Town of Yacolt

Yacolt Town Council Meeting Agenda

Monday, January 11, 2021

7:00 PM

Town Hall

Call to Order

Flag Salute

Roll Call

Late Changes to the Agenda

Approve Minutes of Previous Meeting(s)

1. Minutes from 12212020 Council Meeting

Citizen Communication

Anyone requesting to speak to the Council regarding items not on the agenda may come forward at this time. Comments are limited to 3 minutes. Thank you.

Unfinished Business

New Business

2. DYCF Emergency Foster Home

3. Belcorp Short Plat Hearing

Town Clerk's Report

Public Works Department Report

Attorney's Comments

Mayor's Comments

Citizen Communication

Anyone requesting to speak to the Council regarding items not on the agenda may come forward at this time. Comments are limited to 3 minutes. Thank you.

Council's Comments

Approve to Pay Bills on Behalf of the Town

Adjourn

Yacolt Town Council- Meeting Minutes
Monday, December 21st, 2020
Town Hall Virtual/ Telephonic- 7:00 PM

Call to Order

Mayor Listek called the meeting to order at 7:00 pm

Flag Salute

Roll Call

PRESENT

Mayor: Katelyn Listek

Council Members: Amy Boget, Michelle Dawson, Herb Noble, Malita Moseley, Marina Viray

Public Works: Director Tom Esteb

Town Attorney: David Ridenour

Approve Minutes of Previous Meetings

Motion was made to approve minutes of the December 7th Council meeting

Motion: Boget **2nd:** Viray

Aye: Boget, Dawson, Noble, Moseley, Viray **Nay:** 0

Motion passed

Citizen Communication

- A caller wanted a status update on the Tallman's and the Tae Kwon Do buildings. Another caller concurred that it appears that people are living in them, and/or holding events in them. Mayor Listek responded that documentation (photos/ videos, times, notations of activities) is necessary in order to process code violations, and we lack good documentation at this point. We may need to check in with neighbors for this.
- Caller also wanted to voice that she supports recording meetings because when she misses meetings, she likes to be able to hear the audio recordings. Mayor Listek explained that we will record hearings, but are not planning to record regular meetings at this time. She welcomes calls and encourages meeting attendance.

- Another caller asked if there is some kind of plan to lock down the Rec Park parking lot. Late at night, kids do cookies through the lot, creating a noise nuisance and tearing up the ground. Mayor Listek responded that we are aware and are trying to come up with deterrents; again, we need documentation in order to prosecute. (Videos/ photos/ license plate numbers, etc.)

Unfinished business

- Mayor Listek introduced her Mayor's Message and Proposed 2021 Budget for a final review before voting to adopt the budget. No one posed any questions or concerns.

Mayor Listek then introduced Ordinance #584, Adopting the Proposed 2021 Budget.

Motion was made to pass Ordinance #584 as written.

Motion: Viray **2nd:** Noble

Ayes: Dawson, Noble, Viray **Nays:** Boget, Moseley

Motion Passed

New Business

- C-Tran Rep- A C-Tran Board Representative and Alternate needed to be selected. Since Councilman Noble is currently the alternate, he spoke up and recommended that Doug Boff be nominated as our pick for Representative, leaving Noble as alternate, and Ron Onslow (current Rep) in 3rd position.

Motion was made to select our Reps as Noble recommended above.

Motion: Boget **2nd:** Moseley

Ayes: Boget, Dawson, Noble, Moseley, Viray **Nays:** 0

Motion Passed

- Town Engineer- Notice was put out in November for Requests for Qualifications for a firm to act as our Town Engineer. We only received one submittal, from Jackson Civil Engineering, which is the same company we have been using since at least 2017. Jackson's contract was looked over by council and approved as written.

Motion was made for the Town to Execute the contract with Jackson Civil Engineering for 2021.

Motion: Boget **2nd:** Moseley

Ayes: Boget, Dawson, Noble, Moseley, Viray **Nays:** 0

Motion Passed

- Saving Money- A report had been sent out to Council Members by the Town Attorney, to be used as a guideline for future decisions on the use of professionals by the town. The report detailed both attorney and engineering costs incurred over this year. Council members had the opportunity to discuss those fees, and were encouraged to use the report as a tool. Councilmember Boget asked if there has been any progress on setting us up with an interlocal agreement for our building department. Mayor Listek responded that there is really only one city she has found to be comparable to Yacolt, but she is continuing to research. Also, mistakes have been found in the way our own building department. was set up, and steps are being worked on to correct those. Boget also pointed out that that there are tasks on the attorney's report which should be done by Town staff (clerk/ treasurer/ building dep't., legal research), but is there enough time for the clerk to complete all those tasks as needed? She offered that perhaps Council Members might be called on to come in to help if needed.

Town Clerk's Report

- All bank reconciliations are up-to-date, and all treasurer's reports are posted on the website. Daily work is all caught up; all grant paperwork has been submitted for the year, and all their funds have been received. The clerk has created a new, automated payroll spreadsheet to streamline recording of staff's hours for all of 2021. Next goal: correcting public works payroll distributions to start off 2021 payroll accurately.

Public Works Report

- Will be working in the shop for about a month to winterize equipment, mowers, etc. The star on the Christmas tree appears to have a direct short higher than 20 feet up. Jes Seekins will try to climb up there before Christmas to find, repair the short if possible. A drone was flown up around tree, but no damage could be seen.

Attorney's Comments

- Since the clerk is posting notices, calendaring, etc., the attorney has only been having to look things over, rather than originating new work lately. He is able to be more hands-off as the clerk handles more responsibilities. The paralegal concept may still be a good option; we are behind on filling PRA requests, which is something a paralegal could help with. Boget said she had thought the paralegal idea was dead-in-the-water; Mayor Listek wasn't sure the paralegal was an entirely efficient idea, but if anyone wants to refer a paralegal, she will be happy to talk with them. Atty. Ridenour suggested that perhaps when the clerk gets to the point of really needing help, we could look at hiring a paralegal part-time, and just use the attorney as support.

Ridenour also wanted to point out two other issues:

a) Code enforcement: One violation has been resolved; another file remains open, and we are still compiling info. He pointed out that if anyone in the community has a complaint, they should file it clerically and follow proper steps, including providing documentation.
b) Fees: He is open off-the-clock for any council members' questions about fees or dealing with any complex problems. He is devoted to saving the Town money, as can be seen on his report, which clearly shows much work done gratis.

Mayor's Comments

- With all the challenges this year has brought to our community, this year has seemed so long, yet has flown by so fast. Thank you to all community members for pulling together in the midst of situations such as the wildfires and the pandemic. We should all count every day as a blessing. She thanked the council, and knows that in the coming year, they can all make a positive impact on the people around them. She pointed out how diverse and balanced our council is, and that they are a beautiful representation of our community. She thanked the Town staff, attorney, and engineer for pulling together for a successful year. She hopes everyone's holidays are filled with love and happiness.

Council's Comments

- Noble thanked our Public Works staff, Tom and Terry, for everything they do behind the scenes to keep this town running smoothly, particularly being out in the bad weather this time of year.
- Boget wishes all a happy Yule, Kwanzaa, Merry Christmas – however they celebrate the holidays.
- Dawson wished everyone a Merry Christmas, and is looking forward to January 2021.
- Moseley said she celebrates Hanukkah, and wished to share a Happy Hanukkah to those others who celebrate it.

Approval to pay bills on behalf of the town

Motion made to pay the bills on behalf of the town: $26, 139.14 total

Motion: Boget **2nd:** Viray

Yea: Boget, Dawson, Noble, Moseley, Viray **Nay**: 0

Motion Passed

Adjourn

Mayor Listek adjourned the meeting at 8:04 pm

_____ _____

Katelyn J. Listek, Mayor Stephanie Fields, Clerk

Town of Yacolt
Request for Council Action

CONTACT INFORMATION FOR PERSON/GROUP/DEPARTMENT REQUESTING COUNCIL ACTION:

Name: Brittney Samaduroff

Group Name:

Address:

Phone: (360) 550-2719

Email Address: Brittneysamaduroff@dcvisitation.com

Alt. Phone:

ITEM INFORMATION:

Item Title: DCYF Temporary housing for foster teens

Proposed Meeting Date: January 11, 2021

Action Requested of Council:

Council will hear presentation by Department of Children, Youth and Families Representative

Proposed Motion: none

Staff Contact(s): Clerk Fields clerk@townofyacolt.com

Mayor Listek mayorlistek@townofyacolt.com

(360) 686-3922

Town of Yacolt
Request for Council Action

CONTACT INFORMATION FOR PERSON/GROUP/DEPARTMENT REQUESTING COUNCIL ACTION:

Name: Stephanie Fields, Town Clerk

Group Name: Staff

Address: 202 W. Cushman St.
P.O. Box 160
Yacolt, WA 98675

Phone: (360) 686-3922

Email Address: clerk@townofyacolt.com

Alt. Phone:

ITEM INFORMATION:

Item Title: Belcorp Short Plat Application: Public Hearing and Council Review.

Proposed Meeting Date: January 11, 2021.

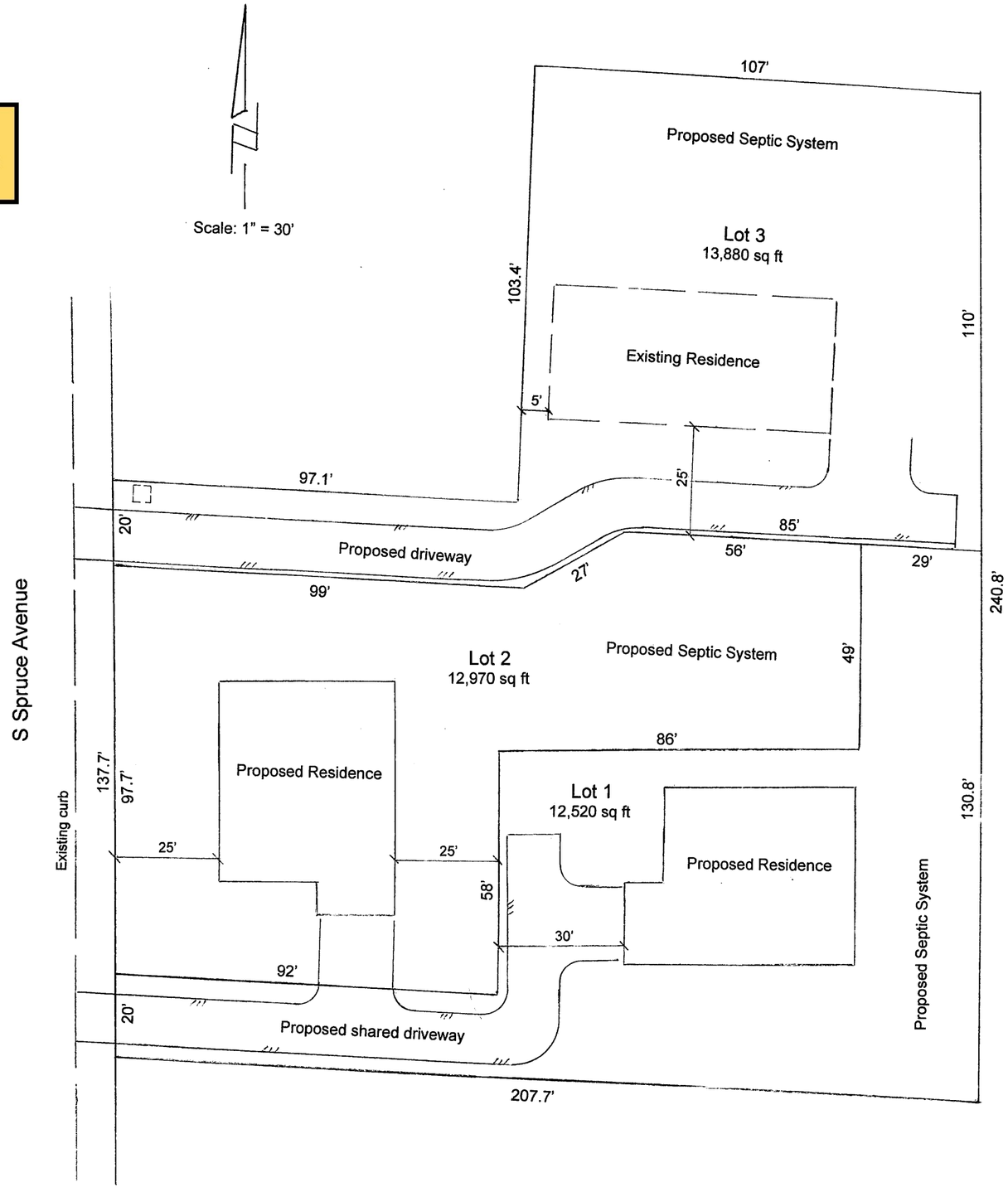
Action Requested of Council: Consider Application to Short Plat the property at 125 S. Spruce Ave. The Council will hear presentations from the Town Engineer and the Applicant, as well as public comments on the proposals. Supporting materials are attached, including: Plat Maps; the Staff Report; SEPA DNS; Applicant's Narrative in Support of the Short Plat Application; Copy of Public Hearing Advertisement; Stormwater Technical Information Report; Applicant's Request for Modification of Yacolt's Sidewalk Standards; and Applicant's Narrative Request for Variance re; Determination of Front Lot Line / Setback for Flag Lot (Lot 3).

Proposed Motion: "I move that the application to Short Plat Parcel #65150-000, at 125 S. Spruce Ave., to create 3 residential building lots be approved with the conditions described by the Town Engineer *[or]* denied."

Summary/ Background: The Applicant is requesting a permit to short plat the parcel at 125 S. Spruce Avenue into three building lots. The Town Engineer suggests that any approval of the Application include conditions as described in the Staff Report. Staff interprets Yacolt's Municipal Code to require a front setback for Lot 3 that is larger than the distance between the "front" lot line and an existing home that would remain on the property. The Applicant interprets its proposal as compliant with the YMC's setback rules, or in the alternative, requests a variance of the Code's minimum front setback requirements.

Staff Contact(s): Stephanie Fields, Town Clerk.
Katelyn Listek, Mayor of Yacolt.

PLAT MAP
PROPOSED SHORT PLAT



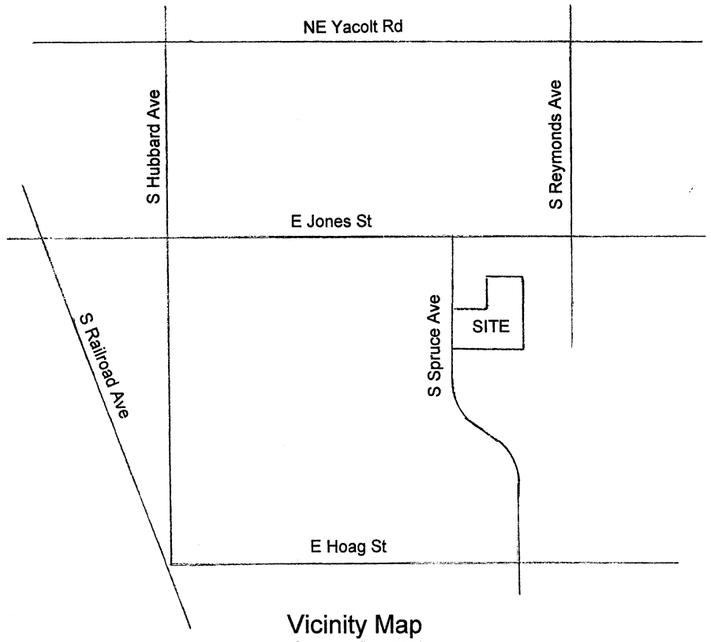
Date: 8-14-20

Contact: Ed Greer
Wyndham Enterprises, LLC
13023 Hwy 99 Suite 7-126
Vancouver WA 98686
360-904-4964 ed@ed-greer.net

Property Owner & Applicant:
Andrew Bell
PO Box 23 Yacolt WA 98675
360-903-8310 andrew@belcorp.co

Belcorp Short Plat
a residential Short Plat
Town of Yacolt WA

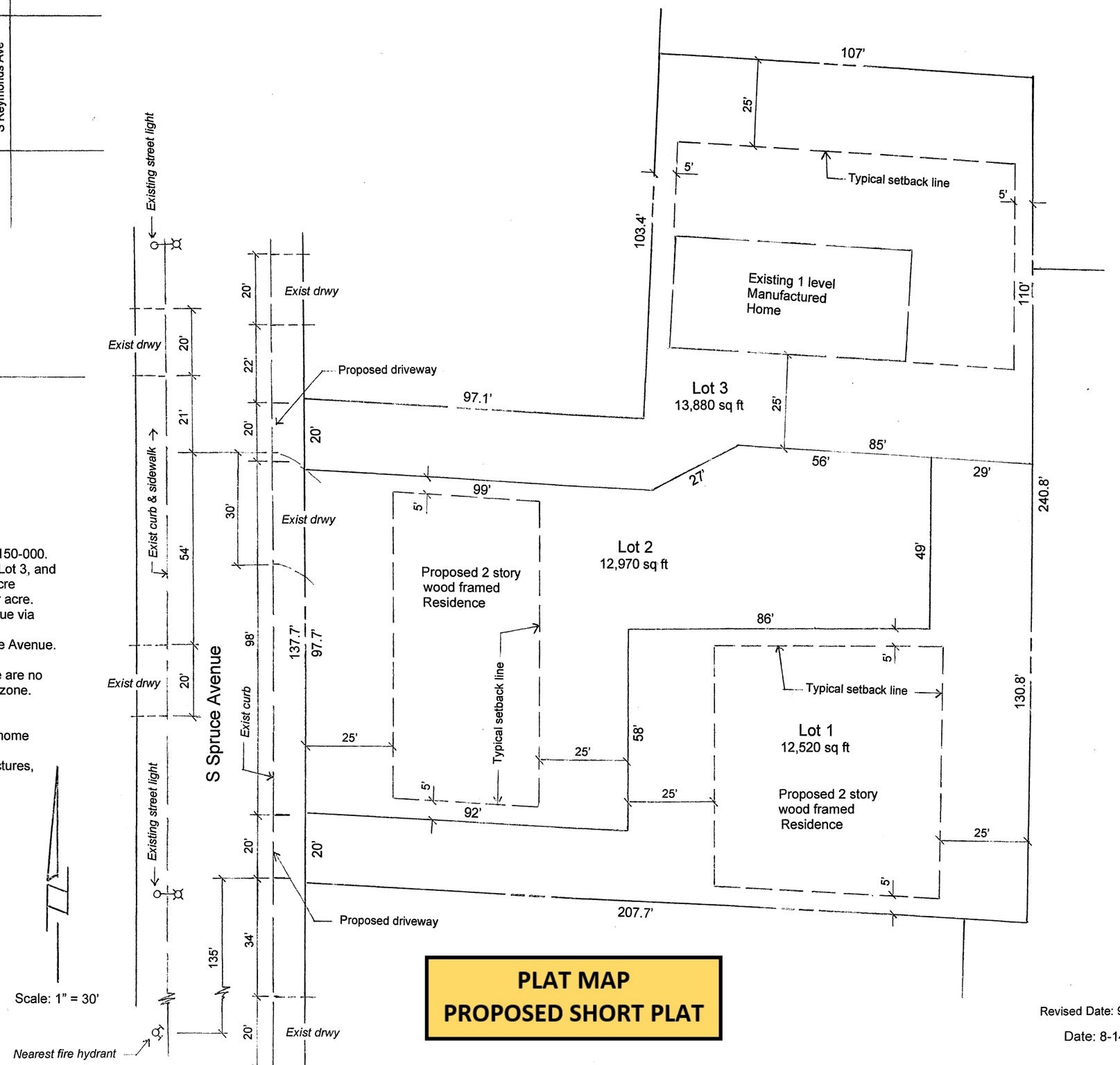
Preliminary
Plot Plan



Vicinity Map
Scale: 1" = 500'

Notes

1. Site address: 125 S Spruce Avenue. County tax lot number 65150-000. Site contains a manufacture home to be retained on proposed Lot 3, and a shop building to be removed. Zone is R1-12.5. Site is 0.91 acre
2. The proposed lots comply with Table 4A. Density is 3.3 lots per acre. Proposed Lots 1 and 3 will have frontage along S Spruce Avenue via 20' wide flag stems.
3. All 3 lots will be connected to the existing water line in S Spruce Avenue. A septic system is proposed for each lot.
4. GIS has a mapped habitat area through the site, however there are no critical areas on the property. Lot 2 is within the 100 year flood zone.
5. There are no striped bicycle lanes along S Spruce Ave. Parking is permitted on both sides.
6. Refer to the Preliminary Plot Plan for information on proposed home locations, driveways and septic systems.
7. Refer to the Existing Conditions Plan for ground contours, structures, graveled areas, etc.
8. No proposed fire hydrants.



Scale: 1" = 30'

Nearest fire hydrant

PLAT MAP
PROPOSED SHORT PLAT

Revised Date: 9-18-20

Date: 8-14-20

Contact: Ed Greer
Wyndham Enterprises, LLC
13023 NE Hwy 99 Suite 7-126
Vancouver WA 98686
360-904-4964 ed@ed-greer.net

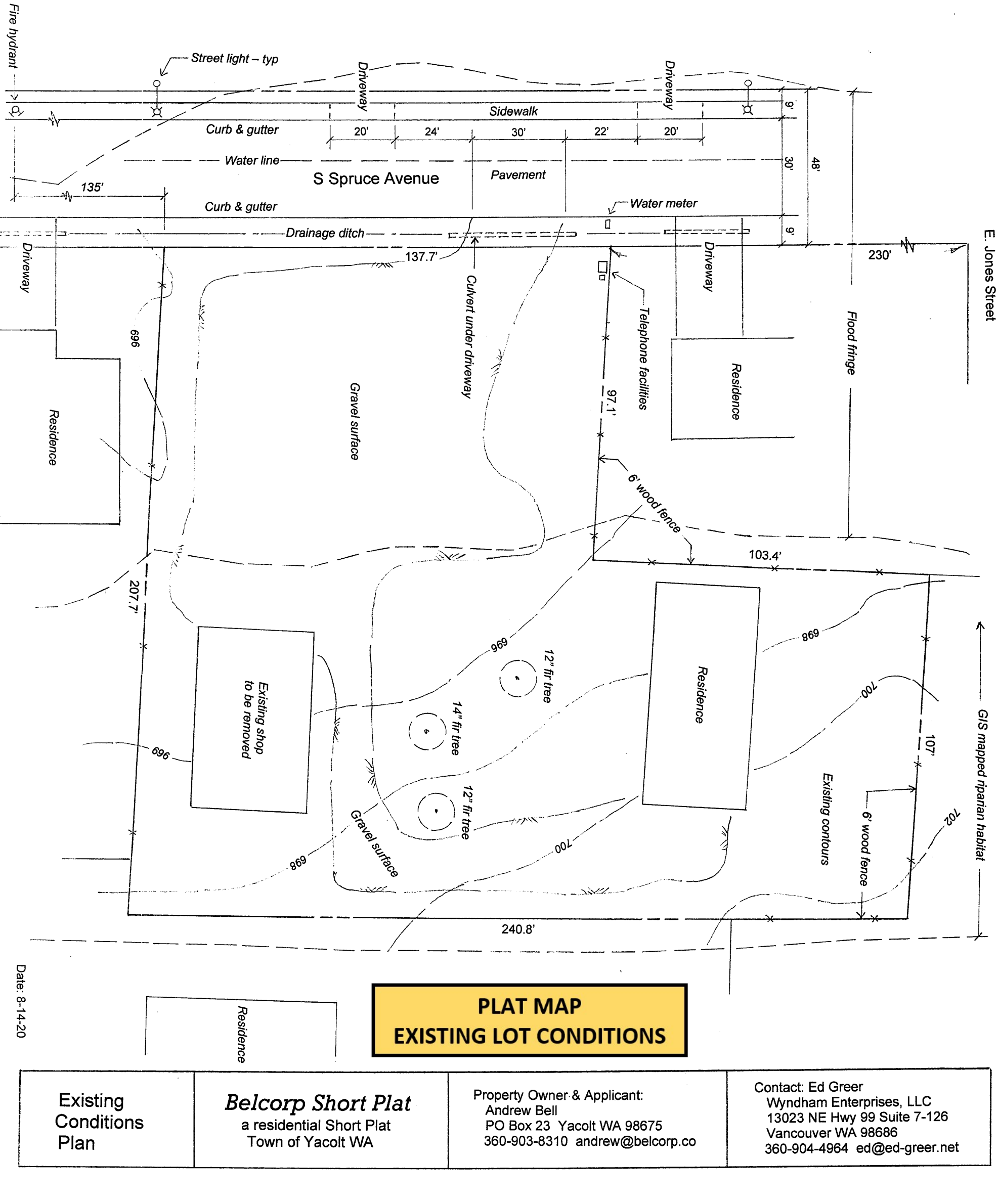
Property Owner & Applicant:
Andrew Bell
PO Box 23 Yacolt WA 98675
360-903-8310 andrew@belcorp.co

Belcorp Short Plat
a residential Short Plat
Town of Yacolt WA

Preliminary
Short Plat

Refer to Preliminary Short Plat for Vicinity Map

Scale: 1" = 30'



Date: 8-14-20

PLAT MAP
EXISTING LOT CONDITIONS

Existing Conditions Plan	*Belcorp Short Plat* a residential Short Plat Town of Yacolt WA	Property Owner & Applicant: Andrew Bell PO Box 23 Yacolt WA 98675 360-903-8310 andrew@belcorp.co	Contact: Ed Greer Wyndham Enterprises, LLC 13023 NE Hwy 99 Suite 7-126 Vancouver WA 98686 360-904-4964 ed@ed-greer.net

Town of Yacolt

202 W. Cushman Street, Yacolt, WA 98675
(360) 686-3922

Staff Report and Recommendation to the Town Council

Project Name: **Belcorp Short Plat**

Report Date: November 18, 2020

Hearing Date: January 11, 2021

Proposal: The applicant is seeking preliminary short plat approval to subdivide 0.91 acres into a three (3)-lot single-family short plat. The application includes a request for modification and a variance request.

Location: 125 S Spruce Avenue, Yacolt, WA 98675
Assessor's Tax Parcel # 65150-000

Applicant/Owner: Andrew Bell

Applicant's Rep: Ed Greer
Wyndham Enterprises, LLC
13023 NE Hwy 99, Suite 7-126
Vancouver, WA 98686
(360) 904-4964

Staff: Katie Listek, Mayor
Tom Esteb, Public Works
Stephanie Fields, Town Clerk
David Ridenour, Town Attorney *(Consultant)*
Devin Jackson, Town Engineer *(Consultant)*

SEPA: Recommending a Final Determination of Non-Significance (DNS)

Recommendation: **Preliminary Denial** subject to conditions listed at the conclusion of this report.

TABLE OF CONTENTS

I. BACKGROUND

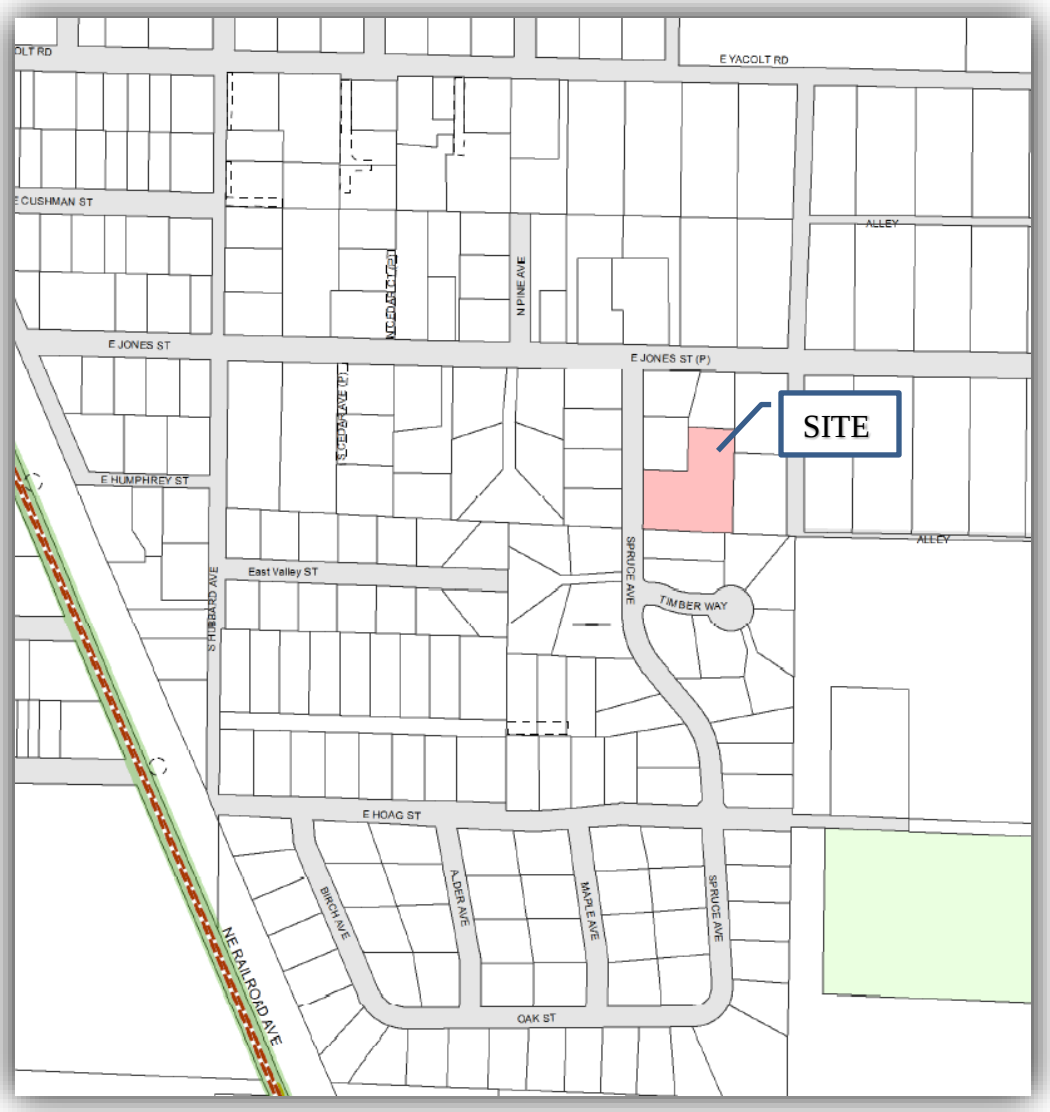
A. General Site Information

Size of Site:	0.91 acres
Existing Vegetation:	Landscaping
Existing Structures:	House and Shop
Adjacent Land Uses:	Surrounded by residential lots
Adjacent Zoning:	Single-Family Residential (R1-12.5) the North, South, East, and West.
Topography:	The site is flat, sloping from north east to south west
Wetlands:	No mapping indicators
Flood Plain:	100-year flood plain
Access Roads:	S. Spruce Avenue

B. Land Use Processing

Date Application Submitted:	August 20, 2020
Application Technically Complete:	October 16, 2020
Notice of Application:	January 11, 2021
Site Posted:	
Reflector Publication:	December 23, 2020
Staff Report Issuance:	November 3, 2020
Public Hearing	January 11, 2021

Figure 1. Location



II. PROCEDURAL REQUIREMENTS

The authority for this review is described in YMC 18.25 (Single-Family Residential Districts); YMC 13.10 (Stormwater Management and Facility Maintenance); YMC 13.25 (Public Works Construction Standards); YMC 16.05-16.10 (SEPA); and the Town of Yacolt Comprehensive Growth Management Plan 2003-2023 (as updated). The Application appears to comply with YMC 16.20-16.45, (Critical Areas). The public hearing will be conducted in accordance with rules of procedure adopted by the Yacolt Town Council. The final decision on the Applications will be made by the Yacolt Town Council.

