PLANNING COMMISSION MEETING

LOCATION: TOWNSHIP ANNEX, 7527 HIGHLAND ROAD, WHITE LAKE, MI 48383
THURSDAY, JULY 20, 2023 – 7:00 PM

White Lake Township | 7525 Highland Rd | White Lake, MI 48383 | Phone: (248) 698-3300 | www.whitelaketwp.com

AGENDA

1. **CALL TO ORDER**
2. **ROLL CALL**
3. **PLEDGE OF ALLEGIANCE**
4. **APPROVAL OF AGENDA**
5. **APPROVAL OF MINUTES**
   A. June 15, 2023
6. **CALL TO THE PUBLIC (FOR ITEMS NOT ON THE AGENDA)**
7. **PUBLIC HEARING**
   A. Sunset Cove
   Located on the north side of Pontiac Lake Road, north of Highland Road (M-59).
   Identified as parcel number 12-13-451-011 (8300 Pontiac Lake Road).
   Consisiting of approximately 2.68 acres.
   Currently zoned PG (Pontiac Lake Gateway).
   Requests:
   1) Preliminary site plan approval
   2) Special land use approval
   Applicant: White Lake JZ, LLC
   30201 Orchard Lake Road, Ste 250
   Farmington Hills, MI 48334

   B. Panera
   Located on the north side of Highland Road (M-59) and west of Bogie Lake Road.
   Identified as parcel number 12-20-276-035.
   Consisiting of a project area on the parcel consisting of approximately 1.63 acres.
   Currently zoned PB (Planned Business District).
   Requests:
   1) Preliminary site plan approval
   Applicant: White Retail II, LLC
   30200 Telegraph Road, Ste 205
   Bingham Farms, MI 48205
8. **CONTINUING BUSINESS**

9. **NEW BUSINESS**
   A. Alpine Valley
   Located north of Highland Road (M-59) between Hill and Porter Roads.

Identified as parcel number 12-21-100-057 (6775 Highland Road).
Consisting of a subject site of approximately 26.9 acres.
Currently zoned PD (Planned Business).
Request:
1) Amended final site plan approval
Applicant: Wisconsin Resorts, Inc
43252 Woodward Avenue Ste 210
Bloomfield Hills, MI 48302

10. OTHER BUSINESS

A. Discussion on Open House public hearing notice

11. LIAISON'S REPORT

12. DIRECTOR'S REPORT

13. COMMUNICATIONS

14. NEXT MEETING DATE: August 3, 2023

15. ADJOURNMENT

Procedures for accommodations for persons with disabilities: The Township will follow its normal procedures for individuals with disabilities needing accommodations for effective participation in this meeting. **Please contact the Township Clerk's office at (248) 698-3300 X-164 at least five days in advance of the meeting.** An attempt will be made to make reasonable accommodations.

WHITE LAKE TOWNSHIP
PLANNING COMMISSION MEETING
JUNE 15, 2023

CALL TO ORDER
Chairperson Seward called the meeting to order at 7:00 PM. He then led the Pledge of Allegiance.

ROLL CALL
Present:
T. Joseph Seward, Chairperson
Scott Ruggles, Township Board Liaison
Matt Slicker
Steve Anderson
Merrie Carlock, Vice Chairperson
Debby Dehart
Pete Meagher

Absent:
Mark Fine
Rob Seeley

Others:
Sean O'Neil, Community Development Director
Justin Quagliata, Staff Planner
Hannah Micallef, Recording Secretary

3 members of the public present.

APPROVAL OF AGENDA
MOTION by Commissioner Anderson, seconded by Commissioner Meagher to approve the agenda as presented. The motion CARRIED with a voice vote: (7 yes votes).

APPROVAL OF MINUTES
A. June 1, 2023
MOTION by Commissioner Carlock, seconded by Commissioner Anderson to approve the minutes as presented. The motion CARRIED with a voice vote: (7 yes votes).

CALL TO THE PUBLIC
No public comment.

PUBLIC HEARING
No public hearing.

CONTINUING BUSINESS

A. Master Plan Update

Director O'Neil gave a brief report of what was to be reviewed this evening: future land use brainstorming and the community engagement plan for the public open house. A date was not yet decided for the open house, but Director O'Neil stated he thought the workshop would take place during one of the August Planning Commission meetings. The Planning Commission discussed potential changes to the future land use map. Staff asked the Commissioners to review the current future land use map and mark-up areas on the map that may be in need of change.

NEW BUSINESS

None.

OTHER BUSINESS

None.

LIAISON'S REPORT

The Trustees had met several times to review and discuss the design of the future Township Hall and Public Safety buildings with staff and the project architects. Bids for Stanley Park Phase 1 improvements were due July 11. Rockin' the Farm would be held at Fisk Farm on August 5 from 5pm-11pm.

DIRECTOR'S REPORT

Director O'Neil said the Corridor Improvement Authority would be meeting with the Citizens Advisory Council on August 3. The Capital Improvement Plan would be reviewed and updated within the next few months.

COMMUNICATIONS

There was tentatively a special joint Township Board/Planning Commission/Civic Center Development Committee meeting scheduled for 5:00 P.M. on July 20 to review the conceptual plans for the new Township Hall and Public Safety buildings.

NEXT MEETING DATE: July 20, 2023

ADJOURNMENT

MOTION by Commissioner Anderson, seconded by Commissioner Meagher to adjourn at 8:41 P.M. The motion CARRIED with a voice vote: (7 yes votes).

Director's Report

Project Name: Sunset Cove

Description: Preliminary site plan & special land use approvals

Date on Agenda this packet pertains to: July 20, 2023

☒Public Hearing

☒Initial Submittal

☐Revised Plans

☒Preliminary Approval

☐Final Approval

☒Special Land Use

☐Rezoning

☐Other:

Contact	Consultants & Departments	Approval	Denial	Approved w/Conditions	Other	Comments
Sean O'Neil	Planning Director	☐	☐	☐	☒	
DLZ	Engineering Consultant	☐	☐	☐	☒	See letter dated 06/15/2023.
DLZ	Traffic Engineer	☐	☐	☐	☒	See letter dated 02/17/2023.
Justin Quagliata	Staff Planner	☐	☐	☐	☒	See letter dated 06/13/2023.
John Holland	WLT Fire Chief	☐	☐	☐	☒	See letter dated 06/01/2023.

DLZ
ARCHITECTURE • ENGINEERING • PLANNING
SURVEYING • CONSTRUCTION SERVICES

INNOVATIVE IDEAS
EXCEPTIONAL DESIGN
UNMATCHED CLIENT SERVICE

June 15, 2023

Sean O' Neil
Community Development Department
Charter Township of White Lake
7525 Highland Road
White Lake, Michigan 48383

RE: Sunset Cove Condominiums- Preliminary Site Plan Review – 3rd Review

Ref: DLZ No. 2245-7382-19 Design Professional: Sieber Keast Lehner

Dear Mr. O' Neil,

Our office has performed a Preliminary Site Plan review for the above-mentioned revised plan dated May 24, 2023. The plans were reviewed for feasibility based on general conformance with the Township Engineering Design Standards.

General Site Information

This site fronts Pontiac Lake and is east of Pontiac Lake Road and north of M-59. Total site acreage is approximately 3.31 acres.

Site Improvement Information:

- Construction of two 5-story buildings with first floor parking, including ADA parking.
- Construction of a 2-story restaurant (4,835.40 sq.ft.) with associated parking, including ADA parking.
- Site to be serviced by proposed water main and sanitary sewer.
- Storm water runoff is proposed to be routed via storm sewer to and detained in Pontiac Lake.

The following items should be noted with respect to Planning Commission review:

Note that comments from our February 5, 2023 review are in *italics*. Responses to those comments are in **bold**. New comments are in standard font.

We note that no response letter was received from the design engineer with the current submittal.

a) *The site benchmarks shown will be invalid once construction starts as the two hydrants being used as benchmarks are proposed to be relocated. Provide two additional permanent benchmarks for the site (on NAVD88 datum).* **Comment addressed at this level of review. The designer has noted that additional site benchmarks will be established after PSP approval. We note that new benchmarks will be required to be shown on the FSP/FEP.**

b) *The legal description provided does not appear to correspond with the metes and bounds shown in plan view on the Topographic Survey Sheet 2. Please revise as necessary.* **Comment addressed at this level of review. The designer has indicated that a boundary survey and legal description will be prepared after the PSP approval. This item will be required to be addressed on the FSP/FEP.**

c) *Indicate whether there is an easement for the existing Caruso Circle and the status of this easement. If an easement exists, it will need to be vacated prior to Final Site Plan/Final Engineering Plan approval.* **Comment addressed at this level of review. The designer states that an ALTA survey has not yet been performed on the property. If the survey indicates an existing easement for Caruso Circle, it will need to be vacated prior to FSP/FEP approval.**

d) *Provide the soil boring report. If high water table or poor soils are present, a statement shall be provided addressing how the proposed buildings and underground utilities shall be supported with such conditions. Comment partially addressed. Designer notes in response letter that plan Sheets 6 and 7 containing soil boring report were provided. We note that only Sheet 6 (borings 1-7) was provided with this submittal. Please provide Sheet 7.* **Comment partially addressed. Sheet 7 has now been provided; however, Sheet 6- Soil Boring Location Plan shall be updated with the current building/site layout.**

e) *We defer to the Township Fire Department regarding hydrant spacing/coverage.* **Comment remains as a notation.**

f) *Provide a dedicated parking space for a sanitary sewer pump station and valve pit maintenance vehicle.* **Comment addressed. A dedicated space has been provided. A sign indicating that this space is reserved shall be provided on the FSP/FEP.**

g) *Please clarify the intent for the proposed sanitary sewer pump station; the proposed 2" force main appears to indicate a grinder pump is proposed, however the proposed valve vault contradicts this intent.* **Comment addressed at this level of review. The intent is to connect the proposed 2" force main to the existing 3" diameter force main along Pontiac Lake Road. Further detail regarding the design of the pump station shall be required at the time of FSP/FEP submittal.**

h) *Please consider relocating the ADA parking space for Building 3 next to and on the same side as the elevator. The current location proposes a safety concern for ADA residents attempting to cross the*

parking lot entrance in their attempt to reach the elevator on the opposite side of the entrance. Comment partially addressed. The applicant has provided the following statement regarding the location of the ADA parking space: "ADA parking space was located across the lobby entrance because the dimension between grid lines 4 & 5 to fit 3 spaces (one being ADA space) and therefore will not meet parking count requirement. The access from the ADA space to the building lobby meets the code requirements as it is the shortest route to an accessible entrance." Although this provides a reasoning for the chosen location of the ADA space, it does not address our concern relative to the issue of safety. We defer further discussion of this item to the Township. **Comment rescinded. All proposed ADA spaces are now on the same side as the lobby/elevator locations for both buildings.**

i) *The sidewalk stub to the south should be coordinated with the property to the south. A curb cut on the property to the south was left but the small section of sidewalk has not been installed.* **Comment outstanding. We defer discussion to the Township regarding the above comment. It is our opinion that the applicant should coordinate installation of the small section of sidewalk to the east with the adjacent property owner so as to provide continuity of the sidewalk in accordance with White Lake Township's desire for connectivity within the Township's pedestrian system.**

j) *It will need to be verified that no structures proposed are to be located in the floodplain* ***based on location*** *per the FIRM map panel referenced on the Overall Plan Sheet 3 and Grading Plan Sheet 4. It appears that there is the possibility that a portion of Building 1 and/or the restaurant may be in the floodplain based on* ***location*** *and* ***not elevation.*** *If this is correct, a LOMA from FEMA will be required to correct the FIRM as White Lake Township is an NFIP participant.* **Comment remains. If a LOMA is required, issuance by FEMA shall be required prior to issuance of Final Certificate of Occupancy and approval of the as built plan. We note that it can take up to 60 days for FEMA to issue a LOMA from the time of application submittal.**

k) *Pontiac Lake is a level-controlled lake under the jurisdiction of Oakland County, storm water discharge will need to be reviewed and approved by Oakland County.* **Comment outstanding. The designer has indicated that OCWRC has been contacted regarding the above and that the designer is awaiting response.**

l) *The permitting jurisdiction regarding proposed boat docks is unclear, DLZ defers this comment to the Township Planning Department, Oakland County, or EGLE depending on who has ultimate jurisdiction.* **Comment remains.**

m) *Two parking spaces located along/near the east side of the property are now shown as part of a cross access easement. Is the intent for future access to the adjacent property? Please clarify.* **The parking spaces have been removed and the easement only is now shown. We defer to the Township if this is an acceptable location for future cross access.**

n) Sheet L-1- Southeastern parking lot island proposes an elm tree at a distance < 10' horizontal separation from the proposed storm sewer. Either tree or storm sewer location shall be adjusted to achieve the minimum required 10' horizontal separation.
o) Per Township Zoning Ordinance 5.11O, 5 total ADA spaces are required between the parking areas for the two proposed residential buildings based on parking space calculations. Only 4 spaces are proposed; please provide an additional space.
p) Indicate why the storm sewer appears to be 'looped' in the area SE of Building 1.
q) Restaurant- Wye in a separate sewer lead to bypass oil/grease separator for all sewage exclusive of kitchen.

Recommendation

There are a few items above that will be required to be addressed; there are also items that DLZ has referred to the Township Planning Department, including the sidewalk connection to the adjacent property. There are also a few items that remain outstanding relating to the possible need for a LOMA and confirmation regarding the stormwater jurisdiction. Additionally, the permitting jurisdiction for the proposed docks is unclear and may not be feasible until that jurisdiction and requirements are clarified. These items can be clarified on future submittals, but it should be noted the site plan may need to change to meet these requirements.

Please feel free to contact our office should you have any questions.

Sincerely,

DLZ Michigan

Michael Leuffgen, P.E.
Department Manager

Victoria Loemker, P.E.
Senior Engineer

Encl. None

Cc: Justin Quagliata, Community Development*, via email*
Hannah Micallef, Community Development, *via email*
Aaron Potter, DPS Director, White Lake Township*, via email*
John Holland, Fire Chief, White Lake Township, *via email*
Jason Hanifen, Fire Marshall, White Lake Township, *via email*

X:\Projects\2022\2245\738219 WLT Sunset Cove\PSP -Review.03\Review.03.docx

DLZ
ARCHITECTURE • ENGINEERING • PLANNING
SURVEYING • CONSTRUCTION SERVICES

INNOVATIVE IDEAS
EXCEPTIONAL DESIGN
UNMATCHED CLIENT SERVICE

February 17, 2023

Sean O'Neil, Director
Community Development Department
Charter Township of White Lake
7525 Highland Road
White Lake, Michigan 48383

Re: Sunset Cove
Traffic Impact Assessment Review

Ref: DLZ File No. 2245-7382-19

Date of Study: 2/8/2023

Design Professional: Jacob Swanson, PE;
Kyle J. Paulson; Fleis & VandenBrink Engineering

The applicant has submitted a Traffic Impact Assessment (TIA) for P.I. 12-13-451-011, located along the north side of Pontiac Lake Road approximately 150 feet west of the Highland Road (M-59) intersection. The proposed development in the TIA is a multi-family development with 46 proposed dwelling units and a sit-down restaurant. The TIA utilized a combination of existing Turning Movement Counts (TMC) and the SEMCOG traffic count database to evaluate the existing traffic volumes along Pontiac Lake Road. The latest traffic counts present in the SEMCOG database were from 2021 and the TMC were collected on December 8 and 9, 2021. The tube traffic volume counter collected data on Tuesday, January 17, 2022.

We have reviewed the analysis; the methodology is in line with standard practices, and the findings are supported by the data provided. Based on data from the Multi-Family (Mid-Rise) section of the 11th edition of the "ITE Trip Generation Manual", the additional daily trips are 173 trips per day with 9 AM Peak Hour trips per day and 18 PM Peak Hour trips anticipated to be added to the existing traffic volumes each day. The data for a High Turnover (Sit-down) Restaurant anticipates an additional 518 daily trips, with 46 AM Peak Hour trips and 44 PM Peak Hour trips per day. Based on the White Lake Zoning Ordinance, the number of daily trips generated by the site falls with the thresholds for requiring a Traffic Impact Assessment (500-750 daily trips). The analysis indicates that the development will not significantly negative impact on the traffic in the analysis zone. The level of service (LOS) for the development site drives never fall below a "B", while the existing Pontiac Lake Road LOS primarily maintains a LOS of "A" during the AM and PM peak hours.

The study also evaluated the need for turn lanes or tapers at the proposed site drives. Due to the right-in right-out only easterly drive, a left turn lane warrant was not evaluated for that site driveway. For the westerly site drive, no left turn treatment was warranted. Based on the volume of traffic on Pontiac Lake Road and the number of anticipated right turns into the development, it was determined that a right turn deceleration lane or taper is not warranted at either site driveway. However, the Road Commission for Oakland County (RCOC)

often requires right turn tapers on developments of this nature along their roadways. An RCOC permit will be required prior to construction.

If you have any questions, please feel free to contact to me.

Respectfully,
DLZ, Inc.

Leigh Merrill, P.E.
Project Manager

Cc: Michael Leuffgen, P.E., DLZ *via email*
Hannah Micallef, Community Development *via e-mail*

WHITE LAKE TOWNSHIP
PLANNING COMMISSION

REPORT OF THE
COMMUNITY DEVELOPMENT DEPARTMENT

TO: **Planning Commission**

FROM: **Sean O'Neil, AICP, Community Development Director**

Justin Quagliata, Staff Planner

DATE: **June 13, 2023**

RE: **Sunset Cove**
Preliminary Site Plan and Special Land Use – Review #3

Staff reviewed the revised preliminary site plan (PSP) prepared by Seiber Keast Lehner (revision date May 24, 2023). The previous staff report for the PSP and special land use (attached) should be referenced for a more complete overview of the project and all applicable review comments. A number of changes have been made to the PSP, including:

- Reduction of two units, from 46 to 44
- Reduction of one residential building, from 3 to 2
- Increase of residential building height, from 4 stories to 5 stories
- Increase of 14 boat dock spaces, from 30 to 44
- Increase of parking spaces to 196 to satisfy Zoning Ordinance requirements (192 required)

Overall, there would be 44 condominium units for sale among 2 buildings each consisting of 20, two-bedroom units and 2, three-bedroom units (zero on the prior PSP). The two-bedroom unit sizes range from 1,064 square feet to 1,172 square feet; three-bedroom unit sizes shall be labeled on the architectural plans. The PSP notes the development shall be constructed as a single phase. With 44 total units on 2.68 net acres, density of the proposed multiple-family portion of the development is 16.42 dwelling units per acre (du/a). Staff continues to suggest 14 du/a (which is 4 du/a more than allowed in the most-dense multiple-family zoning district) as appropriate for the site. A reduction of 6 units, from 44 units to 38 units, would reduce the density to 14.18 du/a. The five-story residential buildings would be approximately 67.81 feet in height and require special land use approval.

A two-story, 4,835.4 square foot restaurant is also proposed. Restaurants with or without alcoholic beverage service are permitted with site plan review and approval in the Pontiac Lake Gateway (PG) zoning district. Drive-in or drive-thru restaurants require special land use approval. The type of restaurant or tenant has not been identified by the Developer. The Planning Commission, and ultimately the Township Board, should specify the type of restaurant required on this site (carry-out, sit-down, etc.).

The following list summarizes the 16 required variances:

Pontiac Lake setback variances

The minimum setback from Pontiac Lake is 30 feet for buildings three stories or less, with an additional five feet required for each story over three, and an additional five feet required for each 100 feet of building length. Both Buildings 1 and 2 are five-stories in height and 156 feet in length; therefore, Buildings 1 and 2 each require a 47.8-foot setback from Pontiac Lake (note staff prorated the setback (50 feet could have been required under strict interpretation of the Zoning Ordinance)). The restaurant building is two-stories in height and less than 100 feet in length; therefore, a 30-foot setback from Pontiac Lake is required. Note all buildings and structures are also subject to the required 25-foot natural features setback from Pontiac Lake.

- Building 1
    - 32.89-foot variance from Pontiac Lake building setback
    - 10.09-foot variance for natural features setback encroachment
- Building 2
    - 24.64-foot variance from Pontiac Lake building setback
    - 1.84-foot variance for natural features setback encroachment
- Restaurant Building
    - 10.46-foot variance from Pontiac Lake building setback
    - 5.46-foot variance for natural features setback encroachment

Other building setback variances

For safety reasons and to provide open space, the Zoning Ordinance requires setbacks between buildings. Where two or more multiple-family structures are erected on the same lot, a minimum setback of 20 feet must be provided between structures. If the structures have a common yard, this setback must be increased by two feet for each ten feet or part thereof by which each of the buildings exceed 40 feet in length on that side of the building facing the common yard. Both Buildings 1 and 2 are over 40 feet in length facing the common yard; therefore, a 45.5-foot setback is required between Buildings 1 and 2. Furthermore, structures located within a multiple-family development must have a minimum setback of 25 feet from the back of sidewalk or 25 feet from back of curb for developments without sidewalks. Buildings 1, 2, and 3 do not meet the required setbacks. Also, the minimum setback between Building 1 (residential) and the restaurant building is 35 feet (the 35-foot setback is the minimum commercial building side yard setback of 15 feet (in General Business and Restricted Business) plus the minimum setback between buildings of 20 feet in a multiple-family development); only 28.3 feet are provided.

- Buildings 1 and 2
    - 13.46-foot variance from setback between buildings
- Building 1 and Restaurant Building
    - 6.7-foot variance from setback between buildings
- Building 1
    - 22-foot variance from back of sidewalk

- Building 2
    - 22-foot variance from back of sidewalk

Build-to-line coverage

In the PG zoning district, buildings must occupy 75 percent of the front build-to-line of a site, which is defined as its front right-of-way line. For Commissioners unfamiliar with this concept, a build-to-line is the building line to which a building must be constructed. Generally, a build-to-line is the opposite of a setback; however, similar to setback, a build-to-line runs parallel to the right-of-way and is established to create a generally consistent building line along a street. The build-to-line designates the specific location or range within which the front building line must be located. A variance is required from the 75 percent build-to-line coverage.

Landscaping

For every new development requiring site plan review, except site condominiums as regulated in Article 6, Section 1, interior landscaping areas shall be provided, equal to at least 15 percent of the total lot area. These landscaped areas shall be grouped near all building entrances, building foundations, pedestrian walkways, and service areas, and may also be placed adjacent to fences, walls, or rights-of-way. These planting areas shall be so located as to breakup an otherwise continuous abutment of building facade with sidewalks and/or parking areas. All interior landscaping shall provide one large deciduous, small ornamental deciduous, or evergreen tree and five shrubs for every 300 square feet of required interior landscaping area. It appears a variance is required from this requirement. The landscape summary on Sheet L-1 shall be updated to include interior landscaping.

Within every parking area containing 10 or more spaces, there shall be parking lot landscaping in accordance with: 15 square feet per residential parking space and 20 square feet per restaurant parking space. One large deciduous tree or small deciduous ornamental tree and three shrubs shall be required for every 100 square feet of required parking lot landscaping area. These landscaping areas shall be located so as to better define parking spaces and drives. Landscaping on the perimeter of the parking lot does not satisfy the parking lot landscaping requirement. Island locations shall also be considered in a manner that will assist in controlling traffic movements. The requirements, for trees and islands, may be modified when it is found through careful coordination of parking lot landscaping with peripheral and building plantings an unnecessary duplication of plantings would be created. In addition, consideration shall be given to situations when an excess number of small islands would be created that would only serve to disrupt reasonable traffic patterns and maintenance activities. Trees and shrubs as previously described are not provided; therefore, a variance is required.

Public sidewalk standards

The Zoning Ordinance requires a minimum six-foot-wide sidewalk placed one-foot from the inside edge of the right-of-way along the Pontiac Lake Road property frontage, which the Developer will be required to install as part of the project. The submitted site plan shows a six-foot concrete sidewalk along a portion of the property frontage; the frontage sidewalk along Pontiac Lake Road is not proposed to be constructed to the west property line. Therefore, a variance is required.

Drive aisle width

Twenty-four feet of drive width is required between Buildings 1 and 2, and entering the covered parking. The site plan measures these drive widths as 24 feet to the back of curb; road measurement surface is taken between the edges of the gutter pan (required drive width must be provided between the edges of the gutter pan (edge of metal)). Therefore, a variance is required.

Parking space depth

Curb and gutter (including gutter pan) shall not be included in the measurement of parking space depth. Parking spaces abutting landscape areas are proposed at approximately 16 feet in depth. Therefore, a variance is required.

The following list summarizes outstanding comments from previous and current reviews (refer to previous reviews for items identified as "comment remains as a notation"):

- The building material percentages on Sheets A.200 and A.201 do not result in 100 percent. Furthermore, on Sheets A.200 and A.201 the facade areas next to the elevations differ from the sum of the material areas listed in the tables on those sheets. Revise for consistency.

- If the required cross-access is not built to the property line as part of this project, an agreement (subject to review of the Township Attorney) would have to be submitted by the Developer and approved by the Township at final site plan.

- The site plan shall be revised to show the required box pattern parking spaces.

- The Zoning Ordinance requires the area, quantity, location, and dimensions of all signs to be provided with a preliminary site plan.

- Trash rooms are shown on the ground floor of the residential buildings on Sheets 3 and A.100. The Developer shall clarify if the intent is for a trash collection company to drive a trash truck through the site, stop at each building, enter the garages to collect trash from the trash rooms, and take the trash to the trash truck.

- The Seiber Keast Lehner plan is the prevailing plan – there is no reason to have an architectural site plan in the plan set, so Sheet C.100 shall be removed from the plan set.

Outdoor Lighting

Site lighting is required to comply with the Zoning Ordinance. Information on site lighting was provided (photometric plan prepared by Gasser Bush dated May 18, 2023) and will be reviewed in detail at final site plan. Following are initial comments on the lighting (photometric) plan:

- Footcandles shall be measured at approximately five feet above grade. Revise accordingly, and the plan must contain a note (revise General Note 2) confirming footcandles are measured at five feet above grade.

- Partial lighting specifications were provided on the photometric plan. Complete catalog details (cut sheets) for all proposed luminaries shall be provided. Luminaire selections and colors are subject to review and approval by the Township.

- A light pole detail indicating the total height, including the base, pole, and fixture shall be provided. Mounting height is measured from grade to the sky side of the fixture – revise mounting height note on photometric plan.

- It is unclear if the EV smart commercial pole base housing on Page 2 of the photometric plan is proposed or is provided as an advertisement. If not proposed, remove from the plan sheet.

- Light pole locations shall be removed from Sheet 3 of the site plan (stated in prior reviews).

Planning Commission Options

The Planning Commission may recommend approval, approval with conditions, or denial of the preliminary site plan to the Township Board; action on the special land use is determined by the Planning Commission. Special land uses for building height are evaluated using the general standards for all special land uses listed in Section 6.10 of the Zoning Ordinance. Any recommendation of approval of the PSP or approval of the special land use shall be conditioned on the Developer addressing all staff and consultant review comments and recommendations, and requesting/receiving the necessary variances from the Zoning Board of Appeals.

Notes:

1. Evidence, satisfactory to the Township Attorney, that the signatories on the application are authorized to execute on behalf of the Applicant and Property Owner shall be provided (company/corporate resolution). (Comment outstanding from prior reviews).

2. The note in the title block on the architectural plans regarding scale drawings and dimensions shall be removed. The Zoning Ordinance requires plans be to scale. Revise accordingly. (Comment outstanding from prior reviews). Contrary to the Architect's response letter to the first review indicating this item has been addressed, the architectural plans still contain the aforementioned note).

WHITE LAKE TOWNSHIP
PLANNING COMMISSION

REPORT OF THE
COMMUNITY DEVELOPMENT DEPARTMENT

TO: **Planning Commission**

FROM: **Sean O'Neil, AICP, Community Development Director**

Justin Quagliata, Staff Planner

DATE: **February 3, 2023**

RE: **Sunset Cove**
Preliminary Site Plan and Special Land Use – Review #2

White Lake JZ, LLC has requested preliminary site plan (PSP) approval to construct three **(now two)**, four-story multiple-family residential buildings**, one, three-story multiple-family residential building,** and a 4,836 square foot two-story restaurant at 8300 Pontiac Lake Road **(the address and parcel number shall be provided on Sheet 1 of the PSP)** **(comment addressed – address and parcel number are now on Sheet 1)**, located on the north side of Pontiac Lake Road, north of Highland Road (M-59). The 2.68-acre (net area) site is zoned PG (Pontiac Lake Gateway) and contains 509.45 feet of frontage on Pontiac Lake Road. **The legal description of the parcel shall be reviewed by the Township Engineering Consultant. (Comment outstanding). Additionally, the surveyor's seal and signature shall be placed on Sheet 2 of the PSP. (Comment outstanding. The response letter provided to the first review by the Developer's architect states a boundary survey/legal description will be done if the PSP is approved).**

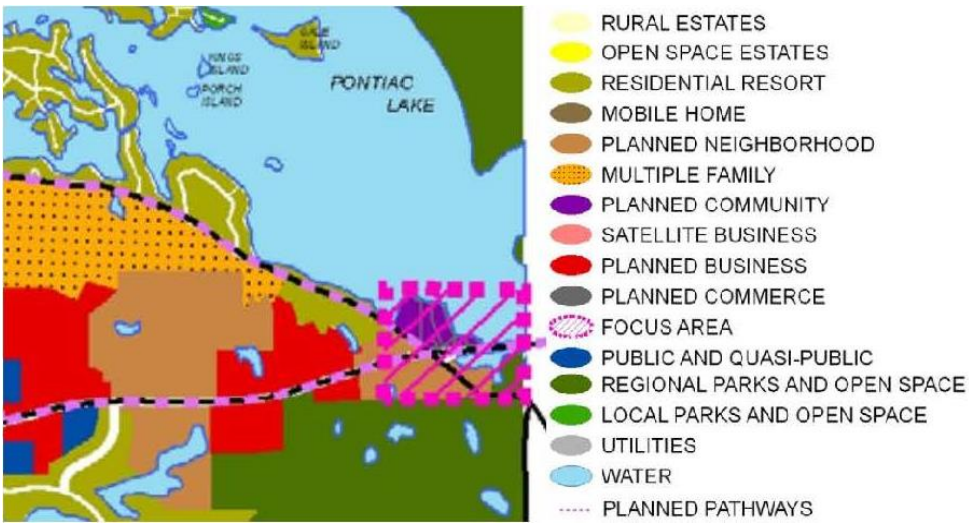
The PSP notes the development shall be constructed as a single phase. Overall, there would be 50 **(now 46)** units among three buildings consisting of two, 18-unit buildings and one, 14-unit **(now 10-unit)** building. All of the units would contain two bedrooms and be accessed from the interior of the buildings via a common corridor circulating through the buildings. Upper floors could be accessed by an elevator or stairways. Unit sizes range from 1,000 square feet to 1,214 square feet. The **four-story** residential buildings would be ~~four stories in height (~~55'–4"~~)~~ **in height**~~,~~ **and require special land use approval (in the PG district buildings over 40 feet or four-stories in height require special land use approval).** ~~with~~ **All of the residential buildings would have** covered parking (garage) on the first floors. 27 **(now 26)** parking spaces would be on the first floor of Building Type 1 (18-unit buildings) and 20 **(now 19)** parking spaces would be on the first floor of Building Type 2 (14-unit **(now 10-unit)** building). All of the units would have a balcony.

The Developer must clarify if the units would be apartments for rent (and provide anticipated lease rates) or condominiums for sale (and provide anticipated price range). (Comment addressed. The response letter provided to the first review by the Developer's architect indicates the units would be condos for sale ranging from $400,000 - $500,000 (based on economy and interest rates).

Master Plan

The Future Land Use Map from the Master Plan designates the subject site in the Planned Community category, and the property is located in the Pontiac Lake Gateway Focus Area. Planned Community is intended to be characterized by a mix of uses including higher residential densities and a variety of housing product types as well as a core area with retail, dining, entertainment, governmental, recreational, institutional, office and personal service establishments. Residential elements of a Planned Community may take the form of a freestanding neighborhood, or may be permitted on the upper floors of nonresidential development in the community core area. Multi-use/story buildings are expected to have two or three stories, however open space must be provided. Connections to and segments of the Township community-wide pathway system are required as an integral part of all developments. With 50 total units on 2.68 net acres, density of the proposed multiple-family portion of the development is 18.66 dwelling units per acre (du/a). Multiple-family developments are typically limited to a maximum of 10 du/a. Given the subject property is zoned PG, **staff suggests 14 du/a as appropriate maximum density for the site. A reduction of 12 units, from 50 units to 38 units, would reduce the density to 14.18 du/a. (Comment outstanding. The fourth floor of Building 3 has been eliminated, reducing the quantity of units from 50 units to 46 units. With 46 total units on 2.68 net acres, density of the proposed multiple-family portion of the development is 17.16 du/a (density only reduced 1.5 du/a). Staff continues to suggest 14 du/a (which is 4 du/a more than allowed in the most-dense multiple-family zoning district) as appropriate for the site. A reduction of 8 units, from 46 units to 38 units, would reduce the density to 14.18 du/a).**

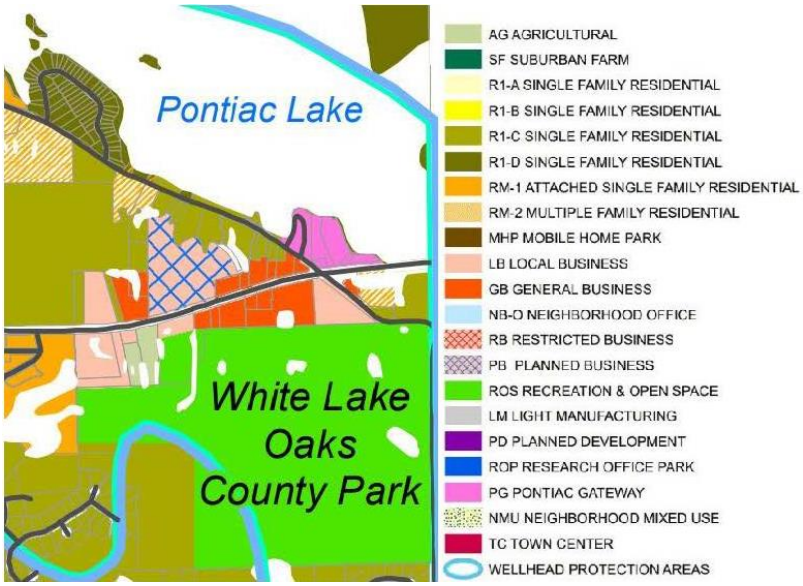
FUTURE LAND USE MAP



Zoning

The subject site is located in the PG (Pontiac Lake Gateway) zoning district, which requires a minimum of 5,000 square feet of lot area. The PG district does not have a minimum lot width requirement. Restaurants with or without alcoholic beverage service are permitted with site plan review and approval in the PG zoning district. Drive-in or drive-thru restaurants require special land use approval. The type of restaurant or tenant has not been identified by the Developer. **The Planning Commission, and ultimately the Township Board, should specify the type of restaurant required on this site (carry-out, sit-down, etc.). (Comment outstanding. No information has been provided as to the type of restaurant proposed).**

ZONING MAP



Physical Features

The site was formerly occupied by Village on the Lake mobile home community, but is currently vacant. Topography of the site is generally level. Pontiac Lake is adjacent to the north and west sides of the site.

Access

The site fronts on Pontiac Lake Road, which along the property is a paved, two-lane public road without curb and gutter designated as a thoroughfare with a 120-foot right-of-way requirement by the Road Commission for Oakland County (RCOC). **The Developer will be required to dedicate the additional portion of the future right-of-way at the north side of Pontiac Lake Road to the RCOC. (Comment remains as a notation. The future right-of-way is proposed to be dedicated and shown on the site plan).**

Two, two-way driveways are proposed to serve the site. Two-way undivided driveways must have a throat width of 25 feet. **The throat width shall be increased to 25 feet (throat length is the distance parallel to the centerline of a driveway from the public or private road right-of-way or access easement to the first on-site location at which a driver can make a right-turn or left-turn). (Comment addressed. Throat width has been revised).**

All dimensions for drive widths and parking space depth shall be revised. (Comment partially addressed. Not all drive widths have been revised (for example: the drive width between Building 1 and Building 2). The site plan measures drive widths to the back of curb; road measurement surface is taken between the edges of the gutter pan (required drive width shall be provided between the edges of the gutter pan). Furthermore, curb and gutter (including gutter pan) shall not be included in the measurement of parking space depth. If required drive width and parking space depth are not provided, variances shall be required from the Zoning Board of Appeals. (As proposed, a drive aisle width variance is required). Additionally, the plans shall be revised to clearly indicate the on-site circulation pattern. (Comment addressed. A traffic control device (raised island) has been added to the easterly driveway for right-in, right-out access only).

The zoning ordinance requires site plans incorporate cross-access with neighboring sites via connected parking aisles or frontage roads, shared side service drives and/or site access drives, and rear service drives connecting to side roads. Such cross-access shall be supported by general-purpose (unrestricted) easements, as well as agreements regarding maintenance responsibilities. **The required cross-access shall be provided to the east property line. (Comment outstanding. An 18-foot-wide cross-access easement area is shown in two parking spaces along the east side of the site. If the required cross-access is not built to the property line as part of this project, an agreement (subject to approval of the Township Attorney) would have to be submitted by the Developer and approved by the Township Board at final site plan. Also, if the cross-access, when implemented, eliminates required parking spaces, an additional variance would be required from the Zoning Board of Appeals as the site is already deficient in parking spaces. Furthermore, the required drive width is 24 feet. If the cross-access easement area is not widened, a variance from the Zoning Board of Appeals is required).**

The zoning ordinance requires a minimum six-foot-wide sidewalk placed one-foot from the inside edge of the right-of-way along the Pontiac Lake Road property frontage, which the Developer will be required to install as part of the project. The submitted site plan shows an eight-foot concrete sidewalk along the property frontage. **The frontage sidewalk along Pontiac Lake Road shall be constructed to the west property line and through the driveways (concrete sections through the approaches). (Comment outstanding. If the sidewalk is not constructed to the west property line, a variance is required from the Zoning Board of Appeals).** Internal sidewalks along Pontiac Lake are five-feet-wide, and seven-feet-wide (not labeled – scaled by staff) along a portion of the accessible parking spaces adjacent to the restaurant building. **A seven-foot-wide sidewalk is required south of the restaurant building – label the aforementioned sidewalk width on the site plan. (Comment addressed. A seven-foot-wide sidewalk is provided and labeled south of the restaurant building).**

The Developer shall submit a trip generation analysis prepared which estimates future vehicle trips that could be generated by development of the property with the proposed project. **(Comment partially addressed. A trip generation analysis was submitted which shows the anticipated number of vehicle trips triggers the requirement to provide a traffic impact assessment (TIA). The response letter provided to the first review by the Developer's engineer indicates a TIA is being performed by Fleis & Vandenbrink).** The purpose of a trip generation analysis is to determine, based on the projected traffic volumes, if the thresholds for requiring a traffic impact assessment or traffic impact statement are met. A traffic impact assessment is required if the proposed use(s) would generate between 500 and 749 driveway trips per day, or between 50 and 99 peak-hour, peak-direction driveway trips. A traffic impact statement is required if the proposed use(s) would generate 750 or more driveway trips per day, or 100 or more peak-hour, peak-direction driveway trips. An average day is the average 24-hour total of all vehicle trips counted to and from a study site from Monday through Friday. A peak hour of traffic is the hour of highest volume of traffic entering and exiting the site during the morning and afternoon hours.

Utilities

The project would be served by both the municipal water and sanitary sewer systems. The Township Engineering Consultant will perform an analysis of grading, stormwater, and location and capacity of utilities to ensure compliance with all applicable ordinances as well as the Township Engineering Design Standards.

Staff Analysis

The development standards for the PG district allow for 0-foot front yard setbacks, and 0-foot side yard setbacks (0-foot side yards are permitted when interior (within) the PG district). Building 2 is located 1.5 feet **(now 1.43 feet)** from the future Pontiac Lake Road right-of-way and Building 3 is located 5.64 feet **(now 4.73 feet)** from the future Pontiac Lake Road right-of-way. The minimum setback from Pontiac Lake is 30 feet for buildings three stories or less, with an additional five feet required for each story over three, and an additional five feet required for each 100 feet of building length. Both Buildings 1 and 2 are four-stories in height and 156 feet in length; therefore, Buildings 1 and 2 each require a 42.8-foot setback from Pontiac Lake (note staff prorated the setback (45 feet could have been required under strict interpretation of the ordinance)).

The restaurant building is two-stories in height and less than 100 feet in length; therefore, a 30-foot setback from Pontiac Lake is required. Note all buildings and structures are also subject to the required 25-foot natural features setback from Pontiac Lake.

The following setback variances are required from Pontiac Lake:

- Building 1
  - 27.8-foot **(now 30.35 foot)** variance from Pontiac Lake building setback
  - 10-foot **(now 12.55 foot)** variance for natural features setback encroachment
- Building 2
  - 19.8-foot **(now 22.04 foot)** variance from Pontiac Lake building setback
  - 2-foot **(now 4.24 foot)** variance for natural features setback encroachment
- Restaurant Building
  - 9.2-foot **(now 10.46 foot)** variance from Pontiac Lake building setback
  - 4.2-foot **(now 5.46 foot)** variance for natural features setback encroachment

For safety reasons and to provide open space, the zoning ordinance requires setbacks between buildings. Where two or more multiple-family structures are erected on the same lot, a minimum setback of 20 feet must be provided between structures. If the structures have a common yard, this setback must be increased by two feet for each ten feet or part thereof by which each of the buildings exceed 40 feet in length on that side of the building facing the common yard. Both Buildings 1 and 2 are over 40 feet in length facing the common yard; therefore, a 45.5-foot setback is required between Buildings 1 and 2. Furthermore, structures located within a multiple-family development must have a minimum setback of 25 feet from the back of sidewalk or 25 feet from back of curb for developments without sidewalks. Buildings 1, 2, and 3 do not meet the required setbacks. Also, the minimum setback between Building 1 (residential) and the restaurant building is 35 feet (the 35-foot setback is the minimum commercial building side yard setback of 15 feet (in General Business and Restricted Business) plus the minimum setback between buildings of 20 feet in a multiple-family development); ~~only 34.4~~ **37.46** feet is provided.

The following building setback variances are required:

- Buildings 1 and 2
  - 11.4-foot **(now 10.8 foot)** variance from setback between buildings
- ~~Building 1 and Restaurant Building~~
  - ~~0.6-foot variance from setback between buildings~~
- Building 1
  - 25-foot variance from back of sidewalk
- Building 2
  - 25-foot variance from back of sidewalk
- Building 3
  - 25-foot variance from back of sidewalk (east)
  - 20-foot **(now 21.5 foot)** variance from back of curb (west)

In the PG zoning district, buildings must occupy 75 percent of the front build-to-line of a site, which is defined as its front right-of-way line. For Commissioners unfamiliar with this concept, a build-to-line is the building line to which a building must be constructed. Generally, a build-to-line is the opposite of a setback; however, similar to setback, a build-to-line runs parallel to the right-of-way and is established to create a generally consistent building line along a street. The build-to-line designates the specific location or range within which the front building line must be located. A variance is required from the 75 percent build-to-line coverage.

Building Architecture and Design

Generally, exterior building materials should be comprised primarily of high quality, durable, low maintenance material, such as masonry, stone, brick, glass, or equivalent materials. Buildings should be completed on all sides with acceptable materials. The proposed residential building materials are a mix of hardie lap siding (horizontal) with aluminum panels (accents), and split-face block approximately 11 feet up around the base of the buildings, with asphalt shingle roofing. Metal (likely aluminum) balconies would be located on the buildings, using tension rods with turnbuckles anchored to wall plates to attach to the buildings.

The proposed building materials and architecture on the buildings are substandard in nature and not acceptable for a development of this magnitude. The residential buildings are 123-156 feet in length, 55'–4" in height, and could be considered imposing in appearance. In order to soften the appearance, **the facades shall be divided vertically into segments no greater than 60 feet wide. Articulation and relief of the facades shall be achieved by utilizing variegated, high-quality building materials, with each of the aforementioned segments recessed/off-set (change in the building plane) at least two and no more than five feet across the facades of the buildings. At least 70 percent of the facades shall be finished with a combination of masonry, stone, brick, glass, or equivalent materials. Additionally, horizontal cladding (siding) shall not be permitted on the facades; vertical (board and batten style) siding may be utilized outside of the aforementioned 70 percent requirement. (Comments addressed. The building materials have been revised to include a larger quantity of masonry products, articulation of the facade is shown on the revised elevations, and horizontal cladding has been replaced with vertical batten-style siding). Aluminum panels shall not be permitted on the buildings. (Comment outstanding. Aluminum panels remain on the building. The response letter provided to the first review by the Developer's architect indicates the panels have a wood color and texture, and the product is durable. While the Planning Commission has the ability to allow aluminum panels, staff suggests an alternate product be utilized as an accent material (e.g., a tile product). If any hardie lap siding is proposed on the revised building elevations, the colors shall be revised to complement the brick and/or stone product utilized. (Comment addressed. See comment in last paragraph on this page). The exterior elevations shall be revised accordingly. (The building material percentages on Sheets A.200 and A.201 do not result in 100 percent. Other materials (such as the aluminum panels) need to be included in the calculations and the calculations need to be corrected to result in 100 percent. Furthermore, on Sheets A.200 and A.201 the facade areas next to the elevations differ from the sum of the material areas listed in the tables on those sheets. Revise for consistency).**

Colors were also noted on the elevations of the residential buildings showing the different building materials for the project. **The currently proposed color scheme of the buildings should be revised; black and grey building material colors are not compatible with or complimentary to the architectural character the Township intends to achieve in the PG district. A brown/tan/taupe color scheme should be utilized on the buildings. (Comment addressed. The facade color scheme has been revised to utilize brown/tan/taupe colors).**

A sample board of building materials to be displayed at the Planning Commission meeting is required by the zoning ordinance and must be submitted at final site plan. (Comment remains as a notation. This requirement was acknowledged by the Developer's architect in the response letter provided to the first review). Additionally, the address (street number) locations shall be shown on the buildings. Six-inch-tall numbers visible from the street shall be required. The address locations are subject to approval of the Township Fire Marshal. (Comment remains as a notation. The revised elevations show the address of the building).

Exterior elevations shall be provided for the restaurant building at final site plan. Building materials for the restaurant building shall match the residential buildings. (Comment remains as notation. The response letter provided to the first review by the Developer's architect indicates exterior elevations for the restaurant building will be completed and submitted separately from the residential buildings. As the development would be constructed as a single phase (as indicated on the site plan), exterior elevations for the restaurant building shall be provided at final site plan). An outdoor patio should be provided on the lakeside of the restaurant building. If provided, details for the items to be located on the patio and details for the patio surfacing shall be provided at final site plan. An ornamental paving treatment should be required by the Planning Commission. The treatment should be something either decorative or something to provide aesthetic quality to the patio. Potential options for ornamental paving treatments include, but are not limited to, CMU pavers; brick; stone; or stamped, stained, and sealed concrete.

Accessory items such as railings, benches, trash receptacles, outdoor seating (such as tables and chairs), or sidewalk planters located in the vicinity of sidewalks and/or outdoor seating areas are required to be of commercial quality and complement the building design and style. **These details shall be provided at final site plan. (Comment remains as a notation. The response letter provided to the first review by the Developer's architect states see the revised plans. However, details regarding the site accessories described above have not been provided).**

The PG district requires a first/ground floor be at least 14 feet in height, and upper floors are required to be at least 10 feet in height. All three residential buildings have a proposed first/ground floor height of 12 feet. A variance from the minimum floor height standard is required for each of the three buildings.

Trash Receptacle Screening

The zoning ordinance requires dumpsters to be surrounded by a six-foot-tall wall on three sides and an obscuring wood gate on a steel frame on the fourth side, located on a six-inch concrete pad extending 10 feet in front of the gate, with six-inch concrete-filled steel bollards to protect the rear wall and gates. **The pad does not satisfy zoning ordinance standards. A six-foot concrete apron is proposed; therefore, a four-foot variance is required from the Zoning Board of Appeals. (Comment rescinded. The dumpster pad apron has been increased to 10 feet).** The zoning ordinance also states dumpsters and trash storage enclosures shall be constructed of the same decorative masonry materials as the buildings to which they are accessory. Brickform concrete (simulated brick pattern) or stained, decorative CMU block are not permitted where the principal building contains masonry. Plain CMU block is also prohibited. **The dumpster enclosure shall match the same masonry product as the facade of the restaurant building with a steel-backed wood gate painted a complementary color to the masonry product. (Comment remains as a notation. Note 11 on Sheet 3 reiterates the aforementioned requirement). A trash enclosure detail shall be provided showing compliance with the zoning ordinance and incorporation of the aforementioned design elements. (Comment addressed. Dumpster enclosure details have been provided on Sheet A.001). Furthermore, the dumpster enclosure should be reoriented southwest to be at a 45-degree angle with the drive aisle it is currently facing. (Comment addressed. The dumpster has been reoriented southwest to be at a 45-degree angle with the drive aisle).**

A trash collection plan shall be provided for the residential portion of the project. (Comment partially addressed. Trash rooms are now shown on the ground floor of the residential buildings on Sheets 3, A.100, and A.101. The Developer shall clarify if the intent is for a trash collection company to drive a trash truck through the site, stop at each building, enter the garages to collect trash from the trash rooms, and take the trash to the trash truck).

Parking

For multiple-family dwellings, the zoning ordinance requires two parking spaces for each dwelling unit plus ¼ of a space per bedroom for guest parking in common areas. With 50 **(now 46)** multiple-family dwelling units consisting of 100 **(now 92)** bedrooms, a total of 125 **(now 115)** spaces would be required for the project (100 **(now 92)** resident spaces and 25 **(now 23)** guest spaces). A total of 125 **(now 115)** spaces are proposed (74 **(now 71)** covered spaces and 51 **(now 44)** spaces not associated with individual units. **The most northerly parking space east of Building 1 and the two parking spaces between Buildings 1 and 2 shall be removed. (Comment partially addressed. The most northerly parking space east of Building 1 has been removed. However, the two parking spaces between Buildings 1 and 2 have not been removed. Staff recommends denial of the two aforementioned parking spaces due to access and circulation concerns).**

For restaurants (not fast-food (with or without alcohol)), the zoning ordinance requires one parking space per each 60 square feet of gross floor area. With 4,836 square feet, 81 parking spaces would be required to serve the restaurant. A total of 81 spaces are proposed.

The zoning ordinance requires each individual parking space be delineated by dual stripes, two feet apart centered on the dividing lines and painted white. The site plan shall be revised to indicate the required striping. (Comment outstanding. The site plan shall be revised to show the required box pattern). Additionally, a parking stall striping detail shall be provided for the barrier-free space and access aisle as well as the standard space. A "Van Accessible" sign detail for the barrier-free parking shall also be provided. (Comments addressed. The aforementioned details have been added to Sheet 3).

Boat docks are proposed on Pontiac Lake consisting of 26 **(now 30)** spaces. **The docks/spaces shown east of the parcel's lake frontage shall be removed. (Comment addressed. The docks/spaces have been shifted west so they are not in front of the adjacent parcel's lake frontage). The Planning Commission, and ultimately the Township Board, must decide if boat docks would be allowed as part of the site plan. If allowed, approval would also be required from the Michigan Department of Environment, Great Lakes, and Energy (EGLE). (Comments remain as a notation). Furthermore, if allowed, the Township should restrict dock usage west of the parcel to residents on the property. Only the docks (if allowed) in front of the restaurant should be utilized by the public. (Comments remain as a notation. The response letter provided to the first review by the Developer's architect states the Developer agrees the docks west of the parcel shall be restricted to resident use and the docks in front of the restaurant would be utilized by the public). A boat livery or boat marina shall be prohibited. (Comment remains as a notation. The response letter provided to the first review by the Developer's architect states it is noted a boat livery or boat marina is prohibited). Furthermore, the Developer may request the Zoning Board of Appeals make an interpretation allowing the number of required automobile parking spaces on the site to be reduced by one automobile parking space for every two boat parking spaces installed adjacent to the site, up to a maximum of 10 percent of the total number of required automobile parking spaces. Only the Zoning Board of Appeals has the authority to make the aforementioned interpretation. (Comment remains as a notation. A variance is requested to allow for a reduction of 15 parking spaces. 196 parking spaces are required to serve the site (115 residential spaces and 81 restaurant spaces) and 194 parking spaces are proposed).**

The existing wood boat dock at the west property line shall be removed (note on site plan). (Comment addressed. A note indicating removal has been added to Sheet 3).

Off-Street Loading Requirements

The zoning ordinance requires one loading space to serve the proposed restaurant. Such loading and unloading space must be an area 10 feet by 50 feet, with a 15-foot height clearance. **No loading space is proposed, so a variance is required from the Zoning Board of Appeals. (Comment rescinded. A loading space has been added for the restaurant. The response letter provided to the first review by the Developer's architect states the location of the loading space will not interrupt parking for the restaurant because loading/unloading operations will only occur during off-hours).**

Signs

The zoning ordinance requires the area, quantity, location, and dimensions of all signs to be provided with a preliminary site plan. The site plan shows the location of a monument sign within the future road right-of-way. **A permit from the RCOC and a variance from the Zoning Board of Appeals would be required to install a sign in the road right-of-way. (Comment rescinded. The sign is now located outside of the Pontiac Lake Road right-of-way). Placement of the monument sign should be revised to meet locational requirements of the zoning ordinance. (A variance for the sign location is still be required as the monument sign does not meet the minimum required setback from the road right-of-way). The aforementioned signage details shall also be provided. (Comment outstanding).**

Landscaping and Screening

Landscaping must comply with the provisions of the zoning ordinance and should be designed to preserve existing significant natural features and to buffer service areas, parking lots, and dumpsters. A mix of evergreen and deciduous plants and trees are preferred, along with seasonal accent plantings. A landscape plan ~~will be~~ **was** provided and **will be** reviewed in detail during final site plan if the preliminary site plan is approved. Following are initial comments relative to a landscape plan:

- **A 20-foot greenbelt with one large deciduous or evergreen tree and eight shrubs for every 30 linear feet is required for circulation drives, parking lots, and delivery/service areas adjacent to the Pontiac Lake Road right-of-way. An approximately 16-foot variance from the Zoning Board of Appeals is required based on the proposed parking setback. Furthermore, with lack of land area to maintain landscaping, the required greenbelt plant material likely cannot be provided, requiring an additional variance. (Comment rescinded. A variance is not required as circulation drives and parking stalls are now at least 20 feet from the Pontiac Lake Road right-of-way).**

- **A snow storage plan was not provided. Information on method of snow storage shall be provided at final site plan. (Comment remains as a notation. This requirement was acknowledged by the Developer's architect in the response letter provided to the first review). Winter maintenance of parking lot landscape islands (insufficient parking lot landscape islands for plant material – variance required from the Zoning Board of Appeals) shall be required where heavy applications of salt and de-icing products occur through the use of salt tarps which minimize soil absorption and ultimately reduce plant disorders. (Comment remains as a notation).**

- **Note on the site plan what would be done with the existing chain-link fence and existing wood fence (both are currently in poor condition). (Comment addressed. Sheet 3 indicates the existing fencing will be removed).**

Outdoor Lighting

Site lighting is required to comply with the zoning ordinance. Information on site lighting (photometric plan and lighting fixture specification sheets) must be provided at final site plan and will be reviewed in detail at that time. While the site plan shows locations of light poles and the elevations show wall-mounted sconce lighting, site lighting is only reviewed and approved via a photometric plan and required attachments. **All luminaries shall be removed from existing sheets in the plan set (architectural and engineered plans). (Comment partially addressed. All wall-mounted luminaries have been removed from the elevations (Sheets A.200 and A.201. The site plan still shows locations for light poles). Note the type of wall-mounted sconce lighting shown on the elevations is not permitted in the Township and would require a variance from the Zoning Board of Appeals to install. (Comment addressed. See previous comment).**

Planning Commission Options / Recommendation

The Planning Commission may recommend approval, approval with conditions, or denial of the preliminary site plan to the Township Board~~.~~**; action on the special land use is determined by the Planning Commission. Special land uses for building height are evaluated using the general standards for all special land uses listed in Section 6.10 of the zoning ordinance (attached). ~~Staff recommends the plans be revised and resubmitted to address the items identified in this memorandum. All site plan review submittals, following the initial PSP review, shall include a response letter detailing the changes made to the plan since the previous submittal. A list of any requested variances shall also be provided.~~ (Staff recommends once the TIA is submitted and reviewed the project is eligible for consideration by the Planning Commission. Any recommendation of approval of the PSP or approval of the special land use shall be conditioned on the Developer addressing all staff and consultant review comments and recommendations, and requesting/receiving the necessary variances from the Zoning Board of Appeals. Please note the number of variances proposed (21) is excessive. Noncompliance with zoning ordinance standards is being driven by the proposed density on a site of 2.68 net acres. It is unlikely the Zoning Board of Appeals will grant 21 variances. The Planning Commission should consider directing the Developer to revise their plans to eliminate the need for so many variances).**

Notes:

1. The site plan application shall be revised to list White Lake JZ, LLC as the property owner. (Comment addressed. The site plan application has been revised).

2. Notarized signatures of the applicant and property owner shall be provided on the site plan application. (Comment rescinded. See following comment).

3. Evidence, satisfactory to the Township Attorney, that the signatories on the application are authorized to execute on behalf of the applicant and property and owner shall be provided (company/corporate resolution). (Comment outstanding).

4. The note in the title block on the architectural plans regarding scale drawings and dimensions shall be removed. The zoning ordinance requires plans be to scale. Revise accordingly. (Comment outstanding. Contrary to the Architect's response letter to the first review indicating this item has been addressed, the architectural plans still contain the aforementioned note).

a special land use within that particular zoning district, a site plan shall be submitted consistent with the requirements of Section 6.8 – Site Plan Review and Approval, as well as Section 6.10 and 6.11 – Procedures and Standards for Approval of Special Land Uses.

b. Identify any functional deficiencies of the existing site and/or structure, including (but not necessarily limited to):

(1) Parking lot layout, design, and construction

(2) Access (driveway) location and design

(3) Exterior lighting (location, height, prevention of glare)

(4) Signage (design, dimension, method of illumination, and/or location)

(5) Barrier-free accessibility

(6) Stormwater drainage

(7) Connection to municipal utilities (water and sewer)

(8) Wetlands delineation and protection

(9) Non-motorized access (sidewalks and/or pathways)

ii. Should the Director of the Community Development Department determine that the existing structure and/or property requires improvements in order to bring it into reasonable compliance with the standards of the Zoning Ordinance, those improvements shall be completed prior to issuance by the Building Official of a Change of Use Permit.

L. "As-built" engineering plans shall be provided to the Township following construction of the approved site plan.

6.9 PROVISION OF SEWER AND WATER SERVICE

The Township, in approval of a site plan, may condition approval on the applicant making provisions for water, sanitary sewer, and storm sewer facilities in accordance with this section. The Township may, at its option, condition Site Plan approval on the applicant providing one or more of the following documents and/or guarantees:

A. A requirement to connect the subject property to the Township's water or sanitary sewer system if the system abuts the subject property or is extended to the subject property.

B. Advance approval of a special assessment district for water and sewer services, including, if necessary, requiring the following:

i. Appointment of an individual or association to bind the property to participation in a special assessment district;

ii. Execution of any required petitions or other documents;

iii. Participation in the district;

iv. Prohibition against a challenge to the district; and

v. Payment of the special assessments as provided in the roll to be confirmed, subject to any appeal of the amount of the assessment(s) allowed by law.

C. If the Township Board conditions approval upon one or more of the items set forth in this section, the applicant shall execute documentation, in form satisfactory to the Township attorney, to effectuate these conditions.

6.10 GENERAL STANDARDS FOR ALL SPECIAL LAND USES

A. General Requirements. For all special land uses, a site plan shall be submitted to the White Lake Township Planning Commission and conform to the Requirements and Procedures for Site Plan Review set forth in Section 6.8. If the plans meet the required standards of this Ordinance, Article and applicable sections and indicate no adverse effects which, in the opinion of the approval authority, cause injury to the residents, users or adjoining property, or the Township as a whole, the Planning Commission shall approve the use. The power to approve or disapprove all special land uses shall be vested with the Planning Commission as provided by State Law and this Ordinance. In consideration of all applications for special land use approval, the Planning Commission shall review each

case individually as to its applicability and must find affirmatively to each of the following standards of the proposed special land use if it is to be approved. Such uses shall be subject to conditions, restrictions and safeguards deemed necessary within the scope of the law as set forth below.

i. The proposed special land use shall be of such location, size and character that it will be in harmony with the appropriate and orderly development of the surrounding neighborhood and/ or vicinity and applicable regulations of the zoning district in which it is to be located.

ii. The proposed use shall be of a nature that will make vehicular and pedestrian traffic no more hazardous than is normal for the district involved, taking into consideration vehicular turning movements in relation to routes of traffic flow, proximity and relation to intersections, adequacy of sight distances, location and access of off-street parking and provisions for pedestrian traffic, with particular attention to minimizing child-vehicle interfacing.

iii. The proposed use shall be designed as to the location, size, intensity, site layout and periods of operation of any such proposed use to eliminate any possible nuisance emanating therefrom which might be noxious to the occupants of any other nearby permitted uses, whether by reason of dust, noise, fumes, vibration, smoke or lights.

iv. The proposed use shall be such that the proposed location and height of buildings or structures and location, nature and height of walls, fences and landscaping will not interfere with or discourage the appropriate development and use of adjacent land and buildings or unreasonably affect their value.

v. The proposed use shall relate harmoniously with the physical and economic aspects of adjacent land uses as regards prevailing shopping habits, convenience of access by prospective patrons, continuity of development, and need for particular services and facilities in specific areas of the Township.

vi. The standards of density and required open spaces for the proposed special land use shall be at least equal to those required by this Ordinance in the Zoning District in which the proposed special land use is to be located.

vii. The public services and facilities affected by a proposed special land use or activity shall be capable of accommodating increased service and facility loads caused by the land use or activity.

viii. Protection of the natural environment and conservation of natural resources and energy.

ix. The proposed use is necessary for the public convenience at the proposed location.

x. The proposed use is so designed, located, planned and to be operated that the public health, safety and welfare will be protected.

xi. The proposed use shall not cause substantial injury to the value of other property in the neighborhood in which it is to be located and will not be detrimental to existing and/or other permitted land uses in the zoning district.

6.11 PROCEDURES FOR REVIEW AND APPROVAL OF SPECIAL LAND USES

A. Approval. If the Planning Commission determines that the particular special land use(s) should be allowed, it shall endorse its approval thereof on the written application and clearly set forth in a special land use permit the particular use(s) which have been allowed and applicable conditions. Thereafter, the enforcing officer may issue a building permit in conformity with the particular special land use so approved. In all cases where a particular special land use has been granted as

provided herein, application for a building permit in pursuance thereof must be made and received by the Township not later than one (1) year thereafter, or such approval shall automatically be revoked, provided, however, the Planning Commission or Township Board may grant an extension thereof for good cause shown under such terms and conditions and for such period of time not exceeding one (1) year as it shall determine to be necessary and appropriate. If granted concurrently, the duration of final site plan approval and special land use approval shall be the same.

B. Denial. If the Planning Commission determines that the particular special land use(s)

requested does not meet the standards of this Ordinance or otherwise will tend to be injurious to the public health, safety, welfare or orderly development of the Township, it shall deny the application by a written endorsement thereon which clearly sets forth the reason for such denial.

C. Record. The decision on a special land use shall be incorporated in a statement of findings and conclusions relative to the special land use under consideration. The decision shall specify the basis for the decision, and any conditions imposed.

D. Hearings. The Planning Commission shall investigate the circumstances of each such case and give notice of the time and place of any hearing, meeting or review which may be held relative thereto as required by State Law and/or its rules of procedure.

E. Conditions.

The Planning Commission may impose such conditions or limitations in granting approval as may be permitted by State Law and this Ordinance which it deems necessary to fulfill the spirit and purpose of this Ordinance. The conditions may include, conditions necessary to insure that public services and facilities affected by a proposed land use or activity will be capable of accommodating increased service and facility loads caused by the land use or activity, to protect the natural environment and conserve natural resources and energy, to insure compatibility with adjacent uses of land, and to promote the use of land in a socially and economically desirable manner. Conditions imposed shall do all the following:

i. Be designed to protect natural resources, the health, safety, and welfare, as well as the social and economic well-being of those who will use the land use or activity under consideration, residents and landowners immediately adjacent to the proposed land use or activity, and the community as a whole.

ii. Be related to the valid exercise of the police power and purposes which are affected by the proposed use or activity.

iii. Be necessary to meet the intent and purpose of the zoning regulations; be related to the standards established in this Ordinance for the land use or activity under consideration; and be necessary to insure compliance with those standards.

The conditions imposed with respect to the approval of a land use or activity shall be recorded in the record of the approval action and shall remain unchanged except upon the mutual consent of the approving authority and the landowner. The Planning Commission shall maintain a record of changes granted in conditions.

Fire Department
Charter Township
of White Lake

Site / Construction Plan Review

To: Sean O'Neil, Planning Department Director

Date: 06/01/23

Project: Sunset Cove

File #: N/A

Date on Plans: 05/24/23

The Fire Department has the following comments with regard to the second review of preliminary plans for the project known as Sunset Cove:

1. **Access drive.**
   Where the vertical distance between the grade plane and the highest roof surface exceeds 30 feet, approved aerial fire apparatus access roads shall be provided. For the purpose of this section, the highest roof surface shall be determined by measurement to the eave of a pitched roof, the intersection of the roof to the exterior wall, or the top of parapet walls, whichever is greater.
   a. Access drive minimum, unobstructed width requirement = **26', exclusive of shoulders, in the immediate vicinity of the building or portion thereof. Comment Addressed**
   b. Access drive proximity to the buildings - At least one of the required access routes meeting this condition shall be located within a minimum of 15 feet and a maximum of 30 feet from the buildings, **and shall be positioned parallel to one entire side of each building**. The side of the building on which the aerial fire apparatus access road is positioned shall be approved by the fire code official.
   c. All turn radiuses shall accommodate aerial apparatus **(50')**. Provide a turn radius profile on future submittals showing apparatus movement.
   d. The angle of approach and departure shall not exceed 8 degrees. **Notation shown on the Plan**

2. **Hydrants.**
   a. **Relocate the hydrant positioned near the restaurant, to the area west of the dumpster enclosure (impact protection to be provided).**
   b. Hydrant spacing shall not exceed 300'.

3. **Construction / life safety courtesy comment.**
   a. Suppression, alarm, FDC, Standpipe, Flow Indication, and Knox box requirements will be addressed during the construction plan review phase.

John Holland
Fire Chief
jholland@whitelaketwp.com
Plans are reviewed using the International Fire Code (IFC), 2015 Edition and Referenced NFPA Standards.

Sunset Cove Condominiums

8300 Pontiac Lake Road
White Lake Township, MI 48386

Owner

White Lake JZ, LLC
30201 Orchard Lake Road, Suite 250
Farmington Hills, MI 48334
P.248.892.3444

Architect

Krieger | Klatt Architects Inc.
2120 E. 11 Mile Rd.
Royal Oak, MI 48067
P.248.414.9270
F.248.414.9275

Civil Engineer

Seiber Keast Lehner, Inc
39205 Country Club Dr., Suite C8
Farmington Hills, MI 48331
P.248.308.3331

General Scope of Work:

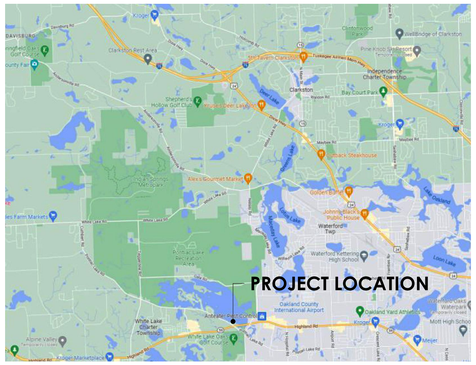
1. Redevelopment of an existing site; new parking lot and new paths for vehicular and pedestrian
2. Constrction of (3) new residential buildings with enclosed parking on first floor. (46) total units.
3. Construction of new restaurant.

Sheet Index:

G.001	Cover Sheet
1.	Civil Cover Sheet
2.	Topographic Survey Plan
3.	Overall Site Plan
4.	Grading Site Plan
5.	Fire Truck Route
6.	Soil Borings Logs
7.	Soil Borings Logs
L-1	Overall Landscape Plan
L-2	Landscape Enlargement Plans
L-3	Landscape Details
1 of 2	Photometric Plan
2 of 2	Lighting specifications
C.100	Architectural Site Plan
A.001	Site Details
A.100	Floor Plans
A.101	Floor Plans
A.200	Building Elevations - Typ.
A.201	Building Elevations - Typ.

View from Pontiac Lake

View from Pontiac Lake



North
Location Map
NTS

North
Site Location
NTS

KRIEGER KLATT ARCHITECTS
2120 E. 11 Mile Rd. | Royal Oak, MI 48067
P: 248.414.9270 F: 248.414.9275
www.kriegerklatt.com

Client:
White Lake JZ, LLC
30201 Orchard Lake Road, Suite 250
Farmington Hills, MI 48334

Project:
Sunset Cove Condominiums
8300 Pontiac Lake Road
White Lake Township, MI 48386

PRELIMINARY NOT FOR CONSTRUCTION

Issued	Description	By
2023-03-31	Discussion Item	RP
2023-05-25	SPA/ZBA	

Seal:
STATE OF MICHIGAN JASON P. KRIEGER ARCHITECT No. 53578 LICENSED ARCHITECT

Note:
Do not scale drawings. Use calculated dimensions only. Verify existing conditions in field.

North Arrow:

Sheet Title:
Cover Sheet

Project Number:
22-096

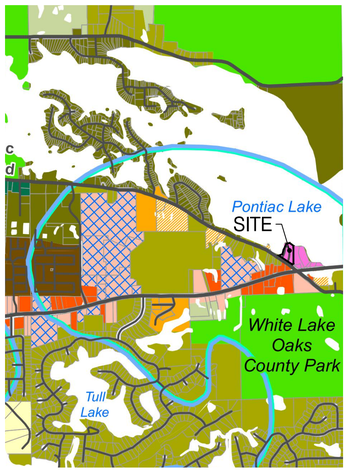
Sheet Number:
G.001

PRELIMINARY SITE PLAN FOR

SUNSET COVE CONDOMINIUMS

PART OF THE WEST 1/2 OF THE SOUTHEAST 1/4
OF SECTION 13, T 3 NORTH , R 8 EAST,
WHITE LAKE TOWNSHIP, OAKLAND COUNTY, MICHIGAN
PARCEL # 12-13-451-011
8300 PONTIAC LAKE ROAD, WHITE LAKE TWP., MI 48386

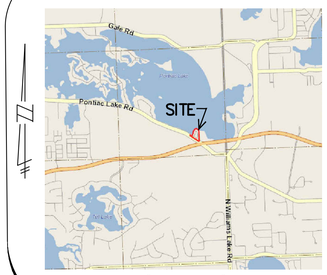
APPLICANT:
WHITE LAKE JZ, LLC
MICHAEL ZEER
30201 ORCHARD LAKE ROAD, SUITE 250
FARMINGTON HILLS, MI 48334
CELL: 248-892-3444
mikezeer@aol.com



AG AGRICULTURAL
SF SUBURBAN FARM
R1-A SINGLE FAMILY RESIDENTIAL
R1-B SINGLE FAMILY RESIDENTIAL
R1-C SINGLE FAMILY RESIDENTIAL
R1-D SINGLE FAMILY RESIDENTIAL
RM-1 ATTACHED SINGLE FAMILY RESIDENTIAL
RM-2 MULTIPLE FAMILY RESIDENTIAL
MHP MOBILE HOME PARK
LB LOCAL BUSINESS
GB GENERAL BUSINESS
NB-O NEIGHBORHOOD OFFICE
RB RESTRICTED BUSINESS
PB PLANNED BUSINESS
ROS RECREATION & OPEN SPACE
LM LIGHT MANUFACTURING
PD PLANNED DEVELOPMENT
ROP RESEARCH OFFICE PARK
PG PONTIAC GATEWAY
NMU NEIGHBORHOOD MIXED USE
TC TOWN CENTER
WELLHEAD PROTECTION AREAS

Zoning Map

White Lake Township
Oakland County, Michigan



"NOT TO SCALE"
LOCATION MAP

SHEET INDEX-SITE CIVIL

1. COVER SHEET
2. TOPOGRAPHIC SURVEY PLAN
3. OVERALL PLAN
4. GRADING PLAN
5. FIRE TRUCK AUTO TURN
6. SOIL BORING LOGS
7. SOIL BORING LOGS

SCALE
100 0 50 100 200 400
(IN FEET)
Scale: 1 inch = 100 ft.

SEIBER KEAST LEHNER
ENGINEERING | SURVEYING
CLINTON TOWNSHIP OFFICE
17001 NINETEEN MILE ROAD, SUITE 3
CLINTON TOWNSHIP, MI 48038
586.412.7050
FARMINGTON HILLS OFFICE
39205 COUNTRY CLUB DRIVE, SUITE C8
FARMINGTON HILLS, MI 48331
248.308.3331

ENGINEER'S SEAL

STATE OF MICHIGAN
JASON M. EMERINE
NO. 6201054218
LICENSED PROFESSIONAL ENGINEER

DATE: 11-15-2022 | DESIGNED BY: A.A. | JOB NUMBER: 21-306
CHECKED BY: J.E. | DRAWING FILE: 1-21306-CV

REVISIONS

NO.	ITEM	DATE
1.	REV. PER TWP. REVIEW	1-5-23
2.	REV. BLDG. 3 AND PARKING PER OWNER	1-19-23
3.	REV. PER TWP. REVIEW	5-3-23
4.	REV. BUILDINGS PER ARCHITECT	5-24-23

COVER SHEET

SEIBER KEAST LEHNER
ENGINEERING | SURVEYING
CLINTON TOWNSHIP OFFICE
17001 NINETEEN MILE ROAD, SUITE 3
CLINTON TOWNSHIP, MI 48038
586.412.7050
FARMINGTON HILLS OFFICE
39205 COUNTRY CLUB DRIVE, SUITE C8
FARMINGTON HILLS, MI 48331
248.308.3331

SHEET 1

LEGEND

- OVERHEAD UTILITY LINES
- EXISTING DITCH
- EXISTING FENCE
- EXISTING SANITARY MANHOLE OR CLEANOUT
- EXISTING STORM SQ. CATCH BASIN
- EXISTING STORM ROUND CATCH BASIN
- EXISTING STORM MANHOLE
- EXISTING FIRE HYDRANT
- EXISTING VALVE IN WELL
- EXISTING TELEPHONE RISER
- EXISTING CABLE RISER
- EXISTING ELEC. TRANSFORMER
- EXISTING ELECTRICAL METER
- GAS METER
- WATER SHUT OFF
- LIGHT POLE
- UTILITY POLE
- GUY WIRE
- P.I. SIGN
- SECTION CORNER
- F.I. FOUND IRON
- S.I. SET IRON
- (M) MEASURED
- (R) RECORD

BENCHMARKS:
SITE BENCHMARK NO. 1
ARROW ON HYDRANT
LOCATED NORTH SIDE OF PONTIAC LAKE ROAD
ELEVATION=969.06 (NAVD88)

SITE BENCHMARK NO. 2
ARROW ON HYDRANT
LOCATED NORTH SIDE OF PONTIAC LAKE ROAD
ELEVATION=968.85 (NAVD88)

FLOOD ZONE CLASSIFICATION:
MAP No.: 26125C0337F
DATED: SEPTEMBER 29, 2006
COMMUNITY PANEL NO.: 260479 0337 F

THIS SITE IS ZONE "X", AREA TO BE DETERMINED TO BE OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOODPLAIN.

LEGAL DESCRIPTION – SIDWELL NO. 12-13-451-011:*
(PER TITLE POLICY NO. F-2533329-Q LT)
A PARCEL OF LAND BEING PART OF THE WEST 1/2 OF THE SOUTHEAST 1/4 OF SECTION 13, T.3N., R.8E., WHITE LAKE TOWNSHIP, OAKLAND COUNTY, MICHIGAN BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT DISTANT EAST, 1332.48 FEET AND NORTH 696.34 FEET FROM THE SOUTH 1/4 CORNER OF SAID SECTION 13, T.3N., R.8E., THENCE NORTH 56 DEGREES 12 MINUTES 00 SECONDS WEST ALONG THE CENTER OF PONTIAC LAKE ROAD, 509.45 FEET; THENCE NORTH 100.12 FEET TO THE SHORE OF PONTIAC LAKE; THENCE EASTERLY, NORTHERLY AND EASTERLY ALONG THE SHORELINE OF SAID PONTIAC LAKE, 920 FEET MORE OR LESS TO THE NORTH AND SOUTH 1/8 LINE; THENCE SOUTH ALONG SAID 1/8 LINE, 606.10 FEET TO THE POINT OF BEGINNING OF THE PARCEL HEREIN DESCRIBED.

* LEGAL DESCRIPTION PROVIDED BY "DAVID P. SMITH & ASSOCIATES" SURVEY DATED: 3/11/08; NO BOUNDARY SURVEY HAS BEEN REQUESTED OR PERFORMED BY SEIBER KEAST LEHNER, INC.

VICINITY MAP

SUNSET COVE CONDOMINIUMS

PART OF THE WEST 1/2 OF THE SOUTHEAST 1/4 OF SECTION 13, TOWN 3 NORTH, RANGE 8 EAST WHITE LAKE TWP., OAKLAND COUNTY, MICHIGAN

DATE: 11-15-22	DESIGNED BY: A.A.	JOB NUMBER: 21-306
	CHECKED BY: J.E.	DRAWING FILE: 2-21306-TOPO

REVISIONS

NO.	ITEM	DATE

TOPOGRAPHIC SURVEY

SEIBER KEAST LEHNER ENGINEERING | SURVEYING

CLINTON TOWNSHIP OFFICE
17001 NINETEEN MILE ROAD, SUITE 3
CLINTON TOWNSHIP, MI 48038
586.412.7060

FARMINGTON HILLS OFFICE
39205 COUNTRY CLUB DRIVE, SUITE C8
FARMINGTON HILLS, MI 48331
248.308.3331

SHEET 2

SITE DATA:

PARCEL ADDRESS: 8300 PONTIAC LAKE RD., WHITE LAKE TWP., MI 48386
PARCEL IDENTIFICATION #: 12-13-451-011

GROSS AREA OF SITE: 3.31 AC.
60' WD. R.O.W. AREA: 0.63 AC.
NET AREA OF SITE: 2.68 AC.
MAX. LOT COVERAGE ALLOWED: N/A

EXISTING ZONING: PG - PONTIAC GATEWAY
ADJACENT ZONING:
NORTH: NO ZONING (PONTIAC LAKE)
SOUTH R1-C SINGLE FAMILY RESIDENTIAL AND GB GENERAL BUSINESS
EAST: PG - PONTIAC GATEWAY
WEST: NO ZONING (PONTIAC LAKE)

MAX. BUILDING HEIGHT ALLOWED: 70 FT.
BUILDING HEIGHT PROPOSED: 5 STORIES 67.81 FT. +/-

SETBACK INFORMATION:
PONTIAC LAKE SETBACK:
REQUIRED RESIDENTIAL BUILDINGS = 47.8'
PROVIDED SETBACK (BLDG. 1) = 30.54' & 16.14'
PROVIDED SETBACK (BLDG. 2) = 23.16' & 24.58'
REQUIRED RESTAURANT SETBACK = 30.0'
PROVIDED SETBACK = 19.54'
REQUIRED SETBACK BETWEEN BLDGS 1 AND 2 = 45.5'
PROVIDED SETBACK = 32.9'
REQUIRED SETBACK BETWEEN BLDG. 1 AND RESTAURANT = 35.0'
PROVIDED SETBACK = 29.5'

UNITS SCHEDULE:
BUILDING 1: 20 (2 BEDROOM UNITS) --- 40 BEDROOMS
2 (3 BEDROOM UNITS) --- 6 BEDROOMS
BUILDING 2: 20 (2 BEDROOM UNITS) --- 40 BEDROOMS
2 (3 BEDROOM UNITS) --- 6 BEDROOMS
TOTAL NUMBER OF BEDROOMS PROVIDED: 92 BEDROOMS
TOTAL NUMBER OF UNITS PROVIDED: 44 UNITS

PARKING REQUIREMENT / PROVIDED:

MULTI-FAMILY
PARKING SPACES REQUIRED: 2 SPACES PER UNIT PLUS 1/4 SPACE PER BEDROOM
2 x 44 UNITS = 88 SPACES
1/4 x 92 BEDROOMS = 23 SPACES
PARKING SPACES REQUIRED = 111 SPACES

RESTAURANT:
GROSS AREA: 4,835.4 S.F.
PARKING SPACES REQUIRED: 1 SPACE PER 60 S.F. OF GROSS AREA
4,835.4 / 60 = 81 SPACES

TOTAL PARKING REQUIRED:
MULTI-FAMILY = 111 SPACES
RESTAURANT = 81 SPACES
TOTAL PARKING REQUIRED = 192 SPACES

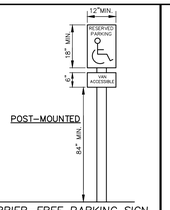
TOTAL PARKING SPACES PROVIDED INCLUDING ONE SPACE FOR SANITARY PUMP STATION:
ENCLOSED PARKING SPACES = 52 SPACES
OFF-STREET PARKING SPACES = 144 SPACES
TOTAL PARKING PROVIDED = 196 SPACES

BARRIER-FREE RESERVED PARKING SIGNS

NOTE: ACCESSIBLE PARKING SPACE SIGNS SHALL HAVE A MIN. HEIGHT AND SIZE TO PERMIT THE SPACE TO BE EASILY IDENTIFIED AND ARE ELEVATED SUCH THAT THEY SHALL NOT PRESENT A HAZARD TO PERSONS WALKING NEAR THE SIGN.

SIGNING NOTES

1. ALL SIGNS SHALL HAVE A MINIMUM BOTTOM MOUNTING HEIGHT OF 7' FROM FINAL GRADE FOR GROUND MOUNTED SIGNS. WALL MOUNTED SIGNS MAY HAVE A BOTTOM MOUNTING HEIGHT OF 5'.
2. ALL ROADSIDE SIGNS SHOULD BE INSTALLED TWO FEET FROM THE FACE OF THE CURB TO THE NEAR EDGE OF THE SIGN.
3. SINGLE SIGNS WITH NOMINAL DIMENSIONS OF 12"x18" OR SMALLER IN SIZE SHALL BE MOUNTED ON A GALVANIZED 2 LB. U-CHANNEL POST. MULTIPLE SIGNS AND/OR SIGNS WITH NOMINAL DIMENSIONS GREATER THAN 12"x18" SHALL BE MOUNTED ON A GALVANIZED 3 LB. OR GREATER U-CHANNEL POST AS DICTATED BY THE WEIGHT OF THE PROPOSED SIGNS.
4. TRAFFIC CONTROL SIGNS SHALL USE THE FHWA STANDARD ALPHABET SERIES.
5. TRAFFIC CONTROL SIGNS SHALL HAVE A HIGH INTENSITY PRISMATIC (HIP) SHEETING TO MEET FHWA RETROREFLECTIVITY REQUIREMENTS.



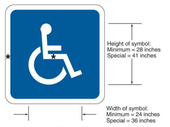
POST-MOUNTED

BARRIER-FREE PARKING SIGN

STRIPING NOTES:

1. PARKING LOTS SHALL HAVE PARKING AREAS AND RAMP PAVEMENT MARKINGS MARKED BY PAINTED 4-INCH WIDE LINES ACCURATELY AND NEATLY ARRANGED AS INDICATED ON THE PLAN. LINES SHALL BE PAINTED WITH AN APPROVED WHITE TRAFFIC PAINT COMPATIBLE WITH BITUMINOUS/CONCRETE SURFACES SUCH AS SHERWIN WILLIAMS NO. B2 9W1; PPG TYPE 11-3 OR 11-4, OR AS APPROVED BY THE OWNER. PROTECT ALL PAINTED AREAS UNTIL PAINT IS COMPLETELY DRY. PARKING AREAS FOR THE PHYSICALLY HANDICAPPED SHALL BE PAINTED WITH BLUE PAINT FOR STRIPING, WHEEL CHAIR SYMBOL SHALL BE PAINTED WHITE. ALL PAINTED MARKINGS AND STRIPING SHALL BE PROVIDED IN TWO COATS.
2. THE INTERNATIONAL SYMBOL FOR ACCESSIBILITY SHALL BE WHITE OR WHITE WITH BLUE BACKGROUND.
3. WHEN A BARRIER FREE PARKING SPACE IS ADJACENT TO A STANDARD PARKING SPACE, BLUE AND WHITE LINES ABUTTING EACH OTHER SHALL BE PROVIDED.

Figure 3B-22. International Symbol of Accessibility Parking Space Marking



R1-1 30"x30" (STOP) SIGN

SCALE

30 0 15 30 60 120
(IN FEET)
Scale: 1 inch = 30 ft.

LOT COVERAGE:

GROSS AREA OF SITE = 3.31 Ac.
BUILDING AREA = 0.72 Ac.
PROPOSED LOT COVERAGE = 0.72 / 3.31 = 21.7%

SIGN QUANTITIES

SYMBOL	DESCRIPTION	QUANTITY PANEL	QUANTITY POST
	R1-1 30"x30" (STOP) SIGN	2	2
	R7-8 12"x8" BARRIER FREE HANDICAP SIGN	2	2
	R7-8P 12"x6" (VAN ACCESSIBLE) SIGN	2	0

PROPOSED IMPROVEMENTS:

1. MUNICIPAL SEWER TO BE PROVIDED BY CONSTRUCTING ON SITE GRAVITY SANITARY SEWER SYSTEM AND ON-SITE PUMP STATION AND FORCE MAIN. THE PROPOSED FORCE MAIN WILL CONNECT TO AN EXISTING 3" DIAMETER FORCE MAIN LOCATED IN PONTIAC LAKE ROAD.
2. WATER SUPPLY TO BE PROVIDED BY CONNECTING TO AN EXIST. 12" WATERMAIN ALONG PONTIAC LAKE ROAD. PROPOSED WATERMAINS SHALL BE 8" AS SHOWN.
3. ON-SITE STORM WATER SYSTEM WILL FLOW TO A SEDIMENT STRUCTURE THEN DISCHARGE TO PONTIAC LAKE. STORM WATER DETENTION TO BE PROVIDED BY BY PONTIAC LAKE.
4. AN 8' WIDE CONC. SIDEWALK TO BE CONSTRUCTED ALONG THE NORTH R.O.W. OF PONTIAC LAKE ROAD AS SHOWN. SEE PAVEMENT CROSS SECTION AND CURB DETAILS ON SHEET 4.
5. ALL ELECTRIC, CABLE TV & PHONE LINES SHALL BE LOCATED UNDERGROUND AND SHALL BE PLACED WITHIN EASEMENTS DEDICATED FOR SUCH USE.

NOTES:

1. ON-SITE SANITARY SEWER, SANITARY FORCE MAINS, AND WATER MAINS SHALL BE CENTERED IN A 20-FOOT WD. EASEMENT.
2. ALL FORCE MAIN, PUMP STATION AND WATER MAIN IMPROVEMENTS WILL BECOME PUBLIC PROPERTY.
3. PROVISIONS PURSUANT TO OAKLAND COUNTY WATER RESOURCE COMMISSION AND SOIL EROSION CONTROL MANUAL WILL BE UNDERTAKEN INCLUDING, BUT NOT LIMITED TO, SILT FENCE AND INLET FILTERS.
4. PROPOSED GRADES WILL MATCH EXISTING ELEVATIONS AT THE PROPERTY LINES UNLESS RETAINING WALLS ARE PROVIDED OR GRADING EASEMENTS OBTAINED.
5. A PERMIT FROM THE ROAD COMMISSION FOR OAKLAND COUNTY WILL BE REQUIRED FOR ALL WORK IN THE PONTIAC LAKE ROAD RIGHT-OF-WAY.
6. ALL WATER MAIN SHALL BE CLASS 54 DUCTILE IRON & ALL GATE VALVES SHALL BE PLACED IN GATE WELLS.
7. ALL STORM STRUCTURES EXCEPT FOR INLETS WHICH CONNECT TO CATCH BASINS WILL BE A MINIMUM OF 4 FEET IN DIAMETER.
8. THE DEVELOPMENT SHALL BE CONSTRUCTED AS A SINGLE PHASE.
9. ALL EXISTING UTILITIES ON THE PROPERTY WILL BE REMOVED, INCLUDING SANITARY SEWER AND STORM SEWER.
10. ALL EXISTING WELLS ON SITE WILL BE ABANDONED IN ACCORDANCE WITH OAKLAND COUNTY HEALTH DEPARTMENT REQUIREMENTS.
11. THE DUMPSTER ENCLOSURE SHALL MATCH THE SAME MASONRY PRODUCT AS THE RESTAURANT BUILDING WITH A STEEL-BACKED WOOD GATE PAINTED WITH A COMPLIMENTARY COLOR TO THE MASONRY PRODUCT.
12. THE ANGLE OF APPROACH AND DEPARTURE SHALL NOT EXCEED 8 DEGREES.
13. REMOVE OR RELOCATE FIXED OBJECTS LOCATED WITHIN THE R.C.O.C. RIGHT-OF-WAY PRIOR TO EXCAVATION. FIXED OBJECTS SHALL BE NO NEARER THAN 5' FROM BACK OF CURB, OR 12' FROM LANE LINE.
14. HYDRANTS SPACING SHALL NOT EXCEED 300 FEET.

LEGEND

EXISTING	PROPOSED	
		PAVEMENT (ASPHALT)
		SIDE WALK (CONCRETE)
		CONCRETE CURB AND GUTTER
		STORM SEWER
		SANITARY FORCE MAIN
		SANITARY GRAVITY MAIN
		WATER MAIN
○	●	MANHOLE
□	■	CATCH BASIN
◁	◀	END SECTION
⊗		GATE VALVE
		HYDRANT
1000	1000	CONTOURS
+ 1000.0	1000.00 T/C	SPOT ELEVATION
		DIRECTIONAL ARROWS
		SURFACE DRAINAGE

SUNSET COVE CONDOMINIUMS

PART OF THE WEST 1/2 OF THE SOUTHEAST 1/4 OF SECTION 13, TOWN 3 NORTH, RANGE 8 EAST WHITE LAKE TWP., OAKLAND COUNTY, MICHIGAN

DATE: 11-15-22 | DESIGNED BY: A.A. | JOB NUMBER: 21-306 | CHECKED BY: J.E. | DRAWING FILE: 3-21306-OA

REVISIONS

NO.	ITEM	DATE
1.	REV. PER TWP. REVIEW	1-5-23
2.	REV. BLDG. 3 AND PARKING PER OWNER	1-19-23
3.	REV. PER TWP. REVIEW	5-3-23
4.	REV. BUILDINGS PER ARCHITECT	5-24-23

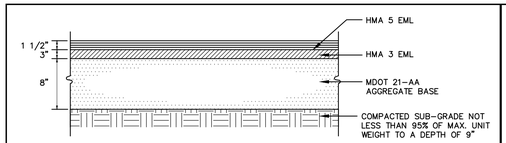
OVERALL PLAN

PARKING SPACES STRIPING REQUIREMENTS

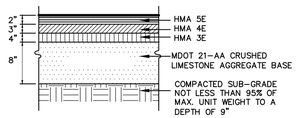
BARRIER-FREE PARKING SPACE LAYOUT VAN ACCESSIBLE

SEIBER KEAST LEHNER ENGINEERING | SURVEYING
CLINTON TOWNSHIP OFFICE
17001 NINETEEN MILE ROAD, SUITE 3
CLINTON TOWNSHIP, MI 48035
586.412.7060
FARMINGTON HILLS OFFICE
39205 COUNTRY CLUB DRIVE, SUITE C8
FARMINGTON HILLS, MI 48331
248.308.3331

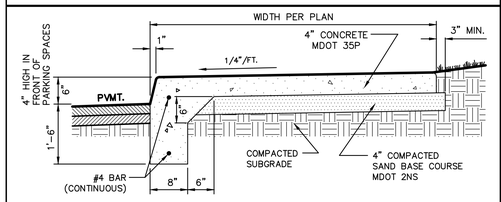
SHEET 3



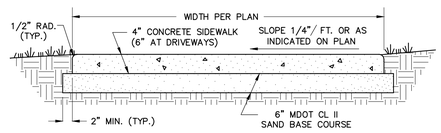
TYPICAL ASPHALT CROSS-SECTION FOR INTERIOR PAVING



TYPICAL ASPHALT CROSS-SECTION WITHIN PONTIAC LAKE ROAD R.O.W. (RCOC) PAVING



THICKENED EDGE SIDEWALK DETAIL



CONCRETE SIDEWALK DETAIL

8" THICK CONCRETE DUMPSTER PAD DETAIL

M.D.O.T. B-2 ROLL CURB WITH GUTTER

STRAIGHT FACE CONCRETE CURB AND GUTTER

LEGEND

EXISTING	PROPOSED	
		PAVEMENT (ASPHALT)
		SIDE WALK (CONCRETE)
		CONCRETE CURB AND GUTTER
		STORM SEWER
		SANITARY FORCE MAIN
		SANITARY GRAVITY MAIN
		WATER MAIN
		MANHOLE
		CATCH BASIN
		END SECTION
		GATE VALVE
		HYDRANT
1000	1000	CONTOURS
+ 1000.0	1000.00 T/C	SPOT ELEVATION
		DIRECTIONAL ARROWS
		SURFACE DRAINAGE

SUNSET COVE CONDOMINIUMS

PART OF THE WEST 1/2 OF THE SOUTHEAST 1/4 OF SECTION 13, TOWN 3 NORTH, RANGE 8 EAST WHITE LAKE TWP., OAKLAND COUNTY, MICHIGAN

DATE: 11-15-22	DESIGNED BY: A.A.	JOB NUMBER: 21-306
	CHECKED BY: J.E.	DRAWING FILE: 4-21306-GR

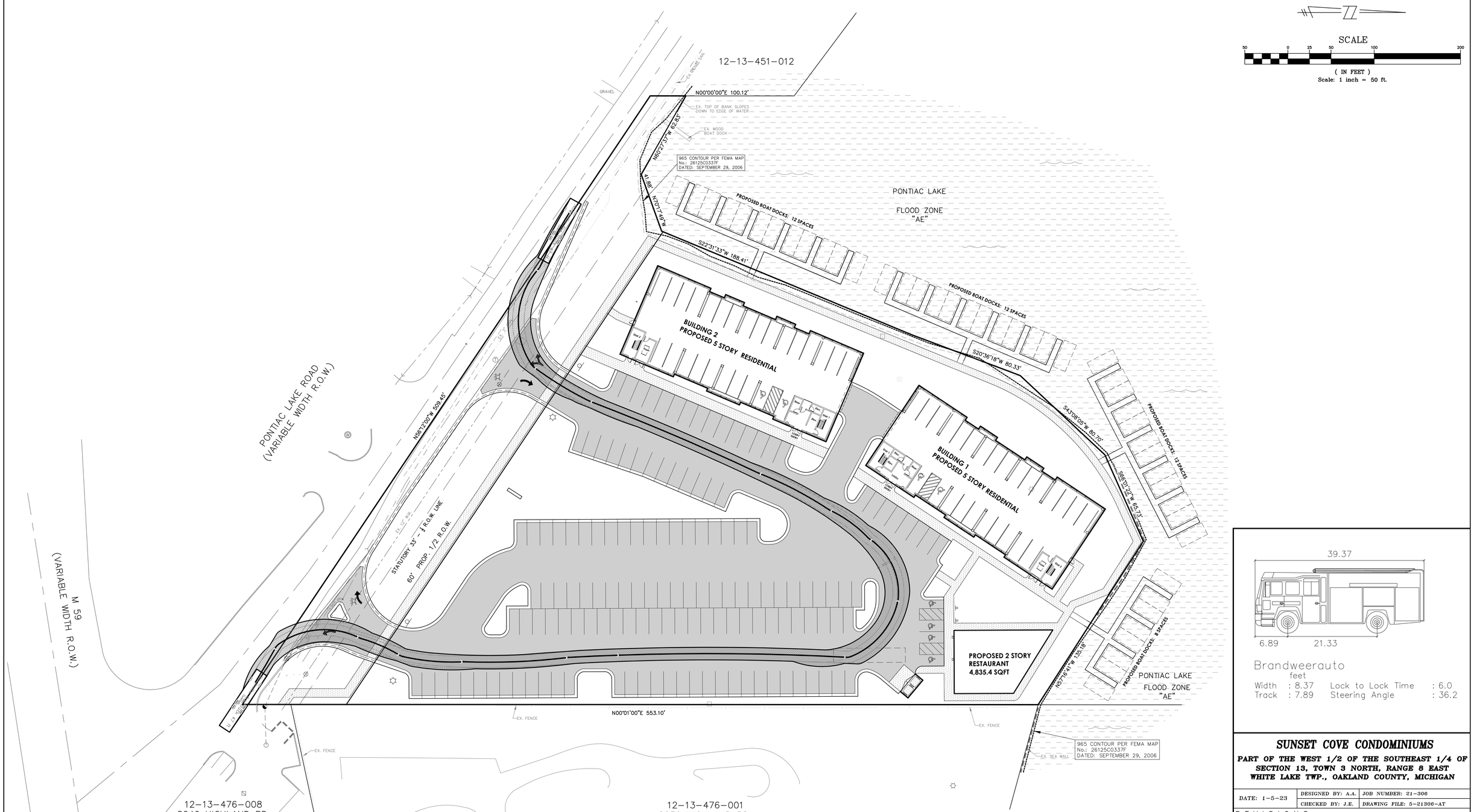
REVISIONS

NO.	ITEM	DATE
1.	REV. PER TWP. REVIEW	1-5-23
2.	REV. BLDG. 3 AND PARKING PER OWNER	1-19-23
3.	REV. PER TWP. REVIEW	5-3-23
4.	REV. BUILDINGS PER ARCHITECT	5-24-23

GRADING PLAN

SEIBER KEAST LEHNER ENGINEERING | SURVEYING
CLINTON TOWNSHIP OFFICE
17001 NINETEEN MILE ROAD, SUITE 3
CLINTON TOWNSHIP, MI 48038
586.412.7050
FARMINGTON HILLS OFFICE
39205 COUNTRY CLUB DRIVE, SUITE C8
FARMINGTON HILLS, MI 48331
248.308.3331

SHEET 4



SCALE

50 0 25 50 100 200

(IN FEET)
Scale: 1 inch = 50 ft.

