvals or permits that will be needed for your proposal, if known.

- *Preliminary Type III Subdivision Review*
- *Public notification and staff report publications*
- *Hearing Examiner's Decision*
- *Final engineering plan review and approval*
- *Final Plat Approval*
- *SEPA*
- *SWPPP – Stormwater Pollution Prevention Plan*

11. Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.) [help]

The applicant proposes a 34 lot single family residential subdivision in the R-7.5 zone. A public road will be constructed that will connect into NE 28th Street and end in a cul-de-sac at the south end of the site.

12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist. [help]

The site is located at 22205 NE 28th Street, Camas, WA 98607, in the SE ¼ of SW 1/4 of Section 21, Township 2 North, Range 3 East of the Willamette Meridian. Parcel 173184-000. See the proposed development plans for a preliminary plat, grading plan, vicinity map and topographical data.

B. ENVIRONMENTAL ELEMENTS [help]

1. Earth [help]

a. General description of the site: [help]

(circle one): Flat, (rolling), hilly, steep slopes, mountainous, other _____

b. What is the steepest slope on the site (approximate percent slope)?

13%

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any agricultural land of long-term commercial significance and whether the proposal results in removing any of these soils. [help]

This site consists of Lauren Loam and Lauren Gravelly Loam. It is unknown if these soils are classified as agricultural or if the site contains prime farmland.

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe. [help]

There are no known surface indications or history of unstable soils in the immediate area.

e. Describe the purpose, type, total area, and approximate quantities and total affected area of any filling, excavation, and grading proposed. Indicate source of fill. [help]

There will be grading for the construction of a public roads, private roads, driveways, the installation of utilities, and the preparation of the site for single family residential housing.

Surplus material may be required to be hauled from the site to an approved dump site or offsite fill may be required. Quantities and source are unknown at this time.

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe. [help]

Standard erosion control measures will be followed during grading construction on the site. A final erosion control plan will be reviewed and approved by City of Camas.

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)? [help]

Approximately 50%

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any: [help]

Proposed measures to reduce and control erosion include providing an erosion control plan for review and approval prior to starting construction on the site and following the conditions of the approved grading and erosion control plan during all phases of construction.

2. Air [help]

a. What types of emissions to the air would result from the proposal during construction, operation, and maintenance when the project is completed? If any, generally describe and give approximate quantities if known. [help]

Construction equipment emissions and dust on the short term. Long-term emissions will be produced by automobile traffic and normal household activities, possibly including wood burning stoves and fireplaces.

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe. [help]

There are no known off-site sources of emissions or odor that may affect the proposal.

c. Proposed measures to reduce or control emissions or other impacts to air, if any: [help]

Dust from construction can be mitigated by sprinkling the site with water during construction as needed.

3. Water [help]

a. Surface Water:

1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into. [help]

Per the Critical Areas Report for the site, "A wetland was mapped within the southwest corner of the parcel by the Clark County GIS MapsOnline software under the "potential wetland presence" layer. The National Wetland Inventory also maps a PFOA wetland within the same general location…Site reconnaissance by AshEco Solutions (AES) identified that the mapped wetland was actually located over 300-feet south of the subject parcel. No

wetlands were identified within the subject parcel by AES."

2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans. [help]

No, there is no work that will take place within 200' of any water bodies.

3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material. [help]

Not applicable – there are no wetlands onsite.

4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known. [help]

The proposal will not require surface water withdrawals or diversions.

5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan. [help]

No, the site does not lie within a 100-year floodplain.

6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge. [help]

No, there will be no discharge of waste material to surface waters.

b. Ground Water:

1) Will groundwater be withdrawn from a well for drinking water or other purposes? If so, give a general description of the well, proposed uses and approximate quantities withdrawn from the well. Will water be discharged to groundwater? Give general description, purpose, and approximate quantities if known. [help]

No ground water will be withdrawn with this proposal. A stormwater infiltration trench is proposed with the site development that will discharge stormwater into the ground. Stormwater from pollution generating surfaces will be treated prior to being routed to the infiltration trench.

2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals. . . ; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve. [help]

No waste material is proposed to be discharged into the ground.

c. Water runoff (including stormwater):

1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe. [help]

The main source of runoff is from stormwater. There will runoff from impervious roof area,

driveways, roadways, and landscaped areas. Street catch basins, yard drains, and roof drains will connect to a pipe network that leads to an infiltration trench or a detention pond.

2) Could waste materials enter ground or surface waters? If so, generally describe. [help]

Yes, if waste materials were somehow released or dumped into surface runoff flows, substances associated with the source material could enter ground or other surface waters. There is no proposal to release waste material to the ground or to surface waters.

3) Does the proposal alter or otherwise affect drainage patterns in the vicinity of the site? If so, describe. [help]

Not anticipated.

d. Proposed measures to reduce or control surface, ground, and runoff water, and drainage pattern impacts, if any: [help]

Use of approved erosion control measures during all phases of development.

4. Plants [help]

a. Check the types of vegetation found on the site: [help]

x deciduous tree: alder, **maple**, aspen, **other: Oregon white oak, ash, cottonwood, cherry**
x evergreen tree: **fir**, cedar, pine, other
x shrubs
____ grass
x pasture
____ crop or grain
____ Orchards, vineyards or other permanent crops.
____ wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other
____ water plants: water lily, eelgrass, milfoil, other
x other types of vegetation: **blackberry**

b. What kind and amount of vegetation will be removed or altered? [help]

Much of the site vegetation will be stripped for site preparation. Trees along the property line are proposed to be retained.

c. List threatened and endangered species known to be on or near the site. [help]

There are 6 priority habitat Oregon white oaks onsite or immediately off-site.

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any: [help]

Street trees and landscaping will be provided throughout the park and open space areas. 3 Oregon white oaks will be preserved while 3 will be removed and mitigated at a 2:1 ratio.

e. List all noxious weeds and invasive species known to be on or near the site. [help]

None known.

5. Animals [help]

a. List any birds and other animals which have been observed on or near the site or are known to be on or near the site. [help]

Examples include:
birds: hawk, heron, eagle, **songbirds, other:** mammals: deer, bear, elk, beaver, other:
fish: bass, salmon, trout, herring, shellfish, other _____

Small mammals, such as mice, voles, and rabbits are located on and near the site. This site is also in an area where larger mammals, such as raccoons, opossum, and mammals indigenous to the Clark County area are sometimes located.

b. List any threatened and endangered species known to be on or near the site. [help]

There are no known threatened or endangered species on or near the site.

c. Is the site part of a migration route? If so, explain. help]

This site is part of the Pacific Flyway for migratory waterfowl.

d. Proposed measures to preserve or enhance wildlife, if any: [help]

The future homes will likely be landscaped with grass lawns and appealing native shrubs and trees.

e. List any invasive animal species known to be on or near the site. [help]

None known

6. Energy and Natural Resources [help]

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc. [help]

The new homes on the site will be served primarily by electricity and natural gas. Wood stoves might be used for heating. Other forms of energy will depend on homeowners.

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe. [help]

No.

c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any: [help]

The new homes will have energy efficient windows and comply with the state building codes which includes conservation measures.

7. Environmental Health [help]

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal? If so, describe. [help]

There are no known environmental health hazards that could occur as a result of this proposal.

1) Describe any known or possible contamination at the site from present or past uses. [help]

Utilizing the "What's in My Neighborhood" section of DOE's database shows that there are no cleanup sites or known hazards within 0.5 miles of the site.

2) Describe existing hazardous chemicals/conditions that might affect project development and design. This includes underground hazardous liquid and gas transmission pipelines located within the project area and in the vicinity. [help]

None known

3) Describe any toxic or hazardous chemicals that might be stored, used, or produced during the project's development or construction, or at any time during the operating life of the project. [help]

None known

4) Describe special emergency services that might be required. [help]

No special emergency services outside those normally expected in a residential area are anticipated to be required in association with this proposal.

5) Proposed measures to reduce or control environmental health hazards, if any: [help]

None

b. Noise [help]

1) What types of noise exist in the area which may affect your project (for example:traffic, equipment, operation, other)? [help]

Light traffic noise from surrounding areas/roads along with typical home use noises. None of these will affect the proposal.

2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indi- cate what hours noise would come from the site. [help]

Short term noises would include construction noises which would occur during approved hours as mandated by City of Camas and Washington State. Long term noises could include slight increase in traffic noise and normal household noises.

3) Proposed measures to reduce or control noise impacts, if any: [help]

Construction on the site will take place during normal working hours as allowed by the City.

8. Land and Shoreline Use [help]

a. What is the current use of the site and adjacent properties? Will the proposal affect current land uses on nearby or adjacent properties? If so, describe. [help]

The proposed site has an existing single-family residence and two outbuildings. To the south is land owned by Clark Coutny, to the east and the west of the site are single family homes on larger lots. To the north is a developed residential subdivision.

b. Has the project site been used as working farmlands or working forest lands? If so, describe. How much agricultural or forest land of long-term commercial significance will be converted to other uses as a result of the proposal, if any? If resource lands have not been designated, how many acres in farmland or forest land tax status will be converted to nonfarm or nonforest use? [help]

The Critical Areas Report for the site states that the site has been used for agricultural purposes since at least the 1970's and has a history of horse grazing.

1) Will the proposal affect or be affected by surrounding working farm or forest land normal business operations, such as oversize equipment access, the application of pesticides, tilling, and harvesting? If so, how: [help]

No, the proposal will not be affected by, nor will it affect, any surrounding working farm or forest land business.

c. Describe any structures on the site. [help]

Single family residences and two outbuildings.

d. Will any structures be demolished? If so, what? [help]

All structures will be demolished.

e. What is the current zoning classification of the site? [help]

R7.5 – Residential

f. What is the current comprehensive plan designation of the site? [help]

SFM

g. If applicable, what is the current shoreline master program designation of the site? [help]

The site does not lie within the shoreline master program

h. Has any part of the site been classified as a critical area by the city or county? If so, specify. [help]

There are Oregon white oaks on site.

i. Approximately how many people would reside or work in the completed project? [help]

It is currently planned that this development will contain 34 lots/homes. At 2.8 people per household, there would be a total of approximately 95 people residing within this development at the time of full buildout.

j. Approximately how many people would the completed project displace? [help]

The removal of one single-family residence has the potential to displace up to 3 people.

k. Proposed measures to avoid or reduce displacement impacts, if any: [help]

The proposal will provide 34 new homes to offset displacement.

L. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any: [help]

By complying with the zoning designation, the comprehensive plan, and the City of Camas Development Code, the proposal will be compatible with the existing and projected land uses.

m. Proposed measures to reduce or control impacts to agricultural and forest lands of long-term commercial significance, if any: [help]

None proposed

9. Housing [help]

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing. [help]

34 new homes, the type of housing is unknown.

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing. [help]

One existing residence will be eliminated. The income level housing type is unknown.

c. Proposed measures to reduce or control housing impacts, if any: [help]

The applicant will pay all impact fees associated with the development at the time of building permit.

10. Aesthetics [help]

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed? [help]

All new home construction will meet City of Camas building codes for residential housing development and not exceed height limits of 35'. Exterior building materials are unknown.

b. What views in the immediate vicinity would be altered or obstructed? [help]

The site will change from a large-lot single family residence to a development with 34 single family homes.

c. Proposed measures to reduce or control aesthetic impacts, if any: [help]

The single-family homes will be landscaped with grass lawns and other appealing landscaping. The main roadway frontage will be landscaped with trees per the City of Camas roadway standards.

11. Light and Glare [help]

a. What type of light or glare will the proposal produce? What time of day would it mainly occur? [help]

When homes are constructed on the proposed lots, there will most likely be light produced from houses, yards, and street lights during evenings and early mornings.

b. Could light or glare from the finished project be a safety hazard or interfere with views? [help]

No, light or glare from the finished project will not be a safety hazard or interfere with views.

c. What existing off-site sources of light or glare may affect your proposal? [help]

There are existing off-site sources of light from adjacent homes and roads, but they will not affect the proposal.

d. Proposed measures to reduce or control light and glare impacts, if any: [help]

Shielding of porch lights and streetlights will reduce light and glare impacts offsite.

12. Recreation [help]

a. What designated and informal recreational opportunities are in the immediate vicinity? [help]

Camp Currie park is adjacent to the south, Lacamas Heritage Trail and Lacamas Creek are to the southwest.

b. Would the proposed project displace any existing recreational uses? If so, describe. [help]

There will be no recreational uses displaced with this proposal.

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any: [help]

The applicant proposes to pay all park impact fees associated with building permits. A 0.5-acre park area is proposed with this development that will provide recreation opportunities onsite.

13. Historic and cultural preservation [help]

a. Are there any buildings, structures, or sites, located on or near the site that are over 45 years old listed

in or eligible for listing in national, state, or local preservation registers ? If so, specifically describe. [help]

The existing single family home is older than 45 years old, but it is unlikely that it would be eligible for national, state, or local preservation registers per the predetermination report.

b. Are there any landmarks, features, or other evidence of Indian or historic use or occupation? This may include human burials or old cemeteries. Are there any material evidence, artifacts, or areas of cultural importance on or near the site? Please list any professional studies conducted at the site to identify such resources. [help]

There are no known landmarks or evidence of historic, archaeological, scientific, or cultural importance known to be on or next to the site. An Archaeological Predetermination Survey was performed by Archaeological Services, LLC for onsite work. The onsite study found no cultural materials.

c. Describe the methods used to assess the potential impacts to cultural and historic resources on or near the project site. Examples include consultation with tribes and the department of archeology and historic preservation, archaeological surveys, historic maps, GIS data, etc. [help]

The report utilized surface surveys and excavation of test pits, as well as reviewing historical maps and records on file at the Washington State Department of Archaeology and Historic Preservation.

d. Proposed measures to avoid, minimize, or compensate for loss, changes to, and disturbance to resources. Please include plans for the above and any permits that may be required. [help]

Based on the findings of the Archaeological Predetermination, no further archaeological work is needed. If during the course of construction any artifacts are discovered, all work will cease, and proper notification shall be given to City of Camas and DAHP.

14. Transportation [help]

a. Identify public streets and highways serving the site or affected geographic area and describe proposed access to the existing street system. Show on site plans, if any. [help]

Access to the site will be from NE 28th Street abutting the north side of the site. New residential roads will be constructed to serve the development. Proposed street layouts are shown on the preliminary plat.

b. Is the site or affected geographic area currently served by public transit? If so, generally describe. If not, what is the approximate distance to the nearest transit stop? [help]

C-tran does not operate in close proximity to the site. The nearest stop is the Fishers Landing Transit Center approximately 6 miles to the southwest.

c. How many additional parking spaces would the completed project or non-project proposal have? How many would the project or proposal eliminate? [help]

Approximately 2-4 parking spaces per single-family home are proposed. This project will eliminate approximately 4 parking spaces with the removal of the existing home. Street parking will be allowed on both sides of the proposed residential roadway.

d. Will the proposal require any new or improvements to existing roads, streets, pedestrian, bicycle or state transportation facilities, not including driveways? If so, generally describe (indicate whether public or private). [help]

Frontage improvements are proposed to bring NE 28th Street up to half-width roadway standards. The construction of this project also proposes to construct NW Noble Avenue as a public roadway that runs north/south terminating in a cul-de-sac and NE 26th Street as a public roadway that runs east/west.

e. Will the project or proposal use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe. [help].

No

f. How many vehicular trips per day would be generated by the completed project or proposal? If known, indicate when peak volumes would occur and what percentage of the volume would be trucks (such as commercial and nonpassenger vehicles). What data or transportation models were used to make these estimates? [help]

It is anticipated that 310 trips per day would be generated by the project. It is expected that 23 trips will occur in the AM peak hour (7:00 – 9:00 AM) and 31 trips will occur in the PM peak hour (4:00 – 6:00).

g. Will the proposal interfere with, affect or be affected by the movement of agricultural and forest products on roads or streets in the area? If so, generally describe. [help]

Not anticipated

h. Proposed measures to reduce or control transportation impacts, if any: [help]

The applicant will pay transportation impact fees.

15. Public Services [help]

a. Would the project result in an increased need for public services (for example: fire protection, police protection, public transit, health care, schools, other)? If so, generally describe. [help]

Yes. The completion of this development and the construction of new homes will increase the need for public services in the area.

b. Proposed measures to reduce or control direct impacts on public services, if any. [help]

This project will pay impact fees for schools, traffic, and parks at the time of building permit.

16. Utilities [help]

a. Circle utilities currently available at the site: [help]
electricity, natural gas, water, refuse service, telephone, sanitary sewer

b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed. [help]

- *Electricity: Clark Public Utilities*
- *Water: City of Camas*
- *Telephone: Century Link, Comcast*
- *Sanitary Sewer: City of Camas*
- *Natural Gas: NW Natural*

C. Signature [help]

Under the penalty of perjury, the above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

DocuSigned by:
Signature: _____
DC05C[illegible]34[illegible]
Name of signee Ryan Styger
Position and Agency/Organization VP of Land Acquisition Pacific Lifestyle Homes
Date Submitted: 8/8/2022

Carey Certo

From: Ken Bullis <kenrbullis@gmail.com>
Sent: Saturday, December 17, 2022 11:04 AM
To: Community Development Email
Subject: case no. sepa22-17 monte verde subdivision comments

WARNING: This message originated outside the City of Camas Mail system. DO NOT CLICK on links or open attachments unless you recognize the sender and are expecting the content. If you recognize the sender as a city employee and you see this message this email is a phishing email. If you are unsure, click the Phish Alert button to redirect the email for ITD review.

Hi,

We received a notice about the development of this subdivision.

This subdivion and all the ones prior and following are adding cars and trucks to 28th Avenue. We drive this road daily. We have repeatedly seen people walking and biking on the road also used by cars and trucks going 50 mph.

A complete sidewalk and bike lane is urgently needed. Pedestrians and bicyclists are going to be killed or injured if they already haven't been.

The entire length of this roadway needs to be upgraded to solve this dangerous situation. The little bit of upgrade for this one small development will only make the road more confusing to use.

A bike lane or even a widened road on one side would allow people from our area to walk or bike to the lacamas lake trail head and parking area. Now, we consider it too dangerous to attemp. So we drive to an overloaded parking area where tickets are routinely given out for parking on the side of the access road.

We believe this is a serious concern that needs to be addressed now, this year.

Sincerely, Ken Bullis

5920 N 86th Ave.
Camas, Wa 9867
206-818-7092

Sent from my iPhone

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
Southwest Region Office
PO Box 47775, Olympia, WA 98504-7775 • 360-407-6300

December 29, 2022

Robert Maul, Planning Manager
City of Camas
Community Development Department
616 Northeast 4th Avenue
Camas, WA 98607

Dear Robert Maul:

Thank you for the opportunity to comment on the determination of nonsignificance for the Monte Verde Subdivision Project (SEPA22-17) located at 22205 Northeast 28th Street as proposed by Ryan Stygar. The Department of Ecology (Ecology) reviewed the environmental checklist and has the following comment(s):

SHORELANDS & ENVIRONMENTAL ASSISTANCE: Meghan Tait (360)-210-2783

The Department of Ecology requests an opportunity to review the Critical Areas Report by AshEco Solutions mentioned in the SEPA checklist. A site visit may be necessary to confirm the wetland delineation. Please submit the critical areas report to Ecology Wetlands Specialist, Meghan Tait, via email at meghan.tait@ecy.wa.gov. For questions or technical assistance, contact Meghan via the provided email or phone number, 360-210-2783.

SOLID WASTE MANAGEMENT: Derek Rockett (360) 407-6287

The applicant proposes to demolish an existing structure(s). In addition to any required asbestos abatement procedures, the applicant should ensure that any other potentially dangerous or hazardous materials present are removed prior to demolition. It is important that these materials and wastes are removed and appropriately managed prior to demolition. It is equally important that demolition debris is also safely managed, especially if it contains painted wood or concrete, treated wood, or other possibly dangerous materials. Please review the "Dangerous Waste Rules for Demolition, Construction, and Renovation Wastes," on Ecology's website at: Construction & Demolition Guidance. All removed debris resulting from this project must be disposed of at an approved site. All grading and filling of land must utilize only clean fill. All other materials may be considered solid waste and permit approval may be required from your local jurisdictional health department prior to filling. Contact the local jurisdictional health department for proper management of these materials.

TOXICS CLEANUP: Sam Meng (360) 999-9587

No confirmed or suspected cleanup sites within a quarter of mile from the project area. No comment. For questions contact Sam Meng with the Toxics Cleanup Program at the Southwest Regional Office at (360) 999-9587.

WATER QUALITY/WATERSHED RESOURCES UNIT:
Brian Johnson (360) 624-5741

Erosion control measures must be in place prior to any clearing, grading, or construction. These control measures must be effective to prevent stormwater runoff from carrying soil and other pollutants into surface water or stormdrains that lead to waters of the state. Sand, silt, clay particles, and soil will damage aquatic habitat and are considered to be pollutants.