III. APPLICABLE REGULATIONS/ANALYSIS

A. Yacolt Municipal Code (YMC); Town of Yacolt Engineering Standards

1.	Title 13 Public Services
13.05 Water Main Installation	**Compliance:** Conditionally

Finding: Potable water will be required for this project. Clark Public Utilities is the public water purveyor for properties within the town limits.

Applicant has provided a Utility Review letter from Clark Public Utilities.

Currently, an 8-inch water line in S Spruce Avenue runs north/south in the street. The applicant shall make connections to this line.

The applicant has not shown the size of the water meters. All water meters including their sizes shall be shown on the final engineering plans.

It should be noted that final engineering plans pertaining to water service for the proposed project shall be submitted for staff and Clark Public Utilities review and approval prior to building permit issuance. Final engineering plans shall be prepared and stamped by a professional engineer registered in the State of Washington.

13.10 Stormwater Management and Facility Maintenance	**Compliance:** Conditionally

Finding: YMC 13.10.010 adopts the Town of Yacolt Stormwater Management Plan. The plan specifies the Puget Sound Manual as the governing manual. The 2014 SWWMM may be used in lieu of the Puget Sound Manual. If the 2014 SWWMM is used it must be followed in it's (entirety/totality). Project is within a Category 1 Critical Aquifer Recharge Area (CARA). LID requirements must be met.

It is anticipated that the development shall create greater than 2,000 square feet of new impervious surface, therefore all minimum requirements apply.

The applicant has submitted a preliminary stormwater plan and preliminary hydrology report for review. The applicant proposes CAVFS and downspout dispersion to treat and infiltrate stormwater runoff.

The final plat shall include a note specifying the stormwater facilities are to be privately owned and maintained.

It should be noted that final engineering plans for stormwater control and drainage shall be submitted for staff review and approval prior to building permit issuance. Final engineering plans shall be prepared and stamped by a professional engineer registered in the State of Washington.

13.15 On-site Sewage Disposal Systems	**Compliance:** Conditionally

Finding: The proposed development will require the construction of on-site sewage disposal systems. The systems are subject to State and Clark County Health Department requirements.

The applicant has provided a Conditional Development Review Evaluation letter from Clark County Health Department.

It should be noted that final engineering plans pertaining to the on-site sewage disposal systems for the proposed project shall be submitted for staff and Clark County Health Department review and approval prior to building permit issuance. Final engineering plans shall be prepared and stamped by a professional engineer registered in the State of Washington.

13.20 Fire Hydrants	**Compliance:** Conditionally

Finding: Fire hydrants serving one- or two-family dwellings shall have a maximum lateral spacing of seven hundred feet (measured along fire apparatus access roads) with no lot or parcel in excess of five hundred feet from a fire hydrant.

The existing hydrant on the west side of S Spruce Avenue is less than 500 feet away and can service all proposed lots.

13.25 Public Works Construction Standards	**Compliance:** Conditionally

Finding: The project shall meet the Town of Yacolt's Engineering Standards for Public Works Construction.

Chapter 1.00 Requirements for Public Improvements

A) All public improvements shall meet Americans with Disabilities Act (ADA) requirements. Per applicant's Request for Modification of Town Standards, it is requested that sidewalks are not required along the frontage of S Spruce Avenue. Staff agrees with Request for Modification due to current area being fully developed to standards, absence of sidewalk abutting development, and existing stormwater facility.

3A.01 Access – Applicant proposes to relocate and replace one access and proposes one new access. The existing access is proposed to be relocated along the north end of the parcel, which will service one lot. The new access along the south end of the parcel will be shared and service two lots.

3A.07 Street Frontage Improvements – All residential subdivisions, commercial developments, and short plats shall install street frontage improvements. Per applicant's Request for Modification of Town Standards, it is requested that sidewalks are not required along the frontage of S Spruce Avenue. Staff agrees with Request for Modification due to current area being fully developed to standards, absence of sidewalk abutting development, and existing stormwater facility.

3A.12 Curb and Gutter – Curb and gutter shall be utilized for street edges whenever possible and shall always be used under the following conditions:

1) All streets – residential, commercial, or arterial. Applicant shall install curb and gutter with driveway drops.

3A.13 Survey Monuments – Survey monuments shall be located in all subdivisions and short plats.

3A.14 Concrete Sidewalks – Sidewalk along the frontage of S Spruce Avenue is required. Per applicant's Request for Modification of Town Standards, it is requested that sidewalks are not required along the frontage of S Spruce Avenue. Staff agrees with Request for Modification due to current area being fully developed to standards, absence of sidewalk abutting development, and existing stormwater facility.

3A.18 Driveways - Applicant proposes two driveways, one of which will be shared. Existing driveway is to be abandoned. Street frontage improvements are required at the location of removed area.

3A.22 Street Illumination – Street lighting is required as a part of all public streets. The applicant has not provided a lighting plan. Calculations shall be included as part of the final engineering plans. A plan compliant with 3B.17 shall be provided as part of the final engineering plans.

It should be noted that final engineering plans pertaining to public works construction standards for the proposed project shall be submitted for staff review and approval prior to building permit issuance. Final engineering plans shall be prepared and stamped by a professional engineer registered in the State of Washington.

2.	**Title 15 Building and Construction**	
15.05 Code for the Abatement of Dangerous Buildings		**Compliance:** Conditionally
Finding: The Town of Yacolt adopts the "Uniform Code for the Abatement of Dangerous Buildings, 1976 Edition." All permits must be secured prior to any construction and all applicable impact and permit fees shall be paid prior to the issuance of the permits.		
15.10 Energy Code		**Compliance:** Conditionally
Finding: The Town of Yacolt adopts the "Northwest Energy Code 1987 Edition." All permits must be secured prior to any construction and all applicable impact and permit fees shall be paid prior to the issuance of the permits.		
15.15 Flood Damage Prevention		**Compliance:** Conditionally
Finding: The Town of Yacolt has adopted a 100-year Flood Plain Map. The proposed development falls within of identified flood plains. Under YMC 15.15.040.A.1, a Development Permit shall be obtained before construction or development begins within any area of special flood hazard.		

3.	**Title 16 Environment**	**Compliance:** Conditionally
Division 1: State Environmental Policy Act (SEPA) – The Town of Yacolt has issued a Determination of Non-Significance (DNS) based on the applicant provided SEPA checklist. The determination and checklist have been provided to agencies and the public for an opportunity to comment. Division 2 – The proposed development is inside a Category 1 Critical Aquifer Recharge Area (CARA). 16.25 - Class V injection wells are prohibited inside Category 1 CARAs. The applicant shall not propose Class V wells for stormwater management. 16.35 - Frequently Flooded areas are required to meet standards outlined in YMC 16.30.020. Proposal falls within the 100-Year Flood floodplain and is required to meet above standards.		

4.	Title 17 Subdivisions
17.05 Short Subdivisions	**Compliance:** Yes
Finding: The development proposes three (3) lots. The development is a Short Subdivision by definition.	

5.	Title 18 Zoning
18.25 Single-Family Residential Districts	**Compliance:** No

Table 4A

				SETBACK			
Classification	**Minimum Lot Area (sq. ft.)**	**Average Lot Width (feet)**	**Average Lot Depth (feet)**	**Front Yard (feet)**	**Side Yard (feet)**	**Opposite Side Yard (feet)**	**Rear Yard (feet)**
R1-10	10,000	60	90	25	5	5	25
R1-12.5	12,500*	80	90	25	5	5	25

The minimum street side yard shall be 15 feet.

* The minimum lot size will be established using Method 2, in the building lot size of 12,500, provided there are no soil concerns that would result in the change of the minimum building lot size.

Finding: Dimensional requirements within the residential districts shall be in accordance with the R1-12.5 Zoning District metrics described in Table 4A above. The maximum coverage by building and structures shall not exceed 50 percent.

Proposed lot containing the existing house does not meet minimum setback distance for a "front lot line". Per the definition pertaining to flag lots, "the front lot line is the shortest lot line adjoining the pole portion of the lot, excluding the undecidable portion of the pole." Setback distance from existing building is 5 feet; however, 25 feet is required.

Applicant has submitted a Variance Request of Town Standards to the Town of Yacolt in regards to the front lot line definition under YMC 18.10.010. Per YMC 18.45.020, variance shall be made only when all of the following conditions and facts exist:

A. *Unusual circumstances of conditions apply to the property and/or to the intended use that do not apply generally to other property in the same vicinity or district;*

B. *Such variance is necessary for the preservation and enjoyment of a substantial property right of the applicant possessed by the owners of other properties in the same vicinity or district;*

C. *The authorization of such variance will not be materially detrimental to the public welfare or injurious to property in the vicinity or district in which property is located;*

D. *That the granting of such variance will not adversely affect the realization of the comprehensive plan.*

After review of Applicant's Variance Request, staff believes it does not adequately address or satisfy YMC 18.45.020 requirements (A), (B), and (D).

Per Condition A: The Applicant's proposal is creating the flag lot condition, which does not meet code standards. The condition does not pre-exist the proposal.

Per Condition B: The Applicant has failed to identify the impacted substantial property rights in the variance request. The Owner has the right to develop the parcel in compliance with the code and zone. The Applicant is requesting to obtain permission to develop outside of the adopted standards which govern the zone.

Per Condition D: Proposal is located within a Single-Family Residential (R1-12.5) district. The applicant's proposal does not meet the requirements of the zone and therefore the proposal does not follow the comprehensive plan as adopted.

18.70 Parking, Access, and Circulation	**Compliance:** Yes

Finding: Application will be required to meet parking standards and the standards of the Town of Yacolt's Engineering Standards.

Table 11A

USE	MINIMUM NUMBER OF PARKING SPACES
A. Residential	
1. 1-, 2- and 3-unit family dwellings	2 spaces/dwelling unit. Single-family and duplex parking may be tandem (one car behind the other).
2. Multifamily dwelling containing 4 or more dwelling units	1 1/2 spaces/dwelling unit
3. Apartment, hotel, rooming or boarding house	1 1/2 spaces/guest accommodation
4. Residential care facility	1 space/7 residents served under age of 12 1 space/5 residents served ages 12 – 17 1 space/4 residents served ages 18 years or older
5. Retirement housing facilities	1 space/each 3 units
B. Commercial residential	
1. Hotel	1 space/bedroom
2. Motel	1 space/bedroom
3. Clubs/lodges	Spaces to meet the combined requirements of the uses being conducted, such as hotel, restaurant, auditorium, etc.
C. Institutions	
1. Welfare or correctional institutions	1 space/3 beds for patients or inmates
2. Convalescent hospital, nursing home, sanitarium, rest home, home for the aged	1 space/3 beds for patients or residents
3. Hospital	2 spaces/bed
D. Places of assembly	
1. Church	1 space/4 seats, or 8 feet of bench length in the main auditorium

YMC 18.70.020A requires a certain number of parking spaces based on the classification of use. Per Table 11A, above, the development is to provide 2 parking spaces per dwelling unit. Applicant to provide adequate spacing for two parking spaces per dwelling unit and ensure ample maneuverability for vehicles. This standard is met.

Table 11B

Angle (degrees)	Type	Stall width	Stall depth	Aisle width	Curb length
A		B	C	D	E
0	Compact	8.0	8.0	12.0	22.0
	Standard	9.0	9.0	12.0	22.0
45	Compact	8.0	19.1	14.0	11.3
	Standard	9.0	19.8	13.0	12.7
60	Compact	8.0	20.4	19.0	9.2
	Standard	9.0	21.8	18.0	10.4
70	Compact	8.0	20.6	20.0	8.5
	Standard	9.0	21.0	19.0	9.6
90	Compact	7.5	15.0	24.0	7.5
	Standard	9.0	20.0	24.0	9.0

YMC 18.70.030 requires off-street parking spaces comply with the standards for stalls and aisles, as set for by Table 11B, above. Off-street parking spaces for dwellings shall be located on the same lot as the dwelling. The application proposes off-street parking spaces for dwellings, located on the same lot per dwelling. This standard is met.

YMC 18.70.040B requires public buildings to provide a loading space per 30,000 square feet of floor area. The application proposes less than 30,000 square feet of floor area. This standard is met.

YMC 18.70.060 requires access and circulation for a proposed development, which shall be improved to the standards in this chapter before the county issues an occupancy permit or final inspection for the development in question. Access is provided from S Spruce Ave through a proposed two-way driveway. Driveways shall comply with the standards for driveways as set by Section 3B.13 of the Town of Yacolt Engineering Standards.

YMC 18.70.070 requires circulation be provided to pedestrian and bicycle routes. No pedestrian or bicycle routes are proposed. This standard is met.

Parking Lot is defined as a paved surface on private property in the engineering standards.

18.75 Landscaping and Screening	**Compliance:** Yes

Finding: Landscaping if required, shall be per this section.

Table 12A – Landscaping and Screening Matrix

	Zoning of proposed development							
	Single-family		Multifamily		Commercial		Light Manufacturing	
Zoning of land abutting development site	Separated from site by a street	Not separated by a street	Separated from site by a street	Not separated by a street	Separated from site by a street	Not separated by a street	Separated from site by a street	Not separated by a street
Single-family	None	None	L2 10-ft	L3 5-ft	L2 10-ft	L4 in 15-ft L5 in 10-ft	L3 10-ft	L4 in 50-ft L5 in 40-ft
Multifamily	None	L3 5-ft	L1 5-ft	L1 5-ft	L2 10-ft	L4 in 15-ft L5 in 10-ft	L3 10-ft	L4 in 15-ft L5 in 10-ft
Commercial	L1 5-ft	L3 10-ft	L2 5-ft	L3 10-ft	L2 10-ft	L1 5-ft	L2 10-ft	L3 5-ft
Light Manufacturing	L1 5-ft	L3 50-ft	L2 5-ft	L3 10-ft	L3 10-ft	L2 5-ft	L2 10-ft	L1 5-ft

YMC 18.75.020 requires landscaping and screening matrix dependent upon zoning adjacent to the proposed development. The proposed development is zoned single-family residential, as are the properties to the North, South, East, and West.

No landscaping or screening is required along these site boundaries. This standard is met.

YMC 18.85 requires the addition of signs common to the several zoning districts for preservation of the character of the area, structures, and uses; the needs of residential, commercial, industrial, and agricultural potential; the need for health, safe, and convenient use of all lands, and the conservation and promulgation of values and resources. The requirements include, but are not limited to, standards relating to the number, size, placement, and physical characteristics of signs.

No signage is proposed with this application. This standard is met.

B.	**Service Development Charges, Impact Fees, Credits**

Fees will be calculated at the time of building permit issuance based on the adopted Fee Schedule at that time. This project doesn't address any creditable capital infrastructure therefore no credits are available for this project.

C.	**Public/ Agency Comments**

1. None at this time.

IV. RECOMMENDATION

After review of the proposal and applicant codes staff recommends the following:

- Rejection of the Variance Request
- Rejection of the Preliminary Short Plat application.
- Modification Request approval.

If council chooses to approve the variance application and preliminary short plat application, staff has determined the below conditions of approval should apply.

CONDITIONS OF APPROVAL

A. <u>Prior To Engineering Approval:</u>

1. Submit final engineering plans, for review and approval by staff, pertaining to transportation, sewer, water, grading, erosion control, stormwater, driveway, and frontage prepared and stamped by a registered engineer in the state of Washington. The following statement shall appear on the cover sheet of all plans at a location immediately above or below the developer engineer's professional stamp. **"I hereby certify that these plans, and related design, were prepared in strict conformance with the Town of Yacolt's Engineering Standards."**

2. Submit final engineering plans:
    a. Containing a combined frontage improvement and driveway plan.

    b. Showing sight distance triangles.

    c. Showing each residential lot having its own individual water service along with trenching and roadway restoration. Applicant shall provide the Town with proof of Clark Public Utilities approval of the plans.

    d. Showing septic locations and dimensions to meet state and Clark County Health Department Standards. Applicant shall provide the Town with proof of Clark County Health Department approval of the plans.

    e. Showing fire hydrants meeting spacing requirements.

    f. Showing stormwater facilities that meet the requirements of the Town of Yacolt Stormwater Plan.

    g. Showing grading and erosion control in conformance with applicable Town standards and standard construction details.

3. Submit proof of Cark County Health Department approval.

4. Submit proof of Clark County Fire District approval.

5. Submit proof of Clark Public Utilities approval.

6. Submit a stormwater report that addresses all requirements of the Town of Yacolt Stormwater Plan.

7. Submit a SWPPP that meets the requirements of the Town of Yacolt Stormwater Plan.

B. <u>Prior To Construction of The Site:</u>

1. Receive signed and approved engineering plans from the Town of Yacolt.

2. Receive an approved ROW permit from the Town of Yacolt

3. Submit a surety bond meeting the requirements of Engineering Standards section 1.10 Securities.

4. Submit a Certificate of Liability Insurance.

5. Erect and conduct erosion control measures consistent with the approved Erosion Control Plan and Town of Yacolt erosion control standards.

6. Submit evidence that an individual on-site has successfully completed formal training in erosion and sediment control by a recognized organization acceptable to the Town.

7. Conduct a pre-construction conference with Town staff. Contact Town Hall to schedule an appointment.

8. If any cultural resources are discovered in the course of undertaking the development activity, the State Office of Historic Preservation and Archaeology and the Town of Yacolt must be notified.

C. <u>Prior To Creation of Impervious Surface:</u>

1. Except roofs, the stormwater treatment and control facilities shall be installed in accordance with the approved final engineered plans and in accordance with the Town of Yacolt Stormwater Plan.

D. <u>Prior To Engineering Acceptance:</u>

1. Construct all public improvements, if applicable, and go on a walkthrough with Town of Yacolt Staff and Engineer and correct any deficiencies as determined by staff and Engineer.

2. A letter shall be provided by the applicant showing that fire flow requirements can be met.

3. Submit to the Town of Yacolt a two-year/20-percent maintenance bond for all completed and accepted public improvements.

4. Submit complete sets of as-built drawings for all required public improvements for streets and roads, stormwater drainage and control, sanitary sewer and water services, as applicable prior to the issuance of the occupancy permit for review and approval by the Town Engineer. Upon acceptance by the Engineer, submit prior to the issuance of the occupancy permit, one (1) Mylar set, one (1) full size paper set, two (2) 11x17 paper sets of As-Built record drawings and one thumb drive version of the as-built drawings in AutoCAD, and PDF formats.

E. <u>Prior To Final Plat Approval:</u>

1. Construct all required public improvements and gain engineering acceptance or provide appropriate bonding.

2. Submit a final plat:
   a. That shows easements for public utilities not located in the right-of-way.

   b. That shows 5' public utility easement along all frontage lines.

   c. With the following note: "No fences are allowed in the sight distance triangle."

   d. With the following note: "All utilities are to be located outside of the sidewalk section and to be underground where possible."

   e. With the following note: "The Town of Yacolt has no responsibility to improve or maintain the private roads contained within or private roads providing access to the property described in this plat."

   f. With a note describing the maintenance responsibilities of each lot owner.

   g. With a note specifying the parties responsible for long-term maintenance of stormwater facilities.

   h. With a note stating: "All new structures shall conform to the setbacks and building heights of the R1-12.5 zoning district."

   i. That shows where any control monuments have been placed.

   j. That shows the dedication of any public roads.

3. Submit a two-year stormwater maintenance contract for review and/or approval.

V. EXHIBITS

Because of the size of the exhibits, they are not included with this report, but listed below. The documents are available for review at the Yacolt Town Hall, 202 W Cushman St, Yacolt, WA 98675.

Belcorp Short Plat	
EXHIBIT #	**DESCRIPTION**
A	Proposed Short Plat revised September 18, 2020
B	Existing Conditions Plan dated August 14, 2020
C	SEPA Determination and Checklist
D	Applicant's Narrative
E	Notice of Application dated December 23, 2020
F	Preliminary Hydrology Report (TIR) dated October 20, 2020
G	Modification Request
H	Variance Narrative

VI. APPEAL

The Decision of the Town Council is appealable to the Washington Superior Court per RCW 36.70C.

STATE ENVIRONMENTAL POLICY ACT (SEPA)
DETERMINATION OF NON-SIGNIFICANCE

CASE NO: **BELCORP SHORT PLAT**

APPLICANT: **ANDREW BELL**

Location: **125 S SPRUCE AVENUE, YACOLT, WA 98675**

Parcels: **65150-000**

Legal Description: **NE ¼ of Section 02**
T4N, R3E, W.M.
0.91 ACRES

SEPA Determination: Determination of Non-significance (DNS)

Comment Deadline: **January 7, 2021** (comments should be delivered to the town hall office at 202 W. Cushman, Yacolt, WA, 98675)

As lead agency under the State Environmental Policy Act (SEPA) Rules [Chapter 197-11, Washington Administrative Code (WAC)], the Town of Yacolt 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 Town Code).

Determination:

Determination of Non-Significance (DNS). The Town of Yacolt, 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 land use application documents as they apply to the Town's Municipal Code and adopted standards.

Date of Publication and Comment Period:

Publication date of this DNS is **December 23, 2020,** and is issued under WAC 197-11- 960. The lead agency will not act on this proposal until the close of the 14-day comment period, which ends on **January 7, 2021.**

SEPA Appeal Process:

A final decision on this proposal will not be made until after the comment period described above. An **appeal** of any aspect of this decision, including the SEPA determination and any required mitigation, must be filed with the Town of Yacolt within fourteen (14) calendar days from the date the notice of that final decision is mailed to parties of record. The appeal must be in writing and should contain the following information:

1. The case number designated by the Town and the name of the applicant.

2. The name and signature of each person or group (petitioners) and a Statement showing that each petitioner is entitled to file an appeal as described in ESHB 1724 Section 415. If multiple parties file a single petition for review, the petition shall designate one party as the contact representative with the Town Clerk/Treasurer. All contact with the group regarding the petition, including notice, shall be with this contact person.

3. A brief statement describing why the SEPA determination is in error.

4. Mail or deliver appeals to the following address:

Appeal to the Town Council
Town of Yacolt
202 W. Cushman St.
Yacolt, WA 98675

Staff Contact Person: Stephanie Fields

Responsible Official: Mayor Katie Listek
Town of Yacolt
202 W. Cushman St.
Yacolt, WA 98675

SEPA Environmental Checklist

Washington Administrative Code (WAC) 197-11-960

Purpose of checklist:

The State Environmental Policy Act (SEPA), Revised Code of Washington (RCW), Chapter 43.21C, requires all governmental agencies to consider the environmental impacts of a proposal before making decisions. An environmental impact statement (EIS) must be prepared for all proposals with significant adverse impacts on the quality of the environment. The purpose of this checklist is to provide information to help you and agencies identify impacts from your proposal and to help agencies decide whether or not an EIS is required.

Instructions for applicants:

This environmental checklist asks you to describe basic information about your proposal. Governmental agencies use this checklist to determine whether or not the environmental impacts of your proposal are significant. Please answer the questions briefly, giving the most precise information or best description known. In most cases, you should be able to answer the questions from your own observations or project plans without the need to hire experts. If you do not know the answer, or if a question does not apply to your proposal, write "do not know" or "does not apply."

Some questions pertain to governmental regulations such as zoning, shoreline, and landmark designations. If you have problems answering these questions, please contact the Clark County Permit Center for assistance.

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. You may be asked to explain your answers or provide additional information related to significant adverse impacts.

Use of checklist for non-project proposals:

Complete this checklist for non-project proposals (e.g., county plans and codes), even if the answer is "does not apply." In addition, complete the supplemental sheet for non-project actions (Part D).

For non-project actions, the references in the checklist to the words "project," "applicant," and "property or site" should be read as "proposal," "proposer," and "affected geographic area," respectively.

SEPA (DNS)
DETERMINATION OF NON-SIGNIFICANCE

Community Development
1300 Franklin Street, Vancouver, Washington
Phone: (360) 397-2375 Fax: (360) 397-2011
www.clark.wa.gov/development

A. Background

1. Name of proposed project, if applicable:
   Belcorp Short Plat

2. Name of applicant:
   Andrew Bell PO Box 23 Yacolt WA 98675 360-903-8310

3. Address and phone number of applicant and contact person:
   Ed Greer, Wyndham Enterprises, LLC 360-904-4964
   13023 NE Hwy 99 Suite 7-126 Vancouver WA 98686

4. Date checklist prepared:
   Sept 18, 2020

5. Agency requesting checklist:
   Town of Yacolt

6. Proposed timing or schedule (including phasing, if applicable):
   As soon as possible.

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

8. List any environmental information that has been or will be prepared related to this proposal.
   None

9. Are other applications pending for governmental approvals affecting the property covered by your proposal? If yes, please explain.
   None known

10. List any government approvals or permits needed for your proposal:
    Approval of Preliminary Short Plat, Final Short Plat, Engineering Plans, Bldg Permit.

11. Give a brief, complete description of your proposal, including the proposed uses and size of the project and site. There are several questions addressed later in this checklist asking 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.)
    Divide 0.91 acre into 3 residential lots for detached single family homes.

12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including street address, section, township, and range. If this proposal occurs over a wide area, please provide the range or boundaries of the site. Also, give a legal description, site plan, vicinity map, and topographic map. You are required to submit any plans required by the agency, but not required to submit duplicate maps or plans submitted with permit applications related to this checklist.
    125 S Spruce Avenue NE 1/4 of Section 2, T4N, R3E, WM

B. Environmental Elements

Agency use only

1. Earth

a. General description of the site (circle one): Flat, rolling, hilly, steep slopes, mountainous, other _____.

b. What is the steepest slope on the site and the approximate percentage of the slope?
6%

c. What general types of soils are found on the site (e.g., clay, sand, gravel, peat, muck)? Please specify the classification of agricultural soils and note any prime farmland.
Yacolt loam & Gumboot silt loam. Not prime farmland.

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

e. Describe the purpose, type, and approximate quantities of any filling or proposed grading. Also, indicate the source of fill.
Some minor grading for new homesites & driveways. No additional fill.

f. Could erosion occur as a result of clearing, construction, or use? If so, please describe.
Yes, due to clearing & construction.

g. What percentage of the site will be covered with impervious surfaces after the project construction (e.g., asphalt or buildings)?
Approx 20%

h. Proposed measures to reduce or control erosion, or other impacts to the earth include:
Contractor to comply with all erosion control measures.

2. Air

a. What types of emissions to the air would result from this proposal (e.g., dust, automobile, odors, industrial wood smoke) during construction and after completion? Please describe and give approximate quantities.
Minor amounts during construction & from vehicular emissions.

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, please describe.
None known

c. Proposed measures to reduce or control emissions or other impacts to air:
None proposed.

Agency use only

3. Water

a. Surface:

1) Is there any surface water body on or in the vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, and wetlands)? If yes, describe the type and provide names and into which stream or river it flows into.
No surface water bodies, however a north/south underground stream occurs along S Spruce Avenue.

2) Will the project require any work within 200 feet of the described waters? If yes, please describe and attach available plans.
Yes, construct new homes & driveways.

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.
None

4) Will the proposal require surface water withdrawals or diversions? Please provide description, purpose, and approximate quantities:
No

5) Does the proposal lie within a 100-year floodplain? If so, please note the location on the site plan.
No, however S Spruce Ave & the west portion of the site are located in a flood fringe, see the Existing Conditions Plan.

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.
No

b. Ground:

1) Will ground water be withdrawn, or will water be discharged to ground water? Please give description, purpose, and approximate quantities.
No

2) Describe waste material that will be discharged into the ground from septic tanks or other sources; (e.g., domestic sewage; industrial, containing the following chemicals. . . ; agricultural; etc.). Describe the size and number of the systems, houses to be served; or, the number of animals or humans the systems are expected to serve.
Septic systems are proposed for the 2 new 3 bedroom homes.

c. Water runoff (including stormwater):

1) Describe the source of runoff (including storm water) and method of collection and disposal. Include quantities, if known. Describe where water will flow, and if it will flow into other water.
Runoff will be treated along the driveways & released to the existing roadway ditch, refer to the Preliminary Stormwater Report.

Agency use only

2) Could waste materials enter ground or surface waters? If so, please describe.
No

d. Proposed measures to reduce or control surface, ground, and runoff water impacts, if any:
Refer to c. 1) above.

4. Plants

a. Check or circle types of vegetation found on the site
- Deciduous tree: alder, maple, aspen, other
- Evergreen tree: fir, cedar, pine, other
- Shrubs
- Grass
- Pasture
- Crop or grain
- 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?
Existing trees & ground cover will be removed.

c. List threatened or endangered species on or near the site.
None known

d. List proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site:
New home owners will add new landscaping.

5. Animals

a. Circle any birds and animals which have been observed on or near the site:

- Birds: hawk, heron, eagle, songbirds, other;
- Mammals: deer, bear, elk, beaver, other; and,
- Fish: bass, salmon, trout, herring, shellfish, other.

b. List any threatened or endangered species known to be on or near the site. Agency use only
None known

c. Is the site part of a migration route? If so, please explain.
Yes, the Pacific Flyway.

d. List proposed measures to preserve or enhance wildlife:
New landscaping around new homes.

6. Energy and natural resources

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.
Electricity & natural gas for general household uses.

b. Would your project affect the potential use of solar energy by adjacent properties? If so, please describe.
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:
Homes to feature latest energy conservation measures.

7. Environmental health

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, please describe.
No

1) Describe special emergency services that might be required.
None

2) Proposed measures to reduce or control environmental health hazards, if any:
None proposed.

b. Noise

1) What types of noise exist in the area which may affect your project (e.g., traffic, equipment, operation, other)?
Some minor traffic noise.

2) What types and levels of noise are associated with the project on a short-term or a long-term basis (e.g., traffic, construction,

operation, other)? Indicate what hours the noise would come from the site.
Short term: home construction during daytime hours.
Long term: minor traffic.

Agency use only

3) Proposed measures to reduce or control noise impacts:
None proposed.

8. Land and shoreline use

a. What is the current use of the site and adjacent properties?
Detached single family homes.

b. Has the site been used for agriculture? If so, please describe.
No

c. Describe any structures on the site.
Single level manufactured home & a shop building.

d. Will any structures be demolished? If so, please describe.
The shop building will be removed.

e. What is the current zoning classification of the site?
R1-12.5

f. What is the current comprehensive plan designation of the site?
UL

g. What is the current shoreline master program designation of the site?
None known

h. Has any part of the site been classified as an "environmentally sensitive" area? If so, please specify.
None known

i. How many people would reside or work in the completed project?
Approx 12 people would reside.

j. How many people would the completed project displace?
None

k. Please list proposed measures to avoid or reduce displacement impacts:
None necessary.

l. List proposed measures to ensure the proposal is compatible with existing and projected land uses and plans:
Zoning and proposed uses are neighborhood compatible.

9. Housing

Agency use only

a. Approximately how many units would be provided? Indicate whether it's high, middle, or low-income housing.
One existing & 2 new homes for middle income buyers.

b. Approximately how many units, if any, would be eliminated? Indicate whether it's high, middle, or low-income housing.
None

c. List proposed measures to reduce or control housing impacts:
None necessary.

10. Aesthetics

a. What is the tallest height of any proposed structure(s), not including antennas? What is proposed as the principal exterior building materials?
2 stories, approx. 26' high, materials undetermined.

b. What views in the immediate vicinity would be altered or obstructed?
None

c. Proposed measures to reduce or control aesthetic impacts:
None proposed.

11. Light and glare

a. What type of light or glare will the proposal produce? What time of day would it mainly occur?
None

b. Could light or glare from the finished project be a safety hazard or interfere with views?
No

c. What existing off-site sources of light or glare may affect your proposal?
None

d. Proposed measures to reduce or control light and glare impacts:
None necessary.

12. Recreation

a. What designated and informal recreational opportunities are in the immediate vicinity?
None known.

Agency use only

b. Would the project displace any existing recreational uses? If so, please describe.
No

c. Proposed measures to reduce or control impacts on recreation, including recreational opportunities to be provided by the project or applicant:
None proposed.

13. Historic and cultural preservation

a. Are there any places or objects on or near the site which are listed or proposed for national, state, or local preservation registers. If so, please describe.
None known

b. Please describe any landmarks or evidence of historic, archaeological, scientific, or cultural importance known to be on or next to the site.
None known

c. Proposed measures to reduce or control impacts:
None proposed.