Brandweerauto
feet

Width	: 8.37	Lock to Lock Time	: 6.0
Track	: 7.89	Steering Angle	: 36.2

SUNSET COVE CONDOMINIUMS

PART OF THE WEST 1/2 OF THE SOUTHEAST 1/4 OF SECTION 13, TOWN 3 NORTH, RANGE 8 EAST WHITE LAKE TWP., OAKLAND COUNTY, MICHIGAN

DATE: 1-5-23	DESIGNED BY: A.A.	JOB NUMBER: 21-306
	CHECKED BY: J.E.	DRAWING FILE: 5-21306-AT

REVISIONS

NO.	ITEM	DATE
1.	REV. BLDG. 3 AND PARKING PER OWNER	1-19-23
2.	REV. PER TWP. REVIEW	5-3-23
3.	REV. BUILDINGS PER ARCHITECT	5-24-23

FIRE TRUCK ROUTE

SEIBER KEAST LEHNER
ENGINEERING | SURVEYING
CLINTON TOWNSHIP OFFICE
17001 NINETEEN MILE ROAD, SUITE 3
CLINTON TOWNSHIP, MI 48038
586.412.7050
FARMINGTON HILLS OFFICE
39205 COUNTRY CLUB DRIVE, SUITE C8
FARMINGTON HILLS, MI 48331
248.308.3331

SHEET 5

McDOWELL & ASSOCIATES — LOG OF SOIL BORING NO. 1

McDOWELL & ASSOCIATES
Geotechnical, Environmental, & Hydrogeologic Services
21355 Hatcher Avenue • Ferndale, MI 48220
Phone: (248) 399-2066 • Fax: (248) 399-2157

JOB NO. 22-304 | SURFACE ELEV. ____ | DATE 8/9/2022
PROJECT: Soils Investigation, Proposed Mixed-Use Development
LOCATION: 8300 Pontiac Lake Road, White Lake Township, Michigan

Sample & Type	Depth	Soil Description	Penetration	Moisture %	Natural Wt. P.C.F.	Dry Den Wt. P.C.F.	Unc. Comp. Strength PSF.	Str. %
	0–1	Moist dark brown sandy TOPSOIL, fill						
A UL	2–3	Compact moist brown fine SAND with trace of silt and dark brown topsoil seams, fill	2, 2, 4	3.6	96			
B UL	5	Medium compact wet brown fine SAND with trace of silt	3, 2, 3	17.5	117			
C UL	7–8		3, 2, 2	21.6	---			
D UL	10	Sightly compact wet brown fine SAND with trace of silt	1, 1, 2	19.7	119			
E UL	15	Very compact wet brown fine SAND with trace of gravel	3, 6, 8					
F UL	20	Extremely compact wet gray SAND & GRAVEL	5, 6, 12					
G UL	25	Very compact wet gray fine SAND with trace of silt	5, 6, 7					

NOTES:
(1) Used Automatic Hammer.
(2) 8VHG KHDG RI ZDWHU EHORZ ˇ¶

TYPE OF SAMPLE: D. - DISTURBED; U.L. - UNDIST. LINER; S.T. - SHELBY TUBE; S.S. - SPLIT SPOON; R.C. - ROCK CORE; ( ) - PENETROMETER
REMARKS: Standard Penetration Test - 'ULYLQJ ´2' 6DPSOHU ¶ :LWK +DPPHU)DOOLQJ ´ &RXQW 0DGH DW ˇ ,QWHUYDOV

GROUND WATER OBSERVATIONS: G.W. ENCOUNTERED AT 4 FT. 5 INS.; G.W. ENCOUNTERED AT FT. INS.; G.W. AFTER COMPLETION 4 FT. 2 INS.; G.W. AFTER MIN. FT. INS.; G.W. VOLUMES Heavy; Cave-,Q DW ¶´

LOG OF SOIL BORING NO. 2

JOB NO. 22-304 | DATE 8/9/2022 | PROJECT: Soils Investigation, Proposed Mixed-Use Development | LOCATION: 8300 Pontiac Lake Road, White Lake Township, Michigan

Sample & Type	Depth	Soil Description	Penetration	Moisture %	Natural Wt. P.C.F.	Dry Den Wt. P.C.F.	Unc. Comp. Strength PSF.	Str. %
	0–1	Moist dark brown sandy TOPSOIL, fill						
A UL	2	Medium compact moist brown fine SAND with topsoil streaks, fill	2, 2, 3	8.7	101			
	3	Medium compact moist brown fine SAND with trace of silt, fill						
B UL	5	Slightly compact moist brown fine SAND with moist topsoil seams, fill	1, 1, 2	12.9	---			
C UL	7–8	Slightly compact wet brown fine to medium SAND with trace of gravel and silt	1, 1, 2	19.2	127			
D UL	10	Slightly compact wet brown fine SAND with trace of silt	1, 1, 1	18.8	---			
E UL	15	Compact wet brown fine SAND with trace of silt	3, 4, 6					
F UL	20	Extremely compact wet gray silty fine SAND	9, 9, 11					

NOTES:
(1) Used Automatic Hammer.
(2) Used head of water below ˇ¶

GROUND WATER OBSERVATIONS: G.W. ENCOUNTERED AT 4 FT. 6 INS.; G.W. AFTER COMPLETION 3 FT. 1 INS.; G.W. VOLUMES Heavy

LOG OF SOIL BORING NO. 3

JOB NO. 22-304 | DATE 8/8//2022 | PROJECT: Soils Investigation, Proposed Mixed-Use Development | LOCATION: 8300 Pontiac Lake Road, White Lake Township, Michigan

Sample & Type	Depth	Soil Description	Penetration	Moisture %	Natural Wt. P.C.F.	Dry Den Wt. P.C.F.	Unc. Comp. Strength PSF.	Str. %
	0	ASPHALT						
	1	Moist brown fine SAND with topsoil streaks, fill						
A UL	2–3	Compact moist brown fine SAND with trace of silt	4, 5, 5	5.4	104			
B UL	5	Medium compact wet brown fine SAND with trace of silt	2, 2, 2	20.2	122			
C UL	7–8	Medium compact wet gray fine SAND with traces of gravel and silt	1, 2, 2	18.9	125			
D UL	10	Sightly compact wet gray fine SAND	1, 1, 2	22.3	121			
E UL	15	Medium compact wet brown fine SAND with trace of gravel	2, 2, 3					

NOTE: Used Automatic Hammer.

GROUND WATER OBSERVATIONS: G.W. ENCOUNTERED AT 3 FT. 6 INS.; G.W. AFTER COMPLETION 3 FT. 3 INS.; G.W. VOLUMES Heavy

LOG OF SOIL BORING NO. 4

JOB NO. 22-304 | DATE 8/9/2022 | PROJECT: Soils Investigation, Proposed Mixed-Use Development | LOCATION: 8300 Pontiac Lake Road, White Lake Township, Michigan

Sample & Type	Depth	Soil Description	Penetration	Moisture %	Natural Wt. P.C.F.	Dry Den Wt. P.C.F.	Unc. Comp. Strength PSF.	Str. %
	0	Moist dark brown sandy TOPSOIL, fill						
	1	Moist brown fine SAND with trace of vegetation and topsoil streaks, fill						
A UL	2–3	Medium compact moist brown fine SAND with traces of silt and vegetation, fill	2, 2, 2	9.8	110			
B UL	5	Sightly compact wet brown fine to medium SAND with discolored streaks, possible fill	1, 1, 1	20.5	123			
C UL	7–8		1, 1, 1	18.6	122			
D UL	10–11	Slightly compact wet brown fine SAND with traces of gravel and silt	1, 1, 1	20.0	123			
E UL	15	Extremely compact wet brown fine SAND with occasional wet gravelly sand seams	8, 9, 12					
F UL	20	Extremely compact wet brown fine SAND	7, 14, 30					
G UL	25	Extremely stiff moist blue silty CLAY with wet silt seams	9, 10, 11					

GROUND WATER OBSERVATIONS: G.W. ENCOUNTERED AT 4 FT. 1 INS.; G.W. AFTER COMPLETION 3 FT. 7 INS.; G.W. AFTER HRS.; G.W. VOLUMES Heavy

LOG OF SOIL BORING NO. 4 (continued)

JOB NO. 22-304 | DATE 8/9/2022 | PROJECT: Soils Investigation, Proposed Mixed-Use Development | LOCATION: 8300 Pontiac Lake Road, White Lake Township, Michigan

Sample & Type	Depth	Soil Description	Penetration Blows for	Moisture %	Natural Wt. P.C.F.	Dry Den Wt. P.C.F.	Unc. Comp. Strength PSF.	Str. %
	26–28	Extremely stiff moist blue silty CLAY with wet silt seams						
H UL	30	Very compact wet gray SAND & GRAVEL with occasional stones	5, 7, 8					

NOTES:
1) Used Automatic Hammer.
2) Re-checked blow counts for B Sample with KHDG RI ZDWHU 'URYH VDPSOHU IURP ¶ˇ´ WR ˇ¶ˇ´ DQG-1R-1W for blow counts.

GROUND WATER OBSERVATIONS: G.W. ENCOUNTERED AT 4 FT. 1 INS.; G.W. AFTER COMPLETION 3 FT. 7 INS.; G.W. VOLUMES Heavy

LOG OF SOIL BORING NO. 5

JOB NO. 22-304 | DATE 8/9/2022 | PROJECT: Soils Investigation, Proposed Mixed-Use Development | LOCATION: 8300 Pontiac Lake Road, White Lake Township, Michigan

Sample & Type	Depth	Soil Description	Penetration	Moisture %	Natural Wt. P.C.F.	Dry Den Wt. P.C.F.	Unc. Comp. Strength PSF.	Str. %
	0–1	Moist dark brown sandy TOPSOIL with traces of brick and wood, fill						
A UL	2	Medium compact moist brown fine SAND with trace of silt, topsoil streaks and vegetation, fill	2, 3, 4					
	3	Compact wet brown fine SAND with trace of silt						
B UL	5	Slightly compact wet brown silty fine to medium SAND with trace of gravel	1, 1, 2	16.9	131			
C UL	7–8	Compact wet brown fine SAND with trace of gravel and silt	2, 3, 3	16.9	125			
D UL	10	Slightly compact wet brown fine SAND with trace of silt	1, 1, 1	23.2	119			
E UL	15	Medium compact wet brown fine SAND with trace of gravel	2, 2, 3	20.1	116			
F UL	20	Very compact brown fine SAND	4, 6, 9					

NOTES:
(1) Used Automatic Hammer.
(2) 8VHG KHDG RI ZDWHU EHORZ ¶

GROUND WATER OBSERVATIONS: G.W. ENCOUNTERED AT 2 FT. 5 INS.; G.W. AFTER COMPLETION 3 FT. 0 INS.; G.W. VOLUMES Heavy

LOG OF SOIL BORING NO. 6

JOB NO. 22-304 | DATE 8/9/2022 | PROJECT: Soils Investigation, Proposed Mixed-Use Development | LOCATION: 8300 Pontiac Lake Road, White Lake Township, Michigan

Sample & Type	Depth	Soil Description	Penetration	Moisture %	Natural Wt. P.C.F.	Dry Den Wt. P.C.F.	Unc. Comp. Strength PSF.	Str. %
	0–1	Moist dark brown sandy TOPSOIL with trace of gravel, fill						
A UL	2	Compact moist brown fine SAND with trace of gravel and topsoil seams, fill	3, 3, 3	16.2	117			
	3–4	Medium compact wet brown fine SAND with traces of silt, topsoil and gravel, possible fill						
B UL	5		1, 1, 2	15.0	129			
C UL	7–8	Slightly compact wet brown fine to medium SAND with traces of gravel	1, 1, 2	15.1	131			
D UL	10		1, 2, 3	20.7	122			
	11–13	Medium compact wet brown fine SAND with trace of silt						
E UL	15		3, 4, 4					
	16–17	Compact wet brown gravelly fine to medium SAND						
F UL	20	Very compact wet brown silty fine SAND	3, 7, 9					

NOTE:
(1) Used Automatic Hammer.
(2) 8VHG KHDG RI ZDWHU EHORZ ¶

GROUND WATER OBSERVATIONS: G.W. ENCOUNTERED AT 2 FT. 7 INS.; G.W. AFTER COMPLETION 2 FT. 7 INS.; G.W. VOLUMES Heavy

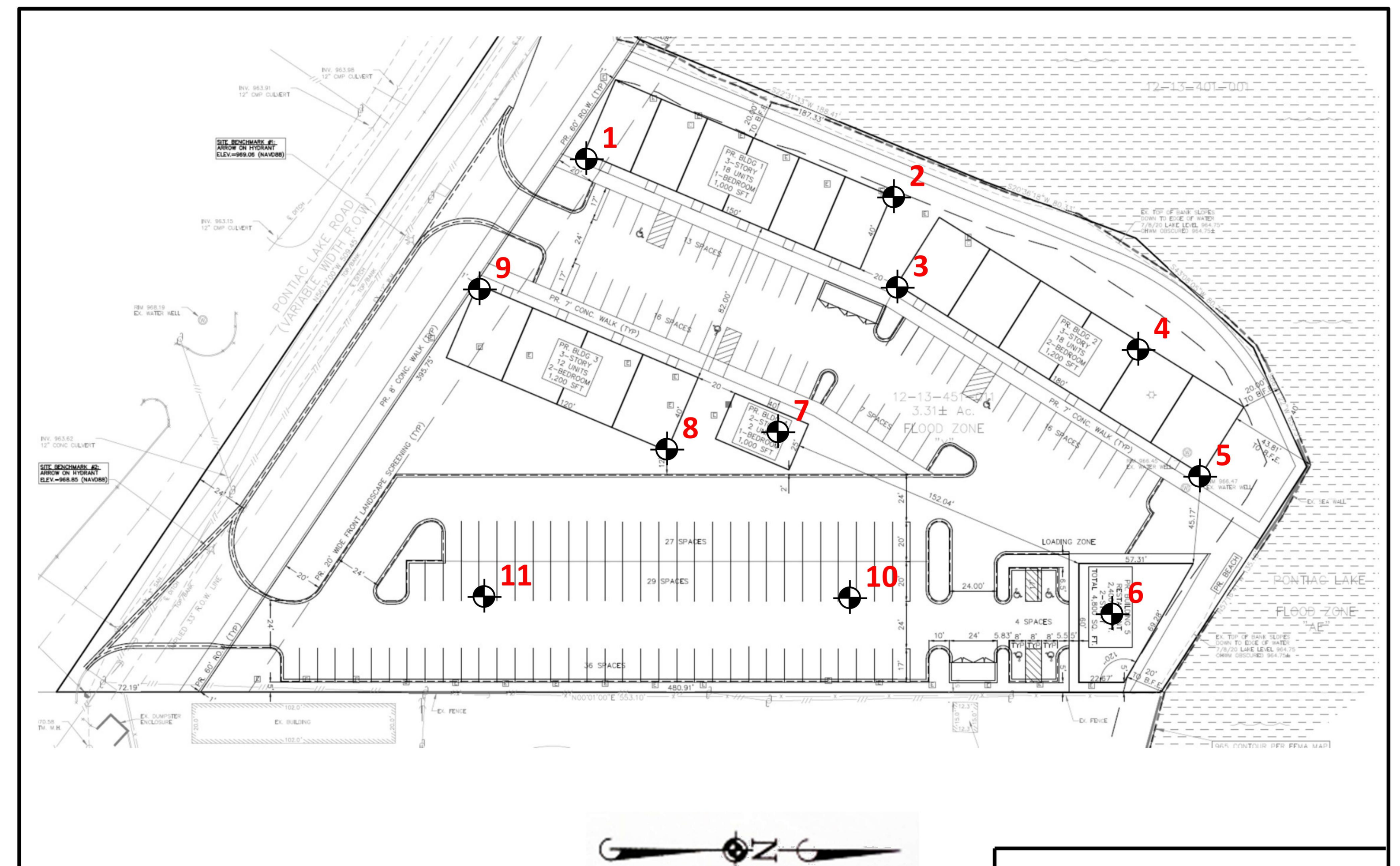
LOG OF SOIL BORING NO. 7

JOB NO. 22-304 | DATE 8/8//2022 | PROJECT: Soils Investigation, Proposed Mixed-Use Development | LOCATION: 8300 Pontiac Lake Road, White Lake Township, Michigan

Sample & Type	Depth	Soil Description	Penetration	Moisture %	Natural Wt. P.C.F.	Dry Den Wt. P.C.F.	Unc. Comp. Strength PSF.	Str. %
	0	Moist dark brown sandy TOPSOIL, fill						
	1	Slightly compact moist brown fine SAND with topsoil streaks, fill						
A UL	2–3	Medium compact moist brown fine SAND with trace of silt and topsoil streaks, fill	2, 2, 2	5.6	101			
B UL	5	Medium compact moist brown fine SAND with trace of silt	2, 3, 3	15.7	120			
	6	Compact wet brown fine to medium SAND with trace of gravel and silt						
C UL	7–8		1, 1, 2	20.9	125			
D UL	10	Slightly compact wet brown fine SAND with traces of gravel and silt	1, 1, 2	19.6	122			
E UL	15	Compact wet brown fine SAND with gravel	1, 3, 6					

NOTE: Used Automatic Hammer.

GROUND WATER OBSERVATIONS: G.W. ENCOUNTERED AT 5 FT. 2 INS.; G.W. AFTER COMPLETION 4 FT. 5 INS.; G.W. VOLUMES Heavy



Note: Base drawing prepared by others.

LEGEND
Soil Boring Locations, 1 through 11: Drilled by McDowell & Associates

McDowell & Associates, 21355 Hatcher Avenue, Ferndale, Michigan 48220, Phone: (248) 399-2066, Fax: (248) 399-2157

Soil Boring Location Plan
Job No. 22-304

SUNSET COVE CONDOMINIUMS

PART OF THE WEST 1/2 OF THE SOUTHEAST 1/4 OF SECTION 13, TOWN 3 NORTH, RANGE 8 EAST
WHITE LAKE TWP., OAKLAND COUNTY, MICHIGAN

DATE: 11-15-22	DESIGNED BY: A.A.	JOB NUMBER: 21-306
	CHECKED BY: J.E.	DRAWING FILE: 6-21306-SB

REVISIONS

NO.	ITEM	DATE
1.	REV. PER TWP. REVIEW	1-5-23

SOIL BORING LOGS

SEIBER KEAST LEHNER
ENGINEERING | SURVEYING
Clinton Township Office, 17001 Nineteen Mile Road, Suite 3, Clinton Township, MI 48038, 586.412.7050
Farmington Hills Office, 39205 Country Club Drive, Suite C8, Farmington Hills, MI 48331, 248.308.3331

SHEET 6

McDOWELL & ASSOCIATES
Geotechnical, Environmental, & Hydrogeologic Services
21355 Hatcher Avenue x Ferndale, MI 48220
Phone: (248) 399-2066 x Fax: (248) 399-2157

LOG OF SOIL BORING NO. 8
PROJECT Soils Investigation
Proposed Mixed-Use Development
LOCATION 8300 Pontiac Lake Road
White Lake Township, Michigan
JOB NO. 22-304
SURFACE ELEV. ______ **DATE** 8/9/2022

Sample & Type	Depth	Soil Description	Penetration	Moisture %	Natural Wt. P.C.F.	Dry Den Wt. P.C.F.	Unc. Comp. Strength PSF.	Str. %
	1	Moist brown fine SAND with topsoil streaks, fill						
		Moist dark brown sandy TOPSOIL with vegetation and wood, fill						
A UL	2–3		1 2 4	6.1	103			
	4	Compact moist brown fine SAND with trace of silt						
B UL	5		4 4 5					
	6							
C UL	7–8	Medium compact wet brown fine SAND with trace of silt	2 2 2	20.7	119			
	9							
D UL	10	Slightly compact wet brown fine to medium SAND with trace of silt	---	20.5	120			
	11–14							
E UL	15	Medium compact wet brown fine SAND with trace of gravel and occasional stones	3 3 4	18.6	122			
	16–19							
F UL	20		4 8 13					
	21–24	Extremely compact wet brown fine SAND with trace of gravel						
G UL	25	Extremely compact wet gray fine SAND	9 10					
		Extremely compact wet gray SILT	14					

TYPE OF SAMPLE: D. - DISTURBED; U.L. - UNDIST. LINER; S.T. - SHELBY TUBE; S.S. - SPLIT SPOON; R.C. - ROCK CORE; ( ) - PENETROMETER

REMARKS: *NOTE:*
(1) Used Automatic Hammer.
(2) 8VHG KHDG RI ZDWHU EHORZ

Standard Penetration Test - 'ULYLQJ 2' 6DPSOHU :LWK +DPPHU)DOOLQJ &RXQW 0DGH DW ,QWHUYDOV

GROUND WATER OBSERVATIONS
G.W. ENCOUNTERED AT 6 FT. 0 INS.
G.W. ENCOUNTERED AT FT. INS.
G.W. AFTER COMPLETION 5 FT. 2 INS.
G.W. AFTER MIN. FT. INS.
G.W. VOLUMES Heavy Cave-,Q DW

McDOWELL & ASSOCIATES
Geotechnical, Environmental, & Hydrogeologic Services
21355 Hatcher Avenue x Ferndale, MI 48220
Phone: (248) 399-2066 x Fax: (248) 399-2157

LOG OF SOIL BORING NO. 9
PROJECT Soils Investigation
Proposed Mixed-Use Development
LOCATION 8300 Pontiac Lake Road
White Lake Township, Michigan
JOB NO. 22-304
SURFACE ELEV. ______ **DATE** 8/9/2022

Sample & Type	Depth	Soil Description	Penetration	Moisture %	Natural Wt. P.C.F.	Dry Den Wt. P.C.F.	Unc. Comp. Strength PSF.	Str. %
	1	Moist dark brown sandy TOPSOIL						
A UL	2–3	Compact moist brown fine SAND with trace of gravel, topsoil streaks and occasional stones, fill	2 3 4	8.5	109			
	4	Moist brown SAND & GRAVEL, fill						
B UL	5	Compact moist brown fine SAND	4 4 4	8.0	103			
	6							
C UL	7–8	Slightly compact wet brown fine SAND	1 1 2	19.8	---			
	9							
D UL	10		2 2 3	192.	124			
	11–14	Medium compact wet brown fine SAND						
E UL	15		3 4 5					
	16–19	Compact wet brown fine SAND with trace of gravel and occasional stones						
F UL	20		3 3 3					
	21–25							

NOTE:
(1) Used Automatic Hammer.
(2) 8VHG KHDG RI ZDWHU EHORZ

TYPE OF SAMPLE: D. - DISTURBED; U.L. - UNDIST. LINER; S.T. - SHELBY TUBE; S.S. - SPLIT SPOON; R.C. - ROCK CORE; ( ) - PENETROMETER

REMARKS:

Standard Penetration Test - 'ULYLQJ 2' 6DPSOHU :LWK +DPPHU)DOOLQJ &RXQW 0DGH DW ,QWHUYDOV

GROUND WATER OBSERVATIONS
G.W. ENCOUNTERED AT 6 FT. 5 INS.
G.W. ENCOUNTERED AT FT. INS.
G.W. AFTER COMPLETION 5 FT. 0 INS.
G.W. AFTER MIN. FT. INS.
G.W. VOLUMES Heavy Cave-,Q DW

McDOWELL & ASSOCIATES
Geotechnical, Environmental, & Hydrogeologic Services
21355 Hatcher Avenue x Ferndale, MI 48220
Phone: (248) 399-2066 x Fax: (248) 399-2157

LOG OF SOIL BORING NO. 10
PROJECT Soils Investigation
Proposed Mixed-Use Development
LOCATION 8300 Pontiac Lake Road
White Lake Township, Michigan
JOB NO. 22-304
SURFACE ELEV. ______ **DATE** 8/8//2022

Sample & Type	Depth	Soil Description	Penetration	Moisture %	Natural Wt. P.C.F.	Dry Den Wt. P.C.F.	Unc. Comp. Strength PSF.	Str. %
	1	Slightly compact moist dark brown sandy TOPSOIL, fill						
A UL	2–3		1 1 1	10.0	107			
	4	Slightly compact moist brown silty fine SAND with traces of topsoil and gravel, fill						
B UL	5	Medium compact wet brown fine to medium SAND with traces of gravel and silt	1 2 3	17.7	124			
	6							
C UL	7–8	Compact wet brown fine SAND with trace of silt	1 2 4					
	9							
D UL	10	Medium compact wet brown fine SAND	1 2 3					
	11–25							

NOTE: Used Automatic Hammer.

TYPE OF SAMPLE: D. - DISTURBED; U.L. - UNDIST. LINER; S.T. - SHELBY TUBE; S.S. - SPLIT SPOON; R.C. - ROCK CORE; ( ) - PENETROMETER

REMARKS:

Standard Penetration Test - 'ULYLQJ 2' 6DPSOHU :LWK +DPPHU)DOOLQJ &RXQW 0DGH DW ,QWHUYDOV

GROUND WATER OBSERVATIONS
G.W. ENCOUNTERED AT 4 FT. 6 INS.
G.W. ENCOUNTERED AT FT. INS.
G.W. AFTER COMPLETION 5 FT. 5 INS.
G.W. AFTER MIN. FT. INS.
G.W. VOLUMES Heavy

McDOWELL & ASSOCIATES
Geotechnical, Environmental, & Hydrogeologic Services
21355 Hatcher Avenue x Ferndale, MI 48220
Phone: (248) 399-2066 x Fax: (248) 399-2157

LOG OF SOIL BORING NO. 11
PROJECT Soils Investigation
Proposed Mixed-Use Development
LOCATION 8300 Pontiac Lake Road
White Lake Township, Michigan
JOB NO. 22-304
SURFACE ELEV. ______ **DATE** 8/8//2022

Sample & Type	Depth	Soil Description	Penetration	Moisture %	Natural Wt. P.C.F.	Dry Den Wt. P.C.F.	Unc. Comp. Strength PSF.	Str. %
		Moist dark brown sandy TOPSOIL, fill						
	1	Moist discolored brown fine SAND, fill						
A UL	2–3	Medium compact moist brown fine SAND with trace of silt	1 2 3	9.0	106			
	4							
B UL	5	Medium compact wet brown fine SAND with trace of silt	1 2 2					
	6							
C UL	7–8	Slightly compact wet brown fine to medium SAND with trace of gravel	1 1 1	18.4	127			
	9							
D UL	10		1 1 1					
	11–25							

NOTE: Used Automatic Hammer.

TYPE OF SAMPLE: D. - DISTURBED; U.L. - UNDIST. LINER; S.T. - SHELBY TUBE; S.S. - SPLIT SPOON; R.C. - ROCK CORE; ( ) - PENETROMETER

REMARKS:

Standard Penetration Test - 'ULYLQJ 2' 6DPSOHU :LWK +DPPHU)DOOLQJ &RXQW 0DGH DW ,QWHUYDOV

GROUND WATER OBSERVATIONS
G.W. ENCOUNTERED AT 4 FT. 10 INS.
G.W. ENCOUNTERED AT FT. INS.
G.W. AFTER COMPLETION 5 FT. 5 INS.
G.W. AFTER MIN. FT. INS.
G.W. VOLUMES Heavy

Job No. 22-304

SIEVE ANALYSIS

Boring	Sample	% Passing #4 Sieve	% Passing #10 Sieve	% Passing #40 Sieve	% Passing #100 Sieve	% Passing #200 Sieve
1	C	10.0	100.0	98.6	8.1	3.5
2	C	95.8	94.3	73.2	9.0	3.3
5	B	92.3	89.0	72.3	24.5	18.2
6	C	87.9	80.0	59.4	16.2	10.9
8	D	100.0	98.8	66.7	5.9	3.1
9	C	100.0	100.0	83.6	12.9	6.5

SUNSET COVE

PART OF THE WEST 1/2 OF THE SOUTHEAST 1/4 OF SECTION 13, TOWN 3 NORTH, RANGE 8 EAST WHITE LAKE TWP., OAKLAND COUNTY, MICHIGAN

DATE: 11-15-22	DESIGNED BY: A.A.	JOB NUMBER: 21-306
	CHECKED BY: J.E.	DRAWING FILE: 6-21306-SB

REVISIONS

NO.	ITEM	DATE
1.	REV. PER TWP. REVIEW	1-5-23

SOIL BORING LOGS

SEIBER KEAST LEHNER
ENGINEERING | SURVEYING

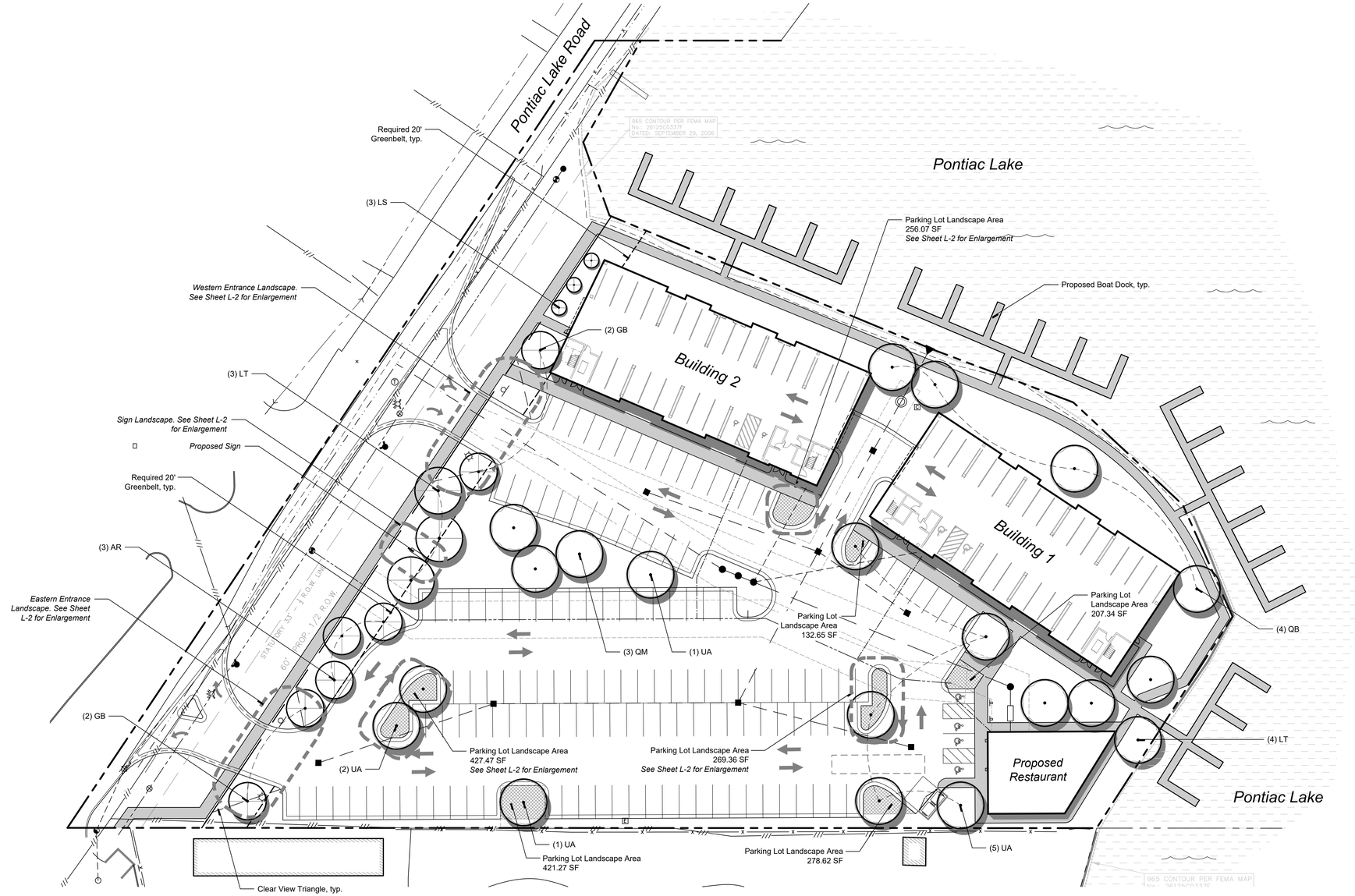
Clinton Township Office
17001 Nineteen Mile Road, Suite 3
Clinton Township, MI 48038
586.412.7050

Farmington Hills Office
39205 Country Club Drive, Suite C8
Farmington Hills, MI 48331
248.308.3331

SHEET 7

design studio
LAND
landscape architecture / land planning

750 Forest Ave. Suite 101
Birmingham, MI 48009
T:: 248.594.3220



Landscape Summary

Greenbelt Requirements
- Required: 20' Greenbelt; 1 tree & 8 shrubs / 30 LF of frontage
- Length of Frontage: 395.75 LF
- Required: 20' Greenbelt; 13 Trees & 105 Shrubs
- Proposed: Variable Greenbelt (10' min.); 13 Trees & 105 Shrubs

Parking Lot Landscape
- Required: 15 SF / Parking Space for Parking Landscape Area; 1 Tree & 3 Shrubs / 100 SF Parking Landscape Area
- Parking Spaces: 132 spaces (196 less spaces in Buildings & areas less than 10 spaces)
- Required: 1,980.00 SF Parking Landscape Area; 20 Trees & 60 Shrubs
- Proposed: 1,992.78 SF Parking Landscape Area; 20 Trees & 60 Shrubs

Plant Schedule This Sheet

Trees

sym.	qty.	botanical name	common name	size	spacing	root
AR	3	*Acer x freemanii 'Armstrong'*	Armstrong Freeman Maple	2.5" cal.	per plans	B&B
GB	4	*Ginkgo biloba 'Princeton Sentry'*	Princeton Sentry Ginkgo	2.5" cal.	per plans	B&B
LS	3	*Liquidambar styraciflua 'Slender Silhouette'*	Slender Silhouette Sweetgum	2.5" cal.	per plans	B&B
LT	7	*Liriodendron tulipifera*	Tulip Tree	2.5" cal.	per plans	B&B
QB	4	*Quercus bicolor*	Swamp White Oak	2.5" cal.	per plans	B&B
QM	3	*Quercus x macdanielii 'Clemons'*	Heritage Oak	2.5" cal.	per plans	B&B
UA	9	*Ulmus americana 'Princeton'*	Princeton American Elm	2.5" cal.	per plans	B&B

STATE OF MICHIGAN
WILLIAM T. KREAD
LANDSCAPE ARCHITECT
No. 1177
LICENSED LANDSCAPE ARCHITECT

■ sheet title:
Overall Landscape Plan

■ project title:
Sunset Cove Condominiums
White Lake Township, Michigan

■ prepared for:
White Lake JZ, LLC
30201 Orchard Lake Road, Suite 250
Farmington Hills, MI 48334

Phone: 248.892.3444

■ job number:	■ date:
23001	01.05.2023
■ drawn by:	■ checked by:
EMJ	WTK

811 Know what's **below.** **Call** before you dig.

■ revisions:
- 01.19.2023 Per Site Revisions
- 05.22.2023 Per Site Revisions

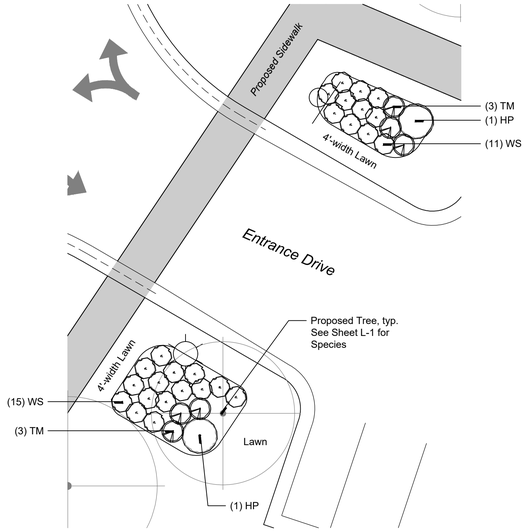
0 15' 30' 60' 90' 120' 1"= 30'

North

sheet no.
L-1

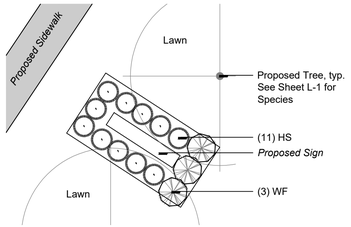
design studio
LAND
landscape architecture / land planning

750 Forest Ave. Suite 101
Birmingham, MI 48009
T:: 248.594.3220



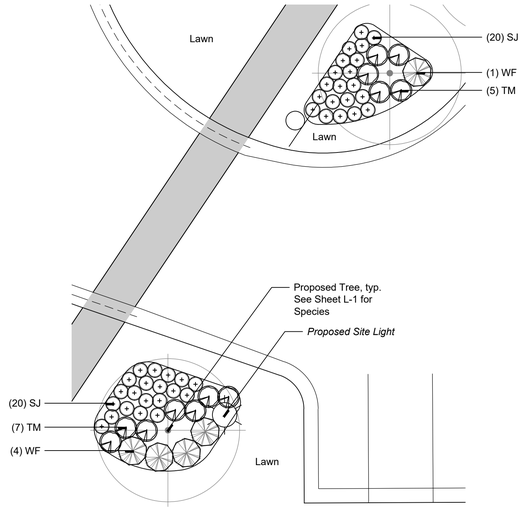
Western Entrance Landscape Enlargement

Note: All shrubs included in this detail are counted towards "Greenbelt Shrubs". See L-1



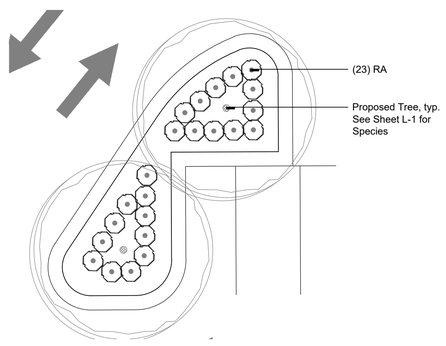
Sign Landscape Enlargement

Note: All shrubs included in this detail are counted towards "Greenbelt Shrubs". See L-1



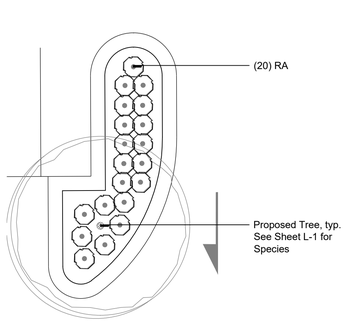
Eastern Entrance Landscape Enlargement

Note: All shrubs included in this detail are counted towards "Greenbelt Shrubs". See L-1



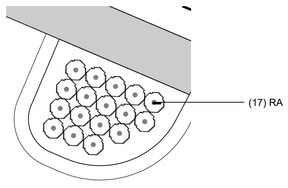
Parking Landscape Area Enlargement

Note: All shrubs included in this detail are counted towards "Parking Lot Landscape Shrubs". See L-1



Parking Landscape Area Enlargement

Note: All shrubs included in this detail are counted towards "Parking Lot Landscape Shrubs". See L-1



Parking Landscape Area Enlargement

Note: All shrubs included in this detail are counted towards "Parking Lot Landscape Shrubs". See L-1

Plant Schedule This Sheet

Shrubs							
sym.	qty.	botanical name	common name	size	spacing	root	notes
HP	2	*Hydrangea paniculata 'Little Quickfire'*	Little Quickfire Panicle Hydrangea	30" ht.	5' o.c.	cont.	
HS	11	*Hydrangea serrata 'Tuff Stuff'*	Tuff Stuff Mountain Hydrangea	30" ht.	36" o.c.	cont.	
RA	60	*Rhus aromatica 'Gro Low'*	Gro Low Fragrant Sumac	30" ht.	36" o.c.	cont.	Maintain +/- 12" back from curb
SJ	40	*Spiraea japonica 'Walbuma'*	Magic Carpet Spiraea	No. 3	24" o.c.	cont.	
TM	18	*Taxus x media 'Densiformis'*	Dense Yew	30" ht.	36" o.c.	B&B	Maintain at +/- 30" height
WF	8	*Weigela florida 'Wine & Roses'*	Wine & Roses Weigela	30" ht.	48" o.c.	cont.	
WS	26	*Weigela florida 'Spilled Wine'*	Spilled Wine Weigela	30" ht.	36" o.c.	cont.	

STATE OF MICHIGAN
WILLIAM T. KREAG
LANDSCAPE ARCHITECT
No. 1177
LICENSED LANDSCAPE ARCHITECT

■ sheet title:

Landscape Enlargement Plans

■ project title:

Sunset Cove Condominiums

White Lake Township, Michigan

■ prepared for:

White Lake JZ, LLC
30201 Orchard Lake Road, Suite 250
Farmington Hills, MI 48334

Phone: 248.892.3444

■ job number:	■ date:
23001	01.05.2023
■ drawn by:	■ checked by:
EMJ	WTK

Know what's **below.** **Call** before you dig.

■ revisions:

01.19.2023	Per Site Revisions
05.22.2023	Per Site Revisions

0 5' 10' 20' 30' 40' 1"= 10'

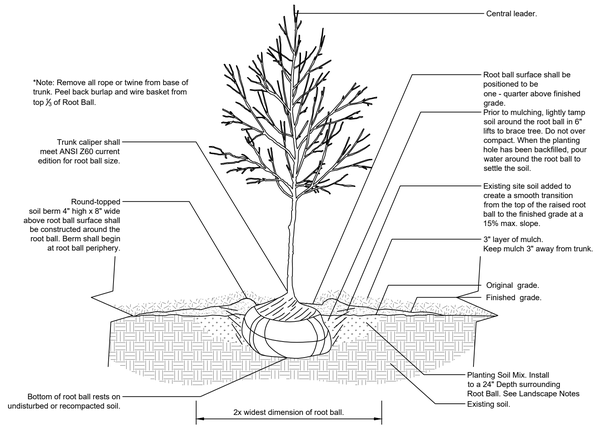
North

sheet no.

L-2

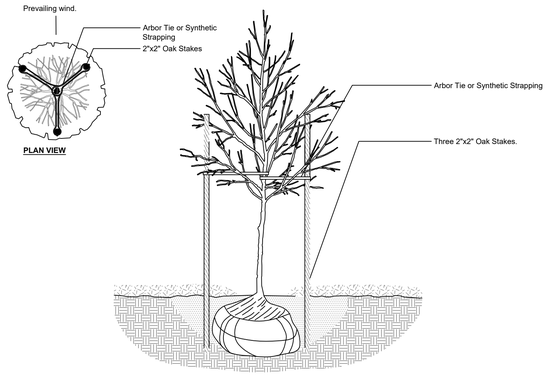
design studio
LAND
landscape architecture / land planning

750 Forest Ave. Suite 101
Birmingham, MI 48009
T:: 248.594.3220



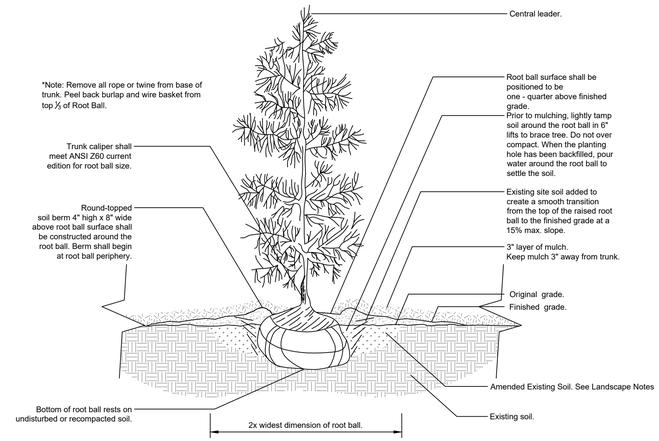
Tree in Existing Soil Detail

NTS



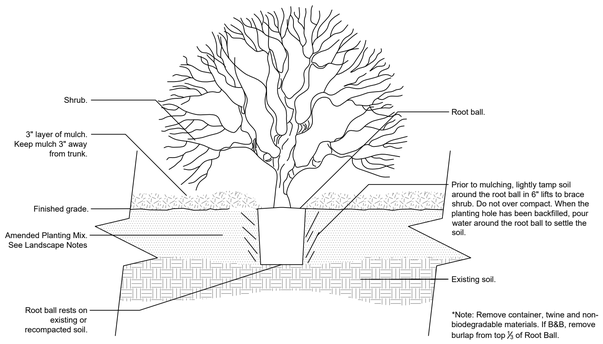
Tree Staking Detail

NTS



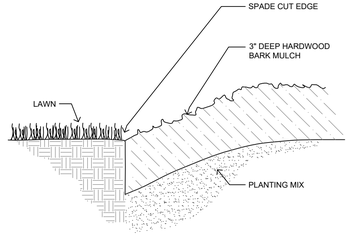
Evergreen Tree Planting Detail

Scale: NTS



Shrub in Planting Bed Detail

NTS



Spade Cut Edging Detail

NTS

Landscape Notes

1. All plant material shall be true to name and free from physical damage and wind burn.
2. Plants shall be full, well-branched, and in a healthy, vigorous growing condition.
3. Plants shall be watered before an after planting is complete.
4. All trees must be staked, fertilized, and mulched and shall be guaranteed to exhibit a normal growth cycle for at least one (1) full year following planting.
5. All material shall conform to the guidelines established in the most recent edition of the American Standard for Nursery Stock.
6. Provide clean backfill soil, using material stockpiled on site. Soil shall be screened and free of any debris, foreign material, or stone.
7. "Agriform" tabs or similar slow-release fertilizer shall be added to the planting pits before being backfilled.
8. Amended planting mix shall consist of 1/3 screened topsoil, 1/3 sand, and 1/3 peat.
9. All plantings shall be mulched with shredded hardwood bark, spread to a minimum depth of 3". Mulch is to be free from debris and foreign material and shall contain no pieces of inconsistent size.
10. The Landscape Contractor shall be responsible for all work shown on the Landscape Drawings and Specifications.
11. No substitutions or changes of location, or plant types shall be made without the approval of the Landscape Architect or Owner's Representative.
12. The Landscape Architect shall be notified of any discrepancies between the plans and field conditions prior to installation.
13. The Landscape Contractor shall be responsible for maintaining all plant material in a vertical condition throughout the guaranteed period.
14. The Landscape Architect shall have the right, at any stage of the installation, to reject any work, or material, that does not meet the requirements of the plan and specifications, if requested by Owner.
15. The Contractor shall be responsible for checking plant quantities to ensure quantities on drawings and plant list are the same. In the event of a discrepancy, the quantities on the plans shall prevail.
16. The Landscape Contractor shall seed and mulch or sod all areas disturbed during construction, throughout the contract limits.
17. A pre-emergent weed control agent, "Preen" or equal, shall be applied uniformly to all planting beds prior to mulching.
18. The Owner and Landscape Architect reserve the right to change location of plant material and alter plant species/variety at the time of installation based upon availability and quantity of material as well as site conditions. Materials will be of similar size, appearance, and growth habit.
19. All Lawn areas shall be seeded or sodded.
20. All Lawn areas shall be irrigated
21. All Landscape areas shall be irrigated by an automatic irrigation system with separate zones for Lawn and Plants.

■ sheet title:

Landscape Details

■ project title:

Sunset Cove Condominiums

White Lake Township, Michigan

■ prepared for:

White Lake JZ, LLC
30201 Orchard Lake Road, Suite 250
Farmington Hills, MI 48334

Phone: 248.892.3444

■ job number:	■ date:
23001	01.05.2023

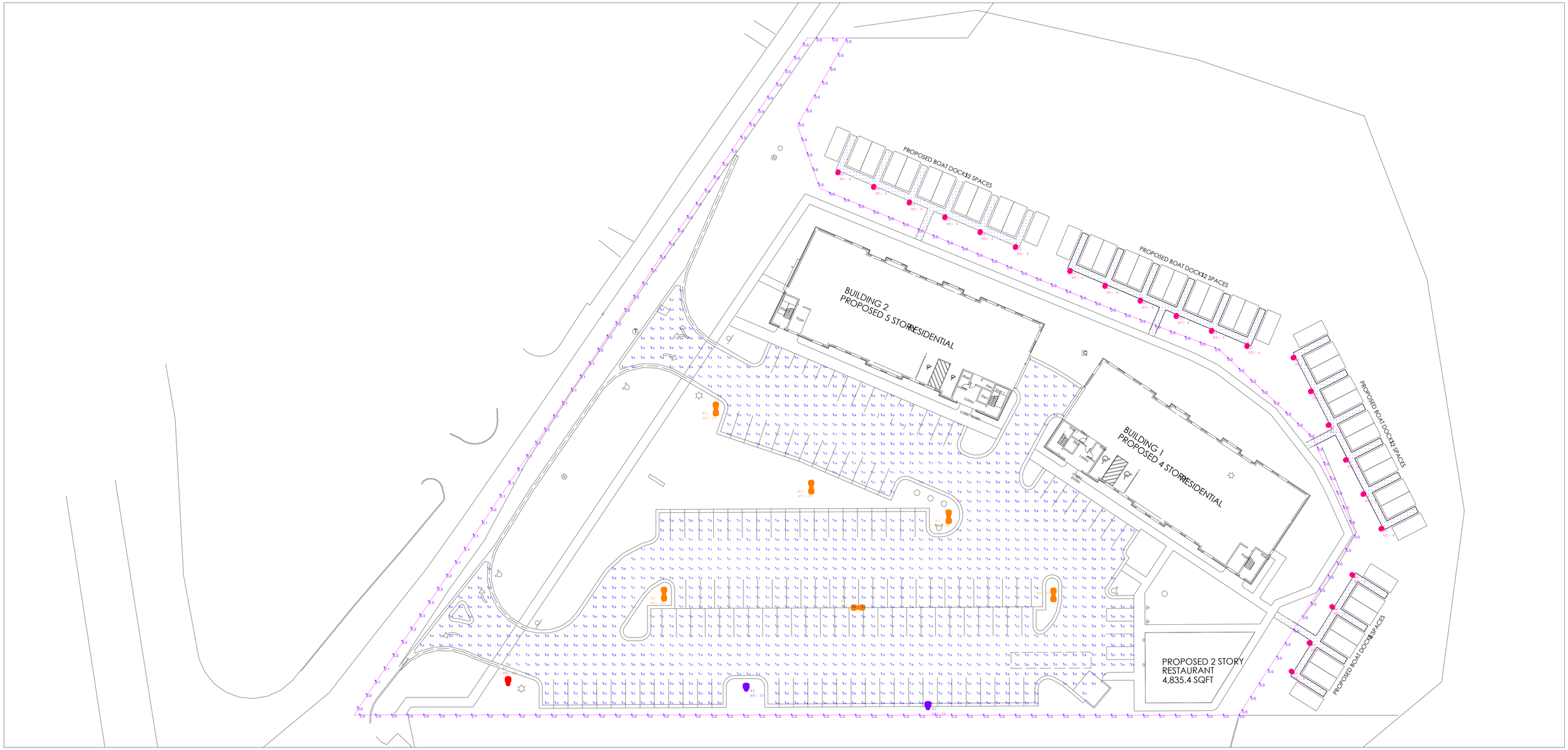
■ drawn by:	■ checked by:
EMJ	WTK

■ revisions:

01.19.2023	Per Site Revisions
05.22.2023	Per Site Revisions

sheet no.

L-3



Schedule								
Label	Symbol	Qty	Manufacturer	Catalog Number	Light Loss Factor	Lumens Per Lamp	Watts	Controls
B2		22	BEGA B2	99558 40K	0.900	1663	21	
E2		2	LITHONIA E2	DSX1 LED P1 40K 80CRI BLC4	0.900	5233	50.9	
E3		6	LITHONIA E3	DSX1 LED P1 40K 70CRI T4M HS (TWIN HEAD)	0.900	6630	50.9015	
E1		1	LITHONIA E1	DSX1 LED P1 40K 70CRI T4M HS	0.900	6630	50.9015	

Statistics					
Description	Avg fc	Max fc	Min fc	Avg/Min (:1)	Max/Min (:1)
BOAT DOCK PATHWAY 1	2.01	9.3	0.0	N.A.	N.A.
BOAT DOCK PATHWAY 2	2.07	9.3	0.0	N.A.	N.A.
BOAT DOCK PATHWAY 3	2.06	9.2	0.0	N.A.	N.A.
BOAT DOCK PATHWAY 4	1.97	9.3	0.0	N.A.	N.A.
PARKING LOT 0 AFF	1.04	2.7	0.1	10.40	27.00
PROPERTY LINE 0 AFF	0.08	0.3	0.0	N.A.	N.A.

PLAN VIEW: NOT TO SCALE

GENERAL NOTE
1. SEE SCHEDULE FOR LUMINAIRE MOUNTING HEIGHT.
2. CALCULATIONS ARE SHOWN IN FOOTCANDLES AT: 0' - 0", FOOD SERVICE AREA AT: 2' - 6", TREES SHOWN AT BOTTOM OF LEAVES
3. **ALTERNATE LIGHTING FIXTURES WILL NOT MEET CITY ORDINANCE COMPLIANCE DUE TO THE PRECISE OPTICAL AND OUTPUT PERFORMANCE SELECTED FOR THESE FIXTURES. ALTERNATE LIGHTING PROPOSALS MUST BE RECALCULATED AND RESUBMITTED TO THE CITY FOR APPROVAL. CONTACT LAYOUTS@GASSERBUSH.COM FOR ASSISTANCE WITH ALTERNATE OPTIONS IF NEEDED."**

- THE ENGINEER AND/OR ARCHITECT MUST DETERMINE APPLICABILITY OF THE LAYOUT TO EXISTING / FUTURE FIELD CONDITIONS.
THIS LIGHTING LAYOUT REPRESENTS ILLUMINATION LEVELS CALCULATED FROM LABORATORY DATA TAKEN UNDER CONTROLLED CONDITIONS IN ACCORDANCE WITH ILLUMINATING ENGINEERING SOCIETY APPROVED METHODS.
ACTUAL PERFORMANCE OF ANY MANUFACTURER'S LUMINAIRE MAY VARY DUE TO VARIATION IN ELECTRICAL VOLTAGE, TOLERANCE IN LAMPS, AND OTHER VARIABLE FIELD CONDITIONS. MOUNTING HEIGHTS INDICATED ARE FROM GRADE AND/OR FLOOR UP.

- THESE LIGHTING CALCULATIONS ARE NOT A SUBSTITUTE FOR INDEPENDENT ENGINEERING ANALYSIS OF LIGHTING SYSTEM SUITABILITY AND SAFETY.
THE ENGINEER AND/OR ARCHITECT IS RESPONSIBLE TO REVIEW FOR MICHIGAN ENERGY CODE AND LIGHTING QUALITY COMPLIANCE.
- UNLESS EXEMPT, PROJECT MUST COMPLY WITH LIGHTING CONTROLS REQUIRMENTS DEFINED IN ASHRAE 90.1 2013. FOR SPECIFIC INFORMATION CONTACT GBA CONTROLS GROUP AT ASG@GASSERBUSH.COM OR 734-266-6705.
- FOR ORDERING INQUIRIES CONTACT GASSER BUSH AT QUOTES@GASSERBUSH.COM OR 734-266-6705.
- THIS DRAWING WAS GENERATED FROM AN ELECTRONIC IMAGE FOR ESTIMATION PURPOSE ONLY. LAYOUT TO BE VERIFIED IN FIELD BY OTHERS.
- MOUNTING HEIGHT IS MEASURED FROM GRADE TO FACE OF FIXTURE. POLE HEIGHT SHOULD BE CALCULATED AS THE MOUNTING HEIGHT LESS BASE HEIGHT.

Sunset Cove_V1 #23-15705.AGI

Gasser Bush Associates / Applications

www.gasserbush.com

Designer: JC3
Date:5/18/2023

Scale: NOT TO SCALE

GBA
GASSER BUSH ASSOCIATES

SPECIFICATION SHEETS ATTACHED AS SEPARATE PDF'S

Schedule								
Label	Symbol	Qty	Manufacturer	Catalog Number	Light Loss Factor	Lumens Per Lamp	Watts	Controls
B2		22	BEGA B2	99558 40K	0.900	1663	21	
E2		2	LITHONIA E2	DSX1 LED P1 40K 80CRI BLC4	0.900	5233	50.9	
E3		6	LITHONIA E3	DSX1 LED P1 40K 70CRI T4M HS (TWIN HEAD)	0.900	6630	50.9015	
E1		1	LITHONIA E1	DSX1 LED P1 40K 70CRI T4M HS	0.900	6630	50.9015	

E1-E3

D-Series Size 1
LED Area Luminaire

d"series

Catalog Number

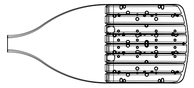
Notes

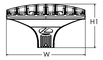
Type

Hit the Tab key or mouse over the page to see all interactive elements.

Specifications

EPA:	0.69 ft² (0.06 m²)
Length:	32.71" (83.1 cm)
Width:	14.26" (36.2 cm)
Height H1:	7.88" (20.0 cm)
Height H2:	2.73" (6.9 cm)
Weight:	34 lbs (15.4 kg)





Introduction

The modern styling of the D-Series features a highly refined aesthetic that blends seamlessly with its environment. The D-Series offers the benefits of the latest in LED technology into a high performance, high efficacy, long-life luminaire.

The photometric performance results in sites with excellent uniformity, greater pole spacing and lower power density. D-Series outstanding photometry aids in reducing the number of poles required in area lighting applications with typical energy savings of 65% and expected service life of over 100,000 hours.

Ordering Information

EXAMPLE: DSX1 LED P7 40K 70CRI T3M MVOLT SPA NLTAIR2 PIRHN DDBXD

DSX1 LED

Series	LEDs	Color temperature[2]	Color Rendering Index[2]	Distribution		Voltage	Mounting
DSX1 LED	**Forward optics**	(this section 70CRI only)		AFR Automotive front row	TSM Type V medium	MVOLT (120V-277V)[4]	**Shipped included**
	P1 P6	30K 3000K	70CRI	T1S Type I short	T5LG Type V low glare	HVOLT (347V-480V)[5,6]	SPA Square pole mounting (#8 drilling)
	P2 P7	40K 4000K	70CRI	T2M Type II medium	T5W Type V wide	XVOLT (277V - 480V)[7,8]	RPA Round pole mounting (#8 drilling)
	P3 P8	50K 5000K	70CRI	T3M Type III medium	BLC3 Type III backlight control[3]		SPA5 Square pole mounting #5 drilling[9]
	P4 P9	(this section 80CRI only, extended lead times apply)		T3LG Type III low glare[3]	BLC4 Type IV backlight control[3]		RPA5 Round pole mounting #5 drilling[9]
	P5			T4M Type IV medium	LCCO Left corner cutoff[3]		SPA8N Square narrow pole mounting #8 drilling
	Rotated optics	27K 2700K	80CRI	T4LG Type IV low glare[3]	RCCO Right corner cutoff[3]		WBA Wall bracket[10]
	P10[1] P12[1]	30K 3000K	80CRI	TFTM Forward throw medium			MA Mast arm adapter (mounts on 2 3/8" OD horizontal tenon)
	P11[1] P13[1]	35K 3500K	80CRI				
		40K 4000K	80CRI				
		50K 5000K	80CRI				

Control options		Other options		Finish *(required)*	
Shipped installed		**Shipped installed**		DDBXD	Dark Bronze
NLTAIR2 PIRHN	nLight AIR gen 2 enabled with bi-level motion / ambient sensor, 8-40' mounting height, ambient sensor enabled at 2fc.[11,12,20,21]	SPD20KV	20KV surge protection	DBLXD	Black
PIR	High/low, motion/ambient sensor, 8-40' mounting height, ambient sensor enabled at 2fc.[12,20,21]	HS	Houseside shield (black finish standard)[22]	DNAXD	Natural Aluminum
PER	NEMA twist-lock receptacle only (controls ordered separate)[18]	L90	Left rotated optics[1]	DWHXD	White
PER5	Five-pin receptacle only (controls ordered separate)[14,21]	R90	Right rotated optics[1]	DDBTXD	Textured dark bronze
PER7	Seven-pin receptacle only (controls ordered separate)[14,21]	CCE	Coastal Construction[23]	DBLBXD	Textured black
FAO	Field adjustable output[15,21]	HA	50°C ambient operation[24]	DNATXD	Textured natural aluminum
BL30	Bi-level switched dimming, 30%[16,21]	**Shipped separately**		DWHGXD	Textured white
BL50	Bi-level switched dimming, 50%[16,21]	EGSR	External Glare Shield (reversible, field install required, matches housing finish)		
DMG	0-10v dimming wires pulled outside fixture (for use with an external control, ordered separately)[17]	BSDB	Bird Spikes (field install required)		
DS	Dual switching[18,19,21]				

One Lithonia Way • Conyers, Georgia 30012 • Phone: 1-800-705-SERV (7378) • www.lithonia.com

B2

Surface washers for horizontal surfaces

Post construction: One piece trapezoidal extruded aluminum body, 3/16" wall, with a one piece die-cast aluminum top housing and a base internally welded into an assembly. Die castings are marine grade, copper free (≤ 0.3% copper content) A360.0 aluminum alloy.

Lamp enclosure: One piece die-cast aluminum faceplate secured by four (4) socket head stainless steel screws threaded into stainless steel inserts. Clear tempered glass, ⅛" thick, with internal asymmetrical reflector/optical system. Fully gasketed lens using a molded "O-ring" high temperature silicone rubber gasket.

Electrical: 6.3 W LED luminaire, 9 total system watts, -30° C start temperature. Integral 120 V through 277 V electronic LED driver, 0-10V dimming available. Standard LED color temperature is 3000K with an 80 CRI. Available in 4000K (80 CRI); add suffix K4 to order.

Anchor base: Heavy cast aluminum, slotted for precise alignment. Mounts to BEGA 79824 anchorage kit. Bollards are secured to the post with one (1) stainless steel set screw.

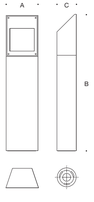
Finish: All BEGA standard finishes are polyester powder coat with minimum 3 mil thickness. Available in four standard BEGA colors: Black (BLK); White (WHT); Bronze (BRZ); Silver (SLV). To specify, add appropriate suffix to catalog number. Custom colors supplied on special order.

U.L. listed for US and Canadian Standards, suitable for wet locations. Protection class: IP 65.

Weight: 8.8 lbs

Luminaire Lumens: 444

Type:
BEGA Product:
Project:
Voltage:
Color:
Options:
Modified:



Lamp	A	B	C	Anchorage
99554 6.3 W LED	6⅜	31½	4⅜	**79824**

BEGA-US 1000 BEGA Way, Carpinteria, CA 93013 (805) 684-0533 FAX (805) 566-9474 www.bega-us.com

EV Smart Commercial Pole Base Housing

Consider including one or more Intelligent Pole Bases (IPB) on your site to future proof for EV Charging stations.

Contact Gasser Bush Associates for more information on IPB and EV Charging Stations at:

www.intelligentpolebase.com

www.gasserbush.com

GENERAL NOTE
1. SEE SCHEDULE FOR LUMINAIRE MOUNTING HEIGHT.
2. CALCULATIONS ARE SHOWN IN FOOTCANDLES AT: 0' - 0", FOOD SERVICE AREA AT: 2' - 6", TREES SHOWN AT BOTTOM OF LEAVES
3. ALTERNATE LIGHTING FIXTURES WILL NOT MEET CITY ORDINANCE COMPLIANCE DUE TO THE PRECISE OPTICAL AND OUTPUT PERFORMANCE SELECTED FOR THESE FIXTURES. ALTERNATE LIGHTING PROPOSALS MUST BE RECALCULATED AND RESUBMITTED TO THE CITY FOR APPROVAL. CONTACT LAYOUTS@GASSERBUSH.COM FOR ASSISTANCE WITH ALTERNATE OPTIONS IF NEEDED."

- THE ENGINEER AND/OR ARCHITECT MUST DETERMINE APPLICABILITY OF THE LAYOUT TO EXISTING / FUTURE FIELD CONDITIONS.
THIS LIGHTING LAYOUT REPRESENTS ILLUMINATION LEVELS CALCULATED FROM LABORATORY DATA TAKEN UNDER CONTROLLED CONDITIONS IN ACCORDANCE WITH ILLUMINATING ENGINEERING SOCIETY APPROVED METHODS.
ACTUAL PERFORMANCE OF ANY MANUFACTURER'S LUMINAIRE MAY VARY DUE TO VARIATION IN ELECTRICAL VOLTAGE, TOLERANCE IN LAMPS, AND OTHER VARIABLE FIELD CONDITIONS. MOUNTING HEIGHTS INDICATED ARE FROM GRADE AND/OR FLOOR UP.

- THESE LIGHTING CALCULATIONS ARE NOT A SUBSTITUTE FOR INDEPENDENT ENGINEERING ANALYSIS OF LIGHTING SYSTEM SUITABILITY AND SAFETY.
THE ENGINEER AND/OR ARCHITECT IS RESPONSIBLE TO REVIEW FOR MICHIGAN ENERGY CODE AND LIGHTING QUALITY COMPLIANCE.
- UNLESS EXEMPT, PROJECT MUST COMPLY WITH LIGHTING CONTROLS REQUIRMENTS DEFINED IN ASHRAE 90.1 2013. FOR SPECIFIC INFORMATION CONTACT GBA CONTROLS GROUP AT ASG@GASSERBUSH.COM OR 734-266-6705.
- FOR ORDERING INQUIRIES CONTACT GASSER BUSH AT QUOTES@GASSERBUSH.COM OR 734-266-6705.
- THIS DRAWING WAS GENERATED FROM AN ELECTRONIC IMAGE FOR ESTIMATION PURPOSE ONLY. LAYOUT TO BE VERIFIED IN FIELD BY OTHERS.
- MOUNTING HEIGHT IS MEASURED FROM GRADE TO FACE OF FIXTURE. POLE HEIGHT SHOULD BE CALCULATED AS THE MOUNTING HEIGHT LESS BASE HEIGHT.

Sunset Cove_V1 #23-15705.AGI

Gasser Bush Associates / Applications

www.gasserbush.com

Designer: JC3
Date:5/18/2023

Scale: NOT TO SCALE

GBA
GASSER BUSH ASSOCIATES

Zoning Information (White Lake Twp.)

Parcel Identification Number: 12-13-451-011
Zoned: PG Pontiac Gateway
Lot Area: 3.31 Gross Acres, 2.68 Net Acres w/ 60' R.O.W.
Maximum Lot Coverage Allowed: N/A

Lot Coverage (Footprints)
- SQ. FT.

Height
Maximum Building Height: 70.00'
- Proposed = 5-stories 67.81 +/-

Setback Information
- Pontiac Lake Setback
  - Req'd. Residential Buildings = 47.8'
  - Provided Setback (Bldg. 1) = 14.91' & 31.06'
  - Provided Setback (Bldg. 2) = 23.16' & 24.58'
  - Req'd. Restaurant Setback = 30.0'
  - Provided Setback = 19.54'
- Req'd. Setback Between Bldgs. 1&2 = 45.5'
- Provided Setback = 32.04'
- Req'd. Setback Between Rest. & Bldg. 1 = 35.0'
- Provided Setback = 28.3'
- Req'd Resi. Setback from Parking = 25.0'
- Provided Setback = 25.0'

Required Spaces: **Restaurant**
1 Space / 60 SQ. FT. of Gross Area
4,800 SQFT / 60 SQ. FT. = **80 Parking Spaces Required**

Required Spaces: **Multi-Family**
(2) Space per Dwelling Unit
(1/4) Additional Space per Bedroom

44 Units X 2 Spaces = 88 Parking Spaces
92 Bedrooms X 1/4 Spaces = 23 Parking Spaces
88 + 23 = **111 Parking Spaces Required**

Total Spaces Required:
80 Spaces (Restaurant) + 111 Spaces (Multi-Family) = **192 Spaces**

Total Provided Spaces
Off Street Parking:
(52) Enclosed Parking Spaces Provided
(144) Off-Street Parking Spaces Provided
(196) Total Spaces Provided

Unit Schedule:
(40) Two Bedroom Units (20 Buildings)
(4) Three Bedroom Units (2 per Building)
(44) Total Units

Request for Variances

- Sidewalk Construction: Section 5.21 (Public Sidewalk Standards)
- Building 1 setback from Pontiac Lake: Section 3.1.18 (Pontiac Lake Gateway District Development Standards)
- Building 1 encroachment into Natural Features Setback: Section 3.11.Q (Notes to District Standards)
- Building 2 setback from Pontiac Lake: Section 3.1.18 (Pontiac Lake Gateway District Development Standards)
- Building 2 encroachment into Natural Features Setback: Section 3.11.Q (Notes to District Standards)
- Restaurant Building setback from Pontiac Lake: Section 3.1.18 (Pontiac Lake Gateway District Development Standards)
- Restaurant Building encroachment into Natural Features Setback: Section 3.11.Q (Notes to District Standards)
- Setback between Buildings 1 and 2: Section 3.11.G (Notes to District Standards)
- Build-to-Line coverage: Section 3.1.18 (Pontiac Lake Gateway District Development Standards)
- Landscape Greenbelt width

Architectural Site Plan
1" = 30'-0"

krieger klatt ARCHITECTS
architecture interiors consulting
1412 E. 11 Mile Rd. | Royal Oak, MI 48067
P: 248.414.9270 **F:** 248.414.9275
www.kriegerklatt.com

Client:
White Lake JZ, LLC
30201 Orchard Lake Road, Suite 250
Farmington Hills, MI 48334

Project:
Sunset Cove Condominiums
8300 Pontiac Lake Road
White Lake Township, MI 48386

Issued	Description	By
2023-03-31	Discussion Item	RP
2023-05-25	SPA/ZBA	

PRELIMINARY NOT FOR CONSTRUCTION

Seal:
STATE OF MICHIGAN JASON P. KRIEGER ARCHITECT No. 53578 LICENSED ARCHITECT

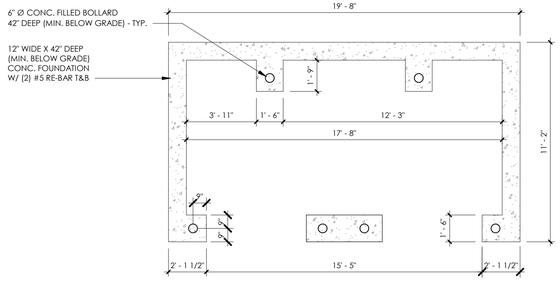
Note:
Do not scale drawings. Use calculated dimensions only. Verify existing conditions in field.

North Arrow:

Sheet Title:
Architectural Site Plan

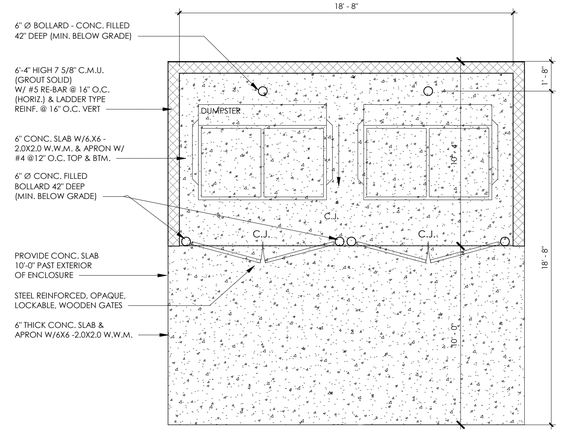
Project Number:
22-098

Sheet Number:
C.100



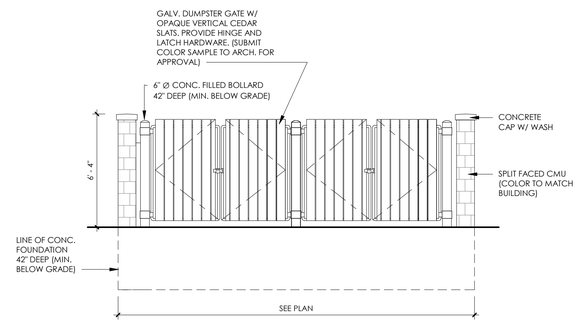
Dumpster Enclosure Foundation Plan

1/4" = 1'-0"



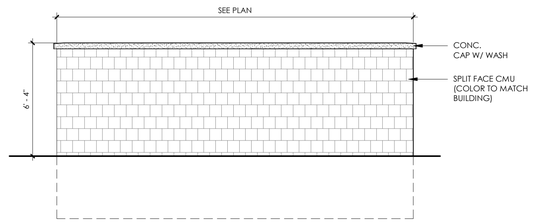
Dumpster Enclosure Floor Plan

1/4" = 1'-0"



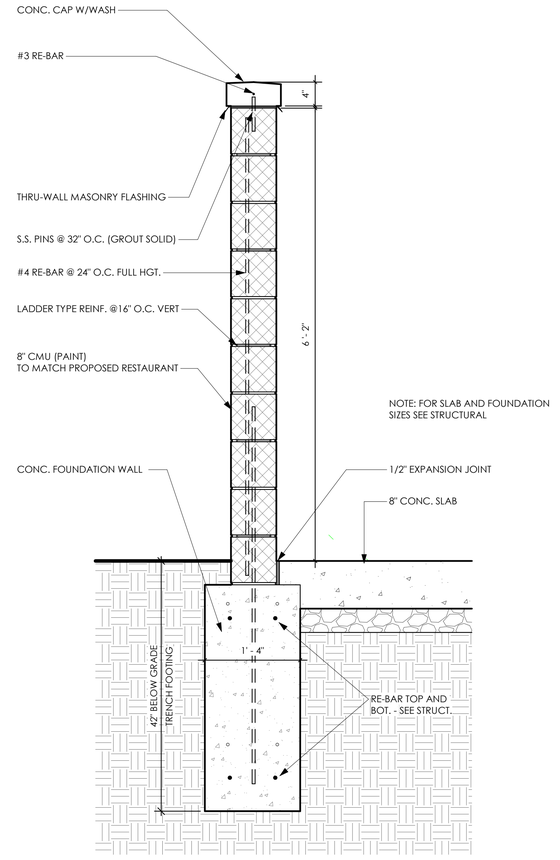
Dumpster Enclosure Front Elevation

1/4" = 1'-0"



Dumpster Enclosure Side/Rear Elevation

1/4" = 1'-0"



Dumpster Enclosure Section

1" = 1'-0"

PRELIMINARY NOT FOR CONSTRUCTION

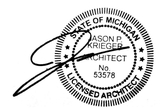
KRIEGER KLATT
ARCHITECTS
2120 E. 11 Mile Rd. | Royal Oak, MI 48067
P: 248.414.9270 **F:** 248.414.9275
www.kriegerklatt.com

Client:
White Lake JZ, LLC

Project:
Sunset Cove Condominiums
8300 Pontiac Lake Road
White Lake Township, MI 48386

Issued	Description	By
2023-03-31	Discussion Item	RP
2023-05-25	SPA/ZBA	

Seal:



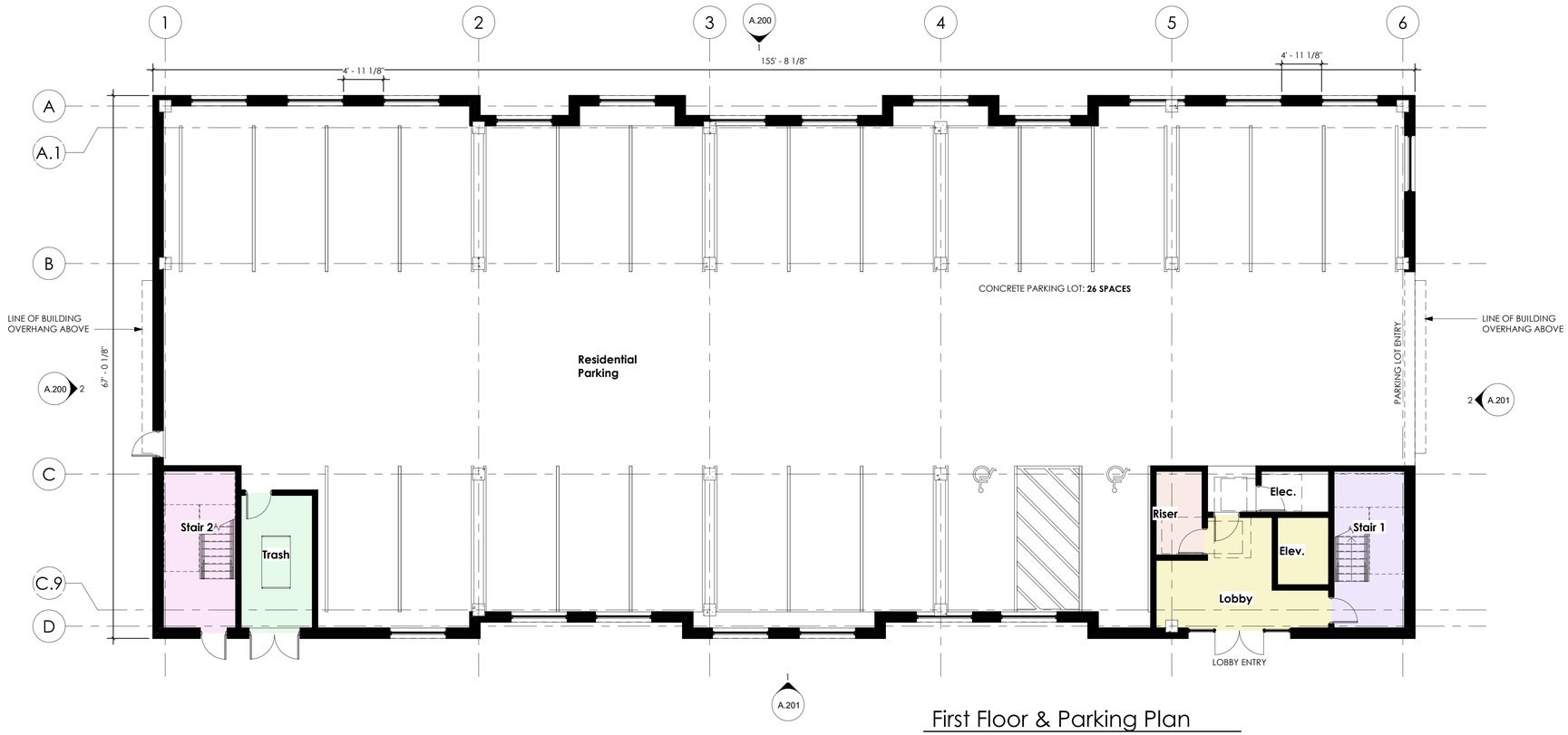
Note:
Do not scale drawings. Use calculated dimensions only. Verify existing conditions in field.

North Arrow:

Sheet Title:
Site Details

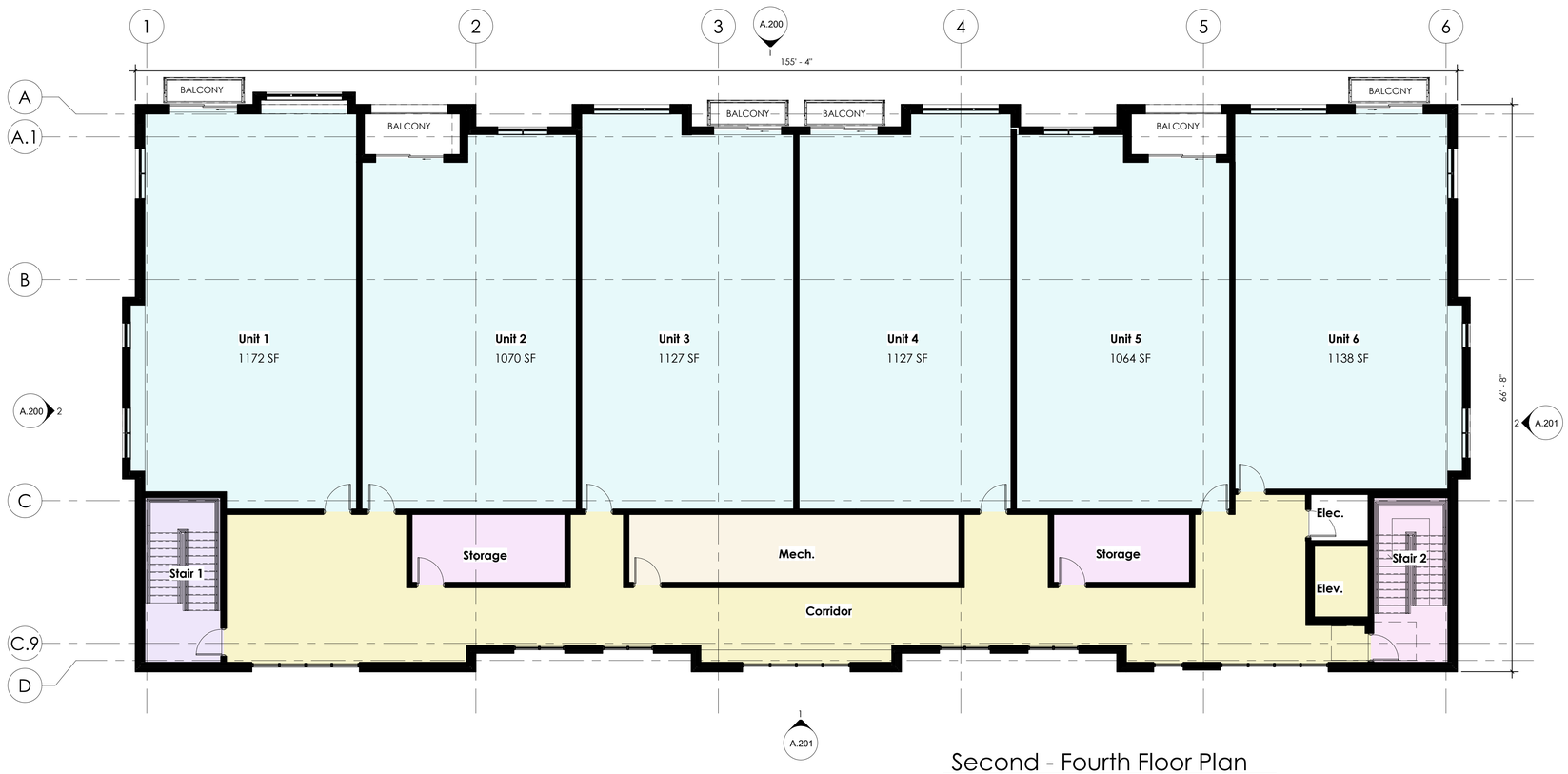
Project Number:
22-096

Sheet Number:
A.001



First Floor & Parking Plan

1/8" = 1'-0"



Second - Fourth Floor Plan

1/8" = 1'-0"

PRELIMINARY NOT FOR CONSTRUCTION

KRIEGER KLATT ARCHITECTS
2120 E. 11 Mile Rd. | Royal Oak, MI 48067
P: 248.414.9270 **F:** 248.414.9275
www.kriegerklatt.com

Client:
White Lake JZ, LLC
30201 Orchard Lake Road, Suite 250
Farmington Hills, MI 48334

Project:
Sunset Cove Condominiums
8300 Pontiac Lake Road
White Lake Township, MI 48386

Issued	Description	By
2023-03-31	Discussion Item	RP
2023-05-25	SPA/ZBA	

Seal:

Note:
Do not scale drawings. Use calculated dimensions only. Verify existing conditions in field.

North Arrow:

Sheet Title:
Floor Plans

Project Number:
22-096

Sheet Number:
A.100

KRIEGER KLATT
ARCHITECTS
2120 E. 11 Mile Rd. | Royal Oak, MI 48067
P: 248.414.9270 **F:** 248.414.9275
www.kriegerklatt.com

Client:

White Lake JZ, LLC
30201 Orchard Lake Road, Suite 250
Farmington Hills, MI 48334

Project:

Sunset Cove Condominiums
8300 Pontiac Lake Road
White Lake Township, MI 48386

Issued	Description	By
2023-03-31	Discussion Item	RP
2023-05-25	SPA/ZBA	

PRELIMINARY NOT FOR CONSTRUCTION

Seal:

Note:

Do not scale drawings. Use calculated dimensions only. Verify existing conditions in field.

North Arrow:

Sheet Title:

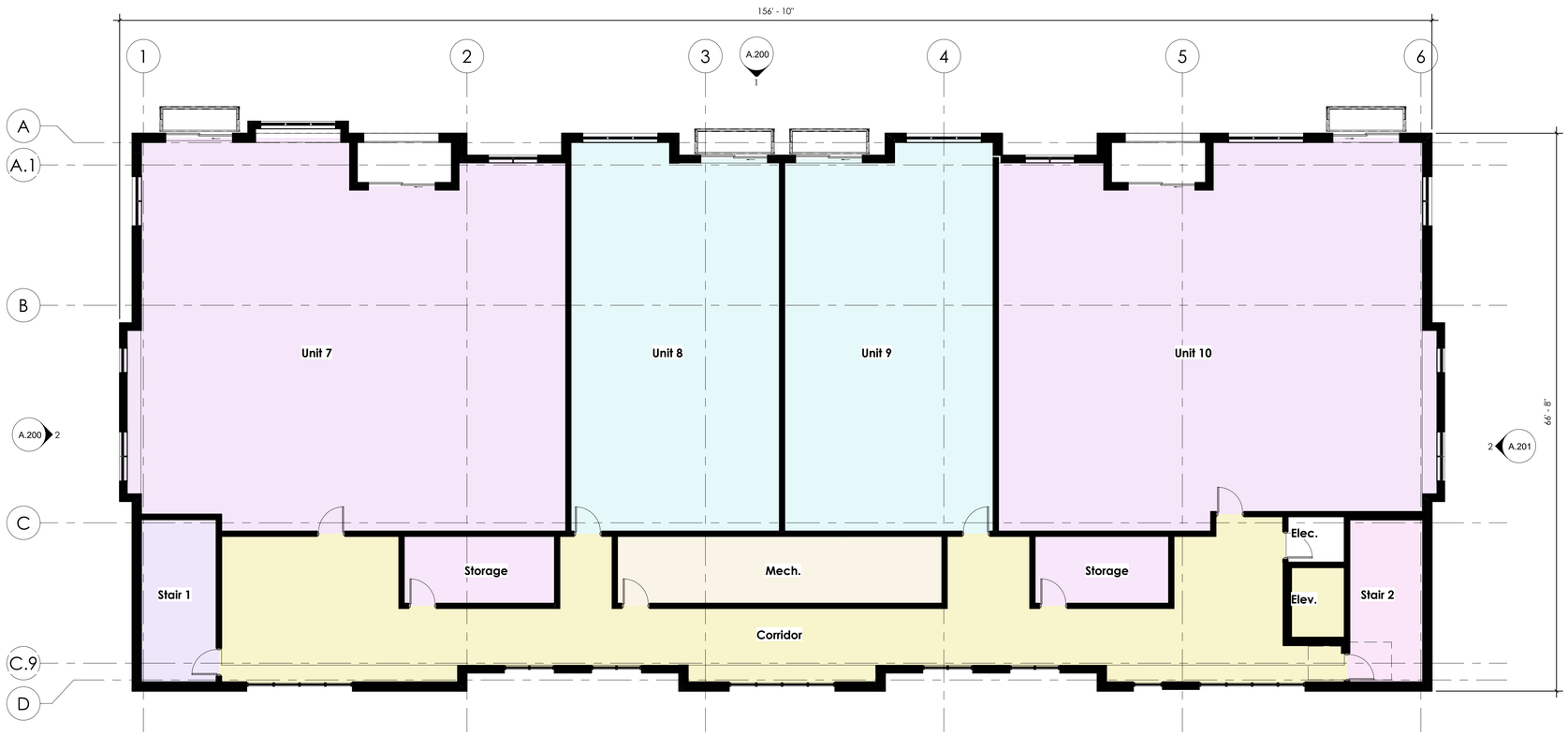
Floor Plans

Project Number:

22-096

Sheet Number:

A.101



Fifth Floor Plan
1/8" = 1'-0"

Front Elevation (Lake Side)

1/8" = 1'-0"

Exterior Material Percentages: Front Facade

SYMBOL	DESCRIPTION	AREA SQFT	PERCENTAGE	REQUIRED
	BRICK, STONE, GLASS	7,331 SQFT	75.7%	MIN. 70%
	BATTEN BOARD	1,764 SQFT	18.2%	MAX. 30%

Exterior Material Schedule X

SYMBOL	DESCRIPTION	LOCATION	MANUFACTURER	FINISH / COLOR
M-1	CULTURED STONE BASE	AS NOTED ON ELEVATIONS	CUSTOM CAST STONE	SPLIT FACE / DARK BUFF
M-2	MASONRY (BRICK)	AS NOTED ON ELEVATIONS	ENDICOTT PRODUCTS OR SIMILAR	EXECUTIVE IRONSPOT
M-3	EXTERIOR SIDING (BATTEN)	AS NOTED ON ELEVATIONS	JAMES HARDIE BATTEN SIDING	MONTEREY TAUPE
M-4	ASPHALT SHINGLES	AS NOTED ON ELEVATIONS	CERTAINTEED	LANDMARK / CHARCOAL BLACK
M-5	ALUM. STOREFRONT	AS NOTED ON ELEVATIONS	KAWNEER OR SIMILAR	ANODIZED / DARK BRONZE
M-6	EXTERIOR LAP SIDING	AS NOTED ON ELEVATIONS	JAMES HARDIE OR SIMILAR	TAN

Exterior Material Percentages: Side Facade

SYMBOL	DESCRIPTION	AREA SQFT	PERCENTAGE	REQUIRED
	BRICK, STONE, GLASS	3,048 SQFT	78.4%	MIN. 70%
	BATTEN BOARD	816 SQFT	21%	MAX. 30%

Side Elevation

1/8" = 1'-0"

KRIEGER KLATT ARCHITECTS
2120 E. 11 Mile Rd. | Royal Oak, MI 48067
P: 248.414.9270 **F:** 248.414.9275
www.kriegerklatt.com

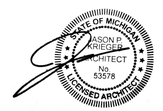
Client:
White Lake JZ, LLC
30201 Orchard Lake Road, Suite 250
Farmington Hills, MI 48334

Project:
Sunset Cove Condominiums
8300 Pontiac Lake Road
White Lake Township, MI 48386

Issued	Description	By
2023-03-31	Discussion Item	RP
2023-05-25	SPA/ZBA	

PRELIMINARY NOT FOR CONSTRUCTION

Seal:



Note:
Do not scale drawings. Use calculated dimensions only. Verify existing conditions in field.

North Arrow:

Sheet Title:
Elevations - Typ.

Project Number:
22-096

Sheet Number:
A.200

Rear Elevation (Parking Side)

1/8" = 1'-0"

Exterior Material Percentages: Rear Facade

SYMBOL	DESCRIPTION	AREA SQFT	PERCENTAGE	REQUIRED
	BRICK, STONE, GLASS	7,712 SQFT	79.4%	MIN. 70%
	BATTEN BOARD, LONGBOARD	1,860 SQFT	19.1%	MAX. 30%

Exterior Material Schedule X

SYMBOL	DESCRIPTION	LOCATION	MANUFACTURER	FINISH / COLOR
M-1	CULTURED STONE BASE	AS NOTED ON ELEVATIONS	CUSTOM CAST STONE	SPLIT FACE / DARK BUFF
M-2	MASONRY (BRICK)	AS NOTED ON ELEVATIONS	ENDICOTT PRODUCTS OR SIMILAR	EXECUTIVE IRONSPOT
M-3	EXTERIOR SIDING (BATTEN)	AS NOTED ON ELEVATIONS	JAMES HARDIE BATTEN SIDING	MONTEREY TAUPE
M-4	ASPHALT SHINGLES	AS NOTED ON ELEVATIONS	CERTAINTEED	LANDMARK / CHARCOAL BLACK
M-5	ALUM. STOREFRONT	AS NOTED ON ELEVATIONS	KAWNEER OR SIMILAR	ANODIZED / DARK BRONZE
M-6	EXTERIOR LAP SIDING	AS NOTED ON ELEVATIONS	JAMES HARDIE OR SIMILAR	TAN

Exterior Material Percentages: Side Facade

SYMBOL	DESCRIPTION	AREA SQFT	PERCENTAGE	REQUIRED
	BRICK, STONE, GLASS	2,806 SQFT	78.8%	MIN. 70%
	BATTEN BOARD	754 SQFT	21.2%	MAX. 30%

Side Elevation (Vehicle Entry)

1/8" = 1'-0"

PRELIMINARY NOT FOR CONSTRUCTION

KRIEGER KLATT ARCHITECTS
2120 E. 11 Mile Rd. | Royal Oak, MI 48067
P: 248.414.9270 **F:** 248.414.9275
www.kriegerklatt.com

Client:
White Lake JZ, LLC
30201 Orchard Lake Road, Suite 250
Farmington Hills, MI 48334

Project:
Sunset Cove Condominiums
8300 Pontiac Lake Road
White Lake Township, MI 48386

Issued	Description	By
2023-03-31	Discussion Item	RP
2023-05-25	SPA/ZBA	

Seal:
STATE OF MICHIGAN JASON P. KRIEGER ARCHITECT NO. 53576 LICENSED ARCHITECT

Note:
Do not scale drawings. Use calculated dimensions only. Verify existing conditions in field.

North Arrow:

Sheet Title:
Elevations - Typ.

Project Number:
22-096

Sheet Number:
A.201

FLEIS&VANDENBRINK
DESIGN. BUILD. OPERATE.

MEMO

VIA EMAIL mikezeer@aol.com

To:	**Mike Zeer** **White Lake JZ, LLC**
From:	**Jacob Swanson, PE** **Kyle J. Paulson** **Fleis & VandenBrink Engineering**
Date:	**February 8, 2023**
Re:	**Sunset Cove Development** **White Lake Township, Michigan** **Traffic Impact Assessment**

1 INTRODUCTION

This memorandum presents the results of the Traffic Impact Assessment (TIA) for the proposed Sunset Cove development in White Lake Township, Michigan. The project site is located at 8300 Pontiac Lake Road, generally in the north quadrant of the Highland Road (M-59) and Pontiac Lake Road intersection, as shown on the attached **Figure 1.** The proposed development includes the construction of multi-family residential housing and a restaurant. Site access is proposed via two (2) driveways on Pontiac Lake Road: one (1) east most Right-In/Right-Out (RIRO) only driveway and one (1) full access driveway to the west. As part of the site plan approval process and for the permitting of site access, White Lake Township has required a TIA for the proposed development to determine the impact of the site-generated traffic on the adjacent roadway system.

The scope of the study was developed based on Fleis & VandenBrink's (F&V) understanding of the development program, accepted traffic engineering practice, and methodologies published by the Institute of Transportation Engineers (ITE). Additionally, White Lake Township and the Road Commission for Oakland County (RCOC) provided input on the scope of work for this project. The study analyses were completed using Synchro/SimTraffic (Version 11) traffic analysis software. Sources of data for this study include F&V subconsultant Quality Counts (QC), White Lake Township, the Southeast Michigan Council of Governments (SEMCOG), RCOC, and ITE.