Any discharge of sediment-laden runoff or other pollutants to waters of the state is in violation of Chapter 90.48 RCW, Water Pollution Control, and WAC 173-201A, Water Quality Standards for Surface Waters of the State of Washington, and is subject to enforcement action.

Construction Stormwater General Permit:
The following construction activities require coverage under the Construction Stormwater General Permit:

1. Clearing, grading and/or excavation that results in the disturbance of one or more acres **and** discharges stormwater to surface waters of the State; and
2. Clearing, grading and/or excavation on sites smaller than one acre that are part of a larger common plan of development or sale, if the common plan of development or sale will ultimately disturb one acre or more **and** discharge stormwater to surface waters of the State.
    a) This includes forest practices (including, but not limited to, class IV conversions) that are part of a construction activity that will result in the disturbance of one or more acres, **and** discharge to surface waters of the State; and
3. Any size construction activity discharging stormwater to waters of the State that Ecology:
    a) Determines to be a significant contributor of pollutants to waters of the State of Washington.
    b) Reasonably expects to cause a violation of any water quality standard.

If there are known soil/ground water contaminants present on-site, additional information (including, but not limited to: temporary erosion and sediment control plans; stormwater pollution prevention plan; list of known contaminants with concentrations and depths found; a site map depicting the sample location(s); and additional studies/reports regarding contaminant(s)) will be required to be submitted. For additional information on contaminated construction sites, please contact Evan Wood at evan.wood@ecy.wa.gov, or by phone at (360) 706-4599.

Additionally, sites that discharge to segments of waterbodies listed as impaired by the State of Washington under Section 303(d) of the Clean Water Act for turbidity, fine sediment, high pH, or phosphorous, or to waterbodies covered by a TMDL may need to meet additional sampling and record keeping requirements. See condition S8 of the Construction Stormwater General Permit for a description of these requirements. To see if your site discharges to a TMDL or 303(d)-listed waterbody, use Ecology's Water Quality Atlas at: https://fortress.wa.gov/ecy/waterqualityatlas/StartPage.aspx.

The applicant may apply online or obtain an application from Ecology's website at: http://www.ecy.wa.gov/programs/wq/stormwater/construction/ - Application. Construction site operators must apply for a permit at least 60 days prior to discharging stormwater from construction activities and must submit it on or before the date of the first public notice.

Ecology's comments are based upon information provided by the lead agency. As such, they may not constitute an exhaustive list of the various authorizations that must be obtained or legal requirements that must be fulfilled in order to carry out the proposed action.

If you have any questions or would like to respond to these comments, please contact the appropriate reviewing staff listed above.

Department of Ecology
Southwest Regional Office

(GMP:202206198)

cc: Meghan Tait, SEA
Derek Rockett, SWM
Sam Meng, TCP
Brian Johnson, WQ

In re: Monte Verde Subdivision

) NO. SUB22-05
)
) AFFIDAVIT OF MAILING
)
)
)
)
)
Respondent.)

STATE OF WASHINGTON)
) ss.
CLARK COUNTY)

I, Carey Certo, on oath says:

I, Carey Certo, on January 4, 2023, I directed a true and correct copy of the Notice of Application to be served upon the parties herein, in the above-entitled action, by depositing with the U.S. Post Office, Camas, Washington, a postage-prepaid envelope containing same addressed as follows: See attached list.

Carey Certo
SIGNATURE

SUBSCRIBED and SWORN to before me this 5th day of January, 2023.

AIREANNA BALDWIN NOTARY PUBLIC STATE OF WASHINGTON My Comm. Expires October 01, 2024 No. 183848

Aireanna Baldwin
Notary Public in and for the State of Washington, residing at Clark County
My appointment expires: 10/1/2024

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EMMERT FAMILY III LLC
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HAPPY VALLEY, OR 97086

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BAKKER JOEL
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GME DEVELOPMENT LLC
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VANCOUVER, WA 98660

GREEN MOUNTAIN ESTATES HOA
604 EVERGREEN BLVD
VANCOUVER, WA 98660

GREEN MOUNTAIN ESTATES HOA
604 EVERGREEN BLVD
VANCOUVER, WA 98660

NOTICE OF APPLICATION FOR MONTE VERDE SUBDIVISION

(File no. SUB22-05)

Consolidated Files: Archeological (ARCH22-12), Critical Areas Review (CA22-13), and State Environmental Policy Act (SEPA22-17)

NOTICE IS HEREBY GIVEN that an application for the "Monte Verde Subdivision" a 34-lot single-family residential subdivision requesting preliminary plat approval was received on June 26, 2022, and deemed technically complete on November 7, 2022. A public hearing is required for the development proposal and will be scheduled at a later date. A separate public hearing notice will be mailed to all property owners within 300-feet of the subject development and published in the Post Record.

Location: The 8.6-acre site is zoned Single-Family Residential (R-7.5) in the City of Camas. The site is located at 22205 NE 28th Street in the SE & SW ¼ of Section 21 Township 2 North, Range 3 East, Camas, WA, Parcel Number: 173184000.

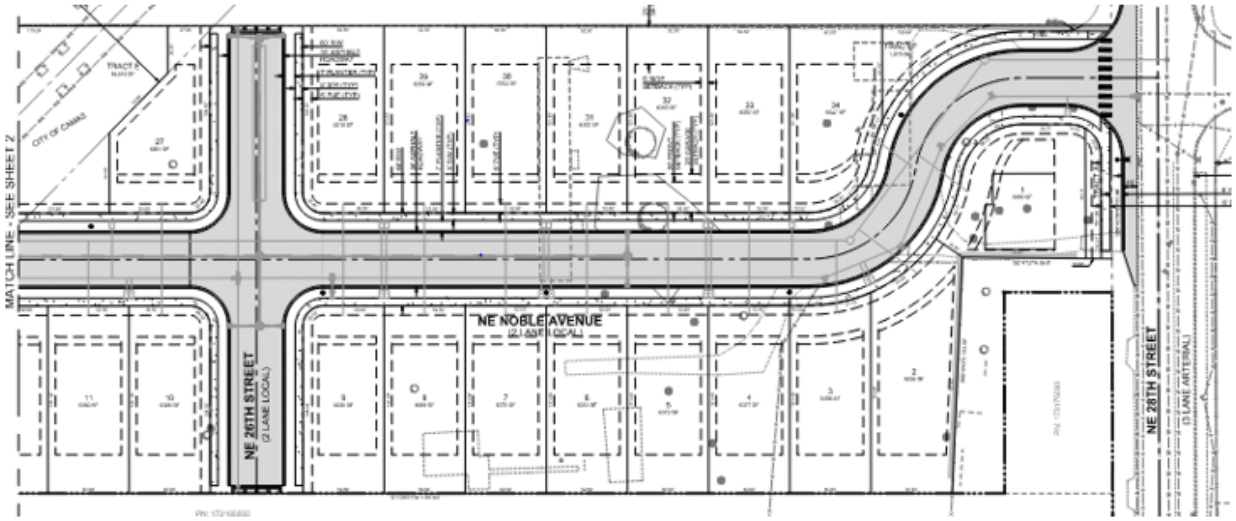
Application Materials: The application included the following: project narrative, SEPA checklist, preliminary development plans, tree report, geotechnical report, archaeological predetermination*, preliminary stormwater report, and traffic study. Application materials are available for review from the Community Development Department during regular business hours Monday – Friday 8am-5pm.

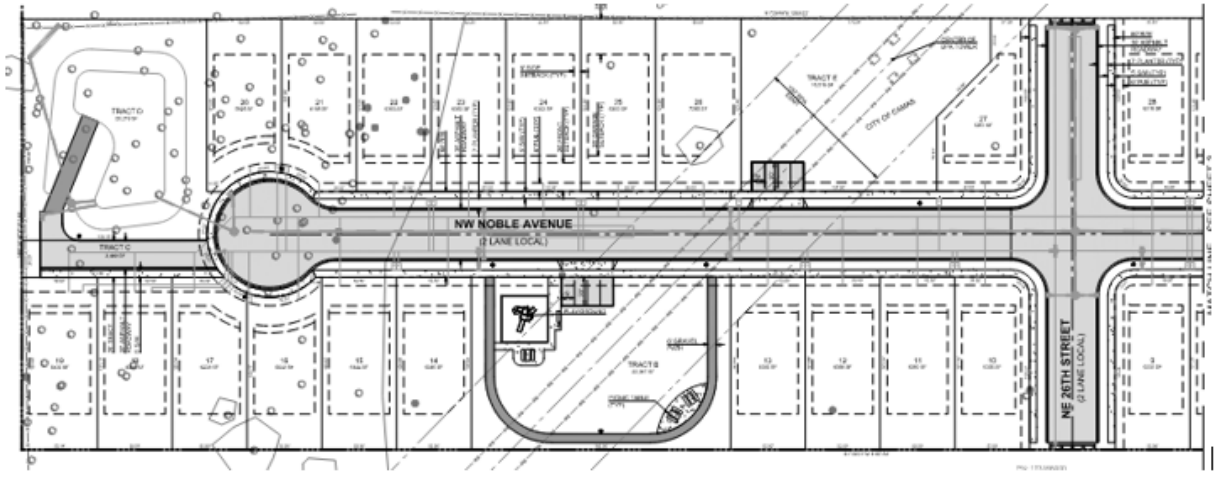
Questions/Comments: For questions related to this application, please contact Yvette Sennewald, Senior Planner, at (360) 817-1568 or by email at communitydevelopment@cityofcamas.us.

*consistent with RCW 42.56.300, Archaeological information is exempt from public disclosure.