14. Transportation

a. Identify the public streets and highways serving the site, and describe proposed access to the existing street system. Show on site plans, if any.
2 new driveways are proposed to connect to existing S Spruce Ave.

b. Is the site currently served by public transit? If not, what is the approximate distance to the nearest transit stop?
No, nearest stop unknown.

c. How many parking spaces would the completed project have? How many would the project eliminate?
4 in garages, 2 open. None eliminated.

d. Will the proposal require new roads or streets, or improvements to existing roads or streets, not including driveways? If so, please describe and indicate whether it's public or private.
No

e. Will the project use water, rail, or air transportation? If so, please describe.
No

Agency use only

f. How many vehicular trips per day would be generated by the completed project? Indicate when peak traffic volumes would occur.
20 new daily trips, peak times: 7 to 8am & 5 to 6 pm.

g. Proposed measures to reduce or control transportation impacts:
None proposed.

15. Public services

a. Would the project result in an increased need for public services (e.g., fire protection, police protection, health care, schools, other)? If so, please describe.
Very slight increase in all services.

b. Proposed measures to reduce or control direct impacts on public services:
Builder to pay required impact fees.

16. Utilities

a. Circle the utilities currently available at the site: electricity, natural gas, water, refuse service, telephone, sanitary sewer, septic system, other.

b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on or near the site:
Water & Electricity: Clark Public Utilities;
Trash & recycling: Waste Connections; Telephone: Century Link.

C. Signature

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: _____Date Submitted: _____

D. SEPA Supplemental sheet for non-project actions

Agency use only

Instructions:
Because these questions are very general, it may be helpful to read them in conjunction with the list of the elements of the environment. When answering these questions, be aware of the extent of the proposal and the types of activities likely to result from this proposal. Please respond briefly and in general terms.

1. How would the proposal increase discharge to water; emissions to air; production, storage, or release of toxic or hazardous substances; or production of noise?

   Proposed measures to avoid or reduce such increases are:

2. How would the proposal be likely to affect plants, animals, fish, or marine life?

   Proposed measures to protect or conserve plants, animals, fish, or marine life are:

3. How would the proposal be likely to deplete energy or natural resources?

   Proposed measures to protect or conserve energy and natural resources are:

4. How would the proposal use or affect environmentally sensitive areas or those designated (or eligible or under study) for governmental protection; such as parks, wilderness, wild and scenic rivers, threatened or endangered species habitat, historic or cultural sites, wetlands, floodplains, or prime farmlands?

   Proposed measures to protect such resources or to avoid or reduce impacts are:

5. How would the proposal be likely to affect land and shoreline use? Will it allow or encourage land or shoreline uses incompatible with existing plans?

Proposed measures to avoid or reduce shoreline and land use impacts are:

Agency use only

6. How would the proposal be likely to increase demands on transportation or public services and utilities?

   Proposed measures to reduce or respond to such demand(s) are:

7. Identify whether the proposal may conflict with local, state, or federal laws or requirements for the protection of the environment.

Narrative for Preliminary Short Plat
(*Written Statement)*

Belcorp Short Plat

a residential Short Plat
Town of Yacolt

Introduction

The subject property is located at 125 S Spruce Avenue, and is also known as Clark County tax lot number 65150-000. Zone is R1-12.5. The site is surrounded by detached single family homes. The site contains a recently remodeled manufactured home, which will remain on proposed Lot 3, and a shop which will be removed.

Previous Proposal

The previous property owner processed land use applications for this site in 2019. The new property owner is now filing new land use applications.

Proposal

The project proposes to create 3 residential lots for detached single family homes on the 0.91 acre site. The lot design is based upon proposed septic system locations determined by soils that allow proper infiltration. The compacted gravel areas cannot be used for drainfields. All lots comply with the minimum area, minimum width and minimum depth as indicated on 18.25.050 Table 4A. Future homes will comply with the setbacks, maximum height, lot coverage and off street parking codes as stated in Code 18.25. Proposed Lots 1 and 3 will have frontage along S Spruce Avenue via 20' wide flag stems. The proposed south line of Lot 3 is the shortest line adjoining the pole portion of the lot, therefore the south line is the front of the lot, according to the Front Lot Line definition under 18.10.010. Density is 3.3 lots per acre.

Critical Areas

GIS has a mapped riparian habitat strip through the entire town, however there are no critical areas on the property. Lot 2 is within the 100 year flood zone.

Transportation

Existing S Spruce Avenue is classified as a local residential street with an existing right of way of 48 feet and a curb section of 30 feet. The existing driveway will be removed. New driveways will be constructed within the two flag stems.

Water and Sewer

Clark Public Utilities serves domestic water to the Town of Yacolt. The proposed 3 lots will connect services to the existing water line in S Spruce Avenue.
There is no public sanitary sewer line in S Spruce Avenue. A sewer septic system is proposed for each lot. Refer to the Septic Plan prepared by McNair Septic Design.

Stormwater

A Preliminary Stormwater Plan has been prepared by Windsor Engineering, LLC and is included in this application package.

APPLICANT'S NARRATIVE (SHORT PLAT)

Town of Yacolt Public Hearing Notice (Development Application – Belcorp.)

For publication in the December 23, 2020 edition of the Reflector

Ad copy follows:

Town of Yacolt
Yacolt, Washington

Notice of Application and of Public Hearing:
Development (Short Plat/Variance/SEPA DNS) of 125 S. Spruce Avenue, Parcel # 65150-000

HEARING DATE: MONDAY, January 11, 2021
HEARING TIME: 7:00 p.m. (During Council Mtg.)
HEARING LOCATION: The Public Hearing and associated Council Meeting are expected to be held virtually. Attendance will be solely by video conferencing and telephone connection. You may join the meeting from your computer, tablet or smartphone by linking to: https://global.gotomeeting.com/join/959811477. To dial in using your phone, call +1 (646) 749-3112. Access Code: 959-811-477

SUBJECT: The Town Council will hold a Public Hearing on the applications of Andrew Bell, for (a) variance; (b) short plat; and, (c) a related Environmental Determination of Non-Significance, (DNS), under the State Environmental Policy Act, (SEPA).

NOTICE IS HEREBY GIVEN that the Town of Yacolt has received an application for Development. Pursuant to YMC 18.95, the Town of Yacolt established a comment period on said applications and scheduled a public hearing on the applications and the proposed development.

1. Case File Name/Number: Belcorp Short Plat
2. Date of Application: June, 2020
3. Date of Notice of Complete Application: October 16, 2020
4. Description of Proposed Project: Development of Parcel #65150-000; Creation of a 3 residential lot short plat for detached single-family homes on the 0.91-acre site.
5. Project permits included with the Applications: Master Land Use, Clark Public Utilities Water Review Letter, Department of Health Review Letter, Variance Application, and SEPA Application
6. Further studies requested by reviewing authorities: No additional studies requested by reviewing authorities.
7. Other permits not included in the Application: No additional applications required at this time.
8. Existing environmental documents that evaluate the proposed project: GIS has a mapped riparian habitat strip through the entire town; however, there are no critical areas on the property.
9. The public has the right to comment on the Applications through testimony or written comments. The public has the right to receive notice of and to participate in any hearings; to request a copy of the decision once made; and to any appeal rights that may apply.
10. The deadline for submitting written comments is Thursday, Jan. 7, 2021. Written comments received by the Town on or before Thursday, Jan. 7, 2021 will be considered by the Town Council.

PUBLIC HEARING
NOTICE / ADVERTISEMENT

11. A consolidated staff report, the SEPA checklist, and the SEPA DNS will be available for inspection by the public at no cost beginning Wednesday, Dec. 23, 2020.
12. The deadline for submitting a SEPA appeal and/or any appeal of the final decisions on the substantive Applications is 30 days following final decision on the Applications.
13. Name and contact information for Applicant / Applicant's Representative:
Owner: Andrew Bell
Representative: Ed Greer
Wyndham Enterprises, LLC
13023 NE Hwy 99 Suite7-126
Vancouver, WA 98686
(360) 904-4964
14. Description of site: The site is located at 125 S. Spruce Avenue and zoned R1-12.5. The site is located in the NE ¼ of Section 2, T4N, R3E, WM. The site is surrounded by detached single-family homes. The Parcel is roughly 0.91 acres in size. The Parcel currently has a single-family residence and a shop.
15. A map of the subject property and area is provided below.
16. Information about the Applications may be examined by the public from Wednesday, Dec. 23, 2020 through Monday, Jan. 11, 2021 at Yacolt Town Hall, 202 W. Cushman, Yacolt, Washington, on business days between the hours of 8:00 a.m. and 5:00 p.m. (Note: Closed between 12:00 and 1:00) Due to the State of Washington's Emergency Coronavirus Orders, please contact Town Hall to make arrangements to view the applications.
17. The authority for this review is described in YMC 18.25 (Single-Family Residential Districts); YMC 18.95 (Public Hearing Procedures and Notice of Hearings); YMC 13.10 (Stormwater Management and Facility Maintenance); YMC 13.25 (Public Works Construction Standards); YMC 16.05-16.10 (SEPA); and the Town of Yacolt Comprehensive Growth Management Plan 2003-2023 (as updated). The Application appears to comply with YMC 16.20-16.45, (Critical Areas). The public hearing will be conducted in accordance with rules of procedure adopted by the Yacolt Town Council. The final decision on the Applications will be made by the Yacolt Town Council.
18. Coronavirus Emergency: The meeting and public hearing are scheduled for virtual attendance only pursuant to Governor Inslee's Proclamations 20-05 and 20-28 (as amended). In the event the Town is able or required to allow in-person attendance at either of the meetings, the meetings will be held in the Yacolt Town Hall's Council Chambers at 202 W. Cushman, Yacolt, WA 98675. Please check the Town's website at townofyacolt.com for updates.

For further information, please contact the Yacolt Town Clerk at 360-686-3922 or at clerk@townofyacolt.com.
THE PUBLIC IS INVITED to attend this public hearing. Dated this 11th day of January, 2021.
Katelyn J. Listek, Mayor
Stephanie Fields, Town Clerk

PUBLIC HEARING
NOTICE / ADVERTISEMENT

WINDSOR
ENGINEERS

STORMWATER TECHNICAL INFORMATION REPORT

Belcorp Yacolt Short Plat

10/20/2020

Revision Log		
0	8/11/20	1st Submittal
1	9/29/20	Revised per Town response
2	10/20/20	Revised per Town response

CERTIFICATE OF THE ENGINEER

Title: STORMWATER TECHNICAL INFORMATION REPORT

Project: Belcorp Yacolt Short Plat

This Technical Information Report (TIR) has been prepared under my supervision and meets the standard of care for similar documents within this community. The TIR includes the required information per the below references and complies with the code. The proposed stormwater design is feasible.

References:

YMC 13.10 Stormwater Management

Windsor Engineers LLC

10/20/2020

Tyler Stewart, PE
Project Engineer

Table of Contents

References

13.10 STORMWATER MANAGEMENT AND FACILITY MAINTENANCE
<https://www.codepublishing.com/WA/Yacolt/#!/Yacolt13/Yacolt1310.html>

Project Team

Jurisdiction	Town of Yacolt
Developer	Andrew Bell Belcorp
Civil Engineer	Windsor Engineers LLC 12009 NE 99th St, Suite 1460 Vancouver, WA 98682 360.610.4931 Travis Tormanen, PE, Project Manager ttormanen@windsorengineers.com Tyler Stewart, PE, Civil Engineer tstewart@windsorengineers.com

1.0 GENERAL

1.1 Purpose and Scope

The purpose of this report is to demonstrate feasibility of stormwater management associated with the construction of the Belcorp Yacolt Short Plat. This report will evaluate the proposed stormwater conveyance, water quality, and water quantity design.

1.2 Project Location

Address	125 S Spruce Ave
Parcel	65150000
Area	0.91 acres
Section-Township-Range	NE Qtr of Section 02 T4N R3E WM
Jurisdiction	Yacolt

1.3 Project Description

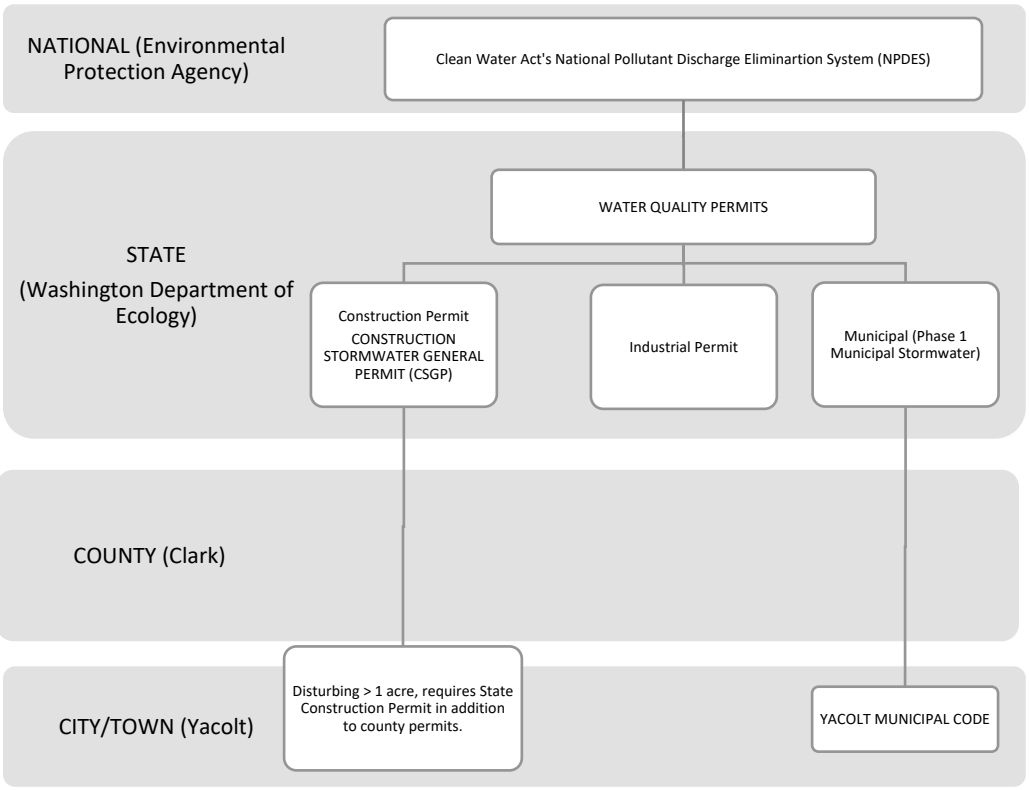
The project site is 0.91 acres located within the Township of Yacolt. A single-family residence and a shop currently exist on the property. The developer plans to short plat the property into 3 lots, with the existing single family residence occupying 1 lot and new single family residence being built on the lot including the existing shop and a new single family residences on the last lot.

The site topography generally slopes from East to West uniformly along the site for half of the site before flattening out.

Figure 1: Overall Parcel

1.4 Applicable Codes and Standards

To protect our countries waters, legislature was enacted starting very broadly as the (Clean Water Act) of 1972, administered by the EPA as the (National Pollutant Discharge Elimination System (NPDES)), delegated to the states authority as (DOE Water Quality Permits), and finally managed as the (Construction Stormwater General Permit). Washington State implements the CSGP through (DOE Stormwater Manuals) and municipalities/counties may adopt portions of this manual or an equivalent.



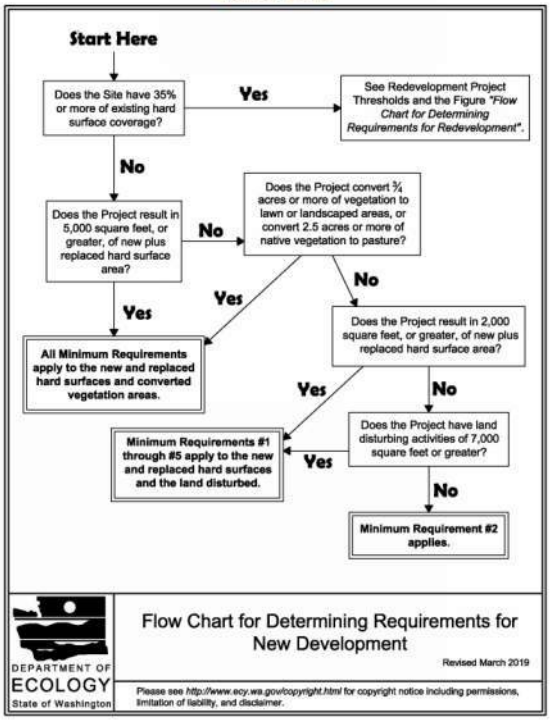
The calculations and stormwater management methods in the report are based on the following references:

YMC 13.10 Stormwater Management

1.5 Determination of Applicable Minimum Requirements

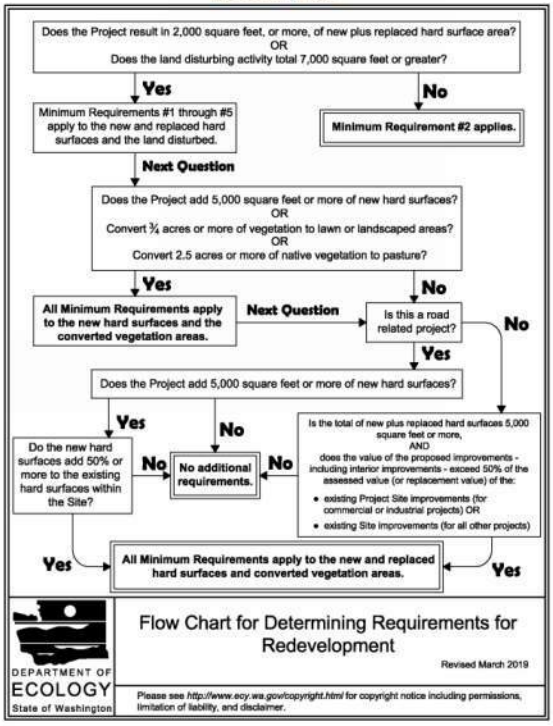
- The existing impervious area is approximately 0.41 acres out of approximately 0.91 acres (45%) → Redevelopment Flow Chart applies.
- More than 7,000 square feet of land will be disturbed → Minimum Requirements #1 through #5 apply.
- New + Replaced Impervious is greater than 5,000 sf. → All Minimum Requirements apply to the new and replaced hard surface and the converted vegetation areas.
- The project site is defined as the area disturbed by the proposed development.

Figure I-3.1: Flow Chart for Determining Requirements for New Development



2019 Stormwater Management Manual for Western Washington
Volume I - Chapter 3 - Page 89

Figure I-3.2: Flow Chart for Determining Requirements for Redevelopment



2019 Stormwater Management Manual for Western Washington
Volume I - Chapter 3 - Page 90

Figure 2 Flow Chart

Land-Disturbing Activity	Area (SF)	Area (Acres)
Existing Hard Surface	16,341	0.375
Proposed Hard Surface	-	0.000
Replaced Impervious Surface	13,000	0.298
Native Vegetation Converted to Lawn or Landscaping	-	0.000
Native Vegetation Converted to Pasture	-	0.000
Total Amount of Land-Disturbing Activity	26,185	0.601
New Non-PGHS Surfaces: Proposed Roof	7,500	0.172
New PGHS Surfaces: Proposed Driveway	5,500	0.126
Total Non-pollution Generating Surfaces	7,500	0.172
Total Pollution Generating Surfaces	5,500	0.126

Table 1 Site Characteristics

TDA	Impervious Area (Ac)	Flowrate in 100-yr event (CFS)
Existing Conditions	0.375*	0.469
Developed Conditions	0.298	0.353
*Modeled as Forested condition (0 acres impervious).		

Table 2 TDA Summary

2.0 MINIMUM REQUIREMENTS

2.1 Minimum Requirement #1: Preparation of Stormwater Site Plans

A site stormwater plan and topographic map have been prepared and are included in this report.

2.2 Minimum Requirement #2: Construction Stormwater Pollution Prevention

An Abbreviated Construction Stormwater Pollution Prevention Plan (SWPPP) has been prepared and is included in this report. The project disturbs less than 1 acre, therefore the state permit isn't required and the Abbreviated Construction SWPPP is appropriate.

2.3 Minimum Requirement #3: Source Control of Pollution

None of the following activities are proposed for this site, therefore no measures shall be implemented for source control.

Manufacturing Business, Transportation and Communication, Retail and Wholesale Business, Service Business, Public Agency Activities

2.4 Minimum Requirement #4: Preservation of Natural Drainage Systems and Outfalls

Natural drainage patterns on the site will be maintained by minimizing the areas of disturbance for the construction of the residence to the extent practicable. No major grading is proposed for the site that would alter the general drainage pattern of the area. The site drains from the northeast to the south west.

2.5 Minimum Requirement #5: On-site Stormwater Management

Clark County GIS identifies the soils as Gumboot silt loam and Yacolt loam within the disturbed project area. The stormwater generated by residences will be dispersed across the driveway surface and treated with the driveway runoff using the CAVFS. All disturbed areas will be prepped in accordance with BMP T5.13 prior to replanting of vegetation to preserve the soils ability to infiltrate runoff and promote vegetation of the area.

- Lawn and Landscape Area – BMP T5.13 Post Construction Soil Quality and Depth
- Roofs – BMP T5.10B Downspout Dispersion is feasible for semi-urban lot with less permeable soils.
    - BMP T5.30 Full Dispersion is not feasible (inadequate native vegetation area, lack of space).
    - BMP T5.10A Downspout Full Infiltration is not feasible (low infiltration rate).
    - BMP T7.30 Bioretention is not feasible (lack of usable space)
- Driveway - BMP T5.12 Sheet Flow Dispersion, BMP T5.13 Post Construction Soils Depth and Quality, and BMP T7.40 Compost Amended Vegetated Filter Strip (CAVFS)
    - BMP T5.30 Full Dispersion is not feasible (inadequate native vegetation area, lack of space).
    - BMP T5.15 Permeable Pavement is not feasible.
    - BMP T7.30 Bioretention is not feasible (lack of usable space).

2.6 Minimum Requirement #6: Runoff Treatment

The site does meet the threshold for land-disturbing activities runoff treatment facilities because the PGHS surface proposed is greater than 5,000 square feet. Treatment of the driveway will be achieved using the CAVFS system along the driveway. The roof drainage will be dispersed across the driveway and managed with the driveway runoff using the CAVFS.

The site complies with runoff treatment.

2.7 Minimum Requirement #7: Flow Control

This site does not discharge stormwater directly or indirectly into a surface waterbody. The site introduces more than 5,000 square feet of impervious surface and therefore meets the threshold for land-disturbing activities requiring flow control facilities. Flow control is achieved using a CAVFS along the driveway and amending the disturbed soils. Infiltration testing was completed for the site and provides for an infiltration rate of 0.71 inches per hour. For design purposes the rate was reduced to 0.35 inches per hour, providing a factor of safety of 2. The roof drainage will be dispersed across the driveway and managed with the driveway runoff using the CAVFS.

The site complies with flow control requirements.

2.8 Minimum Requirement #8: Wetlands Protection

The project does not propose any discharge of stormwater directly or indirectly into a wetland, therefore Minimum Requirement #8 does not apply.

2.9 Minimum Requirement #9: Operation and Maintenance

The stormwater system will be privately owned, operated, and maintained. See Stormwater Manual 2015, Book 4 – Stormwater Facility Operations and Maintenance.

3.0 CONVEYANCE SYSTEMS ANALYSIS AND DESIGN

The runoff from the homes will be dispersed using splash blocks. No other conveyance systems are proposed with this site. All runoff will be managed using dispersion and infiltration.

4.0 ADDITIONAL REQUIREMENTS

4.1 Offsite Analysis

No offsite analysis has been conducted for the site as the site is exempt from the requirements of conducting an offsite analysis.

4.2 Other Permits

Future permits will be required for each lot at the time applying for Building Permits.

5.0 APPENDICES

Appendix A – General Information, Vicinity Map, Quarter Section Map, Flow Charts

Appendix B – Stormwater Plan

Appendix C – Infiltration Testing / Soils Information

Appendix D – Stormwater Summary, Basin Maps, MGS Flood Report

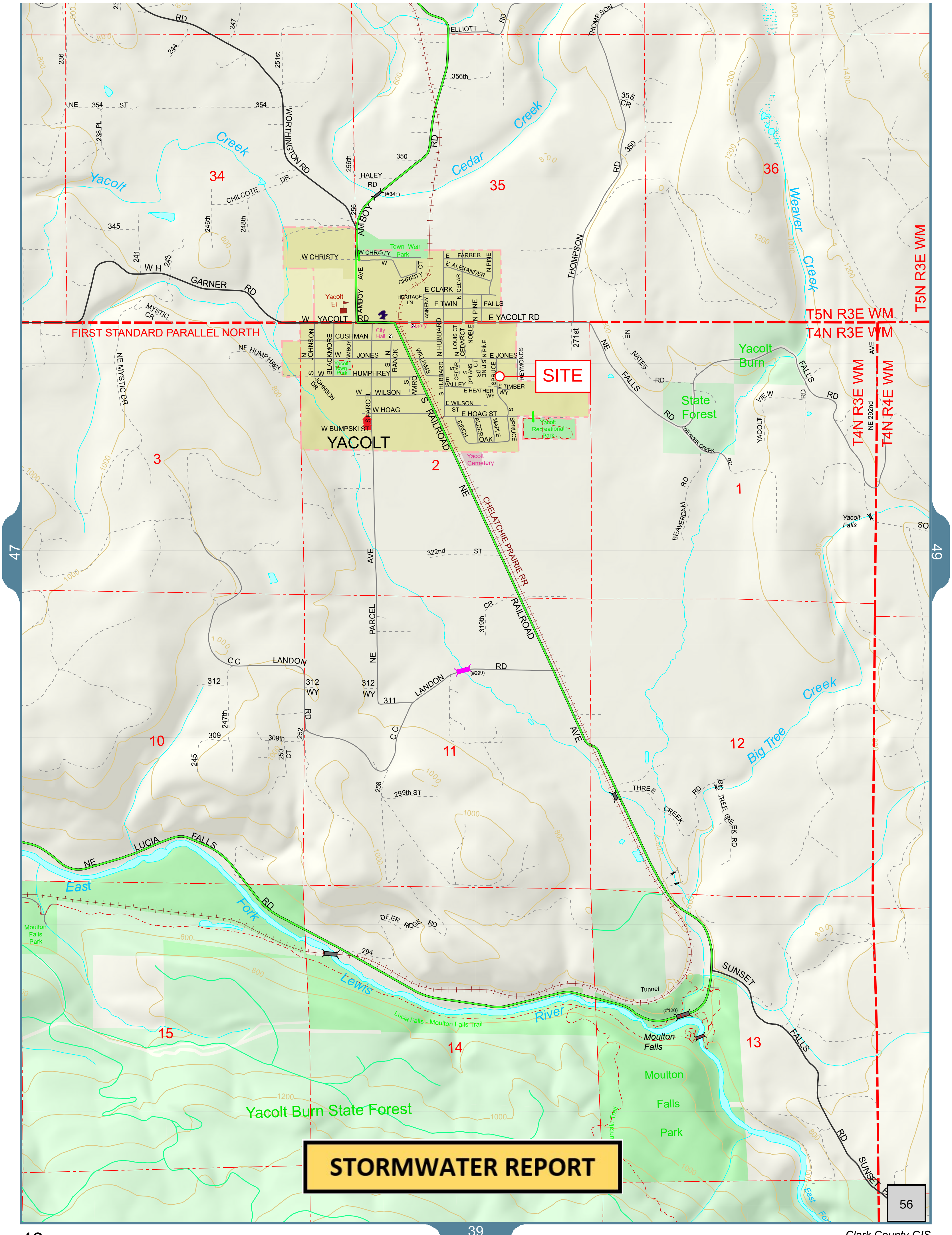
Appendix E – Abbreviated SWPPP

Appendix A

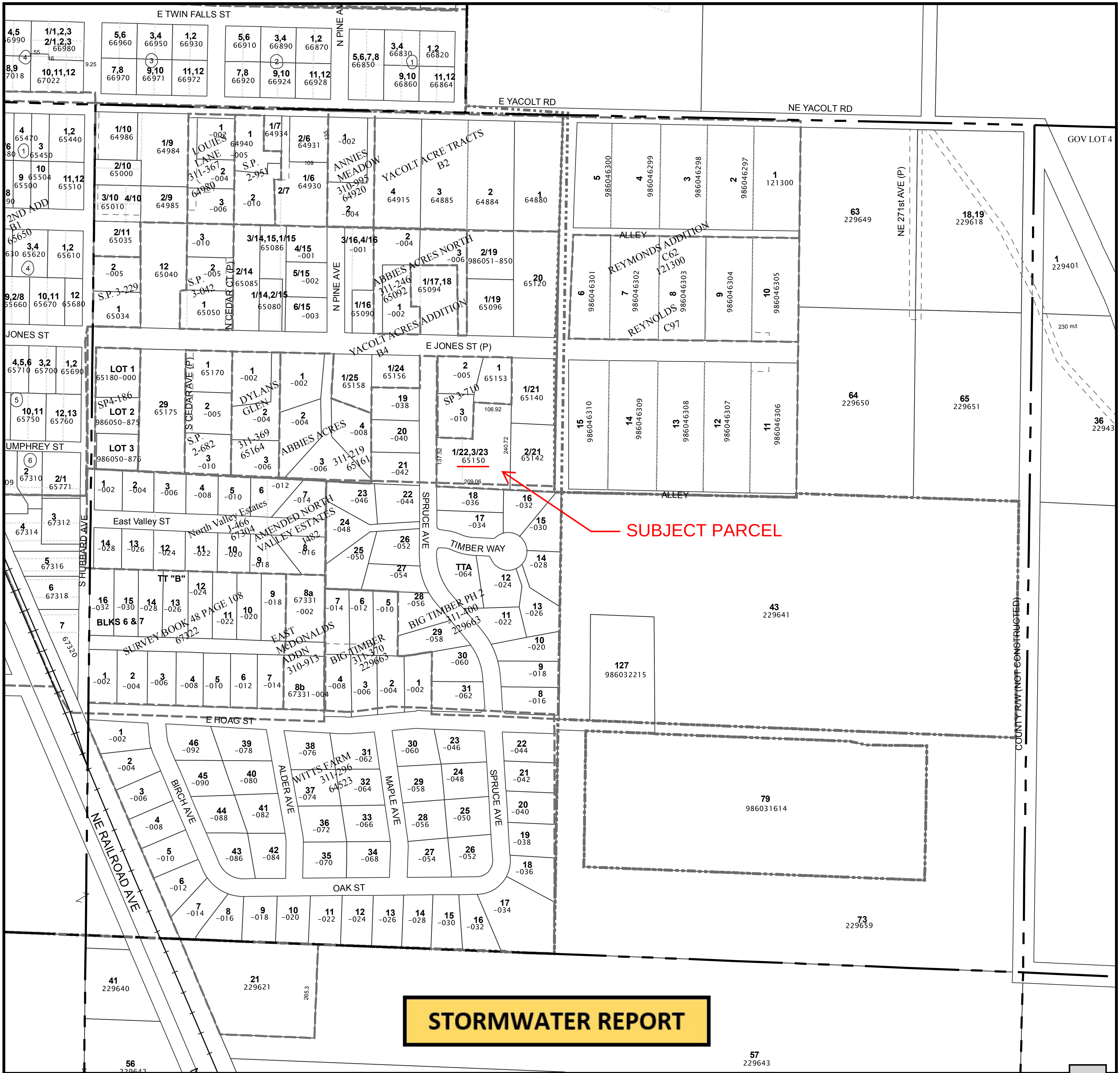
General Information, Vicinity Map, Quarter Section Map, Flow Charts

STORMWATER REPORT

VICINITY MAP



Clark County GIS



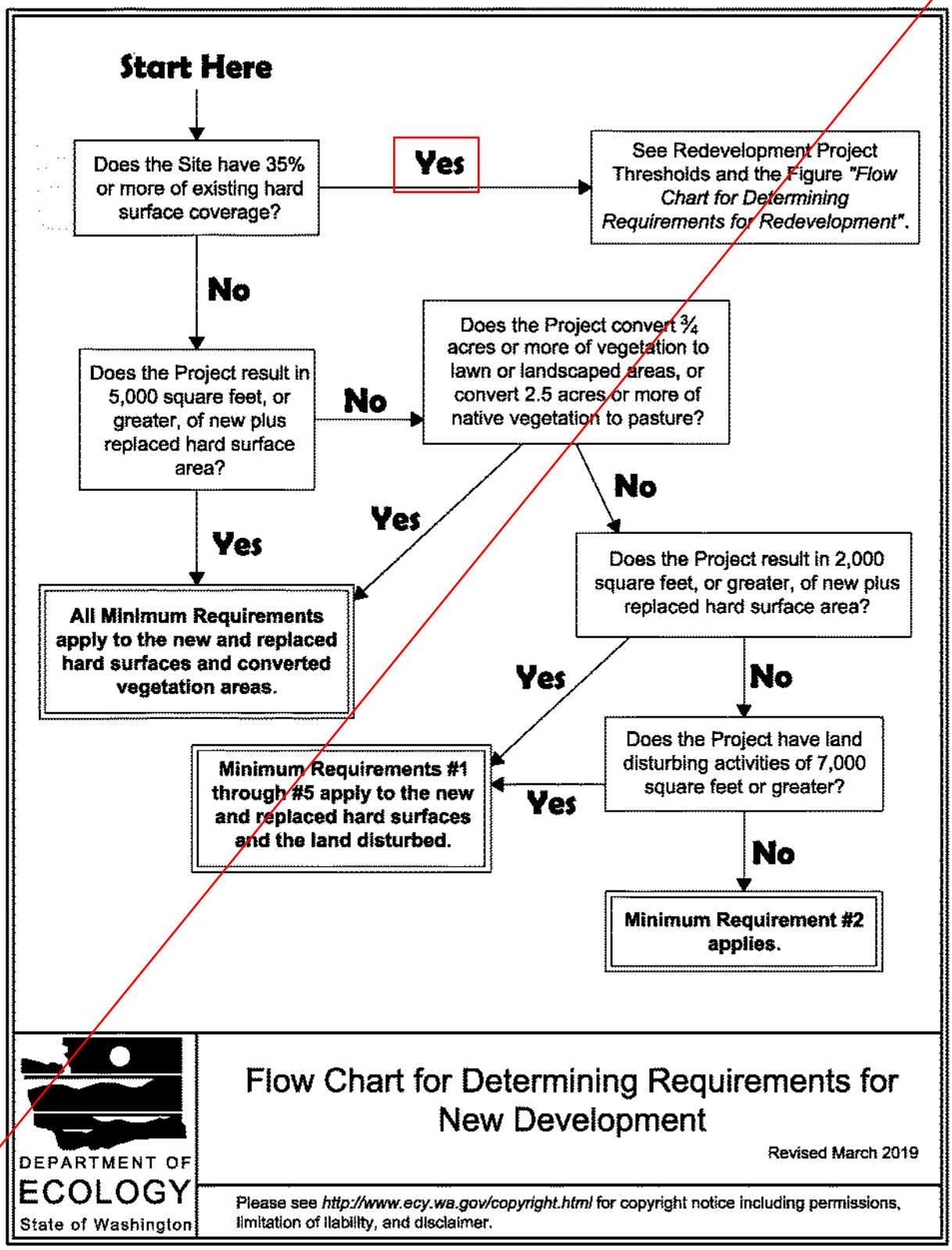
Printed: February 15, 2020
Scale - 1:3600
1" = 300'

Information shown on this map was collected from several sources. Clark County accepts no responsibility for any inaccuracies that may be present.