2 BACKGROUND DATA

2.1 EXISTING ROAD NETWORK

Vehicle transportation for the study area is provided via Highland Road (M-59). The lane use and traffic control at the study intersections are shown on the attached **Figure 2** and the study roadways are further described below. For the purposes of this study, site driveways and minor street were assumed to have an operating speed of 25 miles per hour (mph), unless otherwise noted.

Pontiac Lake Road generally runs in the northwest and southeast directions, adjacent to the south side of the project site. Pontiac Lake Road is classified as a *Major Collector*, is under the jurisdiction of the RCOC, and has a posted speed limit of 35 mph. The study section of the roadway provides a two-lane cross-section, with one (1) lane in each direction. Additionally, at the intersection with Highland Road (M-59), Pontiac Lake Road widens to provide exclusive left- and right-turn lanes in both directions.

27725 Stansbury Boulevard, Suite 195
Farmington Hills, MI 48334
P: 248.53[illegible]
F: 248.53[illegible]
www.fven[illegible]

2.2 EXISTING TRAFFIC VOLUMES

F&V subconsultant QC collected 24-hours of existing weekday Turning Movement Count (TMC) data on Tuesday, January 17th, 2023 in the vicinity of the proposed site driveway intersection on Pontiac Lake Road.

During collection of the turning movement counts, Peak Hour Factors (PHFs), pedestrian and bike volumes, and commercial truck percentages were recorded and used in the traffic analysis. The peak hour traffic volumes for each intersection were utilized and the volumes were balanced upward through the study network and balanced through the proposed site driveways. Therefore, the raw traffic volumes shown in the data collection may not match the traffic volumes used in the analysis and shown on the attached traffic volume figures.

The AM and PM peak hours for the study roadway network were observed to generally occur on weekdays between 7:15 AM to 8:15 AM and 4:30 PM to 5:30 PM, respectively. F&V collected an inventory of existing lane use and traffic controls, as shown on the attached **Figure 2**. The existing 2023 peak hour traffic volumes are shown on the attached **Figure 2**. All applicable background data referenced in this memorandum is attached.

3 BACKGROUND (2026) CONDITIONS

Historical population and economic profile data was obtained for White Lake Township from SEMCOG in order to calculate a background growth rate to project the existing 2023 peak hour traffic volumes to the site buildout year of 2026. Population and employment projections from 2020 to 2045 were reviewed and show an average annual growth of 0.16% and 0.01%, respectively. Therefore, a conservative background growth rate of **0.5%** per year was applied to the existing peak hour traffic volumes to forecast the background 2026 traffic volume ***without the proposed development***.

In addition to the background traffic growth, it is important to account for traffic that will be generated by developments within the vicinity of the study area that are currently under construction or will be within the buildout year. At the time of this study, no planned background developments were identified, within the vicinity of the project site. Therefore, the background peak hour traffic volumes shown on the attached **Figure 2** were calculated based on the application of the annual background growth rate applied to the existing peak hour traffic volumes shown on the attached **Figure 2**.

4 SITE TRIP GENERATION

The number of weekday peak hour (AM and PM) and daily vehicle trips generated by the proposed development were calculated using the rates published by the Institute of Transportation Engineers (ITE) in *Trip Generation, 11th Edition*. The proposed development includes the construction of a 4,836 square foot restaurant and 46 units of multi-family residential housing. Review of the ITE *Trip Generation Manual, 11th Edition*, indicates that the following land uses codes (LUC) were determined to be the best fit for the proposed development. Additionally, in order to provide a conservative evaluation of the proposed development, pass-by trips and internal trip capture was not considered. The trip generation used in this analysis is summarized in **Table 1**.

LUC 221: Multi-Family Housing (Mid-Rise)

- Mid-rise multifamily housing includes apartments and condominiums located in a building that has between four (4) and ten (10) floors of living space. Access to individual dwelling units is through an outside building entrance, a lobby, elevator, and a set of hallways.

LUC 932: High Turnover (Sit-down) Restaurant

- This land use consists of sit-down, full-service eating establishments (that may include alcohol service) with a typical duration of stay of 60 minutes or less. A patron typically waits to be seated, is served by wait staff, orders from a menu, and pays after the meal. A small proportion of customers may carry-out orders.

Table 1: Trip Generation Summary

Land Use	ITE Code	Amount	Units	Average Daily Traffic (vpd)	AM Peak Hour (vph)			PM Peak Hour (vph)		
					In	Out	Total	In	Out	Total
Multi-Family Housing (Mid-Rise)	221	46	DU	173	2	7	9	11	7	18
High Turnover (Sit-down) Restaurant	932	4,836	SF	518	25	21	46	27	17	44
Total New Trips				**691**	**27**	**28**	**55**	**38**	**24**	**62**

5 SITE TRIP DISTRIBUTION

The vehicular trips that would be generated by the proposed development were assigned to the study roadway network based on the proposed site access plan and driveway configurations, the existing peak hour traffic patterns in the adjacent roadway network, and the methodologies published by ITE. The ITE trip distribution methodology assumes that new trips will enter the network and access the development, then leave the development and return to their direction of origin. The site trip distributions utilized in this analysis are summarized in **Table 2**.

Table 2: Site Trip Distribution

To/From	Via	Residential		Commercial	
		AM	PM	AM	PM
East	Pontiac Lake Road	80%	65%	19%	65%
West	Pontiac Lake Road	20%	35%	81%	35%
Total		**100%**	**100%**	**100%**	**100%**

The vehicular traffic volumes shown in **Table 1** were distributed to the study network according to the distribution shown in **Table 2**. The site-generated trips shown on the attached **Figure 5** were added to the background peak hour traffic volumes shown on the attached **Figure 4**, in order to calculate the future peak hour traffic volumes with the addition of the proposed development. Future peak hour traffic volumes are shown on the attached **Figure 6**.

6 FUTURE (2026) CONDITIONS

The future peak hour vehicle delays and LOS ***with the proposed development*** were calculated based on the future lane use and traffic control shown on the attached **Figure 2,** the proposed site access plan and driveway configurations, future peak hour traffic volumes shown on the attached **Figure 6**, and the methodologies presented in the HCM6. The results of the future conditions analysis, ***with the addition of the proposed development***, are attached and summarized in **Table 3**.

Table 3: Future Intersection Operations

Intersection		Control	Approach	Future Conditions			
				AM Peak		PM Peak	
				Delay (s/veh)	LOS	Delay (s/veh)	LOS
1	Pontiac Lake Road & W. Site Drive	Stop (Minor)	EBL	7.3	A	7.8	A
			WB	Free			
			SB	9.4	A	10.7	B
2	Pontiac Lake Road & Gas Station Drive	Stop (Minor)	EB	Free			
			WBL	7.6	A	7.5	A
			NB	9.3	A	9.9	A
3	Pontiac Lake Road & E. Site Drive	Stop (Minor)	EB	Free			
			WB	Free			
			SBR	8.6	A	9.5	A

The results of the future conditions analysis indicates that all the study intersection approaches and movements are expected to operate acceptably, at LOS D or better during both the AM and PM peak periods. Additionally, review of SimTraffic network simulations at the existing gas station and proposed site drive intersections indicates acceptable operations and minimal vehicle queueing. Vehicles at the stop-controlled study intersections and site driveways were observed to find adequate gaps within the through traffic along Pontiac Lake Road, without experiencing significant delays or excessive vehicle queuing.

7 ACCESS MANAGEMENT – AUXILIARY TURN LANE EVALUATION

Pontiac Lake Road is under the jurisdiction of the RCOC; therefore, the RCOC warranting threshold guidelines were utilized in order to determine the need for auxiliary turn lanes at the proposed site driveways. The proposed E. Site Drive will operate as a Right-In/Right-Out (RIRO) driveway; therefore, left-turn lane warrants were not evaluated at this location. The result of the analyses shown on the attached RCOC warrant charts and are summarized in **Table 4.**

Table 4: Turn Lane Warrant Analysis Summary

Site Driveway Intersection	Right-Turn Treatment	Left-Turn Treatment
Pontiac Lake Road & West Site Drive	**No Treatment**	**No Treatment**
Pontiac Lake Road & East Site Drive	**No Treatment**	**N/A**

The results of the auxiliary turn lane evaluations indicates that auxiliary turn lane treatments are NOT warranted or recommended at the proposed site driveways on Pontiac Lake Road.

8 CONCLUSIONS

The conclusions of this TIA are as follows:

- The results of the future conditions analysis indicates that all the study intersection approaches and movements are expected to operate acceptably, at LOS D or better during both peak periods. Additionally, review of SimTraffic microsimulations also indicated acceptable operations throughout the study roadway network during both peak periods, with minimal vehicle queueing observed.
- The RCOC auxiliary turn lane warranting thresholds were evaluated at the proposed site driveways on Pontiac Lake Road. The results of the evaluation indicate that auxiliary turn lane treatments are NOT warranted or recommended at the proposed site driveways on Pontiac Lake Road.

Any questions related to this memorandum, study, analysis, and results should be addressed to Fleis & VandenBrink.

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Michigan.

Digitally signed by Jacob Swanson
Date: 2023.02.08 17:44:30 -05'00'

Attached: Figures 1-2
Proposed Site/Concept Plan
Traffic Volume Data
Synchro / SimTraffic Results
Auxiliary Turn Lane Warrants

FIGURE 1

SITE LOCATION MAP

SUNSET COVE DEVELOPMENT
WHITE LAKE TOWNSHIP, MICHIGAN

F&V

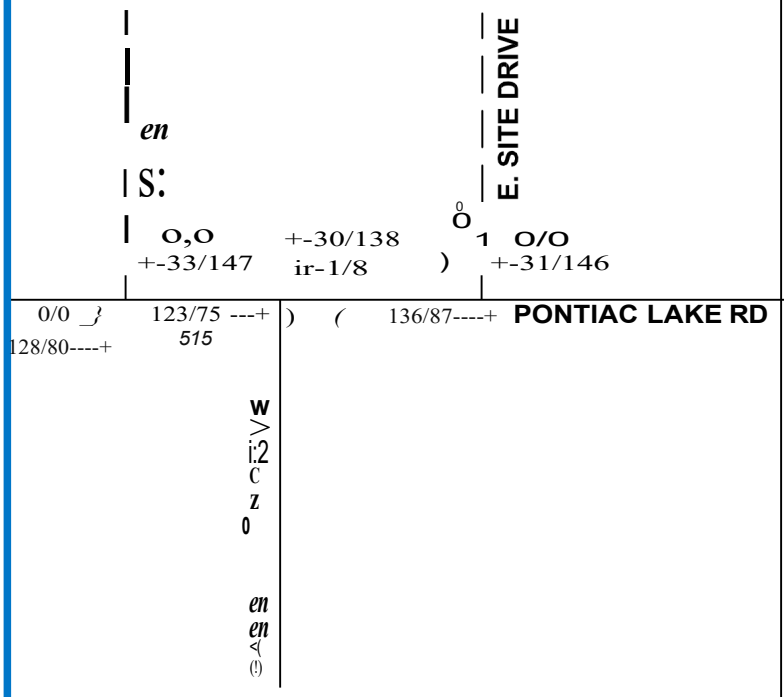
LEGEND

SITE LOCATION

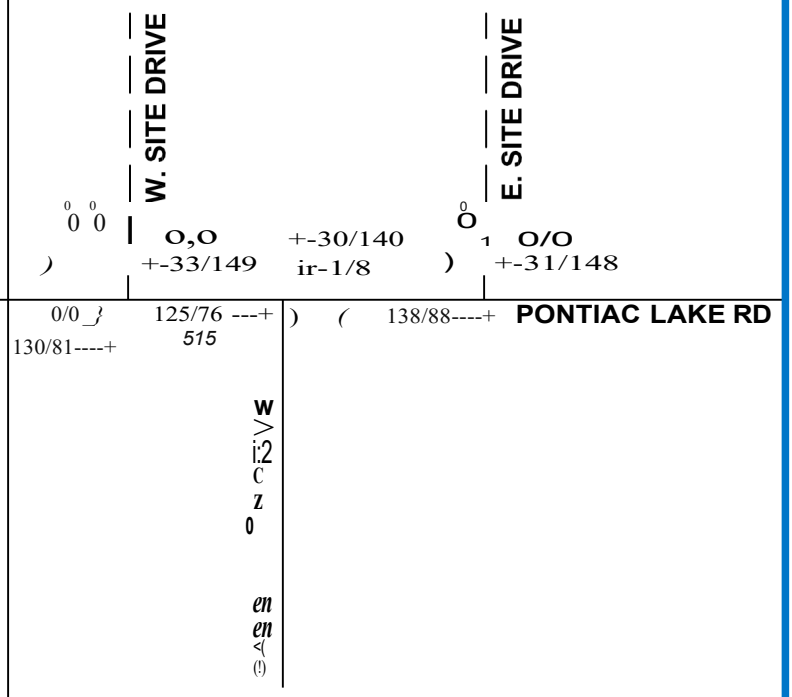
NORTH

SCALE:NOT TO

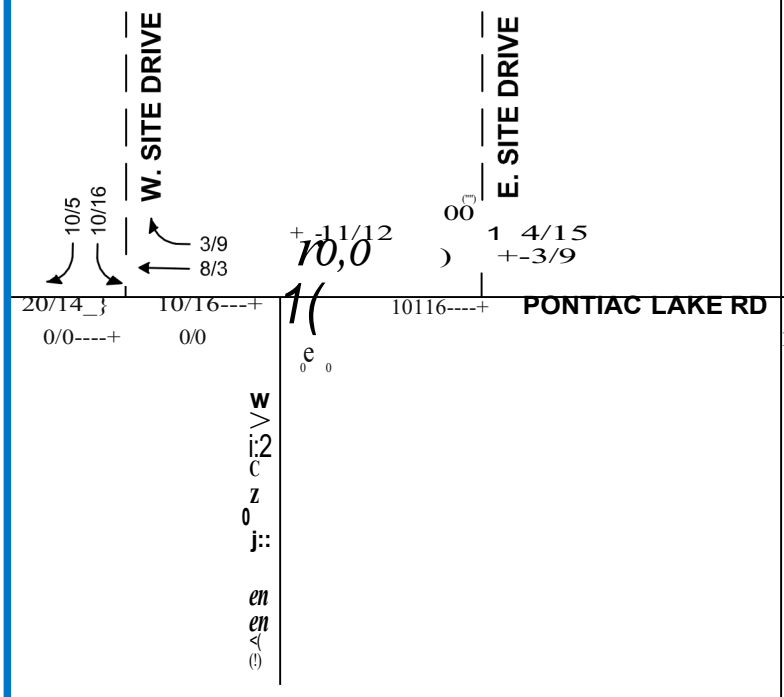
EXISTING



BACKGROUND



SITE GEN



FUTURE

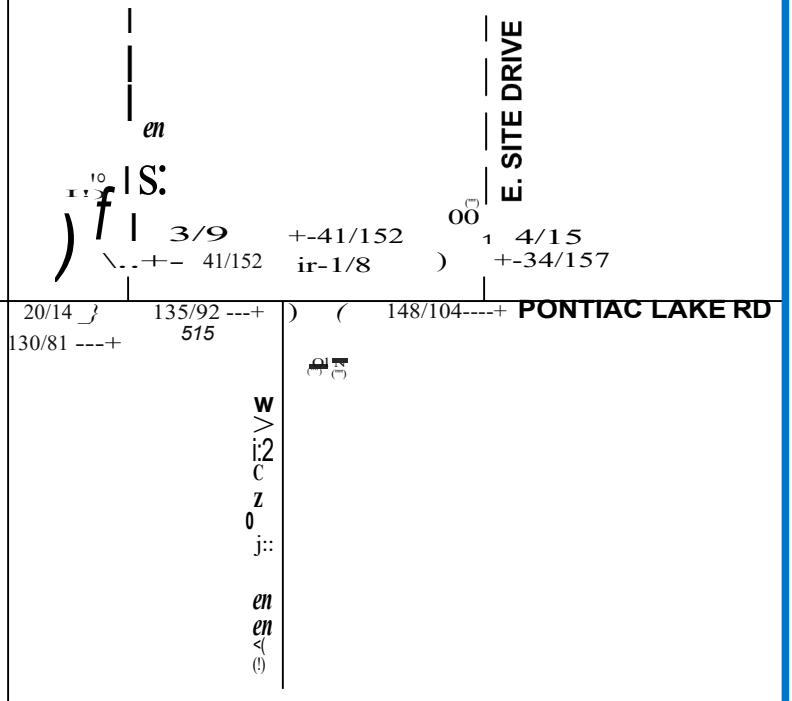


FIGURE 2
TRAFFIC VOLUMES

SUNSET COVE DEVELOPMENT
WHITE LAKE TOWNSHIP, MICHIGAN

LEGEND

NORTH
SCALE:NOT TO SCALE

ROADS

PROPOSED ROADS

TRAFFIC VOLUMES (AM/PM)

SI[illegible] DATA:

PARCEL ADDRESS: 8300 PONTIAC LAKE RD., WHITE LAKE TWP., MI 48386
PARCEL IDENTIFICATION #: 12-13-451-011

GROSS AREA OF SITE: 3.31 AC.
60' WO. R.O. W. AREA: 0.63 AC.
NET AREA OF SITE: 2.68 AC.

EXISTING ZONING: PG - PONTIAC GATEWAY
ADJACENT ZONING:
NORTH: NO ZONING (PONTIAC LAKE)
SOUTH R1-C SINGLE FAMILY RESIDENTIAL AND GB GENERAL BUSINESS
EAST: PG - PONTIAC GATEWAY
WEST: NO ZONING (PONTIAC LAKE)

MAX. BUILDING HEIGHT ALLOWED: 70 FT.
BUILDING HEIGHT PROPOSED: 55 FT.+/-

RESIDENTIAL:
TOTAL UNITS PROVIDED: 46 UNITS
BUILDING 1: 18 (2 BEDROOM UNITS) 36 BEDROOMS
BUILDING 2: 18 (2 BEDROOM UNITS) 36 BEDROOMS
BUILDING 3: 10 (2 BEDROOM UNITS) 20 BEDROOMS
TOTAL NUMBER OF BEDROOMS PROVIDED: 92 BEDROOMS

PAPKING SPACES REQUIRED: 2 SPACES PER UNIT PLUS 1/4 SPACE PER BEDROOM
2 x 46 UNITS = 92 SPACES
1/4 x 92 BEDROOMS = 23 SPACES
PARKING SPACES REQUIRED = 115 SPACES

RESTAURANT:
GROSS AREA: 4,836 S.F.
PARKING SPACES REQUIRED: 1 SPACE PER 60 S.F. OF GROSS AREA
4,836 / 60 = 80.6 SPACES
PARKING SPACES REQUIRED = 81 SPACES

PAPKING VARIANCE REQUEST FOR BOAT DOCKING:
APPLICANT REQUESTS A PARKING REQUIREMENT VARIANCE DUE TO DOCKING PROVIDED. THIRTY (30) BOAT DOCKING SPACES HAVE BEEN PROVIDED. A VARIANCE FROM THE ZONING BOARD OF APPEALS (ZBA) IS REQUESTED TO REDUCE THE PARKING REQUIREMENT BY ONE (1) PARKING SPACE FOR EVERY TWO (2) BOAT DOCKING SPACES. THEREFORE, A PARKING REQUIREMENT VARIANCE (REDUCTION) OF FIFTEEN (15) PARKING SPACES IS REQUESTED.

PARKING REQUIREMENT / PROVIDED:
TOTAL PARKING REQUIRED:
RESIDENTIAL = 115 SPACES
RESTAURANT= 81 SPACES
BOAT PARKING VARIANCE= -15 SPACES (REDUCTION)
TOTAL PARKING REQUIRED= 181 SPACES

TOTAL PARKING SPACES PROVIDED INCLUDING = 194 SPACES
ONE SPACE DEDICATED FOR SAN. PUMP STATION

BARRIER-FREE RESERVED PARKING SIGNS

NOTE: ACCESSIBLE PARKING SPACE SIGNS SHALL HAVE A MIN. HEIGHT AND SIZE TO PERMIT THE SPACE TO BE EASILY IDENTIFIED AND ARE ELEVATED SUCH THAT THEY SHALL NOT PRESENT A HAZARD TO PERSONS WALKING NEAR THE SIGN.

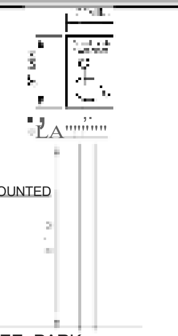
SIGNING NOTES

1. ALL SIGNS SHALL HAVE A MINIMUM BOTTOM MOUNTING HEIGHT OF 7' FROM FINAL GRADE FOR GROUND MOUNTED SIGNS. WALL MOUNTED SIGNS MAY HAVE A BOTTOM MOUNTING HEIGHT OF 5'.
2. ALL ROADSIDE SIGNS SHOULD BE INSTALLED TWO FEET FROM THE FACE OF THE CURB TO THE NEAR EDGE OF THE SIGN.
3. SINGLE SIGNS WITH NOMINAL DIMENSIONS OF 12"x18" OR SMALLER IN SIZE SHALL BE MOUNTED ON A GALVANIZED 2 LB U-CHANNEL POST. MULTIPLE SIGNS AND/OR SIGNS WITH NOMINAL DIMENSIONS GREATER THAN 12"x18" SHALL BE MOUNTED ON A GALVANIZED 3 LB. OR GREATER U-CHANNEL POST AS DICTATED BY THE WEIGHT OF THE PROPOSED SIGNS.
4. TRAFFIC CONTROL SIGNS SHALL USE THE FHWA STANDARD ALPHABET SERIES
5. TRAFFIC CONTROL SIGNS SHALL HAVE A HIGH INTENSITY PRISMATIC (HIP) SHEETING TO MEET FHWA RETROREFLECTIVITY REQUIREMENTS.

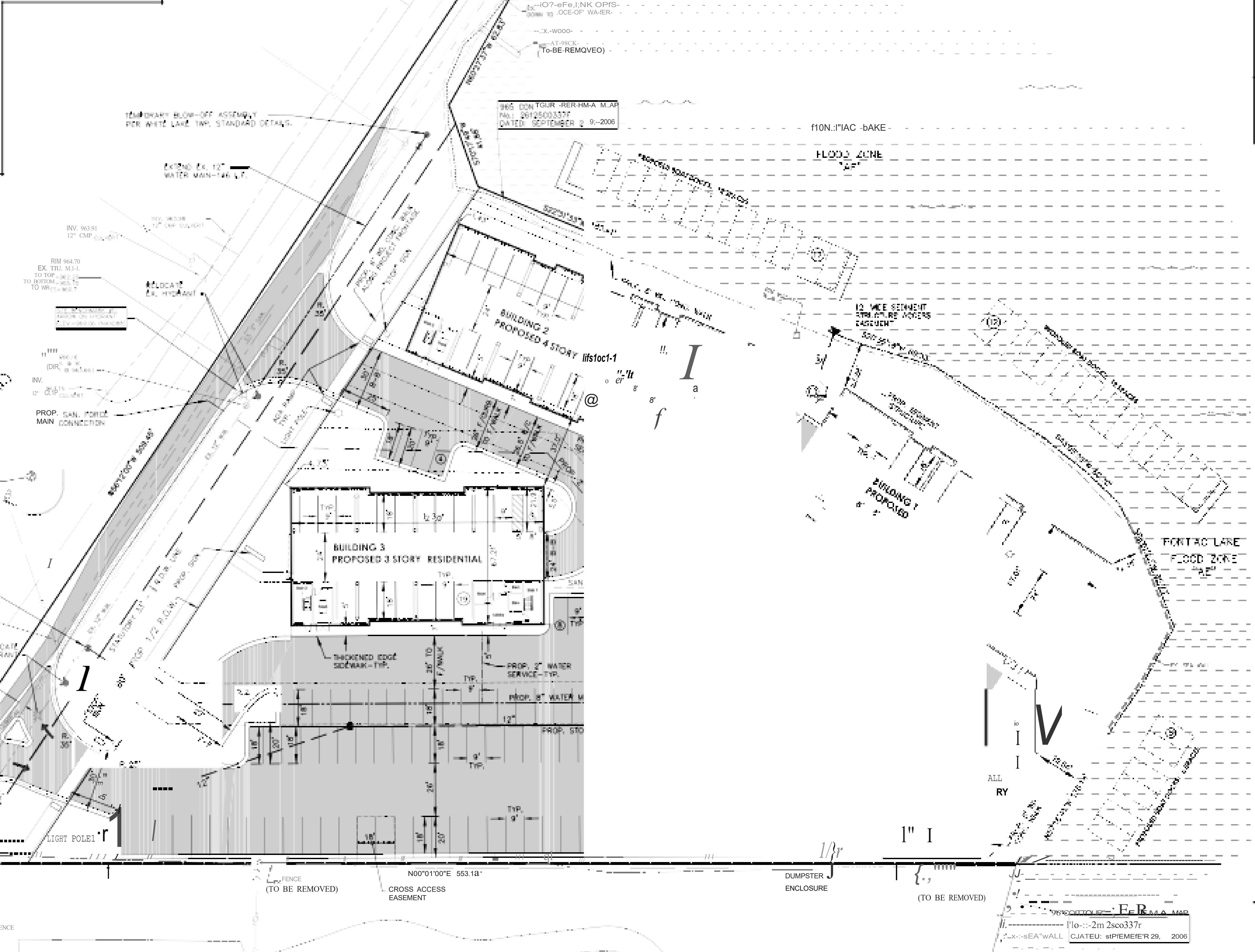
STRIPING NOTES:

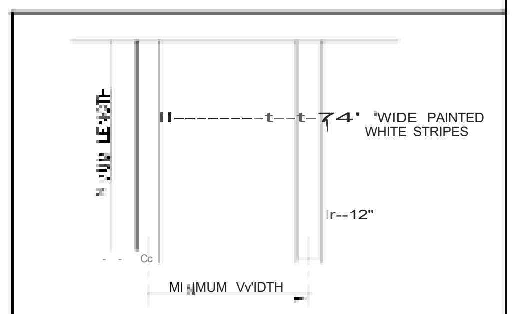
1. PARKING LOTS SHALL HAVE PARKING AREAS AND RAMP PAVEMENT MARKINGS MARKED BY PAINTED 4-INCH WIDE LINES ACCURATELY AND NEATLY ARRANGED AS INDICATED ON THE PLAN. LINES SHALL BE PAINTED WITH AN APPROVED WHITE TRAFFIC PAINT COMPATIBLE WITH BITUMINOUS/CONCRETE SURFACES SUCH AS SHERWIN WILLIAMS NO. 82 9W1; PPG TYPE 11-3 OR 11-4, OR AS APPROVED BY THE OWNER. PROTECT ALL PAINTED AREAS UNTIL PAINT IS COMPLETELY DRY. PARKING AREAS FOR THE PHYSICALLY HANDICAPPED SHALL BE PAINTED WITH BLUE PAINT FOR STRIPING. WHEEL CHAIR SYMBOL SHALL BE PAINTED WHITE. ALL PAINTED MARKINGS AND STRIPING SHALL BE PROVIDED IN TWO COATS.
2. THE INTERNATIONAL SYMBOL FOR ACCESSIBILITY SHALL BE WHITE OR WHITE W/ BLUE BACKGROUND
3. WHEN A BARRIER FREE PARKING SPACE IS ADJACENT TO A STANDARD PARKING SPACE, BLUE AND WHITE LINES ABUTTING EACH OTHER SHALL BE PROVIDED.

R1-1 30"x30" (STOP) SIGN

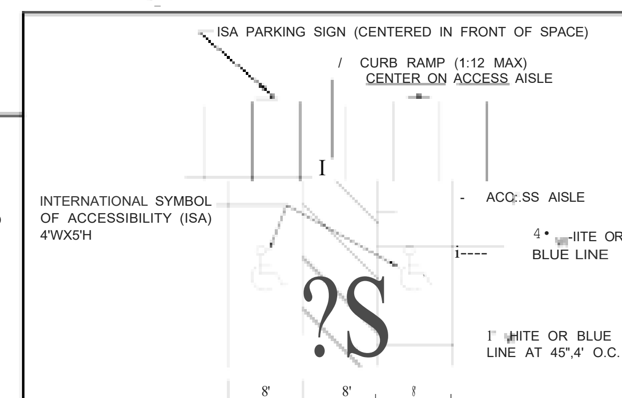


BARRIER-FREE PARKING SIGN





PARKING SPACES SIRIPING REQUIREMENTS



BARRIER-FREE PARKING SPACE LAYOUT VAN ACCESSIBLE

SCALE

(IN FEET)
Scale: 1 inch = 30 ft.

LOT COVERAGE:

GROSS AREA OF SITE	=	3.31 Ac.
BUILDING AREA	=	0.72 Ac.
PROPOSED LOT COVERAGE	=	0.72 / 3.31 = 21.7%

SIGN QUANTITIES

SYMBOL	DESCRIPTION	QUANITITY PANEL	QUANITITY POST
	R1-1 30nx30" (STOP) SIGN	2	2
	R7-8 12"x8n BARRIER FREE HANDICAP SIGN	2	2
	R7-8P 12"x6n (YAN ACCESSIBLE) SIGN	2	0

PROPOSED IMPROVEMENTS:

1. MUNICIPAL SEWER TO BE PROVIDED BY CONSTRUCTING ON SITE GRAVITY SANITARY SEWER SYSTEM AND ON-SITE PUMP STATION AND FORCE MAIN. THE PROPOSED FORCE MAIN WILL CONNECT TO AN EXISTING 3" DIAMETER FORCE MAIN LOCATED IN PONTIAC LAKE ROAD.
2. WATER SUPPLY TO BE PROVIDED BY CONNECTING TO AN EXIST. 12" WATERMAIN ALONG PONTIAC LAKE ROAD. PROPOSED WATERMAINS SHALL BE B" AS SHOWN.
3. ON-SITE STORM WATER SYSTEM WILL FLOW TO A SEDIMENT STRUCTURE THEN DISCHARGE TO PONTIAC LAKE. STORM WATER DETENTION TO BE PROVIDED BY BY P NTIAC LAKE.
4. AN 8' WIDE CONC. SIDEWALK TO BE CONSTRUCTED ALONG THE NORTH R.O.W. OF PONTIAC LAKE ROAD AS SHOWN. SEE PAVEMENT CROSS SECTION AND CURB DETAILS ON SHEET 4.
5. ALL ELECTRIC, CABLE TV & PHONE LINES SHALL BE LOCATED UNDERGROUND AND SHALL BE PLACED WITHIN EASEMENTS DEDICATED FOR SUCH USE.

NOIES:

1. ON-SITE SANITARY SEWER, SANITARY FORCE MAINS, AND WATER MAINS SHALL BE CENTERED IN A 20-FOOT WO. EASEMENT.
2. ALL FORCE MAIN, PUMP STATION AND WATER MAIN IMPROVEMENTS WILL BECOME PUBLIC PROPERTY.
3. PROVISIONS PURSUANT TO OAKLAND COUNTY WATER RESOURCE COMMISSION AND SOIL EROSION CONTROL MANUAL WILL BE UNDERTAKEN INCLUDING, BUT NOT LIMITED TO, SILT FENCE AND INLET FILTERS.
4. PROPOSED GRADES WILL MATCH EXISTING ELEVATIONS AT THE PROPERTY LINES UNLESS RETAINING WALLS ARE PROVIDED OR GRADING EASEMENTS OBTAINED.
5. A PERMIT FROM THE ROAD COMMISSION FOR OAKLAND COUNTY WILL BE REQUIRED FOR ALL WORK IN THE PONTIAC LAKE ROAD RIGHT-OF-WAY.
6. ALL WATER MAIN SHALL BE CLASS 54 DUCTILE IRON & ALL GATE VALVES SHALL BE PLACED IN GATE WELLS.
7. ALL STORM STRUCTURES EXCEPT FOR INLETS WHICH CONNECT TO CATCH BASINS WILL BE A MINIMUM OF 4 FEET IN DIAMETER.
8. THE DEVELOPMENT SHALL BE CONSTRUCTED AS A SINGLE PHASE.
9. ALL EXISTING UTILITIES ON THE PROPERTY WILL BE REMOVED, INCLUDING SANITARY SEWER AND STORM SEWER.
10. ALL EXISTING WELLS ON SITE WILL BE ABANDONED IN ACCORDANCE WITH OAKLAND COUNTY HEALTH DEPARTMENT REQUIREMENTS.
11. THE DUMPSTER ENCLOSURE SHALL MATCH THE SAME MASONRY PRODUCT AS THE RESTAURANT BUILDING WITH A STEEL-BACKED WOOD GATE PAINTED WITH A COMPLIMENTARY COLOR TO THE MASONRY PRODUCT.
12. THE ANGLE OF APPROACH AND DEPARTURE SHALL NOT EXCEED 300 FEET.
13. REMOVE OR RELOCATE FIXED OBJECTS LOCATED WITHIN THE R.C.O.C. RIGHT-OF-WAY PRIOR TO EXCAVATION. FIXED OBJECTS SHALL BE NO NEARER THAN 5' FROM BACK OF CURB, OR 12' FROM LANE LINE.

LEGEND

EXISTING	PROPOSED	
		PAVEMENT (ASPHALT)
		SIDE WALK (CONCRETE) CONCRETE CURB AND GUTTER
		STORM SEWER
		SANITARY FORCE MAIN
		SANITARY GRAVITY MAIN
		WATER MAIN
		MANHOLE
		CATCH BASIN END SECTION
		GATE VALVE
		HYDRANT
---1000---	1000	CONTOURS
	1000.00 T/C	SPOT ELEVATION
		SURFACE DRAINAGE

SUNSET COVE CONDOMINIUMS

PART OF THE WEST 1/2 OF THE SOUTHEAST 1/4 OF SECTION 13, TOWN 3 NORTH, RANGE 8 EAST
WHITE LAKE TWP., OAKLAND COUNTY, MICHIGAN

DATE: 11-15-22	DESIGNED BY: A.A.	JOB NUMBER: 21-306
	CHECKED BY: J.E.	DRAWING FILE: 21-21306-0A

REVISIONS

NO.	ITEM	DATE
1	REV. PER TWP. REVIEW	1-5-23
2.	REV. BLDG. 3 AND PARKING PER OWNER	1-19-23

OVERALL PLAN

SHEET 3

Quality Counts

File Name : 16067501 - Gas Station Dwy -- Pontiac
Site Code : 16067501
Start Date : 1/17/2023
Page No : 1

Groups Printed- Passenger Vehicles - Heavy Vehicles

	Pontiac Lake Rd Eastbound					Pontiac Lake Rd Westbound					Gas Station Dwy Northbound					Southbound					
Start Time	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Int. Total
12:00 AM	0	2	0	0	2	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	3
12:15 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
12:30 AM	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	2
12:45 AM	0	1	0	0	1	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	3
Total	0	4	0	0	4	0	5	0	0	5	0	0	0	0	0	0	0	0	0	0	9
01:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:15 AM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	2
01:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	2
02:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:15 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
02:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
03:00 AM	0	2	0	0	2	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	3
03:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:45 AM	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Total	0	4	0	0	4	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	5
04:00 AM	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
04:15 AM	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	2
04:30 AM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
04:45 AM	0	5	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
Total	0	9	0	0	9	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	10
05:00 AM	0	4	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
05:15 AM	0	13	0	0	13	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	14
05:30 AM	0	12	1	0	13	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	15
05:45 AM	0	12	0	0	12	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	15
Total	0	41	1	0	42	1	5	0	0	6	0	0	0	0	0	0	0	0	0	0	48
06:00 AM	0	13	2	0	15	0	1	0	0	1	0	0	1	0	1	0	0	0	0	0	17
06:15 AM	0	20	1	0	21	0	2	0	0	2	1	0	0	0	1	0	0	0	0	0	24
06:30 AM	0	25	1	0	26	0	3	0	0	3	0	0	2	0	2	0	0	0	0	0	31
06:45 AM	0	33	2	0	35	0	3	0	0	3	0	0	2	0	2	0	0	0	0	0	40
Total	0	91	6	0	97	0	9	0	0	9	1	0	5	0	6	0	0	0	0	0	112
07:00 AM	0	27	1	0	28	0	4	0	0	4	1	0	2	0	3	0	0	0	0	0	35
07:15 AM	0	26	1	0	27	0	7	0	0	7	0	0	3	0	3	0	0	0	0	0	37
07:30 AM	0	38	2	0	40	1	8	0	0	9	2	0	3	0	5	0	0	0	0	0	54
07:45 AM	0	28	1	0	29	0	5	0	0	5	0	0	3	0	3	0	0	0	0	0	37
Total	0	119	5	0	124	1	24	0	0	25	3	0	11	0	14	0	0	0	0	0	163
08:00 AM	0	31	1	0	32	0	10	0	0	10	1	0	4	0	5	0	0	0	0	0	47
08:15 AM	0	21	0	0	21	1	8	0	0	9	0	0	0	0	0	0	0	0	0	0	30
08:30 AM	0	33	1	0	34	0	6	0	0	6	0	0	2	0	2	0	0	0	0	0	42
08:45 AM	0	15	0	0	15	4	7	0	0	11	1	0	1	0	2	0	0	0	0	0	28
Total	0	100	2	0	102	5	31	0	0	36	2	0	7	0	9	0	0	0	0	0	147
09:00 AM	0	18	0	0	18	0	5	0	0	5	1	0	2	0	3	0	0	0	0	0	26
09:15 AM	0	16	3	0	19	0	8	0	0	8	0	0	0	0	0	0	0	0	0	0	27
09:30 AM	0	12	2	0	14	0	6	0	0	6	2	0	3	0	5	0	0	0	0	0	25
09:45 AM	0	11	3	0	14	0	10	0	0	10	0	0	1	0	1	0	0	0	0	0	25
Total	0	57	8	0	65	0	29	0	0	29	3	0	6	0	9	0	0	0	0	0	103
10:00 AM	0	16	0	0	16	0	13	0	0	13	1	0	3	0	4	0	0	0	0	0	33

Quality Counts

File Name : 16067501 - Gas Station Dwy -- Pontiac
Site Code : 16067501
Start Date : 1/17/2023
Page No : 2

Groups Printed- Passenger Vehicles - Heavy Vehicles

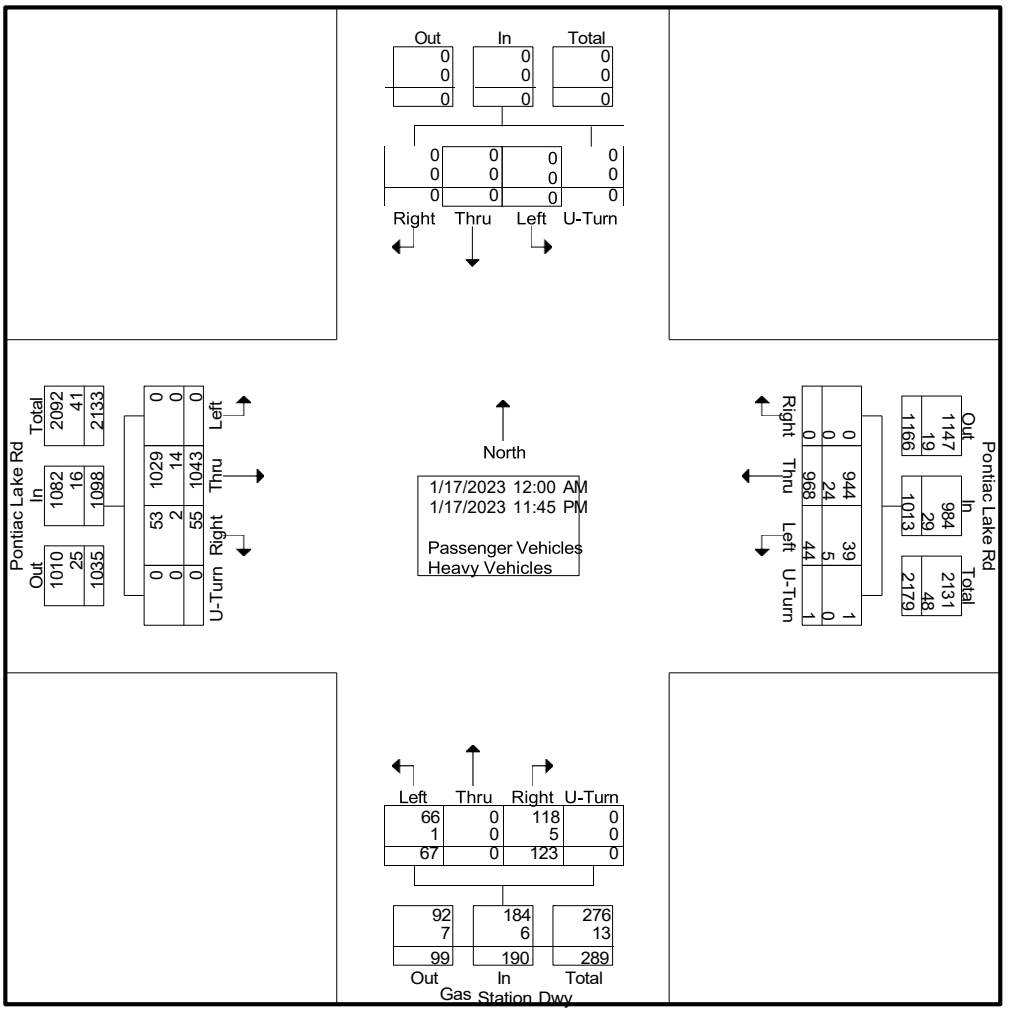
	Pontiac Lake Rd Eastbound					Pontiac Lake Rd Westbound					Gas Station Dwy Northbound					Southbound					
Start Time	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Int. Total
10:15 AM	0	17	1	0	18	1	7	0	0	8	0	0	1	0	1	0	0	0	0	0	27
10:30 AM	0	19	2	0	21	2	4	0	0	6	1	0	0	0	1	0	0	0	0	0	28
10:45 AM	0	11	2	0	13	0	7	0	0	7	3	0	3	0	6	0	0	0	0	0	26
Total	0	63	5	0	68	3	31	0	0	34	5	0	7	0	12	0	0	0	0	0	114
11:00 AM	0	12	1	0	13	1	6	0	0	7	0	0	2	0	2	0	0	0	0	0	22
11:15 AM	0	12	0	0	12	1	10	0	0	11	1	0	2	0	3	0	0	0	0	0	26
11:30 AM	0	19	2	0	21	1	13	0	0	14	3	0	2	0	5	0	0	0	0	0	40
11:45 AM	0	17	1	0	18	1	17	0	0	18	0	0	4	0	4	0	0	0	0	0	40
Total	0	60	4	0	64	4	46	0	0	50	4	0	10	0	14	0	0	0	0	0	128
12:00 PM	0	14	0	0	14	1	7	0	0	8	2	0	4	0	6	0	0	0	0	0	28
12:15 PM	0	11	1	0	12	0	18	0	0	18	2	0	2	0	4	0	0	0	0	0	34
12:30 PM	0	16	0	0	16	0	14	0	0	14	0	0	2	0	2	0	0	0	0	0	32
12:45 PM	0	18	0	0	18	0	12	0	0	12	1	0	1	0	2	0	0	0	0	0	32
Total	0	59	1	0	60	1	51	0	0	52	5	0	9	0	14	0	0	0	0	0	126
01:00 PM	0	10	2	0	12	0	15	0	0	15	0	0	1	0	1	0	0	0	0	0	28
01:15 PM	0	7	0	0	7	0	12	0	0	12	0	0	4	0	4	0	0	0	0	0	23
01:30 PM	0	15	1	0	16	0	13	0	0	13	0	0	3	0	3	0	0	0	0	0	32
01:45 PM	0	14	0	0	14	2	14	0	1	17	2	0	1	0	3	0	0	0	0	0	34
Total	0	46	3	0	49	2	54	0	1	57	2	0	9	0	11	0	0	0	0	0	117
02:00 PM	0	15	0	0	15	0	15	0	0	15	0	0	2	0	2	0	0	0	0	0	32
02:15 PM	0	14	1	0	15	0	16	0	0	16	1	0	2	0	3	0	0	0	0	0	34
02:30 PM	0	19	1	0	20	2	26	0	0	28	1	0	3	0	4	0	0	0	0	0	52
02:45 PM	0	14	0	0	14	0	23	0	0	23	2	0	1	0	3	0	0	0	0	0	40
Total	0	62	2	0	64	2	80	0	0	82	4	0	8	0	12	0	0	0	0	0	158
03:00 PM	0	11	0	0	11	2	21	0	0	23	1	0	2	0	3	0	0	0	0	0	37
03:15 PM	0	15	0	0	15	0	36	0	0	36	2	0	0	0	2	0	0	0	0	0	53
03:30 PM	0	17	2	0	19	0	26	0	0	26	3	0	0	0	3	0	0	0	0	0	48
03:45 PM	0	25	2	0	27	0	27	0	0	27	1	0	5	0	6	0	0	0	0	0	60
Total	0	68	4	0	72	2	110	0	0	112	7	0	7	0	14	0	0	0	0	0	198
04:00 PM	0	12	0	0	12	0	17	0	0	17	3	0	6	0	9	0	0	0	0	0	38
04:15 PM	0	22	1	0	23	2	33	0	0	35	1	0	3	0	4	0	0	0	0	0	62
04:30 PM	0	8	1	0	9	1	26	0	0	27	2	0	6	0	8	0	0	0	0	0	44
04:45 PM	0	26	2	0	28	2	35	0	0	37	1	0	1	0	2	0	0	0	0	0	67
Total	0	68	4	0	72	5	111	0	0	116	7	0	16	0	23	0	0	0	0	0	211
05:00 PM	0	20	2	0	22	2	27	0	0	29	2	0	1	0	3	0	0	0	0	0	54
05:15 PM	0	21	0	0	21	3	50	0	0	53	4	0	4	0	8	0	0	0	0	0	82
05:30 PM	0	13	0	0	13	1	22	0	0	23	3	0	2	0	5	0	0	0	0	0	41
05:45 PM	0	8	2	0	10	1	26	0	0	27	1	0	2	0	3	0	0	0	0	0	40
Total	0	62	4	0	66	7	125	0	0	132	10	0	9	0	19	0	0	0	0	0	217
06:00 PM	0	15	0	0	15	0	26	0	0	26	1	0	4	0	5	0	0	0	0	0	46
06:15 PM	0	15	0	0	15	2	25	0	0	27	1	0	1	0	2	0	0	0	0	0	44
06:30 PM	0	17	0	0	17	0	26	0	0	26	0	0	3	0	3	0	0	0	0	0	46
06:45 PM	0	16	0	0	16	0	20	0	0	20	0	0	1	0	1	0	0	0	0	0	37
Total	0	63	0	0	63	2	97	0	0	99	2	0	9	0	11	0	0	0	0	0	173
07:00 PM	0	8	1	0	9	0	16	0	0	16	0	0	1	0	1	0	0	0	0	0	26
07:15 PM	0	9	1	0	10	2	15	0	0	17	1	0	1	0	2	0	0	0	0	0	29
07:30 PM	0	7	1	0	8	2	14	0	0	16	2	0	1	0	3	0	0	0	0	0	27
07:45 PM	0	5	0	0	5	1	11	0	0	12	4	0	2	0	6	0	0	0	0	0	23
Total	0	29	3	0	32	5	56	0	0	61	7	0	5	0	12	0	0	0	0	0	105
08:00 PM	0	5	0	0	5	2	9	0	0	11	0	0	1	0	1	0	0	0	0	0	17
08:15 PM	0	0	0	0	0	1	13	0	0	14	3	0	0	0	3	0	0	0	0	0	17
08:30 PM	0	6	1	0	7	0	7	0	0	7	0	0	1	0	1	0	0	0	0	0	15
08:45 PM	0	4	0	0	4	0	15	0	0	15	0	0	1	0	1	0	0	0	0	0	20
Total	0	15	1	0	16	3	44	0	0	47	3	0	3	0	6	0	0	0	0	0	69

Quality Counts

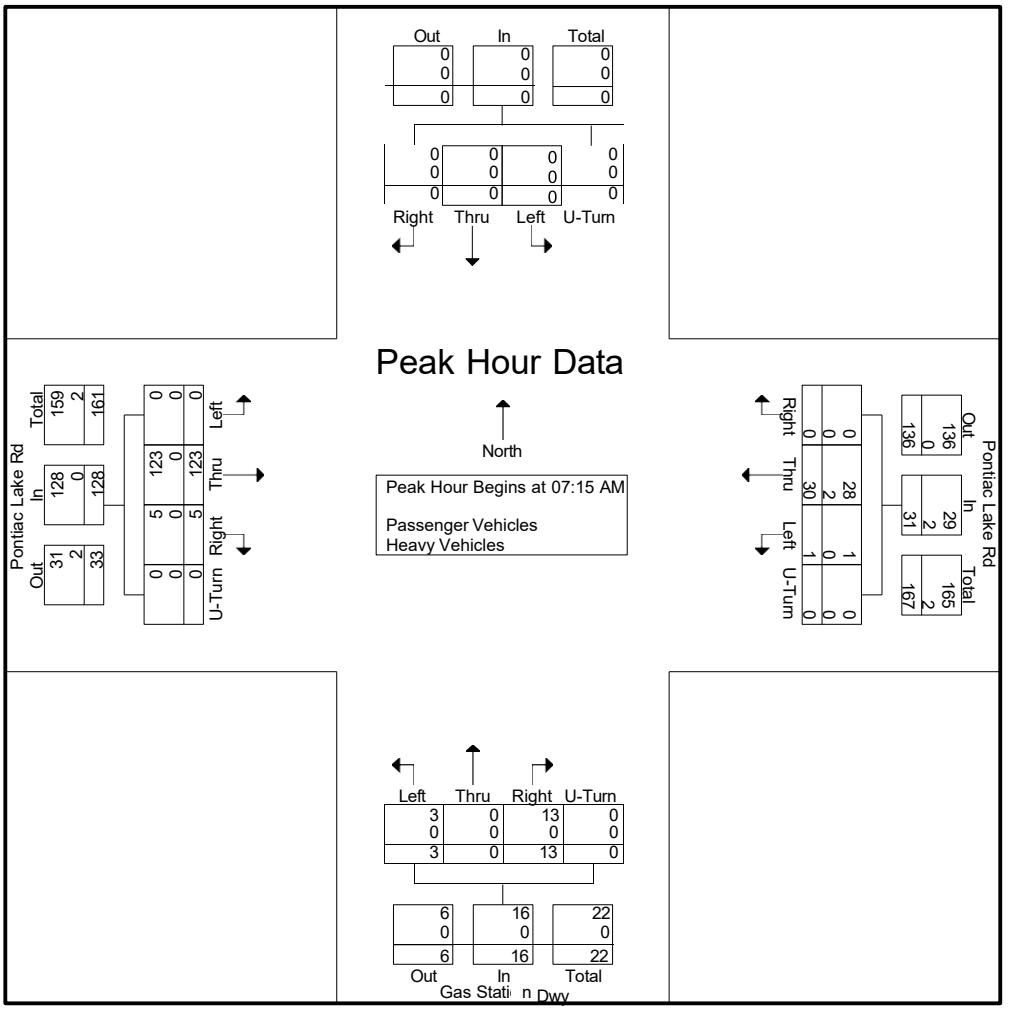
File Name : 16067501 - Gas Station Dwy -- Pontiac
Site Code : 16067501
Start Date : 1/17/2023
Page No : 3

Groups Printed- Passenger Vehicles - Heavy Vehicles

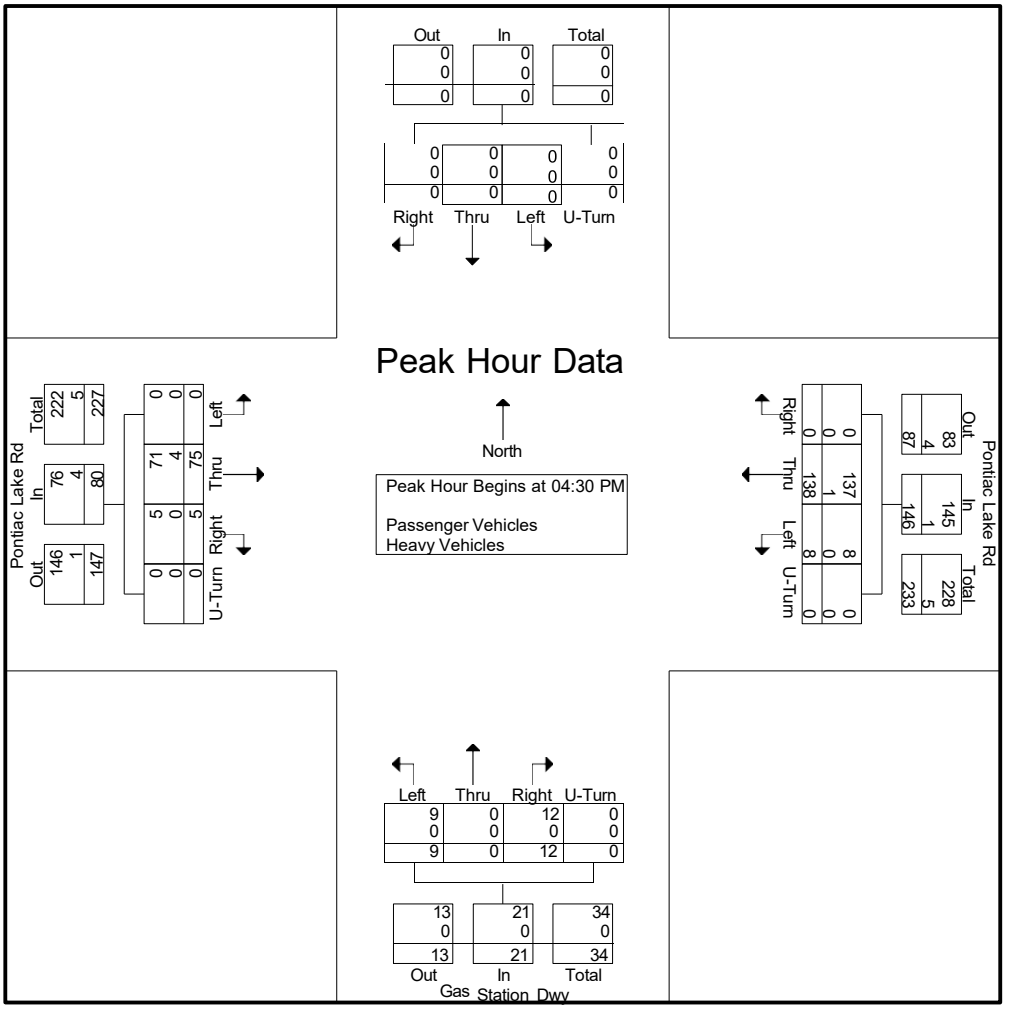
	Pontiac Lake Rd Eastbound					Pontiac Lake Rd Westbound					Gas Station Dwy Northbound					Southbound					
Start Time	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Int. Total
09:00 PM	0	5	0	0	5	0	7	0	0	7	0	0	0	0	0	0	0	0	0	0	12
09:15 PM	0	2	0	0	2	0	8	0	0	8	0	0	1	0	1	0	0	0	0	0	11
09:30 PM	0	4	0	0	4	0	7	0	0	7	0	0	0	0	0	0	0	0	0	0	11
09:45 PM	0	1	0	0	1	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	3
Total	0	12	0	0	12	0	24	0	0	24	0	0	1	0	1	0	0	0	0	0	37
10:00 PM	0	3	0	0	3	0	5	0	0	5	0	0	1	0	1	0	0	0	0	0	9
10:15 PM	0	1	0	0	1	0	5	0	0	5	0	0	0	0	0	0	0	0	0	0	6
10:30 PM	0	2	1	0	3	0	6	0	0	6	0	0	0	0	0	0	0	0	0	0	9
10:45 PM	0	2	1	0	3	1	6	0	0	7	1	0	0	0	1	0	0	0	0	0	11
Total	0	8	2	0	10	1	22	0	0	23	1	0	1	0	2	0	0	0	0	0	35
11:00 PM	0	1	0	0	1	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	3
11:15 PM	0	0	0	0	0	0	4	0	0	4	1	0	0	0	1	0	0	0	0	0	5
11:30 PM	0	1	0	0	1	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	3
11:45 PM	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	2
Total	0	3	0	0	3	0	9	0	0	9	1	0	0	0	1	0	0	0	0	0	13
Grand Total	0	1043	55	0	1098	44	968	0	1	1013	67	0	123	0	190	0	0	0	0	0	2301
Apprch %	0	95	5	0		4.3	95.6	0	0.1		35.3	0	64.7	0		0	0	0	0		
Total %	0	45.3	2.4	0	47.7	1.9	42.1	0	0	44	2.9	0	5.3	0	8.3	0	0	0	0	0	
Passenger Vehicles	0	1029	53	0	1082	39	944	0	1	984	66	0	118	0	184	0	0	0	0	0	2250
% Passenger Vehicles	0	98.7	96.4	0	98.5	88.6	97.5	0	100	97.1	98.5	0	95.9	0	96.8	0	0	0	0	0	97.8
Heavy Vehicles	0	14	2	0	16	5	24	0	0	29	1	0	5	0	6	0	0	0	0	0	51
% Heavy Vehicles	0	1.3	3.6	0	1.5	11.4	2.5	0	0	2.9	1.5	0	4.1	0	3.2	0	0	0	0	0	2.2



	Pontiac Lake Rd Eastbound					Pontiac Lake Rd Westbound					Gas Station Dwy Northbound					Southbound					
Start Time	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 12:00 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	0	26	1	0	27	0	7	0	0	7	0	0	3	0	3	0	0	0	0	0	37
07:30 AM	0	**38**	**2**	0	**40**	**1**	8	0	0	9	**2**	0	3	0	**5**	0	0	0	0	0	**54**
07:45 AM	0	28	1	0	29	0	5	0	0	5	0	0	3	0	3	0	0	0	0	0	37
08:00 AM	0	31	1	0	32	0	**10**	0	0	**10**	1	0	**4**	0	5	0	0	0	0	0	47
Total Volume	0	123	5	0	128	1	30	0	0	31	3	0	13	0	16	0	0	0	0	0	175
% App. Total	0	96.1	3.9	0		3.2	96.8	0	0		18.8	0	81.2	0		0	0	0	0		
PHF	.000	.809	.625	.000	.800	.250	.750	.000	.000	.775	.375	.000	.813	.000	.800	.000	.000	.000	.000	.000	.810
Passenger Vehicles	0	123	5	0	128	1	28	0	0	29	3	0	13	0	16	0	0	0	0	0	173
% Passenger Vehicles	0	100	100	0	100	100	93.3	0	0	93.5	100	0	100	0	100	0	0	0	0	0	98.9
Heavy Vehicles	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	2
% Heavy Vehicles	0	0	0	0	0	0	6.7	0	0	6.5	0	0	0	0	0	0	0	0	0	0	1.1



	Pontiac Lake Rd Eastbound					Pontiac Lake Rd Westbound					Gas Station Dwy Northbound					Southbound					
Start Time	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 11:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	0	8	1	0	9	1	26	0	0	27	2	0	**6**	0	**8**	0	0	0	0	0	44
04:45 PM	0	**26**	**2**	0	**28**	2	35	0	0	37	1	0	1	0	2	0	0	0	0	0	67
05:00 PM	0	20	2	0	22	2	27	0	0	29	2	0	1	0	3	0	0	0	0	0	54
05:15 PM	0	21	0	0	21	**3**	**50**	0	0	**53**	**4**	0	4	0	8	0	0	0	0	0	**82**
Total Volume	0	75	5	0	80	8	138	0	0	146	9	0	12	0	21	0	0	0	0	0	247
% App. Total	0	93.8	6.2	0		5.5	94.5	0	0		42.9	0	57.1	0		0	0	0	0		
PHF	.000	.721	.625	.000	.714	.667	.690	.000	.000	.689	.563	.000	.500	.000	.656	.000	.000	.000	.000	.000	.753
Passenger Vehicles	0	71	5	0	76	8	137	0	0	145	9	0	12	0	21	0	0	0	0	0	242
% Passenger Vehicles	0	94.7	100	0	95.0	100	99.3	0	0	99.3	100	0	100	0	100	0	0	0	0	0	98.0
Heavy Vehicles	0	4	0	0	4	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	5
% Heavy Vehicles	0	5.3	0	0	5.0	0	0.7	0	0	0.7	0	0	0	0	0	0	0	0	0	0	2.0



Quality Counts

File Name : 16067501 - Gas Station Dwy -- Pontiac
Site Code : 16067501
Start Date : 1/17/2023
Page No : 1

Groups Printed- Bikes, Peds

	Pontiac Lake Rd Eastbound					Pontiac Lake Rd Westbound					Gas Station Dwy Northbound					Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
12:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1
08:15 AM	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	2
09:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Quality Counts

File Name : 16067501 - Gas Station Dwy -- Pontiac
Site Code : 16067501
Start Date : 1/17/2023
Page No : 2

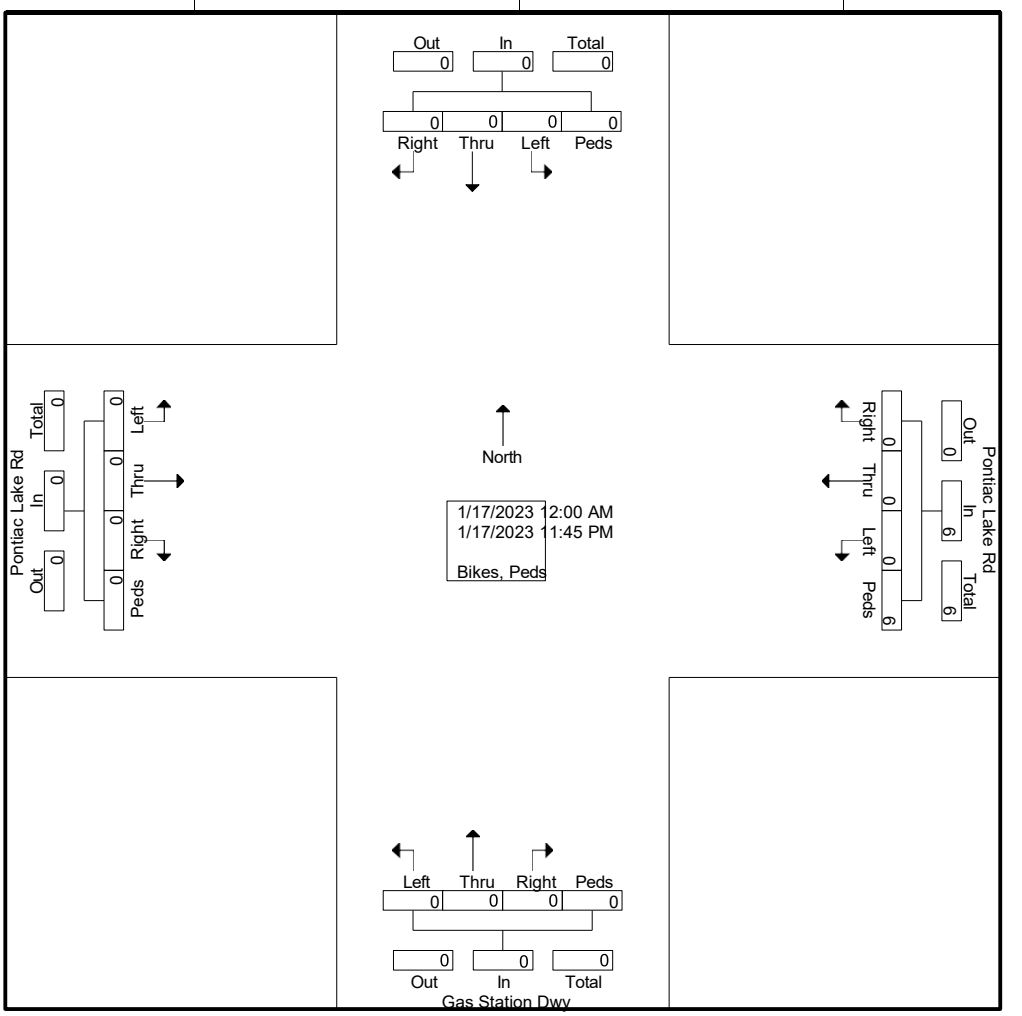
Groups Printed- Bikes, Peds

	Pontiac Lake Rd Eastbound					Pontiac Lake Rd Westbound					Gas Station Dwy Northbound					Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	2
01:30 PM	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1
01:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	3
02:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:00 PM	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1
06:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1
07:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

File Name : 16067501 - Gas Station Dwy -- Pontiac
Site Code : 16067501
Start Date : 1/17/2023
Page No : 3

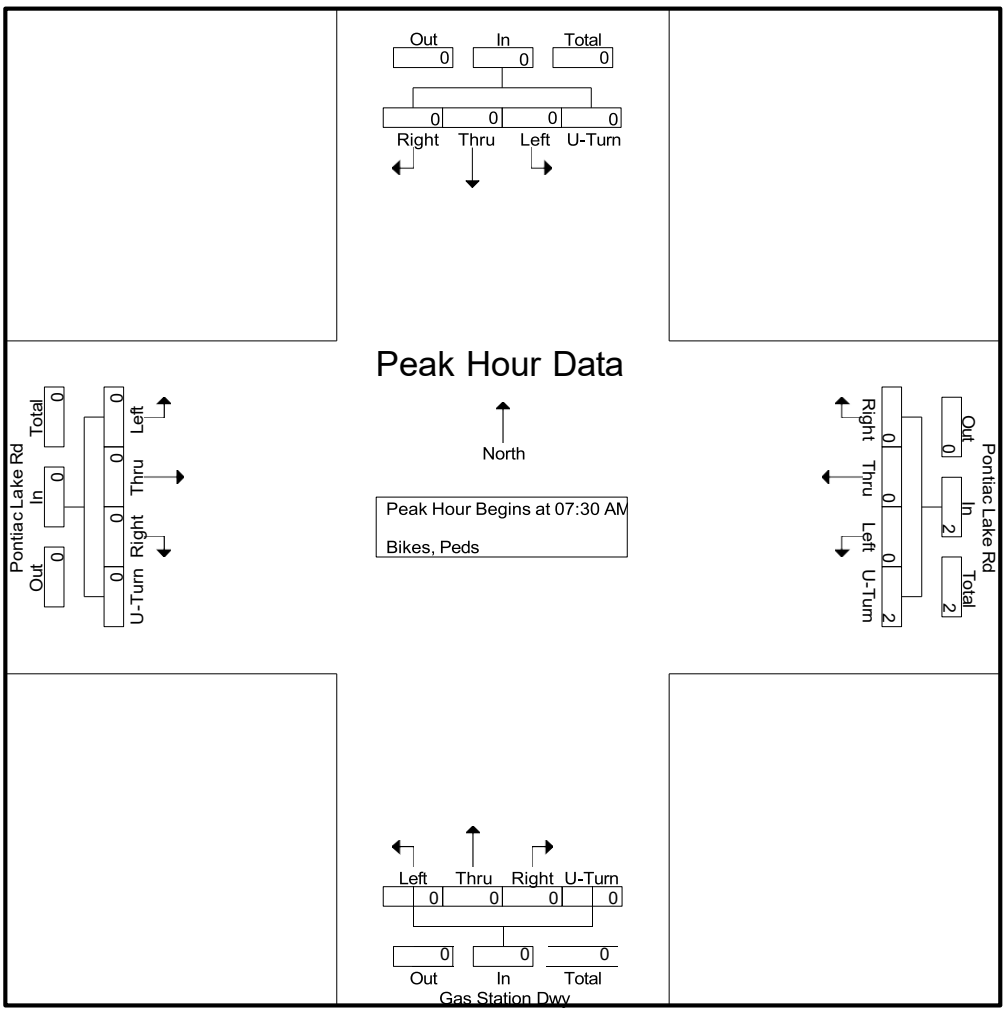
Groups Printed- Bikes, Peds

	Pontiac Lake Rd Eastbound					Pontiac Lake Rd Westbound					Gas Station Dwy Northbound					Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
09:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	6	6	0	0	0	0	0	0	0	0	0	0	6
Apprch %	0	0	0	0		0	0	0	100		0	0	0	0		0	0	0	0		
Total %	0	0	0	0	0	0	0	0	100	100	0	0	0	0	0	0	0	0	0	0	

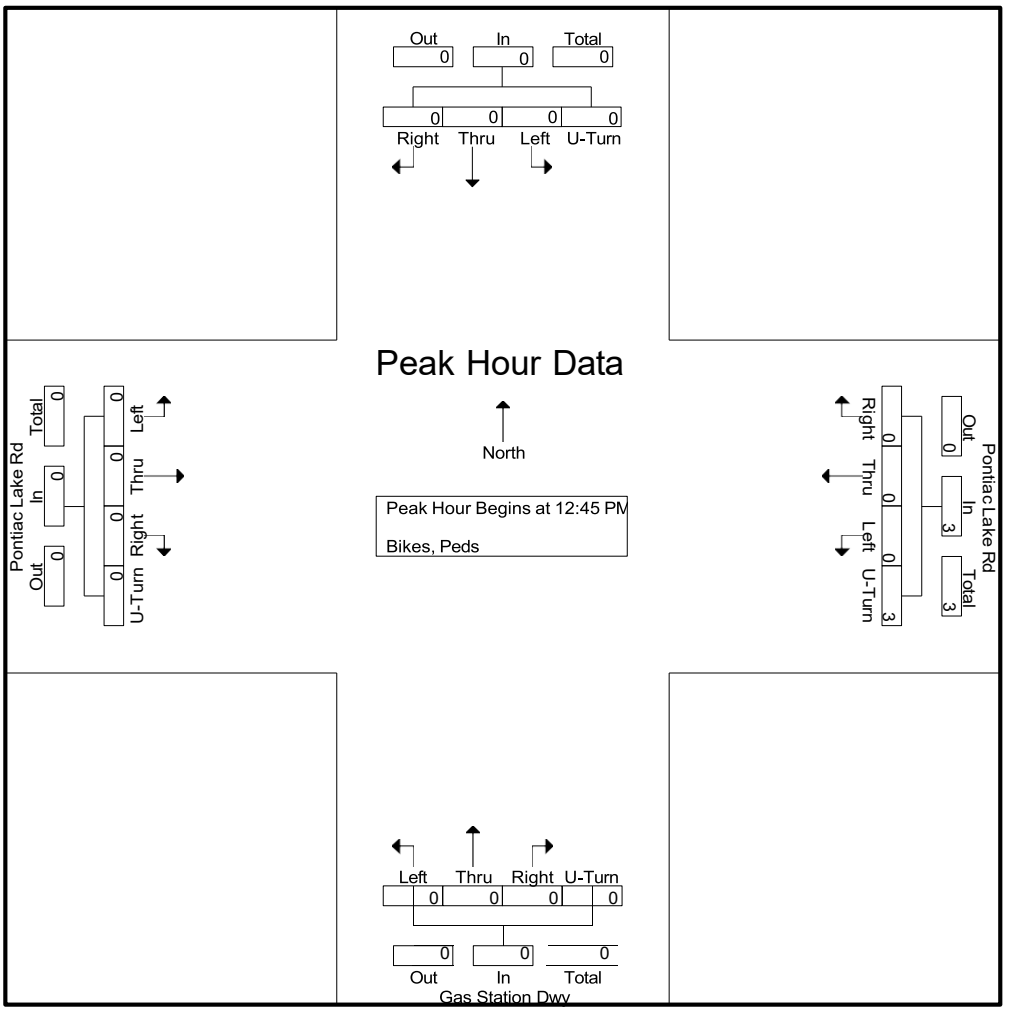


File Name : 16067501 - Gas Station Dwy -- Pontiac
Site Code : 16067501
Start Date : 1/17/2023
Page No : 4

	Pontiac Lake Rd Eastbound					Pontiac Lake Rd Westbound					Gas Station Dwy Northbound					Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	**1**	**1**	0	0	0	0	0	0	0	0	0	0	**1**
08:15 AM	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1
Total Volume	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	2
% App. Total	0	0	0	0		0	0	0	100		0	0	0	0		0	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.500	.500	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.500



	Pontiac Lake Rd Eastbound					Pontiac Lake Rd Westbound					Gas Station Dwy Northbound					Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 11:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 12:45 PM																					
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	**2**	**2**	0	0	0	0	0	0	0	0	0	0	**2**
01:30 PM	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1
Total Volume	0	0	0	0	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	3
% App. Total	0	0	0	0		0	0	0	100		0	0	0	0		0	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.375	.375	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.375



Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	20	130	41	3	10	10
Future Vol, veh/h	20	130	41	3	10	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	80	80	78	78	92	92
Heavy Vehicles, %	0	0	7	7	2	2
Mvmt Flow	25	163	53	4	11	11

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	57	0	-	0	268	55
Stage 1	-	-	-	-	55	-
Stage 2	-	-	-	-	213	-
Critical Hdwy	4.1	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.2	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1560	-	-	-	721	1012
Stage 1	-	-	-	-	968	-
Stage 2	-	-	-	-	823	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1560	-	-	-	708	1012
Mov Cap-2 Maneuver	-	-	-	-	708	-
Stage 1	-	-	-	-	951	-
Stage 2	-	-	-	-	823	-

Approach	EB	WB	SB
HCM Control Delay, s	1	0	9.4
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1560	-	-	-	833
HCM Lane V/C Ratio	0.016	-	-	-	0.026
HCM Control Delay (s)	7.3	0	-	-	9.4
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Int Delay, s/veh	0.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	135	5	1	41	3	13
Future Vol, veh/h	135	5	1	41	3	13
Conflicting Peds, #/hr	0	0	0	0	0	3
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	80	80	78	78	80	80
Heavy Vehicles, %	0	0	7	7	0	0
Mvmt Flow	169	6	1	53	4	16

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	175	0	227	175
Stage 1	-	-	-	-	172	-
Stage 2	-	-	-	-	55	-
Critical Hdwy	-	-	4.17	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.263	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1372	-	766	874
Stage 1	-	-	-	-	863	-
Stage 2	-	-	-	-	973	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1372	-	765	872
Mov Cap-2 Maneuver	-	-	-	-	765	-
Stage 1	-	-	-	-	863	-
Stage 2	-	-	-	-	972	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	9.3
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	850	-	-	1372	-
HCM Lane V/C Ratio	0.024	-	-	0.001	-
HCM Control Delay (s)	9.3	-	-	7.6	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	148	34	4	0	8
Future Vol, veh/h	0	148	34	4	0	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	80	80	78	78	92	92
Heavy Vehicles, %	0	0	7	7	2	2
Mvmt Flow	0	185	44	5	0	9

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	47
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy						6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy						3.318
Pot Cap-1 Maneuver	0	-	-	-	0	1022
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver						1022
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	8.6
HCM LOS			A

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	1022
HCM Lane V/C Ratio	-	-	-	0.009
HCM Control Delay (s)	-	-	-	8.6
HCM Lane LOS	-	-	-	A
HCM 95th %tile Q(veh)	-	-	-	0

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	14	81	152	9	16	5
Future Vol, veh/h	14	81	152	9	16	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	71	71	69	69	92	92
Heavy Vehicles, %	5	5	1	1	2	2
Mvmt Flow	20	114	220	13	17	5

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	233	0	-	0	381	227
Stage 1	-	-	-	-	227	-
Stage 2	-	-	-	-	154	-
Critical Hdwy	4.15	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.245	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1317	-	-	-	621	812
Stage 1	-	-	-	-	811	-
Stage 2	-	-	-	-	874	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1317	-	-	-	611	812
Mov Cap-2 Maneuver	-	-	-	-	611	-
Stage 1	-	-	-	-	798	-
Stage 2	-	-	-	-	874	-

Approach	EB	WB	SB
HCM Control Delay, s	1.1	0	10.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1317	-	-	-	649
HCM Lane V/C Ratio	0.015	-	-	-	0.035
HCM Control Delay (s)	7.8	0	-	-	10.7
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Int Delay, s/veh	1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	92	5	8	152	9	12
Future Vol, veh/h	92	5	8	152	9	12
Conflicting Peds, #/hr	0	0	0	0	0	3
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	71	71	69	69	66	66
Heavy Vehicles, %	5	5	1	1	0	0
Mvmt Flow	130	7	12	220	14	18

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	137	0	378	137
Stage 1	-	-	-	-	134	-
Stage 2	-	-	-	-	244	-
Critical Hdwy	-	-	4.11	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.209	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1453	-	628	917
Stage 1	-	-	-	-	897	-
Stage 2	-	-	-	-	801	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1453	-	622	914
Mov Cap-2 Maneuver	-	-	-	-	622	-
Stage 1	-	-	-	-	897	-
Stage 2	-	-	-	-	794	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	9.9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	761	-	-	1453	-
HCM Lane V/C Ratio	0.042	-	-	0.008	-
HCM Control Delay (s)	9.9	-	-	7.5	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	104	157	15	0	3
Future Vol, veh/h	0	104	157	15	0	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	71	71	69	69	92	92
Heavy Vehicles, %	5	5	1	1	2	2
Mvmt Flow	0	146	228	22	0	3

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	239
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy						6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy						3.318
Pot Cap-1 Maneuver	0	-	-	-	0	800
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver						800
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	9.5
HCM LOS			A

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	800
HCM Lane V/C Ratio	-	-	-	0.004
HCM Control Delay (s)	-	-	-	9.5
HCM Lane LOS	-	-	-	A
HCM 95th %tile Q(veh)	-	-	-	0

Intersection: 1: Pontiac Lake Road & W. Site Drive

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	24	34
Average Queue (ft)	1	13
95th Queue (ft)	11	37
Link Distance (ft)	420	181
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Gas Station Drive & Pontiac Lake Road

Movement	EB	NB
Directions Served	TR	LR
Maximum Queue (ft)	3	32
Average Queue (ft)	0	12
95th Queue (ft)	3	35
Link Distance (ft)	54	118
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: Pontiac Lake Road & E. Site Drive

Movement	SB
Directions Served	R
Maximum Queue (ft)	31
Average Queue (ft)	8
95th Queue (ft)	30
Link Distance (ft)	166
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Zone Summary

Zone wide Queuing Penalty: 0

Intersection: 1: Pontiac Lake Road & W. Site Drive

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	28	31
Average Queue (ft)	2	15
95th Queue (ft)	13	38
Link Distance (ft)	420	181
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Gas Station Drive & Pontiac Lake Road

Movement	EB	WB	NB
Directions Served	TR	LT	LR
Maximum Queue (ft)	2	19	40
Average Queue (ft)	0	1	15
95th Queue (ft)	2	7	39
Link Distance (ft)	54	137	118
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: Pontiac Lake Road & E. Site Drive

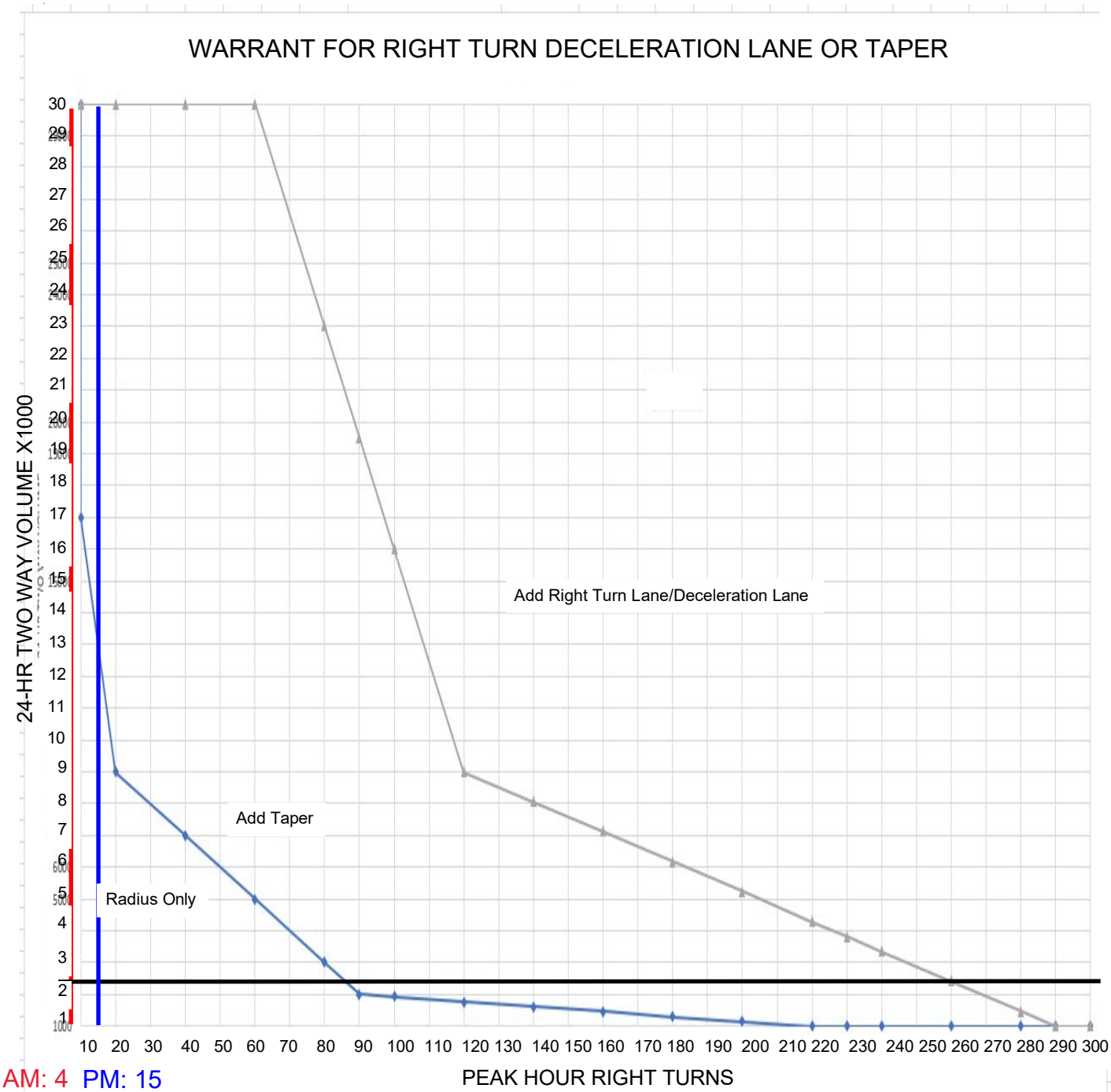
Movement	EB	SB
Directions Served	T	R
Maximum Queue (ft)	3	30
Average Queue (ft)	0	2
95th Queue (ft)	3	16
Link Distance (ft)	137	166
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Zone Summary

Zone wide Queuing Penalty: 0

Pontiac Lake Road and E. Site Drive (RT Warrant

FIGURE 6-3



AM: 4 PM: 15

PM IS THE CONTROLLING SCENARIO:

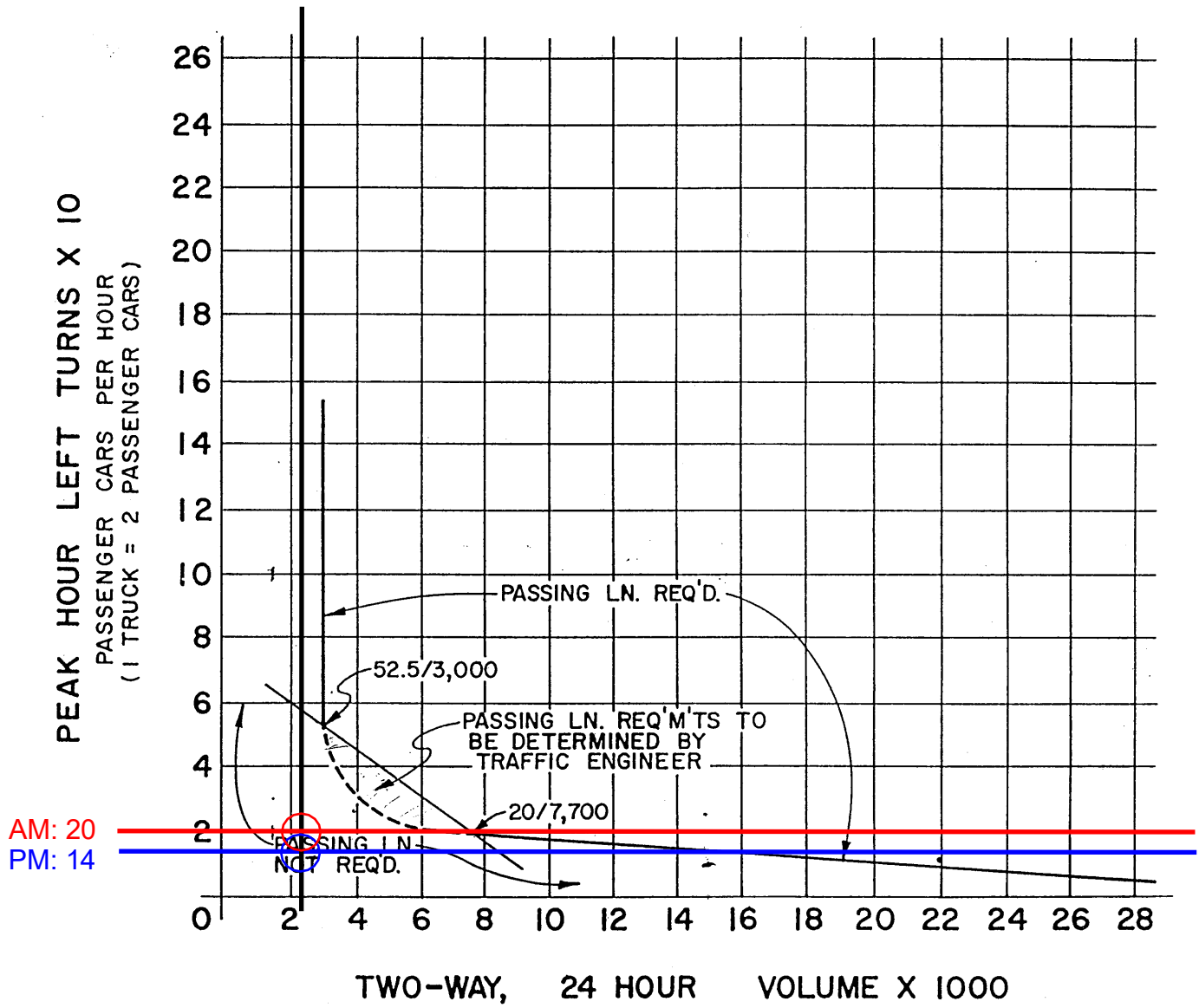
RT TREATMENT NOT RECOMMENDED

2-way Peak Volume (AM) = 186 vph
2-way Peak Volume (PM) = 276 vph
2-way Peak Volume (Avg.) = 231 vph
Assuming k-factor is 10% of ADT volume
2-way 24-Hr Volume = 2,310 vpd

Pontiac Lake Road and W. Site Drive (LT Warran

WARRANT FOR LEFT TURN PASSING LANE

(BASED ON TOTAL DEVELOPMENT)

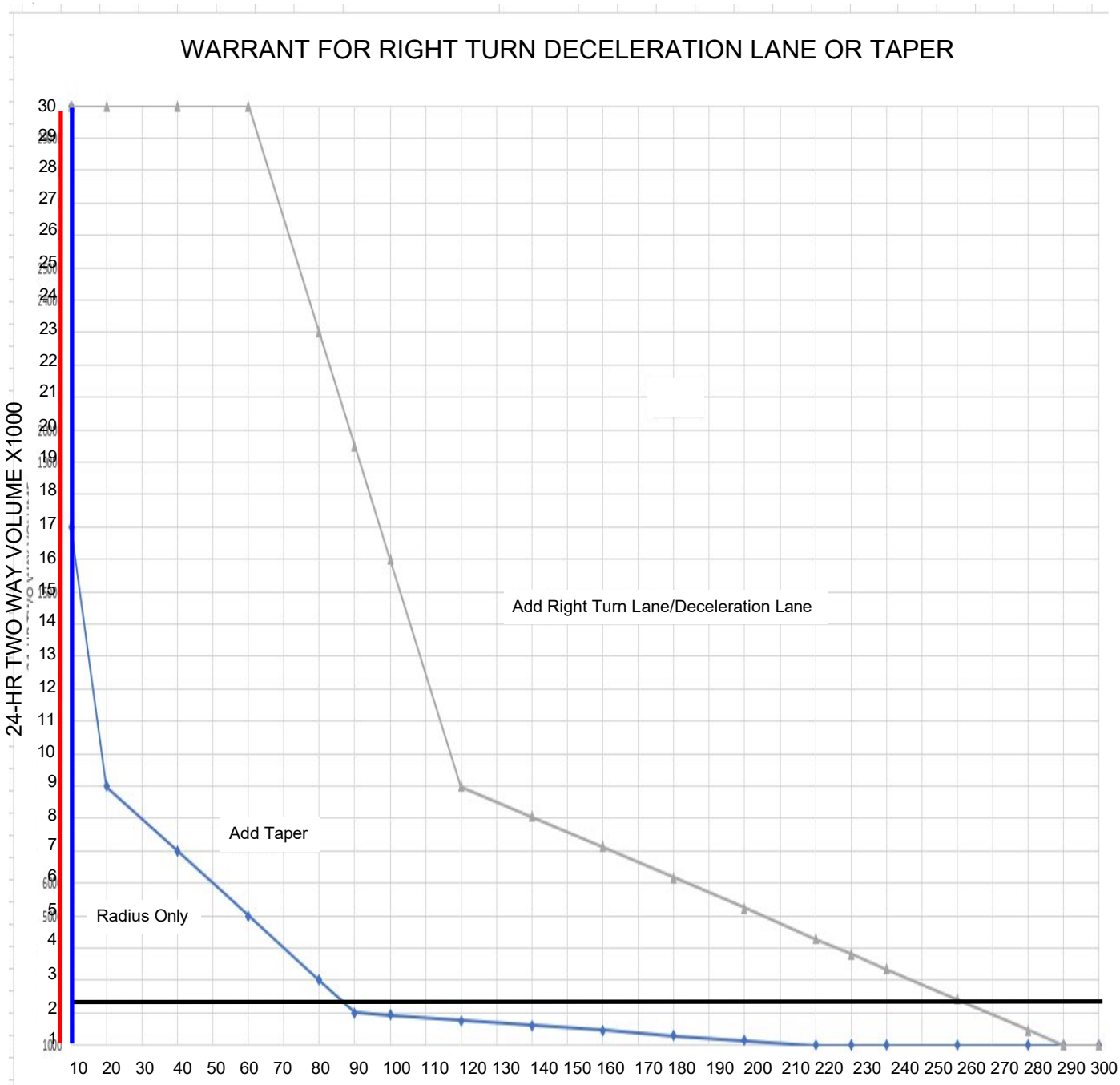


2-way Peak Volume (AM) = 194 vph
2-way Peak Volume (PM) = 256 vph
2-way Peak Volume (Avg.) = 225 vph
Assuming k-factor is 10% of ADT volume
2-way 24-Hr Volume = 2,250 vpd

AM IS THE CONTROLLING SCENARIO:

LT TREATMENT NOT RECOMMENDED

FIGURE 6-3



AM: 3 PM: 9

PM IS THE CONTROLLING SCENARIO:

RT TREATMENT NOT RECOMMENDED

2-way Peak Volume (AM) = 194 vph
2-way Peak Volume (PM) = 256 vph
2-way Peak Volume (Avg.) = 225 vph
Assuming k-factor is 10% of ADT volume
2-way 24-Hr Volume = 2,250 vpd

Director's Report

Project Name: Panera

Description: Preliminary site plan approval

Date on Agenda this packet pertains to: July 20, 2023

☒Public Hearing

☒Initial Submittal

☐Revised Plans

☒Preliminary Approval

☐Final Approval

☐Special Land Use

☐Rezoning

☐Other:

Contact	Consultants & Departments	Approval	Denial	Approved w/Conditions	Other	Comments
Sean O'Neil	Planning Director	☐	☐	☐	☒	
DLZ	Engineering Consultant	☐	☐	☐	☒	See letter dated 07/10/2023.
Justin Quagliata	Staff Planner	☐	☐	☐	☒	See letter dated 07/27/2023.
Jason Hanifen	WLT Fire Marshal	☐	☐	☐	☒	See letter dated 07/06/2023.

DLZ
ARCHITECTURE • ENGINEERING • PLANNING
SURVEYING • CONSTRUCTION SERVICES

INNOVATIVE IDEAS
EXCEPTIONAL DESIGN
UNMATCHED CLIENT SERVICE

July 10, 2023

Sean O' Neil
Community Development Department
Charter Township of White Lake
7525 Highland Road
White Lake, Michigan 48383

RE: Panera Bread and Retail Development- Preliminary Site Plan Review – 3rd Review

Ref: DLZ No. 2345-7567-03 Design Professional: Stonefield Engineering & Design

Dear Mr. O' Neil,

Our office has performed a Preliminary Site Plan review for the above-mentioned revised plan dated June 22, 2023. The plans were reviewed for feasibility based on general conformance with the Township Engineering Design Standards.

General Site Information

This approximately 1.624 acre site is located north of M-59, west of Bogie Lake Road, and southeast of Meijer.

Site Improvement Information:

- Construction of an approximately 3,206 square foot drive thru restaurant and approximately 2,662 square foot retail space.
- Associated paved and curbed parking area, including three (3) ADA parking spaces.
- One entrance off Meijer Drive.
- Water and sanitary sewer service.
- Storm water management facilities.

The following items should be noted with respect to Planning Commission review:

We note that comments from our June 20, 2023 review are in *italics*. Responses to those comments are in **bold**. New comments are in standard font.

a) *The ALTA survey shows the existing storm sewer in the Meijer Drive as 12" diameter which is incorrect per Meijer Storm Sewer A/B plan dated 02/21/2006 (shown as 15" diameter); revise all existing storm sewer in Meijer Drive on the ALTA survey and all relevant plan sheets to reflect the correct pipe sizes. Comment partially addressed. A copy of the Meijer storm sewer plan has been attached. Please update the pipe size.* **Comment addressed. Existing storm sewer diameter has been corrected.**

b) *The northeastern most end island and the end island to the east of the easternmost ADA parking space are required to be a minimum of 8 'wide per Zoning Ordinance 5.11.M.i. The widths appear short by 0.5'. Comment remains. A variance shall be requested for the northeastern most end island width. The end island to the east of the easternmost ADA parking space is now 8' wide.* **Comment addressed. The northeastern most end island is now 8' in width.**

c) *The parking layout does not lend itself to safe ingress and egress of pedestrians to the restaurant and/or retail space; most pedestrians will be required to cross the drive thru lanes to gain access to the restaurant and/or retail. Comment partially addressed. Please provide a note on Sheet C-3 that a 'Yield to Pedestrians in Cross Walk' sign shall be provided at the southernmost crosswalk.* **Comment addressed. A note to provide a sign has been added to Sheet C-3.**

d) *The existing rim elevation for storm sewer structure number 10048 as shown on the manhole schedule on the plan sheets and in plan view (shown as 992.35') on Sheet C-5 shall be verified. Per the manhole schedule, the rim elevation is 997.66' and it is 998.70' per Meijer Storm Sewer A/B plan dated 02/21/2006. Comment partially addressed. A copy of the Meijer storm sewer plan has been attached. Please update the rim elevation.* **Comment addressed. Rim elevation has been updated per the Meijer Storm Sewer as built plan.**

e) *All storm sewer proposed under pavement shall be RCP CLIV or better. Comment partially addressed. Pipe class has been updated with the exception of YD-1 (a new structure not shown on the previous plan) to proposed Cleanout. This segment of storm sewer shall be a minimum of 12" diameter, RCP CLIV, and end with a manhole structure where a cleanout is currently proposed. This segment must meet the above requirements per WLT Engineering Design Standards Section C.2.k.* **Comment addressed. Pipe class and diameter have been updated to meet Township Engineering Standards.**

f) *The applicant will need to provide information detailing whether this site falls under the Meijer Storm Water Management Facilities Easement, Maintenance Agreement and Lien document or if a new agreement will be required for this development. Likely a new agreement will be required and supporting exhibits will need to be provided. Please refer to the Township DPS review letter dated March 2, 2023 for further information. Applicant provided a copy of an agreement related to the Meijer storm detention and retention basins. This agreement does not appear to apply to the outlots or future improvements on the outlots. DLZ recommends a new Storm Water Maintenance Facilities Easement, Maintenance Agreement, and Lien be provided for this development to cover the proposed stormwater devices that are part of this development.* **Comment remains. Design engineers**

indicates that a new agreement will be provided after Preliminary Site Plan approval and during Final Engineering Plan submittal/review.

g) *Per the Meijer Storm District Map dated 05/23/2003, the southern portion of this site is proposed to drain to an inlet (38A) located to the southeast of the site (at northwest corner of M-59 and Bogie Lake Road). The Panera plan proposes to route all of the developed flow to the existing 15" storm sewer in Meijer Drive. Design engineer shall demonstrate that adequate capacity exists in the existing 15" storm sewer to the north such that the sewer can accept developed flow for the entire Panera site. Comment addressed for this level of review. Future submittals will need to look at downstream pipe capacity to the outlet because the project area is larger than the original drainage district anticipated.* **Comment remains.**

h) *Based on grading shown, the proposed Cosmo's Car Wash catch basin proposed to the east will collect some of the drainage from the Panera Bread site (drainage from greenspace area east of Panera retaining wall). The design engineer for Panera will be required to verify that Cosmo's Car Wash Storm Sewer and pretreatment unit have the capacity to accommodate this off site flow. A drainage agreement and easement with Cosmo's Car Wash will be required.* **Comment remains and has been addressed at this level of review. Design engineer response is that the drainage agreement and easement will be provided under separate cover when complete. The drainage agreement/easement as well as calculations to demonstrate Cosmo's storm sewer capacity shall be required prior to FSP/FEP approval.**

i) *ADA parking spaces will need to meet ADA standards in terms of slopes and dimensions; further details will be reviewed at the time of Final Site Plan/Final Engineering Plan submittal.* **Comment remains. Design engineer states that additional grading details will be provided at the time FEP submittal.**

j) *Preliminary grading of the site has been proposed and demonstrates general drainage patterns; we note that the proposed 997 contour near the northwest corner of the site will result in ponding of water with no positive outlet. We further note that the wall grades on the south of the property are off in elevation with a top of wall grade 40 feet below the bottom. Please note that retaining walls over 30" in height will require a decorative railing. Please revise. Comment partially addressed. A yard inlet has been provided at the low point. In addition, proposed wall height elevations have now been adjusted. Please add a note regarding the requirement for decorative fencing at the top of the wall.* **A note regarding the installation of a guide rail at the top of the retaining wall has been added to Sheet C-3. A detail of the guide rail shall be required at the time of FEP submittal.**

k) *Details regarding the proposed retaining wall shall be provided on the FSP/FEP; we note that it shall be demonstrated that the proposed retaining wall along the eastern side of the property shall provide the required support to manage the lateral and vertical stresses of a standard fire truck. Comment remains. Engineer notes that retaining wall design and specifications shall be provided under separate cover. We note that the design and specifications shall be signed and sealed by a structural*

Professional Engineer. In addition, calculations/report shall demonstrate that wall shall not impact proposed sanitary sewer at the point where the sewer crosses under the wall. **Comment remains. Per engineer, wall design and specifications will be provided at the time of FEP submittal.**

l) *We defer to the Township Fire Department regarding hydrant coverage.* **Comment addressed. Engineer states that all Fire Department comments have been addressed.**

Recommendation

A few comments remain; however, these comments can be addressed at the time of Final Site Plan/Final Engineering Plan submittal. We now recommend approval of the Preliminary Site Plan.