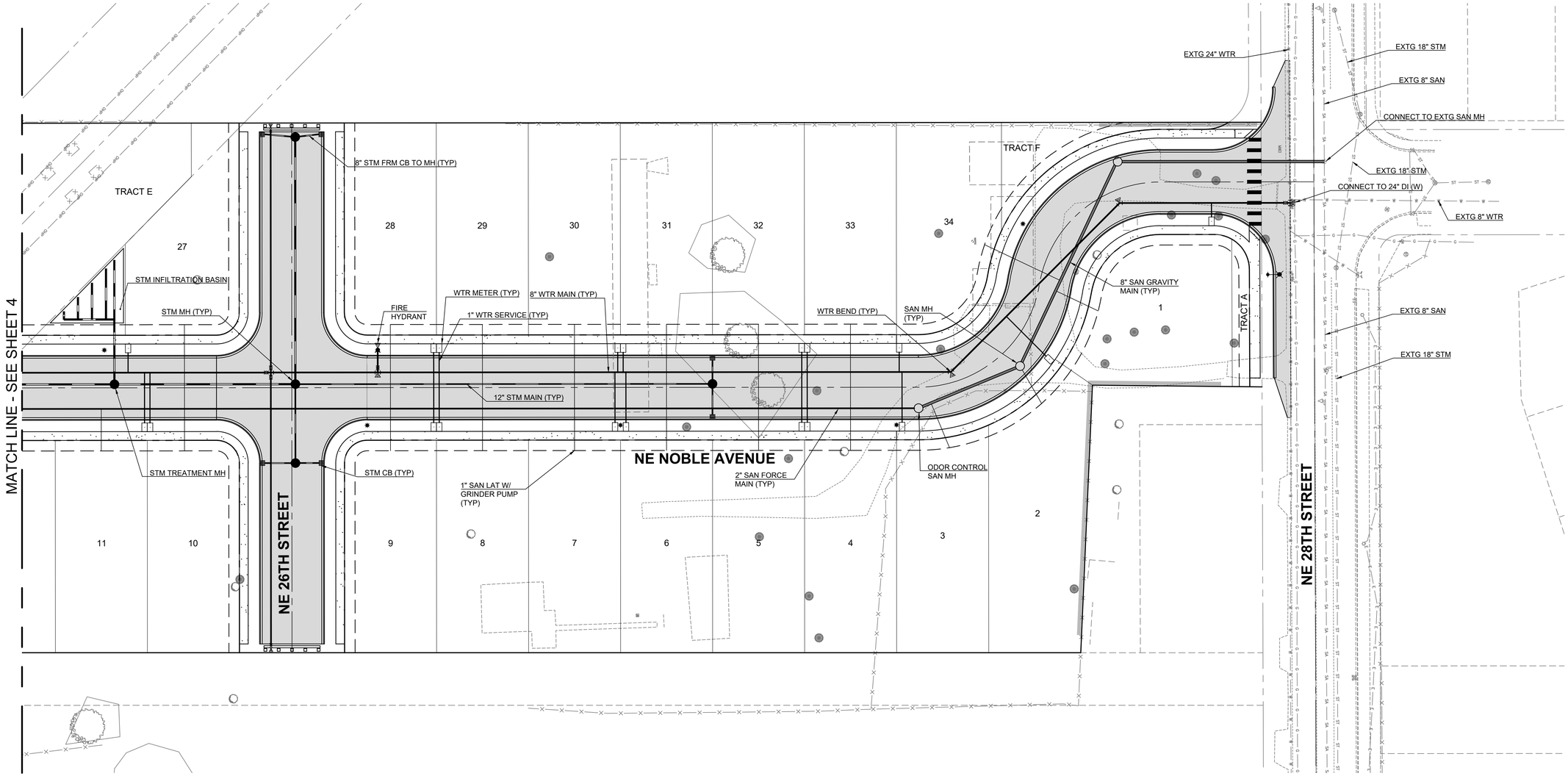
Published in the Post Record on January 5, 2023 Legal Publication # 768350
Posted at Camas City Hall, Camas Library, City of Camas website at: http://www.cityofcamas.us
Mailed to property owners within 300-feet on January 4, 2023

Preliminary Plat for Monte Verde Subdivision





UTILITY PIPE SIZING NOTE:
The utility pipe sizes listed are for preliminary purposes only, and are subject to change as part of the final design.



Scale 1" = 30'
30 15 0 30

Legend	
Proposed Asphalt Concrete	
Proposed Cement Concrete	
Proposed Gravel	
Proposed Retaining Wall	

Preliminary Utility Plan - North For:

Monte Verde

A Subdivision Located In The City Of Camas, Washington

Engineering - Surveying - Planning | 604 W. Evergreen Blvd., Vancouver, WA 98660 | PH (360) 944-6519 | Fax (360) 944-6539

PLS ENGINEERING

Revisions

1	2	3	4	5	6

SCOTT W. GILLILAND — STATE OF WASHINGTON — 22773 — REGISTERED PROFESSIONAL ENGINEER — 7.25.22

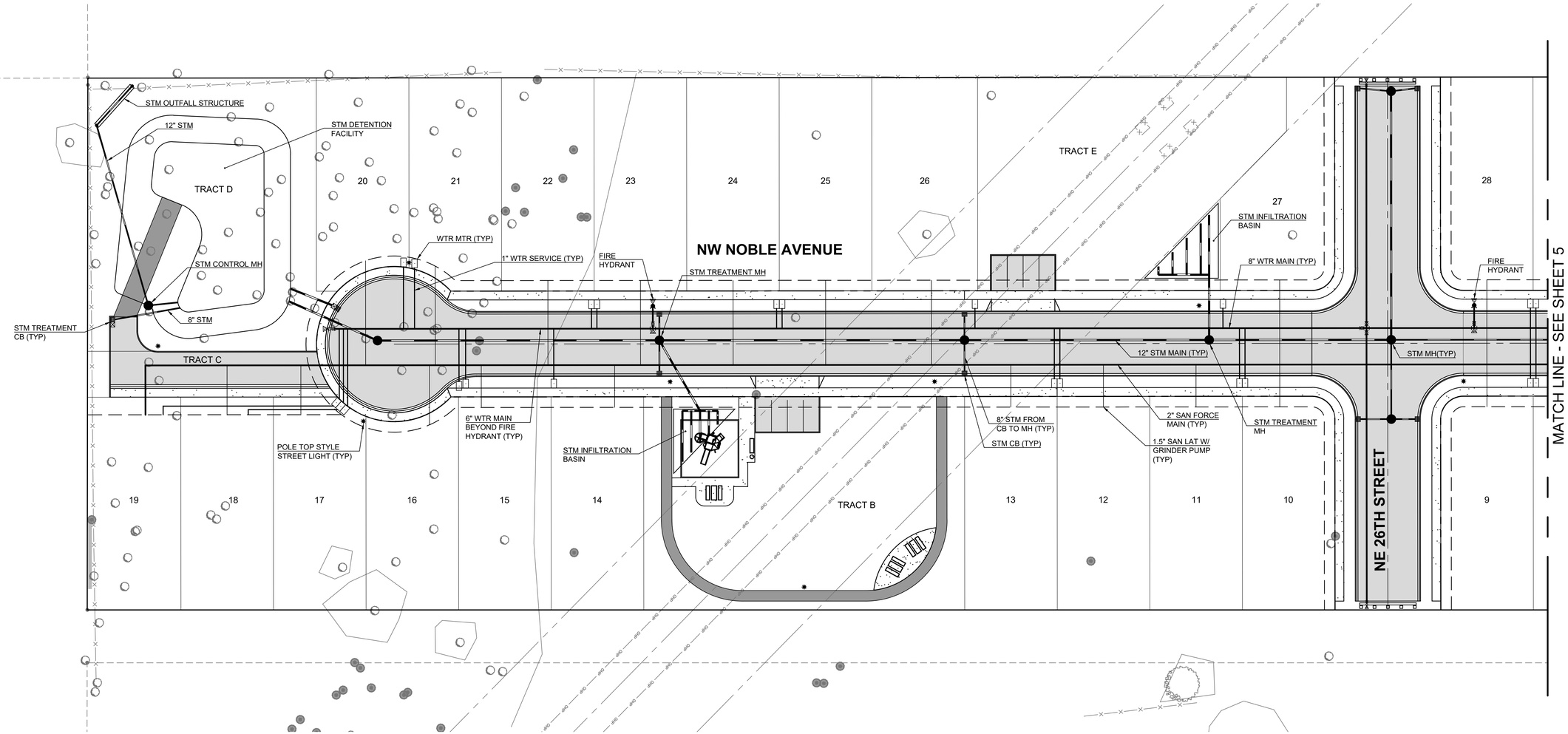
Project No.	3382
SCALE:	H: 1" = 30' V: N/A
DESIGNED BY:	SWG
DRAFTED BY:	JSV
REVIEWED BY:	SWG

5
9

UTILITY PIPE SIZING NOTE:
The utility pipe sizes listed are for preliminary purposes only, and are subject to change as part of the final design.

Scale 1" = 30'
30 15 0 30

Legend	
Proposed Asphalt Concrete	
Proposed Cement Concrete	
Proposed Gravel	
Proposed Retaining Wall	



Preliminary Utility Plan - South For:

Monte Verde

A Subdivision Located In The City Of Camas, Washington

Engineering - Surveying - Planning | 604 W. Evergreen Blvd., Vancouver, WA 98660 | PH (360) 944-6519 | Fax (360) 944-6539

PLS ENGINEERING

Revisions

1	2	3	4	5	6

SCOTT W. GILLILAND — STATE OF WASHINGTON — 42773 — REGISTERED PROFESSIONAL ENGINEER — 7/25/22

Project No. 3382	
SCALE:	H: 1" = 30' V: N/A
DESIGNED BY:	SWG
DRAFTED BY:	JSV
REVIEWED BY:	SWG

4
9

In re: Monte Verde Subdivision

) NO. SUB22-05
)
) AFFIDAVIT OF MAILING
)
)
)
)
)
Respondent.)

STATE OF WASHINGTON)
) ss.
CLARK COUNTY)

I, Carey Certo, on oath says:

I, Carey Certo, on February 1, 2023, I directed a true and correct copy of the Notice of Public Hearing to be served upon the parties herein, in the above-entitled action, by depositing with the U.S. Post Office, Camas, Washington, a postage-prepaid envelope containing same addressed as follows: See attached list.

Carey Certo
SIGNATURE

SUBSCRIBED and SWORN to before me this 7th day of February, 2023.