Clark County
Geographic Information System

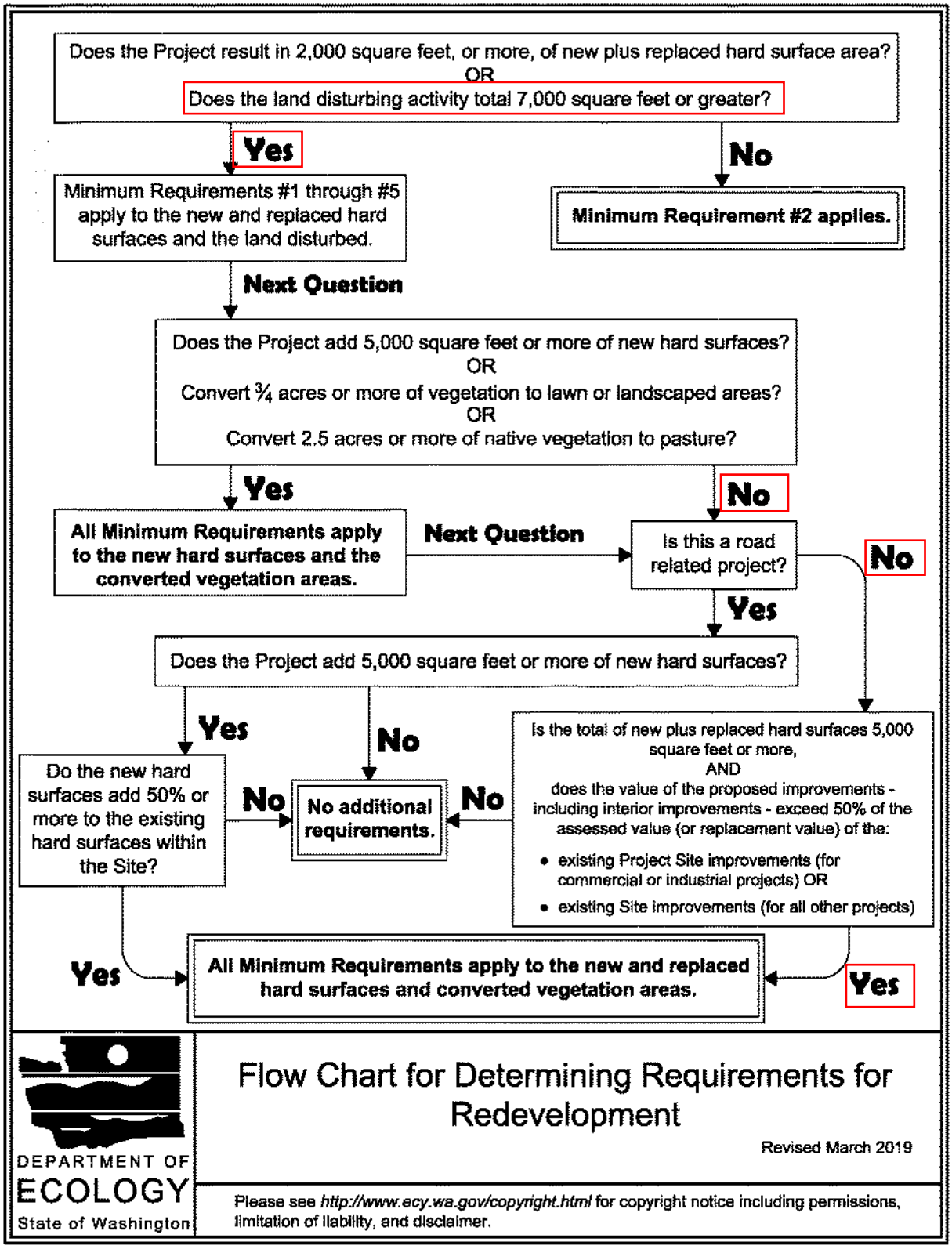
NE Qtr of Section 02 T4N R3E WM

Figure I-3.1: Flow Chart for Determining Requirements for New Development



STORMWATER REPORT

Figure I-3.2: Flow Chart for Determining Requirements for Redevelopment



STORMWATER REPORT

Figure I-3.3: Flow Chart for Determining MR #5 Requirements

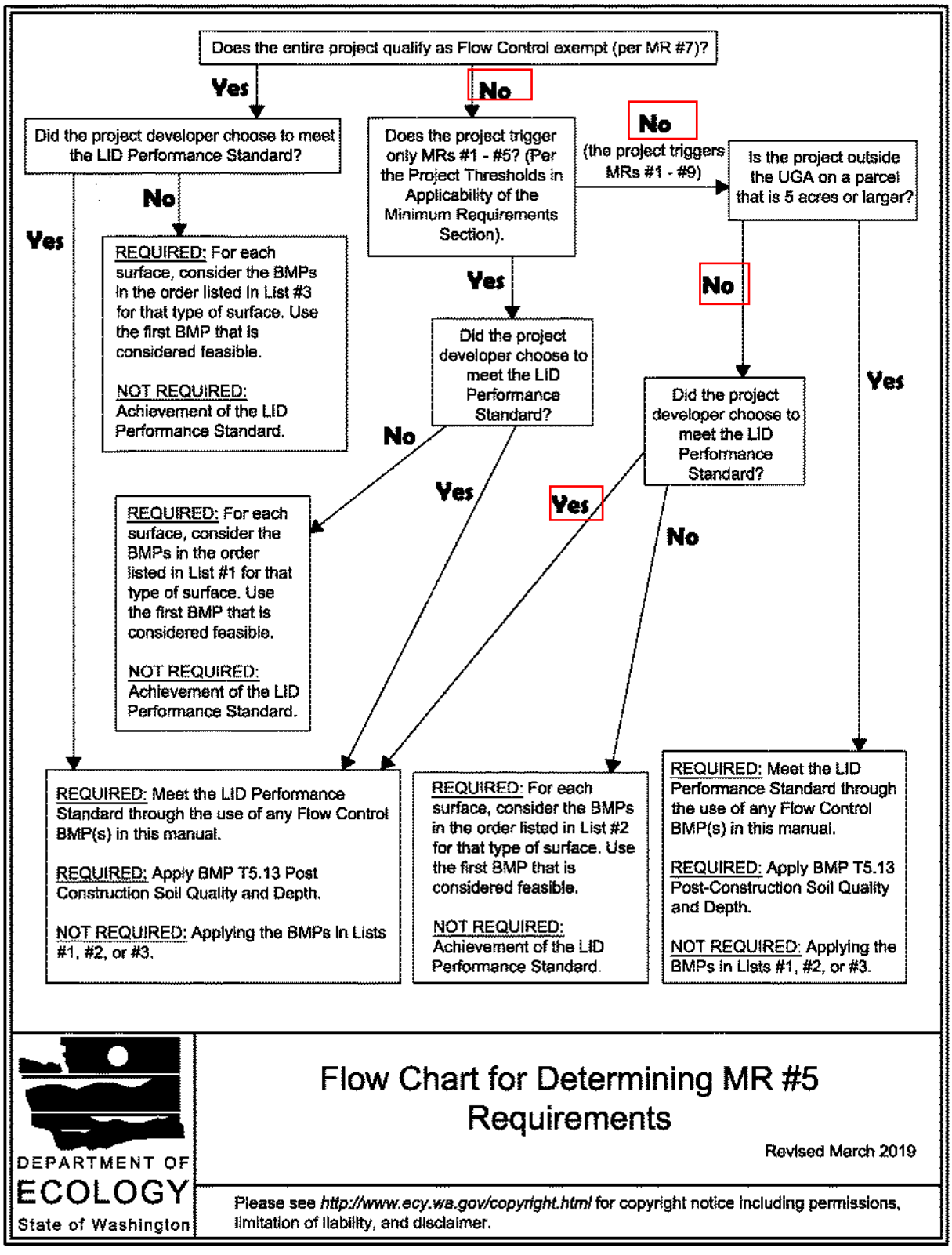


Table I-3.2: The List Approach for MR5 Compliance

List #1 (For MR #1 - #5 Projects That Are Not Flow Control Exempt)	List #2 (For MR #1 - #9 Projects That Are Not Flow Control Exempt)	List #3 (For Flow Control Exempt Projects)
Surface Type: Lawn and Landscaped Areas		
BMP T5.13: Post-Construction Soil Quality and Depth	BMP T5.13: Post-Construction Soil Quality and Depth	BMP T5.13: Post-Construction Soil Quality and Depth
Surface Type: Roofs		
1. BMP T5.30: Full Dispersion or BMP T5.10A: Downspout Full Infiltration	1. BMP T5.30: Full Dispersion or BMP T5.10A: Downspout Full Infiltration	1. BMP T5.10A: Downspout Full Infiltration
2. BMP T5.14: Rain Gardens or BMP T7.30: Bioretention	2. BMP T7.30: Bioretention	2. BMP T5.10B: Downspout Dispersion Systems
3. BMP T5.10B: Downspout Dispersion Systems	3. BMP T5.10B: Downspout Dispersion Systems	3. BMP T5.10C: Perforated Stub-out Connections
4. BMP T5.10C: Perforated Stub-out Connections	4. BMP T5.10C: Perforated Stub-out Connections	
Surface Type: Other Hard Surfaces		
1. BMP T5.30: Full Dispersion	1. BMP T5.30: Full Dispersion	BMP T5.12: Sheet Flow Dispersion or BMP T5.11: Concentrated Flow Dispersion
2. BMP T5.15: Permeable Pavements or BMP T5.14: Rain Gardens or BMP T7.30: Bioretention	2. BMP T5.15: Permeable Pavements	
3. BMP T5.12: Sheet Flow Dispersion or BMP T5.11: Concentrated Flow Dispersion	3. BMP T7.30: Bioretention	
	4. BMP T5.12: Sheet Flow Dispersion or BMP T5.11: Concentrated Flow Dispersion	

Notes for using the List Approach:

1. Size BMP T5.14: Rain Gardens and BMP T7.30: Bioretention used in the List Approach to have a minimum horizontal projected surface area below the overflow which is at least 5% of the area drain-

Table I-3.2: The List Approach for MR5 Compliance (continued)

List #1 (For MR #1 - #5 Projects That Are Not Flow Control Exempt)	List #2 (For MR #1 - #9 Projects That Are Not Flow Control Exempt)	List #3 (For Flow Control Exempt Projects)
ing to it. 2. When the designer encounters BMP T5.15: Permeable Pavements in the List Approach, it is not a requirement to pave these surfaces. Where pavement is proposed, it must be permeable to the extent feasible unless BMP T5.30: Full Dispersion is employed.		

Objective

The objective of On-Site Stormwater Management is to use practices distributed across a development that reduce the amount of disruption of the natural hydrologic characteristics of the site.

Competing Needs Criteria

LID BMPs can be superseded or restricted where they are in conflict with:

- Requirements of the following federal or state laws, rules, and standards:
  - Historic Preservation Laws and Archaeology Laws as listed at https://dahp.wa.gov/project-review/preservation-laws,
  - Federal Superfund or Washington State Model Toxics Control Act,
  - Federal Aviation Administration requirements for airports,
  - Americans with Disabilities Act.
- When an LID requirement has been found to be in conflict with special zoning district design criteria adopted and being implemented pursuant to a community planning process. The existing local codes may supersede or reduce the LID requirement.
- Public health and safety standards (e.g. active zone of a skate park, bike park, or sport court where permeable pavement violates safety standards).
- Transportation regulations to maintain the option for future expansion or multi-modal use of public rights-of-way.
- A local Critical Area Ordinance that provides protection of tree species.
- A local code or rule adopted as part of a Wellhead Protection Program established under the Federal Safe Drinking Water Act; or adopted to protect a Critical Aquifer Recharge Area established under the State Growth Management Act.

Supplemental Guidelines

In order to meet the LID Performance Standard, designers may use any Flow Control BMP in the SWMMWW. There are no specific Flow Control BMPs that must be used to meet the LID Performance Standard.

STORMWATER REPORT

Appendix B

Preliminary Stormwater Plan, BMPs

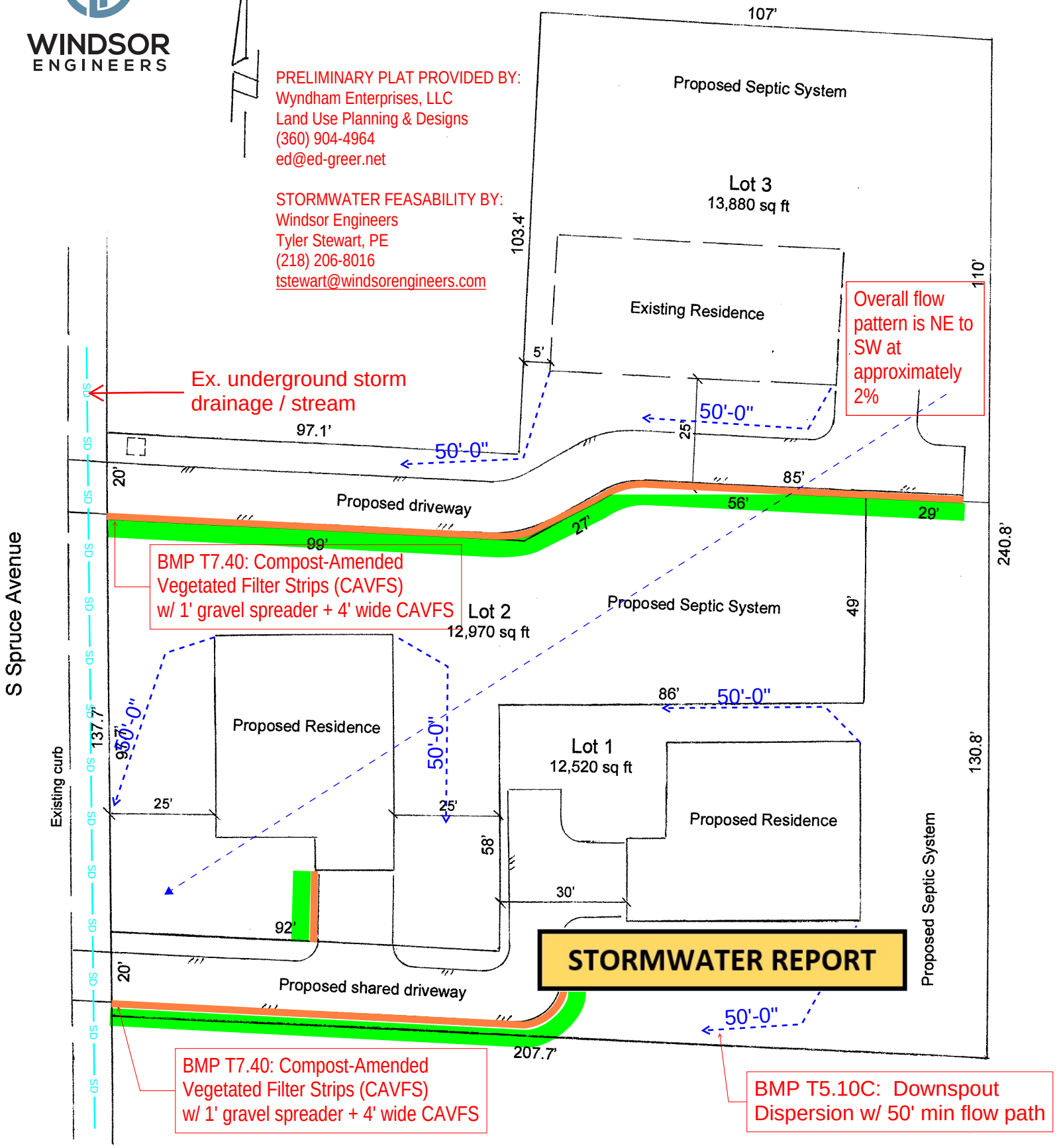
STORMWATER REPORT

BELCORP YACOLT SHORT PLAT
STORMWATER FEASABILITY EXHIBIT
10/20/2020

WINDSOR ENGINEERS

PRELIMINARY PLAT PROVIDED BY:
Wyndham Enterprises, LLC
Land Use Planning & Designs
(360) 904-4964
ed@ed-greer.net

STORMWATER FEASABILITY BY:
Windsor Engineers
Tyler Stewart, PE
(218) 206-8016
tstewart@windsorengineers.com



Preliminary Plot Plan
Scale: 1" = 30'

1. Grade away from each structure at 5% for 10'.
2. Protect the vegetated flow path per BMP C101 and amend all disturbed sols per BMP T5.13.
3. Maintain 10' between Septic drainfield and stormwater facility.

V-4 Roof Downspout BMPs

V-4.1 Introduction to Roof Downspout BMPs

Roof downspout BMPs are simple pre-engineered designs for infiltrating and/or dispersing runoff from roof areas for the purposes of increasing opportunities for ground water recharge and reduction of runoff volumes from development.

Roof downspout BMPs include infiltration trenches, dry wells, and partial dispersion systems for use in individual lots, proposed plats, and short plats. Roof downspout BMPs are used in conjunction with, and in addition to, any Flow Control BMPs that may be necessary. They are included in the list of BMPs to consider if using the List Approach for compliance with I-3.4.5 MR5: On-Site Stormwater Management.

How to Select Roof Downspout BMPs

Large lots in rural areas (5 acres or greater) typically have enough area to disperse or infiltrate roof runoff. Lots created in urban areas will typically be smaller (about 8,000 square feet) and have a limited amount of area in which to site infiltration or dispersion trenches. BMP T5.10A: Downspout Full Infiltration should be used in those soils that readily infiltrate. BMP T5.10B: Downspout Dispersion Systems should be used for urban lots located in less permeable soils, where infiltration is not feasible. Where BMP T5.10B: Downspout Dispersion Systems is not feasible because of very small lot size, or where there is a potential for creating drainage problems on adjacent lots, use BMP T5.10C: Perforated Stub-out Connections to connect downspouts with perforated stub-out connections to the street drainage system, which directs the runoff to a stormwater management facility.

Where supported by appropriate soil infiltration tests, downspout full infiltration in finer soils may be practical using a larger infiltration system.

Roof downspout BMPs can be applied to individual commercial lot developments when the percent impervious area and pollutant characteristics are comparable to those from residential lots.

Note: Other innovative downspout control BMPs such as rain barrels, ornamental ponds, downspout cisterns, or other downspout water storage devices may be used to supplement any of the BMPs in this chapter if approved by the reviewing authority.

BMP T5.10A: Downspout Full Infiltration

Downspout full infiltration systems are trench or drywell designs intended only for use in infiltrating runoff from roof downspout drains. They are not designed to directly infiltrate runoff from pollutant-generating impervious surfaces.

Roof surfaces that comply with this BMP are considered to be "fully infiltrated" (i.e., zero percent effective imperviousness).

Procedure for Evaluating Feasibility

1. Have one of the following prepare a soils report to determine if soils suitable for infiltration are present on the site:

    - A professional soil scientist certified by the Soil Science Society of America (or an equivalent national program)
    - A locally licensed on-site sewage designer
    - A suitably trained person working under the supervision of a professional engineer, geologist, hydrogeologist, or engineering geologist registered in the State of Washington.

    The report shall reference a sufficient number of soils logs to establish the type and limits of soils on the project site. The report should at a minimum identify the limits of any outwash type soils (i.e., those meeting USDA soil texture classes ranging from coarse sand and cobbles to medium sand) versus other soil types and include an inventory of topsoil depth.

2. Complete additional site-specific testing on lots or sites containing outwash (coarse sand and cobbles to medium sand) and loam type soils.

    Individual lot or site tests must consist of at least one soils log at the location of the infiltration system, a minimum of 4 feet in depth from the proposed grade and at least 1 foot below the expected bottom elevation of the infiltration trench or dry well.

    Identify the NRCS series of the soil and the USDA textural class of the soil horizon through the depth of the log, and note any evidence of high ground water level, such as mottling.

3. Downspout full infiltration is considered feasible on lots or sites that meet all of the following:

    - 3 feet or more of permeable soil from the proposed final grade to the seasonal high ground water table.
    - At least 1-foot of clearance from the expected bottom elevation of the infiltration trench or dry well to the seasonal high ground water table.
    - The downspout full infiltration system can be designed to meet the minimum design criteria specified below.

Setbacks

Local governments may require specific setbacks in sites with slopes over 40%, land slide areas, open water features, springs, wells, and septic tank drain fields. Adequate room for maintenance access and equipment should also be considered. Examples of setbacks commonly used include the following:

1. All infiltration systems should be at least 10 feet from any structure, property line, or sensitive area (except slopes over 40%).
2. All infiltration systems must be at least 50 feet from the top of any slope over 40%. This setback may be reduced to 15 feet based on a geotechnical evaluation, but in no instances may it

be less than the buffer width.

3. For sites with septic systems, infiltration systems must be downgradient of the drainfield unless the site topography clearly prohibits subsurface flows from intersecting the drainfield.

Design Criteria

Infiltration Trenches

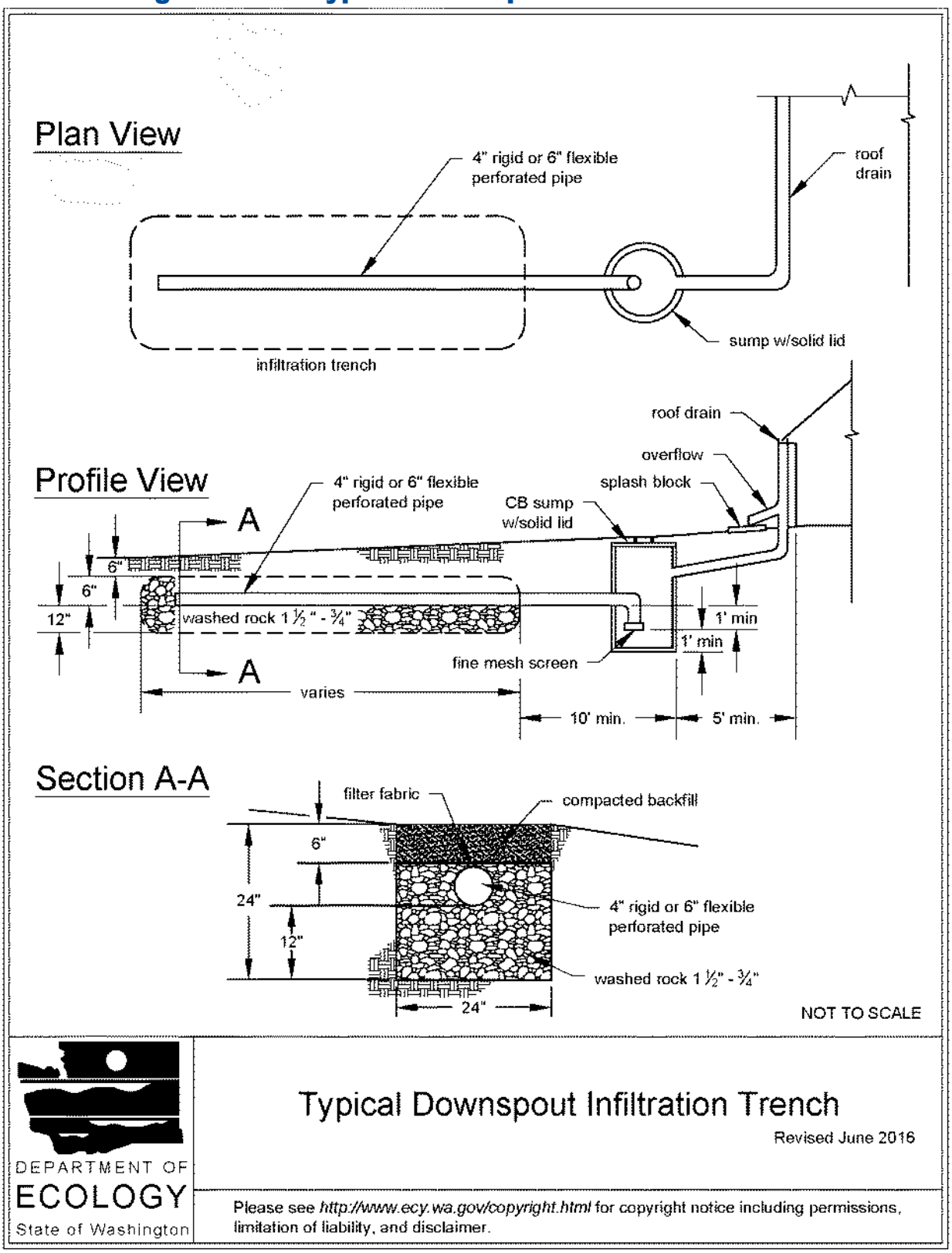
Figure V-4.1: Typical Downspout Infiltration Trench shows a typical downspout infiltration trench system, and Figure V-4.2: Alternative Downspout Infiltration Trench System for Coarse Sand and Gravel presents an alternative infiltration trench system for sites with coarse sand and cobble soils. These systems are designed as specified below.

1. The following minimum lengths (linear feet) per 1,000 square feet of roof area based on soil type may be used for sizing downspout infiltration trenches:
    - Coarse sands and cobbles: 20 LF
    - Medium sand: 30 LF
    - Fine sand, loamy sand: 75 LF
    - Sandy loam: 125 LF
    - Loam: 190 LF
2. Silt and clay type soils have a saturated hydraulic conductivity that is too small for adequate infiltration and are infeasible for downspout infiltration trenches.
3. The maximum length of the trench shall not exceed 100 feet from the inlet sump.
4. The minimum spacing between trench centerlines shall be 6 feet.
5. Filter fabric shall be placed over the drain rock as shown on Figure V-4.1: Typical Downspout Infiltration Trench prior to backfilling.
6. Infiltration trenches may be placed in fill material if:
    - the fill is placed and compacted under the direct supervision of a geotechnical engineer or professional civil engineer with geotechnical expertise, and
    - the measured infiltration rate is at least 8 inches per hour.

    Trench length in fill must be 60 linear feet per 1,000 square feet of roof area. Infiltration rates can be tested using the methods described in V-5.4 Determining the Design Infiltration Rate of the Native Soils.
7. Infiltration trenches should not be built on slopes steeper than 25% (4:1). A geotechnical analysis and report may be required on slopes over 15%, or if the proposed trench is located within 200 feet of the top of a slope steeper than 40%, or in a landslide hazard area.
8. Infiltration trenches may be located under pavement if a small yard drain or catch basin with grate cover is placed at the end of the trench pipe such that overflow would occur out of the

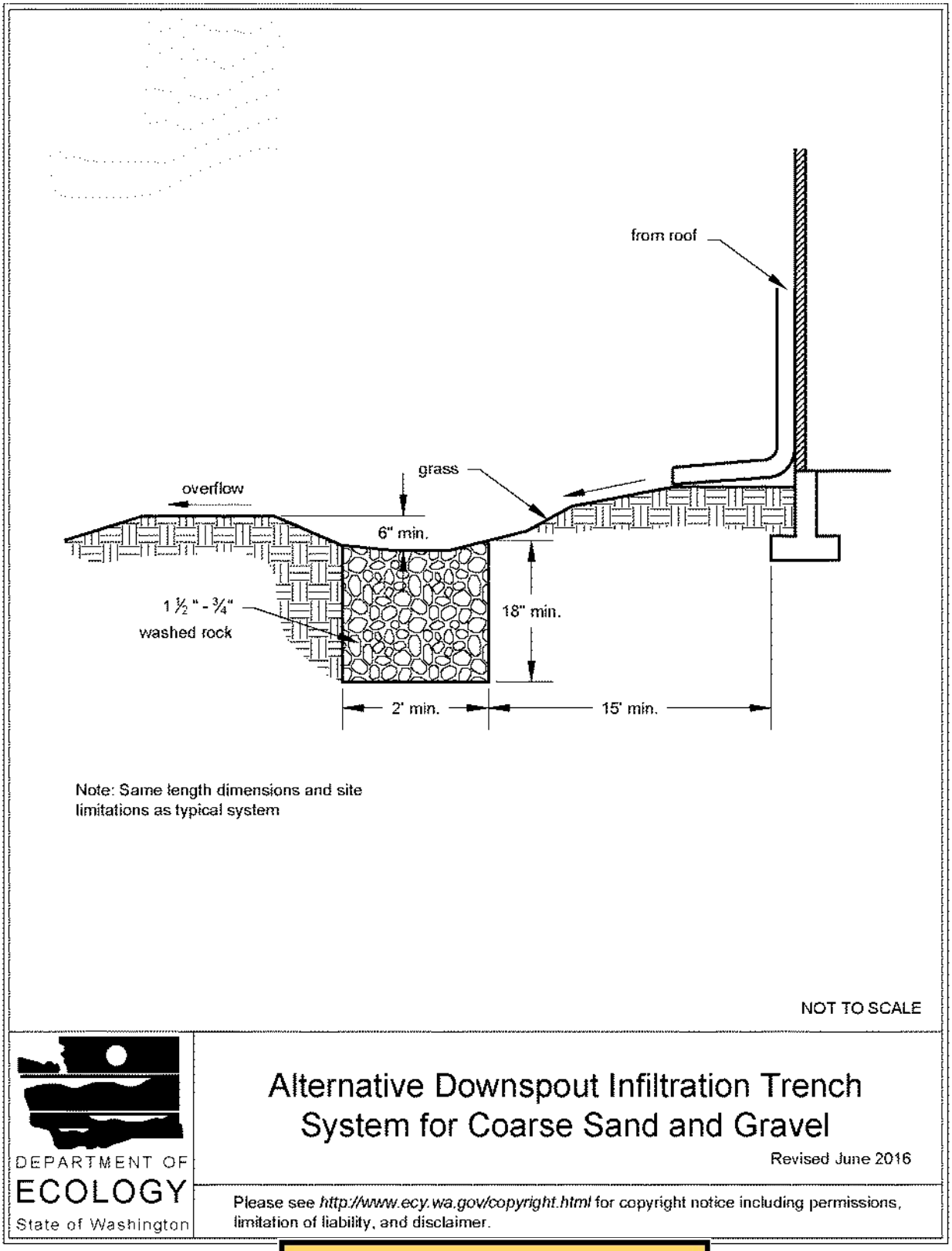
catch basin at an elevation at least one foot below that of the pavement, and in a location which can accommodate the overflow without creating a significant adverse impact to down-hill properties or drainage systems. This is intended to prevent saturation of the pavement in the event of system failure.