Please feel free to contact our office should you have any questions.

Sincerely,

DLZ Michigan

Michael Leuffgen, P.E.
Department Manager

Victoria Loemker, P.E.
Senior Engineer

Cc: Justin Quagliata, Community Development, *via email*
Hannah Micallef, Community Development, *via email*
Aaron Potter, DPS Director, White Lake Township, *via email*
Jason Hanifen, Fire Marshall, White Lake Township, *via email*

X:\Projects\2023\2345\756703 WLT Panera Bread\PSP Review.03\Review.03.docx

WHITE LAKE TOWNSHIP
PLANNING COMMISSION

REPORT OF THE
COMMUNITY DEVELOPMENT DEPARTMENT

TO: **Planning Commission**

FROM: **Sean O'Neil, AICP, Community Development Director**

Justin Quagliata, Staff Planner

DATE: **June 27, 2023**

RE: **Panera Bread**
Preliminary Site Plan – Review #3

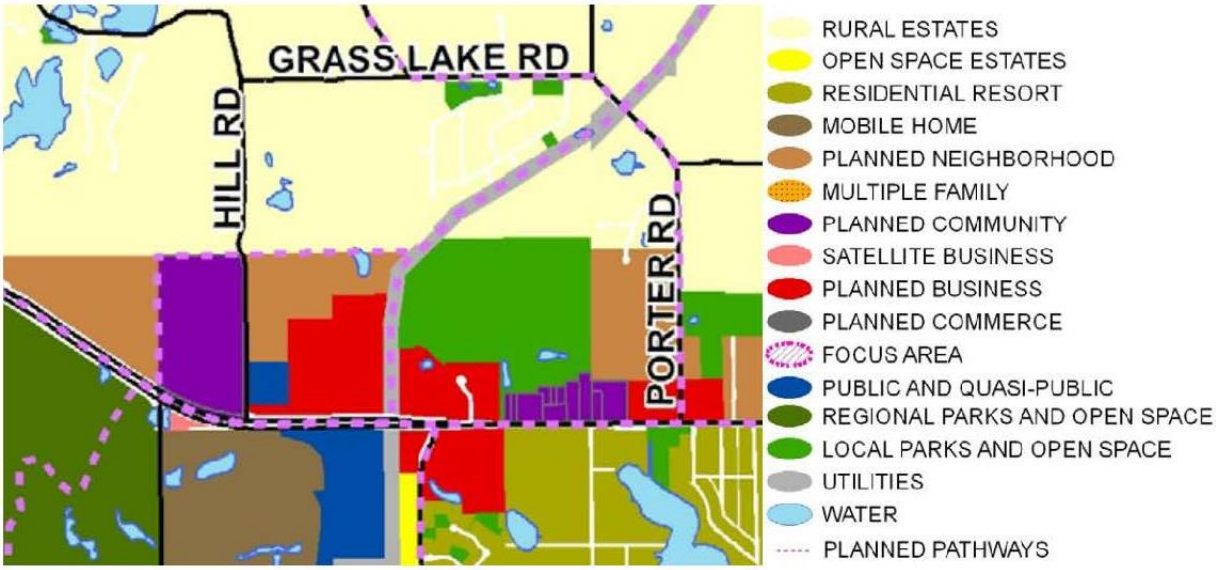
Staff reviewed the revised site plan prepared by Stonefield Engineering & Design (revision date June 22, 2023). The following comments from the first review dated February 27, 2023 and second review dated June 20, 2023 are listed below. Responses to those comments are provided in **(purple)**.

White Lake Retail II, LLC has requested preliminary site plan approval to construct a 5,868 square foot two-tenant building consisting of a 3,206 square foot drive-thru Panera Bread restaurant and a 2,662 square foot retail space on 1.63 acres of Parcel Number 12-20-276-035. **The site plan review application lists the wrong address and parcel number, and a larger parcel size than proposed on the site plan. Revise accordingly. Additionally, the parcel number located in the Land Use and Zoning Table on Sheet C-3 is incorrect. Revise accordingly. Furthermore, the address listed in the title on the Coversheet and in the title blocks on all sheets in the plan set are incorrect. The subject parcel does not possess an address. Remove the incorrect address from the plan set. (Comments addressed. The parcel numbers and address have been corrected. Parcel size has also been corrected on the site plan application).** The subject site is part of a Meijer outlot, zoned PB (Planned Business), and located north of Highland Road (M-59) and south of the Meijer private drive. **Prior to final site plan submission, a land division application shall be submitted to the Assessing Department to separate the proposed outlot parcel from the remaining Meijer property. (Comment remains as a notation. This requirement has been acknowledged by the Applicant's engineer in the response letter provided to the first and second review).**

Master Plan

The Future Land Use Map from the Master Plan designates the subject site in the Planned Business category. All development in Planned Business is required to adhere to strict access management principles in order to minimize traffic conflict and maximize safety throughout the M-59 corridor. Connections to and segments of the Township community-wide pathway system are required as an integral part of all Planned Business development.

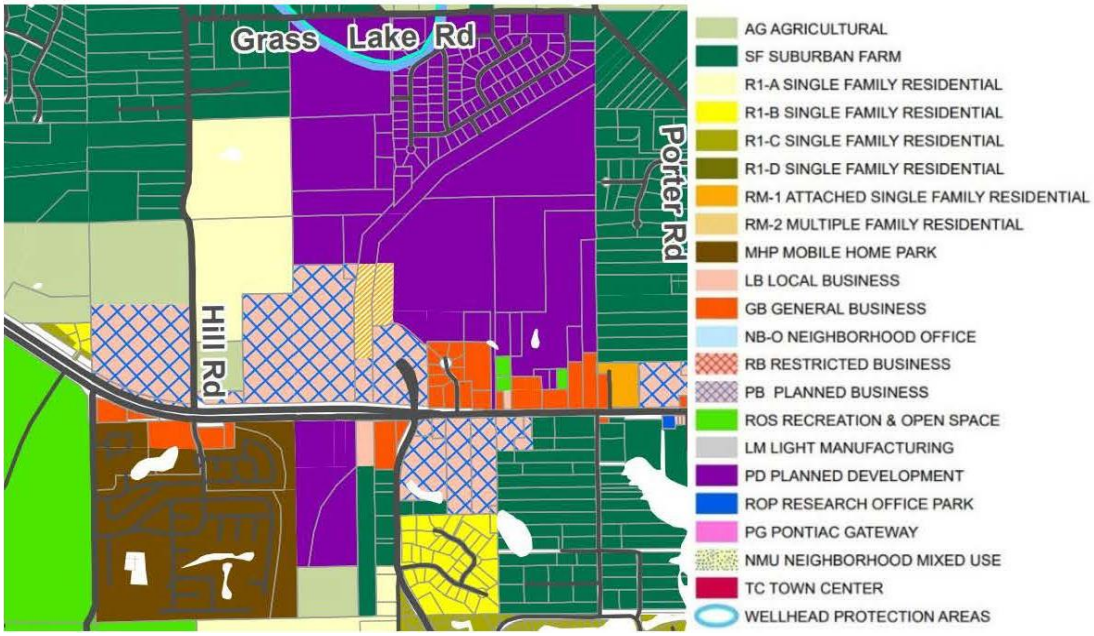
FUTURE LAND USE MAP



Zoning

Drive-thru restaurants and retail commercial uses are principal permitted uses with site plan review and approval in the PB zoning district. A minimum lot area of 10 acres is required in the PB District (the PB district does not have a minimum lot width requirement). **Label the dimensions of the proposed property lines on Sheet C-3. (Comment addressed. All property lines have been dimensioned).** The subject site (proposed parcel) contains 1.63 acres of lot area. While the lot area does not meet the minimum requirement, the Meijer outlots were contemplated at the time of the initial development. A waiver from the minimum area requirement is not necessary.

ZONING MAP



Physical Features

Currently the site is undeveloped. The Michigan Department of Environment, Great Lakes, and Energy (EGLE) Wetland Map and the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map indicate neither wetlands nor floodplain are present on or near the site.

Access

The Meijer Development Agreement prohibits any outlot from having direct access and/or a curb-cut onto Highland Road (M-59). Two proposed driveways to the Meijer private drive would provide access to the site. Two-way undivided driveways must have a throat width of 25 feet. **The throat width shall be increased by one foot, from 24 feet to 25 feet (comment outstanding – driveway throat width shall exclude the gutter pan) (comment addressed – driveway throat width has been increased)** (throat length is the distance parallel to the centerline of a driveway from the public or private road right-of-way or access easement to the first on-site location at which a driver can make a right-turn or left-turn). The zoning ordinance states the number of driveways permitted for a site shall be the minimum number necessary to provide safe and efficient access for regular traffic and emergency vehicles. **The easterly driveway shall be eliminated. Revise accordingly. (Comment addressed. The easterly driveway has been removed).**

The Fire Truck Turning Exhibit (Sheet C-13) indicates a fire truck traversing over a curb, landscaping, a snow storage area, a sidewalk, and another curb to exit the site. Driving outside of designated fire lanes is not, pursuant to the zoning ordinance, acceptable for the efficient and effective use of fire apparatus (likely also noncompliant with the Fire Code). Sheet C-13 shall be revised to demonstrate fire apparatus can enter and exit the site by utilizing drive aisles/maneuvering lanes and the site driveway. (Comment addressed. The exhibit (now Sheet C-14) has been updated).

All dimensions for drive widths and parking space depth shall be revised. The site plan measures drive widths to the back or face of curb; road measurement surface is taken between the edges of the gutter pan (drive width shall be provided between the edges of the gutter pan). (Comment outstanding. Drive aisle width shall exclude the gutter pan). (Comment addressed. The site layout has been revised to remove gutter pans from all parking stall and drive aisle dimensions). Furthermore, gutter pan shall not be included in the measurement of parking space depth. (Comment partially addressed. Excluding the gutter pan from stall dimensions results in a minimum proposed standard space of 9' x 18', which is compliant with the zoning ordinance. Revise the proposed column for Section 5.11.Q within the Off-Street Parking Requirements Table to reflect 9' x 18' spaces. (Comment addressed. The aforementioned table has been updated). The barrier-free spaces shall be revised to exclude gutter pan from the width of the spaces). (Comment addressed. See response to first comment in this paragraph). Provide a note on Sheet C-3 stating such. (Comment outstanding). (Comment addressed. A note has been added to the parking table indicating gutter pans are excluded from the dimensions).

The zoning ordinance requires a minimum eight-foot-wide sidewalk along the Highland Road property frontage. Sidewalk along the aforementioned frontage was constructed by Meijer at the time of the initial development **(the width of the existing sidewalk shall be dimensioned on the site plan). (Comment addressed. Existing sidewalk width (six feet) has been dimensioned on the plans). The Applicant shall be required to repair/replace any broken sections of concrete within the frontage sidewalk adjacent to the site along Highland Road, as determined by the Township Engineering Consultant. This shall be noted on Sheet C-3. (Comment addressed. A note has been added as required).**

A six-foot-wide sidewalk is required along the Meijer private drive. The site plan shall be revised to provide a six-foot-wide concrete sidewalk (the width shall be dimensioned on the plan) extending across the entire northerly frontage; the concrete sections shall be constructed through the driveway. (Comment addressed. A six-foot-wide concrete sidewalk has been proposed along the northern frontage).

Utilities

Municipal water and sanitary sewer are available to serve the site. The Township Engineering Consultant will perform an analysis of utilities, stormwater, and grading to ensure compliance with all applicable ordinances as well as the Township Engineering Design Standards.

Staff Analysis

When reviewing the preliminary site plan, the Planning Commission should consider if the project meets the design standards for Planned Business developments found in Article 6, Section 7 of the zoning ordinance, the appropriateness of the requested waivers, and the site standards and development procedures for a PB development as outlined in Articles 5 and 6, respectively, of the zoning ordinance.

The Planned Business development review process is summarized by the following steps:

1. Preliminary Site Plan: During this review, the site layout and use(s) are established, the amount of open space is determined, and other project details are decided upon. The Planning Commission holds a public hearing, reviews the PB proposal, and makes a recommendation to the Township Board. The Township Board takes final action, approving or denying the preliminary site plan.

2. Final Site Plan: At this time building materials and colors, landscaping, and outdoor lighting are finalized and all conditions of preliminary site plan approval must be satisfied. The Planning Commission reviews and takes action to approve or deny the final site plan, and also reviews the proposed Development Agreement and makes a recommendation to the Township Board.

3. Development Agreement: Upon recommendation by the Planning Commission, the Township Board takes final action on the Development Agreement.

The following standards for drive-thrus found in Article 4, Section 17 of the zoning ordinance must also be utilized:

A. *A front yard setback of at least sixty (60) feet shall be required.* The proposed front yard setback from the north property line is 116.50 feet. **The building setback from the south (front) property line shall be dimensioned on the site plan. The Land Use and Zoning Table shall also be revised to identify the rear setback as a front setback. The Required column in the aforementioned table is also incorrect and shall be revised; the 150-foot maximum front yard setback is not applicable (remove said line from Sheet C-3 and the row in the Land Use and Zoning Table). Per the Meijer Development Agreement, the Highland Road setback requirement for this outlot is 75 feet. Revise accordingly. (Comments addressed. Setbacks have been corrected and all dimensions included).**

   The proposed column for the minimum front yard parking setback (Highland Road) within the Land Use and Zoning Table shows 50.3 feet, and the plan dimensions this setback as 50.2 feet. Revise for consistency. (Comment addressed. The setback (now 46 feet) has been corrected).

B. *Entrance and exit drives shall be at least one hundred (100) feet from any street intersection and two hundred (200) feet from any residential district.* The nearest street intersection (Bogie Lake Road and Meijer private drive – to the east) is approximately 181 feet from the proposed easterly driveway (to be removed – see previous page). Additionally, the proposed driveway exceeds the minimum 200-foot setback from a residential zoning district.

C. *An outdoor lighting plan shall specify the type of fixtures to be used, light intensity, and method of shielding the fixtures so that light does not project onto adjoining properties or on any public or private street or right-of-way. Dropped fixtures shall not be allowed. The site plan shall include a photometric plan and catalog details for all proposed fixtures. Outdoor lights must meet the performance standards of Section 5.18.* See the Outdoor Lighting section of this review.

D. *An obscuring fence, screen wall, or land form buffer shall be provided in accordance with the provisions of Section 5.19 on all sides abutting a residential district.* The property does not abut a residential district.

E. *Adequate off-street waiting space shall be provided to prevent drive-through customers from waiting on a public or private street.* Fast food restaurants with indoor seating require minimum stacking (per lane) of eight (8) vehicles inclusive of the vehicle at the window. The site plan shows 19 waiting spaces for the ordering station, and there are a few additional waiting spaces not indicated prior to reaching the pick-up window.

Building Architecture and Design

In accordance with the M-59 architectural character requirements, exterior building materials shall be comprised primarily of high quality, durable, low maintenance material, such as masonry, stone, brick, glass, or equivalent materials. Buildings should be completed on all sides with acceptable materials **(consideration shall be given to the north facade design as it would be visible from a street. The north facade shall resemble a front facade, not a rear facade)**. **(Comment addressed. The north facade is now comprised of brick veneer with spandrel glazing to give the appearance of windows).** The proposed materials for the 19-foot-tall building are a mix of EFIS (exterior insulation finishing system), aluminum wood-look cladding system, brick veneer, and fiberglass panels. **The building materials do not meet the architectural requirements of the Township, and the building is not designed to create a pleasing appearance. Aluminum cladding, EFIS, and fiberglass panels are not considered high-quality materials. Seventy (70) percent of all elevations of the building should be covered with some type of brick or cultured stone product. (Comment addressed. The north, east, and west facades of the building are now primarily covered with brick veneer, and the north facade contains increased window coverage (the EIFS remains undesirable)).**

All buildings shall have windows at eye level covering at least 30 percent of the front facade (north and south elevations of the building). The building elevations shall be revised to provide the required windows, and a window coverage calculation shall be provided on the building elevations. (Comments addressed. The north and south facades now contain the required window coverage, and such coverage has been noted on the exterior elevations).

Sheets A200, A201, and A101 reference sheets not provided in the plan set – provide the referenced sheets or remove references to sheets not provided. (Comment addressed. References to sheets not provided in the plan set have been removed).

A sample board of building materials to be displayed at the Planning Commission meeting and elevations in color are required by the zoning ordinance and must be submitted at final site plan. Additionally, the address (street number) location shall be shown on the building. Six-inch-tall numbers visible from the street shall be required. The address location is subject to approval of the Fire Marshal. (Comments remain as a notation).

Parking

In addition to the required stacking spaces (which must be provided as described on Page 5 of this review), one parking space per 75 square feet of gross floor area is required for the drive-thru restaurant (43 spaces) and one parking space per 200 square feet of gross floor area is required for the retail space (13 spaces). In total, 56 parking spaces are required and 56 parking spaces are proposed around the building. The required number of barrier-free parking spaces are also provided.

A snow storage plan was not provided. Information on method of snow storage shall be provided (denote snow storage areas on Sheet C-3). (Comment addressed. A snow storage area has been indicated on Sheet C-3). Winter maintenance of parking lot landscape islands shall be required where heavy applications of salt and de-icing products occur through the use of salt tarps which minimize soil absorption and ultimately reduce plant disorders. (Comment addressed. A maintenance note has been added to Sheet C-8).

Off-Street Loading Requirements

The zoning ordinance requires one loading space for a development of this size. Such loading and unloading space must be an area 10 feet by 50 feet, with a 15-foot height clearance. One loading space is proposed. General Note 13 on Sheet C-3 states any loading/unloading would occur off-hours as to not conflict with customer traffic flow.

Trash Receptacle Screening

The zoning ordinance requires dumpsters to be surrounded by a six-foot-tall wall on three sides and an obscuring wood gate on a steel frame on the fourth side, located on a six-inch concrete pad extending 10 feet in front of the gate, with six-inch concrete-filled steel bollards to protect the rear wall and gates. **Four-inch bollards are proposed. Revise accordingly. (Comment addressed. Trash enclosure bollards have been revised to six-inches).** The zoning ordinance also states dumpsters and trash storage enclosures shall be constructed of the same decorative masonry materials as the buildings to which they are accessory. Brickform concrete (simulated brick pattern) or stained, decorative CMU block are not permitted where the principal building contains masonry. Plain CMU block is also prohibited. **The dumpster enclosure shall be faced with the same brick veneer as the facade of the building with a steel-backed wood gate painted a complementary color to the brick/cultured stone. Revise the trash enclosure detail to show incorporation of the aforementioned design elements. (Comment addressed. A note has been added to the trash enclosure detail).**

The proposed enclosure is located northwest of the building. The zoning ordinance prohibits trash enclosures within a required front yard setback, and does not allow enclosures closer to the front lot line than the principal building. The proposed dumpster enclosure is located closer to the Meijer private drive than the building and within the front yard setback. **A waiver is required to allow the dumpster enclosure to project into the front yard and a waiver is required to allow the dumpster enclosure to encroach into the front yard setback. (Comment outstanding. Waivers have been requested by the Applicant).**

General Note 14 on Sheet C-3 states all trash pick-up would occur off-hours as to not conflict with customer traffic flow.

The trash enclosure detail on Sheet C-9 shall be revised to be consistent with Sheet C-3 which shows partitioning wall(s) separating the southerly third of the enclosure from the northerly two-thirds of the enclosure. Sheet C-3 shall include labels to note the type of bins to be placed in each portion of the enclosure. (Comment partially addressed. There are two separate trash enclosure details, a single and a double constructed side by side. The single enclosure detail has been added to the plans. However, four-inch bollards are proposed, and six-inch concrete-filled steel bollards are required – revise accordingly).

Landscaping and Screening

Landscaping must comply with the provisions of the zoning ordinance and should be designed to preserve existing significant natural features and to buffer service areas, parking lots, and dumpsters. A mix of evergreen and deciduous plants and trees are preferred, along with seasonal accent plantings. A landscape plan is not required as part of the preliminary site plan, but was provided for consideration and will be reviewed in detail during final site plan review if the preliminary site plan is approved. Following are initial comments on the landscape plan:

- All required landscape areas in excess of 200 square feet shall be irrigated to assist in maintaining a healthy condition for all plantings and lawn areas. **An irrigation plan shall be provided at final site plan. (Comment remains as a notation. This requirement has been acknowledged by the Applicant's engineer in the response letter provided to the first review).**

- **No more than two planted trees in a row shall be of the same species. (Comment addressed. Species have been revised).**

- **Within the Highland Road greenbelt, evergreen trees shall be required. (Comment outstanding. Nellie Stevens Holly is not an acceptable evergreen tree). (Comment outstanding. Green Giant Arborvitae is considered a shrub, not an evergreen tree. Examples of acceptable evergreen trees are Colorado Green Spruce and Blue Spruce).**

- **The labels on Sheet C-8 stating "area to be lawn" shall be revised to include "sod lawn." (Comment addressed. Labels have been revised accordingly).**

- **The tree and shrub planting details on Sheet C-10 mention mulch. The zoning ordinance states the mulch product itself shall be at least doubled-shredded quality. Revise accordingly. (Comment addressed. Details have been updated to note double-shredded mulch).**

- **A note on Sheet C-8 references a soil erosion plan on Sheet C-10 and such plan is not located on Sheet C-10. (Comment addressed. Reference has been removed).**

- **Unless waived by the Planning Commission, or the administrative staff reviewing the plan, a landscape plan shall be prepared by a landscape architect registered in the State of Michigan. (Comment outstanding. Contrary to the response letter provided to the second review stating the landscape plan has been prepared and stamped by a registered landscape architect, the submitted plan is stamped by a professional engineer).**

Outdoor Lighting

Site lighting is required to comply with the zoning ordinance. Information on site lighting was provided and will be reviewed in detail during final site plan review. Following are initial comments on the lighting (photometric) plan:

- Lighting shall be shielded from adjacent properties and designed to reflect continuity with the pedestrian orientation of the area. Floodlights, wall pack units, and other types of unshielded lights, and lights where the lens or bulb is visible outside of the light fixture are not permitted except in service areas where the lights will not generally be visible by the public or adjacent residential properties. Lights underneath canopies must be fully recessed into the canopy to minimize glare from the light source.

- Partial lighting fixture specifications were provided on the photometric plan. **Complete catalog details (lighting fixture specification sheets) for all proposed fixtures shall be provided. Light fixture selections and colors are subject to review and approval by the Township. (Comment outstanding. The wall pack housing color is not identified on Sheet C-11). (Comment addressed. Wall pack housing color (black) and color temperature (3000K) have been selected on Sheet C-12).**

- **Revise the Lighting Statistics Table to include footcandle information at the building. (Comment addressed. The table has been updated to include building information).**

- **The proposed overall parcel average footcandle level of 1.4 exceeds the allowable average of 0.5 footcandle. Therefore, a waiver is required. (Comment outstanding. A waiver has been requested by the Applicant).**

Signs

The site plan does not show the location of a monument sign. Per the Meijer Development Agreement, freestanding signs are prohibited from being located on any individual outlot. If allowed by Meijer, the tenants may be identified on the freestanding sign at the northwest corner of Bogie Lake Road and Highland Road.

A maximum of one wall sign is permitted for each principal building. In instances where a parcel has frontage on two streets, an additional wall sign may be permitted on the building facing the secondary thoroughfare, which is no greater than five percent of the wall area on which the sign is placed. Where permitted, wall signs must be located flat against the building's front facade or parallel to the front facade on a canopy. The building elevations show five wall signs on the building (north, south, and west facades). **The two wall signs on the west elevation shall be removed, or waivers are required. (Comment addressed. The aforementioned signs have been removed from the building). Additionally, one of the two wall signs shall be removed from the south elevation, or a waiver is required. (Comment addressed. The aforementioned signs are now proposed to be one sign).** Staff does not support signage waivers. The building elevations should be revised to comply with the sign standards.

Outdoor Dining

Outdoor dining is subject to the following standards found in Article 4, Section 18 of the zoning ordinance:

A. *The Planning Commission shall determine that the use is designed and will be operated so as not to create a nuisance to property owners adjacent to or nearby the eating establishment. As such, the proposed use shall meet the following minimum criteria:*

i. *The establishment may operate only during the following hours:*
   - *Monday thru Thursday: 8:00 a.m. – 12:00 midnight*
   - *Friday: 8:00 a.m. – 2:00 a.m.*
   - *Saturday: 10:00 a.m. – 2:00 a.m.*
   - *Sunday: 10:00 a.m. – 10:00 p.m.*

Panera Bread would be required to operate within the allowed hours.

ii. *The use of exterior loudspeakers is prohibited where the site abuts a residential district or use. The noise level at the lot line shall not exceed 70 dB.*

Panera Bread would be required to adhere to said performance standard.

iii. *An outdoor lighting plan shall specify the type of fixtures to be used, light intensity, and method of shielding the fixtures so that light does not project onto adjoining properties or on any public or private street or right-of-way. Dropped fixtures shall not be allowed. The site plan shall include a photometric plan and catalog details for all proposed fixtures. Outdoor lights must meet the performance standards of Section 5.18.*

Information on site lighting was provided and will be reviewed in detail during final site plan if the preliminary site plan is approved. Initial comments on the lighting (photometric) plan were previously provided in this report.

B. *Additional parking spaces must be provided according to the following:*

i. *Outdoor dining areas for more than 30 people or which include either permanent or seasonal structures, such as awning, roofs, or canopies, may be required to provide additional parking according to the following:*

   a. *If the outdoor seating is 25% of the indoor seating or less, no additional parking is necessary.*

   b. *If the outdoor seating is 26%-50% of the indoor seating, the restaurant may be required to provide up to 125% of the parking required for the indoor space.*

   c. *If the outdoor seating is over 50% of the indoor seating capacity, the restaurant may be required to provide up to 150% of the parking required for the indoor space.*

An outdoor patio is proposed at the southwest corner of the building. **Label the size (square footage) of the patio, as well as the proposed number of tables and chairs, on Sheet C-3. (Comment outstanding. The square footage and number of seats have been added to the patio callout on Sheet C-3, but the proposed number of tables remains unidentified. Additionally, Sheet G131 of the architectural plans identifies the patio area as 813 square feet in size. Revise for consistency). (Comment addressed. The patio has been reduced to 394 square feet and a maximum of 28 seats. Tables have been shown on Sheet C-3. Sheet G131 has been updated accordingly).**

Community/Public Benefit

A waiver from the Community Impact Statement (CIS) requirement should be requested. (Comment outstanding. A waiver has been requested by the Applicant). While staff supports waiving submission of a CIS, **a community/public benefit must be provided to qualify for development in the PB district. (Comment addressed. In the response letter provided to the first review, the Applicant's engineer indicated a $20,000 donation to the Parks and Recreation Fund is proposed).** For PB developments, a public benefit(s) must be provided to offset the impact(s) of development on the Township. Community benefits are intended to be for the use and enjoyment of the public-at-large and must be commensurate with the waivers requested for the project. **A community/public benefit is not proposed. (Comment addressed. See response to previous comment).**

Planning Commission Options / Recommendation

The Planning Commission may recommend approval, approval with conditions, or denial of the preliminary site plan to the Township Board. ~~**Staff recommends the plans be revised and resubmitted to address the items identified in this memorandum. A response letter detailing changes made to the plan shall be provided upon resubmission. A revised list of requested waivers shall also be provided, along with a proposed community/public benefit.**~~ **(Staff recommends the project is eligible for consideration by the Planning Commission. Any recommendation of approval of the preliminary site plan shall be conditioned on the Applicant addressing all staff and consultant review comments and recommendations).**

Miscellaneous Comments

- **The building elevations and floor plan shall be sealed by the registered architect who prepared the plans. (Comment addressed. The aforementioned plans have been signed and sealed).**

- **The survey shall be sealed by the professional surveyor who prepared the plan. (Comment addressed. The survey has been signed and sealed).**

- **Sheet 02 of Exhibit A.1 misidentifies the Meijer private drive as Bogie Lake Road. Revise accordingly. (Comment outstanding. The aforementioned sheet did not accompany the second submittal. The Applicant shall verify in writing the intent to remove the sheet from the plan set as an architectural site plan is not needed and the prior sheet is no longer consistent with the prevailing site plan (Stonefield plan)). (Comment addressed. Verification of removal of the sheet from the plan set has been provided).**

Fire Department
Charter Township of White Lake

7420 Highland Road
White Lake, MI 48383
Office (248) 698-3993
www.whitelaketwp.com/fire

Site / Construction Plan Review

To: Sean O'Neil, Planning Department Director

Date: 07/06/23

Project: Panera Bread 6001 Highland Rd. Outlet B

Job #: 2002-248A

Date on Plans: 06/22/23

The Fire Department has the following comments with regard to the 3rd review of preliminary plans for the project known as Panera Bread 6001 Highland Rd. Outlet B:

The Fire Dept. has no further comments at this time.

Jason Hanifen
Fire Marshal
Charter Township of White Lake
(248)698-3993
jhanifen@whitelaketwp.com

Plans are reviewed using the International Fire Code (IFC), 2015 Edition and Referenced NFPA Standards.

SITE DEVELOPMENT PLANS
FOR
HIGHLAND ROAD OUTLOT B
PROPOSED COMMERCIAL DEVELOPMENT

PARCEL ID: 12-20-276-035
HIGHLAND ROAD (M-59) - OUTLOT B
WHITE LAKE TOWNSHIP, OAKLAND COUNTY, MICHIGAN

SOURCE: USGS NATIONAL MAPPER

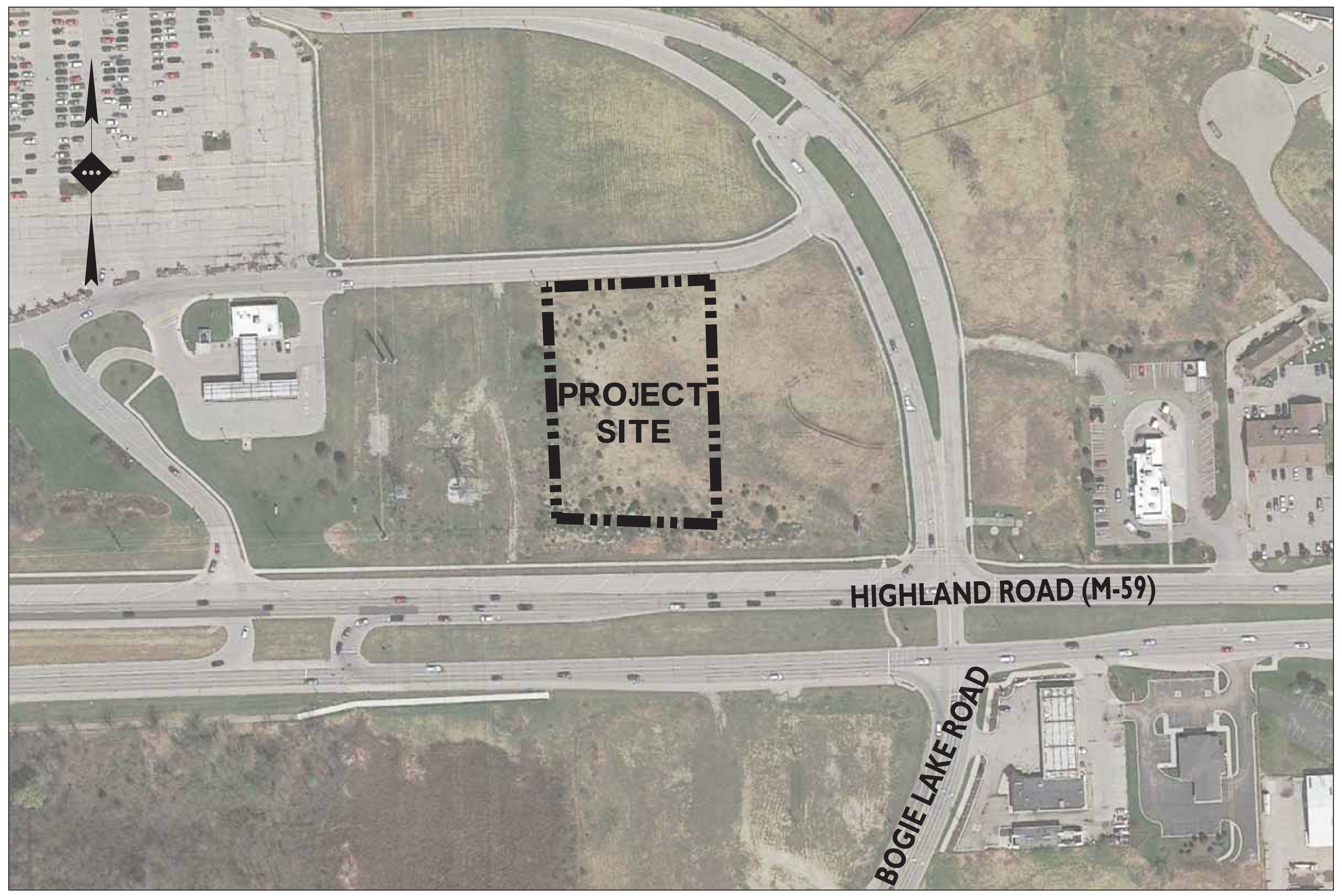
LOCATION MAP
SCALE: 1" = 2,000'±

APPLICANT

WHITE LAKE RETAIL II, LLC
30200 TELEGRAPH ROAD SUITE 205
BINGHAM FARMS, MI 48025

ZONING RELIEF TABLE

RELIEF TYPE	CODE SECTION	REQUIRED	PROPOSED
WAIVER	§ 6.6	COMMUNITY IMPACT STATEMENT (CIS)	NONE
WAIVER	§ 5.19.N.i.c.	NO ENCLOSURES SHALL BE PERMITTED WITHIN A REQUIRED FRONT YARD (60 FT) OR STREET-SIDE SIDE YARD SETBACK, NOR CLOSER TO THE FRONT LOT LINE THAN THE PRINCIPAL BUILDING (116.5 FT).	20.5 FT FROM FRONT LOT LINE
WAIVER	§ 5.18.G.viii	MAXIMUM AVERAGE WALKWAY ILLUMINATION: 1.0 FC	4.85 FC
WAIVER	§ 5.18.G.viii	MAXIMUM GENERAL ILLUMINATION: 0.5 FC	1.40 FC



SOURCE: GOOGLE EARTH PRO

AERIAL MAP
SCALE: 1" = 150'±

SOURCE: CITY OF WHITE LAKE ZONING MAP

ZONING MAP
SCALE: 1" = 150'±

WHITE LAKE CHARTER TOWNSHIP ENGINEERING NOTES:

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE TOWNSHIP'S CURRENT STANDARDS AND SPECIFICATIONS.
2. THE CONTRACTOR SHALL NOTIFY THE TOWNSHIP ENGINEER AND/OR THE AUTHORITY HAVING JURISDICTION, 48 HOURS PRIOR TO THE BEGINNING OF CONSTRUCTION.
3. CONTRACTOR SHALL CONTACT MISS DIG AT 800-482-7171, 72 HOURS IN ADVANCE OF CONSTRUCTION, FOR EXISTING UNDERGROUND UTILITY LOCATIONS.
4. IN ORDER TO VERIFY COMPLIANCE WITH APPROVED PLANS, FULL-TIME CONSTRUCTION OBSERVATION WILL GENERALLY BE REQUIRED DURING ALL PHASES OF UNDERGROUND SITE CONSTRUCTION INCLUDING INSTALLATION OF SANITARY SEWER, STORM SEWERS, DRAINS, WATERMAINS AND APPURTENANCES AS WELL AS PRIVATE STREET CURBING AND PAVING CONSTRUCTION. INTERMITTENT OBSERVATIONS WILL BE MADE FOR SITE GRADING, PARKING LOT CURBING AND PAVING, RETAINING WALL CONSTRUCTION AND OTHER SURFACE ACTIVITY.

PLAN REFERENCE MATERIALS:

1. THIS PLAN SET REFERENCES THE FOLLOWING DOCUMENTS INCLUDING, BUT NOT LIMITED TO:
   - ALTA / NSPS LAND TITLE SURVEY PREPARED BY KEM-TEC & ASSOCIATES INC. DATED 06/21/2023
   - ARCHITECTURAL PLANS PREPARED BY ARCHVISION ARCHITECTS
   - GEOTECHNICAL REPORT PREPARED BY TBD CONSULTANTS DATED XX/XX/XXXX
   - AERIAL MAP OBTAINED FROM GOOGLE EARTH PRO
   - LOCATION MAP OBTAINED FROM USGS NATIONAL MAPPING SYSTEM
2. ALL REFERENCE MATERIAL LISTED ABOVE SHALL BE CONSIDERED A PART OF THIS PLAN SET AND ALL INFORMATION CONTAINED WITHIN THESE MATERIALS SHALL BE UTILIZED IN CONJUNCTION WITH THIS PLAN SET. THE CONTRACTOR IS RESPONSIBLE TO OBTAIN A COPY OF EACH REFERENCE AND REVIEW IT THOROUGHLY PRIOR TO THE START OF CONSTRUCTION.

V:\DET\2022\DET-220180-ALRIG-6001 HIGHLAND ROAD, CHARTER TOWNSHIP OF WHITE LAKE, MI\CADD\PLOT\SDP-01-COVR.DWG

811
Know what's **below**
Call before you dig.

PLANS PREPARED BY:

STONEFIELD
engineering & design
Detroit, MI • New York, NY • Rutherford, NJ
Princeton, NJ • Tampa, FL • Boston, MA
www.stonefieldeng.com
607 Shelby Suite 200, Detroit, MI 48226
Phone 248.247.1115

PROPERTY DESCRIPTION (PARENT PARCEL):

LAND SITUATED IN THE TOWNSHIP OF WHITE LAKE, COUNTY OF OAKLAND, STATE OF MICHIGAN, DESCRIBED AS: PART OF THE NORTHEAST 1/4 OF SECTION 20, TOWN 3 NORTH, RANGE 8 EAST, BEGINNING AT A POINT DISTANT N 00°31'08" E 198.92 FEET AND NORTH 89°58'09" E 519.78 FEET AND S 87°30'16" E513.36 FEET FROM CENTER OF SECTION 20; THENCE N 00°39'06" E 981.32 FEET; THENCE N 90°00'00" E 156.11 FEET; THENCE N 63°45'10" E 76.30 FEET; THENCE N 83°08'44" E 68.91 FEET; THENCE S 73°02'19" E 100.53 FEET; THENCE S 50°34'37" E 136.92 FEET ; THENCE S 50°09'11" E 120.23 FEET; THENCE S 50°21'46" E 66.40 FEET; THENCE S 32°53'46" E 42.85 FEET; THENCE N 90°00'00" E 49.43 FEET; THENCE S 00°19'28" W 474.21 FEET; THENCE N 89°40'32" W 147.67 FEET; THENCE ALONG A CURVE TO THE RIGHT, RADIUS 533.50 FEET, CHORD BEARING S 05°00'27" E 94.46 FEET, A DISTANCE OF 94.59 FEET; THENCE S 00°01'09" E 236.61 FEET; THENCE ALONG A CURVE TO THE RIGHT, RADIUS 5637.58 FEET, CHORD BEARING N 85°18'14" W 118.86 FEET, A DISTANCE OF 118.86 FEET; THENCE N 84°42'00" W 51.36 FEET; THENCE N01°30'56" E 30.03 FEET; THENCE S 88°29'04" E 63.50 FEET; THENCE N 03°10'30" W 150.32 FEET; THENCE ALONG A CURVE TO THE LEFT, RADIUS 966.50 FEET, CHORD BEARING N 19°25'09" W 233.59 FEET, A DISTANCE OF 234.17 FEET; THENCE S 60°22'37" W 36.86 FEET; THENCE ALONG A CURVE TO THE RIGHT, RADIUS 233 FEET, CHORD BEARING S 75°11'17" W 119.13 FEET, A DISTANCE OF 120.47 FEET; THENCE S 90°00'00" W 15.98 FEET; THENCE S 01°30'56" W 332.20 FEET; THENCE N 84°42'00" W189.40 FEET; THENCE ALONG A CURVE TO THE LEFT, RADIUS 5821.58 FEET, CHORD BEARING N 84°52'11" W 28.38 FEET, A DISTANCE OF 28.38 FEET TO THE POINT OF BEGINNING.

PROPERTY DESCRIPTION (PARCEL 'A'):

LAND SITUATED IN THE TOWNSHIP OF WHITE LAKE, COUNTY OF OAKLAND, STATE OF MICHIGAN, DESCRIBED AS: PART OF THE NORTHEAST 1/4 OF SECTION 20, TOWN 3 NORTH, RANGE 8 EAST, BEGINNING AT A POINT DISTANT NORTH 00 DEGREES 31 MINUTES 08 SECONDS EAST 198.92 FEET AND NORTH 89 DEGREES 58 MINUTES 09 SECONDS EAST 519.78 FEET AND SOUTH 87 DEGREES 30 MINUTES 16 SECONDS EAST 513.36 FEET FROM CENTER OF SECTION 20; THENCE NORTH 00 DEGREES 39 MINUTES 06 SECONDS EAST 312.07 FEET; THENCE SOUTH 90 DEGREES 00 MINUTES 00 SECONDS EAST (DUE EAST) 222.10 FEET; THENCE SOUTH 01 DEGREE 30 MINUTES 56 SECONDS WEST 332.20 FEET; THENCE NORTH 84 DEGREES 42 MINUTES 00 SECONDS WEST 189.40 FEET; THENCE ALONG A CURVE TO THE TO THE LEFT, RADIUS 5821.58 FEET, CHORD BEARING NORTH 84 DEGREES 52 MINUTES 11 SECONDS WEST 28.38 FEET, A DISTANCE OF 28.38 FEET TO THE POINT OF BEGINNING.

SHEET INDEX

DRAWING TITLE	SHEET #
COVER SHEET	C-1
DEMOLITION PLAN	C-2
SITE PLAN	C-3
GRADING PLAN	C-4
STORMWATER MANAGEMENT PLAN	C-5
UTILITY PLAN	C-6
LIGHTING PLAN	C-7
LANDSCAPING PLAN	C-8
CONSTRUCTION DETAILS	C-9 TO C-13
FIRE TRUCK TURNING EXHIBIT	C-14

ADDITIONAL SHEETS

DRAWING TITLE	SHEET #
ALTA / NSPS LAND TITLE SURVEY	1 OF 1
WHITE LAKE TWP WATERMAIN DETAILS	1 OF 1
WHITE LAKE TWP STORM SEWER DETAILS	1 OF 1
WHITE LAKE TWP SANITARY DETAILS	1 OF 1
OAKLAND COUNTY SOIL EROSION DETAILS	1 OF 1

ISSUE	DATE	BY	DESCRIPTION
5	06/22/2023	EM	RESUBMISSION FOR SITE PLAN APPROVAL
4	05/05/2023	EM	RESUBMISSION FOR SITE PLAN APPROVAL
3	04/11/2023	EM	FOR CLIENT REVIEW
2	03/16/2023	EM	FOR CLIENT REVIEW
1	02/14/2023	EM/JRC	SUBMISSION FOR SITE PLAN APPROVAL

NOT APPROVED FOR CONSTRUCTION

STONEFIELD
engineering & design
Detroit, MI • New York, NY • Rutherford, NJ
Princeton, NJ • Tampa, FL • Boston, MA
www.stonefieldeng.com
607 Shelby Suite 200, Detroit, MI 48226
Phone 248.247.1115

SITE DEVELOPMENT PLANS
HIGHLAND ROAD
MEIJER OUTLOT B
PROPOSED COMMERCIAL DEVELOPMENT
PARCEL ID: 12-20-276-035
HIGHLAND ROAD (M-59) - OUTLOT B
WHITE LAKE TOWNSHIP
OAKLAND COUNTY, MICHIGAN 48383

STATE OF MICHIGAN
JONATHAN REID COOKSEY
ENGINEER
PROFESSIONAL

STONEFIELD
engineering & design

SCALE: AS SHOWN | PROJECT ID: DET-220180

TITLE: COVER SHEET

DRAWING: C-1

SYMBOL	DESCRIPTION
▬ ▬ ▬ ▬	PROPERTY LINE
— — — —	FEATURE TO BE REMOVED / DEMOLISHED

ALL SITE FEATURES WITHIN THE PROPERTY LINES INDICATED ON THIS PLAN ARE TO REMAIN AND BE PROTECTED THROUGHOUT CONSTRUCTION UNLESS OTHERWISE NOTED. THE CONTRACTOR SHALL NOTIFY STONEFIELD ENGINEERING & DESIGN, LLC. IF SIGNIFICANT DISCREPANCIES ARE DISCERNED BETWEEN THIS PLAN AND FIELD CONDITIONS

ALL TREES ON THIS PLAN INDICATED TO BE PROTECTED THROUGHOUT CONSTRUCITION SHALL BE EQUIPPED WITH A TREE PROTECTION FENCE. NO CONSTRUCTION SHALL OCCUR UNTIL TREE PROTECTION FENCE HAS BEEN INSTALLED AND APPROVED BY THE COMMUNITY DEVELOPMENT DIRECTOR.

MDOT NOTES:

1. A SINGLE LANE CLOSURE IS ALLOWED M-F FROM 9 AM TO 3 PM IN ACCORDANCE WITH MDOT TRAFFIC TYPICALS M0020 & M0240
2. M-59 TO BE KEPT FREE AND CLEAR OF DIRT/DEBRIS
3. DAILY SWEEPING MAY BE REQUIRED

Know what's **below**
Call before you dig.

DEMOLITION NOTES

1. THE WORK REFLECTED ON THE DEMOLITION PLAN IS TO PROVIDE GENERAL INFORMATION TOWARDS THE EXISTING ITEMS TO BE DEMOLISHED AND/OR REMOVED. THE CONTRACTOR IS RESPONSIBLE TO REVIEW THE ENTIRE PLAN SET AND ASSOCIATED REPORTS/REFERENCE DOCUMENTS INCLUDING ALL DEMOLITION ACTIVITIES AND INCIDENTAL TASKS NECESSARY TO COMPLETE THE SITE IMPROVEMENTS.
2. THE CONTRACTOR IS RESPONSIBLE TO DETERMINE THE MEANS AND METHODS OF DEMOLITION ACTIVITIES.
3. EXPLOSIVES SHALL NOT BE USED UNLESS WRITTEN CONSENT FROM BOTH THE OWNER AND ANY APPLICABLE GOVERNING AGENCY IS OBTAINED. BEFORE THE START OF ANY EXPLOSIVE PROGRAM, THE CONTRACTOR IS RESPONSIBLE TO OBTAIN ALL LOCAL, STATE, AND FEDERAL PERMITS. ADDITIONALLY, THE CONTRACTOR WILL BE RESPONSIBLE FOR ALL SEISMIC TESTING AS REQUIRED AND ANY DAMAGES AS THE RESULT OF SAID DEMOLITION PRACTICES.
4. ALL DEMOLITION ACTIVITIES SHALL BE PERFORMED IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL CODES. THE CONTRACTOR IS RESPONSIBLE FOR ENSURING ALL UTILITIES ARE DISCONNECTED IN ACCORDANCE WITH THE UTILITY AUTHORITY'S REQUIREMENTS PRIOR TO STARTING THE DEMOLITION OF ANY STRUCTURE. ALL EXCAVATIONS ASSOCIATED WITH DEMOLISHED STRUCTURES OR REMOVED TANKS SHALL BE BACKFILLED WITH SUITABLE MATERIAL AND COMPACTED TO SUPPORT SITE AND BUILDING IMPROVEMENTS. A GEOTECHNICAL ENGINEER SHOULD BE PRESENT DURING BACKFILLING ACTIVITIES TO OBSERVE AND CERTIFY THAT BACKFILL MATERIAL WAS COMPACTED TO A SUITABLE CONDITION.
5. DEMOLISHED DEBRIS SHALL NOT BE BURIED ON SITE. ALL WASTE/DEBRIS GENERATED FROM DEMOLITION ACTIVITIES SHALL BE DISPOSED OF IN ACCORDANCE WITH ALL LOCAL, STATE AND FEDERAL REQUIREMENTS. THE CONTRACTOR IS RESPONSIBLE TO MAINTAIN ALL RECORDS OF THE DISPOSAL TO DEMONSTRATE COMPLIANCE WITH THE ABOVE REGULATIONS.

30' 0' 30' 60'
GRAPHIC SCALE IN FEET
1" = 30'

ISSUE	DATE	BY	DESCRIPTION
5	06/22/2023	EM	RESUBMISSION FOR SITE PLAN APPROVAL
4	05/05/2023	EM	RESUBMISSION FOR SITE PLAN APPROVAL
3	04/11/2023	EM	FOR CLIENT REVIEW
2	03/16/2023	EM	FOR CLIENT REVIEW
1	02/14/2023	EM/JRC	SUBMISSION FOR SITE PLAN APPROVAL

NOT APPROVED FOR CONSTRUCTION

STONEFIELD
engineering & design
Detroit, MI · New York, NY · Rutherford, NJ
Princeton, NJ · Tampa, FL · Boston, MA
www.stonefieldeng.com
607 Shelby Suite 200, Detroit, MI 48226
Phone 248.247.1115

SITE DEVELOPMENT PLANS

HIGHLAND ROAD MEIJER OUTLOT B

PROPOSED COMMERCIAL DEVELOPMENT

PARCEL ID: 12-20-276-035
HIGHLAND ROAD (M-59) - OUTLOT B
WHITE LAKE TOWNSHIP
OAKLAND COUNTY, MICHIGAN 48383

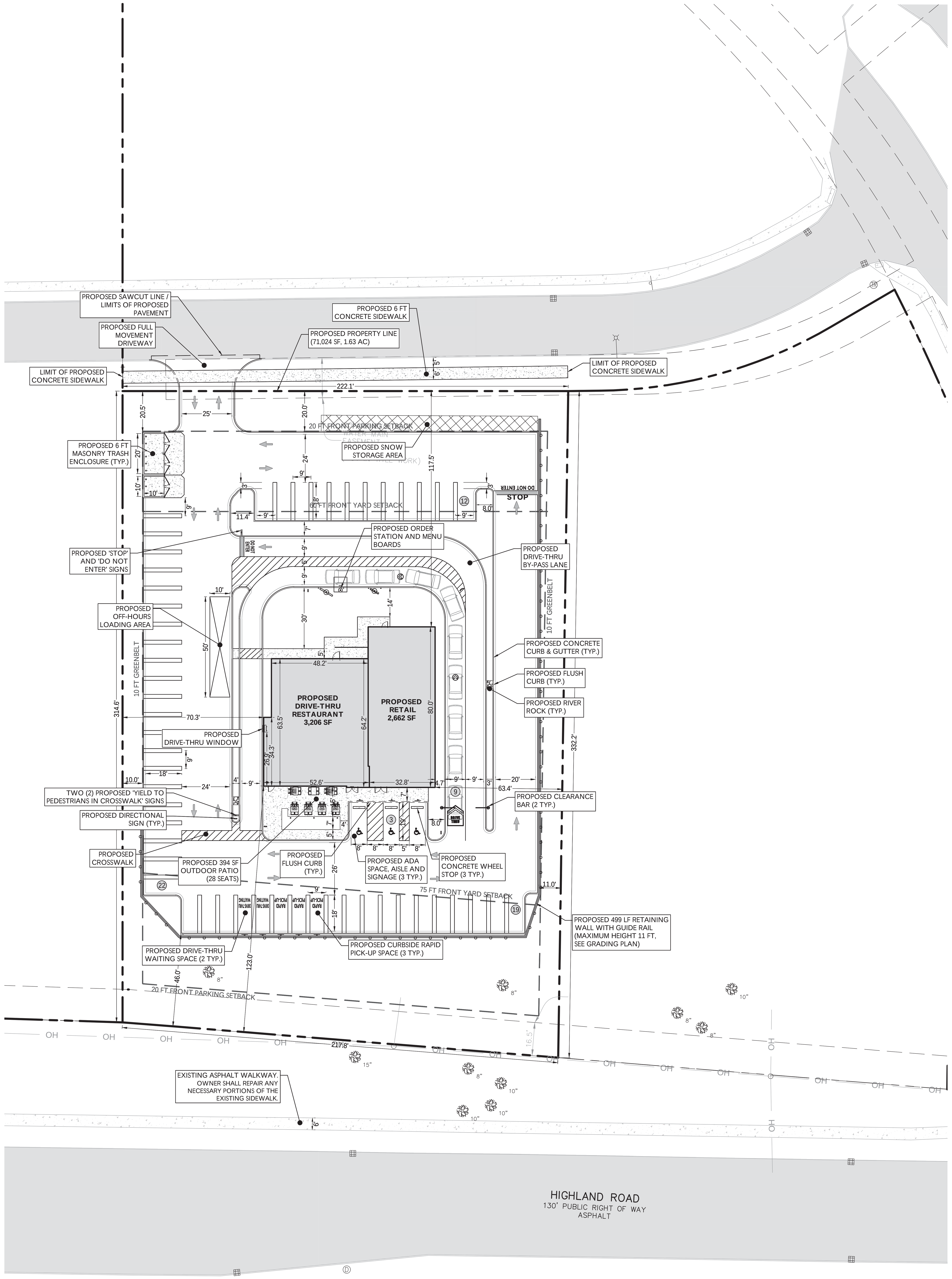
STATE OF MICHIGAN
JONATHAN REID COOKSEY ENGINEER
REID COOKSEY, P.E.
LICENSED PROFESSIONAL ENGINEER

STONEFIELD
engineering & design

SCALE: 1" = 30' | PROJECT ID: DET-220180

TITLE:
DEMOLITION PLAN

DRAWING:
C-2



LAND USE AND ZONING

PID: 12-20-276-035

PLANNED BUSINESS DISTRICT (PB)

PROPOSED USE

RESTAURANT WITH DRIVE-THRU	PERMITTED USE
RETAIL STORE	PERMITTED USE

ZONING REQUIREMENT	REQUIRED	PROPOSED
MINIMUM LOT AREA	10 ACRES (1)	71,024 SF (1.63 AC)
MAXIMUM BUILDING HEIGHT	35 FT / 2 STORIES	19.0 FT / 1 STORY
MINIMUM FRONT YARD SETBACK (SERVICE DRIVE)	60 FT (2)	117.5 FT
MINIMUM FRONT YARD SETBACK (HIGHLAND ROAD)	75 FT (3)	123.0 FT
MINIMUM SIDE YARD SETBACK	N/A	63.4 FT
MINIMUM REAR YARD SETBACK	N/A	N/A
MINIMUM GREENBELT BUFFER	10 FT FROM ADJACENT PROPERTIES	10.0 FT
MINIMUM FRONT YARD PARKING SETBACK (SERVICE DRIVE)	20 FT	20.0 FT
MINIMUM FRONT YARD PARKING SETBACK (HIGHLAND ROAD)	20 FT	46.0 FT

(1) § 3.11(x): A SMALLER PARCEL MAY BE PERMITTED BY PLANNING COMMISSION

(2) § 4.17: A FRONT YARD SETBACK OF AT LEAST SIXTY (60) FT REQUIRED FOR DRIVE- THRU

(3) PER THE MEIJER DEVELOPMENT AGREEMENT, THE HIGHLAND ROAD SETBACK REQUIREMENT FOR THIS OUTLOT IS 75 FEET

OFF-STREET PARKING REQUIREMENTS

CODE SECTION	REQUIRED	PROPOSED
§ 5.11 (m) § 5.11 (m)	DRIVE-THRU PARKING: 1 SPACE PER 75 SF GROSS FLOOR AREA (3,206 SF)(1 SPACE / 75 SF) = 43 SPACES RETAIL PARKING: 1 SPACE PER 200 SF GROSS FLOOR AREA (2,662 SF)(1 SPACE / 200 SF) = 13 SPACES **TOTAL: 43 + 13 = 56 SPACES**	56 SPACES
§ 5.11.Q	90° PARKING: 9 FT X 18 FT W/ 24 FT AISLE	9 FT X 18 FT (1) W/ 24 FT AISLE
§ 5.11.M.i	DRIVE-THRU STACKING: 8 VEHICLES	19 VEHICLES
§ 5.11.M.i	DRIVE-THRU STACKING DIMENSIONS: 9 FT X 20 FT W/ 25 FT MIN RADIUS	10 FT X 20 FT W/ 25 FT RADIUS
§ 5.22 (p)	LOADING ZONE: 10 FT X 50 FT	10 FT X 50 FT
§ 5.11.O	ADA REQUIRED PARKING SPACES: 51-70 TOTAL SPACES = 3 ADA SPACES	3 ADA SPACES

(1) GUTTER PANS ARE NOT TO BE INCLUDED WITHIN THE SHOWN PARKING AND DRIVE AISLE DIMENSIONS

SYMBOL	DESCRIPTION
	PROPERTY LINE
	SETBACK LINE
	SAWCUT LINE
	PROPOSED CURB & GUTTER
	PROPOSED FLUSH CURB
	PROPOSED SIGNS / BOLLARDS
	PROPOSED BUILDING
	PROPOSED CONCRETE
	PROPOSED BUILDING DOORS
	PROPOSED RETAINING WALL WITH GUIDE RAIL

MDOT NOTES:

1. NO LANE CLOSURES PROPOSED
2. M-59 TO BE KEPT FREE AND CLEAR OF DIRT/DEBRIS
3. DAILY SWEEPING MAY BE REQUIRED

GENERAL NOTES

1. THE CONTRACTOR SHALL VERIFY AND FAMILIARIZE THEMSELVES WITH THE EXISTING SITE CONDITIONS AND THE PROPOSED SCOPE OF WORK (INCLUDING DIMENSIONS, LAYOUT, ETC.) PRIOR TO INITIATING THE IMPROVEMENTS IDENTIFIED WITHIN THESE DOCUMENTS. SHOULD ANY DISCREPANCY BE FOUND BETWEEN THE EXISTING SITE CONDITIONS AND THE PROPOSED WORK THE CONTRACTOR SHALL NOTIFY STONEFIELD ENGINEERING & DESIGN, LLC. PRIOR TO THE START OF CONSTRUCTION.
2. THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS AND ENSURE THAT ALL REQUIRED APPROVALS HAVE BEEN OBTAINED PRIOR TO THE START OF CONSTRUCTION. COPIES OF ALL REQUIRED PERMITS AND APPROVALS SHALL BE KEPT ON SITE AT ALL TIMES DURING CONSTRUCTION.
3. ALL CONTRACTORS WILL, TO THE FULLEST EXTENT PERMITTED BY LAW, INDEMNIFY AND HOLD HARMLESS STONEFIELD ENGINEERING & DESIGN, LLC. AND IT'S SUB-CONSULTANTS FROM AND AGAINST ANY DAMAGES AND LIABILITIES INCLUDING ATTORNEY'S FEES ARISING OUT OF CLAIMS BY EMPLOYEES OF THE CONTRACTOR IN ADDITION TO CLAIMS CONNECTED TO THE PROJECT AS A RESULT OF NOT CARRYING THE PROPER INSURANCE FOR WORKERS COMPENSATION, LIABILITY INSURANCE, AND LIMITS OF COMMERCIAL GENERAL LIABILITY INSURANCE.
4. THE CONTRACTOR SHALL NOT DEVIATE FROM THE PROPOSED IMPROVEMENTS IDENTIFIED WITHIN THIS PLAN SET UNLESS APPROVAL IS PROVIDED IN WRITING BY STONEFIELD ENGINEERING & DESIGN, LLC.
5. THE CONTRACTOR IS RESPONSIBLE TO DETERMINE THE MEANS AND METHODS OF CONSTRUCTION.
6. THE CONTRACTOR SHALL NOT PERFORM ANY WORK OR CAUSE DISTURBANCE ON A PRIVATE PROPERTY NOT CONTROLLED BY THE PERSON OR ENTITY WHO HAS AUTHORIZED THE WORK WITHOUT PRIOR WRITTEN CONSENT FROM THE OWNER OF THE PRIVATE PROPERTY.
7. THE CONTRACTOR IS RESPONSIBLE TO RESTORE ANY DAMAGED OR UNDERMINED STRUCTURE OR SITE FEATURE THAT IS IDENTIFIED TO REMAIN ON THE PLAN SET. ALL REPAIRS SHALL USE NEW MATERIALS TO RESTORE THE FEATURE TO ITS EXISTING CONDITION AT THE CONTRACTORS EXPENSE.
8. CONTRACTOR IS RESPONSIBLE TO PROVIDE THE APPROPRIATE SHOP DRAWINGS, PRODUCT DATA, AND OTHER REQUIRED SUBMITTALS FOR REVIEW. STONEFIELD ENGINEERING & DESIGN, LLC. WILL REVIEW THE SUBMITTALS IN ACCORDANCE WITH THE DESIGN INTENT AS REFLECTED WITHIN THE PLAN SET.
9. THE CONTRACTOR IS RESPONSIBLE FOR TRAFFIC CONTROL IN ACCORDANCE WITH MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITION.
10. THE CONTRACTOR IS REQUIRED TO PERFORM ALL WORK IN THE PUBLIC RIGHT-OF-WAY IN ACCORDANCE WITH THE APPROPRIATE GOVERNING AUTHORITY AND SHALL BE RESPONSIBLE FOR THE PROCUREMENT OF STREET OPENING PERMITS.
11. THE CONTRACTOR IS REQUIRED TO RETAIN AN OSHA CERTIFIED SAFETY INSPECTOR TO BE PRESENT ON SITE AT ALL TIMES DURING CONSTRUCTION & DEMOLITION ACTIVITIES.
12. SHOULD AN EMPLOYEE OF STONEFIELD ENGINEERING & DESIGN, LLC. BE PRESENT ON SITE AT ANY TIME DURING CONSTRUCTION, IT DOES NOT RELIEVE THE CONTRACTOR OF ANY OF THE RESPONSIBILITIES AND REQUIREMENTS LISTED IN THE NOTES WITHIN THIS PLAN SET.
13. ANY LOADING/UNLOADING TO OCCUR OFF-HOURS AS TO NOT CONFLICT WITH CUSTOMER TRAFFIC FLOW.
14. ALL TRASH PICKUP TO OCCUR OFF-HOURS AS TO NOT CONFLICT WITH CUSTOMER TRAFFIC FLOW.

30' 0' 30' 60'

GRAPHIC SCALE IN FEET

1" = 30'

ISSUE	DATE	BY	DESCRIPTION
5	06/22/2023	EM	RESUBMISSION FOR SITE PLAN APPROVAL
4	05/05/2023	EM	RESUBMISSION FOR SITE PLAN APPROVAL
3	04/11/2023	EM	FOR CLIENT REVIEW
2	03/16/2023	EM	FOR CLIENT REVIEW
1	02/14/2023	EM/JRC	SUBMISSION FOR SITE PLAN APPROVAL

NOT APPROVED FOR CONSTRUCTION

STONEFIELD engineering & design
Detroit, MI · New York, NY · Rutherford, NJ
Princeton, NJ · Tampa, FL · Boston, MA
www.stonefieldeng.com
607 Shelby Suite 200, Detroit, MI 48226
Phone 248.247.1115

SITE DEVELOPMENT PLANS

HIGHLAND ROAD MEIJER OUTLOT B

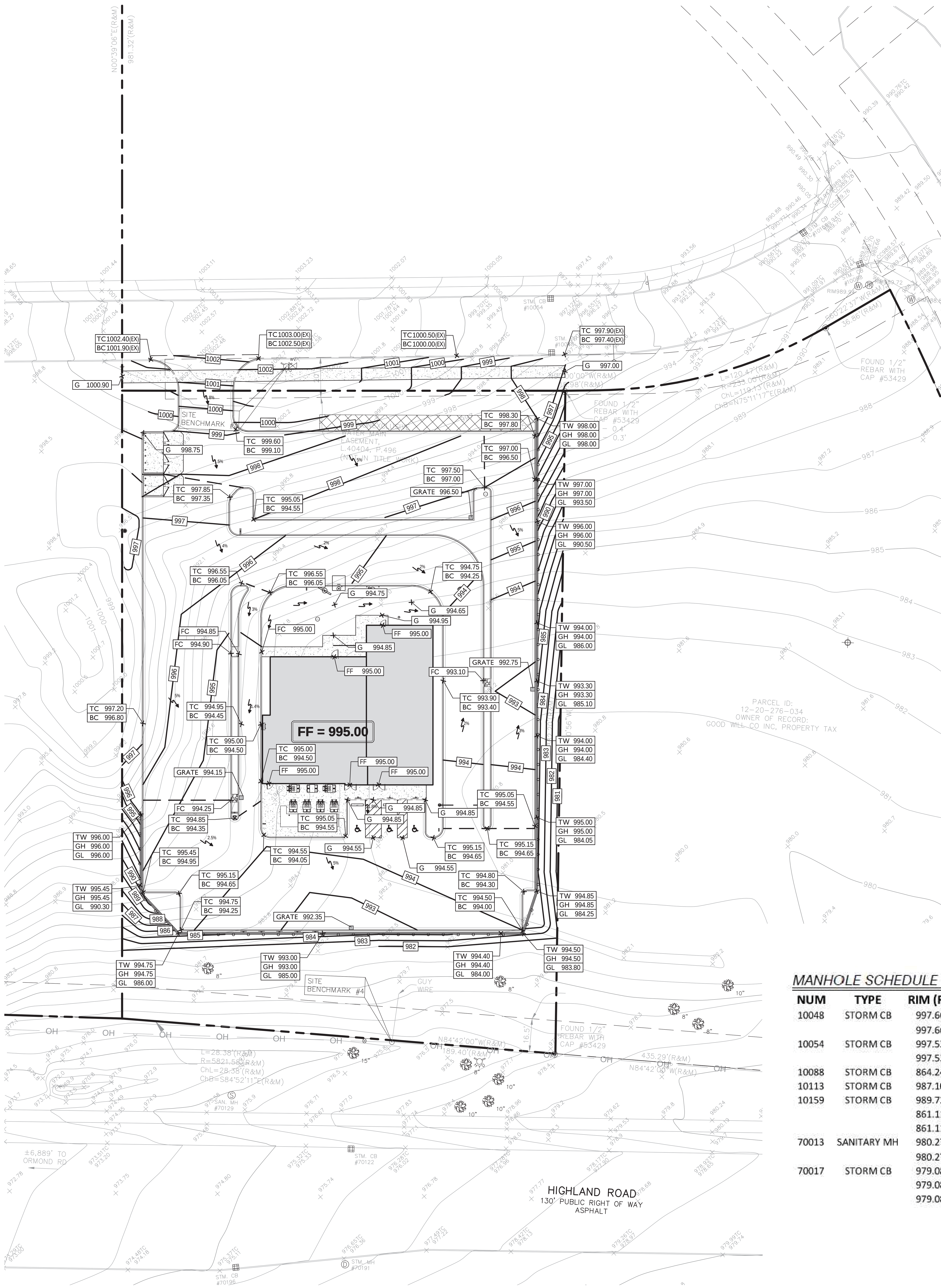
PROPOSED COMMERCIAL DEVELOPMENT

PARCEL ID: 12-20-276-035
HIGHLAND ROAD (M-59) - OUTLOT B
WHITE LAKE TOWNSHIP
OAKLAND COUNTY, MICHIGAN 48383

STATE OF MICHIGAN
JONATHAN REID COOKSEY
ENGINEER
PROFESSIONAL ENGINEER

STONEFIELD engineering & design

SCALE: 1" = 30'	PROJECT ID: DET-220180
TITLE: SITE PLAN	
DRAWING: C-3	



SYMBOL / DESCRIPTION

SYMBOL	DESCRIPTION
	PROPERTY LINE
100	PROPOSED GRADING CONTOUR
RIDGELINE	PROPOSED GRADING RIDGELINE
	PROPOSED DIRECTION OF DRAINAGE FLOW
G 100.00	PROPOSED GRADE SPOT SHOT
TC 100.50 / BC 100.00	PROPOSED TOP OF CURB / BOTTOM OF CURB SPOT SHOT
FC 100.00	PROPOSED FLUSH CURB SPOT SHOT

MANHOLE SCHEDULE

NUM	TYPE	RIM (FT)	SIZE (IN)	DIR	INV ELEV (FT)	NUM	TYPE	RIM (FT)	SIZE (IN)	DIR	INV ELEV (FT)
10048	STORM CB	997.66	12	N	984.91	70046	STORM CB	979.24	18	W	974.04
		997.66	12	S	985.06			979.24	18	E	973.89
10054	STORM CB	997.53	12	S	984.93	70095	SANITARY MH	980.49	15	NE	951.09
		997.53	12	NE	984.78			980.49	15	W	951.29
10088	STORM CB	864.24	12	NW	859.94	70101	STORM CB	979.37	12	S	975.77
10113	STORM CB	987.10	12	E	982.55	70122	STORM CB	975.46	12	S	971.46
10159	STORM CB	989.73	12	SE	983.48	70129	SANITARY MH	975.17	15	E	951.07
		861.11	12	SW	854.86			975.17	15	W	951.17
		861.11	12	NW	854.81	70182	STORM CB	980.28	12	N	975.03
70013	SANITARY MH	980.27	8	N	970.67			980.28	12	S	975.08
		980.27	8	SE	970.47	70191	STORM MH	976.75	12	S	971.15
70017	STORM CB	979.08	18	W	973.68			976.75	12	N	971.20
		979.08	18	N	973.53	70196	STORM CB	975.22	12	SE	971.22
		979.08	12	NE	974.18	70211	STORM BEEHIVE	978.23	18	E	974.53

GRADING NOTES

1. ALL SOIL AND MATERIAL REMOVED FROM THE SITE SHALL BE DISPOSED OF IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL REQUIREMENTS. ANY GROUNDWATER DE-WATERING PRACTICES SHALL BE PERFORMED UNDER THE SUPERVISION OF A QUALIFIED PROFESSIONAL. THE CONTRACTOR IS REQUIRED TO OBTAIN ALL NECESSARY PERMITS FOR THE DISCHARGE OF DE-WATERED GROUNDWATER. ALL SOIL IMPORTED TO THE SITE SHALL BE CERTIFIED CLEAN FILL. CONTRACTOR SHALL MAINTAIN RECORDS OF ALL FILL MATERIALS BROUGHT TO THE SITE.
2. THE CONTRACTOR IS REQUIRED TO PROVIDE TEMPORARY AND/OR PERMANENT SHORING WHERE REQUIRED DURING EXCAVATION ACTIVITIES, INCLUDING BUT NOT LIMITED TO UTILITY TRENCHES, TO ENSURE THE STRUCTURAL INTEGRITY OF NEARBY STRUCTURES AND STABILITY OF THE SURROUNDING SOILS.
3. PROPOSED TOP OF CURB ELEVATIONS ARE GENERALLY 4 INCHES TO 7 INCHES ABOVE EXISTING GRADES UNLESS OTHERWISE NOTED. THE CONTRACTOR WILL SUPPLY ALL STAKEOUT CURB GRADE SHEETS TO STONEFIELD ENGINEERING & DESIGN, LLC. FOR REVIEW AND APPROVAL PRIOR TO POURING CURBS.
4. THE CONTRACTOR IS RESPONSIBLE TO SET ALL PROPOSED UTILITY COVERS AND RESET ALL EXISTING UTILITY COVERS WITHIN THE PROJECT LIMITS TO PROPOSED GRADE IN ACCORDANCE WITH ANY APPLICABLE MUNICIPAL, COUNTY, STATE AND/OR UTILITY AUTHORITY REGULATIONS.
5. MINIMUM SLOPE REQUIREMENTS TO PREVENT PONDING SHALL BE AS FOLLOWS:
   - CURB GUTTER: 0.50%
   - CONCRETE SURFACES: 1.00%
   - ASPHALT SURFACES: 1.00%
5. A MINIMUM SLOPE OF 1.00% SHALL BE PROVIDED AWAY FROM ALL BUILDINGS. THE CONTRACTOR SHALL ENSURE POSITIVE DRAINAGE FROM THE BUILDING IS ACHIEVED AND SHALL NOTIFY STONEFIELD ENGINEERING & DESIGN, LLC. IF THIS CONDITION CANNOT BE MET.
6. FOR PROJECTS WHERE BASEMENTS ARE PROPOSED, THE DEVELOPER IS RESPONSIBLE TO DETERMINE THE DEPTH TO GROUNDWATER AT THE LOCATION OF THE PROPOSED STRUCTURE. IF GROUNDWATER IS ENCOUNTERED WITHIN THE BASEMENT AREA, SPECIAL CONSTRUCTION METHODS SHALL BE UTILIZED AND REVIEWED/APPROVED BY THE CONSTRUCTION CODE OFFICIAL. IF SUMP PUMPS ARE UTILIZED, ALL DISCHARGES SHALL BE CONNECTED DIRECTLY TO THE PUBLIC STORM SEWER SYSTEM WITH APPROVAL FROM THE GOVERNING STORM SEWER SYSTEM AUTHORITY.

ADA NOTES

1. THE CONTRACTOR SHALL MAINTAIN A MAXIMUM 2.00% SLOPE IN ANY DIRECTION WITHIN THE ADA PARKING SPACES AND ACCESS AISLES.
2. THE CONTRACTOR SHALL PROVIDE COMPLIANT SIGNAGE AT ALL ADA PARKING AREAS IN ACCORDANCE WITH STATE GUIDELINES.
3. THE CONTRACTOR SHALL MAINTAIN A MAXIMUM 5.00% RUNNING SLOPE AND A MAXIMUM OF 2.00% CROSS SLOPE ALONG WALKWAYS WITHIN THE ACCESSIBLE PATH OF TRAVEL (SEE THE SITE PLAN FOR THE LOCATION OF THE ACCESSIBLE PATH). THE CONTRACTOR IS RESPONSIBLE TO ENSURE THE ACCESSIBLE PATH OF TRAVEL IS 36 INCHES WIDE OR GREATER UNLESS INDICATED OTHERWISE WITHIN THE PLAN SET.
4. THE CONTRACTOR SHALL MAINTAIN A MAXIMUM 2.00% SLOPE IN ANY DIRECTION AT ALL LANDINGS. LANDINGS INCLUDE, BUT ARE NOT LIMITED TO, THE TOP AND BOTTOM OF AN ACCESSIBLE RAMP, AT ACCESSIBLE BUILDING ENTRANCES, AT AN AREA IN FRONT OF A WALK-UP ATM, AND AT TURNING SPACES ALONG THE ACCESSIBLE PATH OF TRAVEL. THE LANDING AREA SHALL HAVE A MINIMUM CLEAR AREA OF 60 INCHES BY 60 INCHES UNLESS INDICATED OTHERWISE WITHIN THE PLAN SET.
5. THE CONTRACTOR SHALL MAINTAIN A MAXIMUM 8.33% RUNNING SLOPE AND A MAXIMUM 2.00% CROSS SLOPE ON ANY CURB RAMPS ALONG THE ACCESSIBLE PATH OF TRAVEL. WHERE PROVIDED, CURB RAMP FLARES SHALL NOT HAVE A SLOPE GREATER THAN 10.00% IF A LANDING AREA IS PROVIDED AT THE TOP OF THE RAMP. FOR ALTERATIONS, A CURB RAMP FLARES SHALL NOT HAVE A SLOPE GREATER THAN 8.33% IF A LANDING AREA IS NOT PROVIDED AT THE TOP OF THE RAMP. CURBS RAMPS SHALL NOT RISE MORE THAN 6 INCHES IN ELEVATION WITHOUT A HANDRAIL. THE CLEAR WIDTH OF A CURB RAMP SHALL BE NO LESS THAN 36 INCHES WIDE.
6. ACCESSIBLE RAMPS WITH A RISE GREATER THAN 6 INCHES SHALL CONTAIN COMPLIANT HANDRAILS ON BOTH SIDES OF THE RAMP AND SHALL NOT RISE MORE THAN 30" IN ELEVATION WITHOUT A LANDING AREA IN BETWEEN RAMP RUNS. LANDING AREAS SHALL ALSO BE PROVIDED AT THE TOP AND BOTTOM OF THE RAMP.
7. A SLIP RESISTANT SURFACE SHALL BE CONSTRUCTED ALONG THE ACCESSIBLE PATH AND WITHIN ADA PARKING AREAS.
8. THE CONTRACTOR SHALL ENSURE A MAXIMUM OF ¼ INCHES VERTICAL CHANGE IN LEVEL ALONG THE ACCESSIBLE PATH. WHERE A CHANGE IN LEVEL BETWEEN ¼ INCHES AND ½ INCHES EXISTS, CONTRACTOR SHALL ENSURE THAT THE TOP ¼ INCH CHANGE IN LEVEL IS BEVELED WITH A SLOPE NOT STEEPER THAN 1 UNIT VERTICAL AND 2 UNITS HORIZONTAL (2:1 SLOPE).
9. THE CONTRACTOR SHALL ENSURE THAT ANY OPENINGS (GAPS OR HORIZONTAL SEPARATION) ALONG THE ACCESSIBLE PATH SHALL NOT ALLOW PASSAGE OF A SPHERE GREATER THAN ½ INCH.

30' 0' 30' 60'

GRAPHIC SCALE IN FEET

1" = 30'

ISSUE	DATE	BY	DESCRIPTION
5	06/22/2023	EM	RESUBMISSION FOR SITE PLAN APPROVAL
4	05/05/2023	EM	RESUBMISSION FOR SITE PLAN APPROVAL
3	04/11/2023	EM	FOR CLIENT REVIEW
2	03/16/2023	EM	FOR CLIENT REVIEW
1	02/14/2023	EM/JRC	SUBMISSION FOR SITE PLAN APPROVAL

NOT APPROVED FOR CONSTRUCTION

STONEFIELD
engineering & design
Detroit, MI · New York, NY · Rutherford, NJ
Princeton, NJ · Tampa, FL · Boston, MA
www.stonefieldeng.com
607 Shelby Suite 200, Detroit, MI 48226
Phone 248.247.1115

SITE DEVELOPMENT PLANS

HIGHLAND ROAD MEIJER OUTLOT B

PROPOSED COMMERCIAL DEVELOPMENT

PARCEL ID: 12-20-276-035
HIGHLAND ROAD (M-59) - OUTLOT B
WHITE LAKE TOWNSHIP
OAKLAND COUNTY, MICHIGAN 48383

STATE OF MICHIGAN
JONATHAN REID COOKSEY
ENGINEER
LICENSED PROFESSIONAL ENGINEER

STONEFIELD engineering & design

SCALE: 1" = 30' PROJECT ID: DET-220180

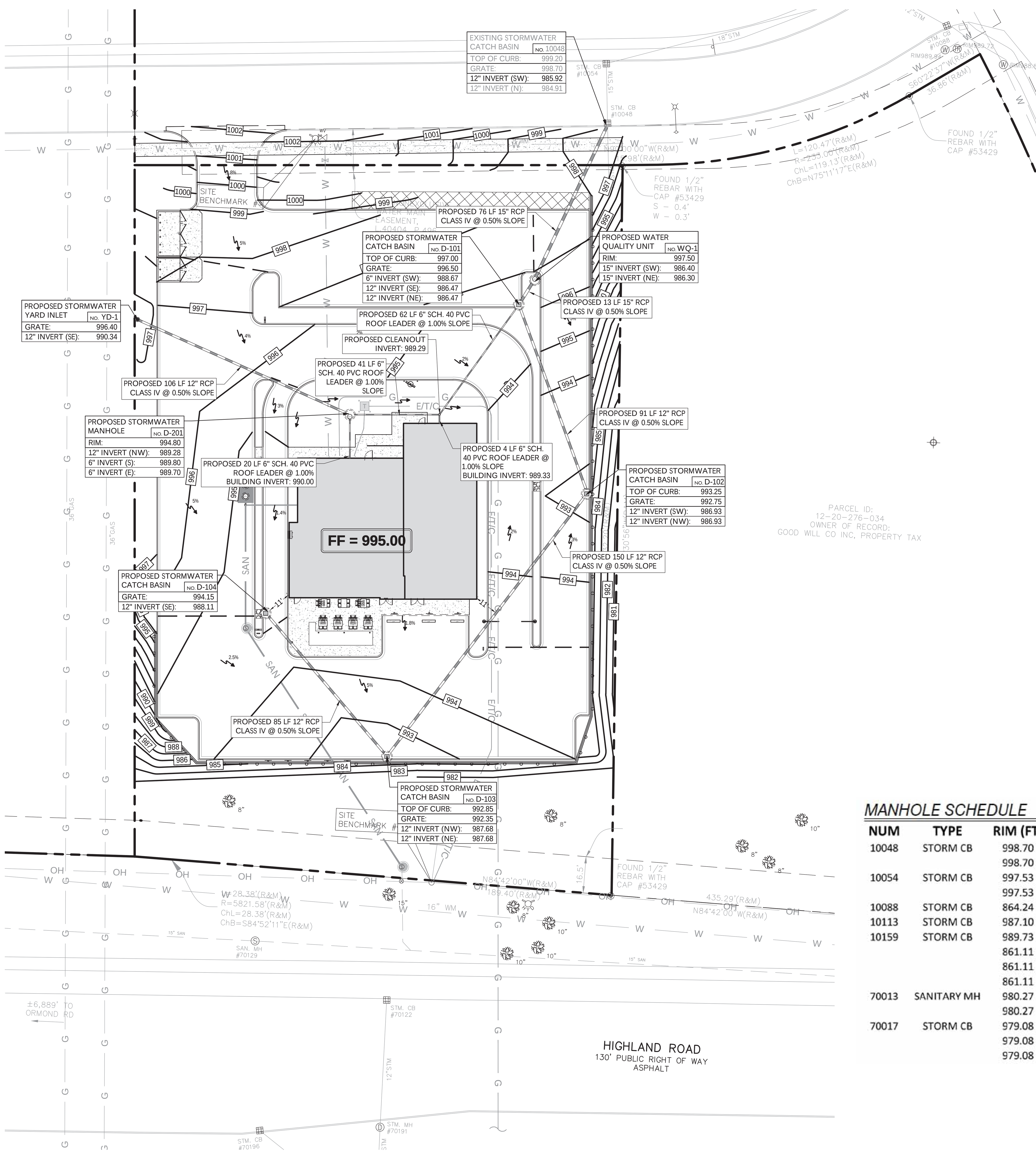
TITLE: GRADING PLAN

DRAWING: C-4

STORMWATER SYSTEM DESIGN (10-YEAR STORM)

Line #	Line ID	Rim Elevation Downstream (FT)	Rim Elevation Upstream (FT)	Invert Downstream (FT)	Invert Upstream (FT)	Pipe Size (IN)	Pipe Length (FT)	Pipe Slope (%)	Flow Rate (CFS)	Pipe Capacity (CFS)	Velocity Downstream (FPS)	HGL Downstream (FT)	HGL Upstream (FT)	Drainage Area (AC)	Runoff Coefficient	Time of Concentration (MIN)	Rainfall Intensity (IN/HR)
1	EX-10048 TO WQ-1	997.66	997.50	985.92	986.30	15	76	0.50	2.90	4.57	2.36	987.17	987.29	0.00	0.00	17.50	0.00
2	WQ-1 TO D-101	997.50	986.46	986.40	986.47	15	13	0.50	2.90	4.74	3.02	987.31	987.33	0.24	0.71	17.50	3.89
3	D-101 TO D-102	986.46	992.75	986.47	986.93	12	91	0.50	2.33	2.53	2.96	987.50	987.85	0.35	0.61	17.00	3.89
4	D-102 TO D-103	992.75	992.35	986.93	987.68	12	150	0.50	1.60	2.52	2.04	988.04	988.36	0.29	0.78	15.90	3.89
5	D-103 TO D-104	992.35	994.15	987.68	988.11	12	85	0.50	0.77	2.53	1.06	988.55	988.60	0.25	0.79	15.00	3.89

*C-Values per White Lake Township standards, Intentisy per 175+(t+25)



MANHOLE SCHEDULE

NUM	TYPE	RIM (FT)	SIZE (IN)	DIR	INV ELEV (FT)	NUM	TYPE	RIM (FT)	SIZE (IN)	DIR	INV ELEV (FT)
10048	STORM CB	998.70	15	N	985.95	70046	STORM CB	979.24	18	W	974.04
		998.70	15	S	986.10			979.24	18	E	973.89
10054	STORM CB	997.53	15	S	984.93	70095	SANITARY MH	980.49	18	NE	951.09
		997.53	18	NE	984.78			980.49	18	W	951.29
10088	STORM CB	864.24	12	NW	859.94	70101	STORM CB	979.37	12	S	975.77
10113	STORM CB	987.10	12	E	982.55	70122	STORM CB	975.46	12	S	971.46
10159	STORM CB	989.73	12	SE	983.48	70129	SANITARY MH	975.17	18	E	951.07
		861.11	18	SW	854.86			975.17	18	W	951.17
		861.11	18	NW	854.81	70182	STORM CB	980.28	12	N	975.03
		861.11	21	NE	PER PLAN			980.28	12	S	975.08
70013	SANITARY MH	980.27	8	N	970.67	70191	STORM MH	976.75	12	S	971.15
		980.27	8	SE	970.47			976.75	12	N	971.20
70017	STORM CB	979.08	18	W	973.68	70196	STORM CB	975.22	12	SE	971.22
		979.08	24	N	973.53	70211	STORM BEEHIVE	978.23	18	E	974.53
		979.08	12	NE	974.18						

SYMBOL	DESCRIPTION
	PROPERTY LINE
100	PROPOSED GRADING CONTOUR
RIDGELINE	PROPOSED GRADING RIDGELINE
MH	PROPOSED STORMWATER STRUCTURES
	PROPOSED STORMWATER PIPING

SITE RUNOFF SUMMARY

Q = C*i*A	POST-DEVELOPMENT
C (VALUE)	**0.58** (2)
I (INTENSITY) (1)	3.89
A (AREA)	1.63 AC
Q (FLOW RATE)	**3.68 CFS**

(1) I = 175/(T+25) PER WHITE LAKE TOWNSHIP ENGINEERING DESIGN STANDARDS FOR THE 10-YEAR, 24-HOUR STORM.
I = 175/(20+25), I = 3.89

(2) SITE IS ACCOUNTED FOR WITHIN EXISTING BASIN AND DESIGNED C-VALUE OF 0.75.

DRAINAGE AND UTILITY NOTES

1. THE CONTRACTOR TO PERFORM A TEST PIT PRIOR TO CONSTRUCTION (RECOMMEND 30 DAYS PRIOR) AT LOCATIONS OF EXISTING UTILITY CROSSINGS FOR STORMWATER IMPROVEMENTS. SHOULD A CONFLICT EXIST, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY STONEFIELD ENGINEERING & DESIGN, LLC. IN WRITING.
2. CONTRACTOR SHALL START CONSTRUCTION OF STORM LINES AT THE LOWEST INVERT AND WORK UP-GRADIENT.
3. THE CONTRACTOR IS REQUIRED TO CALL THE APPROPRIATE AUTHORITY FOR NOTICE OF CONSTRUCTION/EXCAVATION AND UTILITY MARK OUT PRIOR TO THE START OF CONSTRUCTION IN ACCORDANCE WITH STATE LAW. CONTRACTOR IS REQUIRED TO CONFIRM THE HORIZONTAL AND VERTICAL LOCATION OF UTILITIES IN THE FIELD. SHOULD A DISCREPANCY EXIST BETWEEN THE FIELD LOCATION OF A UTILITY AND THE LOCATION SHOWN ON THE PLAN SET OR SURVEY, THE CONTRACTOR SHALL NOTIFY STONEFIELD ENGINEERING & DESIGN, LLC. IMMEDIATELY IN WRITING.
4. THE CONTRACTOR IS RESPONSIBLE TO MAINTAIN A RECORD OF THE AS-BUILT LOCATIONS OF ALL PROPOSED UNDERGROUND INFRASTRUCTURE. THE CONTRACTOR SHALL NOTE ANY DISCREPANCIES BETWEEN THE AS-BUILT LOCATIONS AND THE LOCATIONS DEPICTED WITHIN THE PLAN SET. THIS RECORD SHALL BE PROVIDED TO THE OWNER FOLLOWING COMPLETION OF WORK.

EXCAVATION, SOIL PREPARATION, AND DEWATERING NOTES

1. THE CONTRACTOR IS REQUIRED TO REVIEW THE REFERENCED GEOTECHNICAL DOCUMENTS PRIOR TO CONSTRUCTION, THESE DOCUMENTS SHALL BE CONSIDERED A PART OF THE PLAN SET.
2. THE CONTRACTOR IS REQUIRED TO PREPARE SUBGRADE SOILS BENEATH ALL PROPOSED IMPROVEMENTS AND BACKFILL ALL EXCAVATIONS IN ACCORDANCE WITH RECOMMENDATIONS BY THE GEOTECHNICAL ENGINEER OF RECORD.
3. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING SHORING FOR ALL EXCAVATIONS AS REQUIRED. CONTRACTOR SHALL HAVE THE SHORING DESIGN PREPARED BY A QUALIFIED PROFESSIONAL. SHORING DESIGNS SHALL BE SUBMITTED TO STONEFIELD ENGINEERING & DESIGN, LLC. AND THE OWNER PRIOR TO THE START OF CONSTRUCTION.
4. THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT ALL OPEN EXCAVATIONS ARE PERFORMED AND PROTECTED IN ACCORDANCE WITH THE LATEST OSHA REGULATIONS.
5. THE CONTRACTOR IS RESPONSIBLE FOR ANY DEWATERING DESIGN AND OPERATIONS, AS REQUIRED, TO CONSTRUCT THE PROPOSED IMPROVEMENTS. THE CONTRACTOR SHALL OBTAIN ANY REQUIRED PERMITS FOR DEWATERING OPERATIONS AND GROUNDWATER DISPOSAL.