AIREANNA BALDWIN NOTARY PUBLIC STATE OF WASHINGTON My Comm. Expires October 01, 2024 No. 183848

Aireanna Baldwin
Notary Public in and for the State of Washington, residing at Clark County
My appointment expires: 10/01/2024

CLARK COUNTY PARKS
4700 NE 78TH ST
VANCOUVER, WA 98665

CARRILLO MARIBEL & SANCHEZ TIMOTEO
22401 NE 28TH ST
CAMAS, WA 98607

YOUNG-PALMER NICKI L & PALMER GREGORY A
512 NE 81ST ST STE F
VANCOUVER , WA 98665

EMMERT FAMILY III LLC
10470 SE HILLCREST DR
HAPPY VALLEY, OR 97086

CLARK COUNTY PARKS
4700 NE 78TH ST
VANCOUVER, WA 98665

JOHNSON GLEN C & JOHNSON THERESA M
22307 NE 28TH ST
CAMAS, WA 98607

SOUTHERN DWIGHT A ETAL
22205 NE 28TH ST
CAMAS, WA 98607

HOLLINGSWORTH JAMES MICHAEL JR & HOLLINGSWORTH ROBIN RAYNA
22421 NE 28TH ST
CAMAS, WA 98607

MIDDAGH LINDA
22015 NE 28TH STREET
CAMAS, WA 98607

MERRITT ROCQUE & MERRITT SUE
3602 NE 222ND AVE
CAMAS, WA 98607

MERRITT GWENNA E
3602 NE 222ND AVE
CAMAS, WA 98607

EMMERT TERRY W
11811 SE HWY 212
CLACKAMAS, OR 97015

MITTELSTAEDT PAUL E JR & MITTELSTAEDT ELIZABETH
6202 N 86TH AVE
CAMAS, WA 98607

KUMMERMAN MICHAEL J & KUMMERMAN PAULINE VERONICA
6150 N 86TH AVE
CAMAS, WA 98607

RUTTER TROY EUGENE & RUTTER STEPHANIE DENISE
6138 N 86TH AVE
CAMAS, WA 98607

HOANG ALEXANDER TUNG & HIROMOTO KELBY AKEMI
6124 N 86TH AVE
CAMAS, WA 98607

DAHAL BIDHYA GURUNG & DAHAL LAXMI RAMAN
8602 N WRIGHT ST
CAMAS, WA 98607

BARROW ANSON DAVID & BARROW LAUNIE RAE
4331 SE 179TH CT
VANCOUVER, WA 98683

AXMAKER ANDREW & AXMAKER HOLLY
8616 N WRIGHT ST
CAMAS, WA 98607

RILER DANIEL JOSEPH & RILER MELINDA CATHERINE
8624 N WRIGHT ST
CAMAS, WA 98607

DOAN KHOA DANG & SAING STEPHANY SANPHILAY
8638 N WRIGHT ST
CAMAS, WA 98607

XU JIAN & LIANG YUEHAI TRUSTEES
12462 NW WAKER DR
PORTLAND, OR 97229

GREEN MOUNTAIN PH2 SOUTH HOA
11807 NE 99TH ST STE 1170
VANCOUVER, WA 98682

GREEN MOUNTAIN PH2 SOUTH HOA
11807 NE 99TH ST STE 1170
VANCOUVER, WA 98682

WALKER PHERNELL CLARENCE II
5968 N 86TH AVE
CAMAS, WA 98607

DOYLE KYLE JAMES & MCCALL BRITTANY DAWN
20281 BEECHWOOD TERRACE UNIT 301
ASHBURN, VA 20147

SONG JIE & ZHU HAIQING
5944 N 86TH ST
CAMAS, WA 98607

BRILEY DUANE A & BRILEY NORLEEN
5932 N 86TH AVE
CAMAS, WA 98607

GREEN ERICA M & NUSSER RYAN A
8545 N JUNIPER ST
CAMAS, WA 98607

WALKER CANDICE R
8533 N JUNIPER ST
CAMAS, WA 98607

BULLIS KENNETH R & BULLINGER EILEEN P
5920 N 86TH ST
CAMAS, WA 98607

PHILLIPS WILLIAM CHRISTOPHER & PHILLIPS KATRINA MARIE
8556 N HARGRAVE ST
CAMAS, WA 98607

GOTTSCHALK DREW H & GOTTSCHALK CASEY L
8544 N HARGRAVE ST
CAMAS, WA 98607

MOY JOHN C JR
8538 N HARGRAVE ST
CAMAS, WA 98607

BOUCHER RICHARD D & BOUCHER KAREN M
8522 N HARGRAVE ST
CAMAS, WA 98607

BAKKER JOEL
8510 N HARGRAVE ST
CAMAS, WA 98607

GME DEVELOPMENT LLC
1300 ESTHER ST STE 200
VANCOUVER, WA 98660

GME DEVELOPMENT LLC
1300 ESTHER ST STE 200
VANCOUVER, WA 98660

GREEN MOUNTAIN ESTATES HOA
604 EVERGREEN BLVD
VANCOUVER, WA 98660

GREEN MOUNTAIN ESTATES HOA
604 EVERGREEN BLVD
VANCOUVER, WA 98660

Community Development Department

Notice of Public Hearing

Monte Verde Subdivision

Planning Case No. SUB22-05

A public hearing will be held on **Thursday, February 16, 2023, at 5:00 p.m.,** or soon thereafter, before the City's Hearings Examiner to consider the preliminary plat application for the Monte Verde Subdivision. The public hearing will be held remotely and in person at city hall. The applicant proposes to construct a 34-lot subdivision. The approximate 8.6-acre site is situated in the R-7.5 – Single Family Residential Zone and is located at 22205 NE 28th Street in the SE ¼ of Section 21 and in the SW ¼ of Section 21, Township 2 North, Range 3 East; Camas, WA. Parcel Number 173184000. The application was determined technically complete on November 7, 2022.

Questions/Comments: The public hearing will follow the quasi-judicial process described within Camas Municipal Code §18.55.180. Comments related to this development may be submitted as follows: (1) In person by testifying at the public hearing; (2) by regular mail to Community Development Department staff, Yvette Sennewald, Senior Planner, at Camas City Hall, 616 Northeast Fourth Avenue, Camas, WA 98607; (3) by phone at (360) 817-1568; or (4) by email to: communitydevelopment@cityofcamas.us. It is preferable that written comments be received at least five working days prior to the public hearing, in order to be available with the online agenda and materials. After the agenda has been posted online, all other written comments must be received no later than noon (12:00 p.m.) the day of the hearing, in order for those comments to be handed to the Hearings Examiner by Staff. Written and oral comments may also be submitted in person during the hearing.

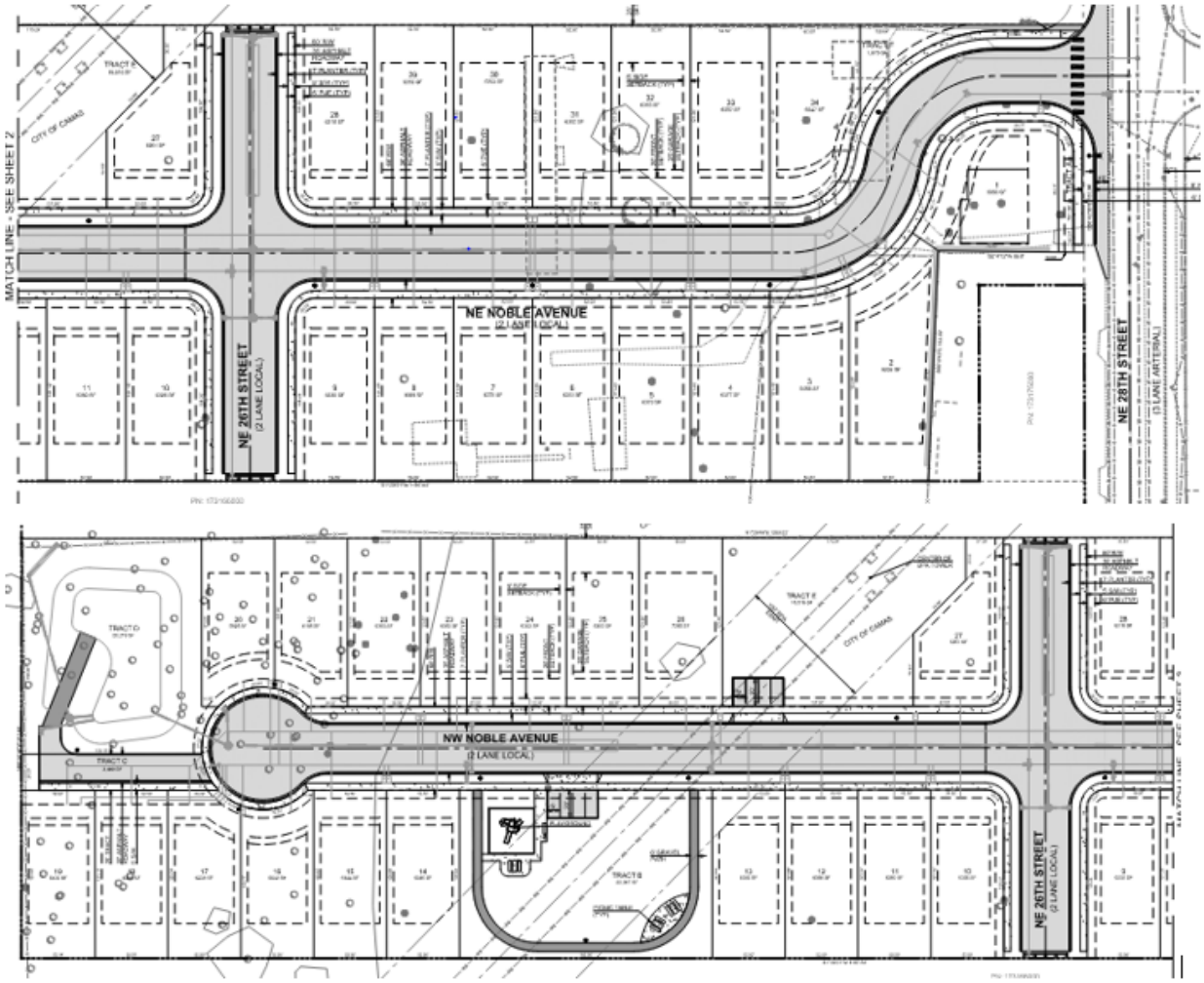
Application Materials: The application included the following: project narrative, development plans and environmental reports, as required for a complete application pursuant to Camas Municipal Code (CMC) §18.55.110. The application materials are also available for viewing at the Community Development Department (616 NE 4th Avenue, Camas, WA) during regular business hours Monday – Friday 8 a.m-5 p.m.

Participate: All citizens are entitled to have equal access to the services, benefits and programs of the City of Camas. Please contact the **City Clerk at (360) 817-1591** for special accommodations if needed. The city will provide translators for non-English speaking persons who request assistance at least three working days prior to a public meeting or hearing.

More Information: The public hearing agenda and supporting documents will be available for review on the City's website at the "Minutes, Agendas & Videos" link within the drop-down menu that is labeled "Your Government" or follow this link: http://www.cityofcamas.us/yourgovernment/minuteagendavideo.

Published in the Post Record on February 2, 2023 Legal Publication #774370
Posted at Camas City Hall, Camas Library, City of Camas web site at: http://www.cityofcamas.us
Mailed to property owners within 300-feet on February 1, 2023

Excerpt from Preliminary Plat Application
Monte Verde Subdivision (File #SUB22-05)



Memo from Community Development Engineering

TO: Yvette Sennewald, Planner

FROM: Anita Ashton, Project Manager

DATE: February 16, 2023

SUBJECT: SUB22-05 Monte Verde Subdivision

The following memo addresses questions from the Applicant and replies from Staff.