Figure V-4.1: Typical Downspout Infiltration Trench



STORMWATER REPORT

Figure V-4.2: Alternative Downspout Infiltration Trench System for Coarse Sand and Gravel

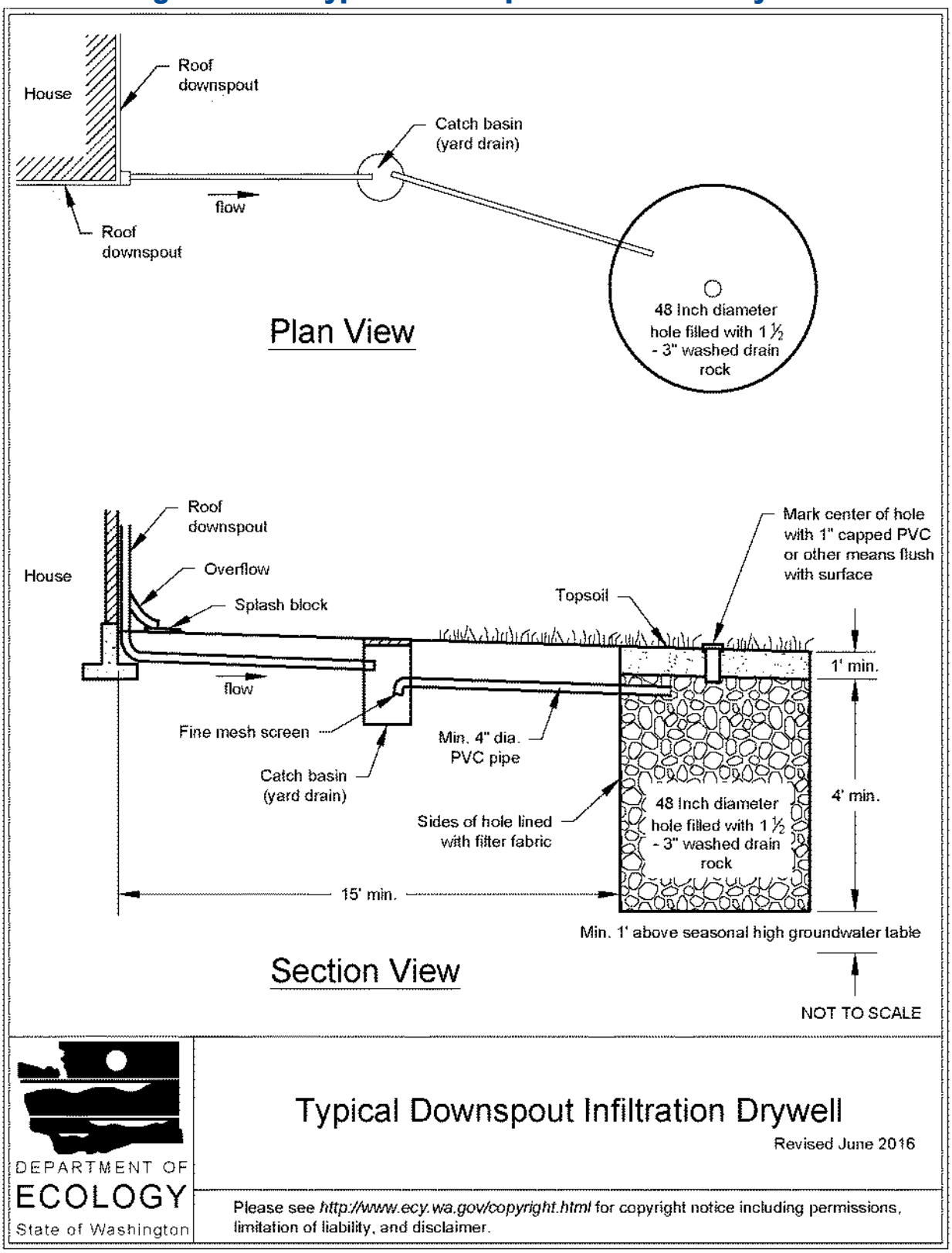


Infiltration Drywells

Figure V-4.3: Typical Downspout Infiltration Drywell shows a typical downspout infiltration drywell system. These systems are designed as specified below.

1. Drywell bottoms must be a minimum of 1 foot above the seasonal high ground water level or impermeable soil layers.
2. When located in course sands and cobbles, drywells must contain a volume of gravel equal to or greater than 60 cubic feet per 1000 square feet of impervious surface served. When located in medium sands, drywells must contain at least 90 cubic feet of gravel per 1,000 square feet of impervious surface served.
3. Drywells must be at least 48 inches in diameter (minimum) and deep enough to contain the gravel amounts specified above for the soil type and impervious surface served.
4. Filter fabric (geotextile) must be placed on top of the drain rock and on drywell sides prior to backfilling.
5. Spacing between drywells must be a minimum of 10 feet.
6. Downspout infiltration drywells must not be built on slopes greater than 25% (4:1). Drywells may not be placed on or above a landslide hazard area or on slopes greater than 15% without evaluation by a licensed engineer in the state of Washington with geotechnical expertise or a licensed geologist, hydrogeologist, or engineering geologist, and with jurisdiction approval.

Figure V-4.3: Typical Downspout Infiltration Drywell



STORMWATER REPORT

Runoff Model Representation

Roof areas served by downspouts that drain to infiltration dry wells or infiltration trenches that are sized in accordance with the guidance in this BMP do not have to be entered into the runoff model. They are presumed to fully infiltrate the roof runoff.

BMP T5.10B: Downspout Dispersion Systems

Downspout dispersion systems are splash blocks or gravel filled trenches, which serve to spread roof runoff over vegetated pervious areas. Dispersion attenuates peak flows by slowing the runoff entering into the conveyance system, allowing some infiltration, and providing some water quality benefits.

Design Criteria

1. Use downspout trenches designed as shown in Figure V-4.4: Typical Downspout Dispersion Trench and Figure V-4.5: Standard Dispersion Trench with Notched Grade Board for all downspout dispersion applications except where splash blocks are allowed below.
2. Splash blocks shown in Figure V-4.6: Typical Downspout Splashblock Dispersion may be used for downspouts discharging to a vegetated flow path at least 50 feet in length as measured from the downspout to the downstream property line, structure, slope over 15%, stream, wetland, or other impervious surface. Sensitive area buffers may count toward flow path lengths.
3. The vegetated flow path must consist of well-established lawn or pasture, landscaping with well-established groundcover , native vegetation with natural groundcover, or an area that meets BMP T5.13: Post-Construction Soil Quality and Depth. The groundcover shall be dense enough to help disperse and infiltrate flows and to prevent erosion.
4. If the vegetated flow path (measured as defined above) is less than 25 feet, BMP T5.10C: Perforated Stub-out Connections may be used in lieu of downspout dispersion. BMP T5.10C: Perforated Stub-out Connections may also be used where implementation of downspout dispersion might cause erosion or flooding problems, either on site or on adjacent lots. For example, this provision might be appropriate for lots constructed on steep hills where downspout discharge could culminate and might pose a potential hazard for lower lying lots, or where dispersed flows could create problems for adjacent off-site lots. This provision does not apply to situations where lots are flat and on-site downspout dispersal would result in saturated yards.

   Note: For all other types of projects, the use of a perforated stub-out in lieu of downspout dispersion shall be as determined by the Local Plan Approval Authority.
5. For sites with septic systems, the discharge point of all dispersion systems must be downslope of the primary and reserve drainfield areas. This requirement may be waived if site topography clearly prohibits flows from intersecting the drainfield or where site conditions (soil permeability, distance between systems, etc.) indicate that this is unnecessary.
6. No erosion or flooding of downstream properties may result.

7. For purposes of maintaining adequate separation of flows discharged from adjacent dispersion devices, the vegetated flowpath segment for the splashblock (or the outer edge of the vegetated flowpath segment for the dispersion trench) must not overlap with other flowpath segments, except those associated with sheet flow from a non-native pervious surface.

8. Have a geotechnical engineer or a licensed geologist, hydrogeologist, or engineering geologist evaluate runoff discharged towards landslide hazard areas. Do not place the discharge point from splashblocks or dispersion trenches on or above slopes greater than 15% or above erosion hazard areas without evaluation by a licensed engineer in the state of Washington with geotechnical expertise or a licensed geologist, hydrogeologist, or engineering geologist, and approval by the Local Plan Approval Authority.

Design Criteria for Dispersion Trenches

1. A vegetated flow path of at least 25 feet in length must be maintained between the outlet of the dispersion trench and any property line, structure, stream, wetland, or impervious surface. A vegetated flow path of at least 50 feet in length must be maintained between the outlet of the trench and any slope steeper than 15%. Sensitive area buffers may count towards flow path lengths.

2. Trenches serving up to 700 square feet of roof area may be 10-foot-long by 2-foot wide gravel filled trenches as shown in Figure V-4.4: Typical Downspout Dispersion Trench.

   For roof areas larger than 700 square feet, a dispersion trench with notched grade board as shown in Figure V-4.5: Standard Dispersion Trench with Notched Grade Board or alternative material approved by the Local Plan Approval Authority may be used. The total trench length must not exceed 50 feet and must provide at least 10 feet of trench length per 700 square feet of roof area.

3. Maintain a setback of at least 5 feet between any edge of the trench and any structure or property line.

Figure V-4.4: Typical Downspout Dispersion Trench

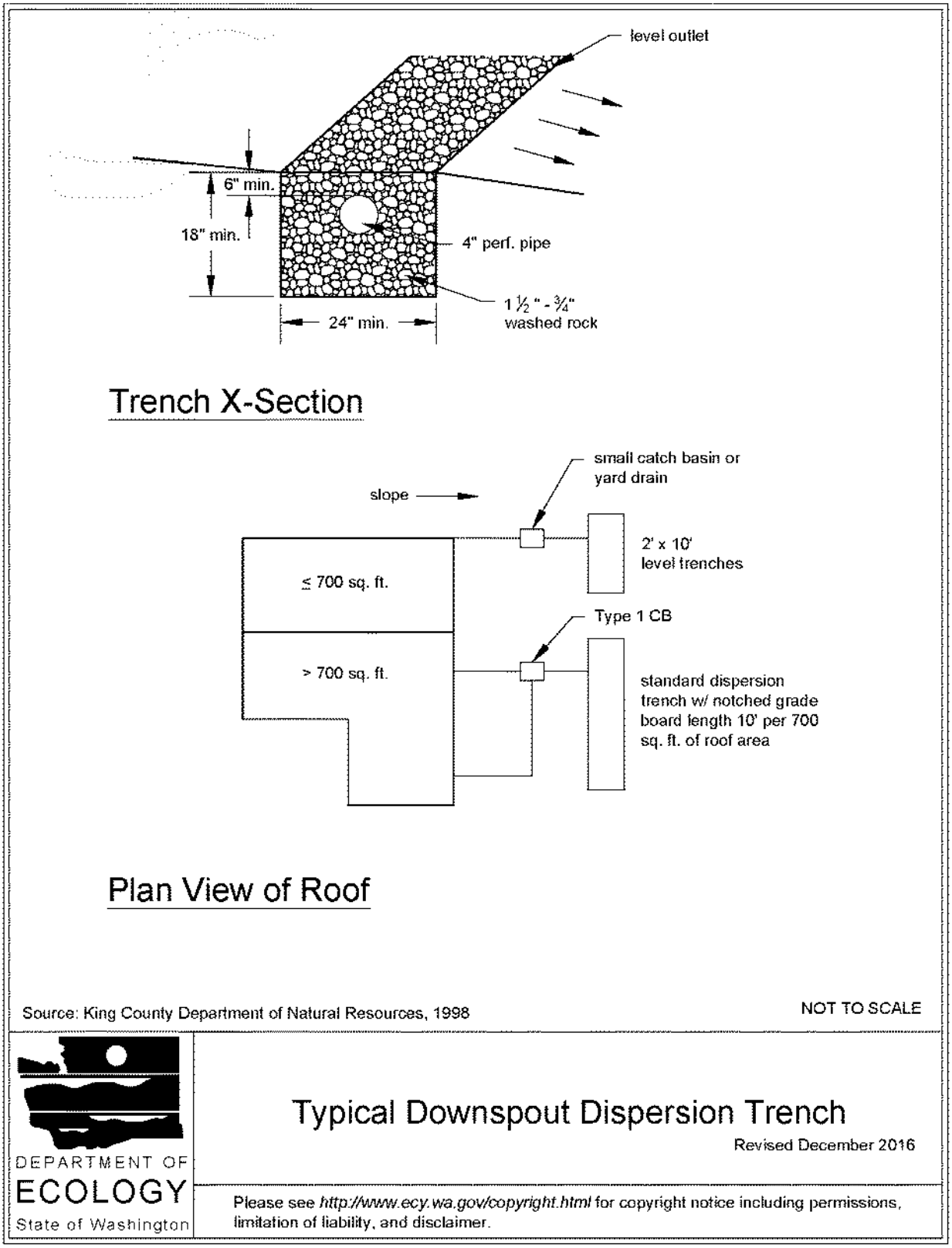
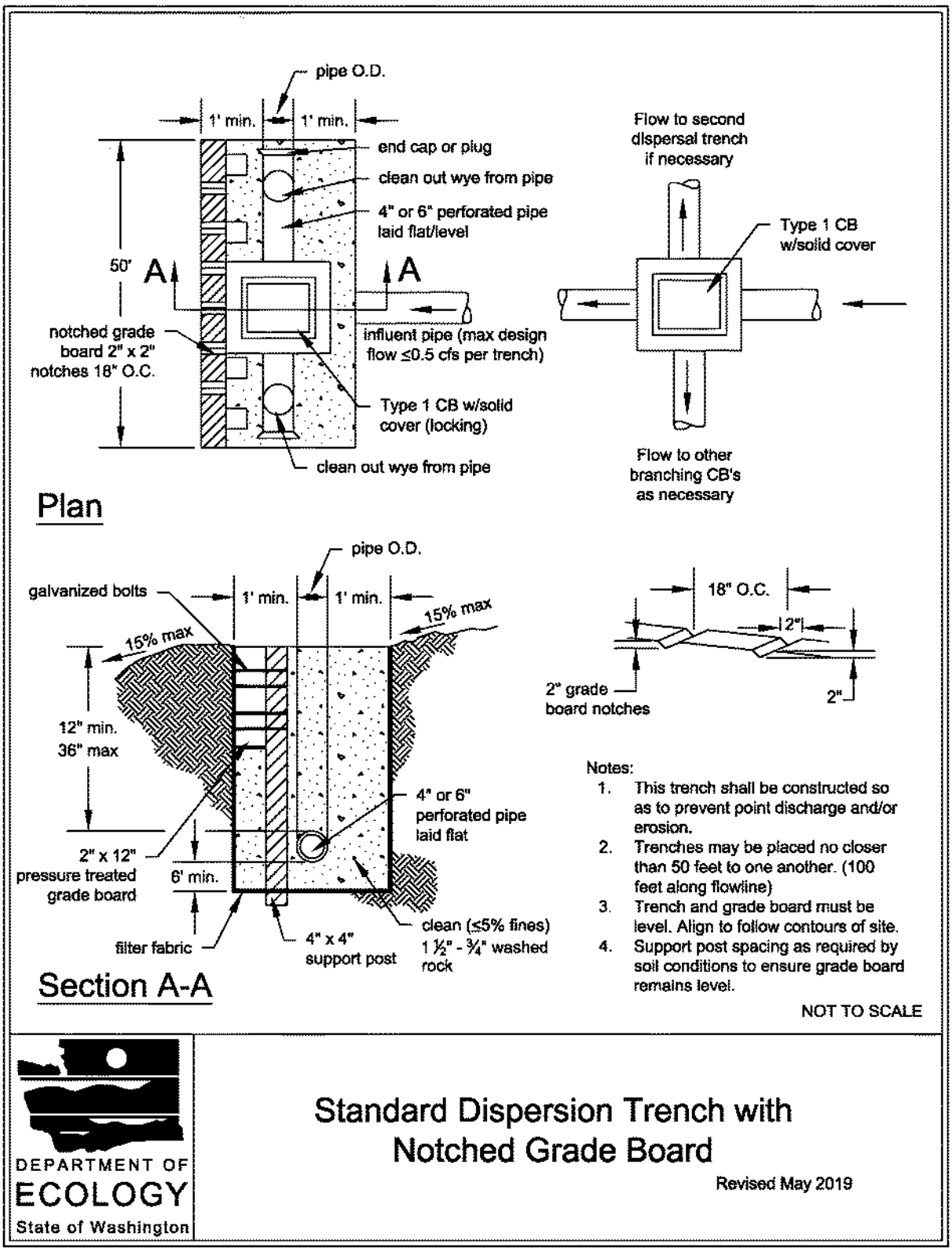


Figure V-4.5: Standard Dispersion Trench with Notched Grade Board



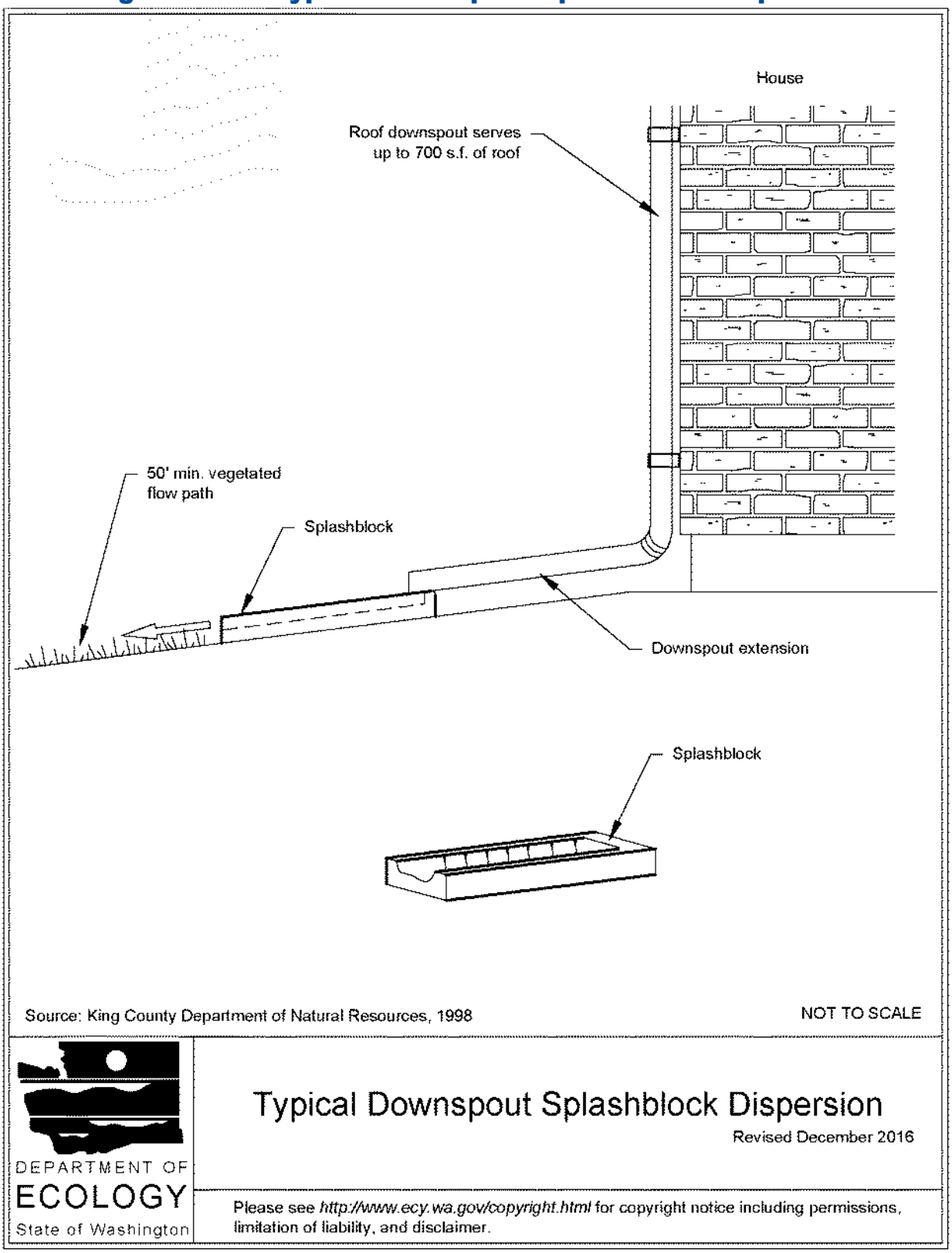
Design Criteria for Splashblocks

A typical downspout splashblock is shown in Figure V-4.6: Typical Downspout Splashblock Dispersion. In general, if the ground is sloped away from the foundation and there is adequate vegetation and area for effective dispersion, splashblocks will adequately disperse storm runoff. If the ground is fairly level, if the structure includes a basement, or if foundation drains are proposed, splashblocks with downspout extensions may be a better choice because the discharge point is moved away from the foundation. Downspout extensions can include piping to a splashblock/discharge point a considerable distance from the downspout, as long as the runoff can travel through a well-vegetated area as described below.

The following apply to the use of splashblocks:

1. Maintain a vegetated flow path of at least 50 feet between the discharge point and any property line, structure, slope steeper than 15%, stream, wetland, lake, or other impervious surface. Sensitive area buffers may count toward flow path lengths.
2. A maximum of 700 square feet of roof area may drain to each splashblock.
3. Place a splashblock or a pad of crushed rock (2 feet wide by 3 feet long by 6 inches deep) at each downspout discharge point.

Figure V-4.6: Typical Downspout Splashblock Dispersion



Runoff Model Representation

The designer has the following options to model the amount of Flow Control presumed to be provided by this BMP:

- When splashblocks or dispersion trenches are used per the guidance above, and the length of the vegetated flow path is at least 50 feet:
    - When modeling in an approved continuous runoff model, the connected roof area should be modeled as a lateral flow impervious area. Do this in WWHM on the Mitigated Scenario screen by connecting the dispersed impervious area (the roof area) to the lawn/landscape lateral flow soil basin element representing the area that will be used for dispersion (the vegetated flow path).

      In situations where multiple downspout dispersions will occur, Ecology allows the roof area to be modeled as a landscaped area (grass) so that the project schematic in the approved continuous runoff model becomes manageable.
    - When calculating the runoff curve number to include in calculations described in III-2.3 Single Event Hydrograph Method, the curve number may be determined by considering the roof area as landscaped area (grass).
- When dispersion trenches are used per the guidance above, and the length of the vegetated flow path is 25 - 50 feet:
    - When modeling in an approved continuous runoff model, the connected roof area should be modeled as a lateral flow impervious area. Do this in WWHM on the Mitigated Scenario screen by connecting the dispersed impervious area (the roof area) to the lawn/landscape lateral flow soil basin element representing the area that will be used for dispersion (the vegetated flow path).

      In situations where multiple downspout dispersions will occur, Ecology allows the roof area to be modeled as 50%landscaped / 50%impervious so that the project schematic in the approved continuous runoff model becomes manageable.
    - When calculating the runoff curve number to include in calculations described in III-2.3 Single Event Hydrograph Method, the curve number may be determined by considering the roof area as 50%landscaped / 50%impervious.

BMP T5.10C: Perforated Stub-out Connections

A perforated stub out connection is a length of perforated pipe within a gravel filled trench that is placed between roof downspouts and a stub out to the local drainage system. Figure V-4.7: Perforated Stub-Out Connection illustrates a perforated stub out connection. These systems are intended to provide some infiltration during drier months. During the wet winter months, they may provide little or no Flow Control.

Applications & Limitations

Perforated stub-outs are not appropriate when the seasonal water table is less than one foot below the trench bottom.

Select the location of the connection to allow a maximum amount of runoff to infiltrate into the ground (ideally a dry, relatively well drained, location). To facilitate maintenance, do not locate the perforated pipe portion of the system under impervious or heavily compacted (e.g., driveways and parking areas) surfaces. Use the same setbacks as for infiltration trenches in BMP T5.10A: Downspout Full Infiltration.

Have a licensed geologist, hydrogeologist, or engineering geologist evaluate potential runoff discharges towards landslide hazard areas. Do not place the perforated portion of the pipe on or above slopes greater than 20% or above erosion hazard areas without evaluation by a licensed engineer in the state of Washington with geotechnical expertise or qualified geologist and jurisdiction approval.

For sites with septic systems, the perforated portion of the pipe must be downgradient of the drainfield primary and reserve areas. This requirement can be waived if site topography will clearly prohibit flows from intersecting the drainfield or where site conditions (soil permeability, distance between systems, etc.) indicate that this is unnecessary.

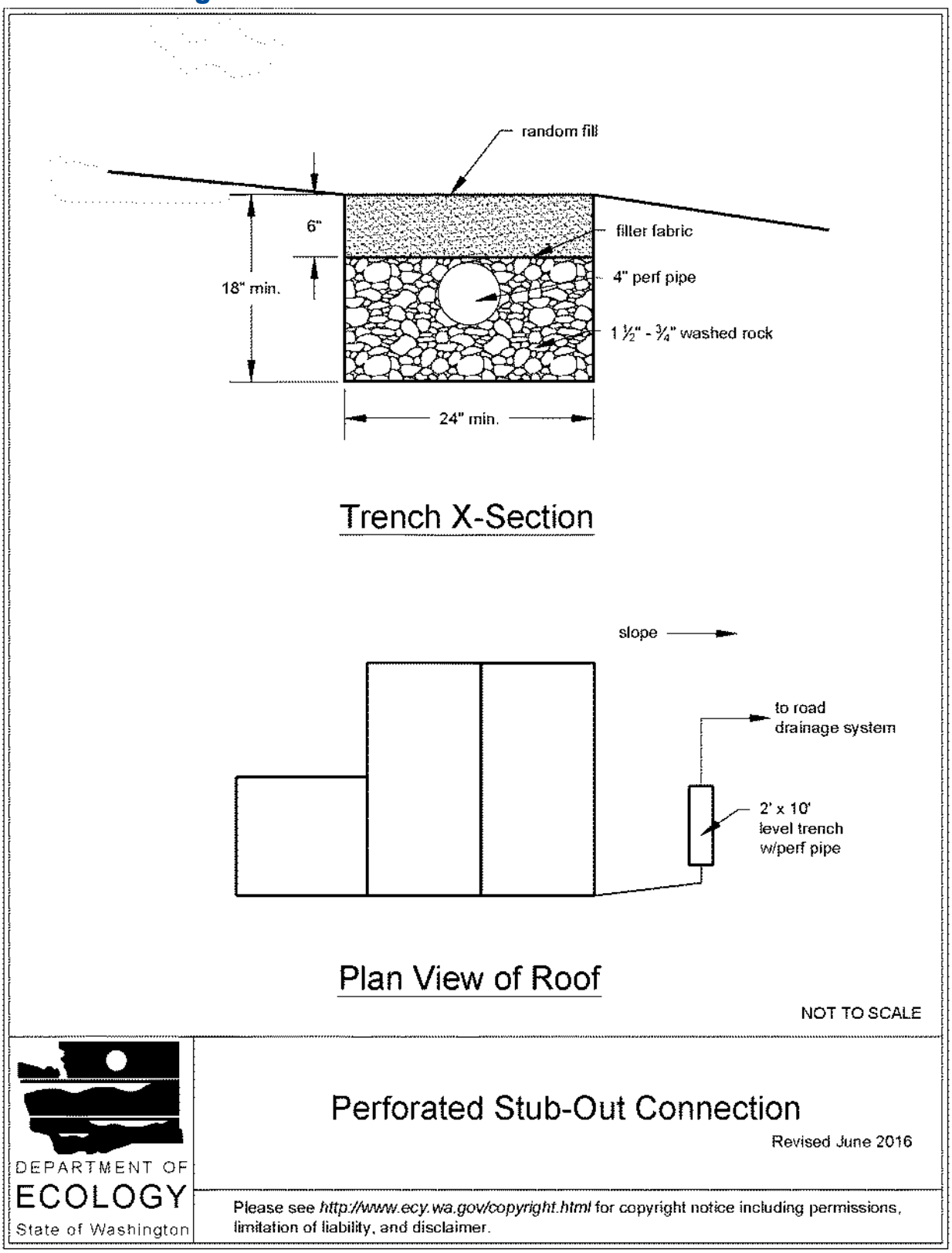
Design Criteria

Perforated stub out connections consist of at least 10 feet of perforated pipe per 5,000 square feet of roof area laid in a level, 2 foot wide trench backfilled with washed drain rock. Extend the drain rock to a depth of at least 8 inches below the bottom of the pipe and cover the pipe. Lay the pipe level and cover the rock trench with filter fabric and 6 inches of fill (see Figure V-4.7: Perforated Stub-Out Connection).

Runoff Model Representation

Any flow reduction is variable and unpredictable. No computer modeling techniques are allowed that would predict any reduction in flow rates and volumes from the connected area.

Figure V-4.7: Perforated Stub-Out Connection



V-11 Miscellaneous LID BMPs

V-11.1 Introduction to Miscellaneous LID BMPs

BMPs in this chapter have been grouped because they have the following in common:

- They employ Low Impact Development (LID) Principles
- They cannot be used to meet I-3.4.6 MR6: Runoff Treatment
- They cannot, by themselves, be used to meet the Flow Control Performance Standard or the LID Performance Standard.
    - Some of the BMPs in this chapter do allow for some amount of Flow Control credit. See the guidance for each individual BMP for details.
- The design methods for each BMP in this chapter are unique. They do not have strong enough design similarities to other BMPs in this volume to place them in the other BMP categories identified in this volume.

BMP T5.13: Post-Construction Soil Quality and Depth

Purpose and Definition

Naturally occurring (undisturbed) soil and vegetation provide important stormwater functions including: water infiltration; nutrient, sediment, and pollutant adsorption; sediment and pollutant biofiltration; water interflow storage and transmission; and pollutant decomposition. These functions are largely lost when development strips away native soil and vegetation and replaces it with minimal topsoil and sod. Not only are these important stormwater functions lost, but such landscapes themselves become pollution generating pervious surfaces due to increased use of pesticides, fertilizers and other landscaping and household/industrial chemicals, the concentration of pet wastes, and pollutants that accompany roadside litter.