30' 0' 30' 60'
GRAPHIC SCALE IN FEET
1" = 30'

ISSUE	DATE	BY	DESCRIPTION
5	06/22/2023	EM	RESUBMISSION FOR SITE PLAN APPROVAL
4	05/05/2023	EM	RESUBMISSION FOR SITE PLAN APPROVAL
3	04/11/2023	EM	FOR CLIENT REVIEW
2	03/16/2023	EM	FOR CLIENT REVIEW
1	02/14/2023	EM/RC	SUBMISSION FOR SITE PLAN APPROVAL

NOT APPROVED FOR CONSTRUCTION

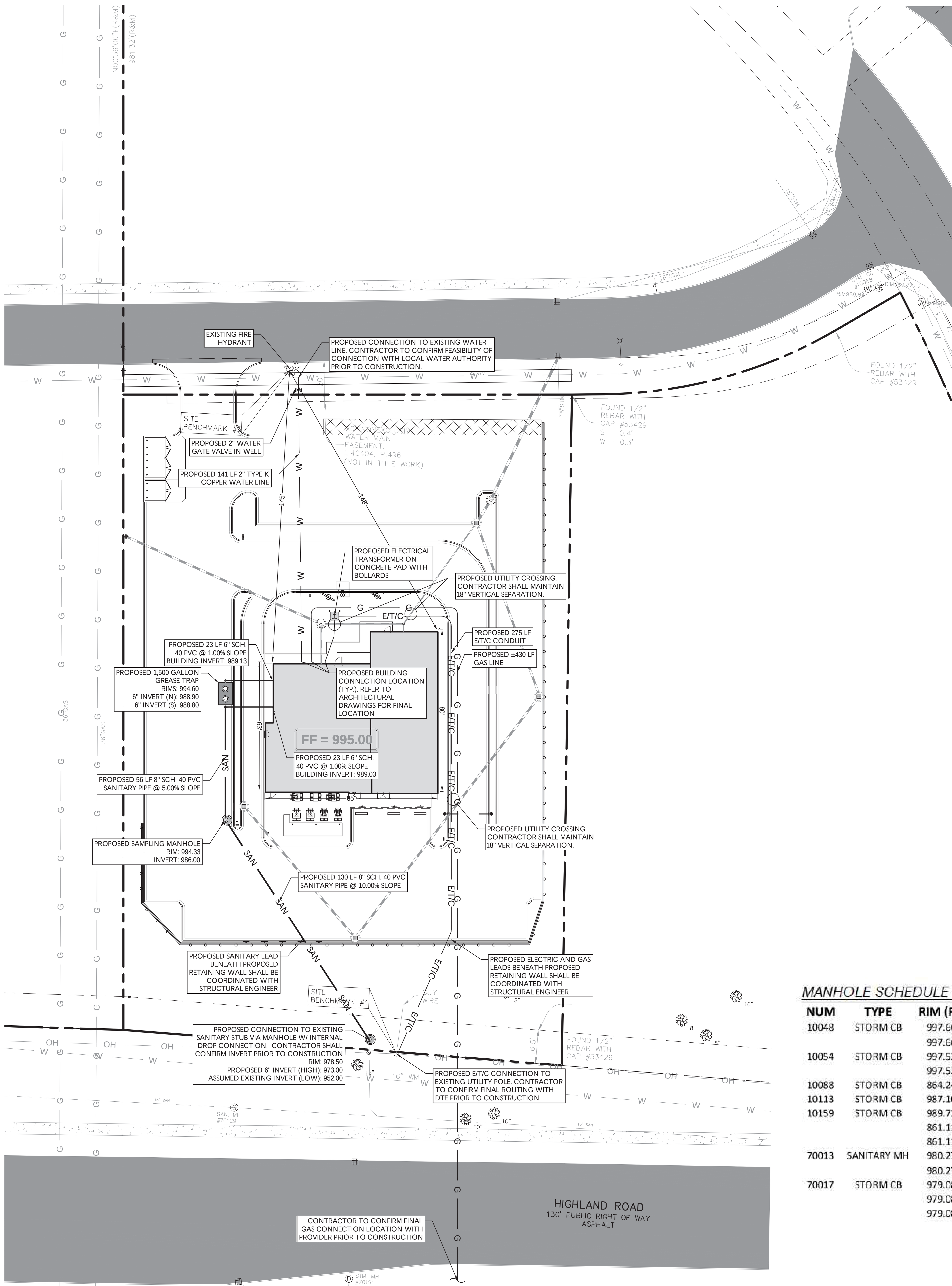
STONEFIELD engineering & design
Detroit, MI · New York, NY · Rutherford, NJ
Princeton, NJ · Tampa, FL · Boston, MA
www.stonefieldeng.com
607 Shelby Suite 200, Detroit, MI 48226
Phone 248.247.1115

SITE DEVELOPMENT PLANS
HIGHLAND ROAD
MEIJER OUTLOT B
PROPOSED COMMERCIAL DEVELOPMENT
PARCEL ID: 12-20-276-035
HIGHLAND ROAD (M-59) - OUTLOT B
WHITE LAKE TOWNSHIP
OAKLAND COUNTY, MICHIGAN 48383

STATE OF MICHIGAN
JONATHAN REID COOKSEY
ENGINEER
PROFESSIONAL ENGINEER

STONEFIELD engineering & design

SCALE: 1" = 30' PROJECT ID: DET-220180
TITLE:
STORMWATER MANAGEMENT PLAN
DRAWING:
C-5



SYMBOL	DESCRIPTION
— — —	PROPERTY LINE
—— SAN ——	PROPOSED SANITARY LATERAL
—— W ——	PROPOSED DOMESTIC WATER SERVICE
—— E/T/C ——	PROPOSED E/T/C CONDUITS
—— G ——	PROPOSED GAS LINE
⋈	PROPOSED VALVE
(S) •	PROPOSED SANITARY MANHOLE / CLEANOUT
T	PROPOSED TRANSFORMER ON CONCRETE PAD WITH BOLLARDS

MANHOLE SCHEDULE

NUM	TYPE	RIM (FT)	SIZE (IN)	DIR	INV ELEV (FT)	NUM	TYPE	RIM (FT)	SIZE (IN)	DIR	INV ELEV (FT)
10048	STORM CB	997.66	12	N	984.91	70046	STORM CB	979.24	18	W	974.04
		997.66	12	S	985.06			979.24	18	E	973.89
10054	STORM CB	997.53	12	S	984.93	70095	SANITARY MH	980.49	15	NE	951.09
		997.53	12	NE	984.78			980.49	15	W	951.29
10088	STORM CB	864.24	12	NW	859.94	70101	STORM CB	979.37	12	S	975.77
10113	STORM CB	987.10	12	E	982.55	70122	STORM CB	975.46	12	S	971.46
10159	STORM CB	989.73	12	SE	983.48	70129	SANITARY MH	975.17	15	E	951.07
		861.11	12	SW	854.86			975.17	15	W	951.17
		861.11	12	NW	854.81	70182	STORM CB	980.28	12	N	975.03
70013	SANITARY MH	980.27	8	N	970.67			980.28	12	S	975.08
		980.27	8	SE	970.47	70191	STORM MH	976.75	12	S	971.15
70017	STORM CB	979.08	18	W	973.68			976.75	12	N	971.20
		979.08	18	N	973.53	70196	STORM CB	975.22	12	SE	971.22
		979.08	12	NE	974.18	70211	STORM BEEHIVE	978.23	18	E	974.53

DRAINAGE AND UTILITY NOTES

1. THE CONTRACTOR IS REQUIRED TO CALL THE APPROPRIATE AUTHORITY FOR NOTICE OF CONSTRUCTION/EXCAVATION AND UTILITY MARK OUT PRIOR TO THE START OF CONSTRUCTION IN ACCORDANCE WITH STATE LAW. CONTRACTOR IS REQUIRED TO CONFIRM THE HORIZONTAL AND VERTICAL LOCATION OF UTILITIES IN THE FIELD. SHOULD A DISCREPANCY EXIST BETWEEN THE FIELD LOCATION OF A UTILITY AND THE LOCATION SHOWN ON THE PLAN SET OR SURVEY, THE CONTRACTOR SHALL NOTIFY STONEFIELD ENGINEERING & DESIGN, LLC. IMMEDIATELY IN WRITING.
2. THE CONTRACTOR IS RESPONSIBLE TO PROTECT AND MAINTAIN IN OPERATION ALL UTILITIES NOT DESIGNATED TO BE REMOVED.
3. THE CONTRACTOR IS RESPONSIBLE FOR REPAIRING ANY DAMAGE TO ANY EXISTING UTILITY IDENTIFIED TO REMAIN WITHIN THE LIMITS OF THE PROPOSED WORK DURING CONSTRUCTION.
4. A MINIMUM HORIZONTAL SEPARATION OF 10 FEET IS REQUIRED BETWEEN ANY SANITARY SEWER SERVICE AND ANY WATER LINES. IF THIS SEPARATION CANNOT BE PROVIDED, A CONCRETE ENCASEMENT SHALL BE UTILIZED FOR THE SANITARY SEWER SERVICE AS APPROVED BY STONEFIELD ENGINEERING & DESIGN, LLC.
5. ALL WATER LINES SHALL BE VERTICALLY SEPARATED ABOVE SANITARY SEWER LINES BY A MINIMUM DISTANCE OF 18 INCHES. IF THIS SEPARATION CANNOT BE PROVIDED, A CONCRETE ENCASEMENT SHALL BE UTILIZED FOR THE SANITARY SEWER SERVICE AS APPROVED BY STONEFIELD ENGINEERING & DESIGN, LLC.
6. THE CONTRACTOR TO PERFORM A TEST PIT PRIOR TO CONSTRUCTION (RECOMMEND 30 DAYS PRIOR) AT LOCATIONS OF EXISTING UTILITY CROSSINGS FOR WATER AND SANITARY SEWER CONNECTION IMPROVEMENTS. SHOULD A CONFLICT EXIST, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY STONEFIELD ENGINEERING & DESIGN, LLC. IN WRITING.
7. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING GAS, ELECTRIC AND TELECOMMUNICATION CONNECTIONS WITH THE APPROPRIATE GOVERNING AUTHORITY.
8. CONTRACTOR SHALL START CONSTRUCTION OF ANY GRAVITY SEWER AT THE LOWEST INVERT AND WORK UP-GRADIENT.
9. THE CONTRACTOR IS RESPONSIBLE TO MAINTAIN A RECORD SET OF PLANS REFLECTING THE LOCATION OF EXISTING UTILITIES THAT HAVE BEEN CAPPED, ABANDONED, OR RELOCATED BASED ON THE DEMOLITION/REMOVAL ACTIVITIES REQUIRED IN THIS PLAN SET. THIS DOCUMENT SHALL BE PROVIDED TO THE OWNER FOLLOWING COMPLETION OF WORK.
10. THE CONTRACTOR IS RESPONSIBLE TO MAINTAIN A RECORD OF THE AS-BUILT LOCATIONS OF ALL PROPOSED UNDERGROUND INFRASTRUCTURE. THE CONTRACTOR SHALL NOTE ANY DISCREPANCIES BETWEEN THE AS-BUILT LOCATIONS AND THE LOCATIONS DEPICTED WITHIN THE PLAN SET. THIS RECORD SHALL BE PROVIDED TO THE OWNER FOLLOWING COMPLETION OF WORK.

30' 0' 30' 60'
GRAPHIC SCALE IN FEET
1" = 30'

ISSUE	DATE	BY	DESCRIPTION
5	06/22/2023	EM	RESUBMISSION FOR SITE PLAN APPROVAL
4	05/05/2023	EM	RESUBMISSION FOR SITE PLAN APPROVAL
3	04/11/2023	EM	FOR CLIENT REVIEW
2	03/16/2023	EM	FOR CLIENT REVIEW
1	02/14/2023	EM/RC	SUBMISSION FOR SITE PLAN APPROVAL

NOT APPROVED FOR CONSTRUCTION

STONEFIELD engineering & design
Detroit, MI · New York, NY · Rutherford, NJ
Princeton, NJ · Tampa, FL · Boston, MA
www.stonefieldeng.com
607 Shelby Suite 200, Detroit, MI 48226
Phone 248.247.1115

SITE DEVELOPMENT PLANS

HIGHLAND ROAD MEIJER OUTLOT B

PROPOSED COMMERCIAL DEVELOPMENT

PARCEL ID: 12-20-276-035
HIGHLAND ROAD (M-59) - OUTLOT B
WHITE LAKE TOWNSHIP
OAKLAND COUNTY, MICHIGAN 48383

STATE OF MICHIGAN
JONATHAN REID COOKSEY
ENGINEER
PROFESSIONAL

STONEFIELD engineering & design

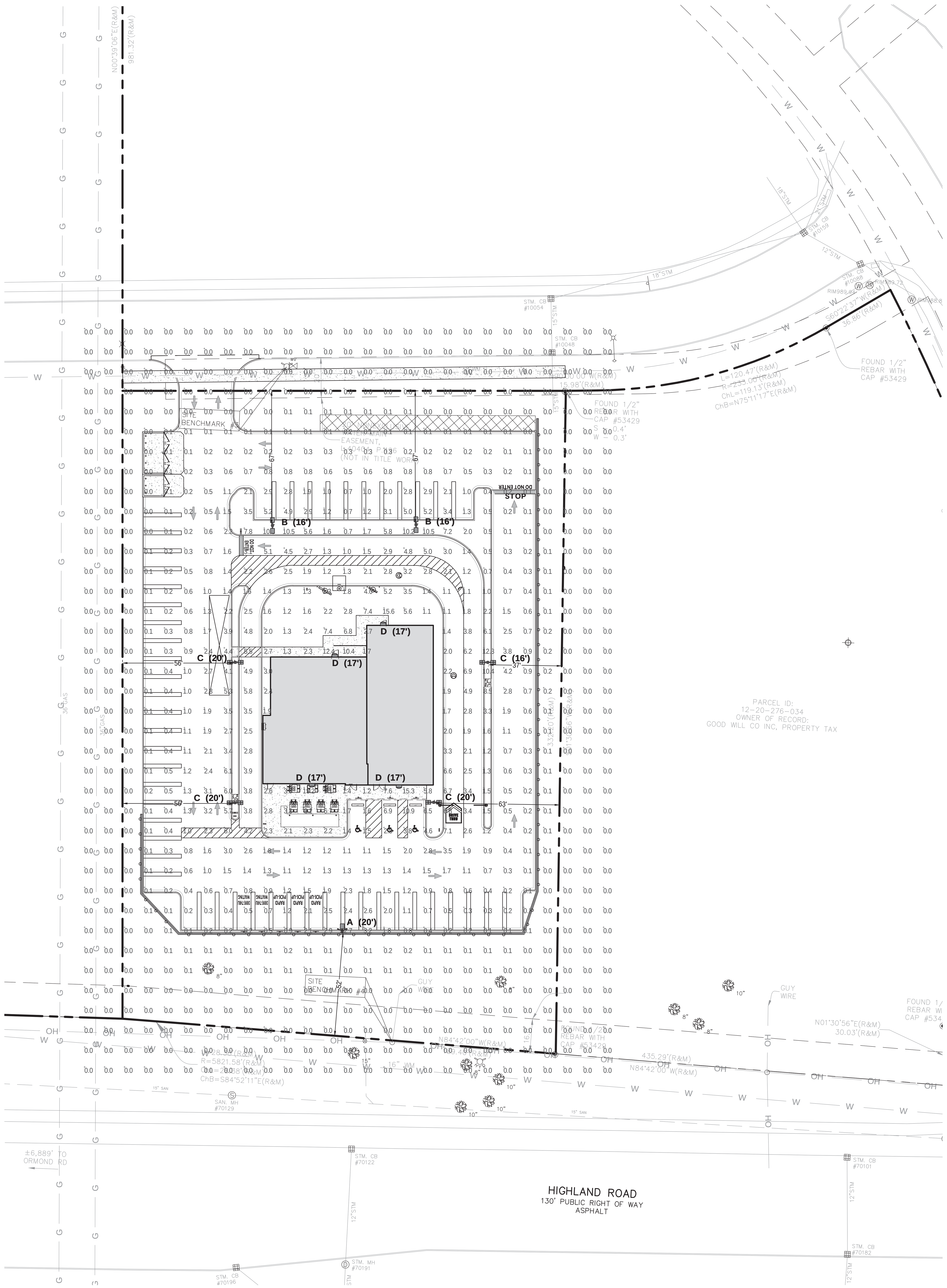
SCALE: 1" = 30' PROJECT ID: DET-220180

TITLE:

UTILITY PLAN

DRAWING:

C-6



SYMBOL	DESCRIPTION
A (XX')	PROPOSED LIGHTING FIXTURE (MOUNTING HEIGHT)
⁺x.x	PROPOSED LIGHTING INTENSITY (FOOTCANDLES)
	PROPOSED AREA LIGHT
	PROPOSED BUILDING MOUNTED LIGHT

PROPOSED LUMINAIRE SCHEDULE

SYMBOL	LABEL	QUANTITY	LIGHTING SPECIFICATION	DISTRIBUTION	LLF	MANUFACTURER	IES FILE
	A	1	PFPRV PREVAIL POLE AND FIXTURE COMBO - LED SINGLE WITH HOUSE SIDE SHIELD	IV	0.9	EATON	PRV-C40-D-UNV-T4-BZ-7030-HSS.ies
	B	2	PFPRV PREVAIL POLE AND FIXTURE COMBO - LED 2 @ 180°	IV	0.9	EATON	PRV-C40-D-UNV-T4-BZ-7030-HSS.ies
	C	4	PFPRV PREVAIL POLE AND FIXTURE COMBO - LED 2 @ 180°	III	0.9	EATON	PRV-C40-D-UNV-T3-BZ-7030-HSS.ies
	D	4	XTOR CROSSTOUR MAXX LED WALLPACK	N/A	0.9	LSI LIGHTING	XTOR6B.ies

LIGHTING REQUIREMENTS

CODE SECTION	REQUIRED	PROPOSED
§ 5.18.G	LIGHT FIXTURES SHALL BE FULL CUT OFF AT 90°	PROVIDED
§ 5.18.G.iii	MINIMUM PROPERTY LINE SETBACK: 5 FT	36 FT
§ 5.18.G.vii.a	MAXIMUM FIXTURE HEIGHTS:	
	WITHIN 25 FT OF PROPERTY LINE: 16 FT	N/A
	WITHIN 26-60 FT OF PROPERTY LINE: 20 FT	20 FT
	WITHIN 61-100 FT OF PROPERTY LINE: 25 FT	20 FT
	> 100 FT OFF PROPERTY LINE: 30 FT	N/A
§ 5.18.G.iii	PERMITTED GLARE:	
	ALL PROPERTY LINES: 0 FC	0.0 FC
§ 5.18.G.viii	FOOT CANDLE LIMITS (MAXIMUM AVERAGE):	
	GENERAL: 0.5 FC	1.40 FC (W)
	DRIVEWAY: 2.0 FC	1.68 FC
	PARKING: 2.0 FC	1.68 FC
	WALKS: 1.0 FC	4.85 (W)
	PROTECTIVE: 1.0 FC	N/A
	BUILDING: 5.0 FC	4.85 FC
	LOADING AREAS: 1.0 FC	N/A

(W) WAIVER

LIGHTING STATISTICS

DESCRIPTION	AVERAGE	MINIMUM	MAXIMUM
OVERALL PARCEL	1.40 FC	0.0 FC	15.6 FC
DRIVEWAY & PARKING AREAS	1.67 FC	0.0 FC	15.6 FC
BUILDING	4.85 FC	1.2 FC	15.3 FC
PROPERTY LINE	0.00 FC	0.00 FC	0.00 FC

(1) ALL CALCULATIONS MEASURED 6 FT ABOVE GRADE

GENERAL LIGHTING NOTES

1. THE LIGHTING LEVELS DEPICTED WITHIN THE PLAN SET ARE CALCULATED UTILIZING DATA OBTAINED FROM THE LISTED MANUFACTURER. ACTUAL ILLUMINATION LEVELS AND PERFORMANCE OF ANY PROPOSED LIGHTING FIXTURE MAY VARY DUE TO UNCONTROLLABLE VARIABLES SUCH ARE WEATHER, VOLTAGE SUPPLY, LAMP TOLERANCE, EQUIPMENT SERVICE LIFE AND OTHER VARIABLE FIELD CONDITIONS.
2. WHERE APPLICABLE, THE EXISTING LIGHT LEVELS DEPICTED WITHIN THE PLAN SET SHALL BE CONSIDERED APPROXIMATE. THE EXISTING LIGHT LEVELS ARE BASED ON FIELD OBSERVATIONS AND THE MANUFACTURER'S DATA OF THE ASSUMED OR MOST SIMILAR LIGHTING FIXTURE MODEL.
3. UNLESS NOTED ELSEWHERE WITHIN THIS PLAN SET, THE LIGHT LOSS FACTORS USED IN THE LIGHTING ANALYSIS ARE AS FOLLOWS:
   - LIGHT EMITTING DIODES (LED): 0.90
   - HIGH PRESSURE SODIUM: 0.72
   - METAL HALIDE: 0.72
4. THE CONTRACTOR SHALL NOTIFY STONEFIELD ENGINEERING & DESIGN, LLC. IN WRITING, PRIOR TO THE START OF CONSTRUCTION, OF ANY PROPOSED LIGHTING LOCATIONS THAT CONFLICT WITH EXISTING/ PROPOSED DRAINAGE, UTILITY, OR OTHER IMPROVEMENTS.
5. THE CONTRACTOR IS RESPONSIBLE TO PREPARE A WIRING PLAN AND PROVIDE ELECTRIC SERVICE TO ALL PROPOSED LIGHTING FIXTURES. THE CONTRACTOR IS REQUIRED TO PREPARE AN AS-BUILT PLAN OF WIRING AND PROVIDE COPIES TO THE OWNER AND STONEFIELD ENGINEERING & DESIGN, LLC.

30' 0' 30' 60'
GRAPHIC SCALE IN FEET
1" = 30'

ISSUE	DATE	BY	DESCRIPTION
5	06/22/2023	EM	RESUBMISSION FOR SITE PLAN APPROVAL
4	05/05/2023	EM	RESUBMISSION FOR SITE PLAN APPROVAL
3	04/11/2023	EM	FOR CLIENT REVIEW
2	03/16/2023	EM	FOR CLIENT REVIEW
1	02/14/2023	EM/JRC	SUBMISSION FOR SITE PLAN APPROVAL

NOT APPROVED FOR CONSTRUCTION

STONEFIELD
engineering & design
Detroit, MI · New York, NY · Rutherford, NJ
Princeton, NJ · Tampa, FL · Boston, MA
www.stonefieldeng.com
607 Shelby Suite 200, Detroit, MI 48226
Phone 248.247.1115

SITE DEVELOPMENT PLANS

HIGHLAND ROAD MEIJER OUTLOT B

PROPOSED COMMERCIAL DEVELOPMENT

PARCEL ID: 12-20-276-035
HIGHLAND ROAD (M-59) - OUTLOT B
WHITE LAKE TOWNSHIP
OAKLAND COUNTY, MICHIGAN 48383

STATE OF MICHIGAN
JONATHAN REID COOKSEY
ENGINEER
PROFESSIONAL

STONEFIELD
engineering & design

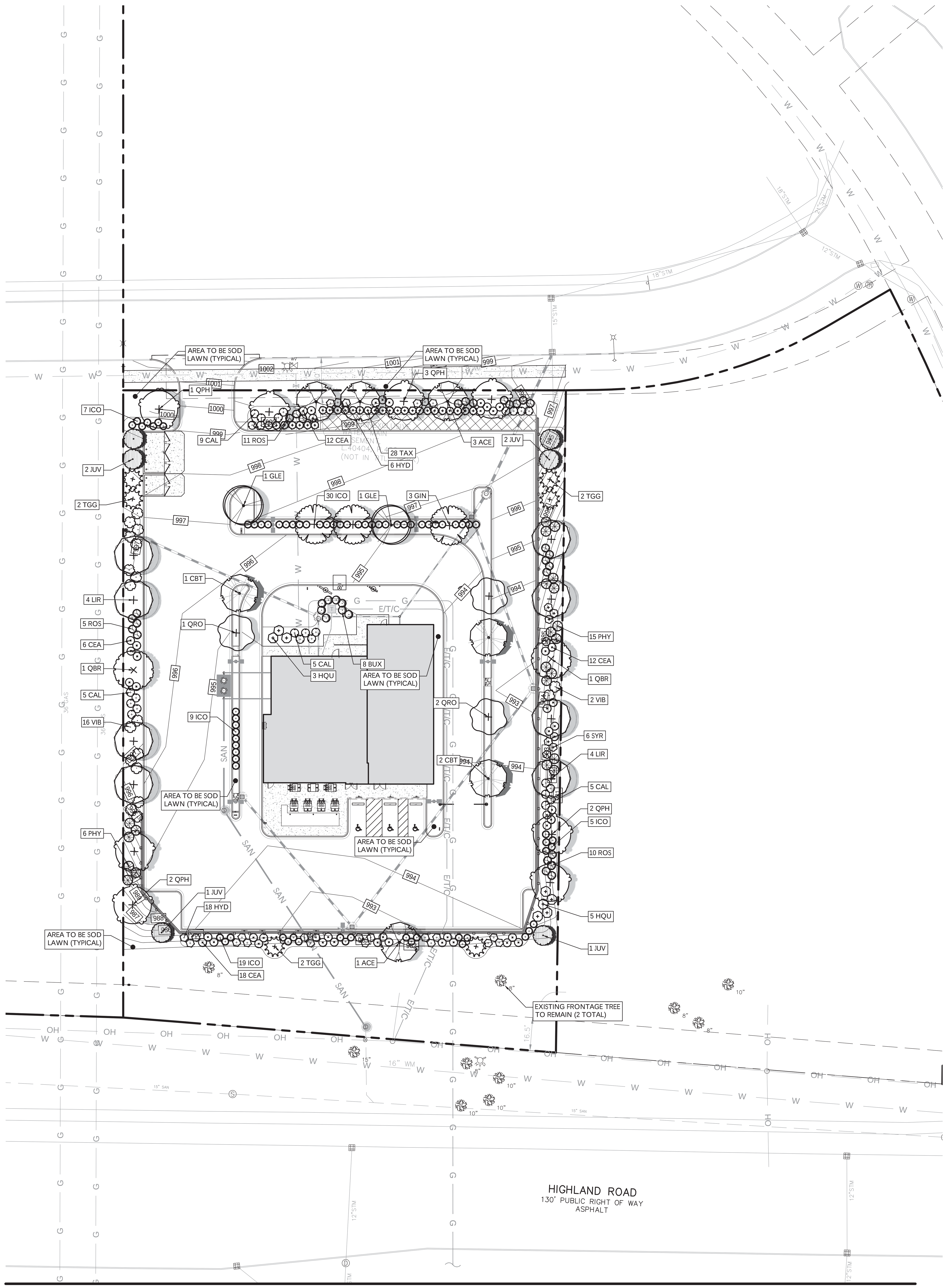
SCALE: 1" = 30' PROJECT ID: DET-220180

TITLE:

LIGHTING PLAN

DRAWING:

C-7



PLANT SCHEDULE

DECIDUOUS TREES	CODE	QTY	BOTANICAL NAME	COMMON NAME	SIZE	CONTAINER
	ACE	4	ACER RUBRUM	RED MAPLE	2.5" - 3" CAL	B&B
	CBT	3	CARPINUS BETULUS	EUROPEAN HORNBEAM	2.5" - 3" CAL	B&B
	GIN	3	GINKGO BILOBA `AUTUMN GOLD`	AUTUMN GOLD MAIDENHAIR TREE	2.5" - 3" CAL	B&B
	GLE	2	GLEDITSIA TRIACANTHOS INERMIS `SHADEMASTER`	SHADEMASTER HONEY LOCUST	2.5" - 3" CAL	B&B
	LIR	8	LIRIODENDRON TULIPIFERA	TULIP POPLAR	2.5" - 3" CAL	B&B
	QBR	2	QUERCUS BOREALIS	NORTHEN RED OAK	2.5" - 3" CAL	B&B
	QPH	8	QUERCUS PHELLOS	WILLOW OAK	2.5" - 3" CAL	B&B
	QRO	3	QUERCUS ROBUR	ENGLISH OAK	2.5" - 3" CAL	B&B
EVERGREEN TREES	CODE	QTY	BOTANICAL NAME	COMMON NAME	SIZE	CONTAINER
	TGG	6	THUJA STANDISHII X PLICATA 'GREEN GIANT'	GREEN GIANT ARBORVITAE	7` - 8` HT	B&B
	JUV	6	JUNIPERUS VIRGINIANA	EASTERN RED CEDAR	7` - 8` HT	B&B
SHRUBS	CODE	QTY	BOTANICAL NAME	COMMON NAME	SIZE	CONTAINER
	CEA	48	CEANOTHUS AMERICANUS	NEW JERSEY TEA	30" - 36"	POT
	CAL	24	CLETHRA ALNIFOLIA	SUMMERSWEET CLETHRA	30" - 36"	POT
	HYD	24	HYDRANGEA MACROPHYLLA `ENDLESS SUMMER`	BAILMER HYDRANGEA	30" - 36"	POT
	HQU	8	HYDRANGEA QUERCIFOLIA	OAKLEAF HYDRANGEA	30" - 36"	POT
	PHY	21	PHYSOCARPUS OPULIFOLIUS	NINEBARK	30" - 36"	POT
	ROS	26	ROSA X `DOUBLE KNOCKOUT`	ROSE	30" - 36"	POT
	SYR	6	SYRINGA PATULA 'MISS KIM'	MISS KIM KOREAN LILAC	30" - 36"	POT
	VIB	18	VIBURNUM DENTATUM	VIBURNUM	30" - 36"	POT
EVERGREEN SHRUBS	CODE	QTY	BOTANICAL NAME	COMMON NAME	SIZE	CONTAINER
	BUX	8	BUXUS MICROPHYLLA `WINTER GEM`	GLOBE WINTER GEM BOXWOOD	15" - 18"	POT
	ICO	70	ILEX GLABRA `COMPACTA`	COMPACT INKBERRY	30" - 36"	B&B
	TAX	28	TAXUS X MEDIA 'DENSIFORMIS'	DENSE ANGLO-JAPANESE YEW	30" - 36"	B&B

NOTE: IF ANY DISCREPANCIES OCCUR BETWEEN AMOUNTS SHOWN ON THE LANDSCAPE PLAN AND WITHIN THE PLANT LIST, THE PLAN SHALL DICTATE.
WHITE PINE IS A PROHIBITED SPECIES AND SHALL NOT BE USED AS A SUBSTITUTE FOR WHITE SPRUCE.

ALL TREES ON THIS PLAN INDICATED TO BE PROTECTED THROUGHOUT CONSTRUCTION SHALL BE EQUIPPED WITH A TREE PROTECTION FENCE. NO CONSTRUCTION SHALL OCCUR UNTIL TREE PROTECTION FENCE HAS BEEN INSTALLED AND APPROVED BY THE COMMUNITY DEVELOPMENT DIRECTOR.

LANDSCAPING AND BUFFER REQUIREMENTS

CODE SECTION	REQUIRED	PROPOSED
§ 5.19	LANDSCAPING ISLANDS:	
	MINIMUM 200 SF IN ANY SINGLE LANDSCAPE AREA	COMPLIES
§ 5.19	GREENBELT LANDSCAPING: PB ADJACENT TO PB ZONE (1)	
	PB ZONE ADJACENT TO PB ZONE: 10 FT WIDTH	10.0 FT
	PB ZONE ADJACENT TO ROW: 20 FT WIDTH	20.0 FT
	1 DECIDUOUS OR EVERGREEN TREE FOR EVERY 30 LF BUFFER	
	(1,061 LF) * (1 TREE / 30 LF) = 35 TREES	2 EXISTING TREES TO REMAIN 33 TREES PROPOSED
	8 SHRUBS PER 30 LF BUFFER	
	(1,061 LF) * (8 SHRUBS / 30 LF) = 283 SHRUBS	283 SHRUBS
§ 5.19.E	INTERIOR LOT LANDSCAPING:	
	15% OF TOTAL LOT AREA	
	(71,024 SF) * (0.15)= 10,654 SF	21,160 SF
	1 TREE PER 300 SF REQUIRED INTERIOR LOT LANDSCAPING AREA	
	(10,654 SF) * (1 TREE / 300 SF) = 36 TREES	36 TREES
	5 SHRUBS FOR EVERY 300 SF REQUIRED INTERIOR LOT LANDSCAPING AREA	
	(10,654 SF) * (5 SHRUBS / 300 SF) = 177 SHRUBS	177 SHRUBS
§ 5.19.G.ii	PARKING LOT LANDSCAPING:	
	20 SF PER PARKING SPACE	
	(56 SPACES) * (20 SF / 1 SPACE) = 1,120 SF	6,378 SF
	1 TREE PER 100 SF OF REQUIRED PARKING LOT LANDSCAPING AREA	
	(1,120 SF) * (1 TREE / 100 SF) = 11 TREES	11 TREES
	3 SHRUBS FOR EVERY 100 SF REQUIRED PARKING LOT LANDSCAPING AREA	
	(1,120 SF) * (3 SHRUBS / 100 SF) = 34 SHRUBS	34 SHRUBS

(1) PER § 5.19.iii THE PLANNING COMMISSION MAY PERMIT A COMBINATION OF A REQUIRED BUFFER TYPE UPON FINDING THAT THE COMBINED LANDSCAPING AND/OR SCREENING WILL ACHIEVE THE SAME EFFECT AS OTHERWISE REQUIRED

PAUL DEVITTO, L.L.A.
MICHIGAN LICENSE No. 3901001797
LICENSED LANDSCAPE ARCHITECT

811
Know what's **below**
Call before you dig.

IRRIGATION NOTE:

1. IRRIGATION CONTRACTOR TO PROVIDE A DESIGN FOR AN IRRIGATION SYSTEM SEPARATING PLANTING BEDS FROM LAWN AREA. PRIOR TO CONSTRUCTION, DESIGN IS TO BE SUBMITTED TO THE PROJECT LANDSCAPE DESIGNER FOR REVIEW AND APPROVAL. WHERE POSSIBLE, DRIP IRRIGATION AND OTHER WATER CONSERVATION TECHNIQUES SUCH AS RAIN SENSORS SHALL BE IMPLEMENTED. CONTRACTOR TO VERIFY MAXIMUM ON SITE DYNAMIC WATER PRESSURE AVAILABLE MEASURED IN PSI. PRESSURE REDUCING DEVICES OR BOOSTER PUMPS SHALL BE PROVIDED TO MEET SYSTEM PRESSURE REQUIREMENTS. DESIGN TO SHOW ALL VALVES, PIPING, HEADS, BACKFLOW PREVENTION, METERS, CONTROLLERS, AND SLEEVES WITHIN HARDSCAPE AREAS.
2. ALL REQUIRED SITE IRRIGATION SYSTEMS SHALL INCLUDE A RAIN SENSOR OR SIMILAR MEASURE TO ENSURE IRRIGATION DOES NOT OCCUR DURING OR SHORTLY AFTER PRECIPITATION EVENTS. ALL SITE PLANS SHALL NOTE INSTALLATION OF REQUIRED IRRIGATION.

LANDSCAPING NOTES

1. THE CONTRACTOR SHALL RESTORE ALL DISTURBED GRASS AND LANDSCAPED AREAS TO MATCH EXISTING CONDITIONS UNLESS INDICATED OTHERWISE WITHIN THE PLAN SET.
2. THE CONTRACTOR SHALL RESTORE ALL DISTURBED LAWN AREAS WITH A MINIMUM 4 INCH LAYER OF TOPSOIL AND SOD.
3. THE CONTRACTOR SHALL RESTORE MULCH AREAS WITH A MINIMUM 3 INCH LAYER OF MULCH (DOUBLE-SHREDDED QUALITY) .
4. THE MAXIMUM SLOPE ALLOWABLE IN LANDSCAPE RESTORATION AREAS SHALL BE 3 FEET HORIZONTAL TO 1 FOOT VERTICAL (3:1 SLOPE) UNLESS INDICATED OTHERWISE WITHIN THE PLAN SET.
5. THE CONTRACTOR IS REQUIRED TO LOCATE ALL SPRINKLER HEADS IN AREA OF LANDSCAPING DISTURBANCE PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL RELOCATE SPRINKLER HEADS AND LINES IN ACCORDANCE WITH OWNER'S DIRECTION WITHIN AREAS OF DISTURBANCE.
6. THE CONTRACTOR SHALL ENSURE THAT ALL DISTURBED LANDSCAPED AREAS ARE GRADED TO MEET FLUSH AT THE ELEVATION OF WALKWAYS AND TOP OF CURB ELEVATIONS EXCEPT UNLESS INDICATED OTHERWISE WITHIN THE PLAN SET. NO ABRUPT CHANGES IN GRADE ARE PERMITTED IN DISTURBED LANDSCAPING AREAS.
7. TREES SHALL NOT BE PLANTED CLOSER THAN 4 FT TO PROPERTY LINE.
8. TREES SHALL NOT BE PLANTED CLOSER THAN 3 FT TO EXISTING WATER MAIN.
9. ALL REQUIRED LANDSCAPE PLANTINGS SHALL BE GUARANTEED FOR A PERIOD OF TWO (2) YEARS.
10. WINTER MAINTENANCE OF PARKING LOT LANDSCAPE ISLANDS SHALL BE REQUIRED WHERE HEAVY APPLICATIONS OF SALT AND DE-ICING PRODUCTS OCCUR THROUGH THE USE OF SALT TARPS WHICH MINIMIZE SOIL ABSORPTION AND ULTIMATELY REDUCE PLANT DISORDERS

30' 0' 30' 60'
GRAPHIC SCALE IN FEET
1" = 30'

ISSUE	DATE	BY	DESCRIPTION
5	06/22/2023	EM	RESUBMISSION FOR SITE PLAN APPROVAL
4	05/05/2023	EM	RESUBMISSION FOR SITE PLAN APPROVAL
3	04/11/2023	EM	FOR CLIENT REVIEW
2	03/16/2023	EM	FOR CLIENT REVIEW
1	02/14/2023	EM/RC	SUBMISSION FOR SITE PLAN APPROVAL

NOT APPROVED FOR CONSTRUCTION

STONEFIELD
engineering & design
Detroit, MI • New York, NY • Rutherford, NJ
Princeton, NJ • Tampa, FL • Boston, MA
www.stonefieldeng.com
607 Shelby Suite 200, Detroit, MI 48226
Phone 248.247.1115

SITE DEVELOPMENT PLANS

HIGHLAND ROAD MEIJER OUTLOT B

PROPOSED COMMERCIAL DEVELOPMENT

PARCEL ID: 12-20-276-035
HIGHLAND ROAD (M-59) - OUTLOT B
WHITE LAKE TOWNSHIP
OAKLAND COUNTY, MICHIGAN 48383

STATE OF MICHIGAN
JONATHAN REID COOKSEY
ENGINEER
PROFESSIONAL ENGINEER

STONEFIELD
engineering & design

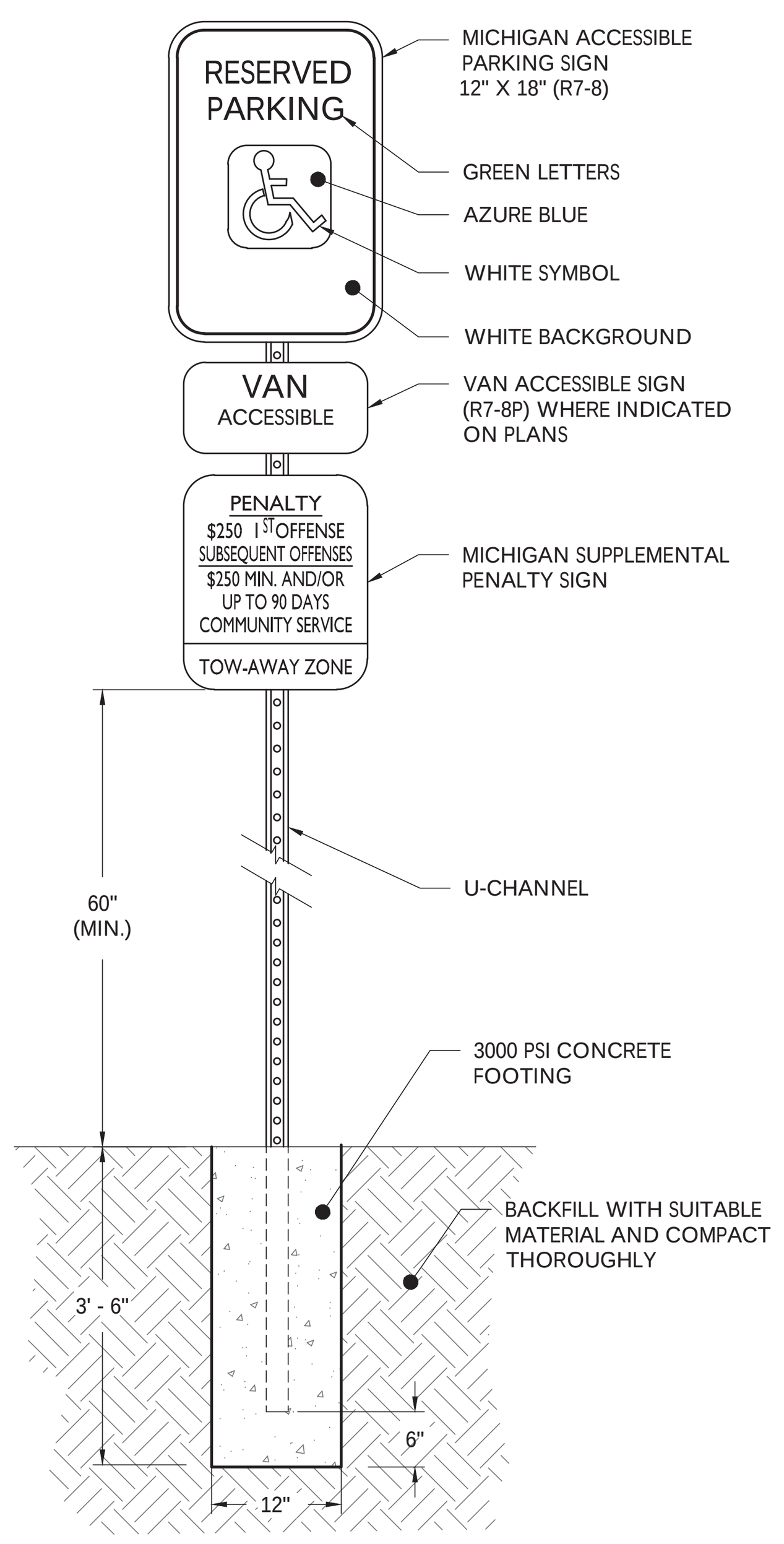
SCALE: 1" = 30' PROJECT ID: DET-220180

TITLE:

LANDSCAPING PLAN

DRAWING:

C-8

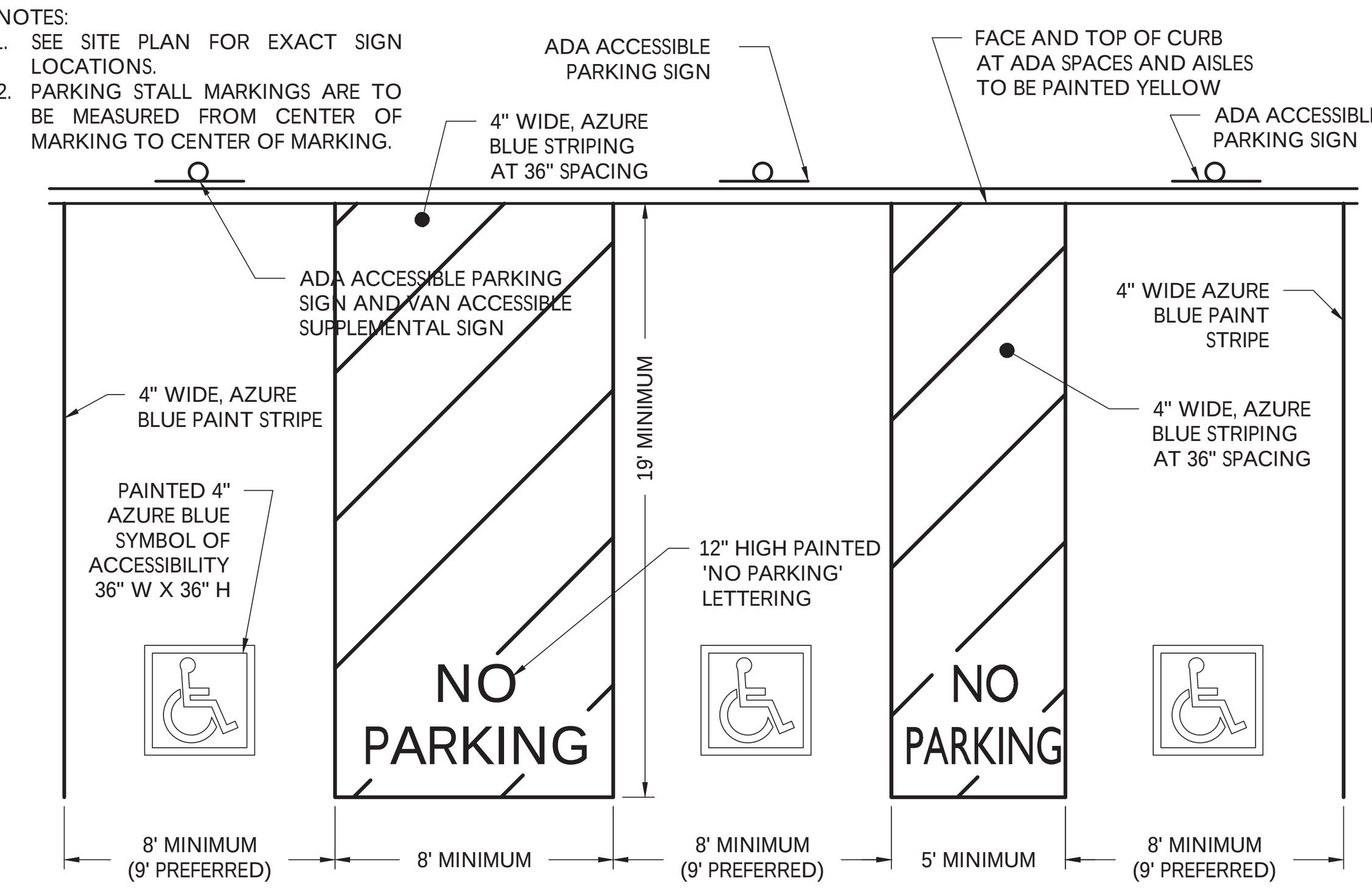


ACCESSIBLE PARKING SIGN DETAIL

NOT TO SCALE

1

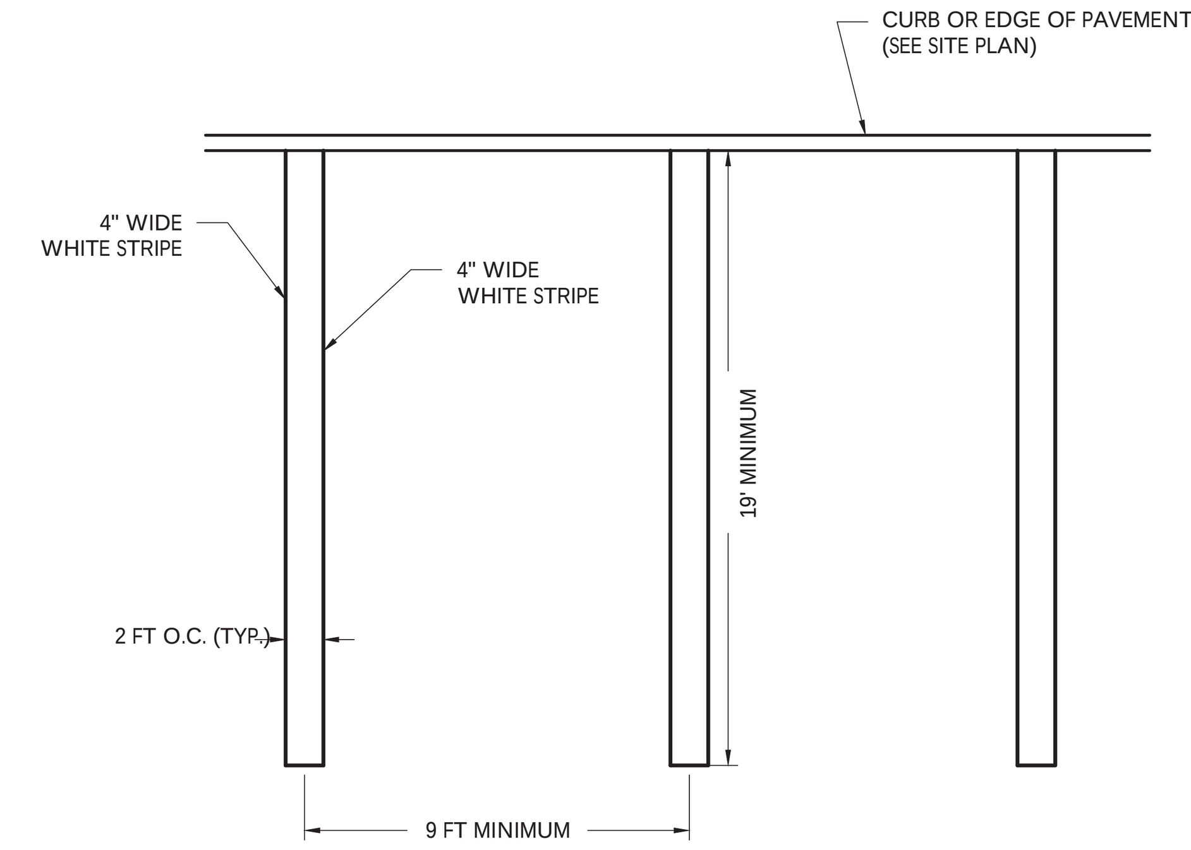
NOTES:
1. SEE SITE PLAN FOR EXACT SIGN LOCATIONS.
2. PARKING STALL MARKINGS ARE TO BE MEASURED FROM CENTER OF MARKING TO CENTER OF MARKING.



ACCESSIBLE PARKING STALL MARKINGS

NOT TO SCALE

2



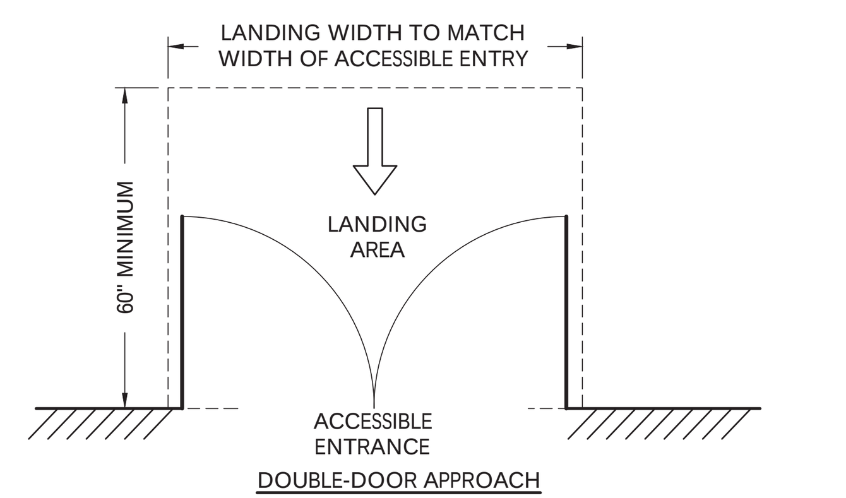
PARKING STALL MARKINGS (DUAL)

NOT TO SCALE

3

PAVEMENT STRIPING & MARKINGS NOTES:
1. ALL SIGNING AND STRIPING IN EXISTING CONDITION IN CONFLICT WITH THE PROPOSED DESIGN PLAN SHALL BE REMOVED.
2. ALL PROPOSED SIGNING AND STRIPING SHALL CONFORM TO THE CURRENT MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) PUBLISHED BY THE FEDERAL HIGHWAY ADMINISTRATION.
3. PAVEMENT STRIPING AND MARKINGS SHALL BE INSTALLED IN CONFORMANCE WITH ALL APPLICABLE LOCAL, COUNTY AND STATE REQUIREMENTS.
4. UNLESS OTHERWISE SPECIFIED, ALL STRIPING AND MARKINGS IN THE PUBLIC RIGHT-OF-WAY SHALL BE OF THERMOPLASTIC PAINT OR PREFORMED THERMOPLASTIC MARKINGS.
5. UNLESS OTHERWISE SPECIFIED, ON SITE PARKING STALL STRIPING, FIRE LANE STRIPING AND DIRECTIONAL ARROWS SHALL BE EPOXY PAINT. ON SITE STOP BARS, "DO NOT ENTER" BARS, AND ASSOCIATED LETTERING SHALL BE THERMOPLASTIC PAINT OR PREFORMED THERMOPLASTIC MARKINGS.

4

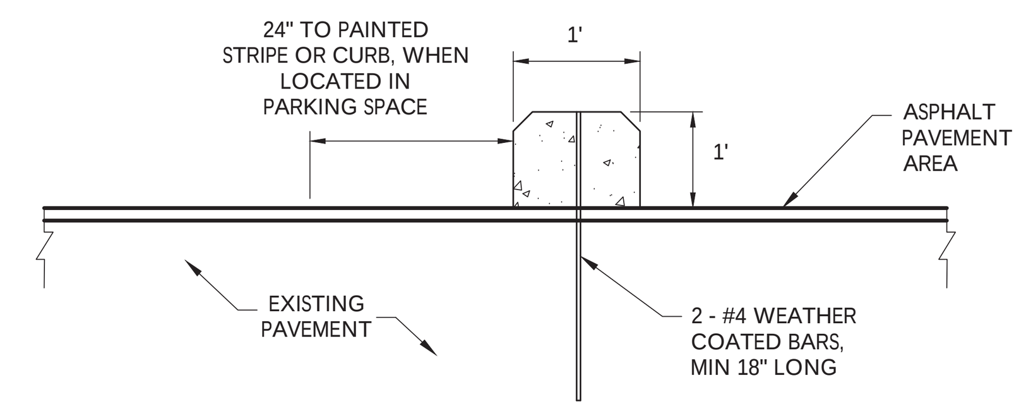


ACCESSIBLE ENTRANCE LANDING DETAIL

NOT TO SCALE

NOTES:
1. MAXIMUM SLOPE ON LANDING SHALL BE 1:50 IN ALL DIRECTIONS
2. DIMENSIONS SHOWN HERE ARE THE MINIMUM DIMENSIONS REQUIRED FOR AN ADA COMPLIANT LANDING AT THE ACCESSIBLE ENTRANCE. REFER TO SITE PLAN FOR SITE SPECIFIC DIMENSIONS THAT MAY SPECIFY A LARGER LANDING AREA.
3. CONTRACTOR SHALL CONTACT THE ENGINEER BEFORE CONSTRUCTION IF THE ACCESSIBLE ENTRANCE ON SITE DOES NOT MATCH THE SCENARIO SHOWN ABOVE.

5

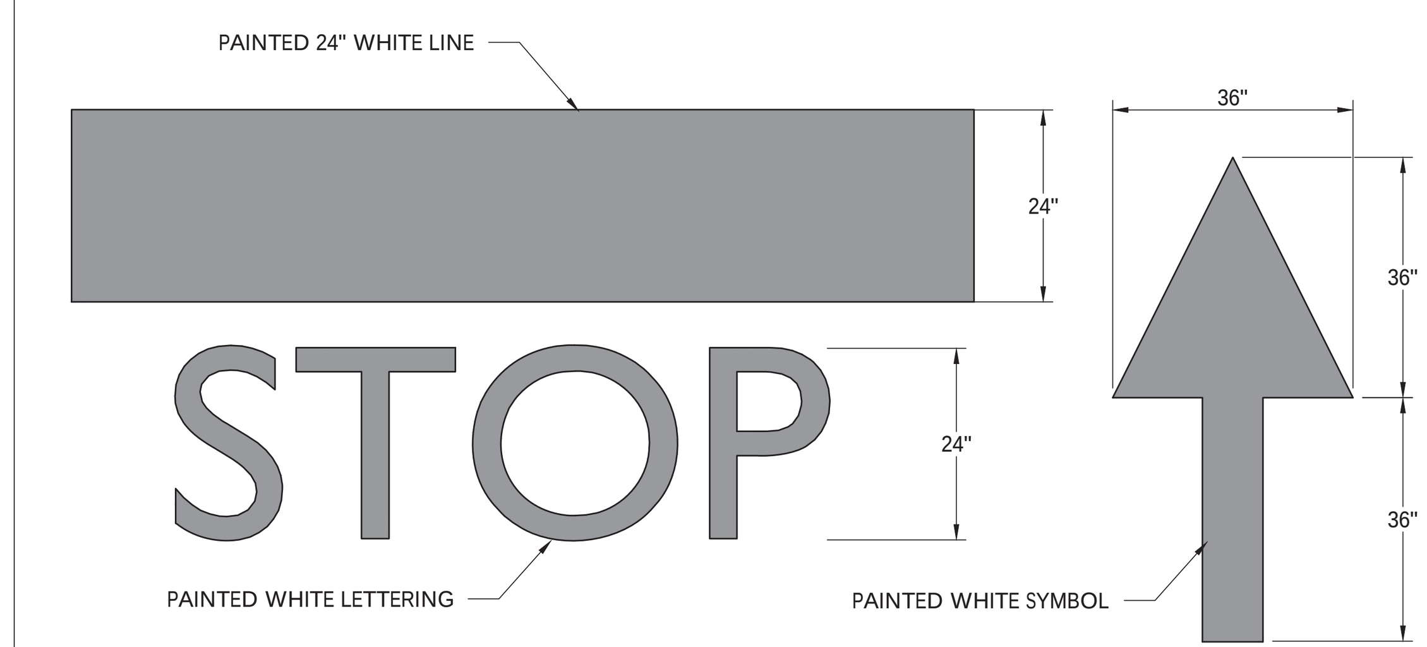


CONCRETE WHEEL STOP DETAIL

NOT TO SCALE

NOTES:
1. ON CONCRETE PAVEMENT, SECURE WHEEL STOP WITH EPOXY BONDING AGENT.
2. WHEEL STOP SHALL BE 6' LONG.
3. WHEEL STOP SHALL BE PREFABRICATED CONCRETE.

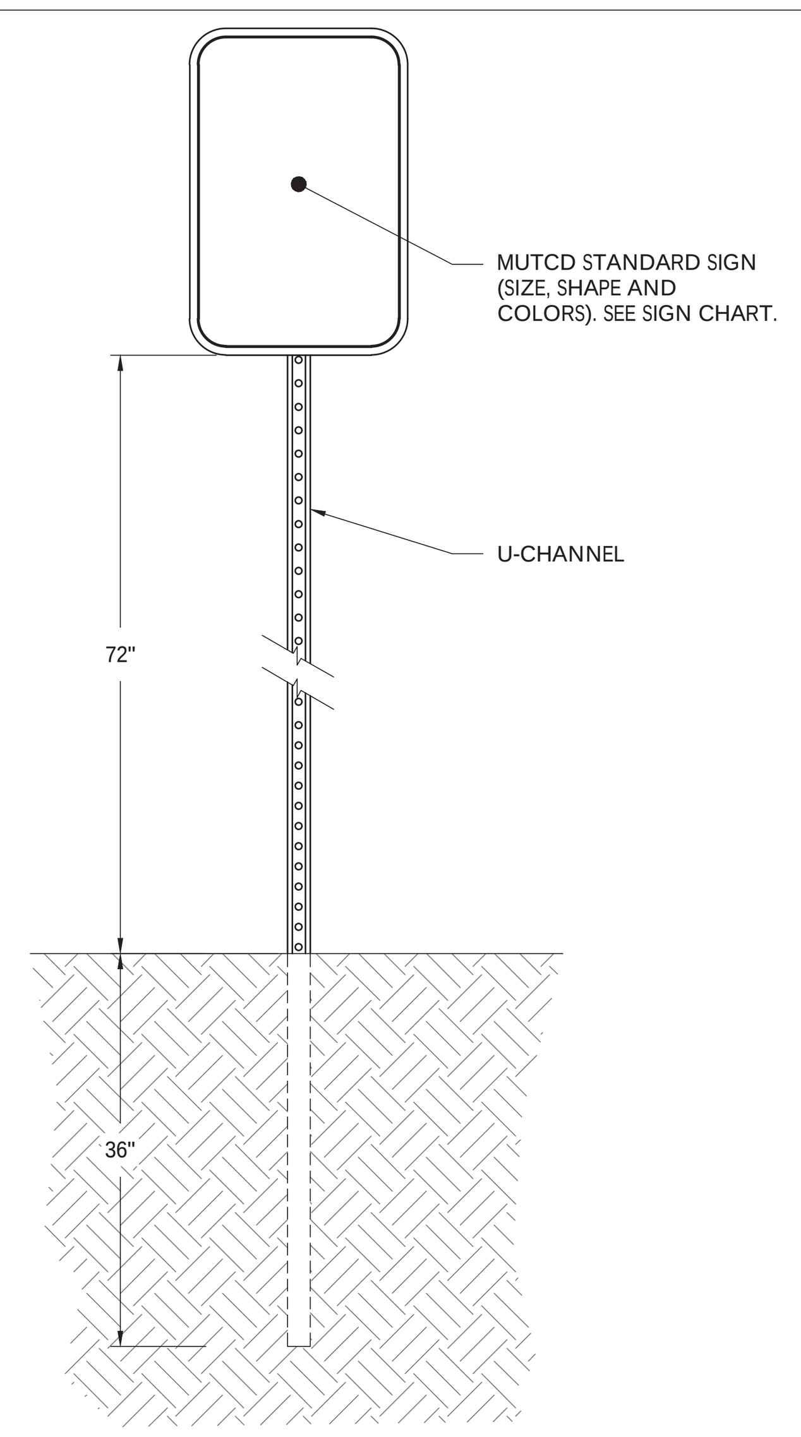
6



STOP BAR & ARROW

NOT TO SCALE

7



SIGN POST

NOT TO SCALE

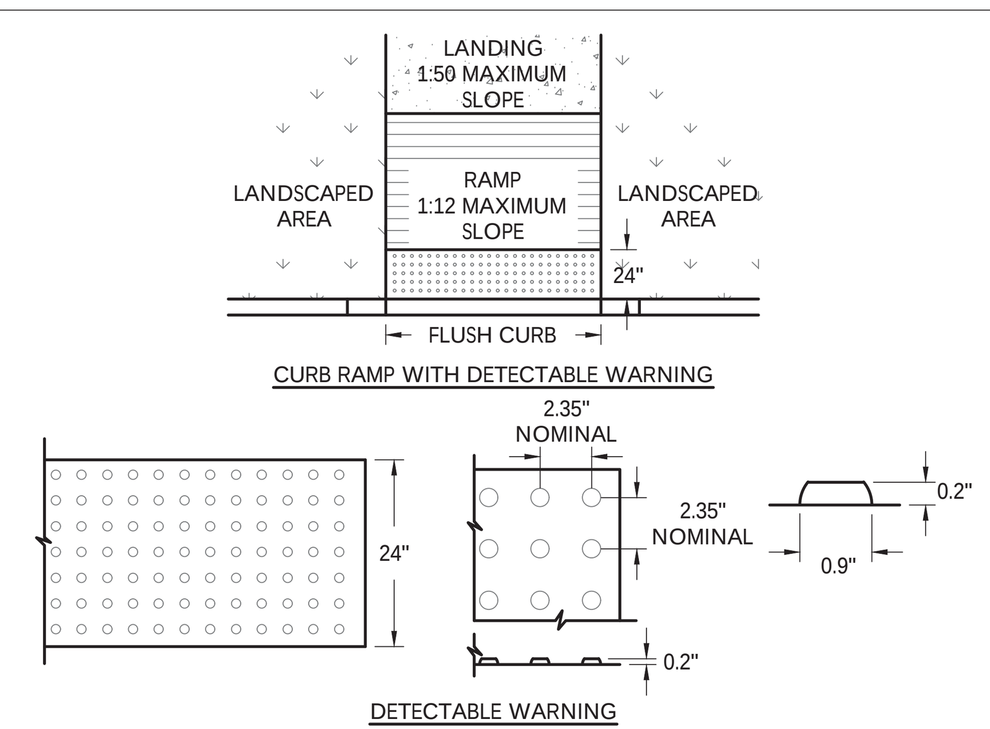
M.U.T.C.D. NUMBER	TEXT	COLOR		SIZE OF SIGN (WIDTH X HEIGHT)	TYPE OF MOUNT
		LEGEND	BACKGROUND		
STOP SIGN (R1-1)	STOP	WHITE	RED	36"x36"	GROUND
DO NOT ENTER (R5-1)	DO NOT ENTER	RED	WHITE	30"x30"	GROUND

SIGN DATA TABLE

NOT TO SCALE

NOTE:
1. ALL SIGNS SHALL BE IN ACCORDANCE WITH THE FEDERAL HIGHWAY ADMINISTRATION (FHWA) MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD), EXCEPT AS NOTED.
2. ALL SIGNS SHALL BE MOUNTED AS TO NOT OBSTRUCT THE SHAPE OF "STOP" (R1-1) AND "YIELD" (R1-2) SIGNS.

8

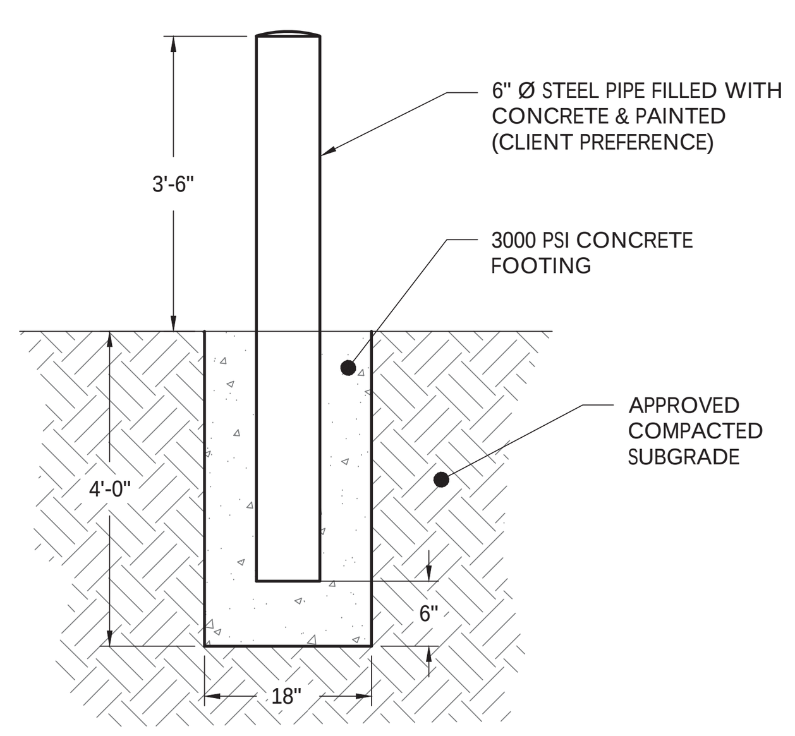


CURB RAMP DETAIL

NOT TO SCALE

NOTES:
1. CROSS SLOPE ON RAMP SHALL NOT EXCEED 2%
2. A FLUSH CURB SHALL HAVE A MINIMUM WIDTH OF 36". SEE PLAN FOR EXACT WIDTH.
3. DOMES SHALL BE ALIGNED ON A SQUARE GRID IN THE PREDOMINANT DIRECTION OF TRAVEL TO PERMIT WHEELS TO ROLL BETWEEN DOMES.
4. VISUAL CONTRAST: THERE SHALL BE A MINIMUM OF 70% CONTRAST IN LIGHT REFLECTANCE BETWEEN THE DETECTABLE WARNING AND AN ADJOINING SURFACE.
5. DETECTABLE WARNING STRIP REQUIRED WHERE RAMP DIRECTS PEDESTRIAN TRAFFIC TOWARDS VEHICLE TRAVEL WAY. WARNING STRIP SHALL BE CAST-IN-PLACE.
6. RAMP SHALL HAVE A MAXIMUM RISE OF 6" WITHOUT A HANDRAIL

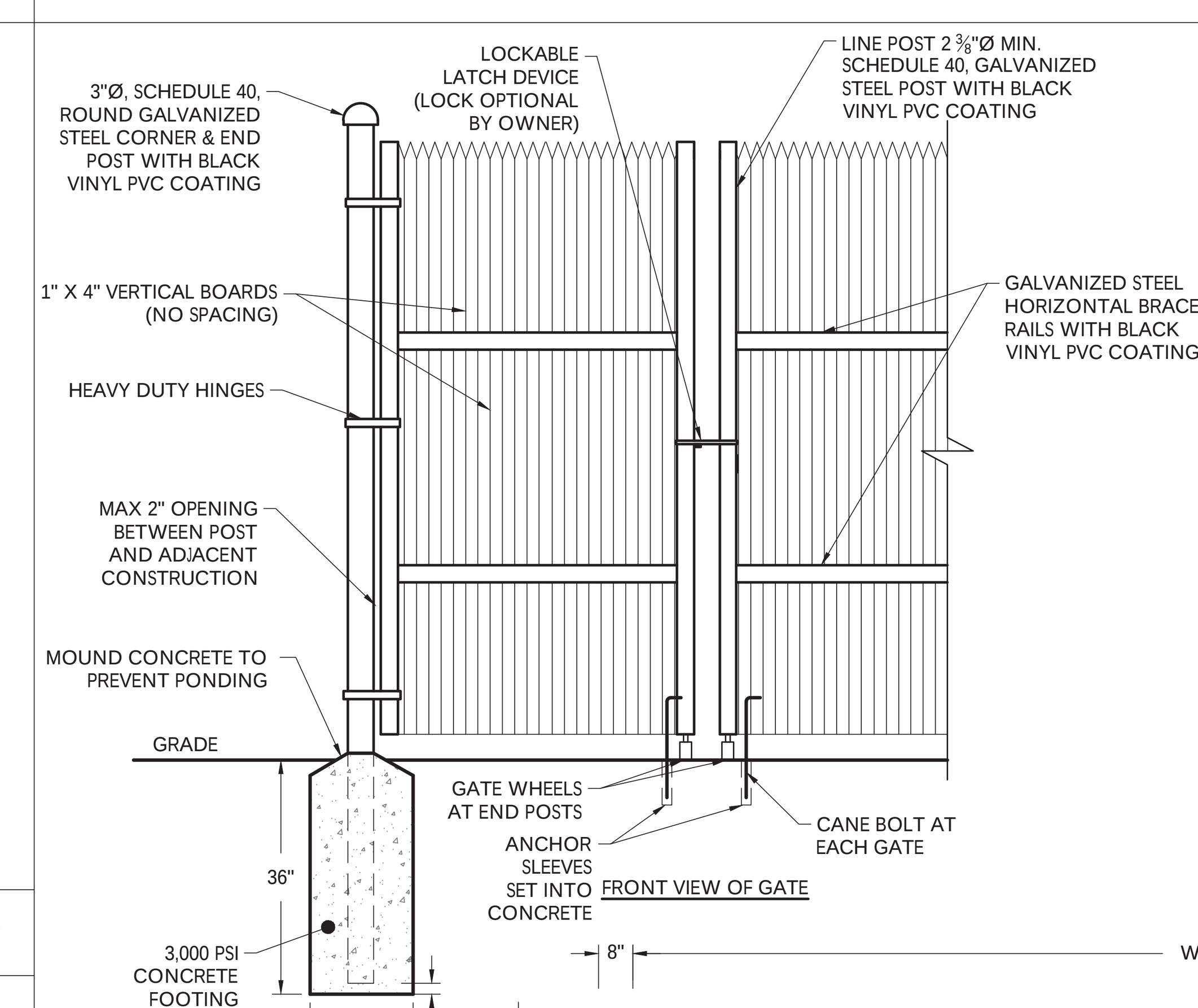
9

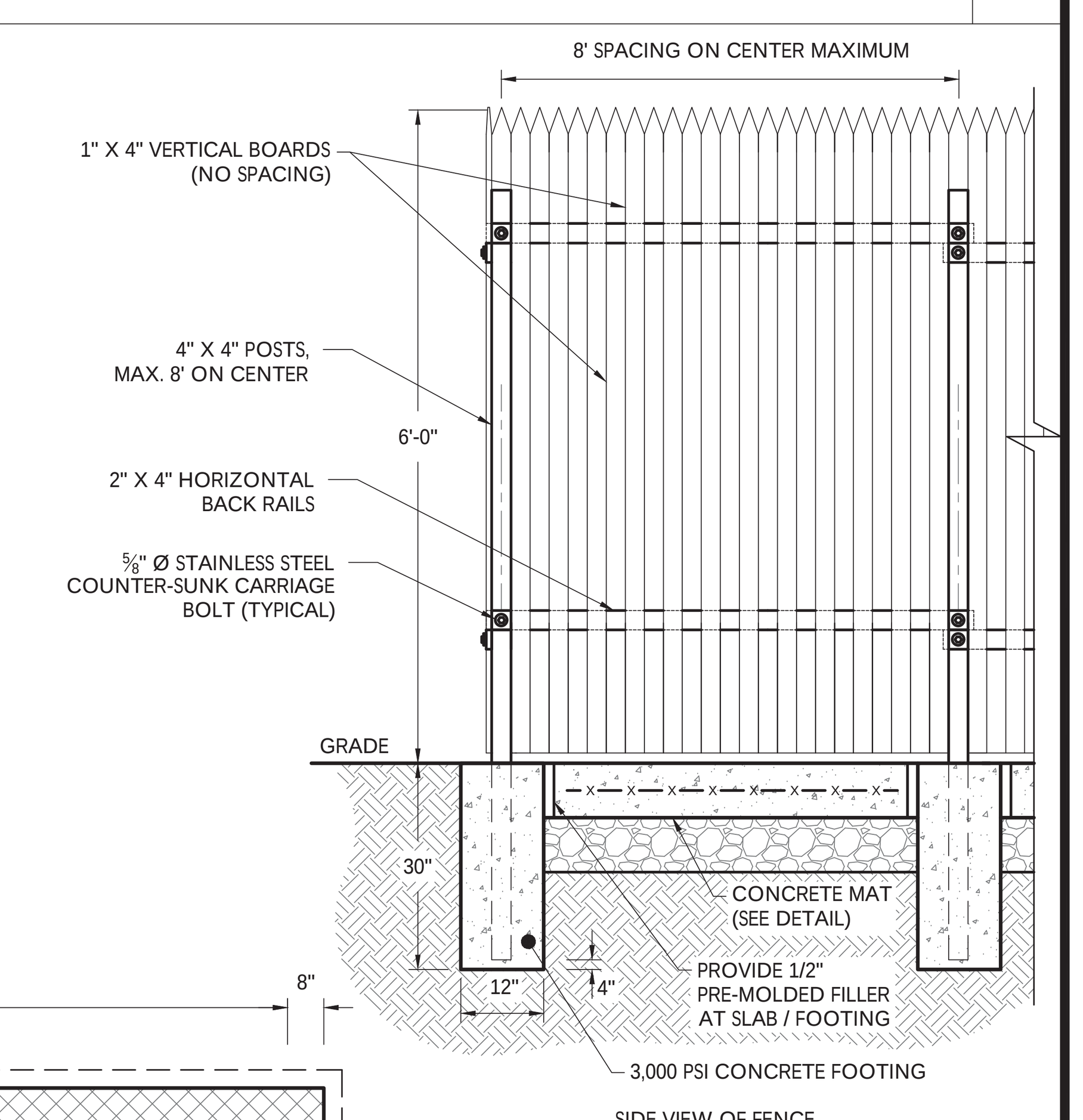


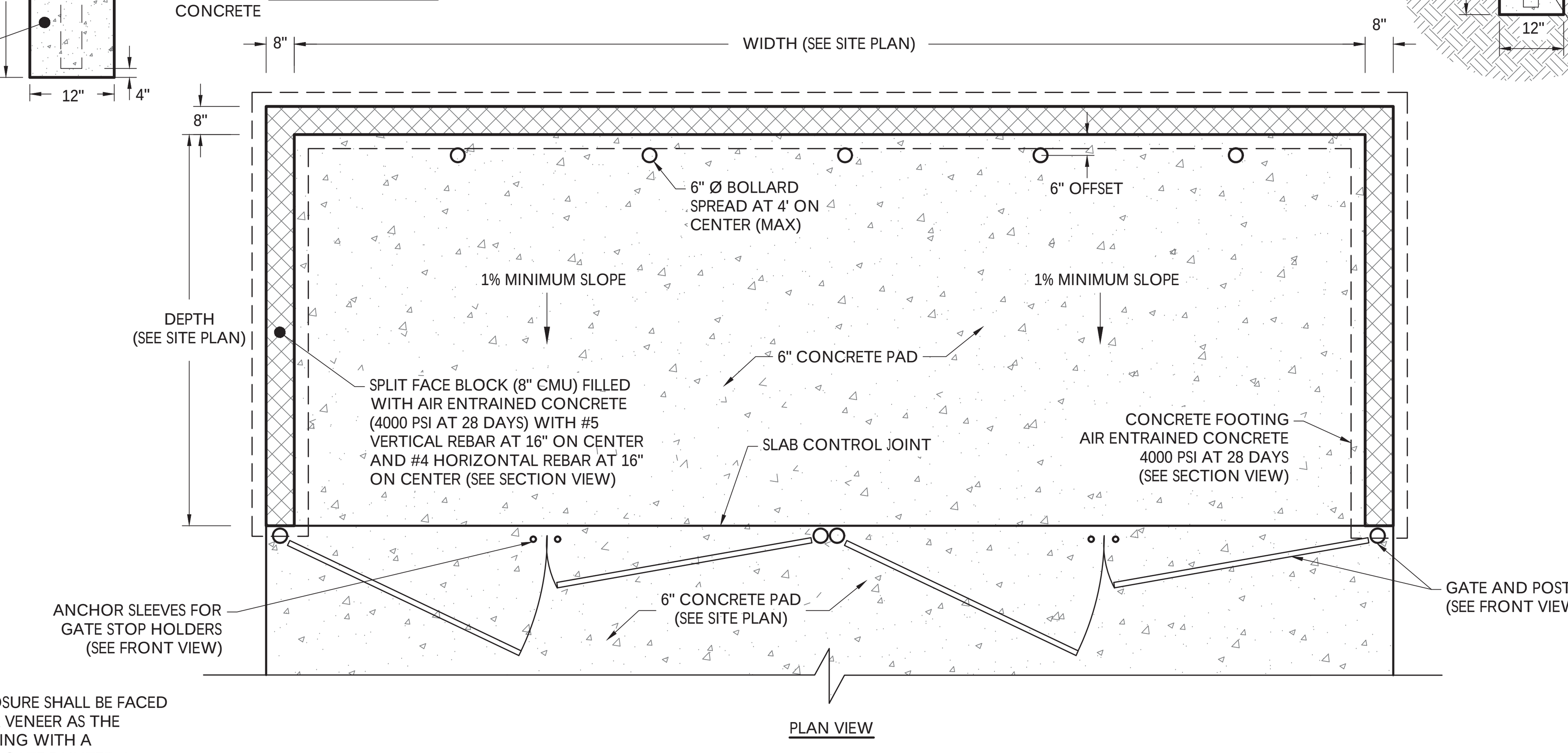
BOLLARD

NOT TO SCALE

10







NOTE:
THE DUMPSTER ENCLOSURE SHALL BE FACED WITH THE SAME BRICK VENEER AS THE FACADE OF THE BUILDING WITH A STEEL-BACKED WOOD GATE PAINTED A COMPLEMENTARY COLOR TO THE BRICK/CULTURED STONE

DOUBLE TRASH / RECYCLE ENCLOSURE DETAIL

NOT TO SCALE

11

ISSUE	DATE	BY	DESCRIPTION
5	06/22/2023	EM	RESUBMISSION FOR SITE PLAN APPROVAL
4	05/05/2023	EM	RESUBMISSION FOR SITE PLAN APPROVAL
3	04/11/2023	EM	FOR CLIENT REVIEW
2	03/16/2023	EM	FOR CLIENT REVIEW
1	02/14/2023	EM/RC	SUBMISSION FOR SITE PLAN APPROVAL

NOT APPROVED FOR CONSTRUCTION

STONEFIELD engineering & design
Detroit, MI · New York, NY · Rutherford, NJ
Princeton, NJ · Tampa, FL · Boston, MA
www.stonefieldeng.com
607 Shelby Suite 200, Detroit, MI 48226
Phone 248.247.1115

SITE DEVELOPMENT PLANS

HIGHLAND ROAD MEIJER OUTLOT B

PROPOSED COMMERCIAL DEVELOPMENT

PARCEL ID: 12-20-276-035
HIGHLAND ROAD (M-59) - OUTLOT B
WHITE LAKE TOWNSHIP
OAKLAND COUNTY, MICHIGAN 48383

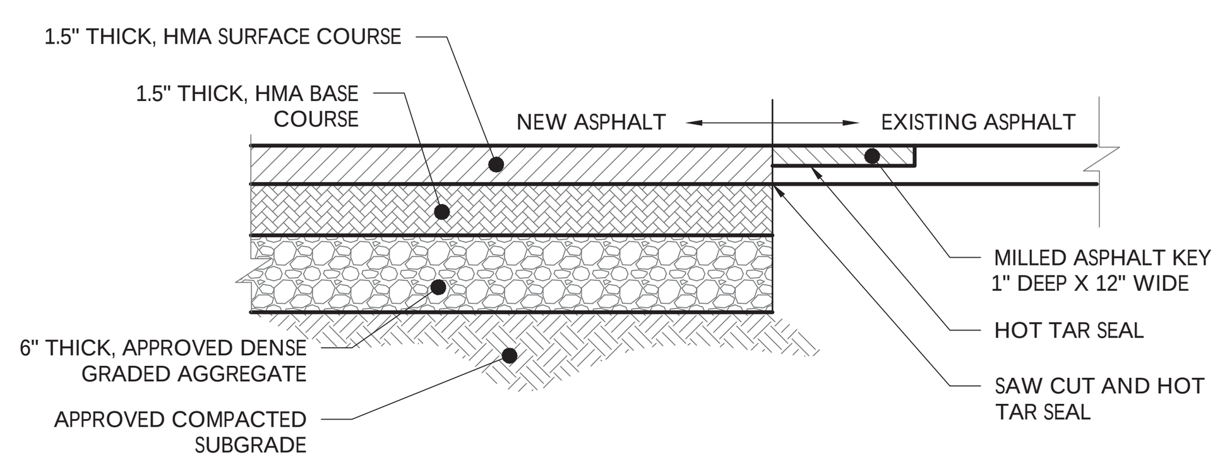
STATE OF MICHIGAN · JONATHAN REID COOKSEY · ENGINEER · PROFESSIONAL ENGINEER

STONEFIELD engineering & design

SCALE: AS SHOWN | PROJECT ID: DET-220180

TITLE:
CONSTRUCTION DETAILS

DRAWING:
C-9

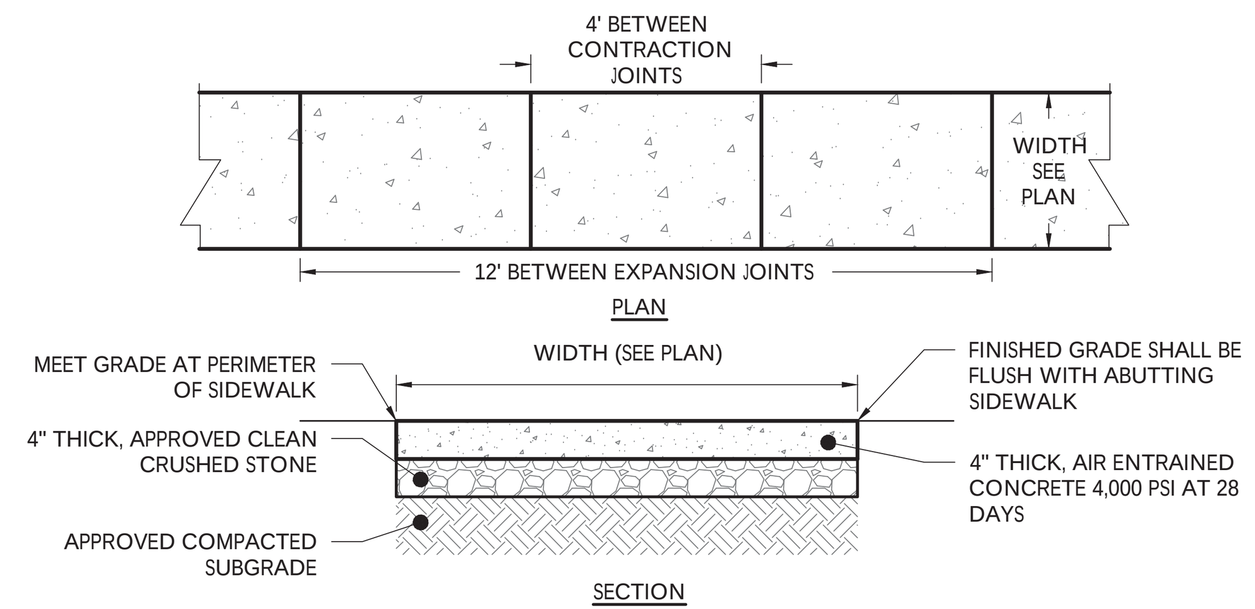


FULL DEPTH ASPHALT PAVEMENT DETAIL

NOT TO SCALE

NOTE:
HMA MIX AND DENSE GRADED AGGREGATE SHALL CONFORM TO STATE DEPARTMENT OF TRANSPORTATION SPECIFICATIONS.

1

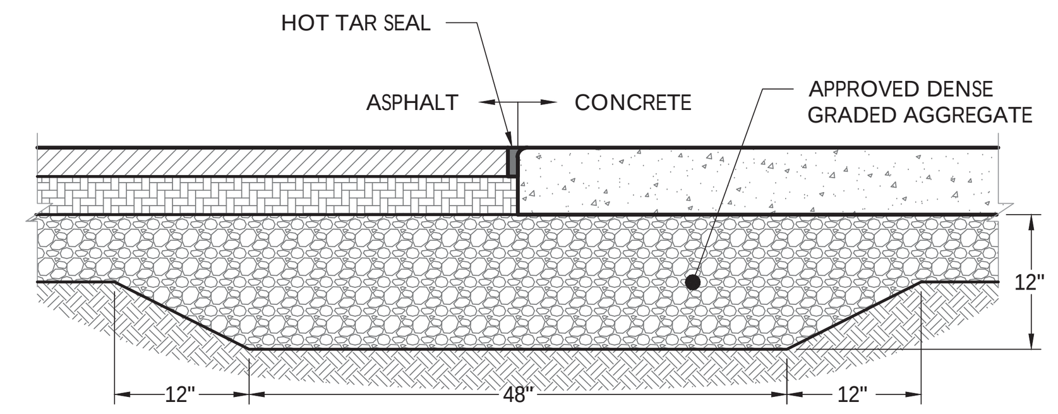


CONCRETE WALKWAY

NOT TO SCALE

NOTES:
1. MAXIMUM CROSS SLOPE SHALL BE ½" PER FOOT.
2. ½" EXPANSION JOINTS SHALL BE PROVIDED AT 12' INTERVALS WITH PRE-MOLDED, BITUMINOUS JOINT FILLER, RECESSED ½" FROM THE SURFACE.
3. 1" DEEP BY ⅛" WIDE, TOOLED CONTRACTION JOINTS SHALL BE PROVIDED AT 4' INTERVALS.
4. EXPANSION JOIN SHALL BE PROVIDED WHERE ADJACENT TO A BUILDING.

2

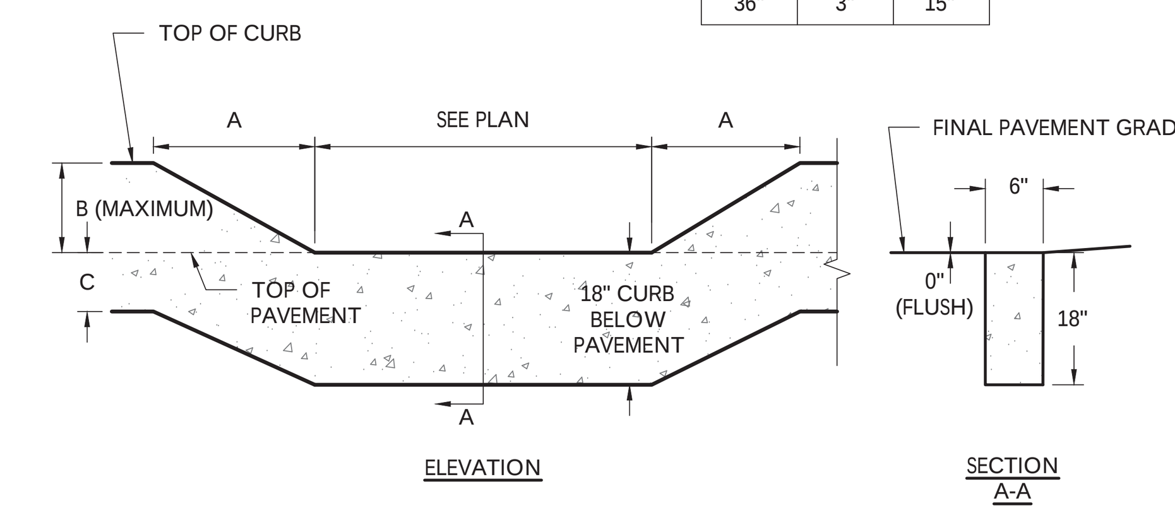


CONCRETE TO ASPHALT TRANSITION

NOT TO SCALE

3

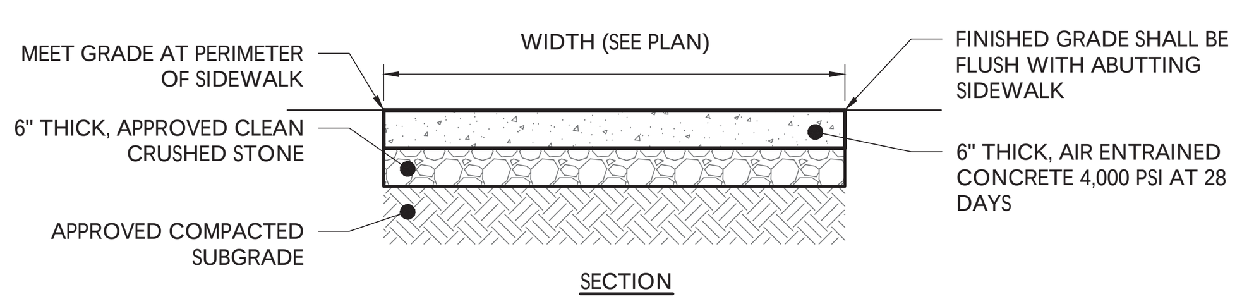
FLUSH CURB DIMENSIONS		
A	B	C
72"	6"	12"
60"	5"	13"
48"	4"	14"
36"	3"	15"



FLUSH CURB

NOT TO SCALE

4

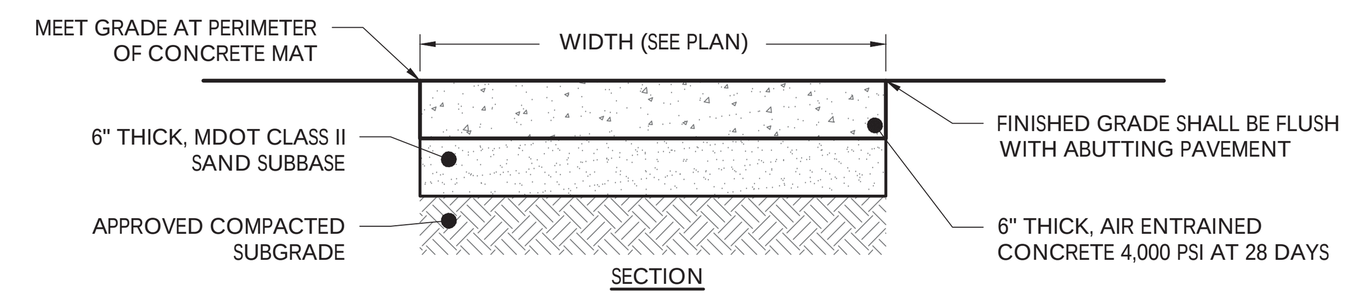


CONCRETE PAVEMENT

NOT TO SCALE

NOTES:
1. ½" EXPANSION JOINTS WITH WATER SEAL SHALL BE PROVIDED AT 12' INTERVALS WITH PRE-MOLDED, BITUMINOUS JOINT FILLER, RECESSED ½" FROM THE SURFACE. LONGITUDINAL REBAR TO BE CUT AT EXPANSION JOINTS.
2. 1" DEEP BY ⅛" WIDE, TOOLED CONTRACTION JOINTS SHALL BE PROVIDED AT MID-POINT BETWEEN EXPANSION JOINTS OR 6' INTERVALS MAX.
3. CONCRETE SHALL RECEIVE BROOM FINISH.
4. ALL EXPOSED CORNERS TO HAVE 12" CHAMFER.

5

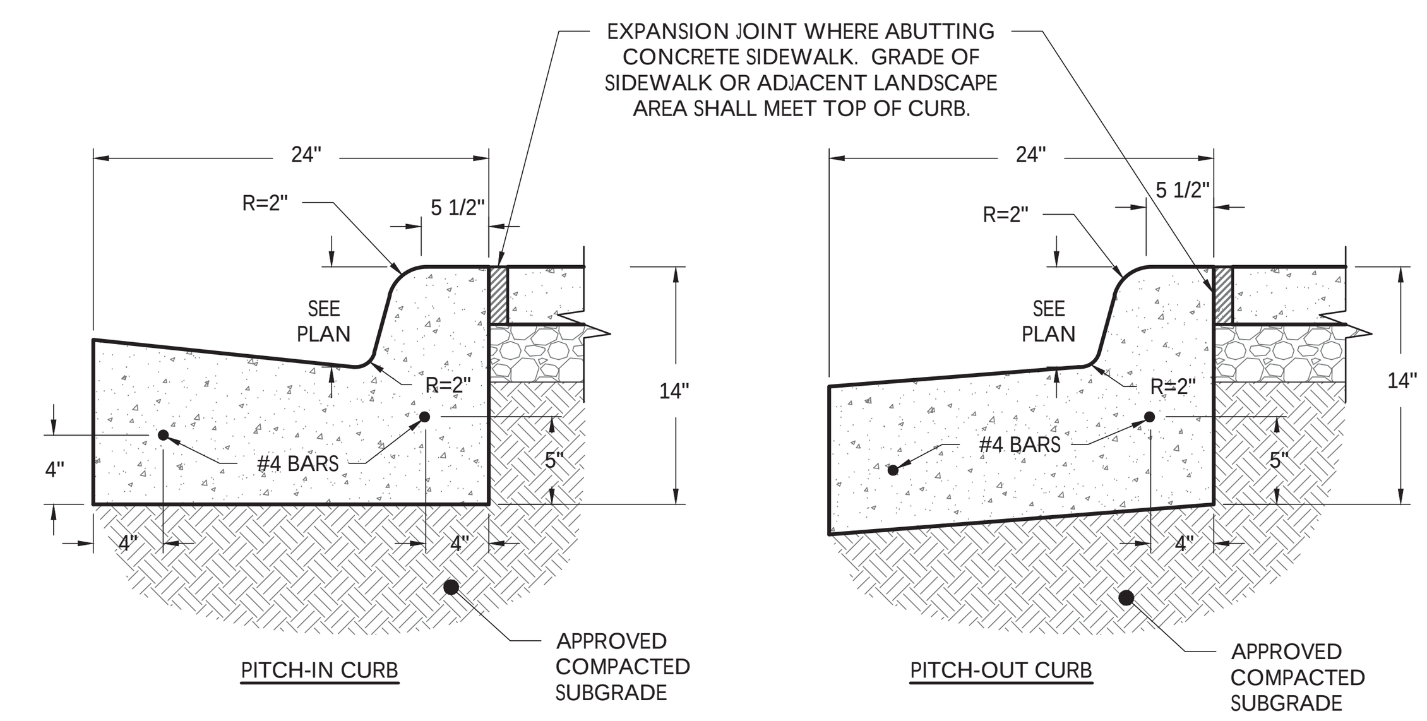


CONCRETE MAT

NOT TO SCALE

NOTES:
1. ½" EXPANSION JOINTS WITH WATER SEAL SHALL BE PROVIDED AT 12' INTERVALS WITH PRE-MOLDED, BITUMINOUS JOINT FILLER, RECESSED ½" FROM THE SURFACE. LONGITUDINAL REBAR TO BE CUT AT EXPANSION JOINTS.
2. 1" DEEP BY ⅛" WIDE, TOOLED CONTRACTION JOINTS SHALL BE PROVIDED AT MID-POINT BETWEEN EXPANSION JOINTS OR 6' INTERVALS MAX.
3. CONCRETE SHALL RECEIVE BROOM FINISH.
4. ALL EXPOSED CORNERS TO HAVE 12" CHAMFER.

6

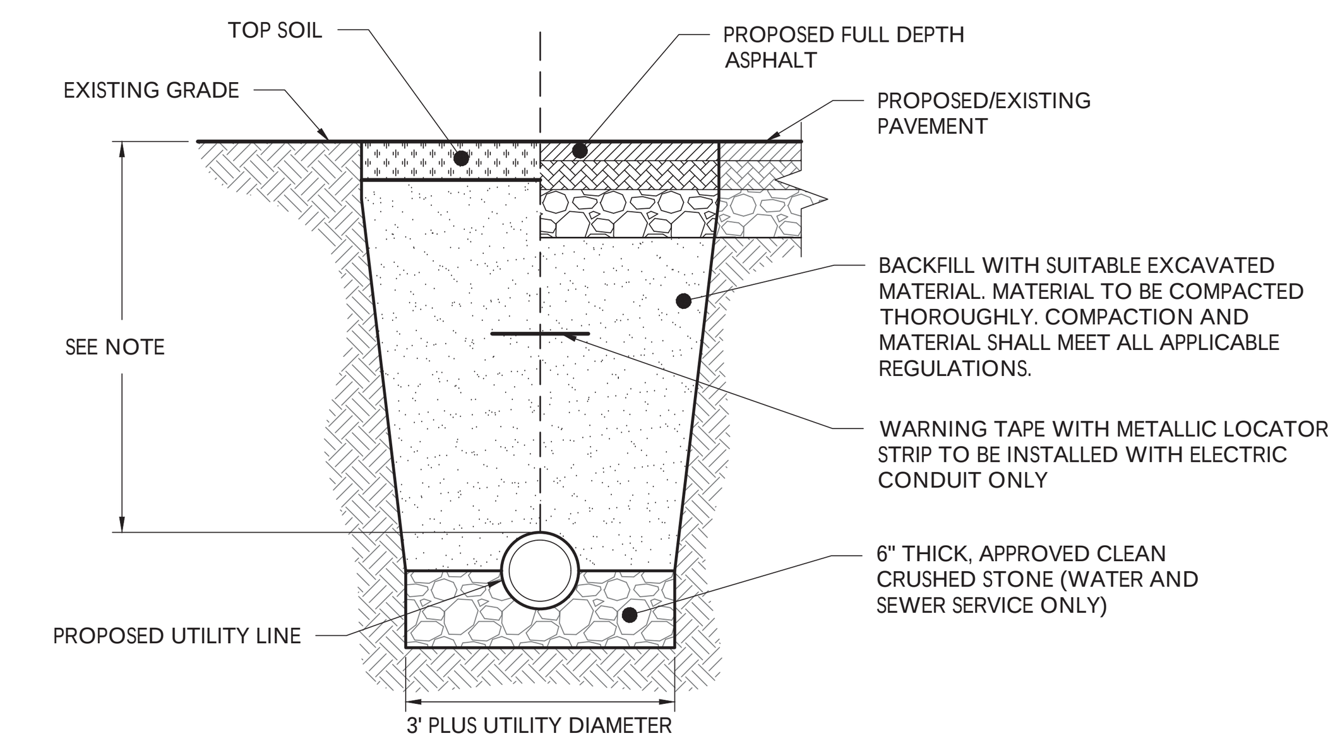


CONCRETE CURB AND GUTTER DETAIL

NOT TO SCALE

NOTES:
1. CONCRETE SHALL BE 3500 PSI AT 28 DAYS, AIR-ENTRAINED.
2. TRANSVERSE EXPANSION JOINTS SHALL BE PROVIDED AT 20 FOOT INTERVALS WITH PRE-MOLDED, BITUMINOUS JOINT FILLER, RECESSED ½" FROM SURFACE.
3. HALF DEPTH CONTRACTION JOINTS SHALL BE PROVIDED AT 10 FOOT INTERVALS.
4. 14" CURB DEPTH SHALL BE MAINTAINED AT DEPRESSED OR FLUSH CURBED AREAS.