COA #10 states: *The applicant will be required to purchase all permanent traffic control signs, street name signs, street lighting, traffic control markings, and gate and controller for the improved subdivision.*

Applicant: We are not proposing a gated community and would ask that the 'gate and controller' language be stricken.

Staff Response: Staff concurs.

Revise COA #10 to read:
"The applicant will be required to purchase all permanent traffic control signs, street name signs, street lighting, and traffic control markings for the improved subdivision."

COA #39 states: *The stormwater plans are to be revised with any and all proposed treatment and/or detention structures located outside of the public right-of-way*.

Applicant: We would like to confirm that the proposed treatment manholes/catch basins are not allowed per city standards.

Staff Response: Correct. Treatment manholes/catch basins, e.g., structures that are privately maintained are not permitted in the public right-of-way. Treatment and detention structures are required to be maintained by the HOA/property owners.

COA #39 does not need to be revised, however, Staff would support the public road being changed to a private road south of future NE 26th Avenue; in which case the treatment structures can be located within the private road. See COA #50 revision below.

COA #46 states prior to final engineering plan approval: *Any existing wells, or septic systems are to be decommissioned and documentation shall be provided to the city that said wells and/or septic systems have been properly decommissioned in accordance with State and County guidelines. Additionally, any water rights associated with a decommissioned well shall be transferred to the City.*

Applicant: We would want this condition to be prior to final plat approval or final acceptance so that the well and septic can be decommissioned during the site construction.

Staff Response: While staff recommends that the applicant decommission the well and septic system prior to final engineering plan approval or prior to land-disturbing activities, staff finds that providing documentation prior to final plat approval is acceptable.

Staff does not support a change to 'prior to final acceptance'.

Revise COA #46 to read:

"Prior to final plat approval, Any existing wells, or septic systems are to be decommissioned and documentation shall be provided to the city that said wells and/or septic systems have been properly decommissioned in accordance with State and County guidelines. Additionally, any water rights associated with a decommissioned well shall be transferred to the City."

COA #50 states: *The street improvement plans are to be submitted with the future local public roads constructed in accordance with CDSM Street Detail ST2 - 2 Lane Local (60' ROW).*

Applicant: We would like to explore the option of a private street during final engineering. Can we revise condition 50 so that we can have the option during final engineering to discuss private internal roads?

Staff Response: Staff supports the option for a private road discussion, with the understanding that this would apply only to the portion of the future internal road (NE Noble Avenue), south of future NE 26th Street.

Per CMC 17.19.040.B.10. future NE 26th Street is to be extended west and east for future development and therefore cannot be a private road.

Revise COA #50 to read:

"The street improvement plans are to be submitted with the future local public roads constructed in accordance with CDSM Street Detail ST2 - 2 Lane Local (60' ROW). Staff may support the segment of the future internal public road (NE Noble Avenue), south of future NE 26th Avenue being changed to a private road.

Road ownership can be determined during final engineering design." If the southern segment of the public road is revised to be a private road it may affect the proposed plat notes, which can also be revised at time of Final Plat application.

COA #51 states: *The street plans and the preliminary plat are to be revised to provide for a dead-end turnaround at future Lot 19 and Tract D. The applicant is to work with engineering and the Fire Marshal for an acceptable dead-end turnaround to accommodate emergency vehicles. Garbage and recycling containers for Lots 17, 18, and 19 are to be placed at the right-of-way for pickup.*

Applicant: The condition requires a turnaround at the end of Tract C. We would like to discuss how the dead-end length is measured so that we can provide a road that does not have a turnaround. We would request that the condition be modified to state, "***If the private road in Tract C is longer than 150'***, then the street plan and preliminary plat are to be revised to provide for a dead-end turnaround at future lot 19 and tract D."

Staff Response: As stated in the discussion, road lengths are measured from the centerline of the adjacent road, which would be the center of the cul-de-sac in this case.

Staff would support the proposed revision.

Revise COA #51 to read:

"If the private road in Tract C is longer than 150-feet, then the street plans and the preliminary plat are to be revised to provide for a dead-end turnaround at future Lot 19 and Tract D. The applicant is to work with engineering and the Fire Marshal for an acceptable dead-end turnaround to accommodate emergency vehicles. Garbage and recycling containers for Lots 17, 18, and 19 are to be placed at the right-of-way for pickup."

COMMUNITY DEVELOPMENT DEPARTMENT
616 NE 4th Avenue
Camas, WA 98607
www.cityofcamas.us

Memorandum

To: Hearings Examiner

From: Yvette Sennewald, Senior Planner

Date: February 17, 2023

RE: Monte Verde Subdivision - Lot Coverage Plat Note Request

Dear Mr. Hearings Examiner,

This memo is in response to the applicant's request during the public hearing on February 16, 2023, to update Plat Note #3 to allow up to 50% lot coverage for single-story residences per CMC 18.09.040 Table 1 Footnote 5. Staff recommends Plat Note #3 should be revised to read: "Maximum building lot coverage can be up to 40% in the R-7.5 Single-Family Residential Zone for two-story dwelling units. Lot coverage for single-story dwelling units within this subdivision may have a maximum lot coverage of up 50% using density bonus/flexibility."

Respectfully,

Yvette Sennewald, Senior Planner

RE: Planning Case SUB22-05 - Monte Verde Subdivision

Jayson Taylor <jayson@plsengineering.com>
To Yvette Sennewald

Reply | Reply All | Forward

Fri 3/3/2023 4:21 PM

You forwarded this message on 3/6/2023 9:29 AM.

Yvette,

Did we receive any additional comments regarding this application this last week? If not, we would like to request that the Examiner close the record as we do not have any additional comments.

Thanks!

Jayson Taylor
Design Engineer
604 W Evergreen Blvd.
Vancouver, Washington 98660
www.plsengineering.com | (360)944-6519

BEFORE THE LAND USE HEARING EXAMINER
FOR THE CITY OF CAMAS, WASHINGTON

Regarding an application by Dwight A. Southern for approval of a preliminary plat to divide 8.6-acres into 34 lots in the R-7.5 zone at 22205 NE 28th Street in the City of Camas	))))	**F I N A L O R D E R** **SUB22-05** **(Monte Verde)**

A. SUMMARY

1. The applicant requests approval to divide an 8.6-acre parcel into 34 lots and tracts for private streets, open space, and stormwater.

a. The site is located at 22205 NE 28th Street; also known as tax parcel number 173184000 (the "site"). The site and abutting properties to the west are zoned R-7.5 (Single Family Residential, 7,500 square foot average lot size). Properties to the north, across NE 28th Street, are zoned R-6 (Single Family Residential, 6,000 square foot average lot size). Properties to the east are located in unincorporated Clark County and zoned R-12 (Medium Density Residential, 12 units per acre). Properties to the south are zoned PF (Public Facilities). All proposed lots comply with the minimum dimensional standards for the R-7.5 zone, as modified by the density transfer ordinance.

b. The site is currently developed with a single-family detached residence and several outbuildings. The applicant proposed to remove all of the existing structures to accommodate the proposed development. In addition, a BPA powerline easement bisects the site diagonally from southwest to northeast. The northern portion of the site is primarily grass with scattered trees. There is a forested area on the southern portion of the site. There are several Oregon white oak trees on and near the site. The property slopes gently towards the south; no steep slopes or severe erosion hazard areas were identified on the site.

c. The City of Camas will supply domestic water and sanitary sewer service to the proposed development. The applicant will collect and treat stormwater from all public and private roads, sidewalks, and driveway on the site and convey it to proposed infiltration facilities within the proposed street on the site. Runoff from roofs will bypass the treatment facilities and discharge to the infiltration system. Excess stormwater will be conveyed to a detention facility in proposed Tract D. The applicant will discharge stormwater from the detention facility onto the slopes at the southwest corner of the site at less than predevelopment rates, using a flow spreader outfall.

f. The applicant will dedicate right-of-way and construct frontage improvements along the site's NE 28th Street frontage. The applicant will extend a new public street, proposed NE Noble Avenue, into the site from NE 28th Street, terminating in a cul-de-sac turnaround near the south boundary of the site. The applicant will extend a second street, proposed NE 26th Street, to the east and west of proposed NE Noble Avenue, terminating at the boundaries of the site to allow for further extension when the abutting properties redevelop. The applicant will extend a new private street south of the

proposed cul-de-sac at the south end of NE Noble Avenue to provide access to Lots 18 and 19 and the stormwater facility in Tract D.

2. The City issued a Determination of Nonsignificance ("DNS") for the subdivision pursuant to the State Environmental Policy Act ("SEPA"). The City issued the DNS on December 15, 2022. The SEPA determination was not appealed and is now final.

3. City of Camas Hearing Examiner Joe Turner (the "examiner") conducted a public hearing to receive testimony and evidence about the application. City staff recommended that the examiner approve the preliminary plat subject to conditions. See the Staff Report to the Hearing Examiner dated January 26, 2023. The applicant accepted those findings and conditions without exception. One other person testified in support of the application. No one else testified orally or in writing.

4. Based on the findings provided or incorporated herein, the examiner approves the preliminary plat subject to the conditions at the end of this final order.

B. HEARING AND RECORD HIGHLIGHTS

1. The examiner received testimony at a public hearing about this application on February 16, 2023. All exhibits and records of testimony are filed at the City of Camas. At the beginning of the hearing, the examiner described how the hearing would be conducted and how interested persons could participate. The examiner disclaimed any *ex parte* contacts, bias or conflicts of interest. The following is a summary by the examiner of selected testimony and evidence offered at the public hearing.

2. City planner Yvette Sennewald summarized the Staff Report and her PowerPoint presentation.

a. The site consists of an 8.4-acre parcel located south of NE 28th Street. The applicant proposed to subdivide the site into 34 lots.

b. The applicant proposed to retain 0.93-acres of open space on the site, primarily the portion of the site that is subject to the BPA easement. The applicant proposed to improve the open space with a play structure and pedestrian paths. Therefore, the applicant is entitled to develop the site pursuant to the City's density transfer ordinance, which allows smaller lot sizes and negotiated flexibility to the lot size, lot width, lot depth, building setback, or lot coverage standards under CMC 18.09.040, Table 1 and 2. The applicant requests smaller lots, ranging in size from approximately 5,822 – 8,265 square-feet, and to reduce the minimum lot width from 60 to 52.5 feet.

c. The site currently contains 153 tree units. The applicant proposed to remove 129 existing trees, retaining three trees which equate to 23 tree units. The applicant will plant 157 new trees on the site to meet the City's minimum tree density requirement.

d. There are no wetlands on the site. The nearest wetland is more 500 feet away.

e. There are 11 Oregon white oak trees on or near the site, of which six are considered "habitat of local importance" and regulated by the City (20-inches or more diameter at breast height ["dbh"]). The applicant proposed to remove three regulated trees and plant additional oak trees on the site as mitigation to ensure no net loss of habitat functions on the site.

f. She requested the examiner modify the proposed conditions of approval in the Staff Report as noted in Exhibit 32.