Establishing soil quality and depth regains greater stormwater functions in the post development landscape, provides increased treatment of pollutants and sediments that result from development and habitation, and minimizes the need for some landscaping chemicals, thus reducing pollution through prevention.

Applications and Limitations

Establishing a minimum soil quality and depth is not the same as preservation of naturally occurring soil and vegetation. However, establishing a minimum soil quality and depth will provide improved on-site management of stormwater flow and water quality.

Soil organic matter can be attained through numerous materials such as compost, composted woody material, biosolids, and forest product residuals. It is important that the materials used to

meet this BMP be appropriate and beneficial to the plant cover to be established. Likewise, it is important that imported topsoils improve soil conditions and do not have an excessive percent of clay fines.

This BMP can be considered infeasible on till soil slopes greater than 33 percent.

Design Guidelines

Soil Retention

Retain, in an undisturbed state, the duff layer and native topsoil to the maximum extent practicable. In any areas requiring grading, remove and stockpile the duff layer and topsoil on site in a designated, controlled area, not adjacent to public resources and critical areas, to be reapplied to other portions of the site where feasible.

Soil Quality

All areas subject to clearing and grading that have not been covered by impervious surface, incorporated into a drainage facility or engineered as structural fill or slope shall, at project completion, demonstrate the following:

1. A topsoil layer with a minimum organic matter content of 10% dry weight in planting beds, and 5% organic matter content in turf areas, and a pH from 6.0 to 8.0 or matching the pH of the undisturbed soil. The topsoil layer shall have a minimum depth of eight inches except where tree roots limit the depth of incorporation of amendments needed to meet the criteria. Subsoils below the topsoil layer should be scarified at least 4 inches with some incorporation of the upper material to avoid stratified layers, where feasible.
2. Mulch planting beds with 2 inches of organic material.
3. Use compost and other materials that meet the following organic content requirements:
    a. The organic content for "pre-approved" amendment rates can be met only using compost meeting the compost specification for BMP T7.30: Bioretention, with the exception that the compost may have up to 35% biosolids or manure.

       The compost must also have an organic matter content of 40% to 65%, and a carbon to nitrogen ratio below 25:1.

       The carbon to nitrogen ratio may be as high as 35:1 for plantings composed entirely of plants native to the Puget Sound Lowlands region.

    b. Calculated amendment rates may be met through use of composted material meeting (a.) above; or other organic materials amended to meet the carbon to nitrogen ratio requirements, and not exceeding the contaminant limits identified in Table 220-B, Testing Parameters, in WAC 173-350-220.

The resulting soil should be conducive to the type of vegetation to be established.

Implementation Options

The soil quality design guidelines listed above can be met by using one of the methods listed below:

1. Leave undisturbed native vegetation and soil, and protect from compaction during construction.
2. Amend existing site topsoil or subsoil either at default "pre-approved" rates, or at custom calculated rates based on tests of the soil and amendment.
3. Stockpile existing topsoil during grading, and replace it prior to planting. Stockpiled topsoil must also be amended if needed to meet the organic matter or depth requirements, either at a default "pre-approved" rate or at a custom calculated rate.
4. Import topsoil mix of sufficient organic content and depth to meet the requirements.

More than one method may be used on different portions of the same site. Soil that already meets the depth and organic matter quality standards, and is not compacted, does not need to be amended.

Planning/Permitting/Inspection/Verification Guidelines & Procedures

Local governments are encouraged to adopt guidelines and procedures similar to those recommended in *Building Soil: Guidelines and Resources for Implementing Soil Quality and Depth BMP T5.13 in WDOE Stormwater Management Manual for Western Washington* (Stenn et al., 2016).

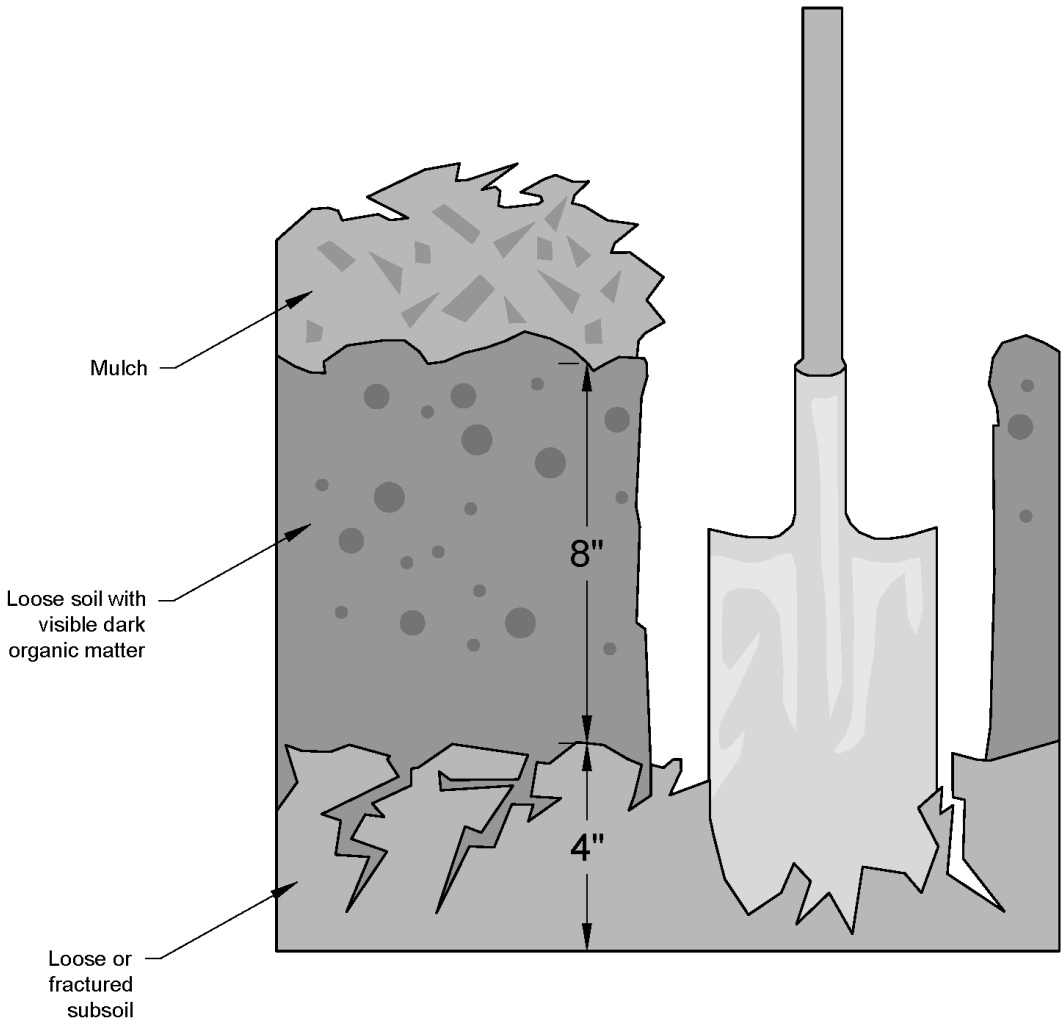
Maintenance

- Establish soil quality and depth toward the end of construction and once established, protect from compaction, such as from large machinery use, and from erosion.
- Plant vegetation and mulch the amended soil area after installation.
- Leave plant debris or its equivalent on the soil surface to replenish organic matter.
- Reduce and adjust, where possible, the use of irrigation, fertilizers, herbicides and pesticides, rather than continuing to implement formerly established practices.

Runoff Model Representation

All areas meeting the soil quality and depth design criteria may be entered into approved runoff models as "Pasture" rather than "Lawn/Landscaping".

Figure V-11.1: Planting Bed Cross-Section



Reprinted from *Guidelines and Resources For Implementing Soil Quality and Depth BMP T5.13 in WDOE Stormwater Management Manual for Western Washington*, 2010, Washington Organic Recycling Council

NOT TO SCALE

DEPARTMENT OF ECOLOGY
State of Washington

Planting Bed Cross-Section

Revised June 2016

BMP T5.30: Full Dispersion

Purpose and Definition

This BMP allows for "fully dispersing" runoff from impervious surfaces and cleared areas of Project Sites into areas preserved as forest, native vegetation, or cleared area.

Ecology accepts Full Dispersion as meeting I-3.4.5 MR5: On-Site Stormwater Management, I-3.4.6 MR6: Runoff Treatment, and I-3.4.7 MR7: Flow Control. Sites that can fully disperse are not required to provide additional Runoff Treatment or Flow Control BMPs. Hard surfaces that are not fully dispersed should be partially dispersed to the maximum extent practicable.

Applications and Limitations

The site (or area of the site) that is applying full dispersion per this BMP must be laid out to allow the runoff from the impervious (or cleared) surface to fully disperse into the preserved dispersion area. (i.e. Have full access to and not be intercepted by pipe(s), ditch(es), stream(s), river(s), pond(s), lake (s), or wetland(s)).

Projects that successfully apply this BMP on all or a portion of their site will decrease effective impervious surfaces, and may avoid triggering the TDA Thresholds in I-3.4.7 MR7: Flow Control.

A site (or an area of a site) that applies full dispersion per this BMP consists of the following elements:

- **An impervious (or cleared) area**. The impervious (or cleared) area is the area that the design is mitigating for by using this BMP.
- **A flow spreader.** Runoff from the impervious (or cleared) area may need to be routed through a flow spreader (see V-1.4.2 Flow Spreaders), depending on the site layout and type of impervious surface, as further described below.
- **A dispersion area.** This area defines the limits of the Full Dispersion BMP. The impervious (or cleared) area must disperse into the preserved dispersion area.
    - The dispersion area must be forest, native vegetation, or a cleared area depending on the site type. Details are provided below for what amount of vegetation the dispersion area must contain based on site type.
    - If the dispersion area must be preserved as forest or native vegetation, it may be a previously cleared area that has been replanted in accordance with Native Vegetation Landscape Specifications (below).
    - The dispersion area should be situated to minimize the clearing of existing forest cover, to maximize the preservation of wetlands (though the wetland area and any streams and lakes do not count as part of the dispersion area), and to buffer stream corridors.
    - The dispersion area should be placed in a separate tract or protected through recorded easements for individual lots.
    - The dispersion area should be shown on all property maps and should be clearly

marked during clearing and construction on the site.

- All trees within the dispersion area at the time of permit application shall be retained, aside from:
  - dangerous or diseased trees, and
  - approved timber harvest activities regulated under WAC Title 222. Class IV General Forest Practices that are conversions from timberland to other uses are not acceptable for the preserved area.
- The dispersion area may be used for passive recreation and related facilities, including pedestrian and bicycle trails, nature viewing areas, fishing and camping areas, and other similar activities that do not require permanent structures. Cleared areas and areas of compacted soil associated with these areas and facilities must not exceed eight percent of the dispersion area.
- The dispersion area may contain utilities and utility easements, but not septic systems. For the purpose of this BMP, utilities are defined as potable and wastewater underground piping, underground wiring, and power and telephone poles.
- The dispersion area is not allowed in critical area buffers or on slopes steeper than 20%. Dispersion areas proposed on slopes steeper than 15% or within 50 feet of a geologically hazardous area (RCW 36.70A.030(5)) must be approved by a geotechnical engineer or engineering geologist.
- For sites with on-site sewage disposal systems, the discharge of runoff from the dispersion area must be located downslope of the primary and reserve drainfield areas. This requirement may be waived by the permitting jurisdiction if site topography clearly prevents discharged flows from intersecting the drainfield.

- **A flow path through the dispersion area.** The length of the flow path from the impervious (or cleared) area through the dispersion area varies based on the site layout and type of impervious surface, as further described below. Regardless of the site layout and type of impervious surface, the flow path must meet the following criteria:
  - The slope of the flow path must be no steeper than 15% for any 20-foot reach of the flow path. Slopes up to 20% are allowed where flow spreaders are located upstream of the dispersion area and at sites where vegetation can be established.
  - The flow paths from adjacent flow spreaders must be sufficiently spaced to prevent overlap of flows in the flow path areas.

The dispersion of runoff must not create flooding or erosion impacts.

Minimum Design Requirements for Residential Projects

Rural single family residential developments should use this BMP wherever possible to minimize effective impervious surfaces.

Full Dispersion from Impervious Surfaces in Residential Projects

Impervious surfaces within residential projects may be "fully dispersed" if they are within a TDA that is less than 10% impervious. If the TDA has more than 10% impervious area, the design may still fully disperse up to 10% of the TDA's area. The impervious areas that are beyond the 10% cannot drain to the dispersion area, and are subject to the thresholds in I-3.4.6 MR6: Runoff Treatment and I-3.4.7 MR7: Flow Control.

The lawn and landscaping areas associated with the impervious area being mitigated may be dispersed into the dispersion area. The lawn and landscaped area must comply with BMP T5.13: Post-Construction Soil Quality and Depth.

The dispersion area must be preserved as forest or native vegetation.

The dispersion area shall have a minimum area 6.5 times the area of the impervious surface draining to it.

The flow path from the impervious surface through the area preserved as forest or native vegetation must be at least 100 feet in length, or 25 feet for sheet flow from lawn and landscaping areas associated with the impervious area being mitigated.

The following additional guidelines must be followed for the following types of impervious surfaces within residential projects:

- **Full dispersion from roof surfaces:** Runoff from roof surfaces must either:
    - Provide dispersion BMPs as described in BMP T5.10B: Downspout Dispersion Systems prior to the runoff entering the dispersion area. The dispersion area and flow path must meet the criteria described in this BMP.

      or
    - Combine the roof runoff with the road runoff, and follow the guidance for full dispersion from roadway surfaces (below).
- **Full dispersion from driveway surfaces:** Runoff from driveway surfaces must either:
    - Provide dispersion BMPs as described in BMP T5.11: Concentrated Flow Dispersion and BMP T5.12: Sheet Flow Dispersion prior to the runoff entering the dispersion area. The dispersion area and flow path must meet the criteria described in this BMP.

      or
    - Combine the driveway runoff with the road runoff, and follow the guidance for full dispersion from roadway surfaces (below).
- **Full Dispersion from Roadway Surfaces:** Runoff from roadway surfaces comply with all of the following requirements:
    - The road section shall be designed to minimize collection and concentration of roadway runoff. Sheet flow over roadway fill slopes (i.e., where roadway subgrade is above adjacent right-of-way) should be used wherever possible to avoid concentration.

- When it is necessary to collect and concentrate runoff from the roadway and adjacent upstream areas (e.g., in a ditch on a cut slope), concentrated flows shall be incrementally discharged from the ditch via cross culverts or at the ends of cut sections. These incremental discharges of newly concentrated flows shall not exceed 0.5 cfs at any one discharge point from a ditch for the 100-year runoff event. Where flows at a particular ditch discharge point were already concentrated under existing site conditions (e.g., in a natural channel that crosses the roadway alignment), the 0.5-cfs limit would be in addition to the existing concentrated peak flows.
- Ditch discharge points with up to 0.2 cfs discharge for the peak 100-year flow shall use rock pads or dispersion trenches to disperse flows into the dispersion area. Ditch discharge points with between 0.2 and 0.5 cfs discharge for the 100-year peak flow shall use dispersion trenches to disperse flows into the dispersion area. See V-1.4.3 Outfall Systems for details on rock pads and dispersion trenches.
    - Dispersion trenches shall be designed to accept surface flows (free discharge) from a pipe, culvert, or ditch end, shall be aligned perpendicular to the flowpath, and shall have a minimum 2 feet by 2 cross section, 50 feet in length, filled with 3/4-inch to 1 1/2-inch washed rock, and provided with a level notched grade board. Manifolds may be used to split flows up to 2 cfs discharge for the 100-year peak flow between up to 4 trenches. Dispersion trenches shall have a minimum spacing of 50 feet between centerlines.
- Where the Local Plan Approval Authority determines there is a potential for significant adverse impacts downstream (e.g., erosive steep slopes or existing downstream drainage problems), dispersion of runoff from roadway surfaces may not be allowed, or other measures may be required.

Full Dispersion from Cleared Areas in Residential Projects

The runoff from cleared areas of residential projects that are comprised of bare soil, non-native landscaping, lawn, and/or pasture is "fully dispersed" if it meets all of the following criteria:

- Cleared areas must comply with BMP T5.13: Post-Construction Soil Quality and Depth.
- The dispersion area must be preserved as forest or native vegetation.
- The flow path through the cleared area (and leading to the dispersion area) must not be greater than 25 feet.
- If the cleared area has a width of up to 25 feet:
    - The minimum flow path length from the cleared area through the dispersion area must be at least 25 feet.
- If the cleared area has a width of 25 to 250 feet:
    - The minimum flow path length from the cleared area through the dispersion area must be 25 feet, plus an additional 1 foot for every 3 feet of width of the cleared area (beyond the initial 25 feet) up to a maximum width of 250 feet.

- The topography of the cleared area must be such that runoff will not concentrate prior to discharge to the dispersion area.
- The width of the dispersion area must equal the width of the cleared area.

Minimum Design Requirements for Public Road Projects

These criteria apply to the construction of public roads not within the context of residential, commercial, or industrial site development. They will likely only be implementable on roads outside of the urban growth areas where roadside areas are not planned for urban density development.

Full dispersion can be applied to public road projects that meet the following requirements:

- The dispersion area must be outside of the urban growth area; or if inside the urban growth area, in legally protected areas (easements, conservation tracts, public parks).
- If the dispersion area is outside urban growth areas, legal agreements should be reached with the owner(s) of the property(ies) that contain the dispersion area.
- An agreement with the property owner(s) is advised for any dispersion areas that represent a continuation of past practice. If not a continuation of past practice, an agreement should be reached with the property owner.

Full Dispersion by Sheet Flow from Uncollected, Unconcentrated Runoff into the Dispersion Area

The runoff from public road projects that sheet flow into the dispersion area is "fully dispersed" if it meets all of the following criteria:

- The dispersion area must be preserved as forest or native vegetation.
- Depth to the average annual maximum ground water elevation should be at least 3 feet.
- The flow path through any impervious area leading to the dispersion area must not be greater than 75 feet.
- The flow path through any pervious area leading to the dispersion area must not be greater than 150 feet. Pervious flow paths include up-gradient road side slopes that run onto the road and down-gradient road side slopes that precede the dispersion area.
- The width of the dispersion area should be equivalent to the width of impervious surface sheet flowing into it.
- Flow path length through the dispersion area:
    - For outwash soils: The following criteria apply to sites (or areas of sites) with outwash soils (Type A – sands and sandy gravels, possibly some Type B – loamy sands). The outwash soils must have an initial saturated hydraulic conductivity rate of 4 inches per hour or greater. The saturated hydraulic conductivity must be based on a Pilot Infiltration Test or the Soil Grain Size Analysis method as identified in V-5.4 Determining the Design Infiltration Rate of the Native Soils, or another method as allowed by the local government.

        - If the impervious area has a flow path length of up to 20 feet, the flow path length through the dispersion area must be at least 10 feet.
        - If the impervious area has a flow path length greater than 20 feet, the flow path length through the dispersion area must be 10 feet, plus an additional 0.25 feet for every 1 foot of impervious flow path length beyond the initial 20 feet.
    - For other soils: The following criteria apply to sites (or areas of sites) with soils other than those described in the bullet above (Types C and D and some Type B not meeting the criterion described in the bullet above).
        - For every 1 foot of flow path length across the impervious surface, the flow path length through the dispersion area must be 6.5 feet.
        - The minimum flow path length through the dispersion area is 100 feet.
- The lateral slope of the impervious area should be less than 8%.
- Road side slopes must be less than 25%. Road side slopes do not count as part of the dispersion area unless native vegetation is re-established and slopes are less than 15%. Road shoulders that are paved or graveled to withstand occasional vehicle loading count as impervious surface.
- Longitudinal slope of road should be ≤ 5%.
- The average longitudinal (parallel to road) slope of dispersion area should be less than or equal to 15%.
- The average lateral slope of dispersion area should be less than or equal to 15%.

Full Dispersion of Channelized (Collected and Re-dispersed) Stormwater into the Dispersion Area

The runoff from public road projects that is collected and re-dispersed is "fully dispersed" if it meets all of the following criteria:

- The dispersion area may be either:
    - preserved as forest or native vegetation, or
    - cleared land. This cleared land option may only be used if the site is outside of the Urban Growth Area and does not have a natural or man-made drainage system.
- Depth to the average annual maximum ground water elevation should be at least three feet.
- Channelized flow must be re-dispersed to produce the longest possible flow path.
- Flows must be evenly dispersed across the dispersion area.
- Ditch discharge points with up to 0.2 cfs discharge for the peak 100-year flow shall use rock pads or dispersion trenches to disperse flows into the dispersion area. Ditch discharge points with between 0.2 and 0.5 cfs discharge for the 100-year peak flow shall use dispersion trenches to disperse flows into the dispersion area. See V-1.4.3 Outfall Systems for details on

rock pads and dispersion trenches.

  - Dispersion trenches shall be designed to accept surface flows (free discharge) from a pipe, culvert, or ditch end, shall be aligned perpendicular to the flowpath, and shall have a minimum 2 feet by 2 cross section, 50 feet in length, filled with 3/4-inch to 1 1/2-inch washed rock, and provided with a level notched grade board. Manifolds may be used to split flows up to 2 cfs discharge for the 100-year peak flow between up to 4 trenches. Dispersion trenches shall have a minimum spacing of 50 feet between centerlines.

- Approved energy dissipation techniques may be used.
- Limited to on-site (associated with the road) flows.
- The width of the dispersion area should be equivalent to length of the road from which runoff is collected.
- The average longitudinal and lateral slopes of the dispersion area should be ≤ 8%.
- The slope of any flowpath segment within the dispersion area must be no steeper than 15% for any 20-foot reach of the flowpath segment.
- Flow path length through the dispersion area:
  - For outwash soils: The following criteria apply to sites (or areas of sites) with outwash soils (Type A – sands and sandy gravels, possibly some Type B – loamy sands) that have an initial saturated hydraulic conductivity rate of 4 inches per hour or greater. The saturated hydraulic conductivity must be based on field results using procedures (Pilot Infiltration Test or Soil Grain Size Analysis Method) identified in V-5.4 Determining the Design Infiltration Rate of the Native Soils, or another method as allowed by the local government.
    - The dispersion area should be at least ½ of the impervious drainage area.
  - For other soils: The following criteria apply to sites (or areas of sites) with soils other than those described in the bullet above (Types C and D and some Type B not meeting the criterion in the bullet above).
    - For every 1 foot of flow path length across the impervious surface, the flow path length through the dispersion area must be 6.5 feet.
    - The minimum flow path length through the dispersion area is 100 feet.

Full Dispersion by Engineered Dispersion

The runoff from public road projects is "fully dispersed" if it meets all of the following criteria:

- Stormwater can be dispersed via sheet flow or via collection and re-dispersion in accordance with the techniques for Full Dispersion of Channelized (Collected and Re-dispersed) Storm-water into the Dispersion Area (above).
- The dispersion area should be planted with native trees and shrubs.
- For outwash soils: The following criteria apply to sites (or areas of sites) with outwash soils

(Type A – sands and sandy gravels, possibly some Type B – loamy sands) that have an initial saturated hydraulic conductivity rate of 4 inches per hour or greater. The saturated hydraulic conductivity must be based on field results using procedures (Pilot Infiltration Test or Soil Grain Size Analysis Method) identified in V-5.4 Determining the Design Infiltration Rate of the Native Soils, or another method as allowed by the local government.

  - The dispersion area must be compost amended in accordance with guidelines in BMP T5.13: Post-Construction Soil Quality and Depth. The guidance document *Building Soil: Guidelines and Resources for Implementing Soil Quality and Depth BMP T5.13 in WDOE Stormwater Management Manual for Western Washington* (Stenn et al., 2016) can be used, or an approved equivalent soil quality and depth specification approved by Ecology.
  - If the impervious area has a flow path length of up to 20 feet, the flow path length through the dispersion area must be at least 10 feet.
  - If the impervious area has a flow path length greater than 20 feet, the flow path length through the dispersion area must be 10 feet, plus an additional 0.25 feet for every 1 foot of impervious flow path length beyond the initial 20 feet.

- For other soils: The following criteria apply to sites (or areas of sites) with soils other than those described in the bullet above (Types C and D and some Type B not meeting the criterion in the bullet above).
- If the dispersion area has Type C or D soils, it
  - The dispersion area must be compost-amended following guidelines in BMP T5.13: Post-Construction Soil Quality and Depth. The guidance document *Building Soil: Guidelines and Resources for Implementing Soil Quality and Depth BMP T5.13 in WDOE Stormwater Management Manual for Western Washington* (Stenn et al., 2016) can be used, or an approved equivalent soil quality and depth specification approved by Ecology.
  - The dispersion area must have be 6.5 times the area of the surface(s) draining to it.
- The average longitudinal (parallel to road) slope of the dispersion area should be ≤ 15%.
- The average lateral slope of the dispersion area should be ≤ 15%.
- The depth to the average annual maximum ground water elevation should be at least three feet.

Native Vegetation Landscape Specifications

These specifications may be used in situations where an applicant wishes to convert a previously developed surface to a native vegetation landscape for purposes of meeting full dispersion requirements or code requirements for forest retention. Native vegetation landscape is intended to have the soil, vegetation, and runoff characteristics approaching that of natural forestland.

Conversion of a developed surface to native vegetation landscape requires the removal of impervious surface, de-compaction of soils, and the planting of native trees, shrubs, and ground cover in compost-amended soil according to all of the following specifications:

1. Existing impervious surface and any underlying base course (e.g., crushed rock, gravel) must be completely removed from the conversion area(s).
2. Underlying soils must be broken up to a depth of 18 inches. This can be accomplished by excavation or ripping with either a backhoe equipped with a bucket with teeth, or a ripper towed behind a tractor.
3. At least 4 inches of well-decomposed compost must be tilled into the broken up soil as deeply as possible. The finished surface should be gently undulating and must be only lightly compacted.
4. The area of native vegetated landscape must be planted with native species trees, shrubs, and ground cover. Species must be selected as appropriate for site shade and moisture conditions, and in accordance with the following requirements:
    a. Trees: a minimum of two species of trees must be planted, one of which is a conifer. Conifer and other tree species must cover the entire landscape area at a spacing recommended by a professional landscaper or in accordance with local requirements.
    b. Shrubs: a minimum of two species of shrubs should be planted. Space plants to cover the entire landscape area, excluding points where trees are planted.
    c. Groundcover: a minimum of two species of ground cover should be planted. Space plants so as to cover the entire landscape area, excluding points where trees or shrubs are planted.

    For landscape areas larger than 10,000 square feet, planting a greater variety of species than the minimum suggested above is strongly encouraged. For example, an acre could easily accommodate three tree species, three species of shrubs, and two or three species of groundcover.
5. At least 4 inches of hog fuel or other suitable mulch must be placed between plants as mulch for weed control. It is also possible to mulch the entire area before planting; however, an 18-inch diameter circle must be cleared for each plant when it is planted in the underlying amended soil. *Note: Plants and their root systems that come in contact with hog fuel or raw bark have a poor chance of survival.*
6. Plantings must be watered consistently once per week during the dry season for the first two years.
7. The plantings must be well established on at least 90% of the converted area. A minimum of 90% plant survival is required after 3 years.

Conversion of an area that was under cultivation to native vegetation landscape requires a different treatment. Elimination of cultivated plants, grasses and weeds is required before planting and will be required on an on-going basis until native plants are well-established. The soil should be tilled to a depth of 18 inches. A minimum of 8 inches of soil having an organic content of 6 to 12 percent is required, or a four inch layer of compost may be placed on the surface before planting, or 4 inches of

clean wood chips may be tilled into the soil, as recommended by a landscape architect or forester. After soil preparation is complete, continue with steps 4 through 7 above. Placing 4 inches of compost on the surface may be substituted for the hog fuel or mulch. For large areas where frequent watering is not practical, bare-root stock may be substituted at a variable spacing from 10 to 12 feet o.c. (with an average of 360 trees per acre) to allow for natural groupings and 4 to 6 feet o.c. for shrubs. Allowable bare-root stock types are 1-1, 2-1, P-1 and P-2. Live stakes at 4 feet o.c. may be substituted for willow and red-osier dogwood in wet areas.

Runoff Model Representation

Areas that are fully dispersed do not have to use approved runoff models to demonstrate compliance. They are presumed to fully meet the Runoff Treatment and Flow Control requirements in I-3.4.6 MR6: Runoff Treatment and I-3.4.7 MR7: Flow Control.

V-7 Biofiltration BMPs

V-7.1 Introduction to Biofiltration BMPs

Biofiltration BMPs use vegetation in conjunction with slow and shallow-depth flow for Runoff Treatment. As runoff passes through the vegetation, pollutants are removed through the combined effects of sedimentation, filtration, infiltration, settling, and/or plant uptake. These effects are aided by the reduction of the velocity of stormwater as it passes through the biofilter. Biofiltration BMPs include swales that are designed to convey and treat concentrated runoff at shallow depths and slow velocities, and filter strips that are broad areas of vegetation for treating sheet flow runoff.

Biofiltration BMPs remove low concentrations and quantities of total suspended solids (TSS), heavy metals, petroleum hydrocarbons, and/or nutrients from stormwater.

Biofiltration BMPs can be used as basic treatment BMPs for contaminated stormwater runoff from roadways, driveways, parking lots, and highly impervious ultra-urban areas or as the first stage of a treatment train. In cases where hydrocarbons, high TSS, or debris would be present in the runoff, such as sites requiring oil control BMPs per III-1.2 Choosing Your Runoff Treatment BMPs, a pre-treatment BMP for those components would be necessary. Off-line placement is preferred to avoid flattening vegetation and the erosive effects of high flows. Consider biofiltration BMPs in retrofit situations where appropriate. (Center for Watershed Protection, 1998)

Consider the following factors for determining site suitability for biofiltration BMPs:

- Are the target pollutants amenable to biofiltration treatment?
- Is there accessibility for Operation and Maintenance?
- Is there a suitable growth environment; (soil, etc.) for the vegetation?
- If high petroleum hydrocarbon levels (oil/grease) or high TSS loads could impair treatment capacity or efficiency, is there adequate siting for a pre-treatment BMP?
- If the biofilter within the biofiltration BMP can be impacted by snowmelts and ice, refer to (Caraco and Claytor, 1997) for additional design criteria.