7

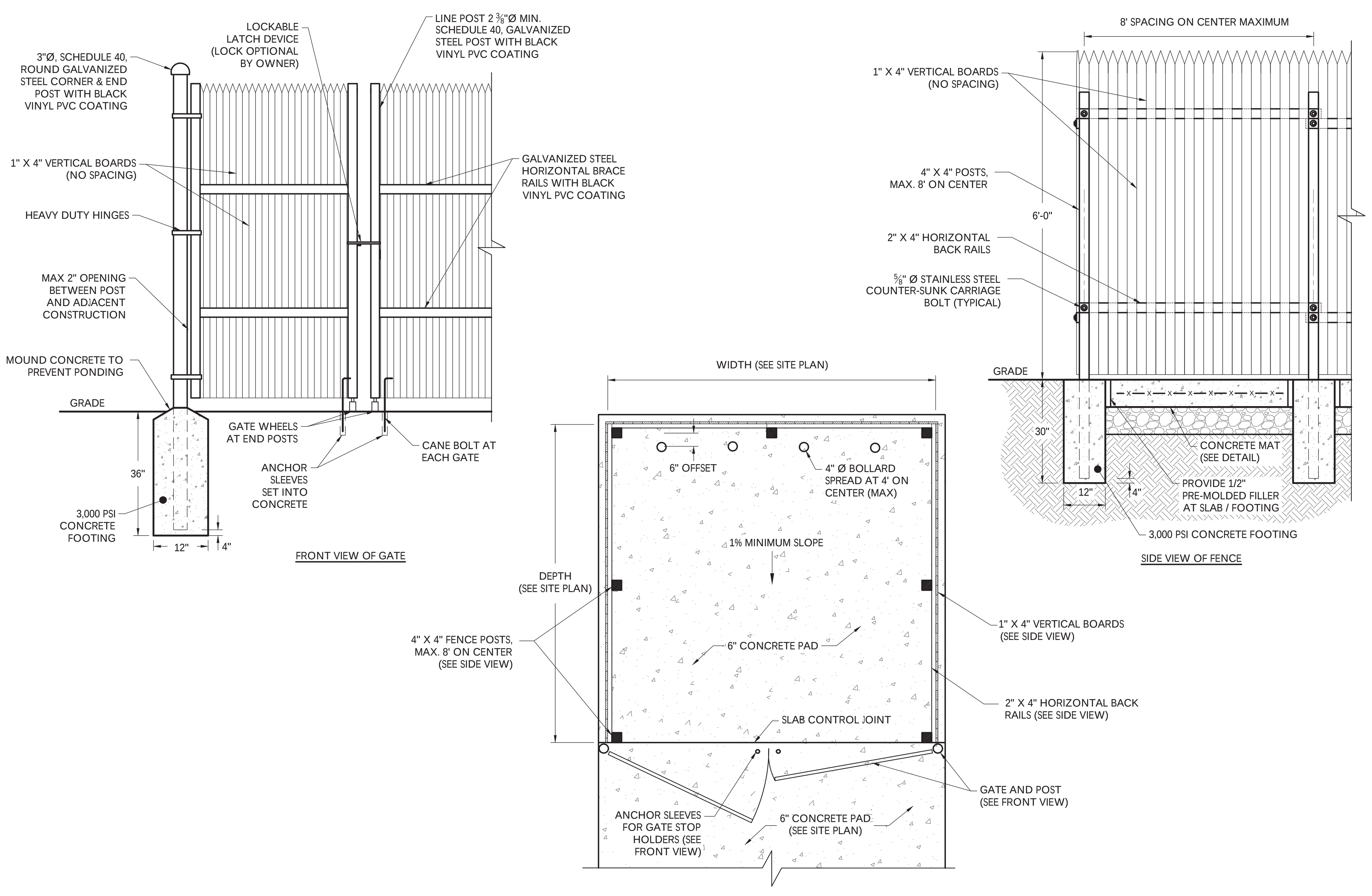


UTILITY TRENCH

NOT TO SCALE

NOTE:
MINIMUM PIPE COVER SHALL BE AS FOLLOW:
- ELECTRIC SERVICE - PER APPLICABLE UTILITY AUTHORITY
- GAS SERVICE - PER APPLICABLE UTILITY AUTHORITY
- SEWER SERVICE - 36" MINIMUM
- WATER SERVICE - 48" MINIMUM

8

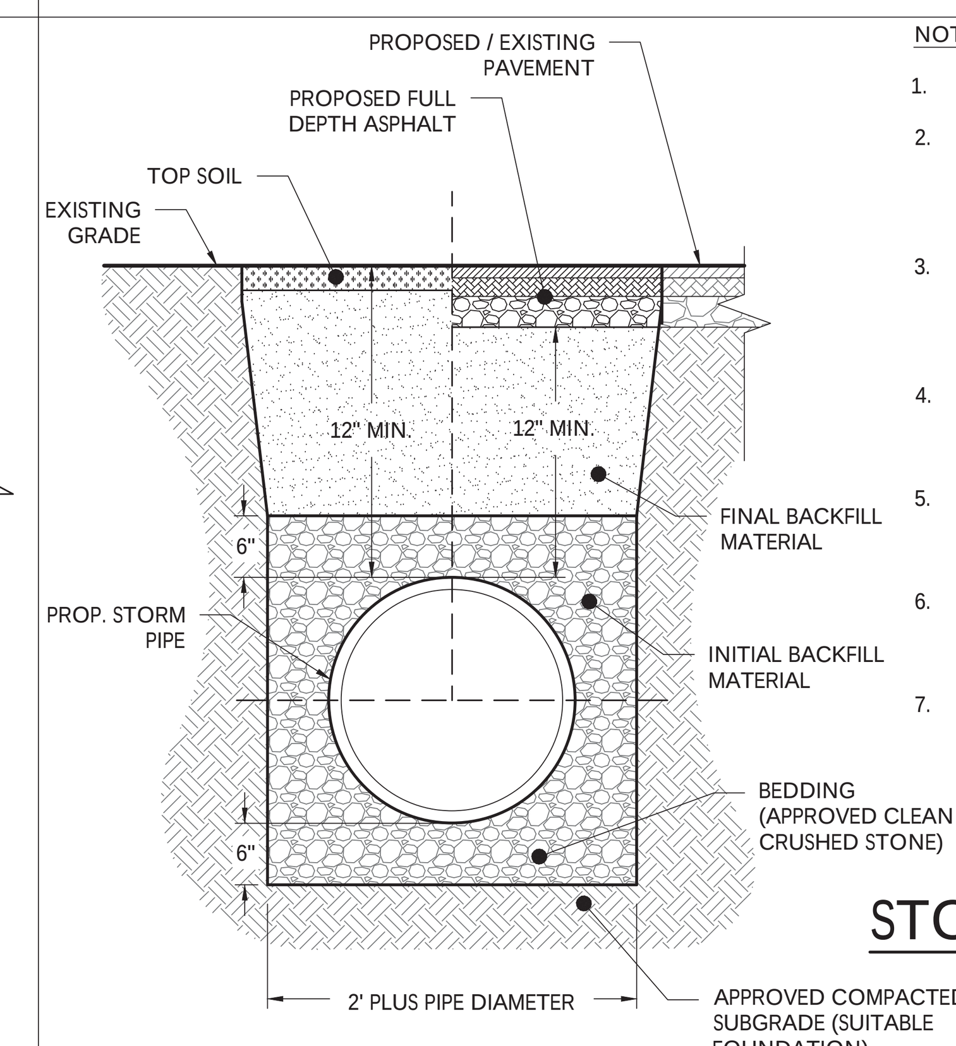


NOTE:
ALL LUMBER SHALL BE PRESSURE TREATED.

SINGLE TRASH ENCLOSURE DETAIL

NOT TO SCALE

9

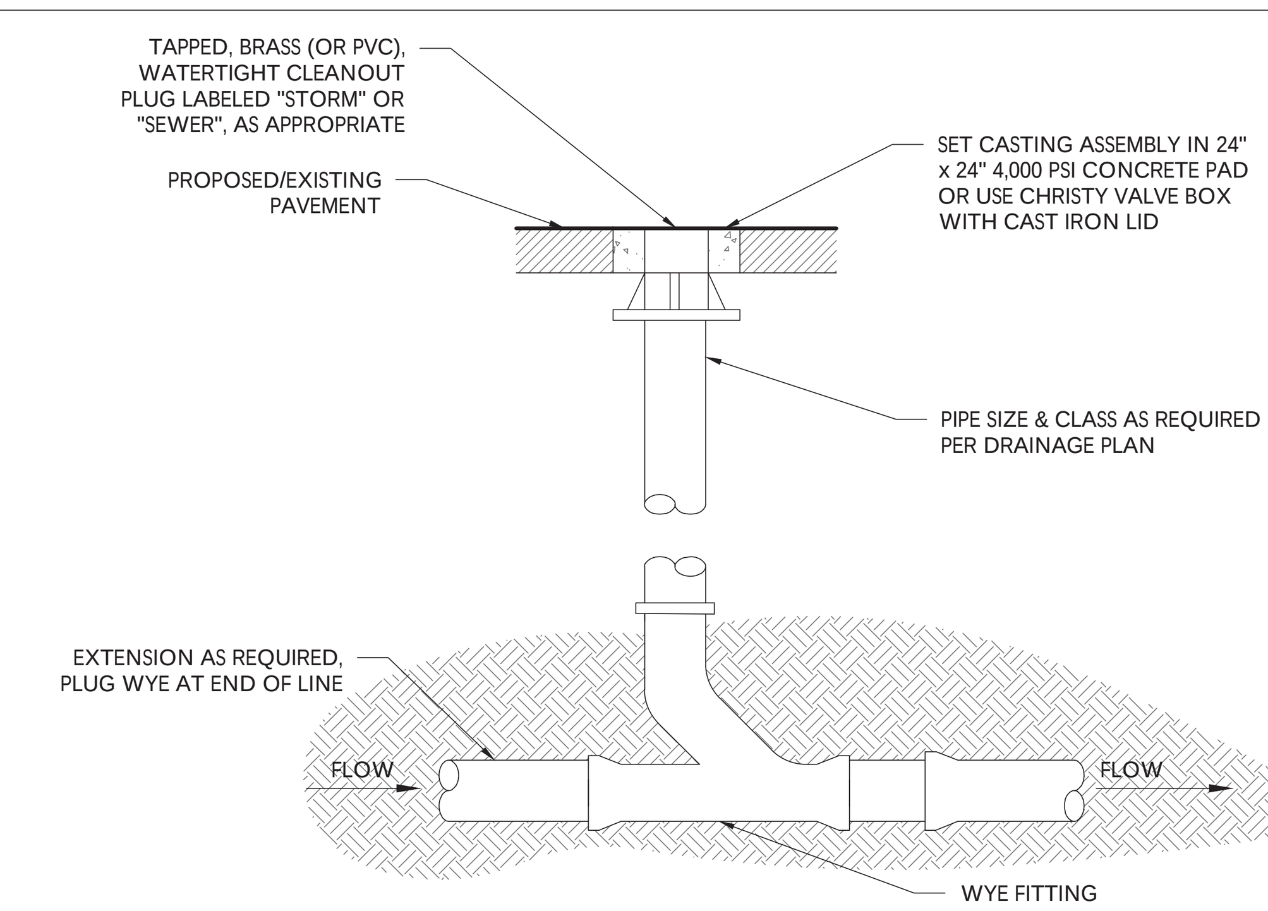


NOTES:
1. ALL PIPE SYSTEM INSTALLATIONS SHALL MEET ALL APPLICABLE STANDARDS AND SPECIFICATIONS.
2. ALL HDPE PIPE SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH ASTM D2321, "STANDARD PRACTICE FOR UNDERGROUND INSTALLATION OF THERMOPLASTIC PIPE FOR SEWERS AND OTHER GRAVITY FLOW APPLICATIONS" (LATEST EDITION).
3. ALL RCP PIPE SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH ASTM C76-15, "STANDARD SPECIFICATION FOR REINFORCED CONCRETE CULVERT, STORM DRAIN, AND SEWER PIPE" (LATEST EDITION).
4. FOR NON HDPE OR RCP PIPE INSTALLATIONS, CONTRACTOR SHALL INSTALL PIPE IN ACCORDANCE WITH ALL APPLICABLE STANDARDS AND SPECIFICATIONS.
5. WHERE THE TRENCH BOTTOM IS UNSTABLE, CONTRACTOR SHALL PROVIDE SUITABLE BACKFILL MATERIAL AS REQUIRED BY ENGINEER OR PER GEOTECH RECOMMENDATIONS.
6. MINIMUM COVER IN TRAFFIC AREAS IS 12" UP TO 48" DIAMETER PIPE AND 24" FOR 54" - 60" DIAMETER PIPE TO BOTTOM OF FLEXIBLE PAVEMENT OR TOP OF RIGID PAVEMENT.
7. CONTRACTOR SHALL INSTALL SUITABLE MATERIAL FOR INITIAL AND FINAL BACKFILL. BACKFILL COMPACTION SHOULD MEET ALL APPLICABLE STANDARDS AND SPECIFICATIONS.

STORM TRENCH DETAIL

NOT TO SCALE

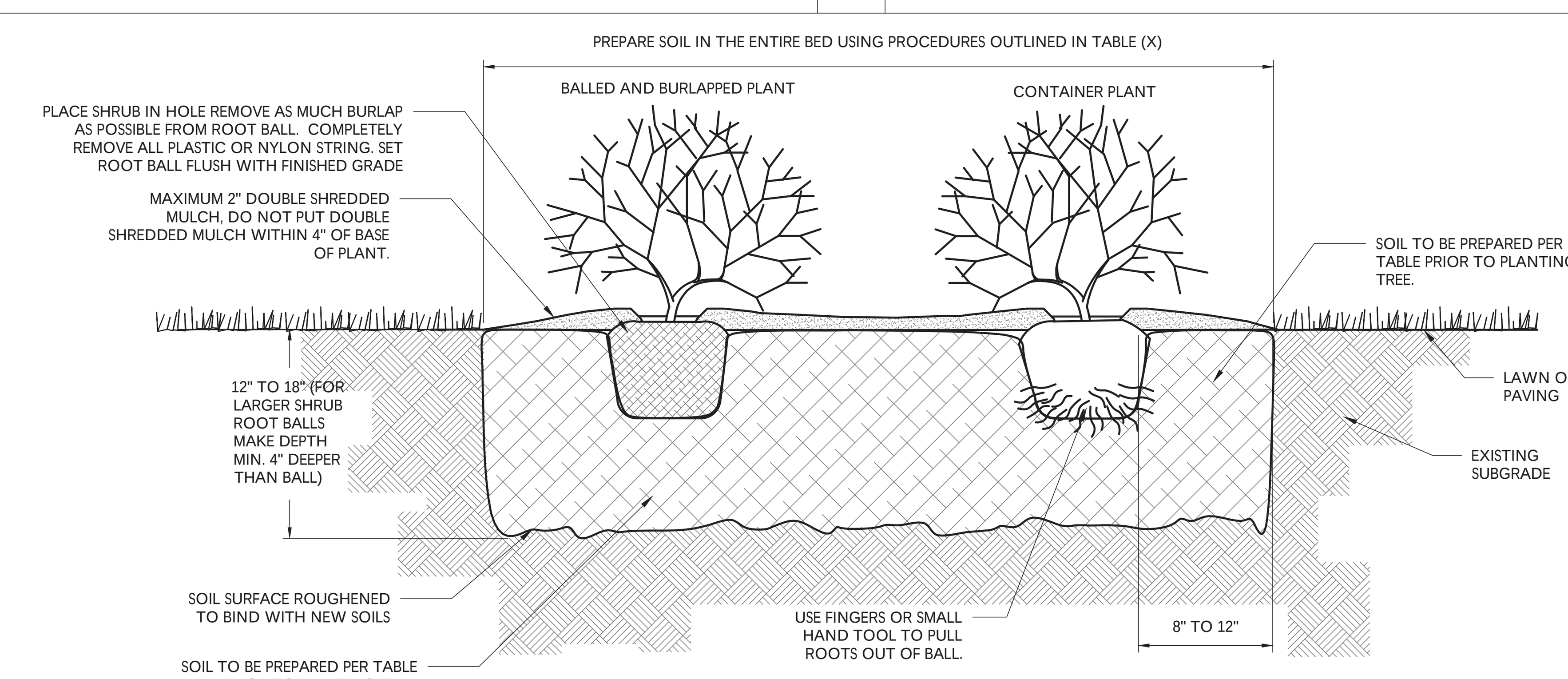
10



HARDSCAPE CLEAN-OUT

NOT TO SCALE

11



SHRUB PLANTING DETAIL

NOT TO SCALE

12

ISSUE	DATE	BY	DESCRIPTION
5	06/22/2023	EM	RESUBMISSION FOR SITE PLAN APPROVAL
4	05/05/2023	EM	RESUBMISSION FOR SITE PLAN APPROVAL
3	04/11/2023	EM	FOR CLIENT REVIEW
2	03/16/2023	EM	FOR CLIENT REVIEW
1	02/14/2023	EM/RC	SUBMISSION FOR SITE PLAN APPROVAL

NOT APPROVED FOR CONSTRUCTION

STONEFIELD
engineering & design
Detroit, MI · New York, NY · Rutherford, NJ
Princeton, NJ · Tampa, FL · Boston, MA
www.stonefieldeng.com
607 Shelby Suite 200, Detroit, MI 48226
Phone 248.247.1115

SITE DEVELOPMENT PLANS
HIGHLAND ROAD MEIJER OUTLOT B
PROPOSED COMMERCIAL DEVELOPMENT

PARCEL ID: 12-20-276-035
HIGHLAND ROAD (M-59) - OUTLOT B
WHITE LAKE TOWNSHIP
OAKLAND COUNTY, MICHIGAN 48383

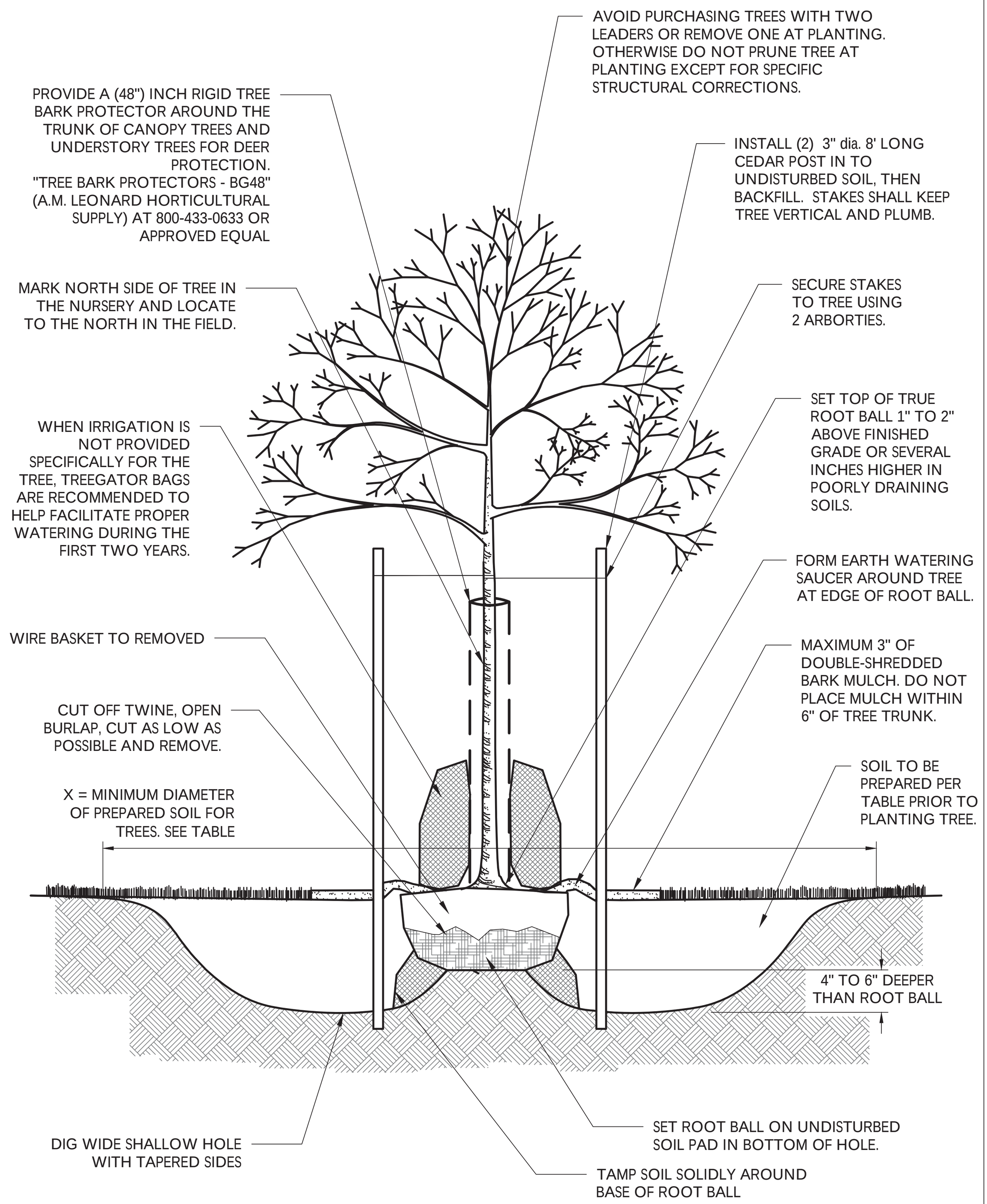
STATE OF MICHIGAN
JONATHAN REID COOKSEY
ENGINEER
PROFESSIONAL ENGINEER

STONEFIELD
engineering & design

SCALE: AS SHOWN | PROJECT ID: DET-220180

TITLE:
CONSTRUCTION DETAILS

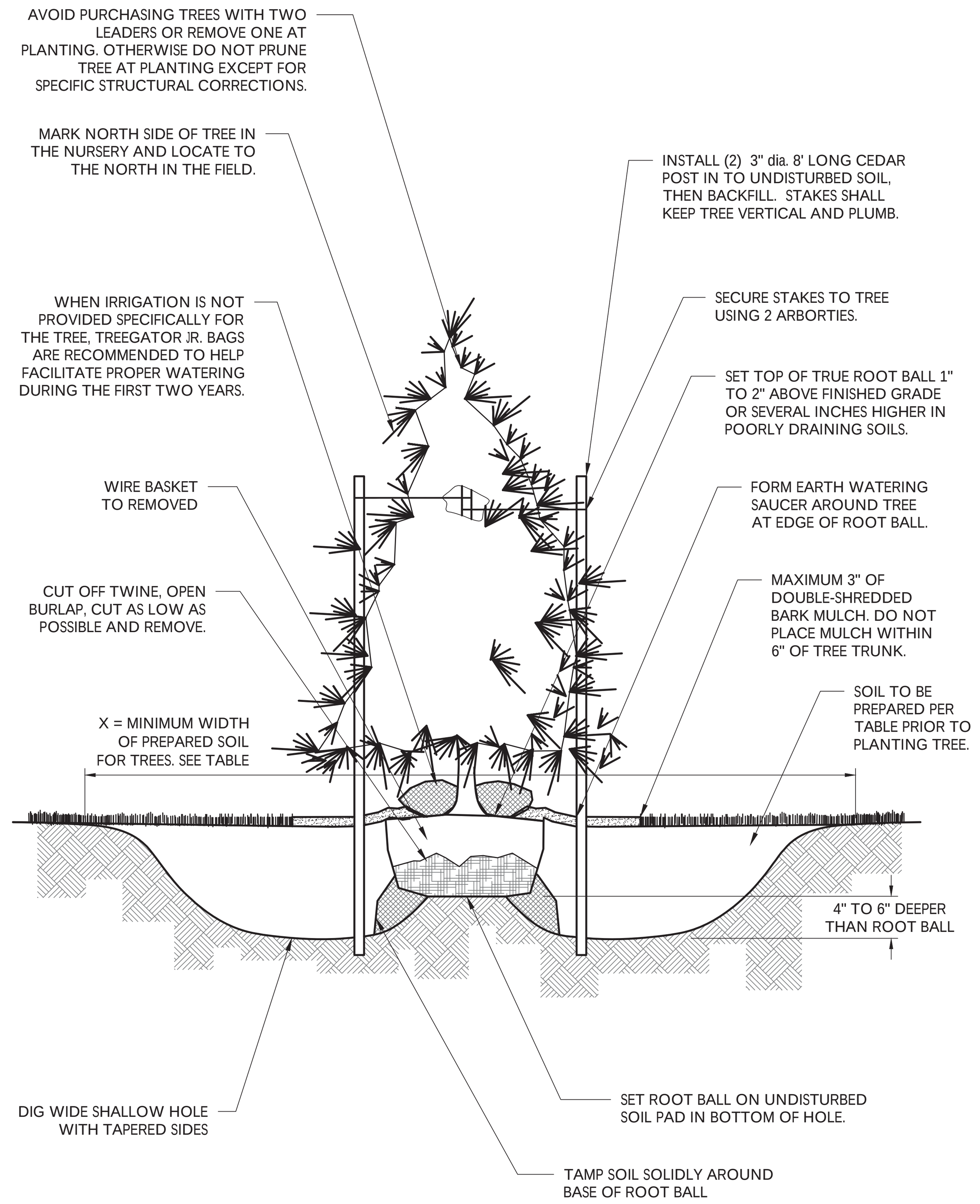
DRAWING:
C-10



DECIDUOUS TREE PLANTING DETAIL

NOT TO SCALE

1



CONIFEROUS TREE PLANTING DETAIL

NOT TO SCALE

2

ISSUE	DATE	BY	DESCRIPTION
5	06/22/2023	EM	RESUBMISSION FOR SITE PLAN APPROVAL
4	05/05/2023	EM	RESUBMISSION FOR SITE PLAN APPROVAL
3	04/11/2023	EM	FOR CLIENT REVIEW
2	03/16/2023	EM	FOR CLIENT REVIEW
1	02/14/2023	EM/RC	SUBMISSION FOR SITE PLAN APPROVAL

NOT APPROVED FOR CONSTRUCTION

STONEFIELD engineering & design

Detroit, MI · New York, NY · Rutherford, NJ
Princeton, NJ · Tampa, FL · Boston, MA
www.stonefieldeng.com

607 Shelby Suite 200, Detroit, MI 48226
Phone 248.247.1115

SITE DEVELOPMENT PLANS

HIGHLAND ROAD MEIJER OUTLOT B

PROPOSED COMMERCIAL DEVELOPMENT

PARCEL ID: 12-20-276-035
HIGHLAND ROAD (M-59) - OUTLOT B
WHITE LAKE TOWNSHIP
OAKLAND COUNTY, MICHIGAN 48383

STATE OF MICHIGAN
JONATHAN REID COOKSEY
ENGINEER
PROFESSIONAL

STONEFIELD engineering & design

SCALE: AS SHOWN | PROJECT ID: DET-220180

TITLE: CONSTRUCTION DETAILS

DRAWING: C-11

DESCRIPTION

Lumark

The Prevail™ LED pole and fixture combination makes selection and installation of poles and fixtures simple. Included is the die-cast Prevail area, site and roadway luminaire with standard mounting arm, square straight steel pole, anchor bolts, base cover, template and hardware. Stock configurations are available in single and dual fixture combinations. The Prevail luminaire delivers a new level of versatility and value in patent pending, architectural design that delivers energy savings greater than 85% and replaces 150-450W metal halide fixtures. The Prevail fixture and pole combo is ideal for general area/site lighting applications.

Catalog #		Type
Project		
Comments		Date
Prepared by		

SPECIFICATION FEATURES

Construction
Construction is comprised of a heavy-duty, single-piece die-cast aluminum housing in dark bronze polyester powder paint. The die-cast aluminum door is tethered to provide easy access to the driver if replacement is required. The optics is mounted on a versatile, aluminum plate that dissipates heat from the LEDs resulting in longer life of the fixture. The fixture is IP66 and 3G vibration rated (ANSI C136.31).

Optics
Available in Type III and IV distributions with lumen packages ranging from 7,000 to 20,000 nominal lumens. Light engine configurations consist of 1 or 2 high-efficacy LEDs mounted to metal-core circuit boards to maximize heat dissipation and promote long life (up to L91/50,000 hours at 25°C) per IESNA TM-21. For the ultimate level of spill light control, an optional house side shield accessory can be field or factory installed.

Electrical
Available in 120-277V 50/60Hz. 10kV/10kA surge protection standard. 0-10V dimming driver is standard with leads external to the fixture to accommodate controls capability such as dimming and occupancy. Suitable for ambient temperatures from -40°C to 40°C.

Mounting
The versatile, patent pending, standard mount arm accommodates multiple drill patterns ranging from 1-1/2" to 4-7/8". Removal of the door on the standard mounting arm enables wiring of the fixture without having to access the driver compartment. A knock-out on the standard mounting arm enables round pole mounting.

Pole
Shaft is one-piece construction ASTM A500 grade "B" steel, shot blasted and finished in dark bronze polyester powder coat. Anchor base is fabricated from ASTM grade steel. ASTM A366 steel full base cover is provided to enclose base plate and anchor bolts. Anchor bolts are per ASTM A576 with two nuts, two flat washers, and one lock washer. Hardware and threaded portion of bolt are hot dip galvanized. 3" hook for 3/4" bolt. 4" hook for 1" bolt.

Finish
Housing and cast parts finished in five-stage super TGIC polyester bronze powder coat paint, 2.5 mil nominal thickness for superior protection against fade and wear.

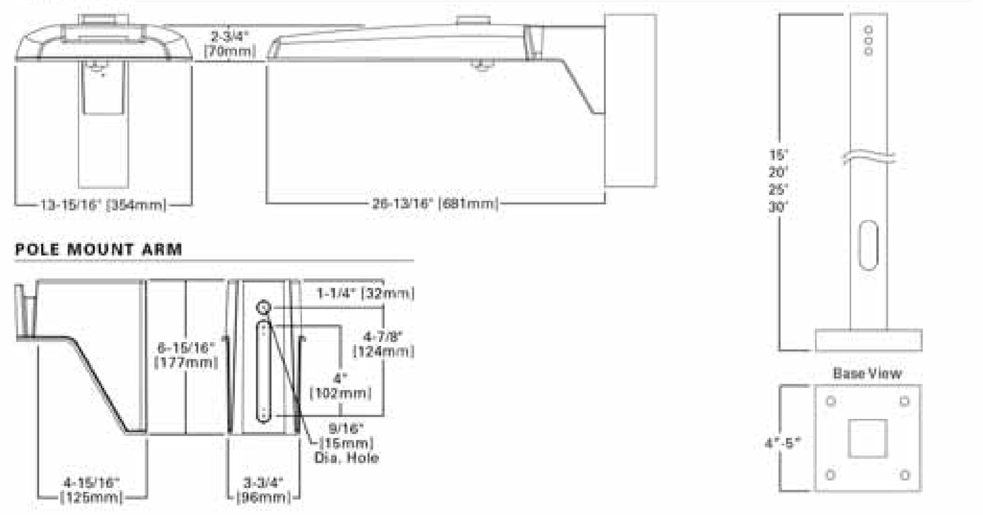
Warranty
Five-year warranty.

PFPRV PREVAIL POLE AND FIXTURE COMBO

LED

POLE AND FIXTURE COMBO

DIMENSIONS



CERTIFICATION DATA
UL and cUL Wet Location Listed
IP66-Rated
3G Vibration Rated
ISO 9001

ENERGY DATA
Electronic LED Driver
0.9 Power Factor
<20% Total Harmonic Distortion
120-277V/50 and 60Hz, 347V/60Hz, 480V/60Hz
-40°C Minimum Temperature Rating
+40°C Ambient Temperature Rating

EPA
Effective Projected Area (Sq. Ft.): 0.75 (1 fixture)

SHIPPING DATA
Approximate Net Weight: 20lbs. [9.09 kgs.] (1 fixture)

EATON Powering Business Worldwide

TD500029EN
October 15, 2019 11:09 AM

page 2 — **PFPRV** PREVAIL POLE AND FIXTURE COMBO

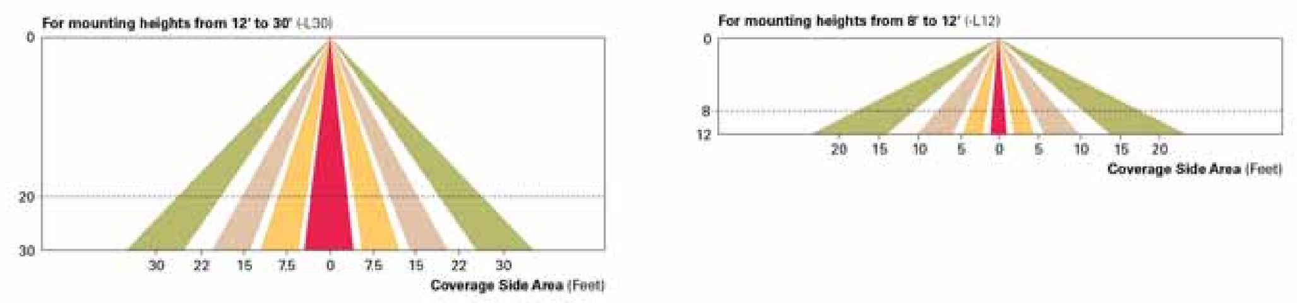
CONTROL OPTIONS

0-10V (D)
This fixture is offered standard with 0-10V dimming wire leads for use with a lighting control panel or other control method.

Photocontrol (PER and PER7)
Photocontrol receptacles provide a flexible solution to enable "dusk-to-dawn" lighting by sensing light levels. Advanced control systems compatible with NEMA 7-pin standards can be utilized with the PER7 receptacle.

Dimming Occupancy Sensor (MSP/DIM-LXX)
These sensors are factory installed in the luminaire housing. When a sensor for dimming operation (/DIM) is selected, the luminaire will dim down to approximately 50 percent power after five minutes of no activity detected. When activity is detected, the luminaire returns to full light output.

These occupancy sensors include an integral photocell that can be activated or inactivated with the programming remote / configuration tool for "dusk-to-dawn" control or "daylight harvesting". Note: For MSP sensors, the factory preset is ON (Enabled). The programming remote / tool is a wireless tool that can be utilized to change the dimming level, time delay, sensitivity and other parameters. A variety of sensor lenses are available to optimized the coverage pattern for mounting heights from 8'-30'.



POWER AND LUMENS

Light Engine		C15	C25	C40	C60
Nominal Power (Watts)		57W	87W	143W	163W
Input Current @ 120V (A)		0.43	0.80	1.09	1.32
Input Current @ 277V (A)		0.19	0.35	0.48	0.57
Type III	Lumens	7,111	13,183	17,144	20,050
	BUG Rating	B1-U0-G2	B2-U0-G3	B3-U0-G4	B3-U0-G4
Type IV	Lumens	7,088	13,140	17,087	19,984
	BUG Rating	B1-U0-G3	B2-U0-G4	B2-U0-G4	B3-U0-G5

LUMEN MAINTENANCE

Ambient Temperature	TM-21 Lumen Maintenance (50,000 Hours)	Theoretical L70 (Hours)
25°C	> 91.30%	> 194,000
40°C	> 87.59%	> 134,000

LUMEN MULTIPLIER

Ambient Temperature	Lumen Multiplier
10°C	1.02
15°C	1.01
25°C	1.00
40°C	0.99

ORDERING INFORMATION

Sample Number: PFPRV-1-C25-T3-15-N/AB

Series [1,2]	Number of Fixtures	Light Engine	Distribution	Pole Height	Maximum Wind Zone (MPH)	Options (Add as Suffix)	Accessories (Order Separately)
PFPRV=Prevail Pole and Fixture Combo	1=1 2=2 3=3 4=4	C15=(1 LED) 7,100 Nominal Lumens C25=(2 LED) 13,100 Nominal Lumens C40=(2 LED) 17,100 Nominal Lumens C60=(2 LED) 20,000 Nominal Lumens	T3=Type III T4=Type IV	15=15' 20=20' 25=25' 30=30'	Blank=80 9=90 0=100	N/AB=No Anchor Bolts (Used when ordered separately) HSS=House Side Shield [3] MSP/DIM-L12=Integrated Sensor for Dimming Operation, 8' - 12' Mounting Height MSP/DIM-L30=Integrated Sensor for Dimming Operation, 12' - 30' Mounting Height PER=NEMA 3PIN Twistlock Photocontrol Receptacle [4] PER7=NEMA 7PIN Twistlock Photocontrol Receptacle [4]	HS/VERD=House Side Shield [3]

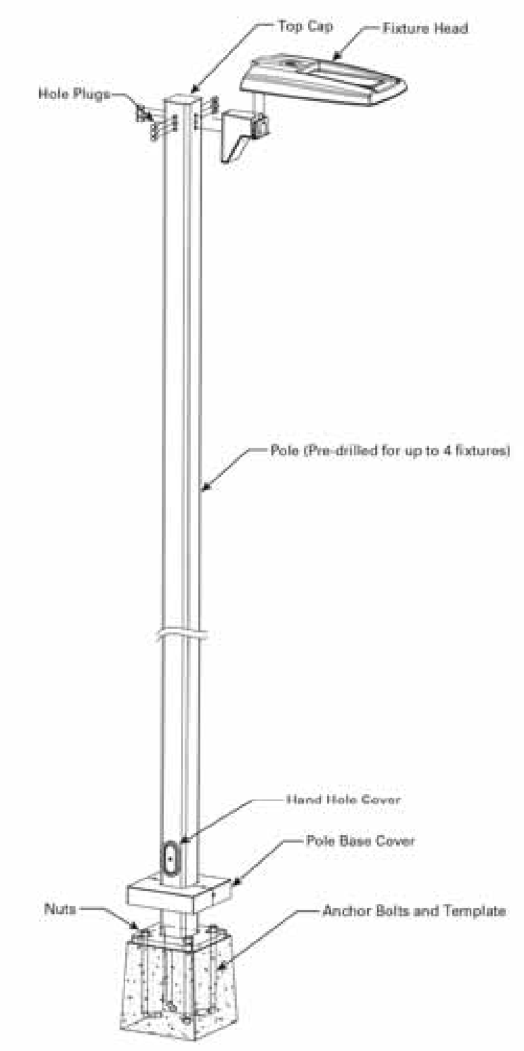
NOTES: 1 4000K CCT, standard bronze, 120-277V, 0-10V dimming. 2 Standard mount arm included with fixture. Supplied with straight steel shaft, anchor bolts, template, base cover and hardware. 3 HSS not available with C60 lumen package. Ordered as an option, it will come factory-installed. Ordered as a field-installable accessory, must order quantity one per optic/LED. 4 Not available with MSP options.

EATON Powering Business Worldwide — Eaton, 1121 Highway 74 South, Peachtree City, GA 30269, P: 770-486-4800, www.eaton.com/lighting — Specifications and dimensions subject to change without notice

TD500029EN
October 15, 2019 11:09 AM

page 3 — **PFPRV** PREVAIL POLE AND FIXTURE COMBO

PREVAIL POLE AND FIXTURE COMBO



INCLUDED POLE REFERENCE TABLES

1 Fixture (EPA= 0.75) Pole Height (Feet)	Wind Zone (MPH) 80	90	100
15	SSS4A15SFM4[1]		
20	SSS4A20SFM4[1]		
25	SSS4A25SFM4[1]		SSS5A25SFM4[2]
30	SSS5A30SFM4[2]		SSS5M30SFM4[2]

2 Fixtures (EPA= 1.50) Pole Height (Feet)	Wind Zone (MPH) 80	90	100
15	SSS4A15SFM4[1]		
20	SSS4A20SFM4[1]		
25	SSS4A25SFM4[1]		SSS5A25SFM4[2]
30	SSS5A30SFM4[2]		SSS5M30SFM4[2]

3 Fixtures (EPA= 2.25) Pole Height (Feet)	Wind Zone (MPH) 80	90	100
15	SSS4A15SFM4[1]		
20	SSS4A20SFM4[1]		
25	SSS4A25SFM4[1]		SSS5A25SFM4[2]
30	SSS5A30SFM4[2]		SSS5M30SFM4[2]

4 Fixtures (EPA= 3.00) Pole Height (Feet)	Wind Zone (MPH) 80	90	100
15	SSS4A15SFM4[1]		
20	SSS4A20SFM4[1]		
25	SSS4A25SFM4[1]		SSS5A25SFM4[2]
30	SSS5A30SFM4[2]		SSS5M30SFM4[2]

NOTES:
1. Uses hardware kit POLSSHDWC4FCHHP.
2. Uses hardware kit POLSSHDWC5FCHHP.

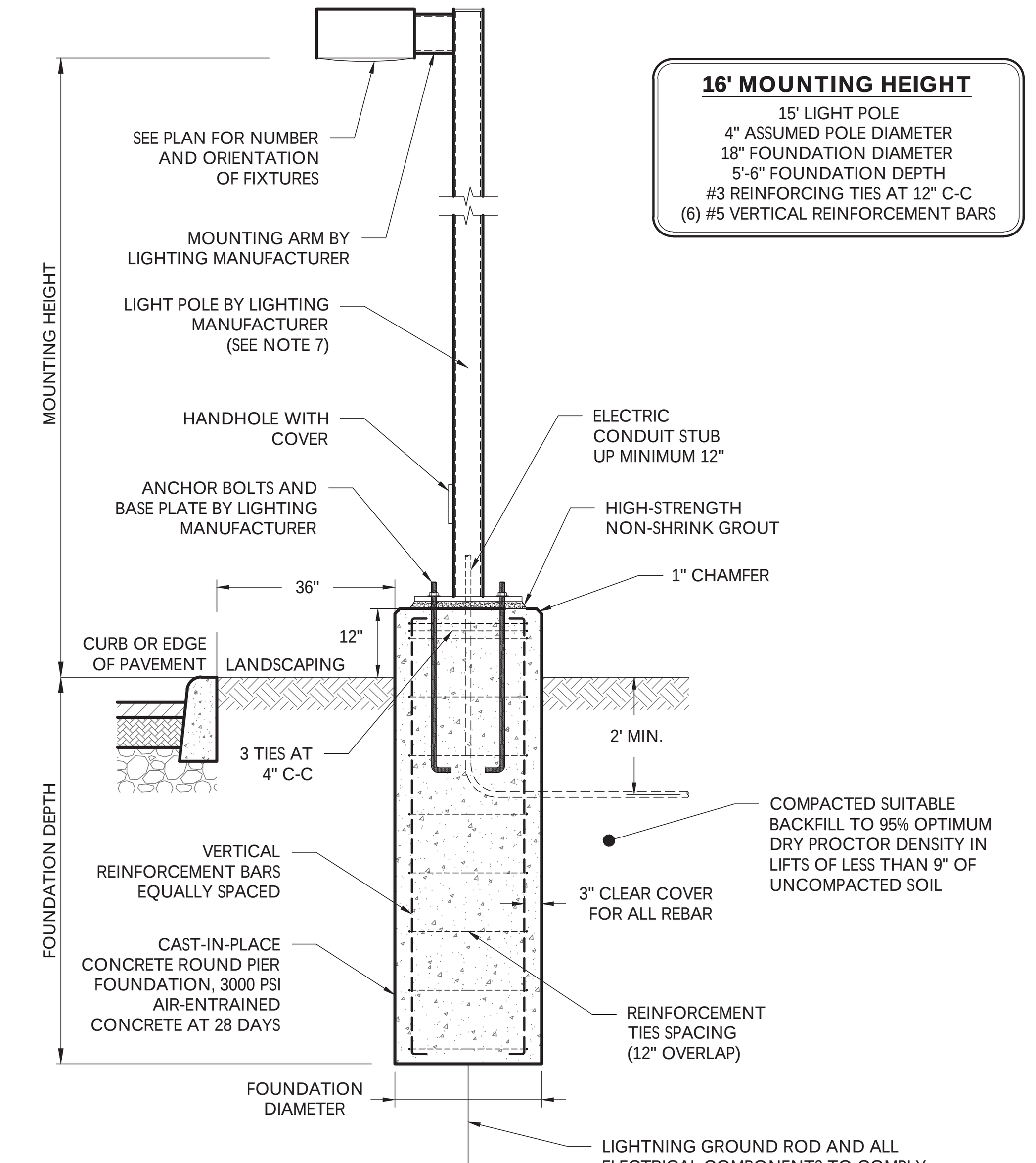
EATON Powering Business Worldwide — Eaton, 1121 Highway 74 South, Peachtree City, GA 30269, P: 770-486-4800, www.eaton.com/lighting — Specifications and dimensions subject to change without notice

TD500029EN
October 15, 2019 11:09 AM

SPECIFICATIONS FOR FIXTURES 'A' 'B' & 'C'

NOT TO SCALE

1



16 FT LIGHT POLE INSTALLATION DETAIL

NOT TO SCALE

NOTES:
1. MINIMUM SOIL BEARING PRESSURE OF 1500 PSF, SOIL FRICTION ANGLE OF 30 DEGREES, AND SOIL DRY UNIT WEIGHT OF 120 PCF SHALL BE CONFIRMED IN THE FIELD BY A QUALIFIED PROFESSIONAL.
2. CAST-IN-PLACE CONCRETE SHALL BE CONSOLIDATED USING VIBRATOR.
3. ALL REBAR TO BE NEW GRADE 60 STEEL.
4. PRE-CAST PIERS ACCEPTABLE UPON WRITTEN APPROVAL OF SHOP DRAWING BY ENGINEER.
5. CONCRETE TO BE INSTALLED A MINIMUM OF 7 DAYS PRIOR TO INSTALLING LIGHT POLE. POURED CONCRETE MIX REQUIRED TO OBTAIN 80% OF DESIGN STRENGTH PRIOR TO INSTALLING LIGHT POLE.
6. CONCRETE SHALL HAVE A MAXIMUM SLUMP OF 4" (WITHIN 1" TOLERANCE).
7. POLE SHALL BE RATED FOR 10 MPH HIGHER THAN MAXIMUM WIND SPEED 33FT ABOVE GROUND FOR THE AREA BASED ON ANSI/ASCE 7-93.
8. POUR TO BE TERMINATED AT A FORM.
9. WORK SHALL CONFORM TO ACI BEST PRACTICES FOR APPROPRIATE TEMPERATURE AND WEATHER CONDITIONS.
10. CONTRACTOR TO TEMPORARILY SUPPORT ADJACENT SOIL AND STRUCTURES DURING EXCAVATION IF REQUIRED.

2

DESCRIPTION

Lumark

The patented Lumark Crosstour™ MAXX LED wall pack series of luminaries provides low-profile architectural style with super bright, energy-efficient LEDs. The rugged die-cast aluminum construction, back box with secure lock hinges, stainless steel hardware along with a sealed and gasketed optical compartment make Crosstour impervious to contaminants. The Crosstour MAXX wall luminaire is ideal for wall/surface, inverted mount for facade/canopy illumination, perimeter and site lighting. Typical applications include pedestrian walkways, building entrances, multi-use facilities, industrial facilities, perimeter parking areas, storage facilities, institutions, schools and loading docks.

Catalog #		Type
Project		
Comments		Date
Prepared by		

SPECIFICATION FEATURES

Construction
Low-profile LED design with rugged one-piece, die-cast aluminum back box and hinged removable door. Matching housing styles incorporate both a full cutoff and refractive lens design. Full cutoff and refractive lens models are available in 58W, 81W and 102W. Patent pending secure lock hinge feature allows for safe and easy tool-less electrical connections with the supplied push-in connectors. Back box includes four 1/2" NPT threaded conduit entry points. The back box is secured by four lag bolts (supplied by others). External fin design extracts heat from the fixture surface. One-piece silicone gasket seals door and back box. Not recommended for car wash applications.

Optical
Silicone sealed optical LED chamber incorporates a custom engineered reflector providing high-efficiency illumination. Full cutoff models integrate an impact-resistant molded refractive prism optical lens assembly meeting requirements for Dark Sky compliance. Refractive lens models incorporate a molded lens assembly designed for maximum forward throw. Solid state LED Crosstour MAXX luminaires are thermally optimized with eight lumen packages in cool 5000K, neutral 4000K, or warm 3000K LED color temperature (CCT).

Electrical
LED driver is mounted to the die-cast aluminum housing for optimal heat sinking. LED thermal management system incorporates both conduction and natural convection to transfer heat rapidly away from the LED source. 58W, 81W and 102W models operate in -40°C to 40°C [-40°F to 104°F]. High ambient 50°C [122°F] models available in 58W and 81W models only. Crosstour MAXX luminaires maintain greater than 89% of initial light output after 72,000 hours of operation. Four half-inch NPT threaded conduit entry points allow for thru-branch wiring. Back box is an authorized electrical wiring compartment. Integral LED electronic driver incorporates surge protection. 120-277V 50/60Hz, 480V 60Hz, or 347V 60Hz electrical operation. 480V is compatible for use with 480V Wye systems only.

Emergency Egress
Optional integral cold weather battery emergency egress includes emergency operation test switch (available in 58W and 81W models only), an AC-ON indicator light and a premium extended rated sealed maintenance-free nickel-metal hydride battery pack. The separate emergency lighting LEDs are wired to provide redundant emergency lighting. Listed to UL Standard 924, Emergency Lighting.

Area and Site Pole Mounting
Optional extruded aluminum 6-1/2" arm features internal bolt guides for supplied twin support rods, allowing for easy positioning of the fixture during installation to pole. Supplied with round plate adapter plate. Optional tenon adapter fits 2-3/8" or 3-1/2" O.D. Tenon.

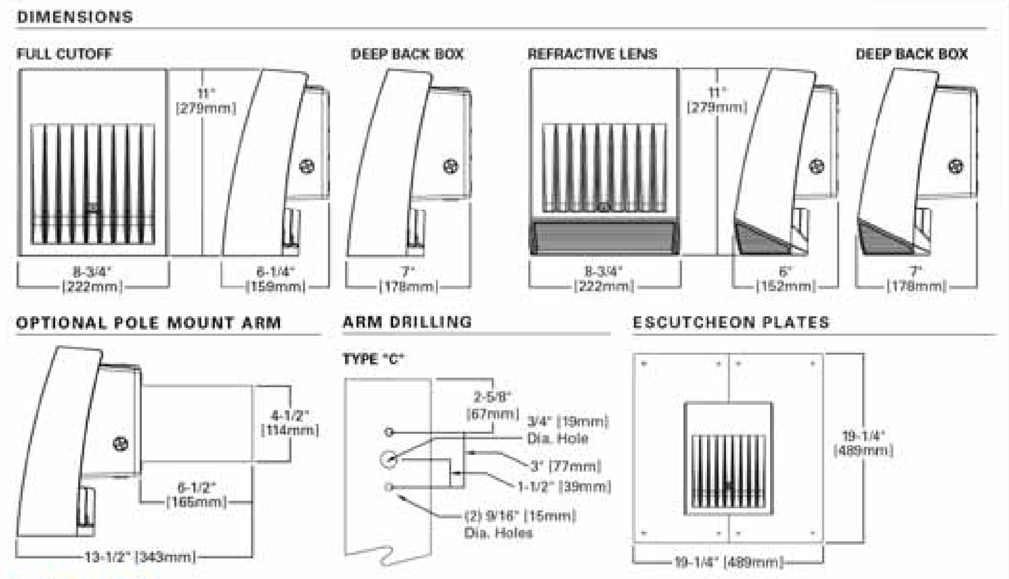
Finish
Crosstour MAXX is protected with a super TGIC carbon bronze or summit white polyester powder coat paint. Super TGIC powder coat paint finishes withstand extreme climate conditions while providing optimal color and gloss retention of the installed life.

Warranty
Five-year warranty.

XTOR CROSSTOUR MAXX LED

APPLICATIONS: WALL / SURFACE INVERTED SITE LIGHTING

DIMENSIONS



CERTIFICATION DATA
UL/cUL Wet Location Listed
LM79 / LM80 Compliant
ROHS Compliant
NOM Compliant Models
3G Vibration Tested
UL924 Listed (CBP Models)
IP66 Rated
DesignLights Consortium® Qualified*

TECHNICAL DATA
40°C Ambient Temperature
External Supply Wiring 90°C Minimum

EPA
Effective Projected Area (Sq. Ft.): XTOR6B, XTOR8B, XTOR12B=0.54
With Pole Mount Arm=0.98

SHIPPING DATA:
Approximate Net Weight: 12-15 lbs. [5.4-6.8 kgs.]

EATON Powering Business Worldwide

*www.designlights.org

TD514005EN
September 17, 2018 3:03 PM

page 2 — **XTOR** CROSSTOUR MAXX LED

POWER AND LUMENS BY FIXTURE MODEL

58W Series						
LED Information	XTOR6B	XTOR6BRL	XTOR6B-W	XTOR6BRL-W	XTOR6B-Y	XTOR6BRL-Y
Delivered Lumens	6,129	6,225	6,038	6,133	5,611	5,826
B.U.G. Rating	B1-U0-G1	B2-U4-G3	B1-U0-G1	B2-U4-G3	B1-U0-G1	B2-U4-G3
CCT (Kelvin)	5000K	5000K	4000K	4000K	3000K	3000K
CRI (Color Rendering Index)	70	70	70	70	70	70
Power Consumption (Watts)	58W	58W	58W	58W	58W	58W

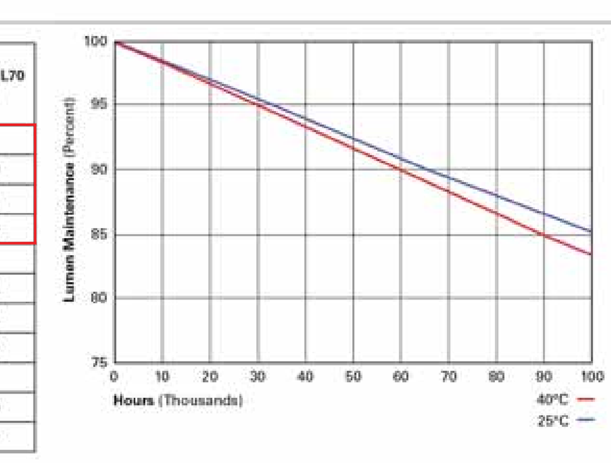
81W Series						
LED Information	XTOR8B	XTOR8BRL	XTOR8B-W	XTOR8BRL-W	XTOR8B-Y	XTOR8BRL-Y
Delivered Lumens	8,502	8,635	8,373	8,504	7,748	8,079
B.U.G. Rating	B2-U0-G1	B2-U4-G3	B2-U0-G1	B2-U4-G3	B2-U0-G1	B2-U4-G3
CCT (Kelvin)	5000K	5000K	4000K	4000K	3000K	3000K
CRI (Color Rendering Index)	70	70	70	70	70	70
Power Consumption (Watts)	81W	81W	81W	81W	81W	81W

102W Series						
LED Information	XTOR12B	XTOR12BRL	XTOR12B-W	XTOR12BRL-W	XTOR12B-Y	XTOR12BRL-Y
Delivered Lumens	12,728	13,458	12,539	13,258	11,861	12,595
B.U.G. Rating	B2-U0-G1	B2-U4-G3	B2-U0-G1	B2-U4-G3	B2-U0-G1	B2-U4-G3
CCT (Kelvin)	5000K	5000K	4000K	4000K	3000K	3000K
CRI (Color Rendering Index)	70	70	70	70	70	70
Power Consumption (Watts)	102W	102W	102W	102W	102W	102W

EGRESS Information	XTOR6B, XTOR8B and XTOR12B Full Cutoff CBP Egress LED	XTOR6B, XTOR8B and XTOR12B Refractive Lens CBP Egress LED
Delivered Lumens	509	468
B.U.G. Rating	N.A.	N.A.
CCT (Kelvin)	4000K	4000K
CRI (Color Rendering Index)	65	65
Power Consumption (Watts)	1.8W	1.8W

LUMEN MAINTENANCE

Ambient Temperature	TM-21 Lumen Maintenance (72,000 Hours)	Theoretical L70 (Hours)
XTOR6B Model		
25°C	> 90%	246,000
40°C	> 88%	217,000
50°C	> 88%	201,000
XTOR8B Model		
25°C	> 89%	219,000
40°C	> 87%	195,000
50°C	> 86%	181,000
XTOR12B Model		
25°C	> 89%	222,000
40°C	> 87%	198,000



CURRENT DRAW

Voltage	XTOR6B	XTOR8B	XTOR12B	XTOR6B-CBP (Fixture/Battery)	XTOR8B-CBP (Fixture/Battery)
120V	0.51	0.71	0.94	0.60/0.25	0.92/0.25
208V	0.25	0.39	0.52	--	--
240V	0.25	0.35	0.45	--	--
277V	0.22	0.31	0.39	0.36/0.21	0.50/0.21
347V	0.19	0.25	0.33		--
480V	0.14	0.19	0.24		--

EATON Powering Business Worldwide — Eaton, 1121 Highway 74 South, Peachtree City, GA 30269, P: 770-486-4800, www.eaton.com/lighting — Specifications and dimensions subject to change without notice.

TD514005EN
September 17, 2018 3:03 PM

page 3 — **XTOR** CROSSTOUR MAXX LED

ORDERING INFORMATION

Sample Number: XTOR6B-W-WT-PC1

Series [1]	LED Kelvin Color	Housing Color	Options (Add as Suffix)
Full Cutoff XTOR6B=58W XTOR8B=81W XTOR12B=102W Refractive Lens XTOR6BRL=58W XTOR8BRL=81W XTOR12BRL=102W	[Blank]=Bright White (Standard) 5000K W=Neutral, 4000K Y=Warm, 3000K	[Blank]=Carbon Bronze (Standard) WT=Summit White BK=Black BZ=Bronze AP=Grey GM=Graphite Metallic DP=Dark Platinum	347V=347V[2,3,4,5] 480V=480V[2,3,4,5,6] PC1=Photocontrol 120V[7] PC2=Photocontrol 208-277V[7,8] PMA=Pole Mount Arm (C Drilling) with Round Adapter[3,9] MS-L20=Motion Sensor for ON/OFF Operation[2,3,10,11] MS/DIM-L20=Motion Sensor for Dimming Operation[2,3,10,11,12,13,14] CBP=Cold Weather Battery Pack[2,3,15,16,17] HA=50°C High Ambient[17]

Accessories (Order Separately)

WG-XTORMX=Crosstour MAXX Wire Guard	VA1033-XX=Single Tenon Adapter for 2-3/8" O.D. Tenon[18]
PB120V=Field Installed 120V Photocontrol	VA1034-XX=2@180° Tenon Adapter for 2-3/8" O.D. Tenon[18]
PB277V BUTTON PC=Field Installed 208-277V Photocontrol[8]	VA1035-XX=3@120° Tenon Adapter for 2-3/8" O.D. Tenon[18]
VA1040-XX=Single Tenon Adapter for 3-1/2" O.D. Tenon[18]	VA1036-XX=4@90° Tenon Adapter for 2-3/8" O.D. Tenon[18]
VA1041-XX=2@180° Tenon Adapter for 3-1/2" O.D. Tenon[18]	VA1037-XX=2@90° Tenon Adapter for 2-3/8" O.D. Tenon[18]
VA1042-XX=3@120° Tenon Adapter for 3-1/2" O.D. Tenon[18]	VA1038-XX=3@90° Tenon Adapter for 2-3/8" O.D. Tenon[18]
VA1043-XX=4@90° Tenon Adapter for 3-1/2" O.D. Tenon[18]	VA1039-XX=2@120° Tenon Adapter for 2-3/8" O.D. Tenon[18]
VA1044-XX=2@90° Tenon Adapter for 3-1/2" O.D. Tenon[18]	EWP/XTORMX=Escutcheon Wall Plate, Carbon Bronze
VA1045-XX=3@90° Tenon Adapter for 3-1/2" O.D. Tenon[18]	EWP/XTORMX-WT=Escutcheon Wall Plate, Summit White
VA1046-XX=2@120° Tenon Adapter for 3-1/2" O.D. Tenon[18]	FSIR-100=Wireless Configuration Tool for Occupancy Sensor[14]

NOTES:
1. DesignLights Consortium® Qualified and classified for both DLC Standard and DLC Premium, refer to www.designlights.org for details.
2. Not available with HA option.
3. Deep back box is standard for 347V, 480V, CBP, PMA, MS-L20 and MS/DIM-L20.
4. Not available with CBP option.
5. Thru-branch wiring not available with HA option or with 347V.
6. Only for use with 480V Wye systems. Per NEC, not for use with ungrounded systems, impedance grounded systems or corner grounded systems (commonly known as Three Phase Three Wire Delta, Three Phase High Leg Delta and Three Phase Corner Grounded Delta systems).
7. Not available with MS-L20 and MS/DIM-L20 options.
8. Use PC2 with 347V or 480V option for photocontrol. Factory wired to 208-277V lead.
9. Customer is responsible for engineering analysis to confirm pole and fixture compatibility for all applications. Refer to our white paper WP513001EN for additional support information.
10. For use in downlight orientation only. Optimal coverage at mounting heights of 9'-20'.
11. 120V thru 277V only.
12. Factory set to 50% power reduction after 15 minutes of inactivity. Dimming driver included.
13. Includes integral photo sensor.
14. The FSIR-100 configuration tool is required to adjust parameters including high and low modes, sensitivity, time delay, cutoff, and more. Consult your lighting representative at Eaton for more information.
15. 120V or 277V operation only.
16. Operating temperatures -20°C to 25°C.
17. Not available in XTOR12B or XTOR12BRL models.
18. Replace XX with housing color.

STOCK ORDERING INFORMATION

58W Series	81W Series	102W Series
Full Cutoff		
XTOR6B=58W, 5000K, Carbon Bronze	XTOR8B=81W, 5000K, Carbon Bronze	XTOR12B=102W, 5000K, Carbon Bronze
XTOR6B-PC1=58W, 5000K, 120V PC, Carbon Bronze	XTOR8B-PC1=81W, 5000K, 120V PC, Carbon Bronze	
XTOR6B-WT= 58W, 5000K, Summit White	XTOR8B-WT=81W, 5000K, Summit White	
XTOR6B-W=58W, 4000K, Carbon Bronze	XTOR8B-PC2=81W, 5000K, 208-277V PC, Carbon Bronze	
XTOR6B-PMA= 58W, 5000K, Pole Mount Arm, Carbon Bronze	XTOR8B-PMA=81W, 5000K, Pole Mount Arm, Carbon Bronze	
XTOR6B-PC2= 58W, 5000K, 208-277V PC, Carbon Bronze	XTOR8B-347V=81W, 5000K, Carbon Bronze, 347V	
Refractive Lens		
XTOR6BRL=58W, 5000K, Refractive Lens, Carbon Bronze	XTOR8BRL=81W, 5000K, Refractive Lens, Carbon Bronze	XTOR12BRL=102W, 5000K, Refractive Lens, Carbon Bronze
XTOR6BRL-PC1=58W, 5000K, Refractive Lens, 120V PC, Carbon Bronze	XTOR8BRL-PC1=81W, 5000K, Refractive Lens, 120V PC, Carbon Bronze	XTOR12BRL-W=102W, 4000K, Refractive Lens, Carbon Bronze
XTOR6BRL-WT=58W, 5000K, Refractive Lens, Summit White	XTOR8BRL-WT=81W, 5000K, Refractive Lens, Summit White	XTOR12BRL-347V=102W, 5000K, Refractive Lens, Carbon Bronze, 347V
XTOR6BRL-W=58W, 4000K, Refractive Lens, Carbon Bronze	XTOR8BRL-PC2=81W, 5000K, Refractive Lens, 208-277V PC, Carbon Bronze	
XTOR6BRL-PMA=58W, 5000K, Refractive Lens, Pole Mount Arm, Carbon Bronze	XTOR8BRL-PMA=81W, 5000K, Refractive Lens, Pole Mount Arm, Carbon Bronze	
XTOR6BRL-PC2=58W, 5000K, Refractive Lens, 208-277V PC, Carbon Bronze	XTOR8BRL-W=81W, 4000K, Refractive Lens, Carbon Bronze	
XTOR6BRL-347V=58W, 5000K, Refractive Lens, Carbon Bronze, 347V	XTOR8BRL-347V = 81W, 5000K, Refractive Lens, Carbon Bronze, 347V	

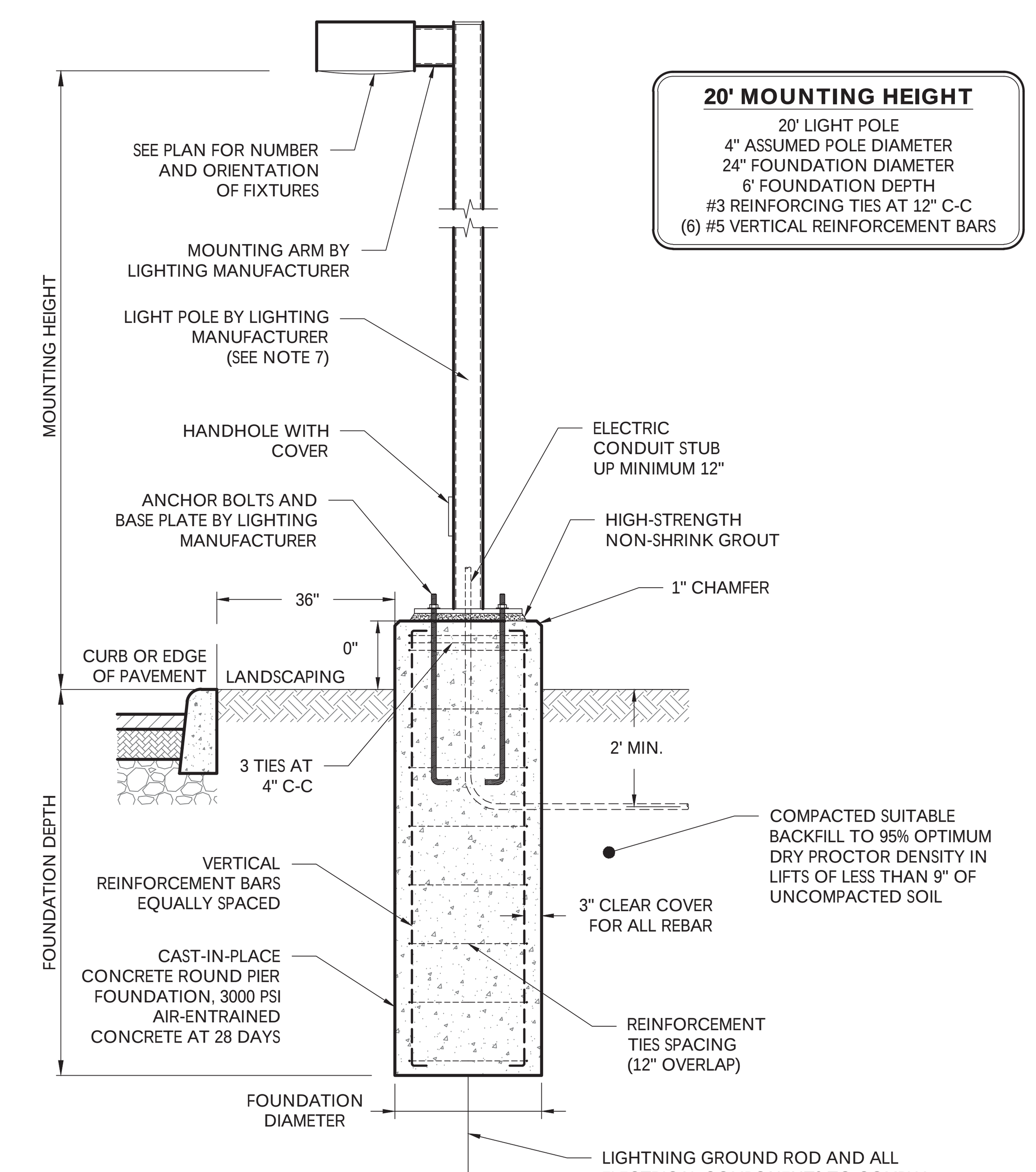
EATON Powering Business Worldwide — Eaton, 1121 Highway 74 South, Peachtree City, GA 30269, P: 770-486-4800, www.eaton.com/lighting — Specifications and dimensions subject to change without notice.

TD514005EN
September 17, 2018 3:03 PM

SPECIFICATIONS FOR FIXTURE 'D'

NOT TO SCALE

3



20 FT LIGHT POLE INSTALLATION DETAIL

NOT TO SCALE

NOTES:
1. MINIMUM SOIL BEARING PRESSURE OF 1500 PSF, SOIL FRICTION ANGLE OF 30 DEGREES, AND SOIL DRY UNIT WEIGHT OF 120 PCF SHALL BE CONFIRMED IN THE FIELD BY A QUALIFIED PROFESSIONAL.
2. CAST-IN-PLACE CONCRETE SHALL BE CONSOLIDATED USING VIBRATOR.
3. ALL REBAR TO BE NEW GRADE 60 STEEL.
4. PRE-CAST PIERS ACCEPTABLE UPON WRITTEN APPROVAL OF SHOP DRAWING BY ENGINEER.
5. CONCRETE TO BE INSTALLED A MINIMUM OF 7 DAYS PRIOR TO INSTALLING LIGHT POLE. POURED CONCRETE MIX REQUIRED TO OBTAIN 80% OF DESIGN STRENGTH PRIOR TO INSTALLING LIGHT POLE.
6. CONCRETE SHALL HAVE A MAXIMUM SLUMP OF 4" (WITHIN 1" TOLERANCE).
7. POLE SHALL BE RATED FOR 10 MPH HIGHER THAN MAXIMUM WIND SPEED 33FT ABOVE GROUND FOR THE AREA BASED ON ANSI/ASCE 7-93.
8. POUR TO BE TERMINATED AT A FORM.
9. WORK SHALL CONFORM TO ACI BEST PRACTICES FOR APPROPRIATE TEMPERATURE AND WEATHER CONDITIONS.
10. CONTRACTOR TO TEMPORARILY SUPPORT ADJACENT SOIL AND STRUCTURES DURING EXCAVATION IF REQUIRED.

4

ISSUE	DATE	BY	DESCRIPTION
5	06/22/2023	EM	RESUBMISSION FOR SITE PLAN APPROVAL
4	05/05/2023	EM	RESUBMISSION FOR SITE PLAN APPROVAL
3	04/11/2023	EM	FOR CLIENT REVIEW
2	03/16/2023	EM	FOR CLIENT REVIEW
1	02/14/2023	EM/JRC	SUBMISSION FOR SITE PLAN APPROVAL

NOT APPROVED FOR CONSTRUCTION

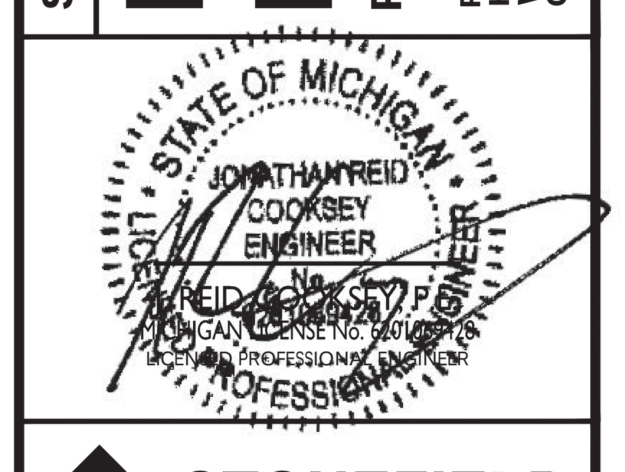
STONEFIELD engineering & design
Detroit, MI · New York, NY · Rutherford, NJ
Princeton, NJ · Tampa, FL · Boston, MA
www.stonefieldeng.com
607 Shelby Suite 200, Detroit, MI 48226
Phone 248.247.1115

SITE DEVELOPMENT PLANS

HIGHLAND ROAD MEIJER OUTLOT B

PROPOSED COMMERCIAL DEVELOPMENT

PARCEL ID: 12-20-276-035
HIGHLAND ROAD (M-59) - OUTLOT B
WHITE LAKE TOWNSHIP
OAKLAND COUNTY, MICHIGAN 48383



STONEFIELD engineering & design

SCALE: AS SHOWN | PROJECT ID: DET-220180

TITLE: CONSTRUCTION DETAILS

DRAWING: C-12

V:\DET\2022\DET-220180-ALRIG-6001 HIGHLAND ROAD, CHARTER TOWNSHIP OF WHITE LAKE, MI\CADD\PLOTS\DP-09-13-DETL.DWG

Project: 6001 Highland Rd.
Location: White Lake, MI

CONTECH ENGINEERED SOLUTIONS

Purpose: To calculate the first flush runoff flow rate (WQF) over a given site area. In this situation the WQV to be analyzed is the runoff produced by the first 1" of rainfall.

Reference: United States Department of Agriculture Natural Resources Conservation Service TR-55 Manual.

Given:

Structure Name	A (acres)	A (miles²)	Runoff Coefficient	Percent Imp. (%)*	t_c (min)	t_c (hr)
WQ-1	1.63	0.00255	0.58	46.67	15.0	0.250

* Assumes runoff coefficient of 0.3 for pervious areas and 0.9 for impervious areas.

Procedure: The Water Quality Flow (WQF) is calculated using the Water Quality Volume (WQV). This WQV, converted to watershed inches, is substituted for the runoff depth (Q) in the Natural Resources Conservation Service (formerly Soil Conservation Service), TR-55 Graphical Peak Discharge Method.

1. Compute WQV in watershed inches using the following equation:

$$WQV = P * R$$

where: WQV = water quality volume (watershed inches)
P = design precipitation (inches)
R = volumetric runoff coefficient = 0.05 + 0.009(I)
I = percent impervious cover

Structure Name	Percent Imp. (%)	R	P (in)	WQV (in)	WQV (cf)
WQ-1	46.67	0.470	1	0.750	4438

2. Compute the NRCS Runoff Curve Number (CN) using the following equation, or graphically using Figure 2-1 from TR-55 (USDA, 1986):

$$CN = 1000 / [10+5P+10Q-10(Q^2+1.25QP)^{1/2}]$$

where: CN = Runoff Curve Number
P = design precipitation (inches)
Q = runoff depth (watershed inches)

Structure Name	Q (in)	CN
WQ-1	0.750	97.54

First Flush Calculation (Page 1 of 2)
3/15/2023

Project: 6001 Highland Rd.
Location: White Lake, MI

CONTECH ENGINEERED SOLUTIONS

3. Using computed CN, read initial abstraction (I_a) from Table 4-1 in Chapter 4 of TR-55; compute I_a/P, interpolating when appropriate.

Structure Name	I_a (in)	I_a/P
WQ-1	0.041	0.041

4. Compute the time of concentration (t_c) in hours and the drainage area in square miles. A minimum t_c of 0.167 hours (10 minutes) should be used.

Structure Name	t_c (hr)	A (miles²)
WQ-1	0.250	0.00255

5. Read the unit peak discharge (q_u) from Exhibit 4-II in Chapter 4 of TR-55 for appropriate t_c for type II rainfall distribution.

Structure Name	t_c (hr)	I_a/P	q_u (csm/in)
WQ-1	0.250	0.041	731

6. Substituting WQV (watershed inches) for runoff depth (Q), compute the water quality flow (WQF) from the following equation:

$$WQF = (q_u)*(A)*(Q)$$

where: WQF = water quality flow (cfs)
q_u = unit peak discharge (cfs/mi²/inch)
A = drainage area (mi²)
Q = runoff depth (watershed inches)

Structure Name	q_u (csm/in)	A (miles²)	Q (in)	WQF (cfs)
WQ-1	731	0.00255	0.750	1.40

First Flush Calculation (Page 2 of 2)
3/15/2023

Estimated Net Annual Solids Load Reduction
Based on the Rational Rainfall Method

CONTECH ENGINEERED SOLUTIONS — CASCADE separator™

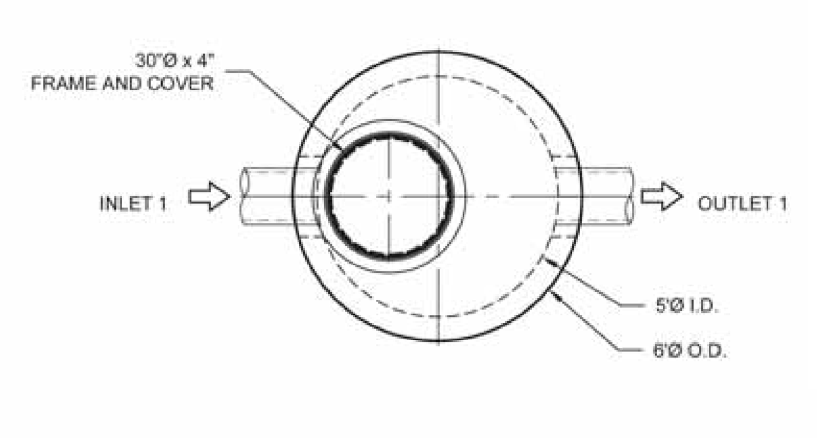
Kril Sports Complex
Pinckney
WQU

AREA 1.63 acres
WEIGHTED C 0.58
TC 15.00 minutes
CASCADE MODEL CS-4
PARTICLE SIZE 110 microns
RAINFALL STATION 78

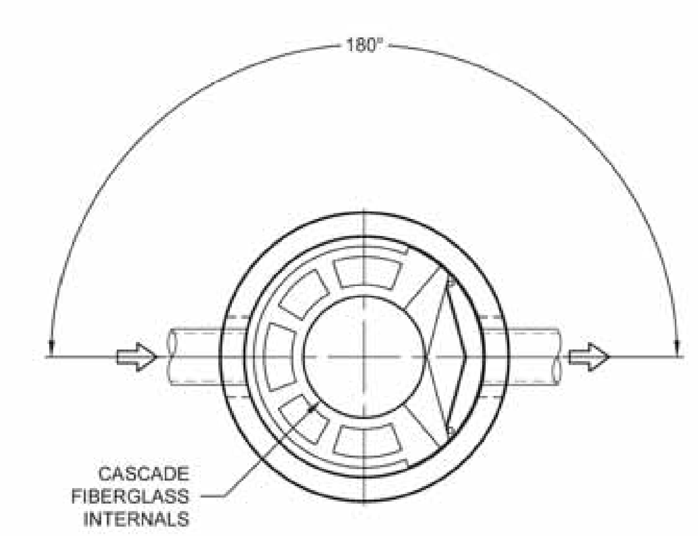
Rainfall Intensity[1] (in/hr)	Percent Rainfall Volume[1]	Cumulative Rainfall Volume	% Rainfall Volume Treated	Total Flowrate (cfs)	Removal Efficiency (%)	Incremental Removal (%)
0.02	13.13%	13.1%	13.1%	0.02	100.0	13.1
0.04	11.36%	24.5%	11.4%	0.04	100.0	11.4
0.06	10.08%	34.6%	10.1%	0.06	100.0	10.1
0.08	7.49%	42.1%	7.5%	0.08	100.0	7.5
0.10	7.01%	49.1%	7.0%	0.09	100.0	7.0
0.12	5.37%	54.4%	5.4%	0.11	100.0	5.4
0.14	4.73%	59.2%	4.7%	0.13	100.0	4.7
0.16	4.13%	63.3%	4.1%	0.15	100.0	4.1
0.18	3.53%	66.8%	3.5%	0.17	100.0	3.5
0.20	2.99%	69.8%	3.0%	0.19	100.0	3.0
0.25	5.50%	75.3%	5.5%	0.24	100.0	5.5
0.30	4.47%	79.8%	4.5%	0.28	100.0	4.5
0.35	3.85%	83.6%	3.9%	0.33	100.0	3.9
0.40	2.16%	85.8%	2.2%	0.38	99.2	2.1
0.45	2.09%	87.9%	2.1%	0.43	97.6	2.0
0.50	1.31%	89.2%	1.3%	0.47	96.0	1.3
0.75	5.07%	94.3%	5.1%	0.71	88.1	4.5
1.00	2.58%	96.9%	2.6%	0.95	80.2	2.1
1.50	2.50%	99.4%	2.5%	1.42	64.3	1.6
2.00	0.51%	99.9%	0.5%	1.89	48.4	0.2
2.54	0.15%	100.0%	0.1%	2.40	37.3	0.1
						97.5

Removal Efficiency Adjustment[2] = 6.5%
Predicted % Annual Rainfall Treated = 93.5%
Predicted Net Annual Load Removal Efficiency = 91.0%

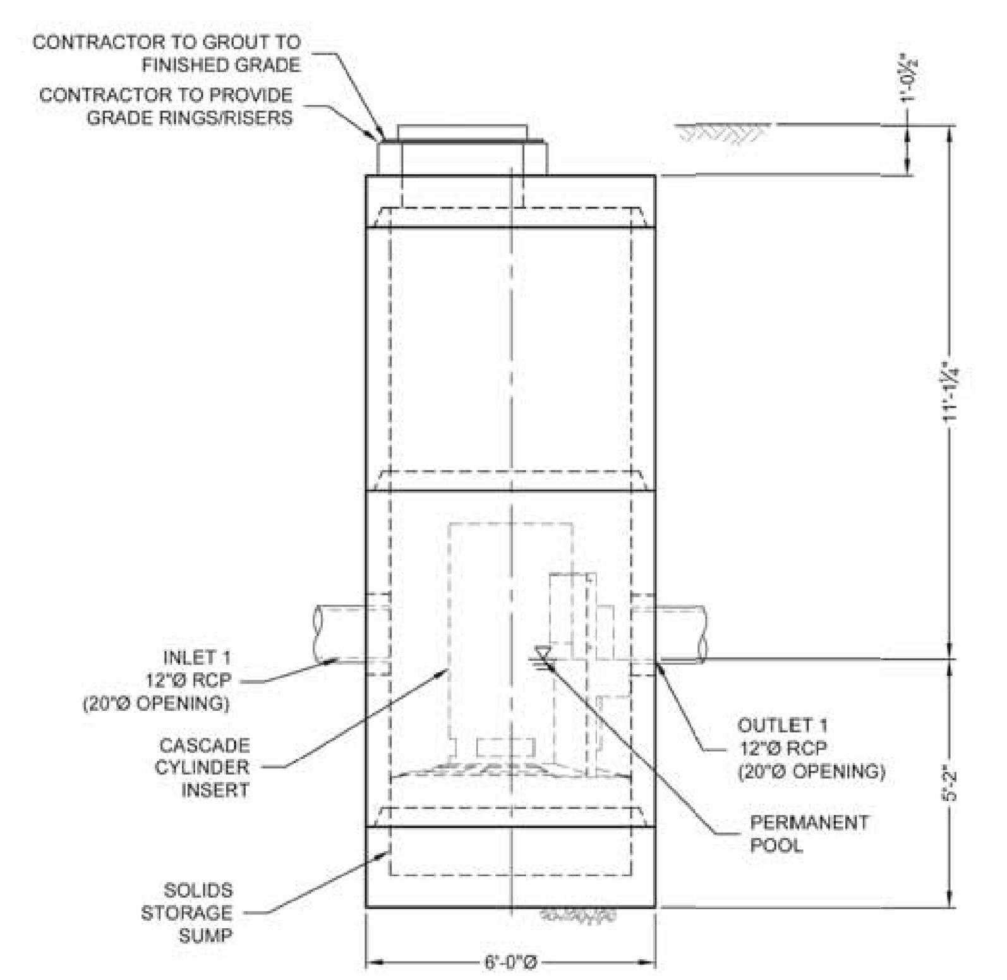
1 - Based on 5.5 years of 15 minute precipitation data form NCDC station 2102 at Detroit City Airport in Detroit, MI
2 - Reduction due to use of 60-minute data for a site that has a time of concentration less than 30-minutes.



PLAN VIEW
(INTERNALS NOT SHOWN)



SECTION FOR PIPE ORIENTATION
(TOP SLAB NOT SHOWN)



ELEVATION VIEW

MATERIAL LIST (PROVIDED BY CONTECH)

COUNT	DESCRIPTION	INSTALLED BY
1	CS-5 FIBERGLASS CYLINDER INSERT, STD.	CONTECH
4	CS-5 ALUMINUM INSTALLATION BRACKET	CONTECH
1	SEALANT FOR JOINTS	CONTRACTOR
1	30"Ø x 4" FRAME AND COVER, EJ#41600483, OR EQUIV.	CONTRACTOR

GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. FOR FABRICATION DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH REPRESENTATIVE. www.ContechES.com
3. CASCADE SEPARATOR WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING. CONTRACTOR TO CONFIRM STRUCTURE MEETS REQUIREMENTS OF PROJECT.
4. STRUCTURE SHALL MEET AASHTO HS-20 LOAD RATING, ASSUMING EARTH COVER OF 0' - 2', AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 AND BE CAST WITH THE CONTECH LOGO.
5. CASCADE SEPARATOR STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C-478 AND AASHTO LOAD FACTOR DESIGN METHOD.

INSTALLATION NOTES
A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CASCADE SEPARATOR MANHOLE STRUCTURE.
C. CONTRACTOR TO ADD JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS, AND ASSEMBLE STRUCTURE.
D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT PIPES. MATCH PIPE INVERTS WITH ELEVATIONS SHOWN. ALL PIPE CENTERLINES TO MATCH PIPE OPENING CENTERLINES.
E. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

STRUCTURE WEIGHT
APPROXIMATE HEAVIEST PICK = 9500 LBS. OF 4 PIECES

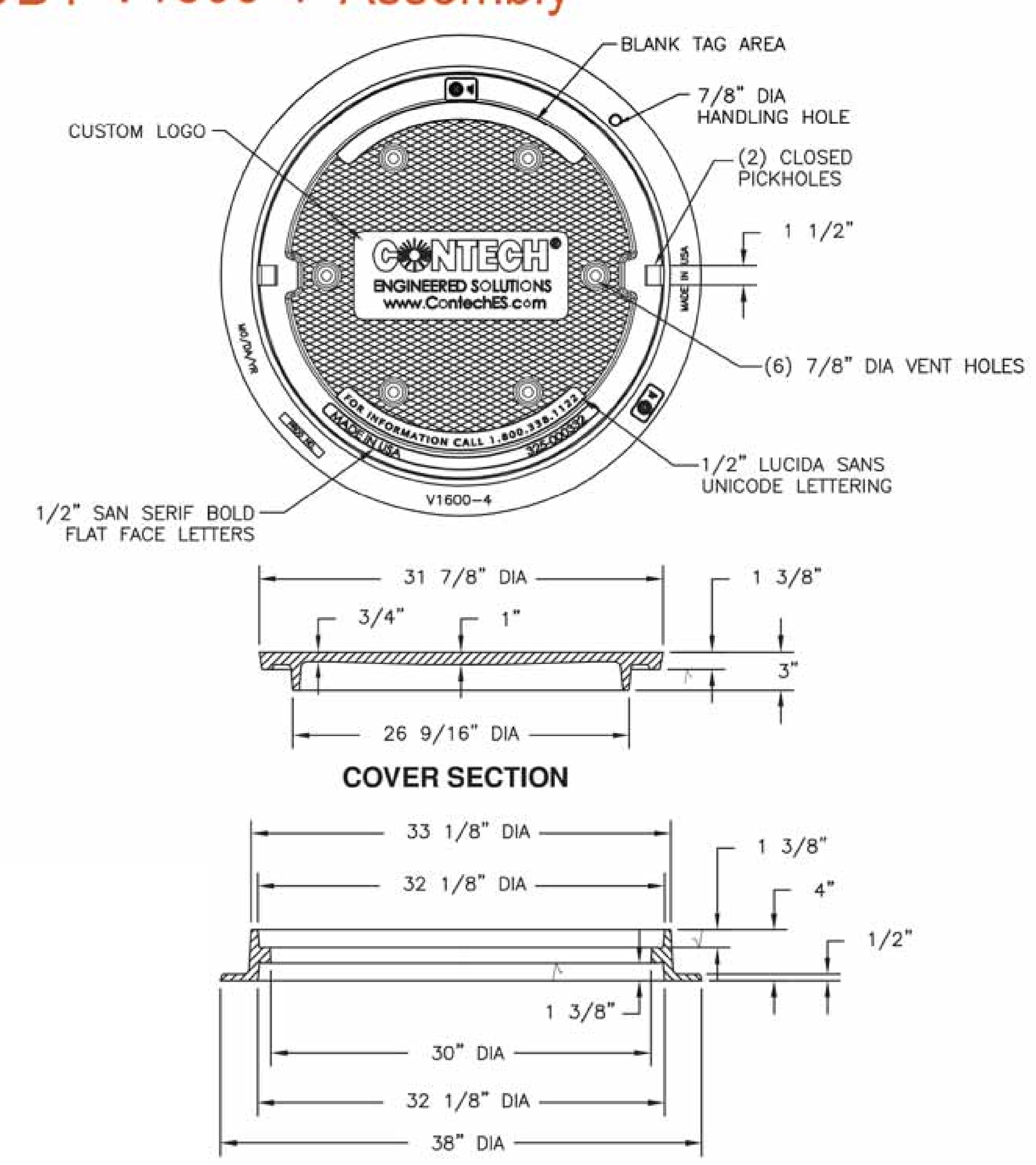
MAXIMUM FOOTPRINT = 6'Ø

CONTECH **PROPOSAL** DRAWING

CS-5 - 747328-10
HIGHLAND ROAD MEIJER
WHITE LAKE, MI
for SYSTEM: WQ-1

CONTECH ENGINEERED SOLUTIONS LLC — CASCADE separator
DATE: 03/15/23 · DESIGNED: CJG · DRAWN: CJG · CHECKED: MSB · APPROVED: MSB · PROJECT No.: 747328 · SEQUENCE No.: 10 · SHEET 1 OF 1
NCI LAYOUT 1A

1810B4 V1600-4 Assembly



Product Number
41600483

Design Features
-Materials
Cover
Gray Iron (CL35B)
Frame
Gray Iron (CL35B)

-Design Load
Heavy Duty
-Open Area
n/a
-Coating
Undipped
- √ Designates Machined Surface

Certification
- ASTM A48
- H25
-
-Country of Origin: USA

Major Components
00180783
41600410

Drawing Revision
5/9/2007 Designer: SMH
2/14/2022 Revised By: DAE

Disclaimer
Weights (lbs./kg) dimensions (inches/mm) and drawings provided for your guidance. We reserve the right to modify specifications without prior notice.

Contact
800 626 4653
ejco.com

WATER QUALITY UNIT CALCULATIONS & SPECIFICATIONS

NOT TO SCALE

ISSUE	DATE	BY	DESCRIPTION
5	06/22/2023	EM	RESUBMISSION FOR SITE PLAN APPROVAL
4	05/05/2023	EM	RESUBMISSION FOR SITE PLAN APPROVAL
3	04/11/2023	EM	FOR CLIENT REVIEW
2	03/16/2023	EM	FOR CLIENT REVIEW
1	02/14/2023	EM/JRC	SUBMISSION FOR SITE PLAN APPROVAL

NOT APPROVED FOR CONSTRUCTION

STONEFIELD engineering & design
Detroit, MI · New York, NY · Rutherford, NJ
Princeton, NJ · Tampa, FL · Boston, MA
www.stonefieldeng.com
607 Shelby Suite 200, Detroit, MI 48226
Phone 248.247.1115

SITE DEVELOPMENT PLANS
HIGHLAND ROAD MEIJER OUTLOT B
PROPOSED COMMERCIAL DEVELOPMENT
PARCEL ID: 12-20-276-035
HIGHLAND ROAD (M-59) - OUTLOT B
WHITE LAKE TOWNSHIP
OAKLAND COUNTY, MICHIGAN 48383

STATE OF MICHIGAN — JONATHAN REID COOKSEY — ENGINEER — PROFESSIONAL

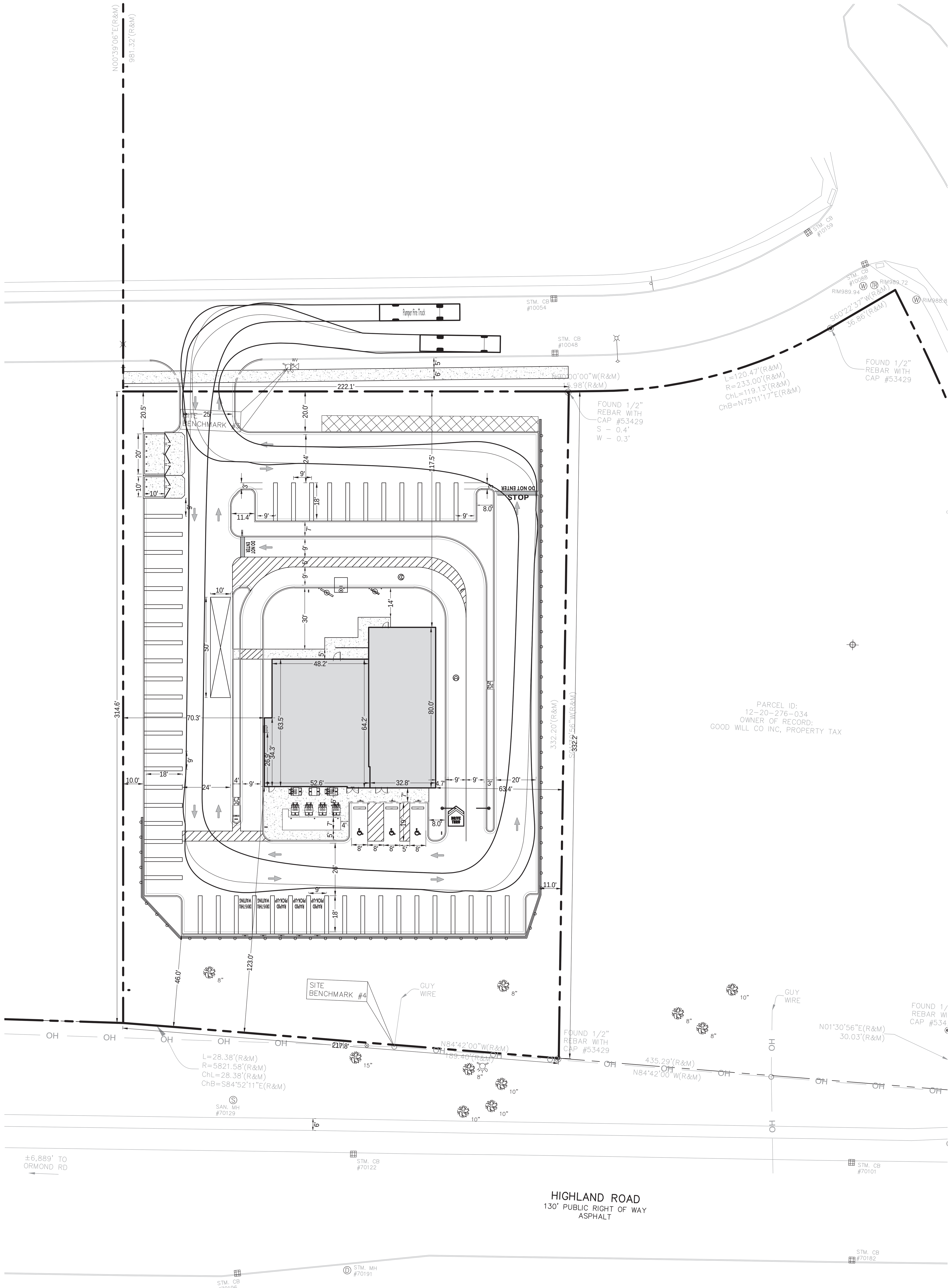
STONEFIELD engineering & design

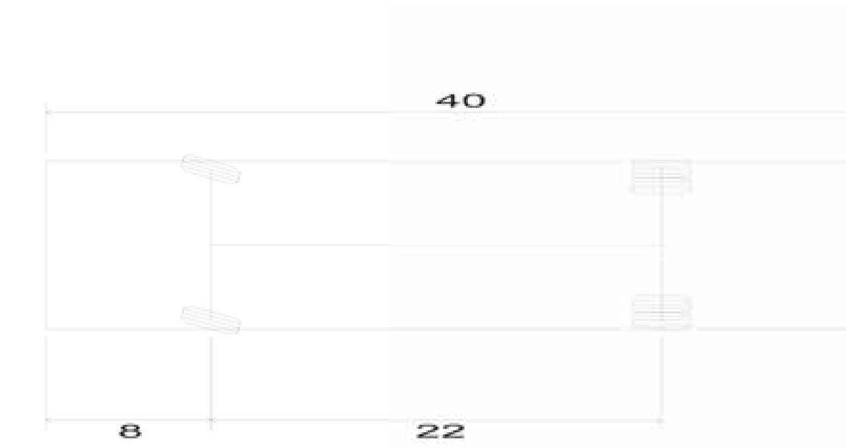
SCALE: AS SHOWN | PROJECT ID: DET-220180

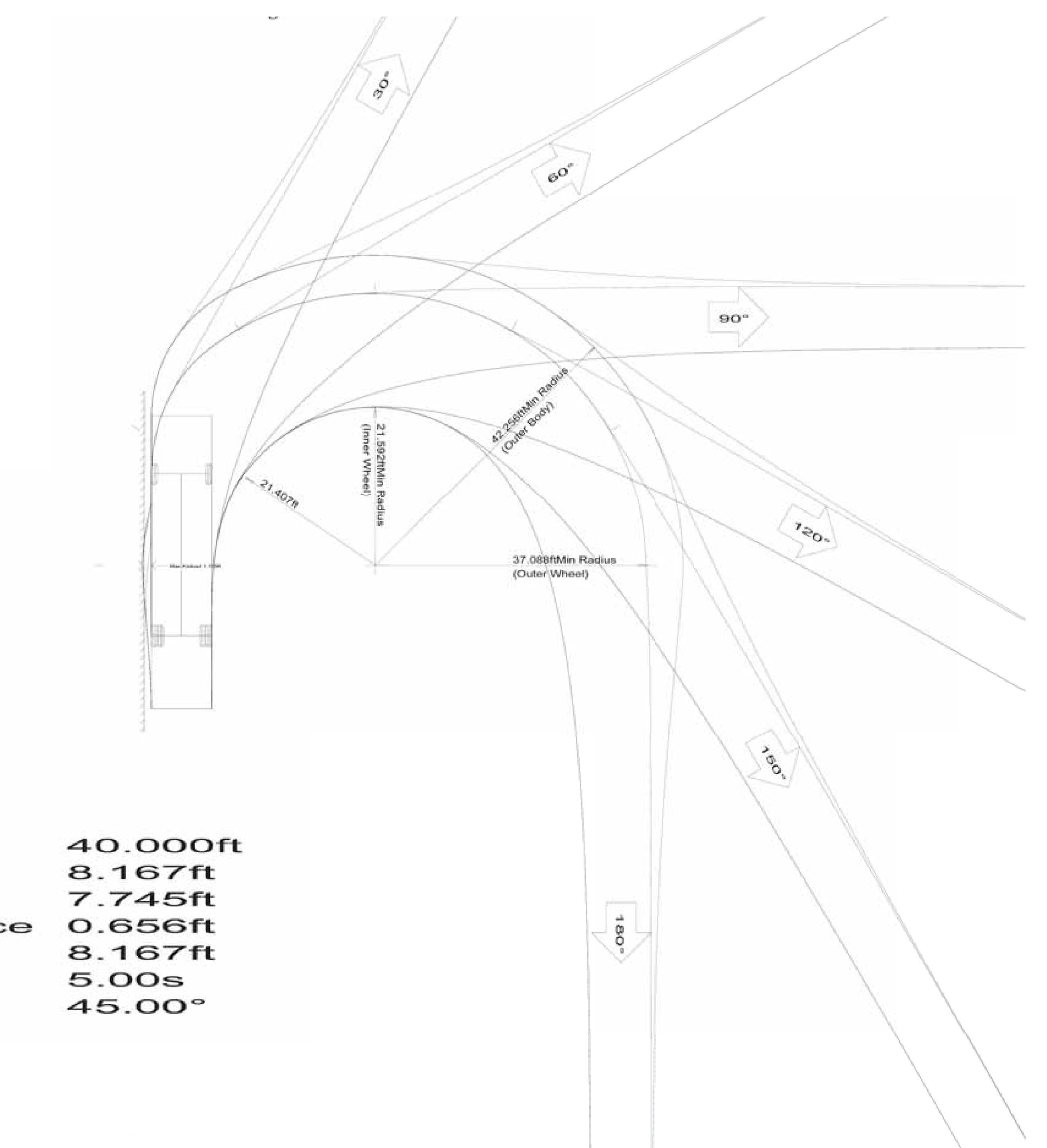
TITLE: CONSTRUCTION DETAILS

DRAWING: C-13

1

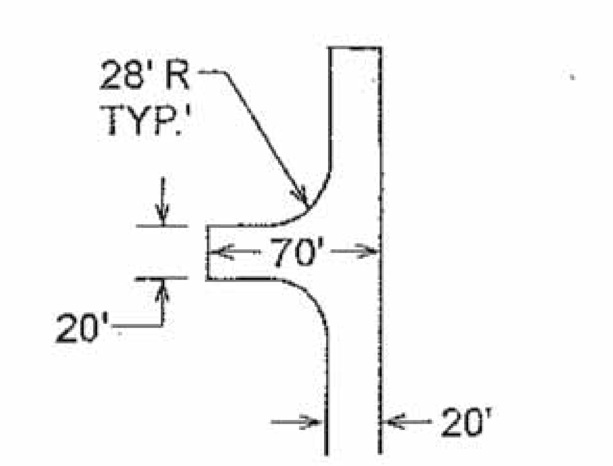






Pumper Fire Truck	
Overall Length	40.000ft
Overall Width	8.167ft
Overall Body Height	7.745ft
Min Body Ground Clearance	0.656ft
Track Width	8.167ft
Lock-to-lock time	5.00s
Max Wheel Angle	45.00°

**PUMPER FIRE TRUCK
VECHICLE TURNING DATA**



ACCEPTABLE ALTERNATIVE
TO 120' HAMMERHEAD

**INTERNATIONAL FIRE CODE
ALTERNATIVE HAMMERHEAD**

GRAPHIC SCALE IN FEET
1" = 30'

ISSUE	DATE	BY	DESCRIPTION
5	06/22/2023	EM	RESUBMISSION FOR SITE PLAN APPROVAL
4	05/05/2023	EM	RESUBMISSION FOR SITE PLAN APPROVAL
3	04/11/2023	EM	FOR CLIENT REVIEW
2	03/16/2023	EM	FOR CLIENT REVIEW
1	02/14/2023	EM/RC	SUBMISSION FOR SITE PLAN APPROVAL

NOT APPROVED FOR CONSTRUCTION

STONEFIELD
engineering & design
Detroit, MI · New York, NY · Rutherford, NJ
Princeton, NJ · Tampa, FL · Boston, MA
www.stonefieldeng.com
607 Shelby Suite 200, Detroit, MI 48226
Phone 248.247.1115

SITE DEVELOPMENT PLANS

HIGHLAND ROAD
MEIJER OUTLOT B

PROPOSED COMMERCIAL DEVELOPMENT

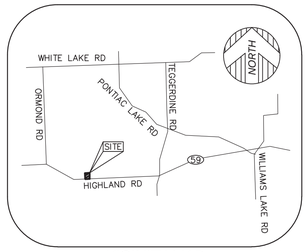
PARCEL ID: 12-20-276-035
HIGHLAND ROAD (M-59) - OUTLOT B
WHITE LAKE TOWNSHIP
OAKLAND COUNTY, MICHIGAN 48383

STONEFIELD
engineering & design

SCALE: 1" = 30' | PROJECT ID: DET-220180

TITLE:
FIRE TRUCK TURNING EXHIBIT

DRAWING:
C-14



VICINITY MAP
(NOT TO SCALE)

PARKING
NO MARKED PARKING ON SITE.