3. City engineering project manager Anita Ashton requested the examiner add a condition of approval requiring that the applicant install an L2 landscape buffer around the stormwater facility in Tract D, as discussed on page 14 of the Staff Report.

4. Planner Jason Taylor accepted the findings and conditions in the Staff Report, as modified by Exhibit 32 and Ms. Ashton's testimony, with one exception. He requested the examiner modify proposed Plat note 3 to allow 50-percent maximum building lot coverage for single-story homes, which will allow residents to "age in place."

5. Planning manager Robert Maul agreed with the proposed change to Plat note 3 to allow 50-percent maximum building lot coverage only for single-story homes. He requested the examiner hold the record open to allow the City an opportunity to propose revised language for Plat note 3. He testified that the City only annexed properties whose owners desired to be included in the City.

6. Glen Johnson, the owner of the property east of the site, testified in support of the proposed development. He noted that there is an existing 30-footwide County right-of-way between the site and his property. He questioned why this site and the five parcels to the west were annexed by the City but the remainder of the surrounding properties remain in unincorporated Clark County.

7. At the conclusion of the hearing the examiner held the record open for three weeks, subject to the following schedule:

a. For one week, until 5:00 p.m. on February 23, 2023, for the City to submit revised language for proposed Plat note 3;

b. For a second week, until 5:00 p.m. on March 2, 2023, for anyone to respond to the City's proposed condition language; and

c. For a second week, until 5:00 p.m. on March 9, 2023, for the applicant to submit a final written argument.

8. During the open record period the City submitted a memorandum dated February 17, 2022, proposing revised language for Plat note 3. (Exhibit 33). No additional testimony or evidence was submitted during the second week of the open

record and the applicant waived their final argument and requested the examiner close the record. Pursuant to the applicant's request, the record in this case closed at 5:00 p.m. on March 3, 2023. (Exhibit 34).

C. DISCUSSION

1. City staff recommended conditional approval of the application, based on the affirmative findings in the Staff Report, as modified by Exhibits 34 and 33 and orally at the hearing. The applicant accepted those findings and conditions, as modified, without exceptions. No one raised any concerns or objections with the proposed development.

2. The examiner concludes that the affirmative findings in the Staff Report show that the proposed preliminary plat does or can comply with the applicable standards of the Camas Municipal Code and Revised Code of Washington, provided that the applicant complies with recommended conditions of approval as modified. The examiner adopts the affirmative findings in the Staff Report, as modified, as his own.

D. CONCLUSION

Based on the above findings and discussion, the examiner concludes that SUB22-05 (Monte Verde Subdivision) and consolidated files ARCH22-12, CA22-13, and SEPA22-17 should be approved, because it does or can comply with the applicable standards of the Camas Municipal Code and the Revised Code of the State of Washington, subject to conditions of approval necessary to ensure the final plat and resulting development will comply with the Code.

E. DECISION

Based on the findings, discussion, and conclusions provided or incorporated herein and the public record in this case, the examiner hereby approves SUB22-05 (Monte Verde Subdivision) and consolidated files ARCH22-12, CA22-13, and SEPA22-17, subject to the following conditions of approval:

Standard Conditions:

1. Engineering site improvement plans shall be prepared in accordance with the City of Camas Design Standards Manual (CDSM) and CMC 17.19.040.
2. The engineering site plans shall be prepared by a licensed civil engineer in Washington State and submitted to the City's Community Development (CDEV) Engineering Department for review and approval. Submittal requirements for first review are as follows:
    a. Submit four (4) full size sets and one (1) half size set of plans.
    b. Submit one (1) electronic version of the final (TIR) stormwater report. Do not submit any hard copies of the Final TIR.
    c. Submit a stamped preliminary engineer's estimate.
3. Community Development (CDEV) Engineering shall collect a total three-percent plan review and construction inspection (PR&CI) fee for the proposed development.

a. A preliminary construction estimate shall be submitted to the CDEV Engineering Department prior to or with submittal of plans for first review.

b. Payment of the one-percent plan review (PR) fee shall be due prior to the start of the plan review process. The PR fees will be provided by the engineering staff.

c. Payment of the two-percent construction inspection (CI) fee shall be due prior to construction plan approval and release of approved plans to the applicant's consultant. The CI fees due will be provided by the engineering staff.

d. Under no circumstances will the applicant be allowed to begin construction prior to construction plan approval.

4. Installation of public improvements shall be in accordance with CMC 17.21 Procedures for Public Improvements.

5. If applicable, existing wells, septic tank, and septic drain fields shall be decommissioned in accordance with state and county guidelines, per CMC 17.19.020.

6. Any entrance structures or signs proposed or required for this project will be reviewed and approved by the city.

   a. All designs will be in accordance with applicable City codes.

   b. The maintenance of the entrance structure will be the responsibility of the homeowners.

7. The applicant will be responsible for ensuring that private utilities; underground power, telephone, gas, CATV, streetlights, and associated appurtenances are installed.

8. A six-foot private utility easement (PUE) shall be located outside of the right-of-way on public streets and outside of the tracts on private streets.

9. A draft street lighting plan shall be submitted to development engineering for review prior to final plan submittal to Clark Public Utility.

10. The applicant will be required to purchase all permanent traffic control signs, street name signs, street lighting, and traffic control markings for the improved subdivision.

11. Prior to any land-disturbing activities of an acre or more, the applicant shall have approved final engineering plans and shall submit a copy of the *NPDES General Construction Stormwater Permit* (GCSWP), which is issued by the Washington State Dept. of Ecology, and the *Stormwater Pollution Prevention Plan* (SWPPP), which is required as a component of the NPDES GCSWP permit.

12. Prior to commencing any land-disturbing activities of an acre or more, the applicant shall submit an Erosion Control Bond (ESC) in the amount of 200-percent of the cost for erosion control measures, per CMC 17.21.030.B and CMC 14.06.200.

13. In the event any item of archaeological interest is uncovered during a permitted ground disturbing action or activity, all ground disturbing activities shall immediately cease, and the applicant shall notify the City and the Department of Archaeology and Historic Preservation (DAHP).

14. Prior to final acceptance, the applicant shall remove all temporary erosion prevention and sediment control measures from the site at completion of all site improvements,

which includes stabilization of all disturbed soil, prior to issuance of Final Acceptance from CDEV Engineering.

15. Prior to final acceptance, final as-built construction drawing submittals shall meet the requirements of the Camas Design Standards Manual (CDSM).
    a. As-builts are to be submitted as PDFs and in either AutoCad or Carlson formats. The cover sheet for the as-builts is to include the originally approved and signed cover sheet.
16. Prior to final acceptance the two-year warranty maintenance bond is to be submitted in accordance with CMC 17.21.070.A Upon final acceptance of the development improvements a two-year (2) warranty bond commences.
17. Per CMC 17.21.070.E A letter of final acceptance will be issued once all items listed in 17.21.070.B-C.
18. Final plat submittals shall meet the requirements of the CMC 17.11.060, CMC 17.01.050, and the Camas Design Standards Manual.
19. A homeowner's association (HOA) will be required and a copy of the CC&Rs for the development will need to be submitted to the City for review and approval. Specifically, the applicant will need to make provisions in the CC&Rs for ownership and maintenance of the private storm drainage systems, open spaces, retaining walls, fencing, walls, landscaping, irrigation, private roads, and tracts or easements outside of the City's right-of-way if applicable. Further, all necessary easements and dedications should be noted on the final plat.
20. Accessory dwelling units shall not be precluded from in the CC&R's.
21. The applicant shall take appropriate measures to ensure landscaping success for a minimum of three years after issuance of Certificate of Occupancy. If plantings fail to survive, the property owner shall promptly replace them.
22. Automatic fire sprinklers installed per NFPA 13D or 13R shall be required in all new residential structures.
23. Provisions for parking enforcement on private Tracts/access driveways, acceptable to the Fire Marshal, shall be included in the CC&Rs at the time of final platting.
24. Per CMC 17.21.060.H Permits for one sales office and/or one model home per plat or phase may be issued after the final plat is recorded, and prior to final acceptance. Building permit applications, for any other residential buildings, will not be accepted until after final acceptance.

Special Conditions of Approval:

Planning:

25. If potential artifacts are discovered during construction, work must immediately cease, and both the State Department of Archaeological and Historic Preservation and the City shall be notified.
26. The recommendations provided by the Department of Ecology shall be complied with.
27. The recommendations in the geotechnical report shall be followed.

28. If potential artifacts are discovered during construction, work must immediately cease, and both the State Department of Archaeological and Historic Preservation and the City shall be notified.
29. The Mitigation Plan contained in the Critical Areas Report & Oregon White Oak Mitigation Plan prepared by Ash Eco Solutions, LLC shall be followed.
30. The installation of temporary construction fencing prior to construction that clearly marks in the field critical area buffers (i.e., Oregon White Oak) and fencing should remain throughout permitted construction activities.
31. The trees identified for preservation shall comply with the tree protection recommendations contained in the Critical Areas report. Any required revisions to the site plan, such as building setbacks and/or site improvements, will require an updated Tree Survey for review and approval prior to Engineering Plan approval and will be conditioned as such.
32. Exterior retaining walls facing the public right-of-way shall be "set back a distance of one foot for every foot in height of a fence in excess of allowed height" per CMC 18.17.060.D. and provide additional landscaping consisting of groundcover, shrubs, and trees.
33. The applicant should consider construction techniques that would decrease the noise associated with the airport per CMC 18.34.080.A

Prior to Final Engineering Plan Approval:

Planning:

34. A detailed construction drawing per CMC 16.53.050.E.3 is to be submitted to the City for review and approval Retaining walls shall comply with CMC 18.17.060.D.
35. A final landscape, tree, and vegetation plan consistent with the landscaping standards in CMC Chapter 18.13 should be submitted to the City for review and approval prior to engineering plan approval. Plants utilized will need to be per the approved City's Plant list and per the Camas Design Manual planting specifications and landscape notes. For plants not on the approved City list, a characteristic card should be submitted to the City for review and approval. Irrigation and landscaping should be installed or bonded for prior to final acceptance per CMC 17.19.030.F.3.