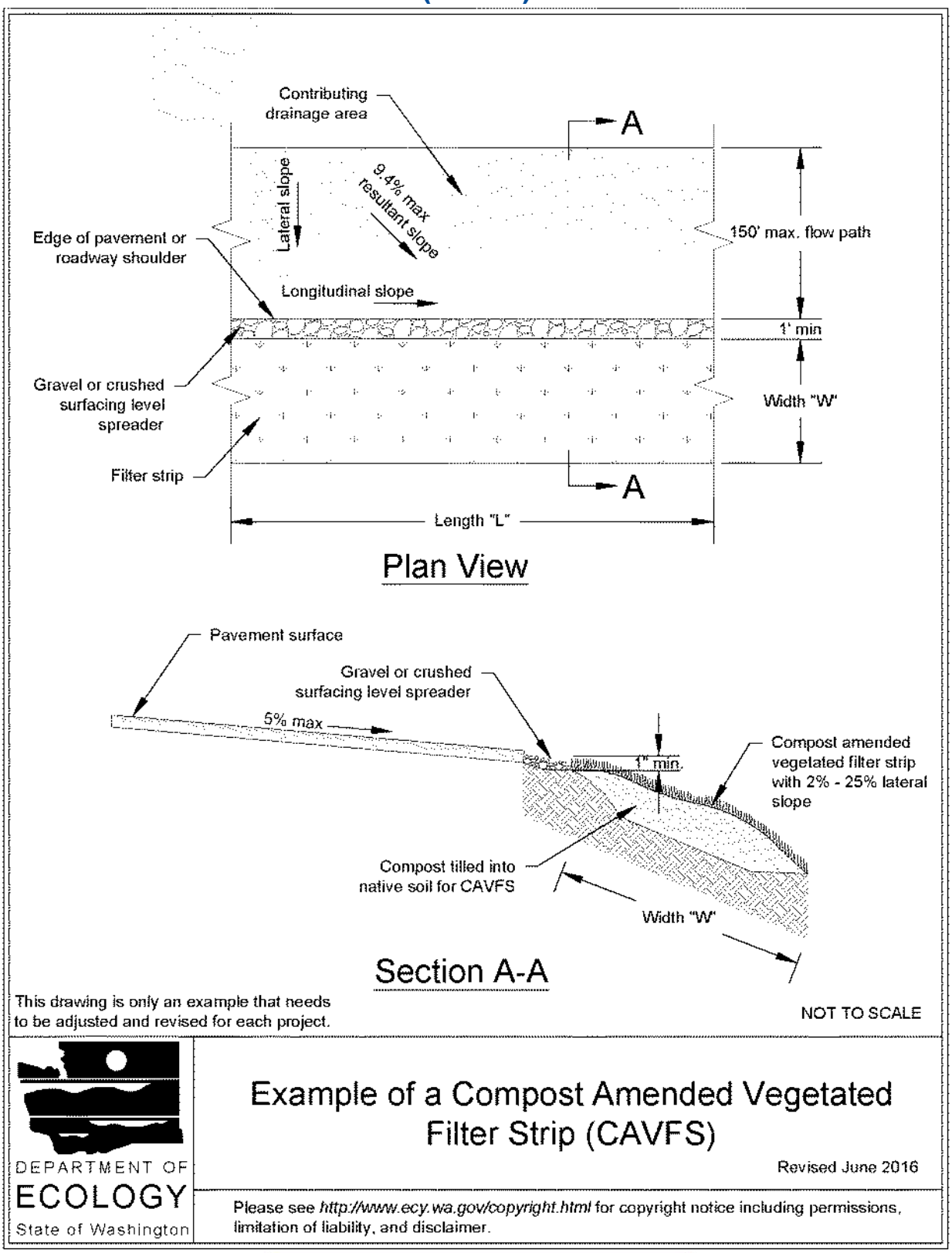
BMP T7.40: Compost-Amended Vegetated Filter Strips (CAVFS)

Description

The compost-amended vegetated filter strip (CAVFS) is a variation of BMP T9.40: Vegetated Filter Strip that adds soil amendments to the roadside embankment (See Figure V-7.1: Example of a Compost Amended Vegetated Filter Strip (CAVFS)). The soil amendments improve infiltration characteristics, increase surface roughness, and improve plant sustainability. Once permanent vegetation is established, the advantages of the CAVFS are higher surface roughness; greater retention and infiltration capacity; improved removal of soluble cationic contaminants through

sorption; improved overall vegetative health; and a reduction of invasive weeds. CAVFS have somewhat higher construction costs than BMP T9.40: Vegetated Filter Strip due to more expensive materials, but require less land area for Runoff Treatment, which can reduce overall costs.

Figure V-7.1: Example of a Compost Amended Vegetated Filter Strip (CAVFS)



Applications

CAVFS can be used to meet basic and enhanced Runoff Treatment performance goals, as described in III-1.2 Choosing Your Runoff Treatment BMPs. It has practical application in areas where there is space for roadside embankments that can be built to the CAVFS specifications.

Design Criteria

The CAVFS design incorporates composted material into the native soils per the criteria in BMP T5.13: Post-Construction Soil Quality and Depth for turf areas. However, as noted below, the compost shall not contain biosolids or manure. The goal is to create a healthy soil environment for a lush growth of turf.

Soil/Compost Mix

- *Presumptive approach*: Place and rototill 1.75 inches of composted material into 6.25 inches of soil (a total amended depth of about 9.5 inches), for a settled depth of 8 inches. Water or roll to compact soil to 85% maximum. Plant grass.
- *Custom approach:* Place and rototill the calculated amount of composted material into a depth of soil needed to achieve 8 inches of settled soil at 5% organic content. Water or roll to compact soil to 85% maximum. Plant grass.

  The amount of compost or other soil amendments used varies by soil type and organic matter content. If there is a good possibility that site conditions may already contain a relatively high organic content, then it may be possible to modify the pre-approved rate described above and still be able to achieve the 5% organic content target.
- The final soil mix (including compost and soil) should have an initial saturated hydraulic conductivity less than 12 inches per hour, and a minimum long-term hydraulic conductivity of 1.0 inch/hour per ASTM Designation D 2434 (Standard Test Method for Permeability of Granular Soils) at 85% compaction per ASTM Designation D 1557 (Standard Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort).

  Infiltration rate and hydraulic conductivity are assumed to be approximately the same in a uniform mix soil. The long term saturated hydraulic conductivity of the soil mix is determined by applying the appropriate infiltration correction factors as explained in Determining the Bioretention Soil Mix Design Infiltration Rate within BMP T7.30: Bioretention.
- The final soil mixt should have a minimum organic content of 5% by dry weight per ASTM Designation D 2974 (Standard Test Method for Moisture, Ash and Organic Matter of Peat and Other Organic Soils) (Tackett, 2004).
- Achieving the above recommendations will depend on the specific soil and compost characteristics. In general, the recommendation can be achieved with 60% to 65% loamy sand mixed with 25% to 30% compost or 30% sandy loam, 30% coarse sand, and 30% compost.
- The final soil mixture should be tested prior to installation for fertility, micronutrient analysis, and organic material content.

- Clay content for the final soil mix should be less than 5%.
- Compost must not contain biosolids, manure, any street or highway sweepings, or any catch basin solids.
- The pH for the soil mix should be between 5.5 and 7.0 (Stenn, 2003). If the pH falls outside the acceptable range, it may be modified with lime to increase the pH or iron sulfate plus sulfur to lower the pH. The lime or iron sulfate must be mixed uniformly into the soil prior to use in LID areas (Low-Impact Development Center, 2004).
- The soil mix should be uniform and free of stones, stumps, roots, or other similar material larger than 2 inches.
- When placing topsoil, it is important that the first lift of topsoil is mixed into the top of the existing soil. This allows the roots to penetrate the underlying soil easier and helps prevent the formation of a slip plane between the two soil layers.

Soil Component

The texture for the soil component of the soil mix should be loamy sand (USDA Soil Textural Classification).

Compost Component

Follow the specifications for compost in BMP T7.30: Bioretention.

Runoff Model Representation

The CAVFS will have an "Element" in the approved continuous runoff model that must be used for determining the amount of water that is treated by the CAVFS. To fully meet Runoff Treatment requirements, Ninety-one percent of the influent runoff file must pass through the soil profile of the CAVFS. Water that merely flows over the surface is not considered treated. Approved continuous runoff models should be able to report the amount of water that it estimates will pass through the soil profile.

Maintenance

Compost, as with other filter mediums, can become plugged with fines and sediment, which may require removal and replacement. Including vegetation with compost helps prevent the medium from becoming plugged with sediment by breaking up the sediment and creating root pathways for stormwater to penetrate into the compost. It is expected that soil amendments will have a removal and replacement cycle; however, this time frame has not yet been established.

BMP T9.10: Basic Biofiltration Swale

Description

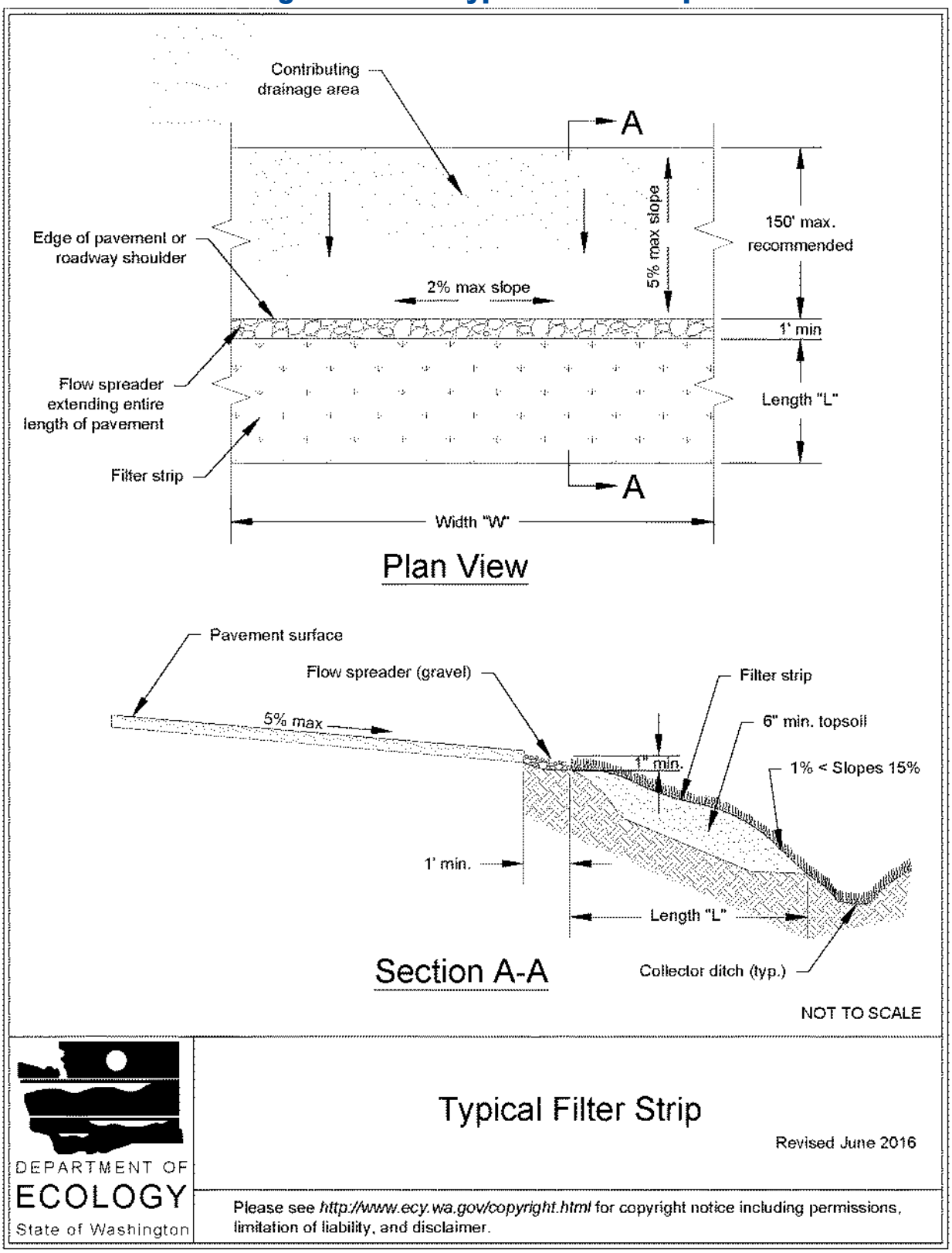
Biofiltration swales are typically shaped as a trapezoid or a parabola as shown in Figure V-7.2: Typical Swale Section.

BMP T9.40: Vegetated Filter Strip

Description

A vegetated filter strip is flat with no side slopes (Figure V-7.11: Typical Filter Strip). Contaminated stormwater is distributed as sheet flow across the inlet width of the vegetated filter strip. Runoff Treatment is provided by passage of water over the surface and through grass.

Figure V-7.11: Typical Filter Strip



Applications and Limitations

The vegetated filter strip is typically used on-line and adjacent and parallel to a paved area such as parking lots, driveways, and roadways.

Design Criteria

- Use the design criteria specified in Table V-7.6: Sizing Criteria for Vegetated Filter Strips.
- Vegetated filter strips should only receive sheet flow.
- Use curb cuts ≥ 12-inch wide and 1-inch above the vegetated filter strip inlet.
- Calculate the design flow depth using Manning's equation as follows:

$$KQ = (1.49AR^{0.67} s^{0.5})/n$$

Substituting for AR:

$$KQ = (1.49Ty^{1.67} s^{0.5})/n$$

Where:

$Ty = A_{rectangle}$, ft^2

$y \approx R_{rectangle}$, design depth of flow, ft. (1 inch maximum)

Q = peak Water Quality Design Flow Rate as described in III-2.6 Sizing Your Runoff Treatment BMPs, ft^3/sec

K = The ratio determined by using Figure V-7.7: Ratio of SBUH Peak/WQ Flow (Online)

n = Manning's roughness coefficient

s = Longitudinal slope of the vegetated filter strip, parallel to the direction of flow

T = Width of the vegetated filter strip, perpendicular to the direction of flow, ft.

A = Vegetated filter strip inlet cross-sectional flow area (rectangular), ft^2

R = hydraulic radius, ft.

Rearranging for y:

$$y = [KQn/1.49Ts^{0.5}]^{0.6}$$

y must not exceed 1 inch

Note: As in biofiltration swale design, an adjustment factor of K accounts for the differential between the Water Quality Design Flow Rate calculated by an approved continuous simulation model and the SBUH design flow rate.

- Calculate the design flow velocity V, ft./sec., through the filter strip:

$$V = KQ/Ty$$

V must not exceed 0.5 ft./sec

- Calculate the required length, ft., of the vegetated filter strip at the minimum hydraulic residence time, t, of 9 minutes:

$$L = tV = 540V$$

Table V-7.6: Sizing Criteria for Vegetated Filter Strips

Design Parameter	Vegetated Filter Strip Sizing
Longitudinal Slope	0.01 - 0.33
Maximum velocity	0.5 ft / sec @ K multiplied by the WQ Design Flow Rate
Maximum water depth[1]	1-inch max.
Manning coefficient	0.35
Minimum hydraulic residence time at Water Quality Design Flow Rate	9 minutes
Minimum length	Sufficient to achieve hydraulic residence time in the vegetated filter strip
Maximum sideslope	Inlet edge ≥ 1" lower than contributing paved area
Max. tributary drainage flowpath	150 feet
Max. longitudinal slope of contributing area	0.05 (steeper than 0.05 needs upslope flow spreader and energy dissipation)
Max. lateral slope of contributing area	0.02 (at the edge of the vegetated filter strip inlet)
1. Below the design water depth install an erosion control blanket, at least 4” of topsoil, and the selected biofiltration seed mix. Above the water line use a straw mulch or sod.	

Appendix C

Infiltration Testing, Soils Information

STORMWATER REPORT

Memo

To:	Andrew Bell - Belcorp
From:	Travis Tormanen – Windsor Engineers
Date:	07-29-2020
Subject:	Infiltration Testing
Windsor Project No.	20105

Windsor Engineers (Windsor) has provide site investigation and infiltration testing on behalf of Belcorp for a project located at 125 S Spruce Ave, Yacolt, WA 98675. The site improvement currently proposed include short plating into 3 lots, an existing shop removed, an existing house remaining, two new single-family dwellings created, and a new driveway to be constructed.

According to both the NRCS Soil Survey and Clark County GIS, two soils are present in the disturbed area: Gumboot Silt Loam (GuB) and Yacolt Loam (YaA)

Figure 1: NRCS Soils Survey Map

The site investigation was conducted over 1 day, Wednesday, July 29th. The method of testing followed the Clark County Stormwater Manual's procedure for the Single-Ring Falling Head Infiltration Test Procedure. Three test pits total were excavated safely to 4 ft below the ground surface. The locations of the test pits for the site are denoted in Figure 2.

Figure 2: Test Pit Locations

The testing procedure included a 4-hour presoak followed by 1 hour of testing. The results are summarized in the Table below.

Infiltration Results						
Test Pit	**Total Draw Down (in)**	**Time (hr)**	**h1 (in)**	**h2 (in)**	**L (in)**	**k (iph)**
1 (TP1)	1.5	1	15	13.5	6	0.63
2 (TP2)	1	1	15	14	6	0.41
3 (TP3)	2.5	1	15	12.5	6	1.09
				Site Average (iph)		**0.71**

Based on the testing results, the site average coefficient of permeability is 0.71 inches per hour for the native soil rate. Based on the tested results and the proposed infiltration system, an infiltration rate of 0.36 is reasonable to use.

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.

STORMWATER REPORT

Map Symbol	Soil Name	HSG
Soils Group (SG) 1		
LeB	LAUREN	B
LgB	LAUREN	B
LgD	LAUREN	B
LgF	LAUREN	B
LIB	LAUREN	B
Ro	ROUGH BROKEN LAND	A
SvA	SIFTON	B
WnB	WIND RIVER VARIANT	B
WnD	WIND RIVER VARIANT	B
WnG	WIND RIVER VARIANT	B
WrB	WIND RIVER VARIANT	B
WrF	WIND RIVER VARIANT	B
	PITS	A
	BONNEVILLE STONY SAND LOAM	A
Soils Group (SG) 2		
BpB	BEAR PRARIE	B
BpC	BEAR PRARIE	B
CnB	CINEBAR	B
CnD	CINEBAR	B
CnE	CINEBAR	B
CnG	CINEBAR	B
CrE	CINEBAR	B
CrG	CINEBAR	B
CsF	CISPUS	B
CtA	CLOQUATO	B
HlA	HILLSBORO	B
HlB	HILLSBORO	B
HlC	HILLSBORO	B
HlD	HILLSBORO	B
HlE	HILLSBORO	B

Map Symbol	Soil Name	HSG
HlF	HILLSBORO	B
Soils Group (SG) 2 (continued)		
KeC	KINNEY	B
KeE	KINNEY	B
KeF	KINNEY	B
KnF	KINNEY	B
LaE	LARCHMOUNT	B
LaG	LARCHMOUNT	B
LcG	LARCHMOUNT	B
MsB	MOSSYROCK	B
NbA	NEWBERG	B
NbB	NEWBERG	B
PhB	PILCHUCK	C
PuA	PUYALLUP	B
SaC	SALKUM	B
VaB	VADER	B
VaC	VADER	B
WaA	WASHOUGAL	B
WgB	WASHOUGAL	B
WgE	WASHOUGAL	B
WhF	WASHOUGAL	B
YaA	YACOLT	B
YaC	YACOLT	B
YcB	YACOLT	B

Soils Group (SG) 3

DoB	DOLLAR	C
HcB	HESSON	C
HcD	HESSON	C
HcE	HESSON	C
HcF	HESSON	C
HgB	HESSON	C
HgD	HESSON	C
HhE	HESSON	C
HoA	HILLSBORO	B

STORMWATER REPORT

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

Map Symbol	Soil Name	HSG
GeD	GEE	C
Soils Group (SG) 4 (continued)		
GeE	GEE	C
GeF	GEE	C
GuB	GUMBOOT	D
HtA	HOCKINSON	D
HuB	HOCKINSON	D
HvA	HOCKINSON	D
LrC	LAUREN	C
LrF	LAUREN	C
MnA	MINNIECE	D
MnD	MINNIECE	D
MoA	MINNIECE VARIANT	D
OdB	ODNE	D
OhD	OLEQUA VARIANT	C
OhF	OLEQUA VARIANT	C
SlB	SARA	D
SlD	SARA	D
SlF	SARA	D
Soils Group (SG) 5		
Sr	SEMIAHMOO	C
Su	SEMIAHMOO VARIANT	D
ThA	TISCH	D

Appendix D

Stormwater Summary, Basins Maps, MGS Flood Report

STORMWATER REPORT

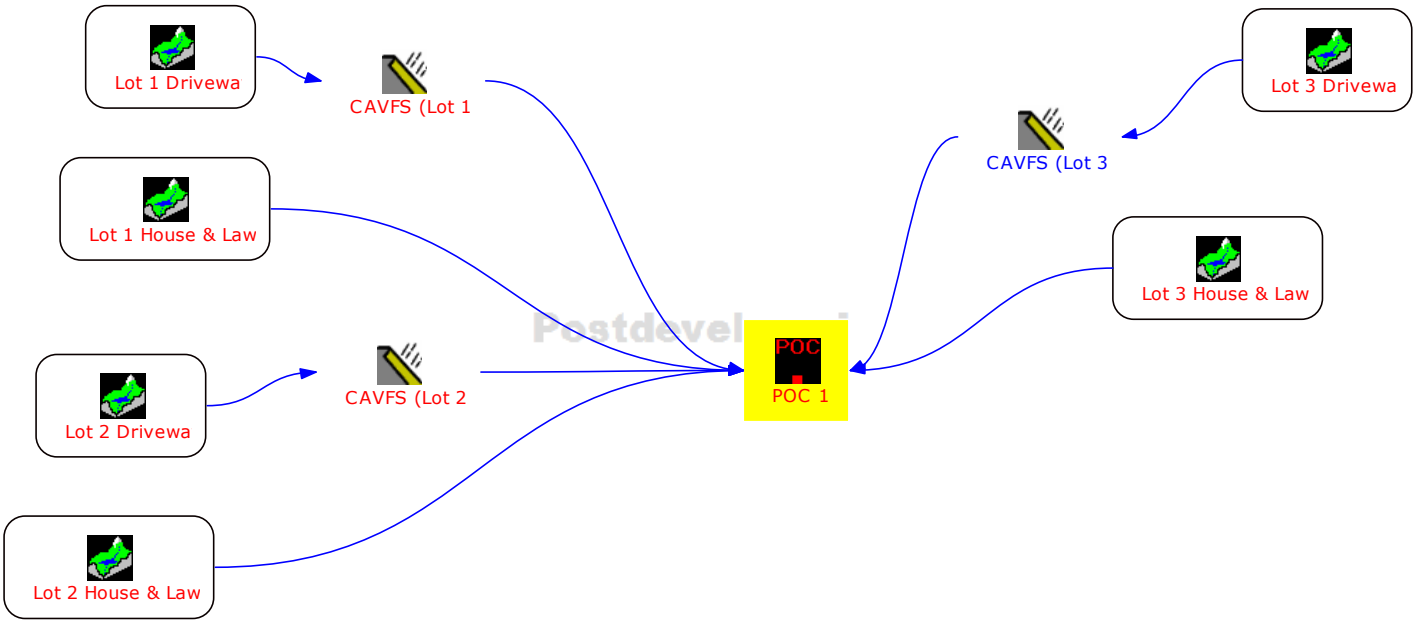
Pre Developed

Existing Parcel					
	total	39,370	0.904	0.529	total lawn (forest)
	gravel	11,661	0.27	0.375	total existing imp
	shop	2,640	0.06	**0.904**	
	house	2,040	0.05		
		16,341			

Post Developed

				Separate	Combined		
Lot 1	Driveway	2,400		0.06	0.06	driveway	
	House	2,500	10,120	0.06	0.23	house + lawn	
	Lot Area (per Ed)	12,520					
	Lawn	7,620		0.17			
	CAVFS						
Lot 2	Driveway	300		0.01	0.01	driveway	
	House	2,500	12,670	0.06	0.29	house + lawn	
	Lot Area (per Ed)	12,970					
	Lawn	10,170		0.23			
	CAVFS						
Lot 3	Driveway	2,800		0.06	0.06	driveway	
	House	2,500	11,080	0.06	0.25	house + lawn	
	Lot Area (per Ed)	13,880					
	Lawn	8,580		0.20			
	CAVFS						
		5,500	Total Drivway		0.13	0.298	Impervious (Driveway+house)
		7,500	Total House		0.17		
		26,370	Total Lawn		0.61		
		39,370	Total Area		**0.904**		

Land-Disturbing Activity	**Area (SF)**	**Area (Acres)**
Existing Hard Surface	16,341	0.375
Proposed Hard Surface	-	0.000
Replaced Impervious Surface	13,000	0.298
Native Vegetation Converted to Lawn or Landscaping	-	0.000
Native Vegetation Converted to Pasture	-	0.000
Total Amount of Land-Disturbing Activity	26,185	0.601
New Non-PGHS Surfaces: Proposed Roof	7,500	0.172
New PGHS Surfaces: Proposed Driveway	5,500	0.126
Total Non-pollution Generating Surfaces	7,500	0.172
Total Pollution Generating Surfaces	5,500	0.126


Lot 1 Drivewa
CAVFS (Lot 1
Lot 3 Drivewa
CAVFS (Lot 3
Lot 1 House & Law
Lot 3 House & Law
POC
POC 1
Lot 2 Drivewa
CAVFS (Lot 2
Lot 2 House & Law

Predeveloped

MGS FLOOD
PROJECT REPORT

Program Version: MGSFlood 4.50
Program License Number: 202010002
Project Simulation Performed on: 10/19/2020 4:25 PM
Report Generation Date: 10/19/2020 4:25 PM

Input File Name: Belcorp_Rev 2.fld
Project Name: Belcorp Yacolt Short Plat
Analysis Title:
Comments:

PRECIPITATION INPUT

Computational Time Step (Minutes): 15

Extended Precipitation Time Series Selected
Climatic Region Number: 24

Full Period of Record Available used for Routing
Precipitation Station : 97004005 Vancouver 40 in_5min 10/01/1939-10/01/2060
Evaporation Station : 971040 Vancouver 40 in MAP
Evaporation Scale Factor : 0.750

HSPF Parameter Region Number: 2
HSPF Parameter Region Name : Clark County

********** Default HSPF Parameters Used (Not Modified by User) **********

********** WATERSHED DEFINITION **********

Predevelopment/Post Development Tributary Area Summary

	Predeveloped	Post Developed
Total Subbasin Area (acres)	0.932	0.900
Area of Links that Include Precip/Evap (acres)	0.000	0.033
Total (acres)	0.932	0.933

----------SCENARIO: PREDEVELOPED
Number of Subbasins: 1

---------- Subbasin : Subbasin (Parcel) ----------

	-------Area (Acres) --------
Clark Co. SG4, Forest	0.932
Subbasin Total	0.932

----------SCENARIO: POSTDEVELOPED
Number of Subbasins: 6

---------- Subbasin : Lot 1 Driveway ----------

	-------Area (Acres) --------
Impervious Flat	0.060
Subbasin Total	0.060

---------- Subbasin : Lot 1 House & Lawn ----------

	-------Area (Acres) --------
Clark Co. SG2, Lawn,	0.230
Subbasin Total	0.230

---------- Subbasin : Lot 2 Driveway ----------
-------Area (Acres) --------
Impervious Flat 0.010

Subbasin Total 0.010

---------- Subbasin : Lot 2 House & Lawn ----------
-------Area (Acres) --------
Clark Co. SG2, Lawn, 0.290

Subbasin Total 0.290

---------- Subbasin : Lot 3 Driveway ----------
-------Area (Acres) --------
Impervious Flat 0.060

Subbasin Total 0.060

---------- Subbasin : Lot 3 House & Lawn ----------
-------Area (Acres) --------
Clark Co. SG2, Lawn, 0.250

Subbasin Total 0.250

********** **LINK DATA** **********

----------SCENARIO: PREDEVELOPED
Number of Links: 0

********** **LINK DATA** **********

----------SCENARIO: POSTDEVELOPED
Number of Links: 4

Link Name: CAVFS (Lot 1)
Link Type: Compost Amended Vegetated Filter Strip (CAVFS)
Downstream Link Name: POC 1

Compost Thickness (ft) : 0.500
Compost Porosity (%) : 10.000
Compost Hydraulic Conductivity (in/hr) : 1.000
CAVFS Length (ft) : 135.000
CAVFS Width (ft) : 4.000
CAVFS Slope, Z (ft/ft) : 100.000
Gravel Spreader Width (ft) : 1.000
Gravel Hydraulic Conductivity (in/hr) : 2.000
Gravel Porosity (%) : 30.000
Soil Infiltration Rate (in/hr) : 0.350
Precipitation and Evaporation Applied to Surface of CAVFS

Link Name: POC 1
Link Type: Copy
Downstream Link: None

Link Name: CAVFS (Lot 2)
Link Type: Compost Amended Vegetated Filter Strip (CAVFS)
Downstream Link Name: POC 1

Compost Thickness (ft) : 0.500

Compost Porosity (%) : 10.000
Compost Hydraulic Conductivity (in/hr) : 1.000
CAVFS Length (ft) : 16.000
CAVFS Width (ft) : 6.000
CAVFS Slope, Z (ft/ft) : 100.000
Gravel Spreader Width (ft) : 1.000
Gravel Hydraulic Conductivity (in/hr) : 2.000
Gravel Porosity (%) : 30.000
Soil Infiltration Rate (in/hr) : 0.350
Precipitation and Evaporation Applied to Surface of CAVFS

Link Name: CAVFS (Lot 3)
Link Type: Compost Amended Vegetated Filter Strip (CAVFS)
Downstream Link Name: POC 1

Compost Thickness (ft) : 0.500
Compost Porosity (%) : 10.000
Compost Hydraulic Conductivity (in/hr) : 1.000
CAVFS Length (ft) : 200.000
CAVFS Width (ft) : 4.000
CAVFS Slope, Z (ft/ft) : 100.000
Gravel Spreader Width (ft) : 1.000
Gravel Hydraulic Conductivity (in/hr) : 2.000
Gravel Porosity (%) : 30.000
Soil Infiltration Rate (in/hr) : 0.350
Precipitation and Evaporation Applied to Surface of CAVFS

**********FLOOD FREQUENCY AND DURATION STATISTICS**********

----------SCENARIO: PREDEVELOPED
Number of Subbasins: 1
Number of Links: 0

----------SCENARIO: POSTDEVELOPED
Number of Subbasins: 6
Number of Links: 4

********** Subbasin: Lot 1 Driveway **********

Flood Frequency Data(cfs)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	2.375E-02
5-Year	3.135E-02
10-Year	3.643E-02
25-Year	4.617E-02
50-Year	5.438E-02
100-Year	6.820E-02
200-Year	7.483E-02
500-Year	8.358E-02

********** Subbasin: Lot 1 House & Lawn **********

Flood Frequency Data(cfs)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	1.352E-02
5-Year	2.981E-02
10-Year	4.164E-02
25-Year	6.436E-02
50-Year	6.711E-02
100-Year	8.042E-02
200-Year	0.109
500-Year	0.147

********** **Subbasin: Lot 2 Driveway** **********

Flood Frequency Data(cfs)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	3.958E-03
5-Year	5.225E-03
10-Year	6.072E-03
25-Year	7.695E-03
50-Year	9.063E-03
100-Year	1.137E-02
200-Year	1.247E-02
500-Year	1.393E-02

********** **Subbasin: Lot 2 House & Lawn** **********

Flood Frequency Data(cfs)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	1.705E-02
5-Year	3.759E-02
10-Year	5.251E-02
25-Year	8.115E-02
50-Year	8.461E-02
100-Year	0.101
200-Year	0.138
500-Year	0.186

********** **Subbasin: Lot 3 Driveway** **********

Flood Frequency Data(cfs)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	2.375E-02
5-Year	3.135E-02
10-Year	3.643E-02
25-Year	4.617E-02
50-Year	5.438E-02
100-Year	6.820E-02
200-Year	7.483E-02
500-Year	8.358E-02

********** **Subbasin: Lot 3 House & Lawn** **********

Flood Frequency Data(cfs)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	1.470E-02
5-Year	3.241E-02
10-Year	4.526E-02
25-Year	6.996E-02
50-Year	7.294E-02
100-Year	8.741E-02
200-Year	0.119
500-Year	0.160

********** Link: CAVFS (Lot 1) ********** Link Inflow Frequency Stats

Flood Frequency Data(cfs)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)

2-Year	2.331E-02
5-Year	3.102E-02
10-Year	3.643E-02
25-Year	4.617E-02
50-Year	5.438E-02
100-Year	6.820E-02
200-Year	7.483E-02
500-Year	8.358E-02

********** Link: CAVFS (Lot 1) ********** Link Outflow 1 Frequency Stats

Flood Frequency Data(cfs)

(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	2.216E-02
5-Year	3.465E-02
10-Year	4.165E-02
25-Year	5.532E-02
50-Year	7.182E-02
100-Year	8.664E-02
200-Year	9.926E-02
500-Year	0.116

********** Link: POC 1 ********** Link Inflow Frequency Stats

Flood Frequency Data(cfs)

(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	7.819E-02
5-Year	0.148
10-Year	0.197
25-Year	0.288
50-Year	0.306
100-Year	0.353
200-Year	0.476
500-Year	0.638

********** Link: CAVFS (Lot 2) ********** Link Inflow Frequency Stats

Flood Frequency Data(cfs)