PARCEL AREA
PARENT PARCEL (12-20-276-035)
561,271± SQUARE FEET = 12.885± ACRES
PARCEL A
70,752± SQUARE FEET = 1.624± ACRES

BASIS OF BEARING
NORTH 00°31'08" EAST, BEING THE NORTH & SOUTH 1/4 LINE OF SECTION 20, AS DESCRIBED.

BENCHMARK
BENCHMARK #1
TURN ARROW ON HYDRANT, FIRST HYDRANT ALONG WEST SIDE OF BOGIE LAKE ROAD NORTH OF HIGHLAND ROAD.
ELEVATION = 982.44' (NAVD 88)

BENCHMARK #2
TURN ARROW ON HYDRANT, FIRST HYDRANT ALONG NORTH SIDE OF HIGHLAND ROAD EAST OF BOGIE LAKE ROAD (NOT SHOWN; OFFSITE).
ELEVATION = 985.56' (NAVD 88)

BENCHMARK #3
ARROW ON TOP OF HYDRANT ON SOUTH SIDE OF ACCESS ROAD TO MEIJER.
ELEVATION = 1004.57' (NAVD 88)

BENCHMARK #4
MAG NAIL IN NORTH FACE OF UTILITY POLE ON SOUTH SIDE OF SITE.
ELEVATION = 977.89' (NAVD 88)

SURVEYOR'S NOTES
1. THE UNDERGROUND UTILITIES SHOWN HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION AND EXISTING DRAWINGS. THE SURVEYOR MAKES NO GUARANTEES THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE. THE SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES OTHER THAN THE STRUCTURE INVENTORY SHOWN HEREON.

2. THERE IS NO OBSERVED EVIDENCE OF CURRENT EARTH MOVING WORK, BUILDING CONSTRUCTION OR BUILDING ADDITIONS.

3. THE SURVEYOR IS UNAWARE OF ANY PROPOSED CHANGES IN STREET RIGHT OF WAY LINES. THERE IS NO OBSERVED EVIDENCE OF RECENT STREET OR SIDEWALK CONSTRUCTION OR REPAIRS.

MANHOLE SCHEDULE

NUM	TYPE	RIM (FT)	SIZE (IN)	DIR	INV ELEV (FT)	NUM	TYPE	RIM (FT)	SIZE (IN)	DIR	INV ELEV (FT)
10048	STORM CB	998.70	15	N	985.95	70046	STORM CB	979.24	18	W	974.04
		998.70	15	S	986.10			979.24	18	E	973.89
10054	STORM CB	997.53	15	S	984.93	70095	SANITARY MH	980.49	18	NE	951.09
		997.53	18	NE	984.78			980.49	18	W	951.29
10088	STORM CB	864.24	12	NW	859.94	70101	STORM CB	979.37	12	S	975.77
10113	STORM CB	987.10	12	E	982.55	70122	STORM CB	975.46	12	S	971.46
10159	STORM CB	989.73	12	SE	983.48	70129	SANITARY MH	975.17	18	E	951.07
		861.11	18	SW	854.86			975.17	18	W	951.17
		861.11	18	NW	854.81	70182	STORM CB	980.28	12	N	975.03
		861.11	21	NE	PER PLAN			980.28	12	S	975.08
70013	SANITARY MH	980.27	8	N	970.67	70191	STORM MH	976.75	12	S	971.15
		980.27	8	SE	970.47			976.75	12	N	971.20
70017	STORM CB	979.08	18	W	973.68	70196	STORM CB	975.22	12	SE	971.22
		979.08	24	N	973.53	70211	STORM BEEHIVE	978.23	18	E	974.53
		979.08	12	NE	974.18						

ZONING REGULATIONS
PB- PLANNED BUSINESS DISTRICT

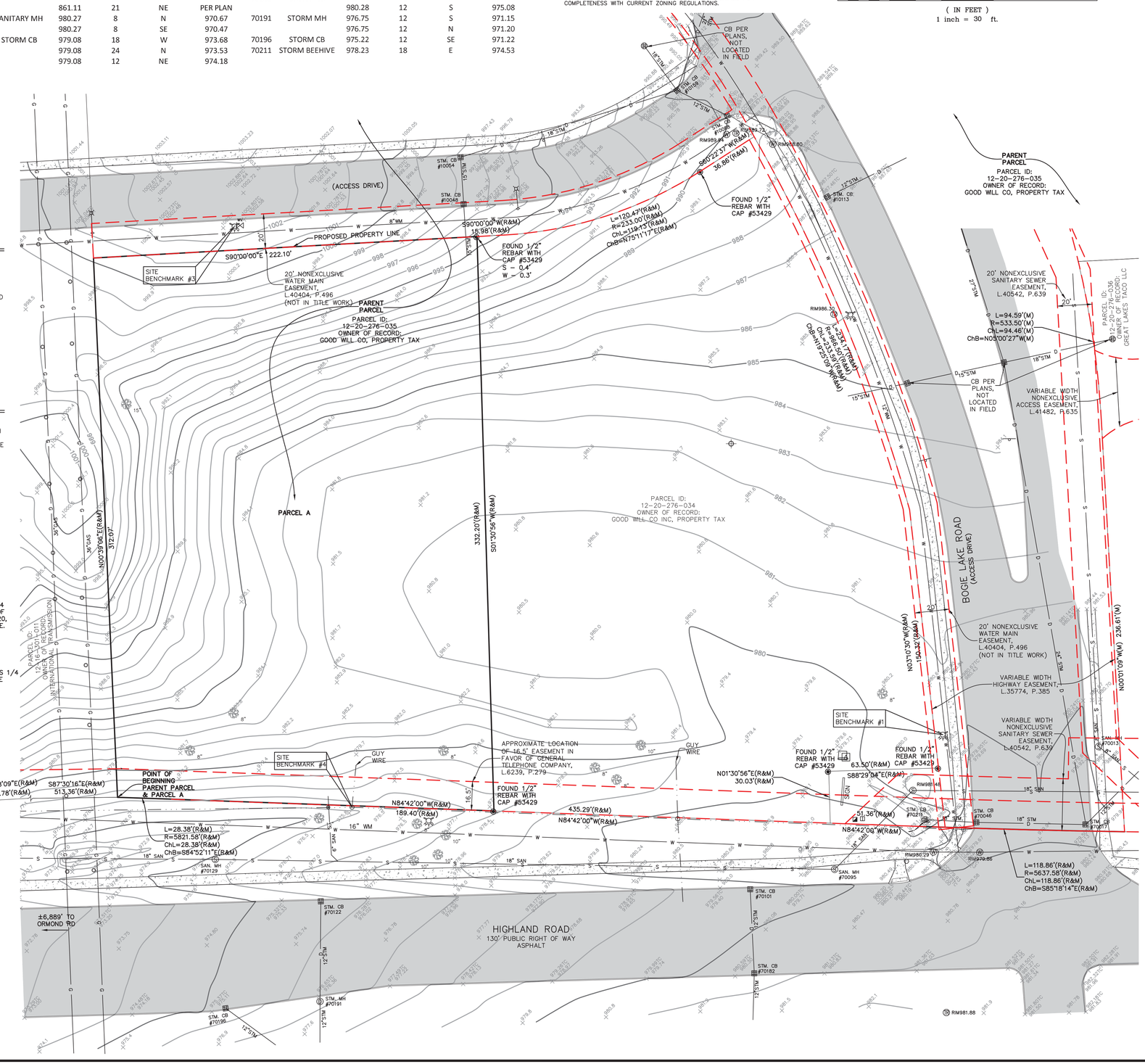
*MINIMUM LOT AREA – 10 ACRES
*MINIMUM LOT WIDTH – TO BE DETERMINED BY PLANNING COMMISSION

*MINIMUM LOT COVERAGE – GOVERNED BY PARKING, LOADING, LANDSCAPING, ETC.

*REQUIRED MINIMUM SETBACK –
FRONT – 50 FEET
SIDE – TO BE DETERMINED BY PLANNING COMMISSION
REAR – TO BE DETERMINED BY PLANNING COMMISSION

*MAXIMUM HEIGHT – 35 FEET/2 STORIES

NOTE: ALL ZONING INFORMATION IS TAKEN FROM THE TOWNSHIP OF WHITE LAKE WEBSITE. ALL ZONING INFORMATION MUST BE VERIFIED FOR COMPLETENESS WITH CURRENT ZONING REGULATIONS.



LEGEND
- FOUND MONUMENT (AS NOTED)
- FOUND SECTION CORNER (AS NOTED)
- (R&M) RECORD AND MEASURED DIMENSION
- (R) RECORD DIMENSION
- (M) MEASURED DIMENSION
- +0.00 GROUND ELEVATION
- ELECTRIC PANEL
- TRANSFORMER
- UTILITY POLE
- GAS LINE MARKER
- LIGHT POLE WITH STREET LAMP
- CABLE TV RISER
- TRAFFIC SIGNAL
- TRAFFIC SIGNAL MANHOLE
- SANITARY MANHOLE
- ROUND CATCH BASIN
- SQUARE CATCH BASIN
- STORM DRAIN MANHOLE
- FIRE HYDRANT
- WATER GATE MANHOLE
- WATER VALVE
- WELL
- LIGHTPOST/LAMP POST
- SINGLE POST SIGN
- SOIL BORING
- DECIDUOUS TREE (AS NOTED)
- PARCEL BOUNDARY LINE
- ADJOINER PARCEL LINE
- EASEMENT (AS NOTED)
- CONCRETE CURB
- EDGE OF CONCRETE (CONC.)
- FENCE (AS NOTED)
- WALL (AS NOTED)
- OVERHEAD UTILITY LINE
- E ELECTRIC LINE
- G GAS LINE
- S SANITARY LINE
- D STORM LINE
- W WATER LINE
- MINOR CONTOUR LINE
- MAJOR CONTOUR LINE
- ASPHALT
- CONCRETE

PROPERTY DESCRIPTION
LAND SITUATED IN THE STATE OF MICHIGAN, COUNTY OF OAKLAND, TOWNSHIP OF WHITE LAKE,

PARCEL A:
A PART OF THE NORTHEAST 1/4 OF SECTION 20, TOWN 3 NORTH, RANGE 8 EAST, BEGINNING AT A POINT DISTANT NORTH 00 DEG. 31' 08" EAST 198.91 FEET AND NORTH 89 DEG. 58' 09" EAST 519.78 FEET AND SOUTH 87 DEG. 30' 16" EAST 513.36 FEET FROM THE CENTER OF SECTION 20; THENCE NORTH 00 DEG. 39' 06" EAST 312.07 FEET; THENCE SOUTH 90 DEG. 00' 00" EAST (DUE EAST) 222.10 FEET; THENCE SOUTH 01 DEG. 30' 56" WEST 332.20 FEET; THENCE NORTH 84 DEG. 42' 00" WEST 189.40 FEET; THENCE ALONG A CURVE TO THE LEFT, RADIUS 5821.58 FEET, CHORD BEARING NORTH 84 DEG. 52' 11" WEST, 28.38 FEET, A DISTANCE OF 28.38 FEET TO THE POINT OF BEGINNING. (ACCORDING TO THE SURVEY BY KEM-TEC PROFESSIONAL ENGINEERING, SURVEYING & ENVIRONMENTAL SERVICES, PROJECT NO. 22-02031 DATED AUGUST 25, 2022 AND LAST REVISED MARCH 31, 2023)

TOGETHER WITH NONEXCLUSIVE DRIVEWAY ACCESS EASEMENT AGREEMENT BY AND BETWEEN AND MEIJER, INC. AND WHITE LAKE RETAIL MANAGEMENT II LLC DATED _____, 2023 AND RECORDED _____, 2015 IN LIBER _____, PAGE _____.

TITLE REPORT NOTE
ONLY THOSE EXCEPTIONS CONTAINED WITHIN THE FIDELITY NATIONAL TITLE INSURANCE COMPANY COMMITMENT No. GLT2300196, DATED MAY 1, 2023, AND RELISTED BELOW WERE CONSIDERED FOR THIS SURVEY. NO OTHER RECORDS RESEARCH WAS PERFORMED BY THE CERTIFYING SURVEYOR.

10. AN OIL AND GAS LEASE FOR THE TERM THEREIN PROVIDED WITH CERTAIN COVENANTS, CONDITIONS AND PROVISIONS, TOGETHER WITH EASEMENTS, IF ANY, AS SET FORTH THEREIN. DATED: NOVEMBER 23, 1965 LESSOR: WOOD CRAFT HOMES, INC., A MICHIGAN CORPORATION LESSEE: BUCKEYE PIPE LINE COMPANY RECORDING DATE: JANUARY 12, 1966 RECORDING NO: LIBER 4835, PAGE 150 (A 20' EASEMENT CENTERED ON THE PIPELINE WITHIN THE PART OF PARCEL ID 12-20-276-035 AS SURVEYED; EXACT LOCATION OF SAID PIPELINE IS UNKNOWN)

12. RIGHT(S) OF WAY AND/OR EASEMENT(S) AND RIGHTS INCIDENTAL THERETO AS SET FORTH IN A DOCUMENT: IN FAVOR OF: GENERAL TELEPHONE COMPANY OF MICHIGAN, A MICHIGAN CORPORATION RECORDING NO: LIBER 6239, PAGE 278 (AS SHOWN)

14. ROAD AND GRADING EASEMENT RECORDING DATE: JANUARY 24, 2003 RECORDING NO.: LIBER 27727, PAGE 92 (DOCUMENT NOT PROVIDED AT TIME OF SURVEY)

15. MEMORANDUM OF DEVELOPMENT AGREEMENT EXECUTED BY: TOWNSHIP OF WHITE LAKE AND GOOD WILL CO, INC, A MICHIGAN CORPORATION RECORDING DATE: JULY 28, 2003 RECORDING NO: LIBER 30116, PAGE 166 MEMORANDUM OF AMENDED DEVELOPMENT AGREEMENT RECORDING DATE: OCTOBER 8, 2015 RECORDING NO: LIBER 48677, PAGE 714 (SEE DOCUMENT FOR TERMS AND CONDITIONS)

22. TOGETHER WITH NONEXCLUSIVE DRIVEWAY ACCESS EASEMENT AGREEMENT BY AND BETWEEN AND MEIJER, INC AND WHITE LAKE RETAIL MANAGEMENT II LLC DATED _____, 2023 AND RECORDED _____, 2015 IN LIBER _____, PAGE _____.

FLOOD NOTE
SUBJECT PARCEL LIES WITHIN:

OTHER AREA (ZONE X): AREAS DETERMINED TO BE OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOODPLAIN.

AS SHOWN ON FLOOD INSURANCE RATE MAP: MAP NUMBER 26125C0319F, DATED 9/29/2006, PUBLISHED BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY.

ADDITIONAL SURVEYOR'S NOTES
1. SUBJECT PROPERTY ABUTS HIGHLAND ROAD, BUT HAS NO DIRECT VEHICULAR ACCESS TO HIGHLAND ROAD, A PUBLIC RIGHT OF WAY. ACCESS TO SUBJECT PROPERTY VIA VARIABLE WIDTH HIGHWAY EASEMENT (BOGIE LAKE ROAD ACCESS DRIVE) LIBER 35774 PAGE 385, AND VIA ACCESS DRIVE (NO CURRENT EASEMENT AT TIME OF SURVEY).

2. UTILITIES (WATER, GAS, ELECTRIC, TELEPHONE, SEWER, AND STORM DRAINAGE) ARE AVAILABLE AND SERVICE THE PROPERTY AND ALL UTILITY LINES ENTER THE PREMISES THROUGH ADJOINING PUBLIC STREETS OR THROUGH APPURTENANT EASEMENTS WHICH ARE SHOWN ON THE SURVEY.

3. THERE IS NO OBSERVED EVIDENCE OF SITE USE AS A SOLID WASTE DUMP, SUMP OR SANITARY LANDFILL.

SURVEYOR'S CERTIFICATION
TO ALRIG USA; WHITE LAKE RETAIL MANAGEMENT II LLC; AND FIDELITY NATIONAL TITLE INSURANCE COMPANY:

THIS IS TO CERTIFY THAT THIS MAP OR PLAT AND THE SURVEY ON WHICH IT IS BASED WERE MADE IN ACCORDANCE WITH THE 2021 MINIMUM STANDARD DETAIL REQUIREMENTS FOR ALTA/NSPS LAND TITLE SURVEYS, JOINTLY ESTABLISHED AND ADOPTED BY ALTA AND NSPS, AND INCLUDES ITEMS 1, 2, 3, 4, 5, 6A, 7A, 8, 9, 11A, 11B, 13, 14, 16, 17, AND 18 OF TABLE A, THEREOF. THE FIELD WORK WAS COMPLETED ON 08/01/22.

DATE OF PLAT OR MAP: 08/10/22

ANTHONY T. SYCKO, JR., P.S.
PROFESSIONAL SURVEYOR
MICHIGAN LICENSE NO. 47976
22556 GRATIOT AVE., EASTPOINTE, MI 48021
TSycko@kemtec-survey.com

STATE OF MICHIGAN
ANTHONY T. SYCKO, JR
PROFESSIONAL SURVEYOR
No. 4001047976
LICENSED PROFESSIONAL SURVEYOR

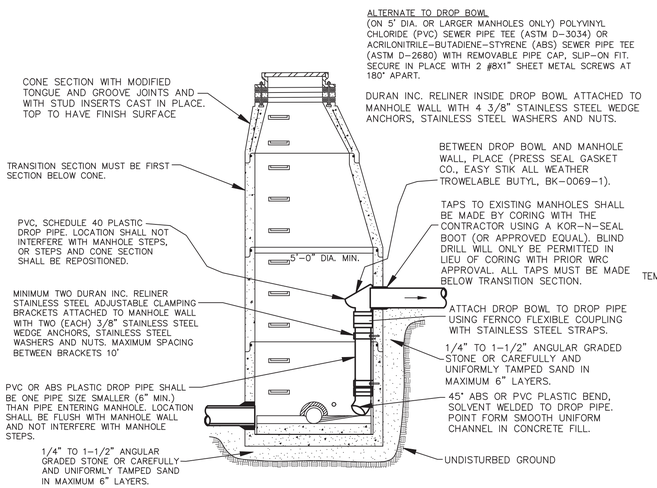
KEM-TEC
PROFESSIONAL ENGINEERING, SURVEYING & ENVIRONMENTAL SERVICES
A GROUP OF COMPANIES
Eastpointe (800) 266.7722
Ann Arbor (734) 994.0888
Detroit (313) 755.0677
Grand Blanc (888) 694.0001
www.kemtecgroupofcompanies.com

ALTA / NSPS LAND TITLE SURVEY
PREPARED FOR: ALRIG USA
6001 HIGHLAND RD, WHITE LAKE, MICHIGAN,
PART OF SECTION 20,
TOWN 3 NORTH, RANGE 8 EAST

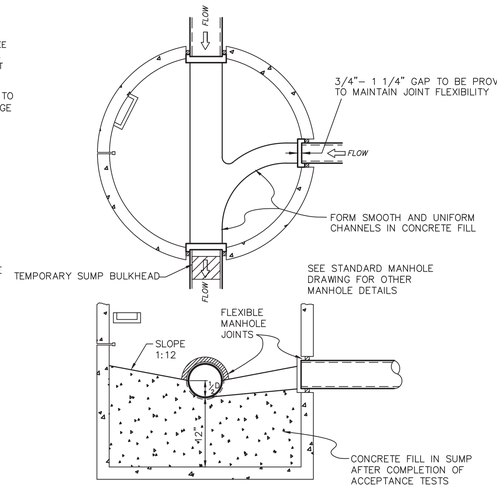
REVISION	DATE	DESCRIPTION
6	06/22/23	MRJ REVISED STORM
5	05/22/23	MRJ REVISED TITLE WORK & PER REVIEW COMMENTS
4	03-31-23	JDM ADDED CERTIFICATION PARTIES
3	03-29-23	JDM ADDED PARCEL A DESCRIPTION
2	03-20-23	MRJ ADDED PROPOSED PARCEL
1	08-25-22	JV RECEIVED TITLE WORK
REVISION	DATE	BY

DRAWN BY: JO 08/05/22
CHECKED BY: ATS 08/10/22
DATE: AUGUST 10, 2022
PROJECT NO.: 22-02031
SCALE: 1" = 30'

1
1 OF 1 SHEETS

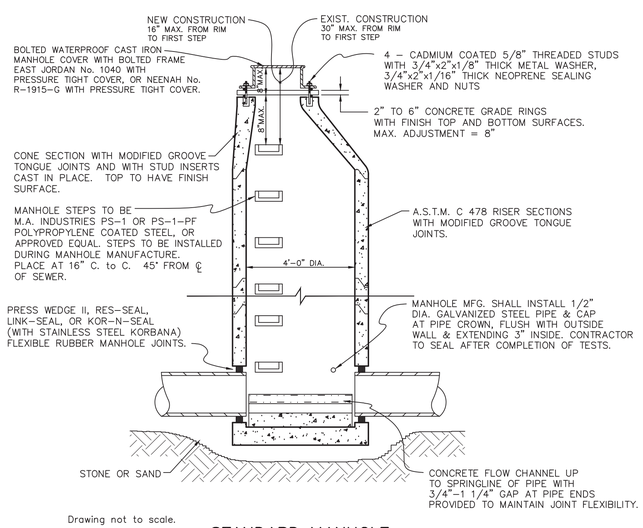


INTERIOR DROP CONNECTION



Drawing not to scale.

SUMP MANHOLE FOR
TESTING, CLEANING, AND DEWATERING



Drawing not to scale.

STANDARD MANHOLE
ON 8" THROUGH 24" DIAMETER SEWERS

SANITARY SEWER CONSTRUCTION NOTES

1. All construction shall conform to the current standards and specifications of the local unit of government and the Oakland County Water Resources Commissioner (OCWRC). All sanitary sewer construction shall have full time inspection supervised by a professional engineer provided by or caused to be provided by the local unit of government.

2. At all connections to Oakland County Water Resources Commissioner's sewers or extensions, and before start of construction, the Contractor must obtain a Sewer Inspection Permit issued by the OCWRC. Gravity sewer permit charges are $250.00 for each connection plus $25.00 for each manhole constructed. Pressure sewer permit charges are $250.00 per 2460 L.F. of force main with a minimum permit fee of $250.00. Failure to pass any test segment will result in an additional charge to the Contractor for each retest, in accordance with the above price schedule. The Contractor shall also have posted with the OCWRC a $5,000.00 surety bond and $500.00 cash deposit. The Contractor shall notify the local unit of government and the OCWRC (248-858-1110) 24 hours prior to the beginning of any construction. Final acceptance tests must be witnessed by County personnel and must be scheduled by Municipality or it's consultant in advance with 24 hour notice at 248-858-1110.

3. No sewer installation shall have an infiltration or exfiltration exceeding 100 gallons per inch diameter per mile of pipe in a 24 hour period, and no single run of sewer between manholes shall exceed 100 gallons per inch diameter per mile. Air tests in lieu of infiltration tests shall be as specified in the OCWRC "Acceptance Tests", dated September, 1972. Only pipe and pipe joints approved by the Oakland County Water Resources Commissioner may be used for sanitary sewer construction.

4. Located in the first manhole upstream from the point of all connections to an existing OCWRC sewer, or extension thereto, a temporary 12-inch deep sump shall be provided in the first manhole above the connection which will be filled in after such successful completion of any acceptance test up to the standard fillet provided for the flow channel. A watertight bulkhead shall be provided on the downstream of the sump manhole.

5. All building leads and risers shall be 6-inch S.D.R. 23.5 ABS OR PVC pipe with chemically fused joints, or an approved equal pipe and joint. Sewer pipe wye shall contain factory installed premium joint material of an approved type compatible with that of the building lead pipe used. Building leads to be furnished with removable air tight and water-tight stoppers.

6. All rigid sewer pipe shall be installed in Class "B" bedding or better. All flexible, semi-flexible or composite sewer pipe shall be installed in conformance to the Oakland County Water Resources Commissioner specifications.

7. All new manholes shall have Oakland County Water Resources Commissioner approved flexible, water-tight seals where pipes pass through walls. Manholes shall be of precast sections with modified groove tongue and rubber gasket type joints. Precast manhole cone sections shall be Oakland County Water Resources Commissioner approved modified eccentric cone type. All manholes shall be provided with bolted, water-tight covers.

8. At all connections to manholes on Oakland County Water Resources Commissioner's sewers or extensions thereto drop connections will be required when the difference in invert elevations exceeds 18-inches. Outside drop connections only will be approved.

9. Taps to existing manholes shall be made by coring. The Contractor shall place a KOR-N-SEAL boot (or OCWRC approved equal) after coring is completed. Blind drilling will not be permitted in lieu of coring.

10. New manholes constructed directly on Oakland County Water Resources Commissioner's sewers shall be provided with covers reading "Oakland County - Sanitary" in raised letters. New manholes built over an existing sanitary sewer shall have monolithic poured bottoms.

11. No ground water, storm water, construction water, downspout drainage or weep tile drainage shall be allowed to enter any sanitary sewer installation.

12. Prior to excavation, the Contractor shall telephone MISS DIG (647-7344) for the location of underground pipeline and cable facilities, and shall also notify representatives of other utilities located in the vicinity of the work.

13. 18" minimum vertical separation and 10' minimum horizontal separation must be maintained between sanitary sewer and water main.

14. Manhole frame and cover shall be as follows: East Jordan heavy manhole cover, base flange type #1040 or Neenah Foundry heavy duty #R-1642 manhole frame. Solid lid cover shall be non-rocking and marked "WHITE LAKE TOWNSHIP SEWER DEPARTMENT."

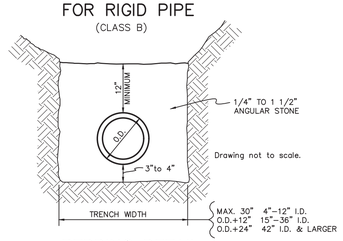
Drawing not to scale.

HOUSE/BUILDING LEAD DETAIL

Drawing not to scale.

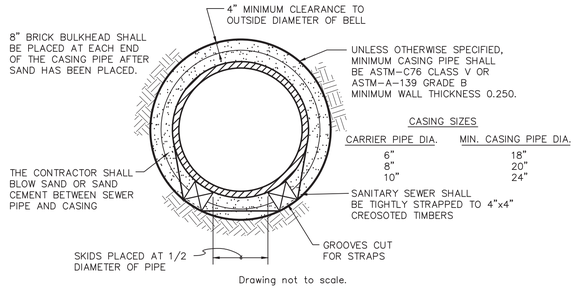
NOTE: APPROVAL MAY BE GIVEN TO ALTERNATE MATERIALS AND METHODS TO ACHIEVE CLASS B BEDDING

BEDDING DETAIL
FOR RIGID PIPE
(CLASS B)



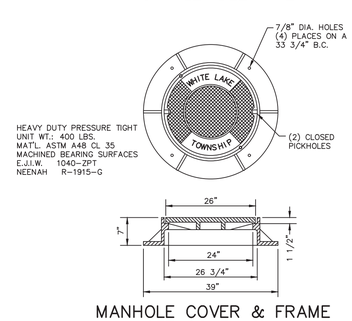
Drawing not to scale.

BEDDING DETAIL
FOR FLEXIBLE PIPE

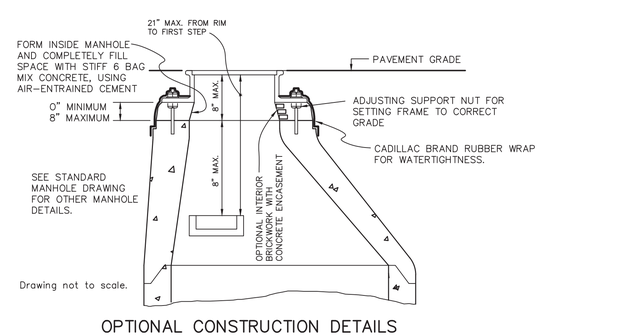


Drawing not to scale.

PIPE BARREL SUPPORT FOR SEWER



MANHOLE COVER & FRAME



Drawing not to scale.

SKETCH OF MINIMUM MANHOLE REQUIREMENTS
ON MANHOLES CONSTRUCTED OVER EXISTING SEWERS

Drawing not to scale.

OPTIONAL CONSTRUCTION DETAILS

DRAWN: CAD
DESIGN: OA
CHECKED: -

SCALE: VERT. -
HORZ. AS NOTED

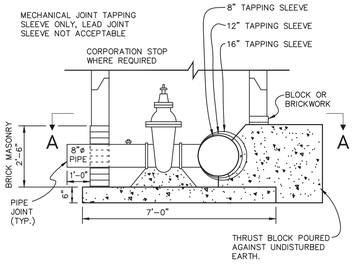
REVISIONS	MARK	ADDENDUM/CHANGE ORDER	DATE	MARK	ADDENDUM/CHANGE ORDER	DATE	MARK	ADDENDUM/CHANGE ORDER	DATE
		FIRST ISSUE	09/11/97		OCWRC COMMENTS	11/06/15			
		UPDATED TITLE BLOCK	04/30/13						
		UPDATED NOTES	02/17/15						

Johnson&Anderson
4494 Elizabeth Lake Road
Waterford, Michigan 48328
tel (248) 681-7800 fax (248) 681-2660
1060 W. Norton Avenue, Suite 7
Muskegon, Michigan 49441
tel (231) 780-3100 fax (231) 780-3115
2291 Water Street, Suite 6
Port Huron, Michigan 48060
tel (810) 987-7820 fax (810) 987-7895

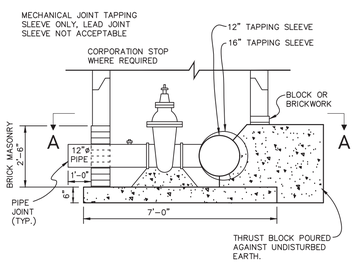
White Lake Township
7525 Highland Road (M-59)
White Lake, Michigan 48383
248-698-3300

SANITARY SEWER STANDARD DETAILS

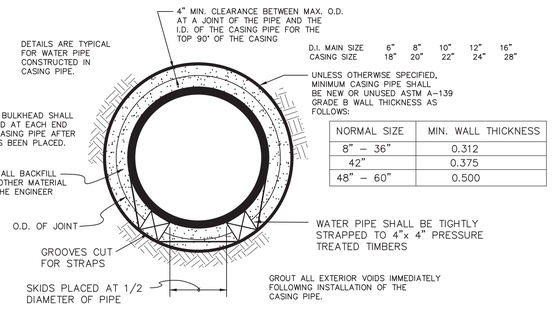
JOB NO.
DATE ISSUED 09/11/97
SHEET NO.



16" X 8", 12" X 8", 8" X 8"
TAPPING SLEEVE, VALVE & WELL
(B-B)



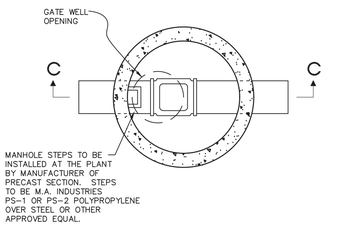
16" X 12", 12" X 12"
TAPPING SLEEVE, VALVE & WELL
(B-B)



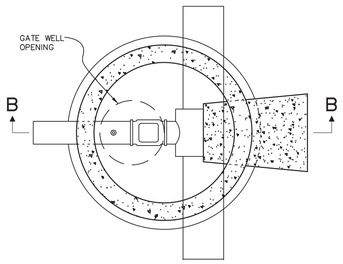
NORMAL SIZE	MIN. WALL THICKNESS
8" – 36"	0.312
42"	0.375
48" – 60"	0.500

Drawing not to scale.

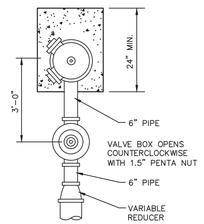
PIPE BARREL SUPPORT FOR WATER MAIN
CONSTRUCTED IN CASING

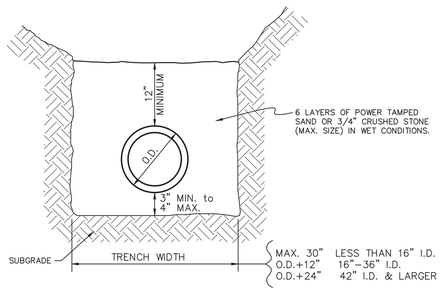


PLAN GATE WELL – TYPICAL
(D-D)

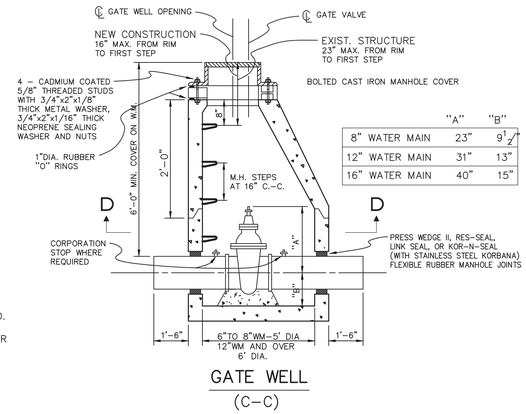


PLAN TAPPING SLEEVE, VALVE & WELL – TYPICAL
(A-A)





Drawing not to scale.
STANDARD BEDDING
FOR WATER PIPE



	"A"	"B"
8" WATER MAIN	23"	9 1/2"
12" WATER MAIN	31"	13"
16" WATER MAIN	40"	15"

GATE WELL
(C-C)

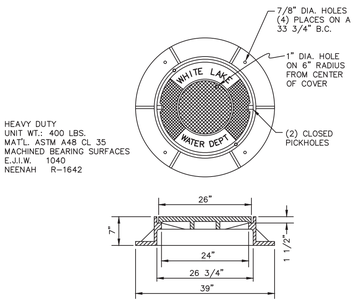
WATER MAIN NOTES

1. All construction procedures and materials used on this project shall conform to White Lake Township current standards and specifications.
2. All hydrants shall be East Jordan Iron Works 5BR–250 traffic model. Self–draining hydrants shall not be used. Valve shall have 1–1/2" pentagon nut and shall open counter–clockwise. Provide two 4.5" pumper outlets with 5" Storz quick connect nozzles (Harrington Integral Hydrant Storz, Model HIHS) as manufactured by Harrington, Inc. of Erie, PA.
3. All hydrants shall be field painted with a heavy coat of bright safety red polyurethane or alkyd gloss enamel, except for the Storz fittings and caps, which shall be left unpainted.
4. Johnson and Anderson, Inc. field personnel will affix to the fixed collar of each Storz connection 1" wide 3M Scotch reflective tape, color coded per NFPA 291 guidelines flow capacity.
5. All water mains shall be ductile iron pipe Class 54, cement lined with push on joints. Mechanical joints allowed only for tapping sleeves, hydrants & hydrant valves. Only Cor–Blue bolts shall be used for assembling mechanical joints. All bends, tees, valves and hydrant tees shall have a poured concrete thrust block as detailed on this sheet. Joints which have thrust blocks bearing on soil of questionable stability shall be fully restrained utilizing Tyler swivel ells and adapters or a system approved by the Township Engineer. HDPE pipe for directional boring, if approved by the Township Engineer, shall meet all of the requirements of the MDEQ and shall be DR9 (200 psi), and shall have two #8 tracer wires, terminated in the nearest gate well at the highest step.
6. Tapping sleeve shall be mechanical joint or approved equal. Ductile Iron or Stainless steel are allowed.
7. Specifications shall include direction of operation of all valves. All valves shall be counter clockwise open.
8. All necessary easements shall be provided in the name of White Lake Township before acceptance of the water distribution system.
9. The design engineer shall furnish White Lake Township with one reproducible sets of "As–Built" water main plans or an AutoCAD file upon completion of the job.
10. All required cross–connection devices shall be installed as required by the local plumbing inspector and in accordance with the standards of the Michigan Department of Public Health.
11. Gate well frame and cover shall be as follows: East Jordan heavy manhole cover, base flange type #1040 or Neenah Foundry heavy duty #R–1642 Manhole frame, solid lid cover shall be non–rocking and marked "White Lake Water Department"
12. Gate valves shall be AWWA approved and of a double disc or resilient wedge design with push on joints, 16" gate valves may be mechanical joint provided Cor–Blue bolts are used. All gate valves with operating nuts greater than 5' below ground surface shall be provided with an extension stem. The length of the extension shall be such that it will be within 5' of the ground surface when an extension is used it shall be held in place by an extension stem guide suitably fastened to the wall of the gate well.
13. 1" corporation stops are to placed on the main at each side of each main line gate valve and at such other locations as may be required by the engineer.
14. All pipe and fittings shall be subjected to a hydro–static pressure test of 150 PSI for a 2 hour duration; Township Engineer must be present. Maximum segment 2000 feet except that longer segments may be tested with allowable leakage based on 2000 feet.
15. 2 consecutive safe bacteria samples shall be taken from the water system approx. 24 hours apart at points established by the Township Engineer. Samples shall be taken by the Township Engineer.
16. Filling, flushing and sampling of water main can only be performed with a "Jumper" Line, the jumper shall be equipped with an approved RPZ type of backflow preventer.
17. Adjustments on gate wells shall be limited to 23" maximum from top of rim to first step in accordance with MIOSHA Rule 341.
18. All new water service lines shall have a minimum nominal size of 1". Services from 1" to 2" may be type K copper tubing or plastic DR–9 (200 PSI rated) meeting ASTM D2737–03 (Standard Specification for Polyethylene (PE) plastic tubing). ASTM Designation and pressure rating shall be stamped on the pipe by the manufacturer. Plastic pipe shall also meet AWWA C–901 Specifications. All sizes shall relate to the copper tubing outside diameter standard size (CTS). Copper pipe joints shall be flared. Fittings shall adapt to the plastic pipe with compression to iron pipe thread adapter. Plastic pipes shall be either compression style with a steel insert or may be fusion welded in the larger sizes.

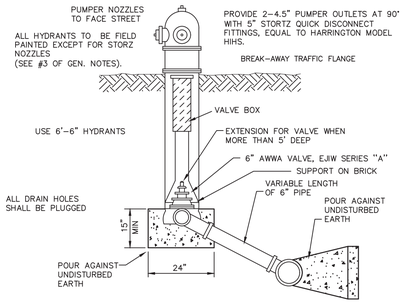
    Plastic water service pipes shall be traced with two #10 copper tracer wires or two #12 copper coated steel or stainless steel wires insulated with a minimum of 30 mils of polyethylene insulation. The tracer wires shall be terminated to supply line so as to be locatable at the building and the curb box without digging.

    Water services sizes 3" and greater shall be Class 54 cement lined ductile iron with push on joints or HDPE DR–9 (200 PSI rated) with fusion welded joints and fittings, DIPS (Ductile Iron Pipe Size).

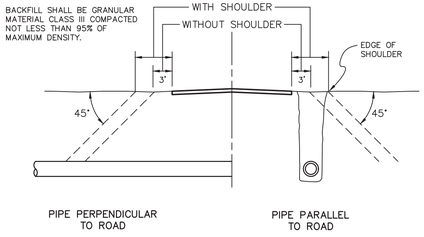
    A stop box shall be installed at the property or easement line and shall be equivalent to an A.Y. McDonald Mfg. 6100 flare regular pattern ball valve. The curb box shall have a 1" riser pipe with an Erie 2–hole pattern cover equivalent to A.Y. McDonald Mfg. 5601L. Stop box shall be protected with a 2"x4" painted blue extending 4 feet above ground.
19. Standard pipe cover shall be 6'–0".
20. Air release manholes shall consist of a standard 5' diameter gate well style structure with a ValMatic Model 25C air release valve mounted on a 1" corporation stop. Air release shall be equipped with the vacuum check option. A 1/2" diameter galvanized pipe air discharge shall be extended to within 12" of the top of the structure. A gooseneck trap shall be installed at the top of the riser to prevent debris & water from entering the valve.

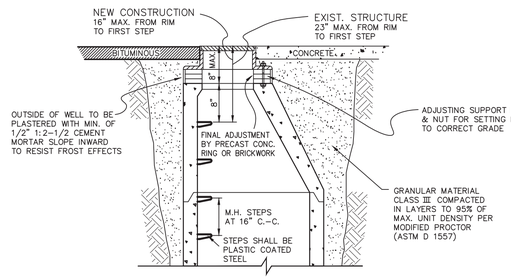


GATE WELL COVER & FRAME

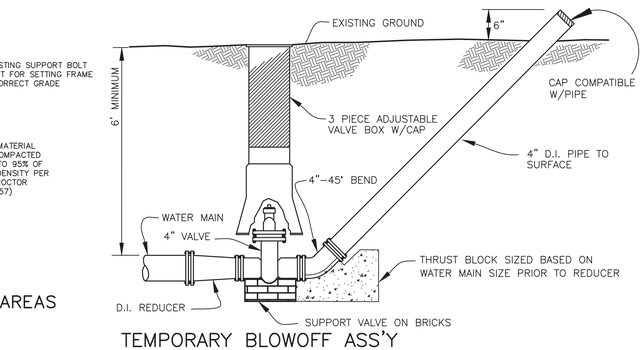


BACKFILL IN THE AREA OF STREETS,
ALLEYS, SIDEWALKS, DRIVES & PARKING AREAS

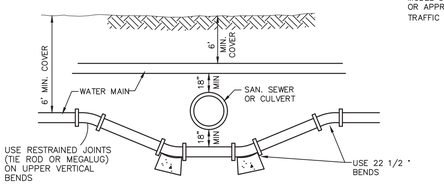




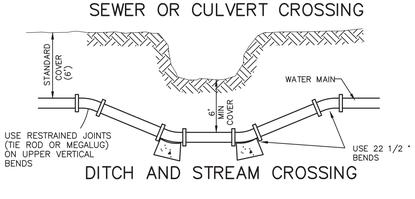
GATE WELL TOPS WITHIN PAVEMENT AREAS



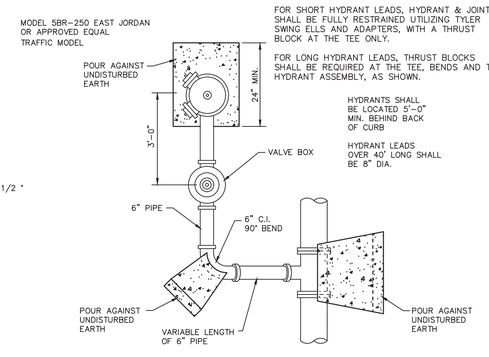
TEMPORARY BLOWOFF ASS'Y



SEWER OR CULVERT CROSSING

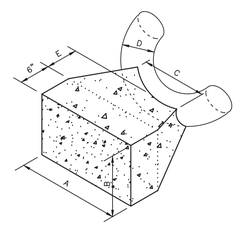


DITCH AND STREAM CROSSING



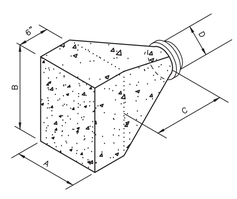
DETAIL OF HYDRANT SETTINGS

NOTE: 3000 PSI CONCRETE TO BE USED. THRUST BLOCK TO ABUT & REST AGAINST UNDISTURBED SOIL. RESTRAINED JOINTS WILL BE REQUIRED IF SOIL STABILITY IS QUESTIONABLE.



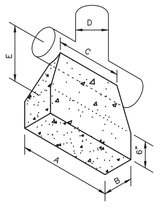
FOR 90° BENDS OR SMALLER

D	A	B	C	E MIN
20"	8"	6.5'	3.5'	2.5"
16"	6"	4'	2.5'	2"
12"	4"	3'	2'	1.75"
10"	3'	3'	2'	1.75"
8"	3'	2'	2'	1.5"
6"	2"	1.5'	2"	1.25"



FOR PLUGS

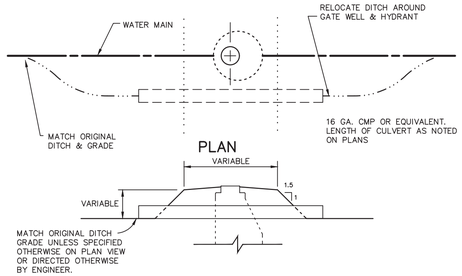
D	A	B	C MIN
20"	7"	5'	2.5"
16"	4.8"	4.8'	2"
12"	4.3"	3'	1.75"
10"	3"	2'	1.5"
8"	2.8"	2.5'	1.5"
6"	1.5"	1.5'	0.25"



FOR TEES

D	A	B	C	E MIN
20"	6.5'	4.5'	3.5'	3"
16"	4.7'	4.7'	2.5'	2.75"
12"	4'	3'	2.5'	2.5"
10"	3'	2'	2'	2.25"
8"	2.7'	2'	2'	2.25"
6"	2'	2'	2'	2.25"

THRUST BLOCK DETAILS



PROFILE
DITCH ENCLOSURE AT GATE WELL

DRAWN: CAD
DESIGN: OA
CHECKED: –

SCALE: VERT. –
HORZ. AS NOTED

REVISIONS	MARK	ADDENDUM/CHANGE ORDER	DATE	MARK	ADDENDUM/CHANGE ORDER	DATE	MARK	ADDENDUM/CHANGE ORDER	DATE	MARK	ADDENDUM/CHANGE ORDER	DATE
		GENERAL REVISION TO CAD	12/29/95		GW & NUT SIZE	07/23/98		CLARIFY HYD. SPEC	02/07/01		REV. HYD, THRUST, AIR REL.	03/29/04
		ADD NOTE 17	11/04/97		PIPE CIVER & FLANGE TAPE	05/12/99		5–BR HYD, WS STAKE	02/27/02		HDPE, HYD, VALVES	07/18/05
		REVISE HYD. & THRUSTING	05/18/98		ADD BLOWOFF	07/06/99		ADD NOTE 19	07/23/03		UPDATED TITLE BLOCK	04/30/13

Johnson&Anderson
4494 Elizabeth Lake Road
Waterford, Michigan 48328
tel (248) 681-7800 fax (248) 681-2660

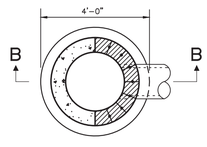
1060 W. Norton Avenue, Suite 7
Muskegon, Michigan 49441
tel (231) 780-3100 fax (231) 780-3115

2291 Water Street, Suite 6
Port Huron, Michigan 48060
tel (810) 987-7820 fax (810) 987-7895

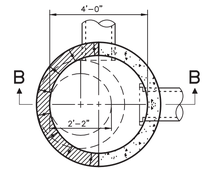
White Lake Township
7525 Highland Road (M-59)
White Lake, Michigan 48383
248-698-3300

WATER MAIN STANDARD DETAILS

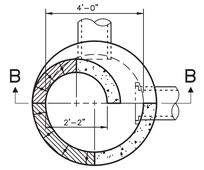
JOB NO.
DATE ISSUED
SHEET NO.



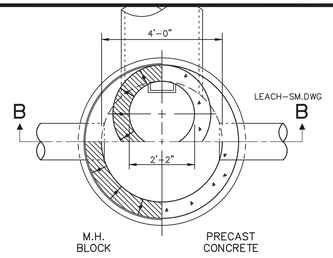
SECTION A–A



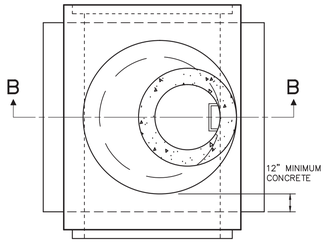
SECTION A–A



SECTION A–A

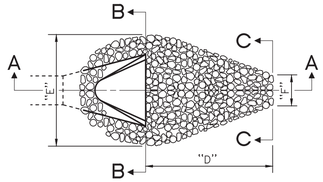


SECTION A–A



SECTION A–A

PIPE DIA.	"D"	"E"	"F"	S.Y.
12"	5'–0"	6'–6"	3'–0"	4
15"	5'–0"	7'–0"	3'–0"	4
18"	5'–0"	7'–6"	3'–6"	4
21"	5'–6"	8'–0"	4'–0"	5
24"	6'–0"	8'–6"	4'–6"	6
27"	6'–6"	9'–0"	5'–0"	7
30"	7'–0"	9'–9"	5'–6"	8
33"	7'–6"	10'–3"	5'–6"	9
36"	8'–0"	10'–9"	6'–0"	10
42"	9'–0"	11'–9"	6'–6"	12
48"	10'–0"	13'–0"	7'–0"	14



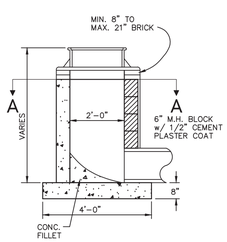
PLAN VIEW

STORM SEWER NOTES

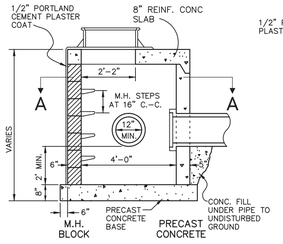
1. PRECAST CONC. RISERS SHALL MEET A.S.T.M. C478
2. DIAMETER OF CONC. BASE: I.D. + 2(WALL) + 8"
3. MANHOLE STEP SPACING SHALL MEET MIOSHA REQUIREMENTS. NO MORE THAN 21" FROM RIM TO FIRST STEP. MAX. 16" O.C. STEPS SHALL BE CAST POLYPROPYLENE REINFORCED WITH A 1/2" STEEL ROD.
4. WALL THICKNESS OF BLOCK STRUCTURES SHALL BE:

DEPTH	THICKNESS
0–8'	6"
8–15'	8"
OVER 15'	12"

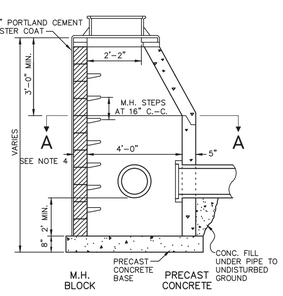
5. MINIMUM I.D. OF STRUCTURE FOR: 36"to 42" = 5'–0"
   48"to 54" = 6'–0"
   LARGER DIAMETER STRUCTURES MAY BE REQUIRED DEPENDING ON PIPING CONFIGURATION.
6. ALL LIFTING HOLES AND VOIDS IN INTERIOR JOINTS SHALL BE FILLED BY MORTAR.
7. THE FINGER DRAIN DETAIL SHALL BE USED AT ALL LOW POINT CATCH BASINS IN PAVEMENT AREAS. THE DETAIL MAY BE OMITTED WITH THE APPROVAL OF THE TOWNSHIP ENGINEER IN AREAS WITH VERY POROUS SOILS AND NO GROUNDWATER PROBLEMS.
8. PRECAST ONE PIECE BASES AND RISERS ARE ACCEPTABLE FOR INLETS, CATCH BASINS AND MANHOLES
9. FRAMES & COVERS WITH INLET CAPACITY (1.0 CFS/90 SQ IN)
   –TRAFFIC AND PARKING AREAS: MDOT "D" (EJIW 5105) 1.9 CFS*
   –REAR YARD AND DITCH INLETS: (EJIW 1040–02) 2.1 CFS*
   –MANHOLES: MDOT "A" (EJIW 1060)
   –CURB AND GUTTER INLETS: MDOT "K" (EJIW 7045) 1.8 CFS*
   –MOUNTABLE CURB & GUTTER: (EJIW 7065) 2.2 CFS*
   –*MAY VARY DUE TO MANUFACTURER CHANGES
10. CONTACT THE TOWNSHIP ENGINEER 48 HOURS PRIOR TO CONSTRUCTION TO SCHEDULE INSPECTION. FULL TIME INSPECTION WILL BE REQUIRED FOR ALL UNDERGROUND STORM SEWER CONSTRUCTION. PHONE (248) 334–9901
11. THE CONTRACTOR SHALL CONTACT MISS DIG 72 HOURS BEFORE CONSTRUCTION AT (800) 482–7171 TO LOCATE EXISTING UNDERGROUND UTILITIES.
12. PRIOR TO START OF CONSTRUCTION, CONTRACTOR SHALL HAVE IN HIS POSSESSION A CURRENT SOIL EROSION CONTROL PERMIT AS ISSUED BY WHITE LAKE TOWNSHIP.
13. A 2' DEEP SUMP SHALL BE USED IN ANY STRUCTURE SUBJECT TO A WATER DROP GREATER THAN 2.0' FROM AN INLET PIPE.
14. ALLOWABLE STORM SEWER PIPE TYPES:
   –12" AND UP: RCP ASTM C–76 MIN. CLASS 3, MIN CLASS 4 UNDER TRAFFIC AREAS, RUBBER JOINT
   –6" TO 15": SCH 40 PVC OR SDR 23.5 PVC WITH RUBBER OR GLUE JOINT
   –6" TO 48": SMOOTH BORE CORRUGATED HIGH DENSITY POLYETHYLENE WITH NEOPRENE LINED JOINTS OR BETTER
15. THE MINIMUM PIPE SIZE IN PUBLIC RIGHT–OF–WAY OR EASEMENTS AND FOR PIPES CARRYING OFF–SITE STORM WATER SHALL BE 12"
16. ALL PIPE ENDS NOT WITHIN A STRUCTURE SHALL HAVE A CONCRETE OR METAL FLARE END SECTION (FES) WITH A BAR SCREEN ON PIPES 18" AND LARGER EXCEPT THOSE WITHIN A SECURE FENCED AREA NEED NO BAR SCREEN.
17. ALL DRAINAGE STRUCTURES WITHIN THE ROAD SHALL BE SEALED WITH WRAPPED GEOTEXTILE PER RCOC STANDARDS



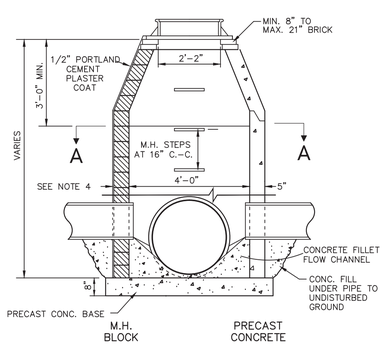
SECTION B–B
24" INLET



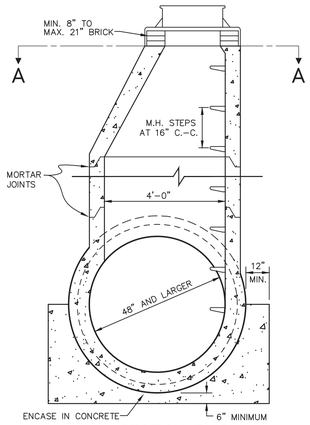
SECTION B–B
STRUCTURE WITH SLAB COVER
(CATCH BASIN SHOWN)



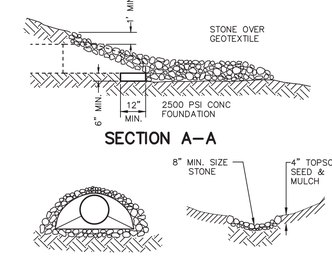
SECTION B–B
STANDARD CATCH BASIN



SECTION B–B
STANDARD STORM MANHOLE



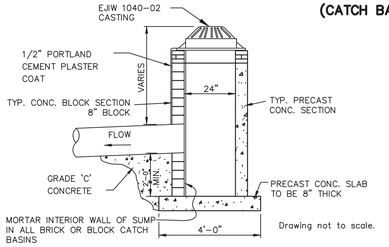
SECTION B–B
STANDARD PRECAST CONCRETE MANHOLE TEE



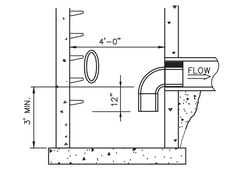
SECTION A–A

SECTION B–B SECTION C–C

PLAIN STONE RIP–RAP



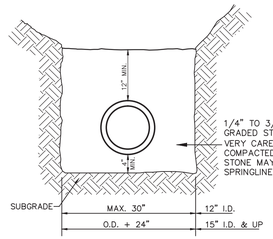
STANDARD REAR YARD CATCH BASIN



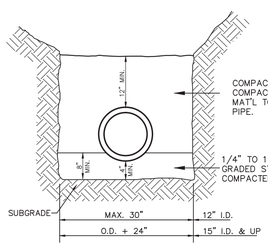
TRAP SHALL BE BULKHEADED IN OUTLET PIPE AND SHALL BE A SCH 40 PVC ASSY WITH A PIPE AREA NO LESS THAN 50% OF THE OUTLET PIPE.

ALTERNATE: USE "THE SNOUT" BASIN TRAP SYSTEM

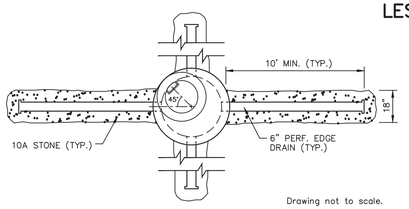
TRAPPED CATCH BASIN



PIPE BEDDING
FOR PLASTIC PIPE

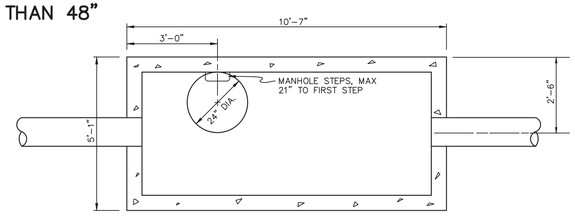


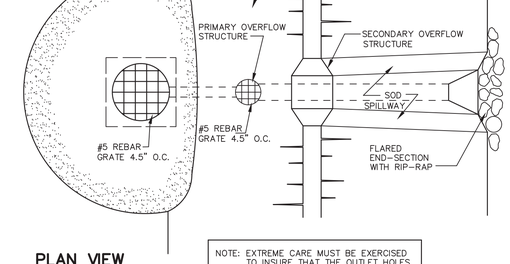
CLASS "B" BEDDING
FOR SEWER PIPE
LESS THAN 48"



Drawing not to scale.

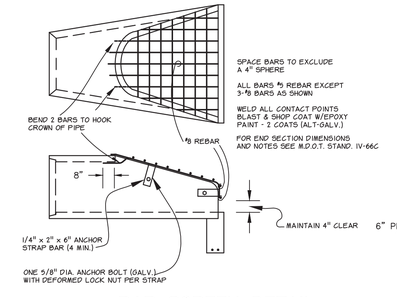
PLAN



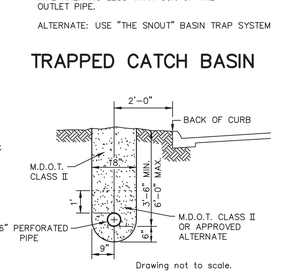


PLAN VIEW

NOTE: EXTREME CARE MUST BE EXERCISED TO INSURE THAT THE OUTLET HOLES IN THE STANDPIPE, DO NOT BECOME CLOGGED WITH SEDIMENT.

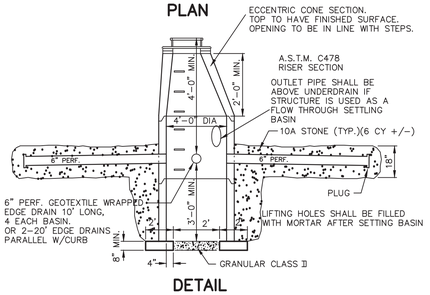


BAR SCREEN DETAIL

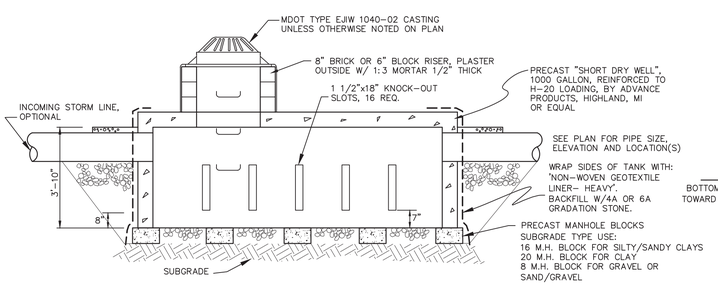


Drawing not to scale.

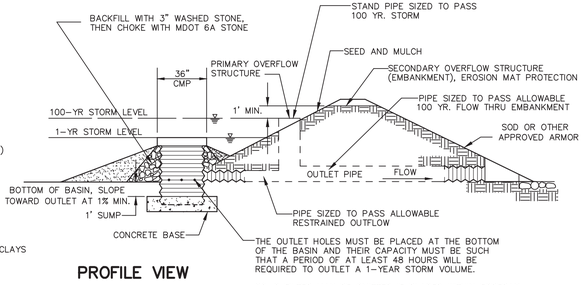
EDGE DRAIN DETAIL



DETAIL
STANDARD LEACHING BASIN

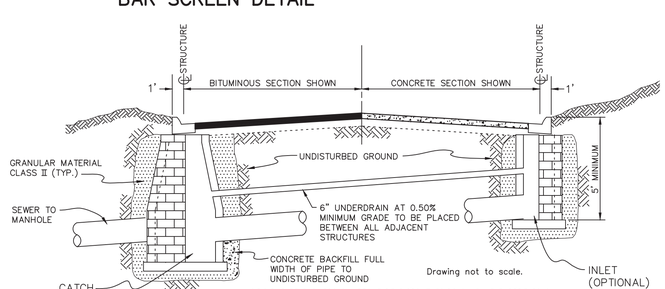


1000 GALLON LEACHING/SETTLING BASIN



PROFILE VIEW

SO–2 DETENTION BASIN OUTLET FILTER (CMP)
(SEE OCDC STANDARD DETAILS FOR SEDIMENT BASIN OR FOREBAY OUTLET STRUCTURE)



Drawing not to scale.

DRAINAGE STRUCTURE LAYOUT

DRAWN: CAD
DESIGN: OA
CHECKED: –

SCALE: VERT. –
HORZ. AS NOTED

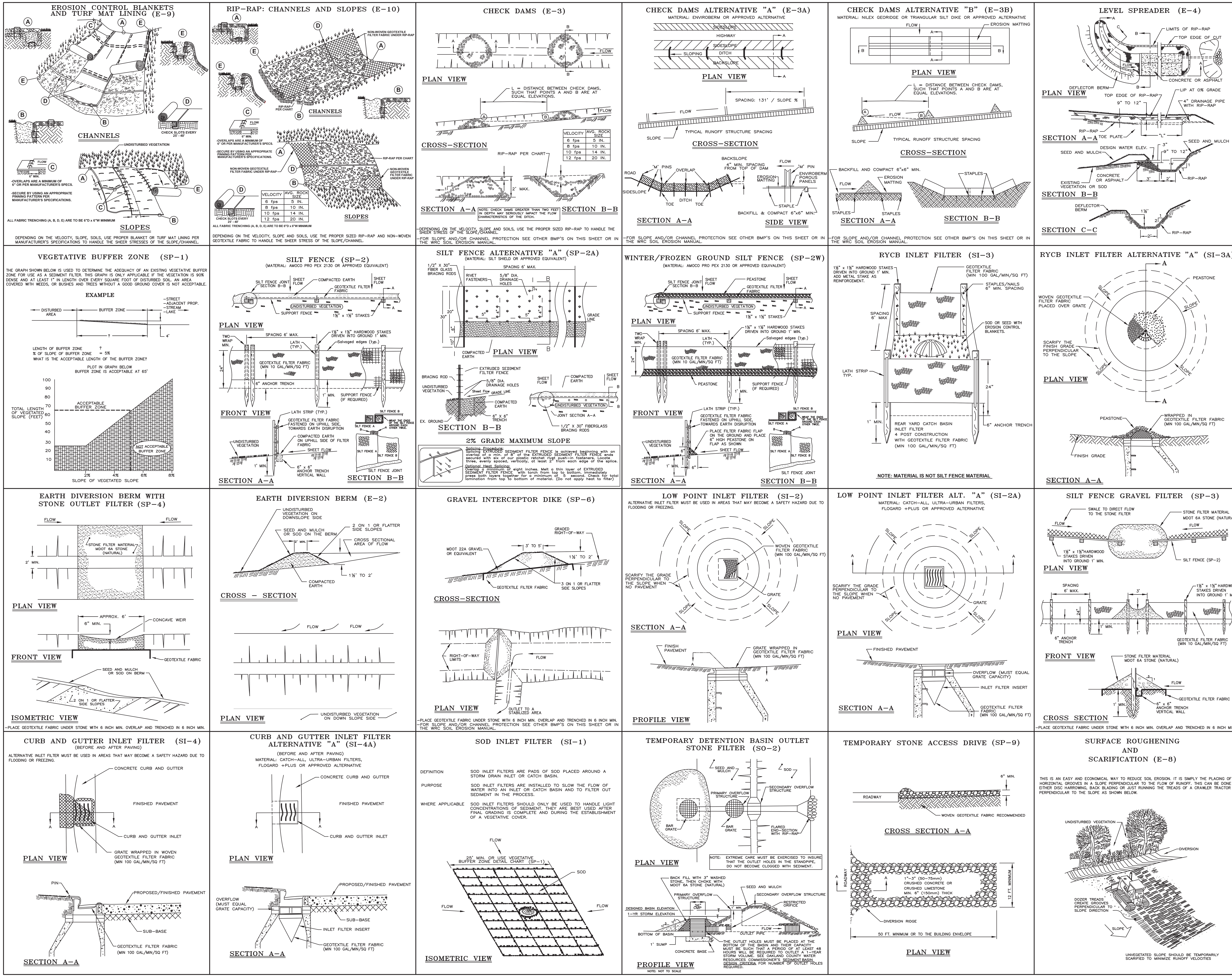
REVISIONS	MARK	ADDENDUM/CHANGE ORDER	DATE	MARK	ADDENDUM/CHANGE ORDER	DATE	MARK	ADDENDUM/CHANGE ORDER	DATE
		FIRST ISSUE	08/16/95		REVISE	10–03–02		REVISE	06–01–07
		ADD SO–1	06–17–96		REVISE	12–17–03		UPDATED TITLE BLOCK	04/30/13
		NEW BAR GRATE	11–03–97		SEC REFERENCE	05–17–05			

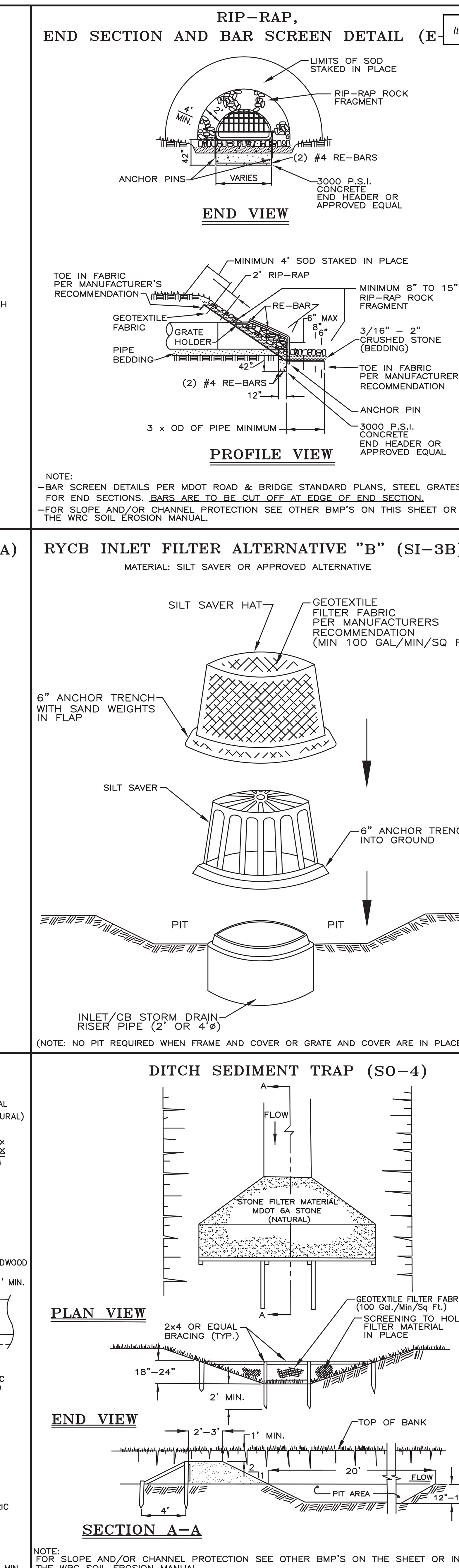
Johnson&Anderson
4494 Elizabeth Lake Road
Waterford, Michigan 48328
tel (248) 681-7800 fax (248) 681-2660
1060 W. Norton Avenue, Suite 7
Muskegon, Michigan 49441
tel (231) 780-3100 fax (231) 780-3115
3910 Lapeer Road
Port Huron, Michigan 48060
tel (810) 987-7820 fax (810) 987-7895

White Lake Township
7525 Highland Road (M-59)
White Lake, Michigan 48383
248-698-3300

STORM SEWER
STANDARD DETAILS

JOB NO.
DATE ISSUED 08/16/95
SHEET NO.


EROSION CONTROL BLANKETS AND TURF MAT LINING (E-9)
CHANNELS
SLOPES
CHECK SLOTS EVERY 25'-40'
-OVERLAPS ARE A MINIMUM OF 6" OR PER MANUFACTURER'S SPECS.
-SECURE BY USING AN APPROPRIATE PINNING PATTERN PER MANUFACTURER'S SPECIFICATIONS.
ALL FABRIC TRENCHING (A, B, D, E) ARE TO BE 6"D x 6"W MINIMUM
DEPENDING ON THE VELOCITY, SLOPE, SOILS, USE PROPER BLANKET OR TURF MAT LINING PER MANUFACTURER'S SPECIFICATIONS TO HANDLE THE SHEER STRESS OF THE SLOPE/CHANNEL.
RIP-RAP: CHANNELS AND SLOPES (E-10)
NON-WOVEN GEOTEXTILE FILTER FABRIC UNDER RIP-RAP
RIP-RAP PER CHART
CHANNELS
SLOPES
VELOCITY | AVG. ROCK SIZE
6 fps | 5 IN.
8 fps | 10 IN.
10 fps | 14 IN.
12 fps | 20 IN.
DEPENDING ON THE VELOCITY, SLOPE AND SOILS, USE THE PROPER SIZED RIP-RAP AND NON-WOVEN GEOTEXTILE FABRIC TO HANDLE THE SHEER STRESS OF THE SLOPE/CHANNEL.
CHECK DAMS (E-3)
PLAN VIEW
L = DISTANCE BETWEEN CHECK DAMS, SUCH THAT POINTS A AND B ARE AT EQUAL ELEVATIONS.
CROSS-SECTION
RIP-RAP PER CHART
2' MAX.
SECTION A-A
SECTION B-B
NOTE: CHECK DAMS GREATER THAN TWO FEET IN DEPTH MAY SERIOUSLY IMPACT THE FLOW CHARACTERISTICS OF THE DITCH.
-DEPENDING ON THE VELOCITY, SLOPE AND SOILS, USE THE PROPER SIZED RIP-RAP TO HANDLE THE SHEER STRESS OF THE SLOPE/CHANNEL.
-FOR SLOPE AND/OR CHANNEL PROTECTION SEE OTHER BMP'S ON THIS SHEET OR IN THE WRC SOIL EROSION MANUAL.
CHECK DAMS ALTERNATIVE "A" (E-3A)
MATERIAL: ENVIROBERM OR APPROVED ALTERNATIVE
HIGHWAY
SIDESLOPE
SLOPING
DITCH
BACKSLOPE
PLAN VIEW
SPACING: 131' / SLOPE %
TYPICAL RUNOFF STRUCTURE SPACING
CROSS-SECTION
"M" PINS
OVERLAP
BACKSLOPE
4" MIN. SPACING FROM TOP OF DAM
EROSION MATTING
ENVIROBERM POROUS PANELS
STAPLE
BACKFILL & COMPACT 6"x6" MIN.
SECTION A-A
SIDE VIEW
-FOR SLOPE AND/OR CHANNEL PROTECTION SEE OTHER BMP'S ON THIS SHEET OR IN THE WRC SOIL EROSION MANUAL.
CHECK DAMS ALTERNATIVE "B" (E-3B)
MATERIAL: NILEX GEORIDGE OR TRIANGULAR SILT DIKE OR APPROVED ALTERNATIVE
EROSION MATTING
PLAN VIEW
L = DISTANCE BETWEEN CHECK DAMS, SUCH THAT POINTS A AND B ARE AT EQUAL ELEVATIONS.
TYPICAL RUNOFF STRUCTURE SPACING
CROSS-SECTION
BACKFILL AND COMPACT 6"x6" MIN.
STAPLES
SECTION A-A
SECTION B-B
-FOR SLOPE AND/OR CHANNEL PROTECTION SEE OTHER BMP'S ON THIS SHEET OR IN THE WRC SOIL EROSION MANUAL.
LEVEL SPREADER (E-4)
LIMITS OF RIP-RAP
TOP EDGE OF CUT
CONCRETE OR ASPHALT
DEFLECTOR BERM
PLAN VIEW
TOP EDGE OF RIP-RAP
LIP AT 0% GRADE
4" DRAINAGE PIPE WITH RIP-RAP
TOE PLATE
SECTION A-A
DESIGN WATER ELEV.
SEED AND MULCH
EXISTING VEGETATION OR SOD
SECTION B-B
SECTION C-C
VEGETATIVE BUFFER ZONE (SP-1)
THE GRAPH SHOWN BELOW IS USED TO DETERMINE THE ADEQUACY OF AN EXISTING VEGETATIVE BUFFER ZONE FOR USE AS A SEDIMENT FILTER. THIS GRAPH IS ONLY APPLICABLE IF THE VEGETATION IS 90% DENSE AND AT LEAST 1" IN LENGTH OVER EVERY SQUARE FOOT OF DISTURBED SOIL. AN AREA COVERED WITH WEEDS, OR BUSHES AND TREES WITHOUT A GOOD GROUND COVER IS NOT ACCEPTABLE.
EXAMPLE
LENGTH OF BUFFER ZONE = ?
% OF SLOPE OF BUFFER ZONE = 5%
WHAT IS THE ACCEPTABLE LENGTH OF THE BUFFER ZONE?
PLOT IN GRAPH BELOW
BUFFER ZONE IS ACCEPTABLE AT 65'
TOTAL LENGTH OF VEGETATED SLOPE (FEET)
ACCEPTABLE BUFFER ZONE
NOT ACCEPTABLE BUFFER ZONE
SLOPE OF VEGETATED SLOPE
SILT FENCE (SP-2)
(MATERIAL: AMOCO PRO PEX 2130 OR APPROVED EQUIVALENT)
PLAN VIEW
FRONT VIEW
SECTION A-A
SECTION B-B
SILT FENCE ALTERNATIVE "A" (SP-2A)
(MATERIAL: SILT SHIELD OR APPROVED EQUIVALENT)
PLAN VIEW
SECTION B-B
2% GRADE MAXIMUM SLOPE
WINTER/FROZEN GROUND SILT FENCE (SP-2W)
(MATERIAL: AMOCO PRO PEX 2130 OR APPROVED EQUIVALENT)
PLAN VIEW
FRONT VIEW
SECTION A-A
SECTION B-B
RYCB INLET FILTER (SI-3)
NOTE: MATERIAL IS NOT SILT FENCE MATERIAL
RYCB INLET FILTER ALTERNATIVE "A" (SI-3A)
PLAN VIEW
SECTION A-A
EARTH DIVERSION BERM WITH STONE OUTLET FILTER (SP-4)
PLAN VIEW
FRONT VIEW
ISOMETRIC VIEW
-PLACE GEOTEXTILE FABRIC UNDER STONE WITH 6 INCH MIN. OVERLAP AND TRENCHED IN 6 INCH MIN.
EARTH DIVERSION BERM (E-2)
CROSS - SECTION
PLAN VIEW
GRAVEL INTERCEPTOR DIKE (SP-6)
CROSS-SECTION
PLAN VIEW
-PLACE GEOTEXTILE FABRIC UNDER STONE WITH 6 INCH MIN. OVERLAP AND TRENCHED IN 6 INCH MIN.
-FOR SLOPE AND/OR CHANNEL PROTECTION SEE OTHER BMP'S ON THIS SHEET OR IN THE WRC SOIL EROSION MANUAL.
LOW POINT INLET FILTER (SI-2)
ALTERNATIVE INLET FILTER MUST BE USED IN AREAS THAT MAY BECOME A SAFETY HAZARD DUE TO FLOODING OR FREEZING.
SECTION A-A
PROFILE VIEW
LOW POINT INLET FILTER ALT. "A" (SI-2A)
MATERIAL: CATCH-ALL, ULTRA-URBAN FILTERS, FLOGARD +PLUS OR APPROVED ALTERNATIVE
PLAN VIEW
SECTION A-A
SILT FENCE GRAVEL FILTER (SP-3)
PLAN VIEW
FRONT VIEW
CROSS SECTION
-PLACE GEOTEXTILE FABRIC UNDER STONE WITH 6 INCH MIN. OVERLAP AND TRENCHED IN 6 INCH MIN.
CURB AND GUTTER INLET FILTER (SI-4)
(BEFORE AND AFTER PAVING)
ALTERNATIVE INLET FILTER MUST BE USED IN AREAS THAT MAY BECOME A SAFETY HAZARD DUE TO FLOODING OR FREEZING.
PLAN VIEW
SECTION A-A
CURB AND GUTTER INLET FILTER ALTERNATIVE "A" (SI-4A)
(BEFORE AND AFTER PAVING)
MATERIAL: CATCH-ALL, ULTRA-URBAN FILTERS, FLOGARD +PLUS OR APPROVED ALTERNATIVE
PLAN VIEW
SECTION A-A
SOD INLET FILTER (SI-1)
DEFINITION SOD INLET FILTERS ARE PADS OF SOD PLACED AROUND A STORM DRAIN INLET OR CATCH BASIN.
PURPOSE SOD INLET FILTERS ARE INSTALLED TO SLOW THE FLOW OF WATER INTO AN INLET OR CATCH BASIN AND TO FILTER OUT SEDIMENT IN THE PROCESS.
WHERE APPLICABLE SOD INLET FILTERS SHOULD ONLY BE USED TO HANDLE LIGHT CONCENTRATIONS OF SEDIMENT. THEY ARE BEST USED AFTER FINAL GRADING IS COMPLETE AND DURING THE ESTABLISHMENT OF A VEGETATIVE COVER.
25' MIN. OR USE VEGETATIVE BUFFER ZONE DETAIL CHART (SP-1)
ISOMETRIC VIEW
TEMPORARY DETENTION BASIN OUTLET STONE FILTER (SO-2)
PLAN VIEW
NOTE: EXTREME CARE MUST BE EXERCISED TO INSURE THAT THE OUTLET HOLES IN THE STANDPIPE, DO NOT BECOME CLOGGED WITH SEDIMENT.
PROFILE VIEW
NOTE: NOT TO SCALE
TEMPORARY STONE ACCESS DRIVE (SP-9)
CROSS SECTION A-A
1"-3" (50-75mm) CRUSHED CONCRETE OR CRUSHED LIMESTONE MIN. 6" (150mm) THICK
50 FT. MINIMUM OR TO THE BUILDING ENVELOPE
PLAN VIEW
SURFACE ROUGHENING AND SCARIFICATION (E-8)
THIS IS AN EASY AND ECONOMICAL WAY TO REDUCE SOIL EROSION. IT IS SIMPLY THE PLACING OF HORIZONTAL GROOVES IN A SLOPE PERPENDICULAR TO THE FLOW OF RUNOFF. THIS CAN BE DONE BY EITHER DISC HARROWING, BACK BLADING OR JUST RUNNING THE TREADS OF A CRAWLER TRACTOR PERPENDICULAR TO THE SLOPE AS SHOWN BELOW.
DOZER TREADS CREATE GROOVES PERPENDICULAR TO SLOPE DIRECTION
UNVEGETATED SLOPE SHOULD BE TEMPORARILY SCARIFIED TO MINIMIZE RUNOFF VELOCITIES


RIP-RAP, END SECTION AND BAR SCREEN DETAIL (E-
END VIEW
PROFILE VIEW
NOTE:
-BAR SCREEN DETAILS PER MDOT ROAD & BRIDGE STANDARD PLANS, STEEL GRATES FOR END SECTIONS. BARS ARE TO BE CUT OFF AT EDGE OF END SECTION.
-FOR SLOPE AND/OR CHANNEL PROTECTION SEE OTHER BMP'S ON THIS SHEET OR IN THE WRC SOIL EROSION MANUAL.
RYCB INLET FILTER ALTERNATIVE "B" (SI-3B)
MATERIAL: SILT SAVER OR APPROVED ALTERNATIVE
(NOTE: NO PIT REQUIRED WHEN FRAME AND COVER OR GRATE AND COVER ARE IN PLACE.)
DITCH SEDIMENT TRAP (SO-4)
PLAN VIEW
END VIEW
SECTION A-A
NOTE: FOR SLOPE AND/OR CHANNEL PROTECTION SEE OTHER BMP'S ON THE SHEET OR IN THE WRC SOIL EROSION MANUAL.

NOTE:

WHILE PERFORMING WORK INVOLVING GROUNDS MAINTENANCE AND/OR THE CONSTRUCTION/MAINTENANCE OF ANY INFRASTRUCTURE, INCLUDING ROADS, WATER MAINS, SANITARY SEWERS, STORM DRAINS AND STORM WATER BEST MANAGEMENT PRACTICES (BMPS), CONTRACTORS SHALL MINIMIZE POLLUTION FROM STORM WATER RUNOFF THAT CAN AFFECT WATER QUALITY RELATED TO WORK ACTIVITIES. POLLUTANTS THAT COULD IMPAIR WATER QUALITY MAY INCLUDE FUEL, GREASE AND OIL, NUTRIENTS, BACTERIA AND PATHOGENS, LITTER AND DEBRIS, AND SOIL EROSION AND SEDIMENTATION. APPLICABLE BMPS SHALL BE IMPLEMENTED BY THE CONTRACTOR TO THE MAXIMUM EXTENT PRACTICABLE TO PROTECT WATER QUALITY AND WILDLIFE HABITAT.

SOIL EROSION AND SEDIMENTATION CONTROL DETAILS

REVISION BLOCK

ORIG. DATE:	01/01/01
SCALE:	NONE
DESIGNED BY:	WRC
DRAWN BY:	Mapping

WRC WATER RESOURCES COMMISSIONER

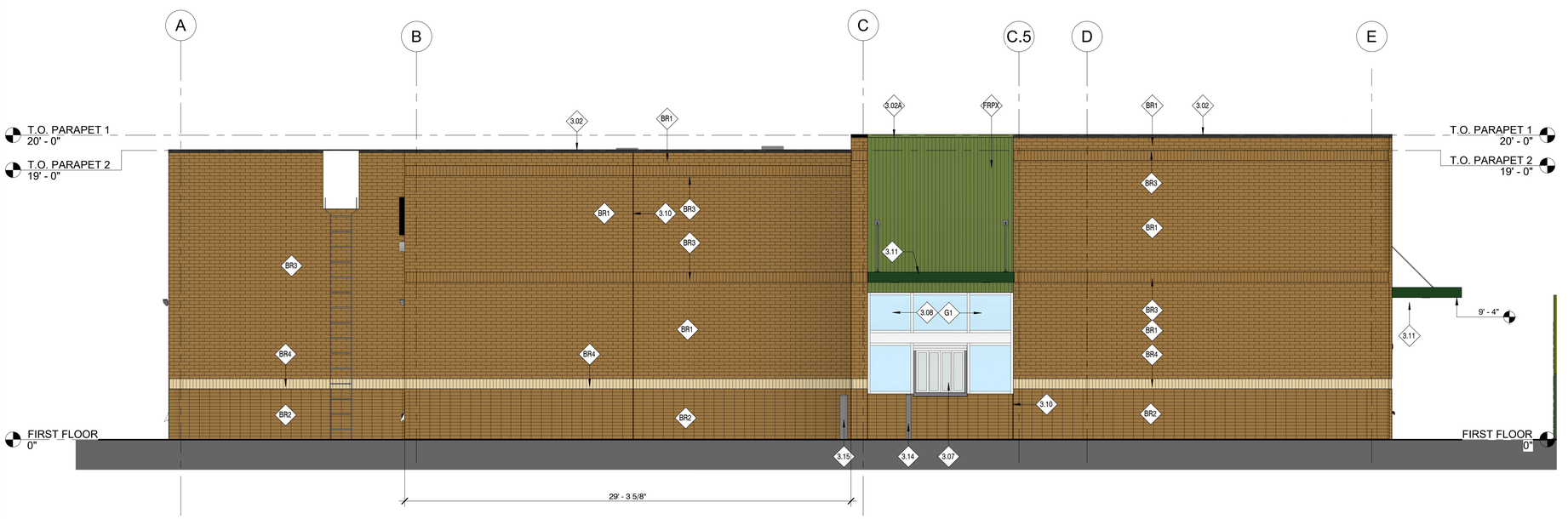
ONE PUBLIC WORKS DRIVE, BLDG 95 WEST WATERFORD, MICHIGAN 48328-1907

SHEET NO.: 1 of 1

22 SOUTH ELEVATION
1/4" = 1'-0"

SOUTH ELEVATION = 1574 SQUARE FOOT

REQUIRED 30% STOREFRONT = 464 SF
PROVIDED STOREFRONT = 699 SF



24 WEST ELEVATION
1/4" = 1'-0"

KEYED NOTES

3.02 PRE-FINISHED METAL 2- PIECE SNAP-ON COMPRESSION COPING BY DUROLAST OR SIMILAR | COLOR: CHARCOAL TO MATCH RAL 7043

3.02A PRE-FINISHED METAL 2- PIECE SNAP-ON COMPRESSION COPING BY DUROLAST OR SIMILAR | COLOR: PANTONE PMS 2307 C.

3.04 MAIN ENTRANCE/EXIT

3.05 SECONDARY ENTRANCE/EXIT

3.07 DRIVE-THRU WINDOW | MFR: QUIKSERV | MODEL: FM42E | TO BE INSTALLED AS PART OF SHELL CONSTRUCTION IN STOREFRONT SURROUND. COLOR TO MATCH STOREFRONT.

3.08 ALUMINUM STOREFRONT SYSTEM WITH 1" INSULATED GLAZING BY LANDLORD.

3.10 CONTROL JOINT WHERE INDICATED. REFER TO DETAILS FOR FURTHER INFORMATION.

3.11 PRE-MANUFACTURED ALUMINUM CANOPY W/ TIE RODS WITH FINISHED UNDERSIDE, PROVIDED/INSTALLED BY LANDLORD | MANF: AMERICAN PRODUCTS, INC. | COLOR: DARK GREEN, PMS 2411C, CANOPY TO INCLUDE LIGHTING, INTERNAL DRAIN (TO TIE INTO STORM), CANOPY UNDERSIDE TO HAVE FINISH TO MATCH [SF2].

3.14 4" DIA. CONCRETE BOLLARD | FINISH: PAINT TO MATCH ADJACENT P285

3.15 6" DIA. CONCRETE BOLLARD | FINISH: PAINT TO MATCH ADJACENT P285

3.16 FIRE DEPARTMENT ACCESS BOX | INSTALLED ADJACENT ENTRY DOOR. COORDINATE LOCATION WITH LOCAL FIRE DEPARTMENT.

3.21 BUILDING ADDRESS SIGN | VERIFY SIZE, LOCATION, AND STYLE WITH LOCAL FIRE DEPARTMENT

3.37 CONTROL JOINT / JOINER REVEAL COVER WITHIN ALUM. CLADDING SYSTEM PER MFR RECOMMENDATIONS. JOINER PIECE TO ALIGNED WITH STOREFRONT MULLION BELOW AS INDICATED.

BR1 BRICK MASONRY WALL SYSTEM | MFR: MODULAR BRICK, COMMON BOND PATTERN |5 COURSE RUNNING + 1 COURSE HEADER| COLOR: MCNEAR - SANTIAGO CREATE MATERIALS CUSTOM BLEND

BR2 BRICK MASONRY WALL SYSTEM | MFR: MODULAR BRICK, STACKED, HORIZONTAL PATTERN| COLOR: MCNEAR - SANTIAGO CREATE MATERIALS CUSTOM BLEND

BR3 BRICK MASONRY WALL SYSTEM | MFR: MODULAR BRICK, STACKED, VERTICAL PATTERN| COLOR: MCNEAR - SANTIAGO CREATE MATERIALS CUSTOM BLEND

BR4 BRICK MASONRY WALL SYSTEM | MFR: MODULAR BRICK, STACKED, VERTICAL PATTERN| COLOR: MCNEAR - TAN BLEND TBD

FRPX REINFORCED FIBERGLASS PANEL | MANF: FORMGLAS | PATTERN: CUSTOM VERTICAL RIBBED | COLOR: PANTONE PMS 2307 C, FINISH: PRIMER - BM HIGH-HIDING ALL PURPOSE PRIMER (046) | TOPCOAT - BM ULTRA-SPEC HP D.T.M. ACRYLIC LOW LUSTRE (HP25).

G1 ALUMINUM STOREFRONT | MFR: KAWNEER TRIFAB VERRSAGLAZE 451T | COLOR: ANODIZED ALUMINUM | 2" x 4 1/2" PROFILE | THERMAL BREAK| 1" CLEAR INSULATED GLAZING: PPG SOLARBAN 70 (OR APPROVED EQUAL) |

PX1 EIFS SYSTEM | PRODUCT: DRYVIT OUTSULATION PLUS MD w/ MOISTURE DRAINAGE SYSTEM |TEXTURE: DRYVIT LYMESTONE | PAINTED COLOR: #105 SUEDE

SF1 SPECIALTY FINISH: PREFABRICATED ALUMINUM WOOD GRAIN CLADDING SYSTEM | MFR: KNOTWOOD CLADDING | COLOR: WHITE ASH

Item B.