Engineering*:*

Water:

36. The applicant shall submit revised utility plans that show an 8-inch water main from NE 28th Street, through the entire length of future "NE/NW Noble Avenue" and south to the end of the cul-de-sac, as well as an eight-inch water main in the east and west dead-end leg of in future NE 26th Street.
37. The applicant shall submit revised water utility plans showing the locations of all proposed irrigation services and the size of each irrigation meter.

Storm Drainage:

38. The applicant shall submit a complete set of stormwater plans for review and approval, per MR #1 of the TIR.

39. The stormwater plans are to be revised with any and all proposed treatment and/or detention structures located outside of the public right-of-way.

40. The applicant shall submit a final stormwater report (TIR) that addresses the on-site conveyance systems analysis and design as well as an updated infiltration trench design and locations.

41. The final stormwater (TIR) report is to be revised and submitted with the current *June 2022 City of Camas Stormwater Sewer System O&M Manual*.

42. The applicant shall submit a complete set of stormwater plans, including the design for the conveyance system in accordance with the Camas Design Standards Manual (CDSM). Additionally, the underground infiltration system on Tract B should be located such that it is not situated below the proposed playground area.

43. The applicant shall submit a revised stormwater plan for Lots 1-34. Said plans should ensure that adjacent parcels and downstream drainageways and/or adjacent properties are not negatively affected by roof drain downspouts and surface water runoff, per Camas Municipal Code (CMC) 14.02 and 17.19.040.C.

Erosion Control:

44. The applicant shall be required to submit a complete set of Erosion Sediment Control (ESC) plans, as a part of the site improvement plans for review and approval.

Sanitary Sewer Disposal:

45. The applicant shall be required to submit the following:

    a. Calculations verifying that the sanitary sewer force main is adequately sized for solids and effluent to be pumped up to the highest point in the conventional gravity sewer main.

    b. Calculations verifying that the pressure sewer laterals, from the grinder pumps to the force main, are adequately sized for solids and effluent.

    c. Specifications and cutsheets for the proposed grinder pumps for approval.

Existing wells, septic tanks, and septic drain fields:

46. Prior to final plat approval, any existing wells, or septic systems are to be decommissioned prior to final engineering plan approval and documentation shall be provided to the city that said wells and/or septic systems have been properly decommissioned in accordance with State and County guidelines. Additionally, any water rights associated with a decommissioned well shall be transferred to the City.

Roads:

[Public Roads]

47. The street improvement plans, along NE 28th Street, are to provide sufficient design information for the tapers to the east and west of the frontage improvements to allow for vehicular transitions.

48. The street improvement plans are to be submitted with the required seven-foot right-of-way dedication on NE 28th Street and street sections in accordance with CDSM Street Detail ST5 3 Lane Collector/Arterial. The applicant is required to construct a

37-foot full depth half-width street improvement, including a minimum of 23-feet of paved surface, curb & gutter, eight-foot planter strip, and six-foot detached sidewalk.

[Interior Public Roads]:

50. The street improvement plans are to be submitted with the future local public roads constructed in accordance with CDSM Street Detail ST2 - 2 Lane Local (60-foot right of way). Staff may support the segment of the future internal public road (NE Noble Avenue) south of future NE 26th Street being changed to a private road. Road ownership can be determined during final engineering design.

[Private Roads]:

51. If the private road in Tract C is longer than 150 feet, then the street plans and the preliminary plat shall be revised to provide for a dead-end turnaround at future Lot 19 and Tract D. The applicant is to work with engineering and the Fire Marshal for an acceptable dead-end turnaround to accommodate emergency vehicles. Garbage and recycling containers for Lots 17, 18, and 19 are to be placed at the right-of-way for pickup.

52. The applicant should provide a design for a 'No Parking and Towing' sign for review and approval. Said sign is to include contact information for a private towing company, as the city does not provide towing on private roads, nor does the city enforce no parking on private roads.

[Street lighting]

53. All street light locations are to be shown on the engineering and landscape plans. Any streetlights provided for private streets are required to be metered separately and are to be owned and maintained by the HOA/homeowners.

54. Prior to submittal of electrical plans to Clark Public Utilities, the preliminary electrical plans for streetlights, transformers, J-boxes, etc., which are prepared by others, are to be submitted to the city for review and approval.

[Street trees and Landscaping]:

55. The applicant is to show proposed driveway locations for each lot to ensure that street trees are not impacted.

56. The applicant is required to submit to the City for review and approval a final landscape plan consistent with the landscaping standards in CMC Chapter 18.13, in addition to CMC Chapter 17.19.030.F.6, and include plantings from the City's approved plant list.

[Storm Facility Landscaping]:

57. The applicant is to submit revised stormwater facility plans that provide:

    a. A minimum six-foot-high black vinyl coated chain link fence with top rail installed along the north property lines of Tract D where the tract abuts the future Lot 20;

    b. An L2 landscape buffer on all boundaries of Tract D; and

    c. A minimum 16-foot-wide double gate at the access road to the facility and a minimum four-foot-wide man gate.

Traffic Impact Analysis:

58. The corner sight-distance triangles/site vision clearance triangles, at to the intersection of the future access road and NE 28th Street, are to be shown on the final engineering plans and landscaping plans.

Prior to Land-Disturbing Activities:

55. Prior to any land-disturbing activities, an electronic copy of Ecology's NPDES GCSWP permit, an electronic copy of the SWPPP, and the financial security for erosion and sediment control are to be submitted to the city.

59. Prior to any land-disturbing activities, which includes tree cutting, clearing and grading, and an approved set of final engineering plans, including erosion prevention and sediment control measures is required.

Prior to Final Plat Approval:

Planning:

60. The applicant shall post a mitigation bond in an amount deemed acceptable by the city to ensure the oak and wetland mitigation is fully functional per CMC 16.51.250.

61. An avigation easement is required to be recorded on the title that provides notice that the property is located within an air traffic area per CMC 18.34.020.B and included as a note on the final plat.

Engineering:

62. The following notes are to be added to the final plat.

    1. Stormwater facilities located on Tracts B, D, and E are to be owned and maintained by the homeowner's association/homeowners at the completion of the two -year warranty period, which expires two-years after issuance of final acceptance.

    2. Right-of-entry shall be granted to the city for inspection purposes of the stormwater facilities located on Tracts B, D, and E.

62. The following note is to be added to the final plat providing to the city a utility easement for access, maintenance, replacement, repair, or extension, over and under the sanitary sewer force main located in private road 'Tract C'.

63. A note is to be added to the plat stating the Tract C is to be owned and maintained by the property owners and/or homeowners association.

64. A note is to be added to the plat stating the 'on-street parking is prohibited on both sides of Tract C'.

Prior to Final Acceptance:

Engineering:

65. The applicant shall remove all temporary erosion prevention and sediment control measures from the site at completion of all site improvements, which includes stabilization of all disturbed soil, prior to issuance of Final Acceptance from CDEV Engineering.

66. Final as-built construction drawing submittals shall meet the requirements of the Camas Design Standards Manual (CDSM).
    a. As-builts are to be submitted as PDFs and in either AutoCad or Carlson formats.
    b. The cover sheet for the as-builts is to include the originally approved and signed cover sheet.
67. The two-year warranty maintenance bond is to be submitted in accordance with CMC 17.21.070.A upon final acceptance of the development improvements a two-year (2) warranty bond commences.
68. The applicant shall be required to install the 'No Parking and Towing' signs.
69. Prior to final acceptance, the applicant is required to pay the proportionate share amount of $13,500.00 to the City of Vancouver. The applicant is to provide Camas staff with documentation of payment of said proportionate share amount.

Prior to Final Occupancy:

Planning:

70. Street trees adjacent to lots should be installed prior to final occupancy per CMC 17.19.030.F.4.

Proposed Plat Notes

1. A homeowner's association (HOA) will be required for this development. Copies of the C.C. & Rs shall be submitted and on file with the City of Camas.
2. Building permits will not be issued by the Building Department until all subdivision improvements are completed and Final Acceptance has been issued by the City.
3. Maximum building lot coverage can be up to 40-percent in the R-7.5 Single-Family Residential Zone for two-story dwelling units. Lot coverage for single-story dwelling units within this subdivision may have a maximum lot coverage of up 50-percent using density bonus/flexibility.
4. The lots in this subdivision are subject to traffic impact fees, school impact fees, fire impact fees and park/open space impact fees. Each new dwelling will be subject to the payment of appropriate impact fees at the time of building permit issuance.
5. Tree topping is not permitted within this development, nor removal of more than 20 percent of a tree's canopy. Trees that are determined to be hazardous by a licensed arborist may be removed after approval by the City. Required street trees shall be promptly replaced with an approved species.
6. In the event any item of archaeological interest is uncovered during a permitted ground disturbing action or activity, all ground disturbing activities shall immediately cease, and the applicant shall notify the City and the Department of Archaeology and Historic Preservation (DAHP).

7. Stormwater facilities located on Tracts B, D, and E are to be owned and maintained by the homeowner's association/homeowners at the completion of the two-year warranty period, which expires two-years after issuance of final acceptance.
8. Right-of-entry shall be granted to the city for inspection purposes of the stormwater facilities located on Tracts B, D, and E.
9. The private road 'Tract C' consists of a utility easement for access, maintenance, replacement, repair, or extension, over and under the sanitary sewer force main is to be conveyed to the city.
10. Tract C is to be owned and maintained by the property owners and/or homeowners association.
11. On-street parking is prohibited on both sides of Tract C.

DATED this 8th day of March 2023.

Joe Turner, AICP
City of Camas Land Use Hearing Examiner

Monte Verde Subdivision (SUB22-05)
Index of Exhibits

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3	Pre-Application Conference Notes	1/20/22
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5	Geotechnical Report	7/12/22
6	Transportation Impact Study	7/13/22
7	Preliminary Stormwater Report	7/2022
8	Mailing Labels Map & Certified List	7/13/22
9	Mailing Labels	8/11/22
10	Critical Areas Report	8/5/22
11	SEPA Checklist	8/8/22
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14	Technically Incomplete Letter	9/7/22
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22	Revised Preliminary Existing Conditions	10/31/22
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24	Technically Complete Letter	11/7/22
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26	SEPA Distribution Packet	12/15/22
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28	Ecology SEPA Comment	12/29/22
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30	Revised Preliminary Utility Plans	1/23/23
31	Notice of Public Hearing	2/3/23
32	Memo from Engineering Staff	2/16/23
33	Staff Supplemental Memo Lot Coverage	2/22/23
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35	Final Order	3/8/23