(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	3.884E-03
5-Year	5.169E-03
10-Year	6.072E-03
25-Year	7.695E-03
50-Year	9.063E-03
100-Year	1.137E-02
200-Year	1.247E-02
500-Year	1.393E-02

********** Link: CAVFS (Lot 2) ********** Link Outflow 1 Frequency Stats

Flood Frequency Data(cfs)

(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	3.704E-03
5-Year	5.798E-03
10-Year	6.985E-03
25-Year	9.271E-03
50-Year	1.202E-02
100-Year	1.459E-02

200-Year	1.674E-02
500-Year	1.958E-02

********** Link: CAVFS (Lot 3) ********** Link Inflow Frequency Stats

Flood Frequency Data(cfs)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	2.331E-02
5-Year	3.102E-02
10-Year	3.643E-02
25-Year	4.617E-02
50-Year	5.438E-02
100-Year	6.820E-02
200-Year	7.483E-02
500-Year	8.358E-02

********** Link: CAVFS (Lot 3) ********** Link Outflow 1 Frequency Stats

Flood Frequency Data(cfs)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	1.919E-02
5-Year	3.306E-02
10-Year	4.262E-02
25-Year	5.550E-02
50-Year	7.004E-02
100-Year	9.587E-02
200-Year	0.111
500-Year	0.132

************Groundwater Recharge Summary **************

Recharge is computed as input to Perlnd Groundwater Plus Infiltration in Structures

Total Predeveloped Recharge During Simulation

Model Element	Recharge Amount (ac-ft)
Subbasin: Subbasin (Parcel)	85.800
Total:	85.800

Total Post Developed Recharge During Simulation

Model Element	Recharge Amount (ac-ft)
Subbasin: Lot 1 Driveway	0.000
Subbasin: Lot 1 House & Lawn	44.124
Subbasin: Lot 2 Driveway	0.000
Subbasin: Lot 2 House & Lawn	55.635
Subbasin: Lot 3 Driveway	0.000
Subbasin: Lot 3 House & Lawn	47.961
Link: CAVFS (Lot 1)	23.422
Link: POC 1 0.000	
Link: CAVFS (Lot 2)	3.972
Link: CAVFS (Lot 3)	26.549
Total:	201.663

Total Predevelopment Recharge is Less than Post Developed
Average Recharge Per Year, (Number of Years= 121)
Predeveloped: 0.709 ac-ft/year, Post Developed: 1.667 ac-ft/year

************Water Quality Facility Data **************

----------SCENARIO: PREDEVELOPED

Number of Links: 0

----------SCENARIO: POSTDEVELOPED

Number of Links: 4

********** Link: CAVFS (Lot 1) **********

Infiltration/Filtration Statistics----------
Inflow Volume (ac-ft): 20.60
Inflow Volume Including PPT-Evap (ac-ft): 25.06
Total Runoff Infiltrated (ac-ft): 23.42, 93.45%
Total Runoff Filtered (ac-ft): 0.03, 0.10%
Primary Outflow To Downstream System (ac-ft): 1.66
Secondary Outflow To Downstream System (ac-ft): 0.00
Percent Treated (Infiltrated+Filtered)/Total Volume: 93.56%

********** Link: POC 1 **********

Infiltration/Filtration Statistics----------
Inflow Volume (ac-ft): 35.49
Inflow Volume Including PPT-Evap (ac-ft): 35.49
Total Runoff Infiltrated (ac-ft): 0.00, 0.00%
Total Runoff Filtered (ac-ft): 0.00, 0.00%
Primary Outflow To Downstream System (ac-ft): 35.49
Secondary Outflow To Downstream System (ac-ft): 0.00
Percent Treated (Infiltrated+Filtered)/Total Volume: 0.00%

********** Link: CAVFS (Lot 2) **********

Infiltration/Filtration Statistics----------
Inflow Volume (ac-ft): 3.43
Inflow Volume Including PPT-Evap (ac-ft): 4.23
Total Runoff Infiltrated (ac-ft): 3.97, 93.95%
Total Runoff Filtered (ac-ft): 0.00, 0.06%
Primary Outflow To Downstream System (ac-ft): 0.26
Secondary Outflow To Downstream System (ac-ft): 0.00
Percent Treated (Infiltrated+Filtered)/Total Volume: 94.01%

********** Link: CAVFS (Lot 3) **********

Infiltration/Filtration Statistics----------
Inflow Volume (ac-ft): 20.60
Inflow Volume Including PPT-Evap (ac-ft): 27.27
Total Runoff Infiltrated (ac-ft): 26.55, 97.36%
Total Runoff Filtered (ac-ft): 0.02, 0.07%
Primary Outflow To Downstream System (ac-ft): 0.74
Secondary Outflow To Downstream System (ac-ft): 0.00
Percent Treated (Infiltrated+Filtered)/Total Volume: 97.43%

************Compliance Point Results **************

Scenario Predeveloped Compliance Subbasin: Subbasin (Parcel)

Scenario Postdeveloped Compliance Link: POC 1

***** Point of Compliance Flow Frequency Data *****
Recurrence Interval Computed Using Gringorten Plotting Position

Predevelopment Runoff		Postdevelopment Runoff	
Tr (Years)	Discharge (cfs)	Tr (Years)	Discharge (cfs)
2-Year	0.115	2-Year	7.819E-02
5-Year	0.201	5-Year	0.148
10-Year	0.255	10-Year	0.197
25-Year	0.377	25-Year	0.288
50-Year	0.394	50-Year	0.306
100-Year	0.469	100-Year	0.353

200-Year	0.590	200-Year	0.476
500-Year	0.749	500-Year	0.638

** Record too Short to Compute Peak Discharge for These Recurrence Intervals

****** Flow Duration Performance ******

Excursion at Predeveloped 50%Q2 (Must be Less Than or Equal to 0%):	-68.1%	PASS
Maximum Excursion from 50%Q2 to Q2 (Must be Less Than or Equal to 0%):	-68.1%	PASS
Maximum Excursion from Q2 to Q50 (Must be less than 10%):	-61.5%	PASS
Percent Excursion from Q2 to Q50 (Must be less than 50%):	0.0%	PASS

MEETS ALL FLOW DURATION DESIGN CRITERIA: PASS

****** LID Duration Performance ******

Excursion at Predeveloped 8%Q2 (Must be Less Than 0%):	-83.3%	PASS
Maximum Excursion from 8%Q2 to 50%Q2 (Must be Less Than 0%):	-68.1%	PASS

MEETS ALL LID DURATION DESIGN CRITERIA: PASS

Appendix E

Abbreviated SWPPP

STORMWATER REPORT

Abbreviated Construction SWPPP

STORMWATER REPORT

STORMWATER REPORT

Abbreviated Construction Stormwater Pollution Prevention Plan (SWPPP)

The Abbreviated Construction SWPPP is a form designed to fulfil Minimum Requirement #2 of the *Clark County Stormwater Manual*. This form may be revised by the Responsible Official.

Table of Contents

The Abbreviated Construction SWPPP may be used for projects that are required to submit a Construction SWPPP under Minimum Requirement #2 and that disturb less than 1 acre. See the *Clark County Stormwater Manual* (CCSM), Section 1.8.4 to confirm eligibility to use this form.

Section 1 — Submittal Requirements

The Abbreviated Construction SWPPP (SWPPP) shall be prepared and stamped by a licensed engineer in the state of Washington or, if preparation of the SWPPP does not involve the practice of engineering, by a person who holds a valid Certified Erosion and Sediment Control Lead (CESCL) certification.

Submittal timing differs based on the type of permit or application and should be discussed with the Responsible Official. In all cases, the SWPPP shall be submitted prior to any land-disturbing activity.

The following submittals are required:

- Completed Abbreviated Construction SWPPP form (Sections 2 – 3)
- Erosion and Sediment Control Site Plan (see Section 4)
- Standard details of Best Management Practices (BMPs), when required (see Section 3E)
- Engineering drawings and calculations of BMPs, when required (see Section 3E)

Purpose

Release of sediment, mud, and muddy stormwater from construction sites is prohibited. The SWPPP describes how erosion, sediment, and stormwater will be controlled during construction. The document lists and shows all erosion and sediment control (ESC) best management practices (BMPs) selected for the site. The SWPPP must be updated if conditions or plans change or if the ESC BMPs are found to be ineffective.

STORMWATER REPORT

Section 2 — Project Overview

County Permit

Development Case or Building Permit Number(s): _____

Property Info

Project Address: _____

Parcel Number _____ Size of Parcel (acres or sq. ft.): _____

Applicant Info

Name: _____

Address: _____

Phone Number: _____ E-mail: _____

Property Owner Info

Name: _____

Address: _____

Phone Number: _____ E-mail: _____

Erosion Control Inspector / CESCL

Designate an erosion control inspector who has the skills to assess the site conditions and construction activities that could impact stormwater quality and the effectiveness of ESC BMPs. The inspector must be on-site or on-call at all times. If construction is carried out by a licensed contractor, then the inspector must be a Certified Erosion and Sediment Control Lead (CESCL).

☐ Inspector identified below will be on-site or on-call at all times.

Name: _____ CESCL # (if needed): _____

Address: _____

Phone Number: _____ Emergency Phone: _____

Section 3 — Project Narrative

The information required in this section is the project narrative. It describes the site and briefly summarizes the planned improvements.

Complete sections A – E, below.

Note: From October 1 thru April 30, clearing, grading, and other soil disturbing activities shall only be permitted by special authorization from the Responsible Official.

A. Project Description

Check all that apply.

☐ New Structure / Building
☐ Building Addition
☐ Grading/Excavation
☐ Paving
☐ Utilities
☐ Other _____

Total Project Area (square feet)	
Total Proposed Impervious and Hard Area (square feet)	
Total Existing Impervious and Hard Area (square feet)	
Total Area to be Disturbed (square feet or acres)	
Total Volume of Cuts (cubic yards)	
Total Volume of Fill (cubic yards)	

Brief Project Description:

_____

_____

_____

_____

_____

B. Existing Site Conditions

Describe the existing site conditions. If there are multiple choices, check all that apply. The  icon means that information requested may be found on Clark County Maps Online.

1. Describe the existing site conditions.

☐ Forest ☐ Prairie ☐ Pasture ☐ Pavement
☐ Landscaping ☐ Brush ☐ Trees ☐ Other

1. Describe how surface water (stormwater) drainage flows across/from the site.

☐ Overland ☐ Gutter ☐ Catch Basin ☐ Ditch/Swale
☐ Storm sewer pipes ☐ Stream/Creek ☐ Other

2.  Are sensitive and/or critical areas present on the site?

☐ Streams ☐ Lakes/Ponds ☐ Wetlands ☐ Steep Slopes/Geohazard
☐ Floodplain ☐ Springs ☐ Habitat ☐ Critical Aquifer Recharge Area

3. Existing utilities and underground objects?

☐Storm ☐ Water ☐ Sewer ☐ Other
☐Fuel tanks ☐ Septic systems ☐ Groundwater wells

C. Adjacent Areas

1. Check any adjacent off-site areas that may be affected by site disturbance and describe below (check all that apply):

☐ Streams ☐ Lakes ☐ Wetlands ☐ Steep Slopes/Geohazards
☐ Residential Areas ☐ Roads ☐ Ditches, pipes, culverts
☐ Other _____

_____

_____

_____

2. Describe how and where surface water enters the site from upstream properties:

_____

_____

_____

_____

_____

3. Describe the downstream drainage path leading from the site to adjacent property, drainage system, or water body. If water is held on-site, describe it:

_____

_____

_____

_____

D. Soils Information

If the project is proposing construction on or near slopes 15% or greater or proposing to infiltrate construction site stormwater runoff, the County may require soils information to be submitted before allowing construction on these sites. Permanent infiltration facilities shall not be used during construction unless approved in writing by the Responsible Official.

1. Does the project propose construction on or near slopes 15% or greater?

☐ Yes ☐ No

2. Does the project propose to infiltrate construction stormwater?

☐ Yes ☐ No

☐ If yes, obtain and attach approval letter from the Responsible Official.

E. Thirteen Elements of a Construction SWPPP

The following 13 elements are required for each SWPPP. For each element that applies to the project, at least one BMP must be selected and used on the site. If an element does not apply to the project site describe why the element does not apply.

Instructions for using and installing each BMP are given in CCSM Book 2, Chapter 8. An index of standard details of many BMPs is given on the Clark County Public Works web site.

Instructions

1. Review the 13 elements of a construction SWPPP, below.
2. Select at least one BMP for each element (review BMP descriptions in CCSM Book 2, Chapter 8, if needed).
3. For any BMP you select, follow the instructions in the table for including the BMP in the Abbreviated Construction SWPPP.
    a. If instructed to draw the BMP on the site plan, see Section 4 for instructions.
    b. If instructed to submit the standard detail, find the BMP's standard detail using the Clark County Public Works web site, and then print and submit the detail.
    c. If instructed to submit a detailed drawing and/or calculations, then have an engineer provide a detailed drawing of the proposed BMP in plan and profile views with dimensions and calculations described in the design criteria.
4. If the element does not apply to the project, check "N/A" and describe why.

For phased construction plans, clearly indicate erosion control methods to be used for each phase of construction.

Element #1 – Preserve Vegetation and Mark Clearing Limits

Retain the duff layer, native topsoil, and natural vegetation in an undisturbed state to the maximum extent practicable. If it is not practicable to retain the duff layer in place, it should be stockpiled onsite, covered to prevent erosion, and replaced immediately upon completion of the ground-disturbing activity.

All construction projects must clearly mark any clearing limits, sensitive areas and their buffers, and any trees that will be preserved prior to beginning any land disturbing activities. Clearly mark the limits both in the field and on the plans. Limits shall be marked in such a way that any trees or vegetation to remain will not be harmed.

STORMWATER REPORT

The BMP(s) being proposed to meet this element are:

Check to Select	If Selected		
	Draw Location(s) on Site Plan	Submit Standard Detail	Submit Detailed Drawing*
☐ C101 Preserving Native Vegetation	x		
☐ C102 Buffer Zones	x		
☐ C103 High Visibility Fence	x		
☐ C233 Silt Fence	x	x	
* Requires Engineering			

OR ☐ Element is N/A: _____

Element #2 – Establish Construction Access

All construction projects subject to vehicular traffic shall provide a means of preventing vehicle "tracking" of soil from the site onto streets or neighboring properties. Limit vehicle ingress and egress to one route if possible. All access points shall be stabilized with a rock pad construction entrance in accordance with BMP C105. The applicant should consider placing the entrance in the area for future driveway(s), as it may be possible to use the rock as a driveway base material. The entrance(s) must be inspected weekly, at a minimum, to ensure no excess sediment buildup or missing rock.

If sediment is tracked offsite, it shall be swept or shoveled from the paved surface immediately. Keep streets clean at all times. Street washing for sediment removal is not allowed as it can transport sediment to downstream water courses and clog the downstream stormwater system.
The proposed construction entrance must be identified on the site plan.

The BMP(s) being proposed to meet this element are:

Check to Select	If Selected		
	Draw Location(s) on Site Plan	Submit Standard Detail	Submit Detailed Drawing/Calcs*
☐ C105 Stabilized Construction Entrance	x	x	
☐ C106 Wheel Wash	x		
☐ C107 Construction Road/Parking Area Stabilization	x		
* Requires Engineering			

OR ☐ Element is N/A: _____

Element #3 – Control Flow Rates

Protect properties and waterways downstream of the development site from erosion due to increases in volume, velocity, and peak flow of stormwater runoff from the project site.

Permanent infiltration facilities shall not be used for flow control during construction unless specifically approved in writing by Environmental Services. Sediment traps can provide flow control for small sites by allowing water to pool and allowing sediment to settle out of the water.

The BMP(s) being proposed to meet this element are:

Check to Select	If Selected		
	Draw Location(s) on Site Plan	Submit Standard Detail	Submit Detailed Drawing/Calcs*
☐ C240 Sediment Trap	x		x
☐ C203 Water Bar	x		
☐ C207 Check Dams	x	x	
☐ C235 Wattles	x	x	
* Requires Engineering			

OR ☐ Element is N/A: _____

Element #4 – Install Sediment Controls

Prior to leaving a construction site, runoff from disturbed areas must pass through a sediment removal device. Sediment barriers are used to slow sheet flow of stormwater and allow the sediment to settle out behind the barrier. Install/construct the sediment control BMP before site grading.

The BMP(s) being proposed to meet this element are:

Check to Select	If Selected		
	Draw Location(s) on Site Plan	Submit Standard Detail	Submit Detailed Drawing/Calcs*
☐ C231 Brush Barrier	x		
☐ C232 Gravel Filter Berm	x	x	x
☐ C233 Silt Fence	x	x	
☐ C234 Vegetated Strip	x		
☐ C235 Wattles	x	x	
☐ C240 Sediment Trap	x		x
* Requires Engineering			

OR ☐ Element is N/A: _____

Element #5 – Stabilize Soils

Stabilize exposed and unworked soils by applying BMPs that protect the soils from raindrop impact, flowing water, and wind.

During the wet season from October 1 through April 30, no soils shall remain exposed or unworked for more than 2 days. From May 1 to September 30, no soils shall remain exposed and unworked for more than 7 days. This applies to all soils on site whether at final grade or not.

The BMP(s) being proposed to meet this element are:

Check to Select	If Selected		
	Draw Location(s) on Site Plan	Submit Standard Detail	Submit Detailed Drawing/Calcs*
☐ C120 Temporary and Permanent Seeding	x		
☐ C121 Mulching	x		
☐ C122 Nets and Blankets	x		
☐ C123 Plastic Covering	x	x	
☐ C124 Sodding	x		
☐ C125 Compost	x		
☐ C126 Topsoiling	x		
☐ C131 Gradient Terraces	x		
☐ C130 Surface Roughening	x		
☐ C140 Dust Control	x		
* Requires Engineering			

OR ☐ Element is N/A: _____

Element #6 – Protect Slopes

Protect slopes by diverting water away from the top of the slope. Reduce slope velocities by minimizing the continuous length of the slope, which can be accomplished by terracing and roughening slope sides. Establishing vegetation on slopes will protect them as well.

The BMP(s) being proposed to meet this element are:

Check to Select	If Selected		
	Draw Location(s) on Site Plan	Submit Standard Detail	Submit Detailed Drawing/Calcs*
☐ C200 Interceptor Dike and Swale	x		x
☐ C201 Grass-Lined Channels	x		x
☐ C203 Water Bars	x		
☐ C204 Pipe Slope Drains	x		x
☐ C206 Level Spreader	x		
☐ C207 Check Dams	x	x	
☐ C208 Triangular Silt Dike	x		
* Requires Engineering			

OR ☐ Element is N/A: _____

Element #7 – Protect Drain Inlets

Protect all storm drain inlets during construction so that site runoff does not enter the inlets without first being filtered to remove sediment.

Install catch basin protection on all catch basins within 500 feet downstream of the project. Once the site is fully stabilized, catch basin protection must be removed.

The BMP(s) being proposed to meet this element are:

Check to Select	If Selected		
	Draw Location(s) on Site Plan	Submit Standard Detail	Submit Detailed Drawing/Calcs*
☐ C220 Storm Drain Inlet Protection	x		
* Requires Engineering			

OR ☐ Element is N/A: _____

Element #8 – Stabilize Channels and Outlets

Stabilize all temporary and permanent conveyance channels and their outlets.

The BMP(s) being proposed to meet this element are:

Check to Select	If Selected		
	Draw Location(s) on Site Plan	Submit Standard Detail	Submit Detailed Drawing/Calcs*
☐ C122 Nets and Blankets	x		
☐ C202 Channel Lining	x		
☐ C207 Check Dams	x	x	
☐ C209 Outlet Protection	x		
* Requires Engineering			

OR ☐ Element is N/A: _____

Element #9 – Control Pollutants

Handle and dispose of all pollutants, including demolition debris and other solid wastes, to keep them out of rain and stormwater. Provide cover and containment for all chemicals, liquid products (including paint), petroleum products, and other materials. Apply fertilizers and pesticides following manufacturers' instructions for application rates and procedures. Handle all concrete and concrete waste appropriately

The BMP(s) being proposed to meet this element are:

Check to Select	If Selected		
	Draw Location(s) on Site Plan	Submit Standard Detail	Submit Detailed Drawing/Calcs*
☐ C150 Materials on Hand	x		
☐ C151 Concrete Handling	x		
☐ C152 Sawcutting and Surface Pollution Prevention	x		
☐ C153 Materials, Delivery, Storage, and Containment	x		
☐ C154 Concrete Washout Area	x		x
* Requires Engineering			

OR ☐ Element is N/A: _____

Element #10 – Control Dewatering

Clean, non-turbid dewatering water, such as groundwater, can be discharged to the stormwater system provided the dewatering flow does not cause erosion or flooding of downstream conveyances or receiving waters. Do not mix clean dewatering water with turbid or contaminated dewatering water. Treat or dispose of turbid or contaminated dewatering water through a sediment pond or trap or to the local sanitary sewer, if permitted.

The BMP(s) being proposed to meet this element are:

Check to Select	If Selected		
	Draw Location(s) on Site Plan	Submit Standard Detail	Submit Detailed Drawing/Calcs*
☐ C203 Water Bars	x		
☐ C236 Vegetative Filtration	x		
* Requires Engineering			

OR ☐ Element is N/A: _____

Element #11 – Maintain BMPs

Maintain and repair ESC BMPs as needed. Inspect all BMPs at least weekly and after every storm event. Keep an inspection log on site and available for review by the County inspector at all times.

Remove all temporary erosion and sediment control BMPs within 30 days after final site stabilization or if the BMP is no longer needed. Any trapped sediment should be removed or stabilized onsite. No sediment shall be discharged into the storm drainage system or natural conveyance systems.

The BMP(s) being proposed to meet this element are:

Check to Select	If Selected		
	Draw Location(s) on Site Plan	Submit Standard Detail	Submit Detailed Drawing/Calcs*
☐ C150 Materials on Hand	x		
☐ C160 Certified Erosion and Sediment Control Lead			
* Requires Engineering			

OR ☐ Element is N/A: _____

Element #12 – Manage the Project

Coordinate all work before initial construction with subcontractors and other utilities to ensure no areas are prematurely worked.

Designate an erosion control inspector for the construction site. If land disturbing activity is undertaken by a licensed contractor, then the erosion control inspector must possess a valid CESCL certification. The erosion control inspector must be on the site or on-call 24 hours a day.

The erosion control inspector is responsible for:

- Ensuring that the erosion and sediment control BMPs are appropriate for the site and are functioning.
- Updating the Abbreviated Construction SWPPP when site conditions warrant.
- Maintaining the inspection log on site.

The BMP(s) being proposed to meet this element are:

Check to Select	If Selected		
	Draw Location(s) on Site Plan	Submit Standard Detail	Submit Schedule
☐ C160 Certified Erosion and Sediment Control Lead			
☐ C162 Scheduling			x
* Requires Engineering			

OR ☐ Element is N/A: _____

Element #13 – Protect Low Impact Development BMPs

Protect LID BMPs from compaction, erosion, and sedimentation.

Bioretention and Rain Gardens

Prevent compaction of areas planned for bioretention and rain gardens by excluding construction equipment. Avoid unnecessary foot traffic, and allow necessary foot traffic only when soils are not wet.

Protect all bioretention and rain gardens from sedimentation through installation and maintenance of erosion and sediment control BMPs on portions of the site that drain into them.

If they accumulate sediment during construction, restore the BMPs to their fully functioning condition. Restoration must include removal of sediment and any sediment-laden bioretention/rain garden soils, and replacing the removed soils with soils meeting the design specification.

Permeable Pavement

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 onto permeable pavements. Permeable pavements fouled with sediments or no longer passing an initial infiltration text must be cleaned using procedures from CCSM Book 4 or the manufacturer's procedures.

Other LID BMPs

Keep all heavy equipment off areas where LID facilities will be located. Protect completed lawn and landscaped areas from compaction by construction equipment.

The BMP(s) being proposed to meet this element are:

Check to Select	If Selected		
	Draw Location(s) on Site Plan	Submit Standard Detail	Submit Detailed Drawing/Calcs*
☐ C102 Buffer Zone	x		
☐ C103 High Visibility Fence	x		
☐ C200 Interceptor Dike and Swale	x		x
☐ C201 Grass-Lined Channels	x		x
☐ C207 Check Dams	x	x	
☐ C208 Triangular Silt Dike	x		
☐ C231 Brush Barrier	x		
☐ C233 Silt Fence	x	x	
☐ C234 Vegetated Strip	x		
* Requires Engineering			

OR ☐ Element is N/A: _____

F. Construction Sequencing/Phasing

1. The standard construction sequence is as follows:
   - Mark clearing/grading limits.
   - Install initial erosion control practices (construction entrance, silt fence, catch basin inserts).
   - Clear, grade, and fill site as outlined in the site plan while implementing and maintaining temporary erosion and sediment control practices at the same time.
   - Install proposed site improvements (buildings, driveways, landscaping, permanent stormwater control facilities (if required), etc.).

- Remove erosion control methods as permitted by the Building Inspector and repair permanent erosion protection as necessary.
- Monitor and maintain permanent erosion protection until fully established.

The Development Inspector or Building Inspector Assigned to the site will tell you at which points in the sequence an erosion control inspection is required.

List any changes from the standard construction sequence outlined above.

_____

_____

_____

_____

2. Construction phasing: If construction is going to occur in separate phases, describe:

_____

_____

_____

_____

3. Construction Schedule

Provide a proposed construction schedule (dates construction starts and ends, and dates for any construction phasing).

Start Date:_____ End Date: _____

Interim Phasing Dates: _____

Wet Season Construction Activities: describe any construction activities that will occur between October 1 and April 30.

_____

_____

_____

_____

Section 4 — Erosion and Sediment Control Site Plan

The erosion and sediment control site plan is a drawing which shows the location of the proposed BMPs.

Submit an erosion and sediment control site plan on 8½ x 11 or 11 x 17 paper.

For projects meeting Minimum Requirements #1 - #5, the site plan may be either drawn by hand or drafted electronically. Blank graph paper is provided below. For projects meeting Minimum Requirements #1 - #9, the plan must be drafted electronically.

The erosion and sediment control site plan must show the location of improvements, grading, filling, and construction stormwater and erosion control BMPs. Show the following listed items on the site plan. The  icon means that information may be found using Clark County Maps Online

-  Address, Parcel Number, and Street names
- North Arrow
- Boundaries of existing vegetation (e.g. tree lines, grass, pasture, fields, etc.)
-  On-site or adjacent critical areas and associated buffers (e.g. wetlands, steep slopes, streams, etc.)
-  Existing and proposed contours
- Areas that are to be cleared and graded
- Cut and fill slopes, indicating top and bottom of slope catch lines
- Locations where upstream run-on enters the site and locations where runoff leaves the site
- Existing surface water flow direction(s)
- Label final grade contours and indicate proposed surface water flow direction and surface water conveyance systems (e.g. pipes, catch basins, ditches, etc.)
- Grades, dimensions, and direction of flow in all (existing and proposed) ditches, swales, culverts, and pipes
- Locations and outlets of any dewatering systems (usually to sediment trap)
- Identify and locate all erosion control techniques to be used during and after construction
- Finish floor elevations of all structures

Request for Modification of Town Standard

Introduction

The subject property is addressed at 125 S Spruce Avenue, located on the east side of S Spruce Avenue approximately 230 feet south of E Jones Street. The property is currently seeking approval of a 3 lot residential Short Plat.

Existing Conditions

S Spruce Avenue has concrete curbs along both sides and concrete sidewalks along the west side. There are no existing sidewalks along the east side of the street from E Jones Street to E Hoag Street.

Request for Modification

Section 1.09 of the Town of Yacolt Engineering Standards for Public Works Construction outlines the process for modification of Town Standards.
This request for Standard Modification is to delete the requirement to construct a public sidewalk along the property's frontage.

Reason: There are no sidewalks existing along the east side of S Spruce Avenue from E Jones Street to E Hoag Street. In fact, most of the Town's streets have sidewalks only on one side.

Modification Criteria

The specification does not apply in the particular application:

If sidewalks were required at this location, each end would be a dead end, requiring pedestrians to cross the street anyway.

A change to a specification or standard is required to address a specific design or construction problem which if not enacted will result in an undue hardship:

None of the other lots along the east side of S Spruce Avenue were required to construct sidewalks. Sidewalk construction would require the installation of storm drain pipe and the existing drainage ditch to be completely covered.

Summary

For the reasons and addressed criteria stated above, the applicant hereby requests that the requirement for frontage sidewalks be deleted.

Submitted by Ed Greer, ICET
August 17, 2020

REQUEST FOR MODIFICATION (SIDEWALK STANDARDS)

Narrative for Variance
Belcorp Short Plat

a residential Short Plat
Town of Yacolt

Introduction

The subject 0.91 acre property is located at 125 S Spruce Avenue, and is also known as Clark County tax lot number 65150-000. Zone is R1-12.5. The site is surrounded by detached single family homes. The site contains a recently remodeled manufactured home, which will remain on proposed Lot 3, and a shop which will be removed.

Proposed Development

The project proposes to create 3 residential lots for detached single family homes on the 0.91 acre site. The lot design is based upon proposed septic system locations determined by soils that allow proper infiltration. The compacted gravel areas cannot be used for drainfields. All lots comply with the minimum area, minimum width and minimum depth as indicated on 18.25.050 Table 4A. Future homes will comply with the setbacks, maximum height, lot coverage and off-street parking codes as stated in Code 18.25. Proposed Lots 1 and 3 will have frontage along S Spruce Avenue via 20' wide flag stems. The proposed south line of Lot 3 is the shortest line adjoining the pole portion of the lot; therefore, the south line is the front of the lot, according to the Front Lot Line definition under 18.10.010. Density is 3.3 lots per acre.

Variance Request

The applicant is requesting a variance of the interpretation from the Town Staff regarding the front lot line of proposed Lot 3. According to the definition under 18.10.010, the front lot line is the shortest line adjoining the pole portion of the lot, which is the proposed south lot line.

Variance Approval Standards 18.45.020

A. Unusual circumstances of conditions apply to the property and/or to the intended use that do not apply generally to other property in the same vicinity or district;

   The unusual circumstances of conditions to the property is the existing residence and shop and the "virgin soil" limitations. Over the years, there has been gravel that has been laid down for the driveway and for the area in front of the shop and the compaction that occurs by everyday use by the weight of vehicles or the area in which a building was constructed upon the ground. It is necessary for septic systems to be constructed using "virgin soils". Using "virgin soils" is beneficial to the drainage system to septic tank. Compacted gravely soils cannot be used for drainfields because it will not allow for proper infiltration.

B. Such variance is necessary for the preservation and enjoyment of a substantial property right of the applicant possessed by the owners of other properties in the same vicinity or district;

Such variance is necessary for the preservation of the existing manufactured home and the enjoyment of the property owner to have the frontage remain as is. Staff does not feel the existing building would meet the setback dimensions in the proposed configuration. By using the flag lot definition as described in the Municipal Code: See 'flag lot' definition, YMC 18.10.010. *Flag lot, the front lot line is the shortest lot line adjoining the pole portion of the lot, excluding the undecidable portion of the pole.*
By using this definition, the existing manufactured home's frontage would now become the westerly side and would not meet the setbacks of the home; thereby, the permitted addition would have to be demolished which would affect the enjoyment of the resident and cause undo hardship to the property owner to have to remove the addition and decrease the value of the existing manufactured home.

C. The authorization of such variance will not be materially detrimental to the public welfare or injurious to property in the vicinity or district in which property is located;

By authorizing and approving the variance, this will allow the resident to retain the addition to the mobile home and keeping the existing frontage will not be detrimental to the public welfare or injurious to property in the vicinity in which the property is located and to remain status-quo.

D. That the granting of such variance will not adversely affect the realization of the comprehensive plan. [Ord. 371 § 8(B), 1997.]

By the granting of such variance will not adversely affect the realization of the comprehensive plan because the proposed lots do not affect in any way the zoning of the property and recognize, maintain and protect low density residential areas.

The applicant hereby requests the Town of Yacolt to approve this Variance.