Bakery-Cafe #:

6348

SYSTEM: NEXT-GEN

Project Team:

ARCVISION INCORPORATED
ARCHITECTURE • ENGINEERING • STORE PLANNING
1950 CRAIG ROAD, SUITE 300 ST.LOUIS, MO 63146
p. 314.415.2400 f. 314.415.2300 t. 800.489.2233
www.arcv.com

Professional Seal:

STATE OF MICHIGAN
FREDERICK J. GOGLIA
ARCHITECT
1301043648
LICENSED ARCHITECT

6/22/23

Project Title:

PROTOTYPE - NEW CONSTRUCTION

TBD HIGHLAND RD
WHITE LAKE, MI 46383

No.	Description	Date

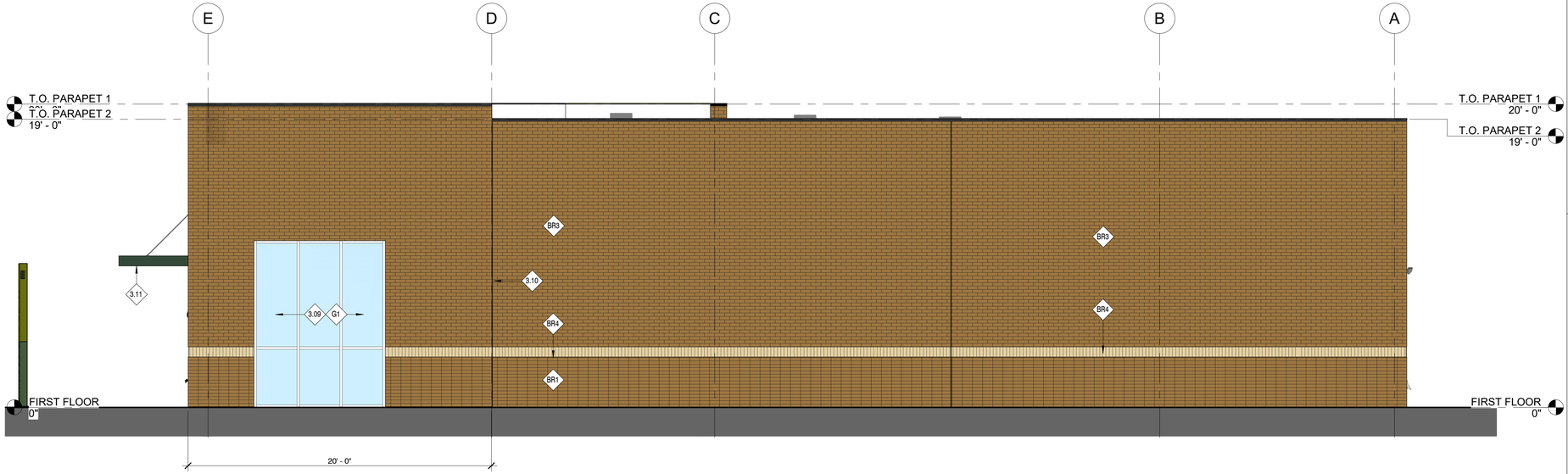
EXTERIOR ELEVATIONS

Project Number: 230094
Drawn By: CAO
Issue Date: XX.XX.XX
DPM: DPM DM: DM CPM: CPM

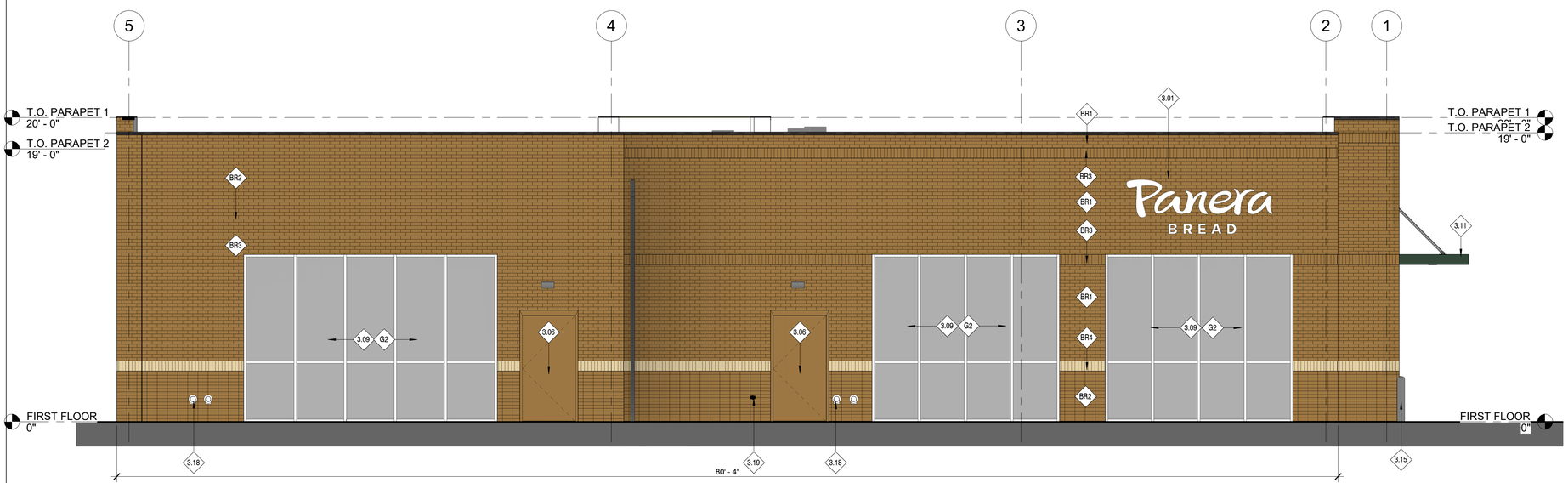
Sheet Number: A200

6/22/2023 11:16:28 AM

PR 2022.04.V1



22 EAST ELEVATION
1/4" = 1'-0"



NORTH ELEVATION = 1526.33 SQUARE FOOT

REQUIRED 30% STOREFRONT = 457.9 SF
PROVIDED STOREFRONT = 458 SF

24 NORTH ELEVATION
1/4" = 1'-0"

KEYED NOTES

3.01 LOCATION OF INTERNALLY ILLUMINATED CLIP LETTERS AND/OR TRADEMARK SYMBOL; PROVIDED AND INSTALLED BY TENANT SIGN VENDOR UNDER SEPARATE PERMIT; G.C. TO PROVIDE BLOCKING IN WALL FOR SIGN AND PROVIDE ACCESS PANEL ON BACKSIDE OF PARAPET FOR ACCESS AS REQUIRED. (UNDER SEPARATE SIGNAGE PERMIT)

3.06 HOLLOW METAL SERVICE DOOR. EXTERIOR PAINT FINISH TO MATCH ADJACENT MATERIAL.

3.09 ALUMINUM STOREFRONT SYSTEM WITH 1" INSULATED SPANDREL GLAZING BY LANDLORD.

3.10 CONTROL JOINT WHERE INDICATED. REFER TO DETAILS FOR FURTHER INFORMATION.

3.11 PRE-MANUFACTURED ALUMINUM CANOPY W/ TIE RODS WITH FINISHED UNDERSIDE, PROVIDED/INSTALLED BY LANDLORD | MANF: AMERICAN PRODUCTS, INC. | COLOR: DARK GREEN, PMS 2411C, CANOPOY TO INCLUDE LIGHTING, INTERNAL DRAIN (TO TIE INTO STORM), CANOPY UNDERSIDE TO HAVE FINISH TO MATCH [SF2].

3.15 6" DIA. CONCRETE BOLLARD | FINISH: PAINT TO MATCH ADJACENT P285

3.18 NICKEL BRONZE NOZZLE RWL/OVERFLOW DRAIN THRU ROOF, MIN. 12" ABOVE GRADE.

3.19 HOSE BIBB | STAINLESS STEEL BOX. REFER TO PLUMBING DRAWINGS.

BR1 BRICK MASONRY WALL SYSTEM | MFR: MODULAR BRICK, COMMON BOND PATTERN |5 COURSE RUNNING + 1 COURSE HEADER| COLOR: MCNEAR - SANTIAGO CREATE MATERIALS CUSTOM BLEND

BR2 BRICK MASONRY WALL SYSTEM | MFR: MODULAR BRICK, STACKED, HORIZONTAL PATTERN| COLOR: MCNEAR - SANTIAGO CREATE MATERIALS CUSTOM BLEND

BR3 BRICK MASONRY WALL SYSTEM | MFR: MODULAR BRICK, STACKED, VERTICAL PATTERN| COLOR: MCNEAR - SANTIAGO CREATE MATERIALS CUSTOM BLEND

BR4 BRICK MASONRY WALL SYSTEM | MFR: MODULAR BRICK, STACKED, VERTICAL PATTERN| COLOR: MCNEAR - TAN BLEND TBD

G1 ALUMINUM STOREFRONT | MFR: KAWNEER TRIFAB VERRSAGLAZE 451T | COLOR: ANODIZED ALUMINUM | 2" x 4 1/2" PROFILE | THERMAL BREAK| 1" CLEAR INSULATED GLAZING: PPG SOLARBAN 70 (OR APPROVED EQUAL)

G2 ALUMINUM STOREFRONT | MFR: KAWNEER TRIFAB VERRSAGLAZE 451T | COLOR: ANODIZED ALUMINUM | 2" x 4 1/2" PROFILE | THERMAL BREAK | 1" INSULATED SPANDREL GLAZING. PPG SOLARBAN 70 (OR APPROVED EQUAL)

6/22/2023 11:15:57 AM

PR 2022.Q4.V1

Item B.

Bakery-Cafe #:

6348

SYSTEM: NEXT-GEN

Project Team:

ARCVISION INCORPORATED
ARCHITECTURE • ENGINEERING • STORE PLANNING
1959 CRAIG ROAD, SUITE 300 ST.LOUIS, MO 63146
p. 314.415.2400 f. 314.415.2300 t. 800.489.2233
www.arcv.com

Professional Seal:

STATE OF MICHIGAN
FREDERICK J. GOGLIA
ARCHITECT
1301043648
LICENSED ARCHITECT
6/22/23

Project Title:

PROTOTYPE - NEW CONSTRUCTION

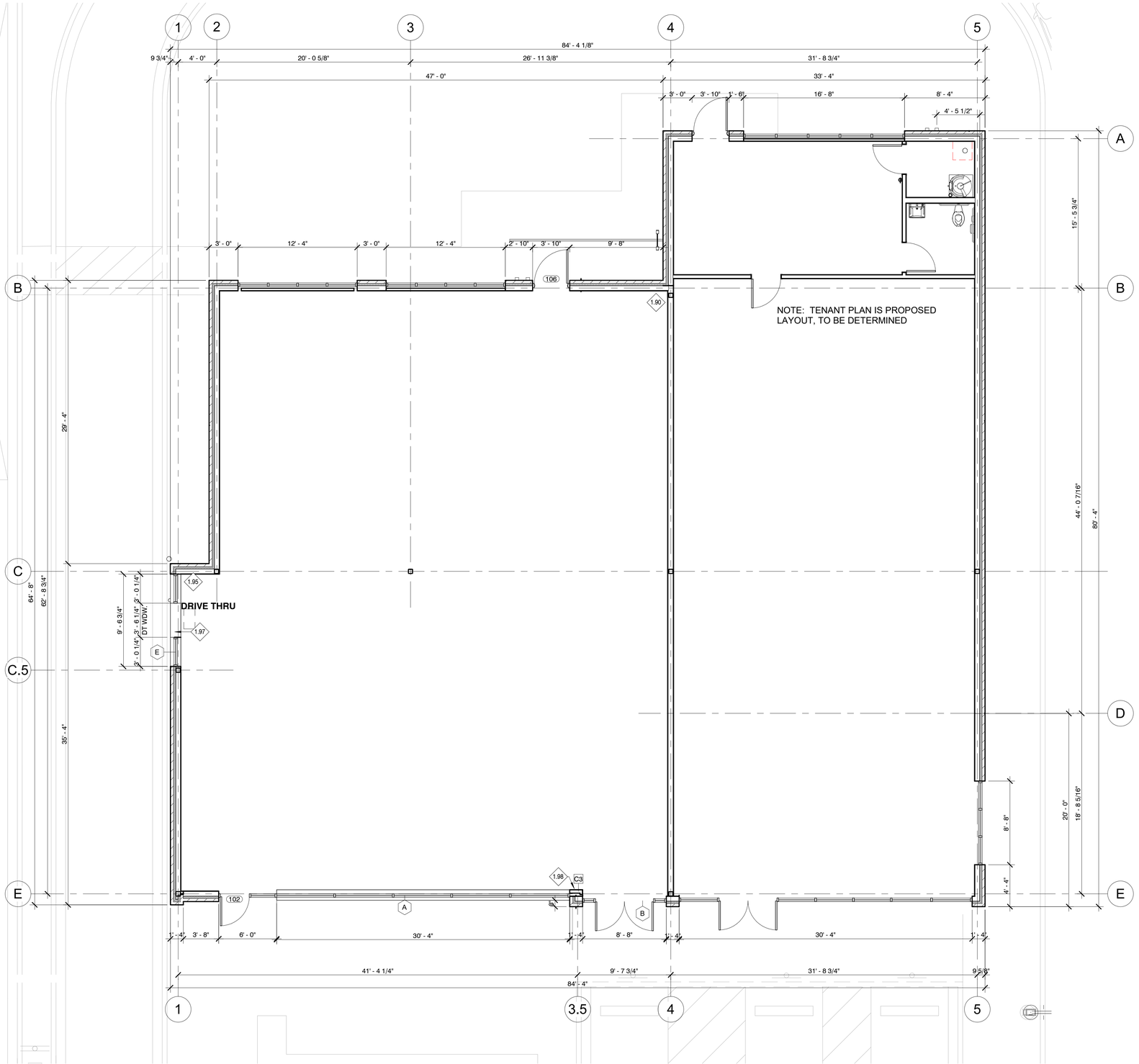
TBD HIGHLAND RD
WHITE LAKE, MI 46383

No.	Description	Date

EXTERIOR ELEVATIONS

Project Number: 230094
Drawn By: CAO
Issue Date: XX.XX.XX
DPM: DPM DM: DM CPM: CPM

Sheet Number: **A201**



24 FLOOR PLAN - DIMENSIONED

3/16" = 1'-0"

6/22/2023 9:56:00 AM

R9.2022.04.V1

Bakery-Cafe #:

6348

SYSTEM: NEXT-GEN

Project Team:

ARCVISION INCORPORATED
ARCHITECTURE • ENGINEERING • STORE PLANNING
1950 CRAIG ROAD, SUITE 300 ST.LOUIS, MO 63146
p. 314.415.2400 f. 314.415.2300 t. 800.489.2233
www.arcv.com

Professional Seal:

STATE OF MICHIGAN
FREDERICK J. GOGLIA
ARCHITECT
1301043648
LICENSED ARCHITECT

6/22/23

Project Title:

PROTOTYPE - NEW CONSTRUCTION

TBD HIGHLAND RD
WHITE LAKE, MI 46383

No.	Description	Date

FLOOR PLAN - DIMENSIONED

Project Number: 230094
Drawn By: CAO
Issue Date: XX.XX.XX
DPM: DPM DM: DM CPM: CPM

Sheet Number: A101

CODE INFORMATION:

APPLICABLE CODES & REGULATIONS:

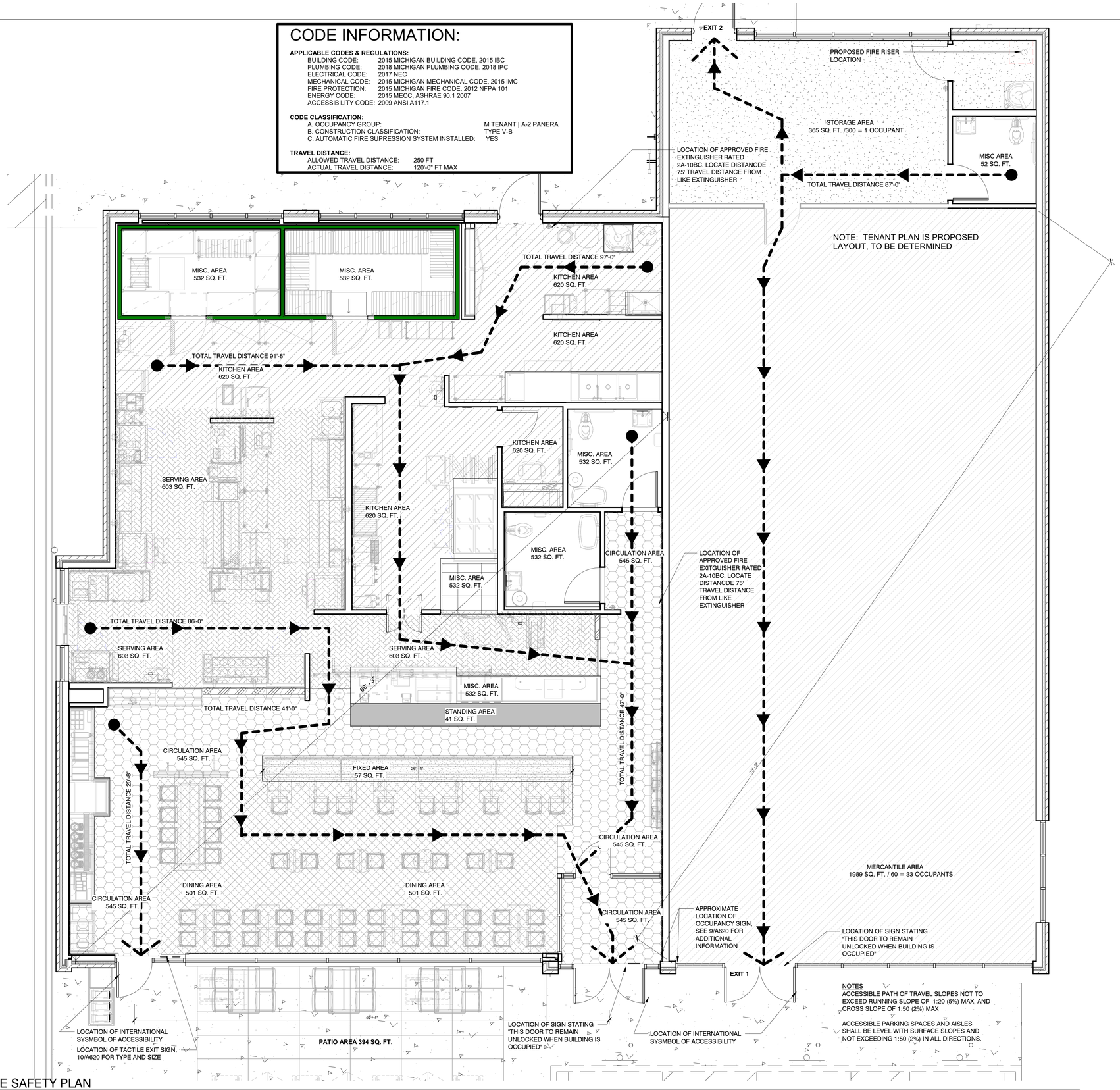
BUILDING CODE:	2015 MICHIGAN BUILDING CODE, 2015 IBC
PLUMBING CODE:	2018 MICHIGAN PLUMBING CODE, 2018 IPC
ELECTRICAL CODE:	2017 NEC
MECHANICAL CODE:	2015 MICHIGAN MECHANICAL CODE, 2015 IMC
FIRE PROTECTION:	2015 MICHIGAN FIRE CODE, 2012 NFPA 101
ENERGY CODE:	2015 MECC, ASHRAE 90.1 2007
ACCESSIBILITY CODE:	2009 ANSI A117.1

CODE CLASSIFICATION:

A. OCCUPANCY GROUP:	M TENANT | A-2 PANERA
B. CONSTRUCTION CLASSIFICATION:	TYPE V-B
C. AUTOMATIC FIRE SUPRESSION SYSTEM INSTALLED:	YES

TRAVEL DISTANCE:

ALLOWED TRAVEL DISTANCE:	250 FT
ACTUAL TRAVEL DISTANCE:	120'-0" FT MAX



24 LIFE SAFETY PLAN
1/4" = 1'-0"

6/22/2023 11:13:39 AM

RB 2022.04.V1

PANERA BUILDING INFORMATION

CONSTRUCTION TYPE	TYPE V - B
SPRINKLERED	BUILDING IS SPRINKLERED

LEGEND - PANERA

CIRCULATION AREA: AREA: 545 SQ. FT.
FIXED SEATING: AREA: 57 SQ. FT. 26'-4" LF
DINING AREA & CAFE: AREA: 501 SQ. FT.
KITCHEN AREA: AREA: 620 SQ. FT.
SERVING AREA: AREA: 603 SQ. FT.
STANDING ROOM: AREA 47 SQ. FT.
MISC. AREA (OVENS, COOLERS, FREEZER AREA): AREA: 532 SQ. FT.
PATIO AREA: AREA: 394 SQ.FT.
INTERIOR AREA (NET): 2,904 SQ. FT
PATIO AREA: 394 SQ FT

ALLOWABLE AREA PER 2015 IBC

TENANT OCCUPANCY	A-2 | ASSEMBLY
MAXIMUM ALLOWABLE BUILDING AREA	6000 SF, ACTUAL PANERA 3,170 SF
TRAVEL DISTANCE (PER 2015 IBC TABLE 1016.2.1)	250 FT ALLOWED (SPRINKLED) | 97 FT ACTUAL

OCCUPANT LOAD OCCUPANT LOAD COUNT TABLE PER 2015 IBC TABLE 1004.1.2

	FUNCTION OF SPACE	OCCUPANT LOAD FACTOR	AREA (SQFT)	OCCUPANTS
DINING AREA	UNCONCENTRATED	15	501	33
CIRCULATION AREA	UNCONCENTRATED	15	545	0
KITCHEN	KITCHEN: COMMERCIAL	200	620	3
SERVICE AREA	KITCHEN: COMMERCIAL	200	603	3
STANDING AREA	STANDING AREA	5	47	9
FIXED SEATING				

BOOTH LENGTHS	COUNT	TOTAL LINEAL LENGTH	LINEAL IN. PER OCC.	TOTAL LINEAL INCHES/ LINEAL IN. PER OCC.
316"	1	26'-4"	24	13

PATIO	SEAT COUNT	28
TOTAL INTERIOR OCCUPANTS:		**63**
TOTAL OCCUPANTS (INCLUDING PATIO):		**91**

EXIT REQUIRMENTS PER 2015 IBC SECTION 1005.3.2

LONGEST INTERIOR DIAGONAL DIMENSION	68'-3"
MIN. DISTANCE BETWEEN DOORWAYS (SPRINKLED)	68'-3"/3 = 22'-9"
ACTUAL DISTANCE BETWEEN CLOSEST DOORWAYS	**40'-4"**

ALLOWABLE EGRESS WIDTH PER 2015 IBC SECTION 1005.3.2

	OCCUPANTS	FACTOR (IN.)	(IN.)
INTERIOR W/ SPRINKLER SYSTEM	65	0.15	9.75
EXTERIOR PATIO SPACE W/OUT SPRINKLER	22	0.20	4.40
MINIMUM EGRESS OPENING WIDTH REQUIRED			14.15
MINIMUM DOOR SIZE (PER 1008.1.1) [CLEAR OPENING]			32.00

	MAIN EXIT (IN.)	SECONDARY (IN.)	TOTAL (IN.)
ACTUAL EGRESS OPENING WIDTH PROVIDED	33.625	33.625	**67.25**

PLUMBING CALCULATIONS PER 2018 INTERNATIONAL PLUMBING CODE, TABLE 403.1

BUILDING OCCUPANCY (TOTAL)	91				
			TOTAL MEN/WOMEN		**46.0**
	WATER CLOSETS		LAVATORIES		OTHER
BUILDING ASSEMBLY	MALE	FEMALE	MALE	FEMALE	
A-2	1:75	1:75	1:200	1:200	1 SERVICE SINK
REQUIRED	1	1	1	1	1
PROVIDED	**1**	**1**	**1**	**1**	**1**

BUILDING INFORMATION - ADJACENT MERCANTILE

CONSTRUCTION TYPE	TYPE V - B
SPRINKLERED	BUILDING IS SPRINKLERED

LEGEND - ADJACENT TENANT

SALES: 1989 SQ. FT.
MISC. AREA: 52 SQ.FT.
STORAGE AREA 365 SQ.FT.
INTERIOR AREA (NET): 2,406 SQ. FT

ALLOWABLE AREA PER 2015 IBC

TENANT OCCUPANCY	M | MERCANTILE
MAXIMUM ALLOWABLE BUILDING AREA	6000 SF, ACTUAL ADJ TENANT 2,573 SF
TRAVEL DISTANCE (PER 2015 IBC TABLE 1016.2.1)	250 FT ALLOWED (SPRINKLED) | 87 FT ACTUAL

OCCUPANT LOAD OCCUPANT LOAD COUNT TABLE PER 2015 IBC TABLE 1004.1.2

	FUNCTION OF SPACE	OCCUPANT LOAD FACTOR	AREA (SQFT)	OCCUPANTS
SALES	UNCONCENTRATED	60	1989	33
STORAGE AREA	UNCONCENTRATED	300	365	1
TOTAL INTERIOR OCCUPANTS:				**34**

EXIT REQUIRMENTS PER 2015 IBC SECTION 1005.3.2

	OCCUPANTS	FACTOR (IN.)	(IN.)
INTERIOR W/ SPRINKLER SYSTEM	34	0.15	5.10
MINIMUM EGRESS OPENING WIDTH REQUIRED			5.10
MINIMUM DOOR SIZE (PER 1008.1.1) [CLEAR OPENING]			32.00

	MAIN EXIT (IN.)	SECONDARY (IN.)	TOTAL (IN.)
ACTUAL EGRESS OPENING WIDTH PROVIDED	65.625	33.625	**99.25**

PLUMBING CALCULATIONS PER 2018 INTERNATIONAL PLUMBING CODE, TABLE 403.1

BUILDING OCCUPANCY (TOTAL)	34				
OCCUPANCY LESS THEN 100 PER 403.2, EXCEPTION 3 (1) UNISEX RESTROOM PROVIDED			TOTAL UNISEX		**34.0**
	WATER CLOSETS		LAVATORIES		OTHER
BUILDING ASSEMBLY	UNISEX		UNISEX		
MERCANTILE	1:500		1:750		1 SERVICE SINK
REQUIRED	1		1		1
PROVIDED	**1**		**1**		**1**

PROTOTYPE - NEW CONSTRUCTION

Item B.

Bakery-Cafe #:

6348

SYSTEM: NEXT-GEN

Project Team:

ARCVISION INCORPORATED
ARCHITECTURE • ENGINEERING • STORE PLANNING
1959 CRAIG ROAD, SUITE 300 ST.LOUIS, MO 63146
p. 314.415.2400 f. 314.415.2300 t. 800.489.2233
www.arcv.com

Professional Seal:

STATE OF MICHIGAN
FREDERICK J. GOGLIA
ARCHITECT
1301043648
LICENSED ARCHITECT
6/22/23

Project Title:

TBD HIGHLAND RD
WHITE LAKE, MI 46383

No.	Description	Date

LIFE SAFETY PLAN

Project Number: 230094
Drawn By: CAO
Issue Date: XX.XX.XX
DPM: DPM DM: DM CPM: CPM

Sheet Number: **G131**

WASTE ROUGH-IN SCHEDULE

PLAN MARK	ITEM NAME	ROUGH-IN	ROUGH-IN LOCATION	REMARKS
11	MOP SINK 36" X 24"	3" WASTE	@ FLOOR	DIRECT CONNECTION -
12A	3 COMP SINK REDUCED SIZE (SS)	FLOOR SINK	@ FLOOR	CONN. 3 COMPARTMENTS WITH 2" COPPER WASTE PIPE WITH TO INDIRECT CONNECTION
13B	2 COMP SINK REDUCED SIZE (SS)	FLOOR SINK	@ FLOOR	EXTEND 1 1/2" WASTE TO INDIRECT CONNECTION TO FLOOR SINK
46ER	DROP-IN SINK (COFFEE)	1 1/2" WASTE	@ 18" A.F.F.	DIRECT CONNECTION PROVIDE W/ COPPER DRAIN LINE
18B	DROP-IN SINK (ESPRESSO)	FLOOR SINK SHARED W/#61	NEARBY	EXTEND COPPER 1 1/2" WASTE TO INDIRECT CONNECTION TO FLOOR SINK
21C	WALL MTD SS HAND SINK (KNEE OPERATED)	1 1/2" WASTE	@ 24" A.F.F.	DIRECT CONNECTION -
23B	ICE MACHINE (W/ REMOTE CONDENSER)	FLOOR SINK SHARED W/#54	@ FLOOR	EXTEND 1" CONDENSATE AND 1" WASTE TO INDIRECT CONN. TO FLOOR SINK
23F	ICE MACHINE (AIR COOLED/ SELF CONTAINED)	HUB DRAIN SHARED W/#24D	@ FLOOR	EXTEND 1" CONDENSATE AND 1" WASTE TO INDIRECT CONN. TO HUB DRAIN
23H	ICE MACHINE (W/ REMOTE CONDENSER)	FLOOR SINK SHARED W/#54D	@ FLOOR	EXTEND 1" CONDENSATE AND 1" WASTE TO INDIRECT CONN. TO FLOOR SINK
24D	ICE STORAGE BIN	HUB DRAIN SHARED W/#23F	@ FLOOR	EXTEND 1" WASTE TO INDIRECT CONNECTION TO HUB DRAIN
25C (ALTERNATE)	ELGE BOTTLE SOFTNER W/ STAND	3/4" CW	PER MANUFACTURER'S RECOMMENDATIONS	EXTEND 3/4" CW FROM ROUGH-IN TO EQUIPMENT CONNECTION
25D	WATER SOFTENER	3" FLOOR DRAIN	NEARBY	COORDINATE ROUTING OF DRAIN LINE WITH EQUIPMENT SUPPLIER
27A	DISHWASHER (UPRIGHT)	FLOOR SINK	@ FLOOR	EXTEND 2" COPPER WASTE PIPE TO INDIRECT CONNECTION TO FLOOR SINK
44.2B.BR	DOUBLE WIDE PROOFER/RETARDER	FLOOR DRAIN	NEARBY	EXTEND 1" DRAIN TO INDIRECT CONNECTION TO FLOOR DRAIN
48A	SINGLE RACK OVEN/GAS	FLOOR DRAIN	NEARBY	EXTEND 1" DRAIN TO INDIRECT CONNECTION TO FLOOR DRAIN
54	SODA/ICE DISP. (8 HD)	FLOOR SINK SHARED W/#23B	@ FLOOR	EXTEND 1" DRAIN TO INDIRECT TO INDIRECT CONN. TO FLOOR SINK
54D	SODA/ICE DISP. (6 HD)	FLOOR SINK SHARED W/#23H	@ FLOOR	EXTEND 1" DRAIN TO INDIRECT TO INDIRECT CONN. TO FLOOR SINK
61	ESPRESSO MACHINE (AUTOMATIC)	FLOOR SINK SHARED W/#18B	NEARBY	EXTEND 1" DRAIN TO INDIRECT CONNECTION TO FLOOR SINK
68A	SOUP RETHERMALIZER	HUB DRAIN	@ FLOOR	EXTEND 1 1/2" COPPER DRAIN PIPE WITH INDIRECT CONNECTION TO HUB DRAIN
71A	COOLER EVAPORATOR	HUB DRAIN	NEARBY	EXTEND 1" DRAIN TO INDIRECT CONNECTION TO HUB DRAIN
72A	FREEZER EVAPORATOR	HUB DRAIN	NEARBY	EXTEND 1" DRAIN TO INDIRECT CONNECTION TO HUB DRAIN

PLUMBING FIXTURE SCHEDULE

PLAN MARK	MANUFACTURER	MODEL	ACCESSORIES	NOTES
FLOOR DRAINS (TYPICAL)	WADE OR EQUAL	1103STD6 W/6" STRAINER	P-TRAP TRAP PRIMER PRECISION PLUMBING PRODUCTS MODEL PP-500	FURNISH FULL GRATE AND 4" HIGH FUNNEL FOR INDIRECT DRAIN FIXTURES
FLOOR CLEANOUT	WADE OR EQUAL	6000		NICKEL BRONZE SECURED TOP
FLOOR SINK	WATTS	FS-740	1/2 GRATE	12"x12"x8" W/PORCELAIN GRATE
FLOOR SINK	WATTS	FS-710	1/2 GRATE	8"x8"x8" W/PORCELAIN GRATE HIGH CAPACITY SOUP STATION ONLY
P6 LAV	KOHLER	SOHO K-2084-R	1-1/4x1-1/2 P-TRAP STOP VALVES	MOUNTING HGT PER ADA, SEE ARCH PLANS
FAUCET (FOR LAV)	TOTO	TEL105-D10EM	SENSOR FAUCET WITH MIXING VALVE	CHROME, PROVIDE MANUFACTURER'S OR EQUAL/VANT 0.5 AERATOR
Q1 WC (ADA)	AMERICAN STD.	3043.001	WHITE-OPEN FRONT SEAT. NO COVER	W/ SLOAN ROYAL # 111-1.28 FLUSH VALVE PER ADA
FPHB (FREEZEPROOF HOSEBIBB)	JAY R. SMITH	5609QT OR EQUAL	KEY OPERATED INTEGRAL VACUUM BREAKER	1/2" FEMALE INLET 3/4" HOSE CONNECTION
GREASE INTERCEPTOR	SCHIER PRODUCTS	GB-250		100 GPM; BUILT-IN FLOW CONTROL VALVE; CAPACITIES: LIQUID : 277 GAL; GREASE: 1,895 LBS @ 100 GPM; SOLIDS: 69 GAL PROVIDE TRAFFIC RATED MANHOLES AND MANHOLE EXTENSIONS
WATER HEATER	A. O. SMITH	BTH-199	DIRECT VENT SEALED COMBUSTION	100 GALLON, 199 MBH, 230 GPH RECOVERY, PROVIDE EXPANSION A.O. SMITH TANK MODEL TW-12-5

DOMESTIC WATER ROUGH-IN SCHEDULE

PLAN MARK	ITEM NAME	ROUGH-IN	ROUGH-IN LOCATION	REMARKS
11	36" X 24" MOP SINK	1/2" 140° HW & CW	@ 36" A.F.F.	SEE PLUMBING FIXTURE SCHEDULE FOR FAUCET MODEL NUMBER W/BFP
12A	3 COMP SINK REDUCED SIZE (SS)	(2) FAUCETS WITH 1/2" 140° HW & 1/2" CW	@ 14" A.F.F.	SEE EQUIPMENT SCHEDULE, SHEET EQ4.1, FOR FAUCET MODEL NUMBER
13B	2 COMP SINK REDUCED SIZE (SS)	1/2" HW & CW	@ 14" A.F.F.	SEE EQUIPMENT SCHEDULE, SHEET EQ4.1, FOR FAUCET MODEL NUMBER
46ER	DROP-IN SINK (COFFEE)	1/2" HW & FCW	@ 18" A.F.F.	SEE EQUIPMENT SCHEDULE, SHEET EQ4.1, FOR FAUCET MODEL NUMBER
18B	INTEGRAL SINK FOR EQ. #403A (ESPRESSO)	1/2" HW & CW	@ 18" A.F.F.	SEE EQUIPMENT SCHEDULE, SHEET EQ4.1, FOR FAUCET MODEL NUMBER
19D	POT FILL FAUCET	1/2"HW & FCW	@ 45" A.F.F.	SEE EQUIPMENT SCHEDULE, SHEET EQ4.1, FOR FAUCET MODEL NUMBER
21C	WALL MTD SS HAND SINK (KNEE OPERATED)	1/2" HW & CW	@ 24" A.F.F.	SEE EQUIPMENT SCHEDULE, SHEET EQ4.1, FOR FAUCET MODEL NUMBER
23B	ICE MACHINE (W/ REMOTE CONDENSER)	1/2" DFCW	@ 96" A.F.F.	EXTEND 1/2" DFCW FROM ROUGH-IN TO EQUIPMENT CONNECTION W/BFP
23F	ICE MACHINE (AIR COOLED/ SELF CONTAINED)	1/2" DFCW	@ 72" A.F.F.	EXTEND 1/2" DFCW FROM ROUGH-IN TO EQUIPMENT CONNECTION W/BFP
23H	ICE MACHINE (W/ REMOTE CONDENSER)	1/2" DFCW	@ 96" A.F.F.	EXTEND 1/2" DFCW FROM ROUGH-IN TO EQUIPMENT CONNECTION W/BFP
25B	WATER FILTER (4 POD)	3/4" SCW	@ 96" A.F.F.	SEE DETAIL ON SHEET P4.1
25C (ALTERNATE)	ELGE BOTTLE SOFTNER W/ STAND	3/4" CW	PER MANUFACTURER'S RECOMMENDATIONS	EXTEND 3/4" CW FROM ROUGH-INS TO EQUIPMENT CONNECTIONS
25D	WATER SOFTNER	1-1/2" CW INLET & 1-1/2" SW OUTLET	@ 90" A.F.F.	EXTEND 1-1/2" CW FROM ROUGH-INS TO EQUIPMENT CONNECTIONS
27A	DISHWASHER (UPRIGHT)	3/4" 140° HW	@ 72" A.F.F.	EXTEND 3/4" 140° HW FROM ROUGH-IN TO CONNECTION TO EQUIPMENT W/BFP
42C	CARBONATOR	1/2" DFCW SHARED W/#54	@ 24" A.F.F.	EXTEND 1/2" DFCW FROM ROUGH-IN TO CONNECTION TO EQUIPMENT W/S.S. BFP
44.2B.BR	DOUBLE WIDE PROOFER/RETARDER	1/2" FCW	@ 84" A.F.F.	EXTEND 1/2" FCW FROM ROUGH-IN TO CONNECTION TO EQUIPMENT W/BFP
48A	SINGLE RACK OVEN/GAS	1/2" FCW	@ 105" A.F.F.	EXTEND 1/2" FCW FROM ROUGH-IN TO CONNECTION TO EQUIPMENT W/BFP
54	SODA/ICE DISP. (8 HD)	1/2" DFCW SHARED W/#42C	@ 24" A.F.F.	EXTEND 1/2" DFCW FROM ROUGH-IN TO CONNECTION TO EQUIPMENT W/BFP
54D	SODA/ICE DISP. (6 HD)	1/2" DFCW SHARED W/#42C	@ 24" A.F.F.	EXTEND 1/2" DFCW FROM ROUGH-IN TO CONNECTION TO EQUIPMENT W/BFP
56A	TEA BREWER	1/2" FCW	@ 46" A.F.F.	EXTEND 1/2" FCW FROM ROUGH-IN TO CONNECTION TO EQUIPMENT W/BFP
58F	COFFEE MAKER	1/2" FCW	@ 46" A.F.F.	EXTEND 3/8" FCW FROM ROUGH-IN TO CONNECTION TO EQUIPMENT W/BFP
61	ESPRESSO MACHINE (AUTOMATIC)	1/2" FCW	RUN IN CASEWORK	EXTEND 3/8" FCW FROM ROUGH-IN TO CONNECTION TO EQUIPMENT W/BFP
68A	SOUP RETHERMALIZER	1/2" HW	@ 12" A.F.F.	EXTEND 1/2" HW FROM ROUGH-IN TO CONNECTION TO EQUIPMENT W/BFP
77A	CHEMICAL DISPENSER @ MOP SINK	1/2" 140° HW	@ 48" A.F.F.	INSTALL 1/2" 140° HW HOSEBIBB W/ VACUUM BREAKER & BFP
77B	CHEMICAL DISPENSER @ 3-COMP SINK	1/2" 140° HW & CW	@ 10" A.F.F.	INSTALL 1/2" 140 DEG. HW & CW ROUGH-INS BELOW SINK /WVACUUM BREAKERS & BFPS. PROVIDE SHUT OFF VALVES AND TEMPERING VALVE PER ECOLAB TEMPERING VALVE INSTALLATION GUIDE. INSTALL TEMPERING VALVE BELOW SINK AND PROVIDE SHUT-OFF VALVE ON TEMPERED LINE. DELIVERY WATER TEMPERATURE TO DISPENSER AFTER TEMPERING VALVE SHALL BE BETWEEN 70 DEG. AND 120 DEG. .F
77C	CHEMICAL DISPENSER @ DISHWASHER	1/2" 140° HW	@ 48" A.F.F.	INSTALL 1/2" 140° HW HOSEBIBB W/ VACUUM BREAKER & BFP

CROSS CONNECTION CONTROL SCHEDULE

FIXTURE	MAKE	MODEL	ASSE, ASME OR ANSI STANDARD
MOP SINK (FAUCET CONTAINS INTERGRAL BACKFLOW DEVICE)	INTEGRAL	-	ASME A112.18.1 ANSI/NSF 61/9
DISHWASHER	WATTS	LF008PCQT	ASSE 1056
ICE MAKER (ABOVE SODA)	AIR GAP	INTERNAL	ASME A112.1.2
ICE MACHINE	AIR GAP	INTERNAL	ASME A112.1.2
CARBONATOR	WATTS	SD-3	ASSE 1022
COFFEE BREWER	WATTS	SD-3	ASSE 1022
TEA BREWER	WATTS	SD-3	ASSE 1022
SOUP RETHERMALIZER	AIR GAP	-	ASME A112.1.2
ESPRESSO	WATTS	SD-3	ASSE 1022
BOTTLE SOFTNER	WATTS	LF009QT	ASSE 1013
WATER FILTER SYSTEM	WATTS	LF009QT	ASSE 1013
RACK OVEN	WATTS	LF007QT	ASSE 1015
DECK OVEN	WATTS	LF007QT	ASSE 1015
PROOFER	WATTS	LF007QT	ASSE 1015
CHEMICAL DISPENSER	WATTS	LF009 W/ AIR GAP FITTING LF909AGA	-
FREEZEPROOF HOSEBIBB	WATTS	-	ASSE 1011
3-COMPARTMENT SINK	AIR GAP	-	ASME A112.1.2
VEGITABLE PREP SINK	AIR GAP	-	ASME A112.1.2
HAND SINKS	AIR GAP	-	ASME A112.1.2
DROP-IN SINKS	AIR GAP	-	ASME A112.1.2
LAVATORIES	AIR GAP	-	ASME A112.1.2
WATER CLOSETS (FLUSH VALVE)	INTEGRAL	-	ASSE 1001
URINAL (FLUSH VALVE)	INTEGRAL	-	ASSE 1001
WATER HEATER	WATTS	LFN360	ANSI Z21.22

PROVIDE APPROPRIATE BACK FLOW PREVENTER AT OTHER EQUIPMENT AS REQUIRED BY CODE.

PLUMBING SPECIFICATIONS

1. GENERAL:

1.1 ALL PLUMBING WORK INCLUDING INSTALLATION, EQUIPMENT, FIXTURES AND PIPING SHALL BE INSTALLED IN STRICT COMPLIANCE WITH LOCAL CODE AND ADOPTED ORDINANCES AND REGULATIONS SET FORTH BY THE AJH (AUTHORITY HAVING JURISDICTION).

1.2 ROUTING OF ALL SANITARY PLUMBING, DOMESTIC WATER PIPING AND GAS PIPING AS SHOWN ON THE PLANS IS SHOWN WITH THE INTENTION OF INDICATING THE APPROXIMATE LOCATION OF EXISTING CONDITIONS, AND NEW ITEMS. PLUMBING CONTRACTORS SHALL VISIT THE JOB SITE CONDITIONS PRIOR RO SUBMITTING BIDS OR STARTING WORK. THE CONTRACTOR SHALL COORDINATE THE INSTALLATION OF HIS WORK WITH THE WORK OF ALL OTHER TRADES TO AVOID INTERFERENCE. CONTRACTORS MAY DEVIATE FROM THE LOCATION OF PIPING SHOWN IF INSTALLATION COMPLIES WITH LOCAL CODES AND INDUSTRIAL PRACTICES, AND IF THE AJH AND OWNER'S REPRESENTATIVE APPROVE. ITEMS NOT SHOWN ON THE PLANS OR SHOWN IN CONFLICT WITH AND CODE, REGULATION OR EXISTING CONDITIONS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY. THE CONTRACTOR IS RESPONSIBLE FOR INSTALLING ALL WORK IN ACCORDANCE WITH LOCAL CODES.

1.3 PRIOR TO SUBMISSION OF THE CONTRACTORS COST ESTIMATE FOR WORK INCLUDED UNDER THIS PROJECT, THE CONTRACTOR SHALL VISIT THE JOB SITE TO EXAMINE ALL EXISTING CONDITIONS RELATED TO HIS WORK, AND UPON FINAL EXAMINATION OF SUCH A FINAL PROPOSAL AS EVIDENCE THAT THIS CONTRACTOR HAS VISITED SAID SITE AND VERIFIED ALL EXISTING CONDITIONS. CLAIM OF ADDITIONAL WORK OR ADDENDUMS DUE TO NON-VERIFICATION OF EXISTING CONDITIONS WILL NOT BE CONSIDERED BY THE OWNER. ALL ADDITIONAL WORK WHICH IS NOT CLEARLY APPROVED PRIOR TO PERFORMANCE OF SUCH WORK WILL BE CHARGED TO THE CONTRACTOR, AND IF NOT SETTLED WILL BE HELD FROM HIS FINAL PAYMENT.

2. MATERIALS:

2.1 DOMESTIC WATER PIPING:

WATER PIPING SHALL BE TYPE-L COPPER WITH WROUGHT FITTINGS. LEAD FREE SOLDER OR SILVER SOLDER SHALL BE USED AT ALL POINTS OF CONNECTION. HANGERS SHALL BE CLEVIS TYPE HANGERS AND SHALL BE USED ON ALL PIPING AT INTERVALS AS REQUIRED BY CODE. THE CONTRACTOR SHALL ALLOW ADDITIONAL CLEARANCE FOR EXPANSION AND CONTRACTION FOR INSULATION AND NON-INSULATED PIPING. AT THE CONTRACTORS OPTION CROSS LINKED ALL POLYETHYLENE (PEX) PIPING MAY BE USED WHERE ALLOWED BY AUTHORITY JURISDICTION, IF PEX IS USED CONTRACTOR BEARS SEISMIC SUBMISSION REQUIRED. COMPONENTS OF THE POTABLE WATER SYSTEM SHALL COMPLY WITH LEAD FREE REQUIREMENTS AS NOTED IN SECTION 1417 OF THE SAFE DRINKING ACT.

2.2 DRAIN,WASTE AND VENT PIPING:

DRAIN, WASTE, AND VENT PIPING SHALL BE SCHEDULE 40 PVC, AS REQUIRED. PVC SHALL NOT BE USED IN RETURN AIR PLENUMS WHERE PROHIBITED BY CODE. WHERE FLOOR OR HUB DRAINS AS SHOWN AS CAST IRON THE CONTRACTOR SHALL PROVIDE A SUITABLE COUPLING WHICH IS APPROVED BY CODE.

ALL CAST IRON SOIL PIPE/FITTINGS BELOW OR ABOVE GROUND SHALL BEAR THE COLLECTIVE TRADEMARK OF CISPI AND/OR BE "NSF INTERNATIONAL".

ALL STANDARD COUPLINGS SHALL BE IN COMPLIANCE TO CISPI 310 (LATEST EDITION), BEARING THE MARK OF NSF CISPI 310 (LATEST EDITION), BEARING THE MARK OF NSF INTERNATIONAL.

OR

AT THE CONTRACTOR'S OPTION AND WHERE ALLOWED BY CODE AND THE LOCAL AUTHORITY HAVING JURISDICTION SCHEDULE 40 PVC-DWV MAY BE USED. CONDENSATE DRAIN LINES FOR COOLERS AND FREEZER SHALL BE COPPER.

3. VALVES:

SHUT OFF VALVES SHALL BE EITHER GATE-TYPE OF BALL VALVES BY "CRANE", "STOCKHAM" OR "POWELL". MIXING VALVES SHALL BE BY "LAWLER" OR APPROVED EQUAL BACKWATER VALVES SHALL BE BY "ZURE" OR APPROVED EQUAL.

4. PLUMBING SPECIALITIES:

4.1 AIR CHAMBERS: SHALL BE CONSTRUCTED OF (LEAD FREE) TYPE-L COPPER. AIR CHAMBERS SHALL BE ONE SIZE LARGER THAN THE SUPPLY PIPING, AND SHALL BE 18 INCHES LONG, PROPERLY CAPPED AND SUPPORTED. FACTORY MANUFACTURED ITEMS CAN BE SUBSTITUTED AT THE CONTRACTORS OPTION BY "NIBCO", "WADE" OR EQUAL.

4.2 CLEAN OUTS: WALL CLEAN OUTS SHALL HAVE STAINLESS STEEL COVERS AS MANUFACTURED BY "WADE" OR APPROVED EQUAL. FLOOR CLEAN OUTS SHALL HAVE SATIN FINISHED TOP, IN FINISHED AREAS AND SATIN BRONZE CAP IN AREAS WHICH ARE NOT FINISHED. CLEAN-OUTS SHALL BE MANUFACTURED BY "WADE" OR APPROVED EQUAL.

4.3 FIXTURES: PLUMBING FIXTURES SHALL BE AS SPECIFIED ON THESE PLANS OR ON THE ARCHITECTURAL PLANS. ALL FIXTURES SHOULD MEET ADA REQUIREMENTS WHERE APPLICABLE. FIXTURES SHOULD BE OF THE HIGHEST QUALITY BY "AMERICAN STANDARD", "KOHLER" OR APPROVED EQUAL AND SHALL MEET THE LEAD FREE REQUIREMENTS AS NOTED IN SECTION 1417 OF THE SAFE DRINKING WATER ACT.

4.4 WATER HEATERS: IF NEW WATER HEATER(S) ARE TO BE INSTALLED THEY SHALL BE AS SPECIFIED ON THE PLANS, AND SHALL BE OF COMMERCIAL GRADE, AND AGA APPROVED IF GAS FIRED AND UL APPROVED IF ELECTRIC. HEATERS SHALL HAVE A 150 PSI WORKING PRESSURE RATING. WATER HEATERS AND ALL COMPONENTS SHALL MEET THE LEAD FREE REQUIREMENTS AS NOTED IN SECTION 1417 OF THE SAFE DRINKING WATER ACT.WATER HEATER INSTALLATION MANUALS SHALL BE GIVEN TO THE OWNER. SEE PLUMBING FIXTURE SCHEDULE.

4.5 GAS PIPING: ALL GAS PIPING SHALL BE SIZED, INSTALLED, TESTED, AND LABELED IN ACCORDANCE WITH LOCAL CODE. GAS PIPING SHALL BE SCHEDULE 40 BLACK IRON. BUSHINGS ARE PROHIBITED. BELL REDUCERS SHALL BE INSTALLED AT REDUCTION IN PIPE SIZE. GROUND JOINTS UNIONS AND SHUT-OFF VALVES SHALL BE INSTALLED AT ALL GAS PIPING APPLIANCES. FLEXIBLE GAS LINES ARE PROHIBITED ON STATIONARY APPLIANCES AND SHALL BE ATTACHED TO ANY FLEXIBLE CONNECTOR AND THE FLOOR SUCH THAT THE FLEXIBLE CONNECTOR CANNOT BE OVER EXTENDED. PAINT EXPOSED PIPING GOING TO OR ON ROOF WITH (ZINC RICH GALVANIZED) PAINT FOR CORROSION PROTECTION. IF REQUIRED BY LOCAL JURISDICTION USE HOT DIPPED, ZINC COATED (GALVANIZED) ASTM A53 PIPE.

5. EXECUTION:

5.1 ALL PLUMBING FIXTURES, EQUIPMENT AND PIPING SHALL BE INSTALLED PER LOCAL CODE AND ESTABLISHED INDUSTRY PRACTICES. LOCATE ALL PIPING, AS SHOWN ON PLANS.

5.2 COORDINATE WITH ALL OTHER TRADES TO AVOID INTERFERENCES, AND ADHERE TO ALL SPECIFICATIONS AND MANUFACTURERS GUIDELINES.

5.3 RUN ALL DOMESTIC WATER PIPING AS HIGH AS POSSIBLE. INSTALL HANGERS AND STRAPPING, ALLOWING FOR EXPANSION AND CONTRACTION OF PIPING. DO NOT HANG OR SUPPORT OTHER EQUIPMENT OR PIPING FROM WATER LINES. SEPARATE HOT AND COLD WATER LINES A MINIMUM OF SIX (6) INCHES. INSULATE ALL PIPING WITH INSULATION WHICH MEETS OR WITH INSULATION WHICH MEETS OR EXCEEDS 25/50 RATINGS.

5.4 INSTALL SOIL, WASTE AND VENT PIPING WITH A MINIMUM SLOPE OF 1/4" PER FOOT IN THE DIRECTION OF FLOW FOR DRAINS AND AGAINST THE FLOW OF VENT GASES. NO FIXTURE SHALL HAVE AN S-TRAP OR BE DOUBLED TRAPPED.

6. VALVES:

LOCATED VALVES SO AS TO BE ACCESSIBLE AND SO THAT SEPARATE SUPPORT CAN BE PROVIDED WHEN NECESSARY. INSTALL ALL STEMS UPRIGHT. DO NOT INSTALL VALVES OF DISSIMILAR COMPOSITION WITHOUT AN APPROVED DIELECTRIC FITTINGS.

7. TEST AND STERILIZATION:

TEST AND STERILIZE ALL PLUMBING PIPING INCLUDING DRAINS, WASTE, VENTS AND WATER PIPING PER LOCAL CODES AND REGULATIONS.

Item B.

Bakery-Cafe:

6348

SYSTEM: G4 (ARIA)

Project Team:

ARCVISION INCORPORATED
ARCHITECTURE • ENGINEERING • STORE PLANNING
1950 CRAIG ROAD, SUITE 300 ST. LOUIS, MO 63146
PHONE: 314.415.2400 www.arcv.com

Professional Seal:

STATE OF MICHIGAN
ROBERT J. MEM
ENGINEER
No. 6201056088
PROFESSIONAL ENGINEER

5/5/23

Project Title:

PROTOTYPE - NEW CONSTRUCTION

Bakery Cafe 6348
HWY 50 # BOGIE ROAD
WHITE LAKE, MI 46383

Panera BREAD®

No.	Description	Date

PLUMBING SPECIFICATIONS AND SCHEDULES

Project Number: 230093
Drawn By: Author
Issue Date: XX.XX.XX
Sheet Number: **P402**

DPM: JUSTIN K. DM: ALLISON M. CPM: CHARLES

Director's Report

Project Name: Alpine Valley

Description: Amended final site plan approval

Date on Agenda this packet pertains to: July 20, 2023

☐Public Hearing

☒Initial Submittal

☐Revised Plans

☐Preliminary Approval

☒Final Approval

☐Special Land Use

☐Rezoning

☐Other:

Contact	Consultants & Departments	Approval	Denial	Approved w/Conditions	Other	Comments
Sean O'Neil	Planning Director	☐	☐	☐	☒	
DLZ	Engineering Consultant	☐	☐	☐	☒	See letter dated 07/05/2023.
Justin Quagliata	Staff Planner	☐	☐	☐	☒	See letter dated 06/28/2023.
Jason Hanifen	WLT Fire Marshal	☐	☐	☐	☒	See letter dated 07/06/2023.

DLZ
ARCHITECTURE • ENGINEERING • PLANNING
SURVEYING • CONSTRUCTION SERVICES

INNOVATIVE IDEAS
EXCEPTIONAL DESIGN
UNMATCHED CLIENT SERVICE

July 5, 2023

Sean O' Neil
Community Development Department
Charter Township of White Lake
7525 Highland Road
White Lake, Michigan 48383

RE: Alpine Valley Building Addition- Preliminary Site Plan, Final Site Plan, and Final Engineering Review – 2nd Review

Ref: DLZ No. 2345-7567-07 Design Professional: Kieft Engineering., Inc.

Dear Mr. O' Neil,

Our office has performed PSP, FSP, and FEP reviews for the above-mentioned revised plan dated June 5, 2023. The plans were reviewed for feasibility and conformance with the Township Engineering Design Standards.

General Site Information

This 134.48 acre site is located north of M-59, between Hill and Porter Roads.

Site Improvement Information:

- Building addition to the existing ski shop/lounge and common area building totaling 926 square feet.
- Restriping of existing parking spaces to result in 8 ADA spaces.
- Proposed paved asphalt parking addition for 5 ADA spaces, including one van accessible space.
- Asphalt repaving and widening of a portion of existing drive.
- Construction of a sedimentation basin between existing drive and pond.
- Site is currently served by well and septic.

We offer the following comments. Note that comments from our previous review dated May 8, 2023 are in *italics*. Responses to those comments are in **bold**. New comments are in standard font. We note that no response letter to our May 8, 2023 comments was received with this submittal. In addition, many additional changes/improvements have been made to the plan versus the first submittal; the design engineer should expect additional commentary.

The following item should be noted with respect to Planning Commission review:

a) *Currently, there are no ADA parking spaces on the existing asphalt parking lot. In addition, it is unknown whether the existing building is ADA accessible. We defer to the Township regarding whether the site shall be required to be brought up to current ADA standards.* **Comment addressed. 8 ADA spaces are now proposed on the existing parking lot and 5 new paved spaces are proposed. Per the developer, in a letter dated June 13, 2023, all parts of the existing building have entrances at ground level; however, whether these are ADA compliant is unknown.**

Final Site Plan/ Final Engineering Plan Comments

1. *Although engineer seal has been provided on the plan, the plan will also require the engineer's signature.* **Comment addressed. Signature has now been provided.**
2. *Provide standard White Lake Township notes on plan per White Lake Township Engineering Design Standards Section A.8. a.-d.* **Comment addressed. Notes have been provided.**
3. *Show existing well and septic fields on plan so as to ensure building addition location does not conflict with these items.* **Comment addressed. Existing well and septic fields are now shown on plan.**
4. *Architectural Sheet A-501-Retaining Wall Section – Decorative railing shall be a minimum of 42" in height. Please revise from 34" minimum to 42" minimum on the detail.* **Comment outstanding. In addition, add note to Sheet 3 that a decorative railing is required for the proposed boulder wall adjacent to the proposed parking area.**
5. Sheet 2- Existing striped parking space count appears incorrect; we total 318 spaces based on what is identified on the plan sheet.
6. Sheet 3- Zoning Ordinance 5.11.Q xviii requires Concrete curbing between the parking stalls and adjacent landscaping, we defer to the Township Planning Department if this requirement applies to this installation as it is a modification to an existing site with no other concrete curbing.
7. Sheet 3- Township Standards call for Dual striping to be provided for parking stalls, we defer to Township Planning Department if that will apply to the proposed parking spaces as the existing site has single line striping. Reference Zoning Ordinance 5.11.Q. xi.
8. Sheet 3- Provide dimensions for all ADA spaces. In addition, for the proposed 5 ADA spaces, provide proposed grades; grades must meet ADA standards. For the existing paved area, the 8 ADA spaces shall also meet ADA standards in terms of grading.
9. Sheet 3- It appears more than one benchmark is now shown on plans. Please provide a benchmark listing (all on NAVD88 datum) on plan.
10. Sheet 3- Pond 1- Is additional flow being added to this pond? If so, demonstrate that adequate capacity exists in pond to accommodate this additional flow.
11. Sheet 3- Western ES-2 (note that there are two separate end sections both labeled as ES-2 – please relabel) appears to be proposed directly over the existing gas line which may be a potential conflict.

12. Sheet 3- ES-2 to ES-2- Provide pipe size, type, slope, profile, and sizing per WLT Engineering and Design Standards.
13. Sheet 3- Several removals are shown on this sheet; all removals should also be shown on the Demolition Plan.
14. Sheet 3- Provide sedimentation basin sizing calculations as well as profile.
15. Sheet 3- Proposed drive elevation of 59.2 near the SE portion of site - provide additional spot grades to the east just adjacent to this proposed grade to demonstrate that drainage will not collect at this point and will instead flow toward the 958.9 spot grade.
16. Sheet 3- Was existing drainage form parking lot previously being routed to Pond 2? If so, what is pond volume and what is increase in pond volume with additional parking and driveway impervious area increase? Is there an existing restrictor at the pond outlet if there is an outlet? Provide details including calculations to demonstrate that the addition of proposed impervious areas will not adversely impact pond storage and/or the downstream regulated wetlands.
17. Sheet 4- What is the existing concrete tank (indicated to be removed) next to the building for? Please specify.

Required Permits and Approvals

The following permits and approvals will be required:

1. SESC permit from OCWRC.
2. A wetlands permit from EGLE may also be required should Pond 2 discharge additional flow to the regulated wetlands to the south or if work shall be required to the pond at or near the pond outlet (if an outlet exists).

Recommendation

Preliminary Site Plan

The plan demonstrates engineering feasibility at the preliminary level of review, and we are therefore recommending approval of the preliminary site plan.

Final Site Plan/Final Engineering Plan

Comments 4-17 listed above shall be required to be addressed and the plans resubmitted for our review***. To help facilitate our review of the revised, resubmitted plan, please provide a response letter addressing the above comments.***

Please feel free to contact our office should you have any questions.

Sincerely,

DLZ Michigan

Michael Leuffgen, P.E.
Department Manager

Victoria Loemker, P.E.
Senior Engineer

Cc: Justin Quagliata, Community Development, *via email*
Hannah Micallef, Community Development, *via email*
Aaron Potter, DPS Director, White Lake Township, *via email*
Jason Hanifen, Fire Marshall, White Lake Township, *via email*

X:\Projects\2023\2345\756707 White Lake Townshi\Alpine Valley SP Review.02\Review.02.docx

WHITE LAKE TOWNSHIP
PLANNING COMMISSION

REPORT OF THE
COMMUNITY DEVELOPMENT DEPARTMENT

TO: **Planning Commission**

FROM: **Sean O'Neil, AICP, Community Development Director**

Justin Quagliata, Staff Planner

DATE: **June 28, 2023**

RE: **Alpine Valley – Building Addition**
Preliminary and Final Site Plan – Review #2

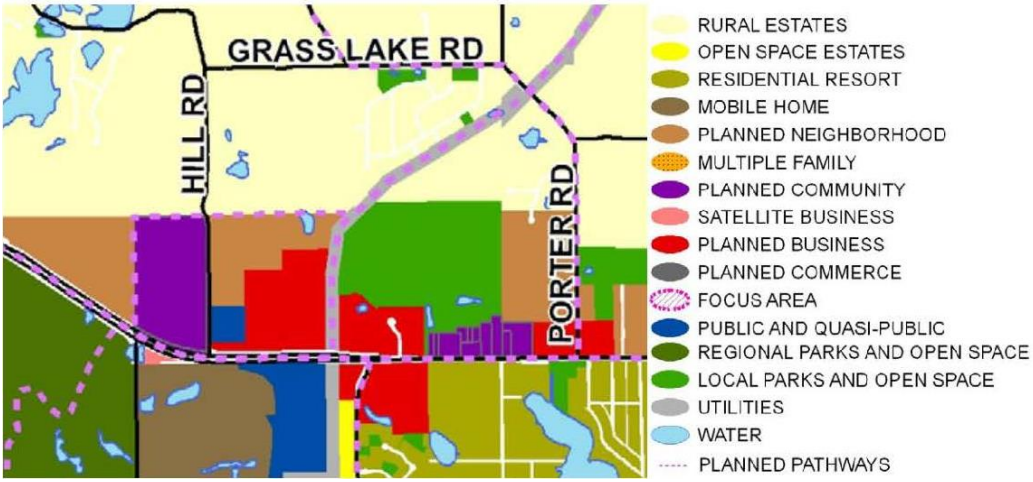
Staff reviewed the revised site plan prepared by Kieft Engineering (revision date June 5, 2023). The following comments from the first review letter dated May 8, 2023 are listed below. Responses to the comments are provided in (red).

Wisconsin Resorts, Inc. has requested site plan approval to construct a building addition at 6775 Highland Road (Parcel Number 12-21-100-057), located on the north side of Highland Road, west of Porter Road. The approximately 26.9-acre subject site is zoned PD (Planned Development) and currently occupied by Alpine Valley Ski Resort. The ski resort includes 11 parcels totaling 134.48 acres. Nine of the 11 parcels are zoned PD; the other two parcels are zoned Recreation and Open Space (ROS). The proposed two-level addition is approximately 1,984 square feet in size. A small portion of the existing building (approximately 66 square feet) would be demolished to facilitate the addition.

Master Plan

The Future Land Use Map from the Master Plan designates the subject site in the Recreation and Open Space category, which includes Township, County, Regional, and State parks, recreation areas and major open spaces, as well as larger private facilities of quasi-public organizations, such as the Girl Scouts.

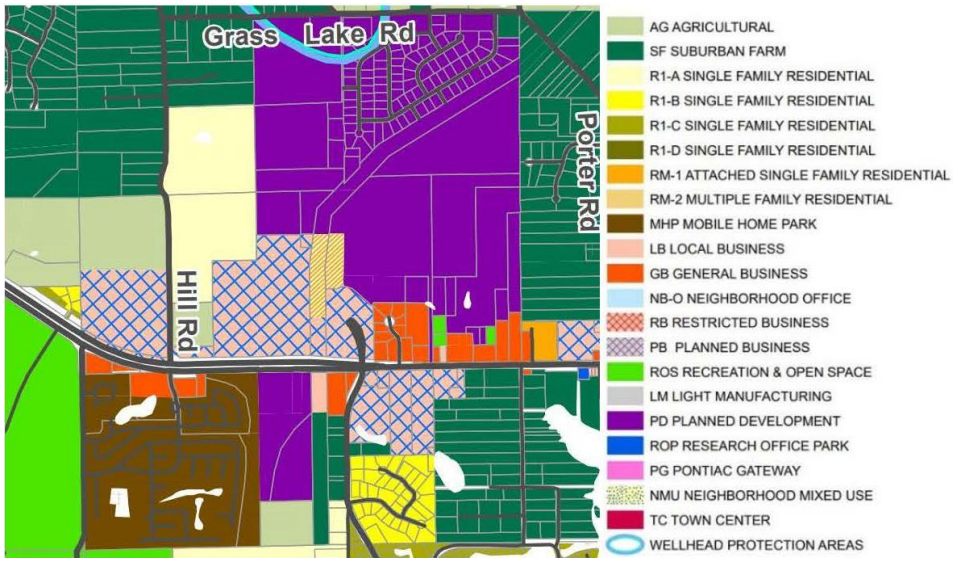
FUTURE LAND USE MAP



Zoning

Ski Resorts are principal permitted uses in the PD zoning district, which requires a minimum lot area 10 acres. The PD district does not have a minimum lot width requirement.

ZONING MAP



Access

The site fronts on Highland Road, which along the subject property is a five-lane (center turn lane) public road with curb and gutter designated as a principal arterial by the National Functional Classification System (NFCS) utilized by the Michigan Department of Transportation (MDOT). No improvements to site access are required to serve the building addition.

Utilities

The site utilizes a private well for potable water and a private septic system for sewage disposal.

Staff Analysis

Approval of this building addition could not be completed with administrative site plan review because the Zoning Ordinance imposes a limit to staff approval of 1,000 square foot or 33% of the area of the building, whichever is less.

The Planning Commission should consider the following items in review of this project:

- Parking lot layout, design, and construction
  - A portion of the parking lot is in poor condition and should, at a minimum, be resurfaced and restriped. (The Applicant stated the parking lot is being repaved in sections annually).

- Access (driveway) location and design
  - The site driveway is located in a 60-foot-wide easement for ingress and egress. The asphalt should be resurfaced if it is in disrepair. (The Applicant stated the access drive will be repaved in the summer of 2023).

- Exterior lighting (location, height, prevention of glare)
  - If new lighting is proposed on the building addition, a photometric plan shall be submitted to the Township for review. (A photometric plan based on existing lighting has been provided. Lighting on the ski hill is not part of the photometric plan, but the Applicant stated this information can be provided. However, this information is not necessary to facilitate the proposed building addition, which is the only improvement currently being considered).

- Signage
  - If new signage is proposed on the building addition, sign plans shall be submitted to the Township for review. (No new signage is proposed at this time).

- Barrier-free accessibility
  - There is no handicap parking onsite, and the building is not barrier-free. (The Applicant stated all parts of the building have entrances at ground level, and a separate parking lot plan will be prepared in the future to address barrier-free accessibility).

- Stormwater drainage
  - The Community Development Department defers to the Township Engineering Consultant on this matter.

- Connection to municipal utilities (water and sewer)
    - The site is in an area intended to be serviced by Township water and sanitary sewer. The Community Development Department defers to the Director of Public Services and Township Engineering Consultant on this matter.

- Wetland delineation and protection
    - The Applicant stated they have enlisted a wetland expert to identify any and all wetlands on the property, if any may or may not be regulated, and will submit the report when available. Based on information available to staff, it does not appear the building addition is located in the vicinity of a wetland. (A wetland delineation and determination report has been provided).

Planned Development Agreement

A development agreement is required and has yet to be submitted to the Township for review. The Planning Commission could recommend approval of a development agreement to the Township Board, conditioned on administrative review and approval of the agreement. (After further considering the proposed improvements at Alpine Valley, a development agreement is not required to facilitate the building addition. Minor additions require site plan review only. When the Developer decides to propose additional recreational or residential uses on the property, that would be when the full planned development review process / site plan review and approval process occurs).

Planning Commission Options / Recommendation

The Applicant has requested preliminary and final site plan approval. As the general layout/engineering of the property would not change, proceeding in this manner would not compromise the review of improvements to the site. The Planning Commission may recommend approval, approval with conditions, or denial of the preliminary site plan to the Township Board; action on the final site plan is determined by the Planning Commission. **Staff recommends approval of the preliminary and final site plan, subject to the items identified in this memorandum being addressed prior to issuance of a building permit.**

The following notations summarize the site plan review:

- Recommendation of approval is in accordance with the plans prepared by Kieft Engineering dated March 8, 2023 (revision date June 5, 2023), subject to revisions as required. Utility, grading, and storm drainage plans for the site are subject to approval of the Township Engineering Consultant and shall be completed in accordance with the Township Engineering Design Standards.

- Recommendation of approval is in accordance with the plans prepared by Smith & Schurman Associates, Inc. (revision date January 16, 2023), subject to revisions as required. Architectural plans are subject to approval of the Building Official.

Fire Department
Charter Township of White Lake

7420 Highland Road
White Lake, MI 48383
Office (248) 698-3993
www.whitelaketwp.com/fire

Site / Construction Plan Review

To: Sean O'Neil, Planning Department Director

Date: 07/06/2023

Project: Alpine Valley Ski Resort

Job #: 22-9243B

Date on Plans: No revised date shown

The Fire Department has the following comments with regards to the construction plans for the project known as Alpine Valley Ski Resort addition.

1. Future submittals shall show the existing building dimensions.

2. The current occupancy type of this existing / nonconforming building is mixed use, primarily A-2. The square footage (SF), and occupant load exceeds the threshold limits for fire protection (suppression / alarm) as defined in the International Fire and Building Code.
   It is our position that this proposed addition, unless constructed as a separate fire area, will add an additional 1,176 SF to the overall building area, and will prompt fire protection compliance throughout the entire building. We defer to the Building Official, and third-party Fire Protection Company for their code interpretation as it applies to this situation.

Jason Hanifen
Fire Marshal
Charter Township of White Lake
(248)698-3993
jhanifen@whitelaketwp.com

Plans are reviewed using the International Fire Code (IFC), 2015 Edition and Referenced NFPA Standards.

SHEET SCHEDULE

NO.	DESCRIPTION
A–101	CODE COMPLIANCE AND DEMOLITION
A–201	FLOOR PLANS
A–301	REFLECTED CEILING PLANS
A–401	EXTERIOR ELEVATIONS
A–501	ADDITION SECTIONS & ROOF PLAN
A–601	WALL SECTIONS
S–01	STRUCTURAL
S–02	STRUCTURAL

ARCHITECT'S SEAL:

Architects seal/signature only applies to scheduled Architectural sheets (those with an 'A' prefix) with the date and designation shown below. See individual sheets by other disciplines for their respective seals.

DATE:	DESIGNATION:
Jan. 16, 2023	PERMITS

STATE OF MICHIGAN · JUSTIN DAVID NOVAK · 1301053706 · LICENSED ARCHITECT

CODE COMPLIANCE:

INTERPRETIVE CODES:

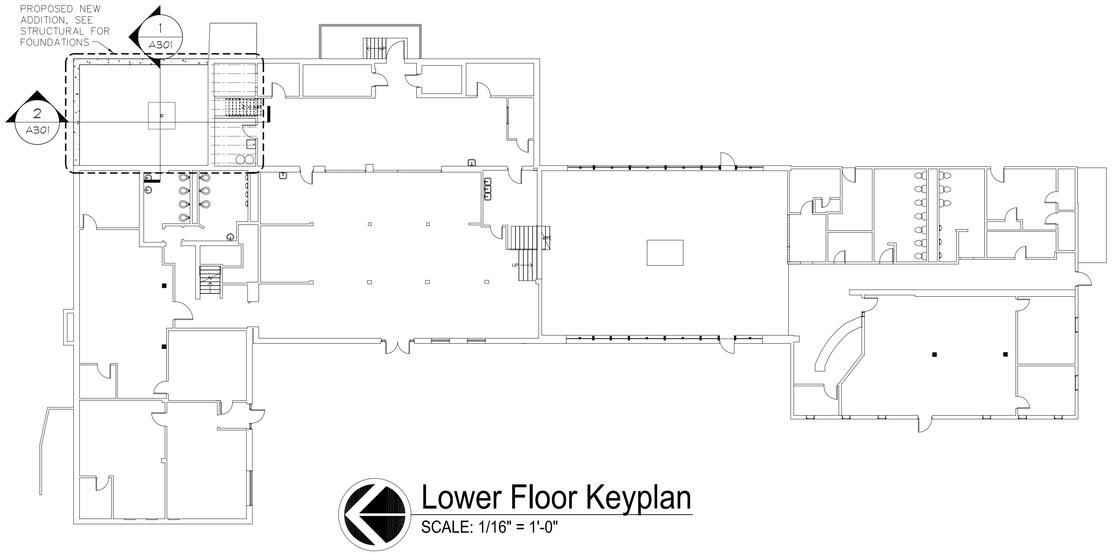
BUILDING = MICHIGAN BUILDING CODE 2015

PLUMBING = MICHIGAN PLUMBING CODE 2015

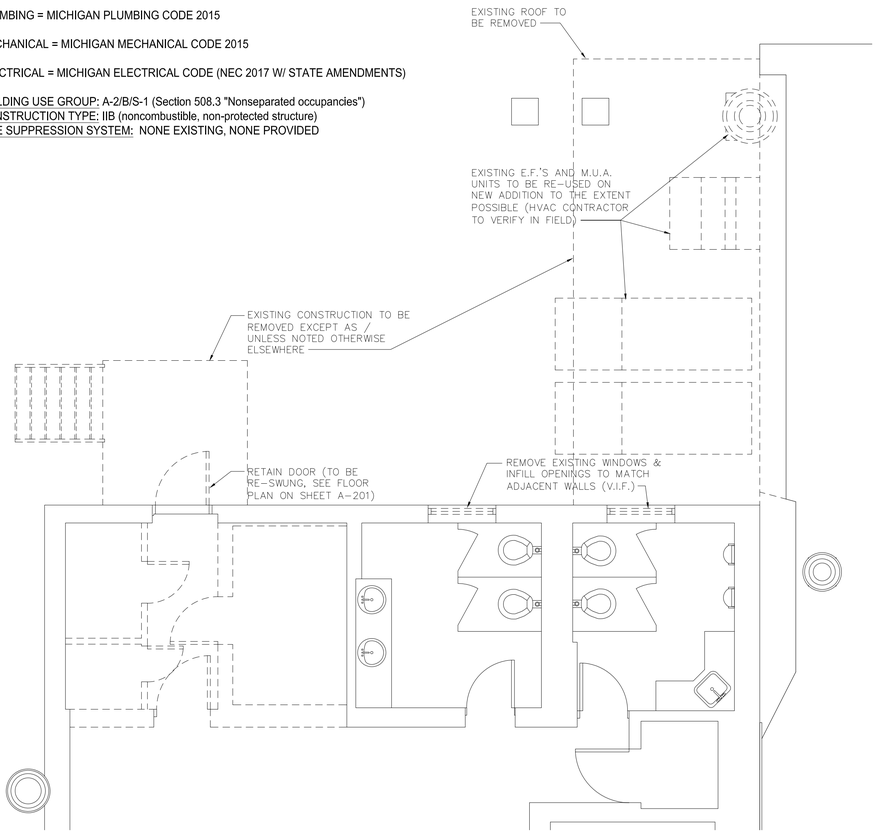
MECHANICAL = MICHIGAN MECHANICAL CODE 2015

ELECTRICAL = MICHIGAN ELECTRICAL CODE (NEC 2017 W/ STATE AMENDMENTS)

BUILDING USE GROUP: A-2/B/S-1 (Section 508.3 "Nonseparated occupancies")
CONSTRUCTION TYPE: IIB (noncombustible, non-protected structure)
FIRE SUPPRESSION SYSTEM: NONE EXISTING, NONE PROVIDED



Lower Floor Keyplan
SCALE: 1/16" = 1'-0"



3rd Floor Demo Plan
SCALE: 1/4"=1'-0"

DEMOLITION NOTES

1 CONTRACTOR TO VERIFY ALL EXISTING FIELD CONDITIONS AND NOTIFY ARCHITECT IMMEDIATELY IF THAT WHICH EXISTS DIFFERS FROM THAT WHICH IS SHOWN.

2 ALL WORK TO COMPLY WITH FEDERAL, STATE AND LOCAL CODES, LAWS AND ORDINANCES.

3 PROTECT EXISTING CONSTRUCTION TO REMAIN AS REQUIRED DURING DEMOLITION.

4 CONTRACTOR TO COORDINATE THE TIMING OF ALL WORK, ACCESS TO THE BUILDING AND USE OF THE BUILDING FACILITIES WITH THE OWNER'S REPRESENTATIVE AND THE LOCAL BUILDING OFFICIAL.

5 CONTRACTOR IS TO REMOVE ALL WALLS, DOORS, ETC. INDICATED AS BEING REMOVED TO THE EXTENT SHOWN. EXISTING CEILING TILE AND GRID IS TO REMAIN AS–IS UNLESS NOTED OTHERWISE.

6 UNLESS INDICATED OTHERWISE, ALL ITEMS AND MATERIALS DESIGNATED TO BE REMOVED SHALL BECOME THE PROPERTY OF THE CONTRACTOR. ALL SUCH MATERIALS SHALL BE REMOVED FROM THE SITE AND TRANSPORTED/DISPOSED OF IN A LAWFUL MANNER.

7 EACH TRADE IS TO REPAIR THEIR OWN DEMOLITION WORK IN AREAS OF EXISTING CONSTRUCTION (i.e. PATCH HOLES, ETC.)

8 CONTRACTOR IS TO PREPARE ALL FLOORS, WALLS ETC. TO RECEIVE NEW FINISHES AS SPECIFIED PER MANUFACTURER'S RECOMMENDATIONS.

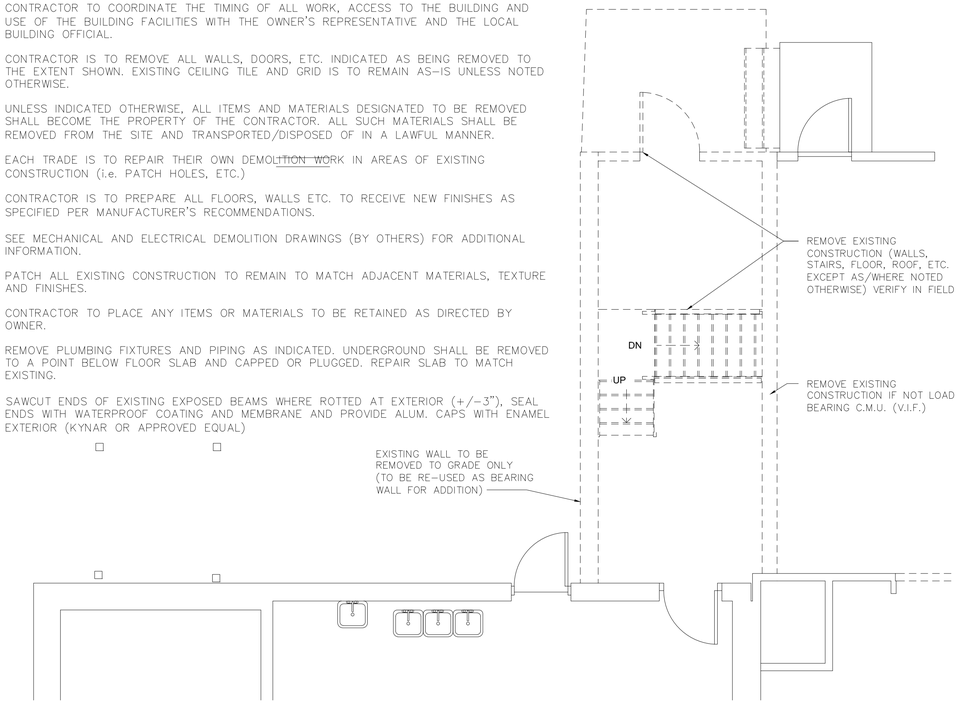
9 SEE MECHANICAL AND ELECTRICAL DEMOLITION DRAWINGS (BY OTHERS) FOR ADDITIONAL INFORMATION.

10 PATCH ALL EXISTING CONSTRUCTION TO REMAIN TO MATCH ADJACENT MATERIALS, TEXTURE AND FINISHES.

11 CONTRACTOR TO PLACE ANY ITEMS OR MATERIALS TO BE RETAINED AS DIRECTED BY OWNER.

12 REMOVE PLUMBING FIXTURES AND PIPING AS INDICATED. UNDERGROUND SHALL BE REMOVED TO A POINT BELOW FLOOR SLAB AND CAPPED OR PLUGGED. REPAIR SLAB TO MATCH EXISTING.

13 SAWCUT ENDS OF EXISTING EXPOSED BEAMS WHERE ROTTED AT EXTERIOR (+/–3"), SEAL ENDS WITH WATERPROOF COATING AND MEMBRANE AND PROVIDE ALUM. CAPS WITH ENAMEL EXTERIOR (KYNAR OR APPROVED EQUAL)



2nd Floor Demo Plan
SCALE: 1/4"=1'-0"

0 2' 4' 8'
GRAPHIC SCALE

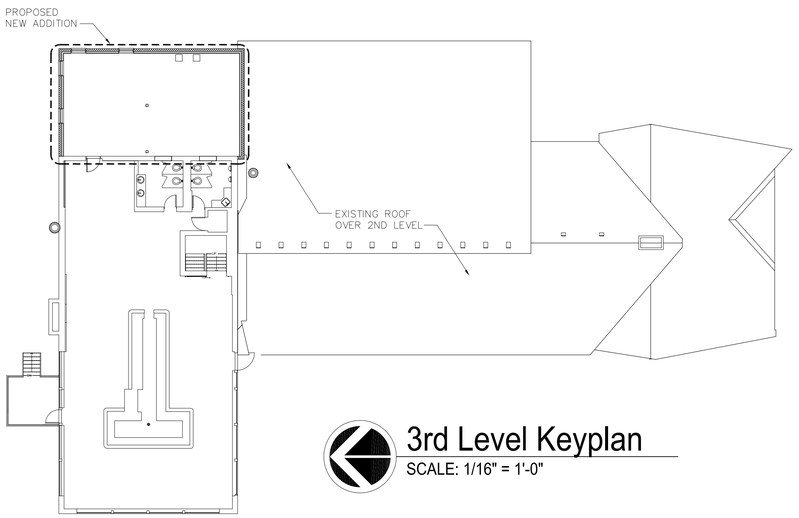
smith+schurman associates, inc.
architects ▪ planners ▪ interior designers
PO Box 1607, Southgate, MI 48195
Telephone: 248-227-9660

CODE COMPLIANCE AND DEMOLITION

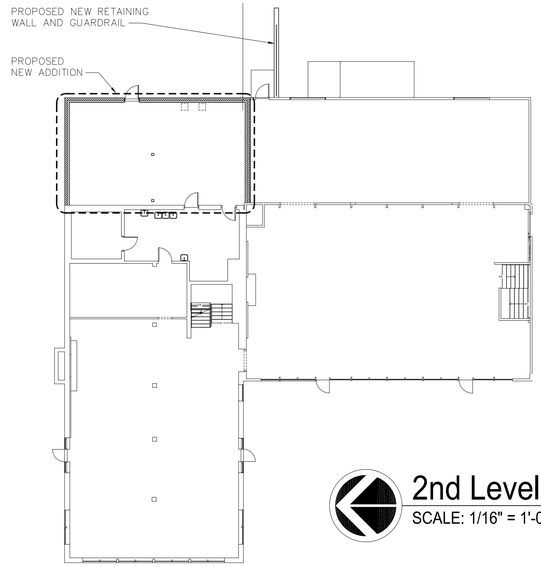
ALPINE VALLEY SKI RESORT
PROPOSED ADDITION
6775 HIGHLAND ROAD
WHITE LAKE, MICHIGAN 48383

ISSUE	DATE
SCHEME	Nov. 30, 2022
REVIEW	Dec. 19, 2022
PERMITS	Jan. 16, 2023

DRAWN BY: JN
CHECKED BY:
JOB NO: 22–9243B
SHEET NUMBER: A–101



3rd Level Keyplan
SCALE: 1/16" = 1'-0"



2nd Level Keyplan
SCALE: 1/16" = 1'-0"

WALL LEGEND

EXISTING CONSTRUCTION TO REMAIN AS-IS TO THE EXTENT POSSIBLE (VERIFY IN FIELD)

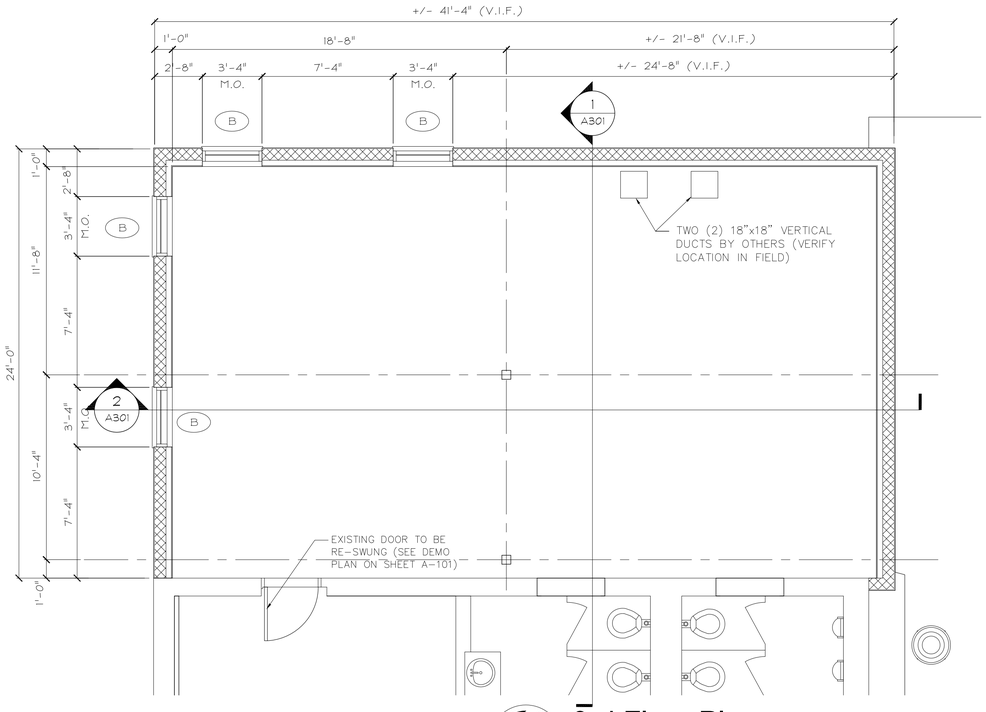
NOM. 8" WIDE C.M.U. WALL, APPLY STUCCO TO EXTERIOR SIDE TO MATCH EXISTING ADJACENT BUILDINGS FINISH. INSTALL HORIZ. JOINT REINF. EVERY OTHER COURSE (16"O.C. VERTICALLY). SEE STRUCTURAL DW'GS FOR ADDITIONAL REINFORCEMENT/ REQUIREMENTS. INSTALL MOISTURE BARRIER ON INSIDE FACE WITH 3-5/8" METAL STUDS AT 24" O.C. MAX. (AND BATT INSULATION BETWEEN STUDS) AND 5/8" GYP. BOARD ON INTERIOR SIDE (PAINTED).

OPENING SCHEDULE

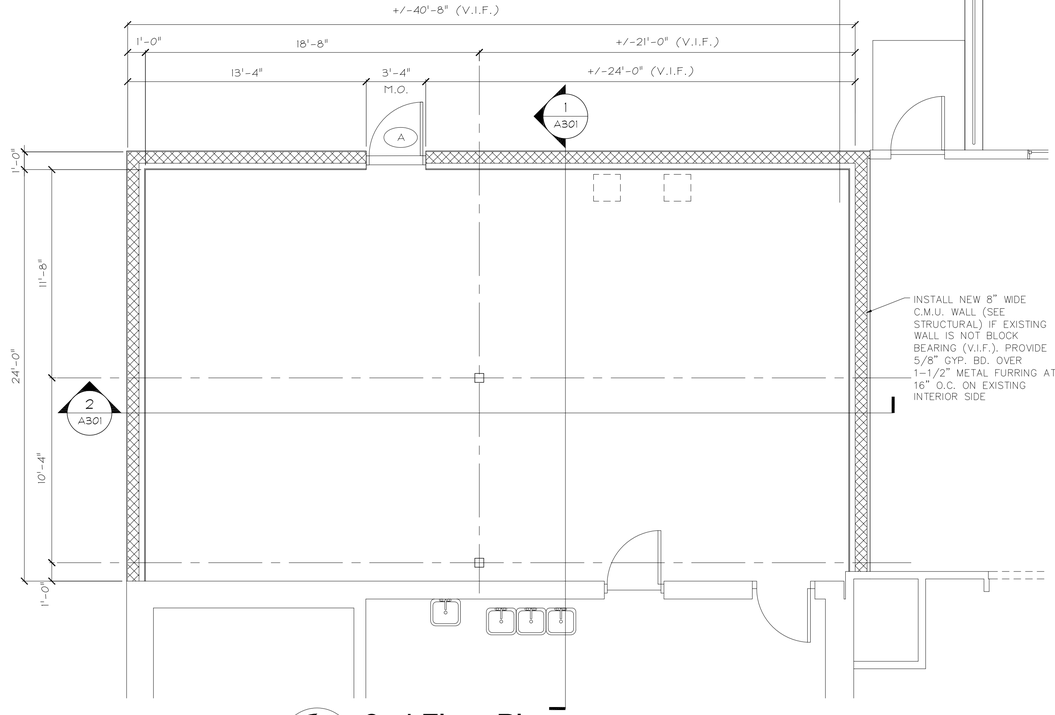
NOTE: UNDESIGNATED DOORS ARE EXISTING TO REMAIN TO THE EXTENT POSSIBLE UNLESS NOTED OTHERWISE (VERIFY IN FIELD). DOOR HARDWARE AS SELECTED BY OWNER. SEE ALSO, GENERAL NOTES ON SHEET A-301.

(A) 3'-4" WIDE (M.O.) x 7'-0" HIGH INSULATED HOLLOW METAL DOOR IN H.M. FRAME (WITH 4" HEAD TO MATCH BLOCK COURSING). INSTALL THREE (3) MASONRY JAMB ANCHORS AT EACH SIDE GROUTED SOLID INTO BLOCK WALL. FURNISH AND INSTALL CLOSING DEVICE, ALUM. THRESH IN MASTIC, AND WEATHERSTRIPPING.

(B) 3'-4" WIDE x 4'-0" HIGH (M.O.) ANOD. ALUM. SASH WITH 1" INSULATED TINTED GLASS (VERIFY COLOR WITH PROJECT MANAGER) AND PRE-CAST STONE EXTERIOR SILL AND SOLID SURFACE MATERIAL FOR INTERIOR SILL. INSTALL SAFETY GLASS WHERE REQUIRED BY BUILDING CODES. INSTALL SHIMS (AND FOAM INSULATION AT SHIMMED VOIDS) AND CONTINUOUS FLASHING AND SEALANT AT EXTERIOR PERIMETER OF SASH FRAME PER MANUFACTURER'S RECOMMENDED SPECIFICATIONS.



3rd Floor Plan
SCALE: 1/4"=1'-0"



2nd Floor Plan
SCALE: 1/4"=1'-0"

0 2' 4' 8'
GRAPHIC SCALE

smith+schurman associates, inc.
architects ▪ planners ▪ interior designers
PO Box 1607, Southgate, MI 48195
Telephone: 248-227-9660

FLOOR PLANS

ALPINE VALLEY SKI RESORT
PROPOSED ADDITION
6775 HIGHLAND ROAD
WHITE LAKE, MICHIGAN 48383

ISSUE	DATE
SCHEME	Nov. 30, 2022
REVIEW	Dec. 19, 2022
PERMITS	Jan. 16, 2023

DRAWN BY: JN
CHECKED BY:
JOB NO: 22-9243B
SHEET NUMBER: A-201

SYMBOL LEGEND

NEW SUSPENDED 24"x48" CEILING GRID WITH ACOUSTIC LAY-IN TILES AT 7'-8" A.F.F.

24"x48" LAY-IN LED CEILING LUMINAIRE: LITHONIA MODEL 28LT4-48L-SDSM-GZ10-LP840 OR APPROVED EQUAL

EXIT LIGHT W/ 90 MINUTE BATTERY BACK-UP

EMERGENCY LIGHT W/ 90 MINUTE BATTERY BACK-UP

S SINGLE POLE SWITCH W/ OCCUPANCY/VACANCY SENSOR

S3 DOUBLE POLE (3-WAY) LIGHT SWITCH WITH OCCUPANCY/VACANCY SENSOR

GENERAL NOTES

1 DO NOT SCALE DRAWINGS. USE DIMENSIONS GIVEN OR FIELD VERIFY IF NECESSARY.

2 ONLY DOCUMENTS INDICATED AS "BIDDING" OR "CONSTRUCTION" ARE TO BE USED FOR BIDDING OR CONSTRUCTION.

3 THE REQUIREMENTS OF ICC/ANSI A117.1 AND THE AMERICANS WITH DISABILITIES ACT (ADA) ARE TO BE FULLY SATISFIED. ALL WORK SHALL MEET THE MOST STRINGENT REQUIREMENTS OF BOTH INCLUDING, BUT NOT LIMITED TO CLEARANCES, LIMITATIONS, ACCESSORIES, ETC. THESE DRAWINGS ARE PREPARED IN ACCORDANCE WITH THE LIMITED SERVICES FOR WHICH THE ARCHITECT WAS CONTRACTED. THE ARCHITECT MAKES NO REPRESENTATION THAT THE INTERPRETATION OF THESE DOCUMENTS WILL RESULT IN COMPLETE COMPLIANCE WITH THE ADA.

4 ALL GLASS SHALL CONFORM TO FS DD-G-451. SAFETY GLASS SHALL CONFORM TO U.S. CONSUMERS PRODUCT SAFETY COMMISSION STANDARD 16 CFR 1201.

5 ALL DOORS REQUIRED TO BE LABELED SHALL BE SET IN LABELED FRAMES AND IDENTIFIED WITH UL LABEL AND PROVIDED WITH APPROVED SELF-CLOSING DEVICES AND POSITIVE LATCHING HARDWARE.

6 ALL DESIGNATED EXIT DOORS SHALL BE EQUIPPED WITH NON-LOCKING AGAINST EGRESS HARDWARE.

7 CONTRACTOR TO VERIFY MECHANICAL EQUIPMENT UNIT LOADS AND LOCATIONS, IF NOT INDICATED ON PLAN, AND REPORT TO ARCHITECT PRIOR TO ERECTION.

8 PLASTIC PIPING, INSULATION AND OTHER COMBUSTIBLE MATERIALS SHALL BE RESTRICTED TO USE WHERE PERMITTED BY CODE AND IN NON-COMBUSTIBLE WALLS AND CEILING SPACES THAT DO NOT CONNECT DIRECTLY TO OCCUPIED ROOMS OR VENTILATING AIR DUCTS OR SPACES, IN ACCORDANCE WITH THE MICHIGAN STATE FIRE MARSHAL REGULATIONS. PROVIDE STEEL PIPING FOR ALL PLASTIC PIPING PASSING THROUGH FIREWALLS. RATED SHAFT WALLS SHALL BE DESIGNATED AS SUCH IN ACCORDANCE WITH 2015 MICHIGAN BUILDING CODE SECTION 703.7.

9 ALL SIGNAGE THAT PROVIDES EMERGENCY INFORMATION OR GENERAL CIRCULATION DIRECTIONS OR SPACE IDENTIFICATION SHALL COMPLY WITH THE MOST STRINGENT OF ANSI A117.1 AND THE AMERICANS WITH DISABILITIES ACT.

10 WHEN REQUIRED, PORTABLE FIRE EXTINGUISHERS SHALL BE FURNISHED BY THE OWNER AND INSTALLED IN ACCORDANCE WITH NFPA 10.

11 ALL FINISH LUMBER SHALL HAVE A MOISTURE CONTENT OF 9% OR LESS.

12 PROVIDE FIRE RETARDANT TREATED (FRT) WOOD BLOCKING WHERE REQUIRED TO SUPPORT ITEMS MOUNTED TO PARTITIONS AND AROUND ALL DOOR OPENINGS, ETC. ALL LUMBER REQUIRED TO BE FIRE TREATED SHALL BEAR THE UL FR-S LABEL.

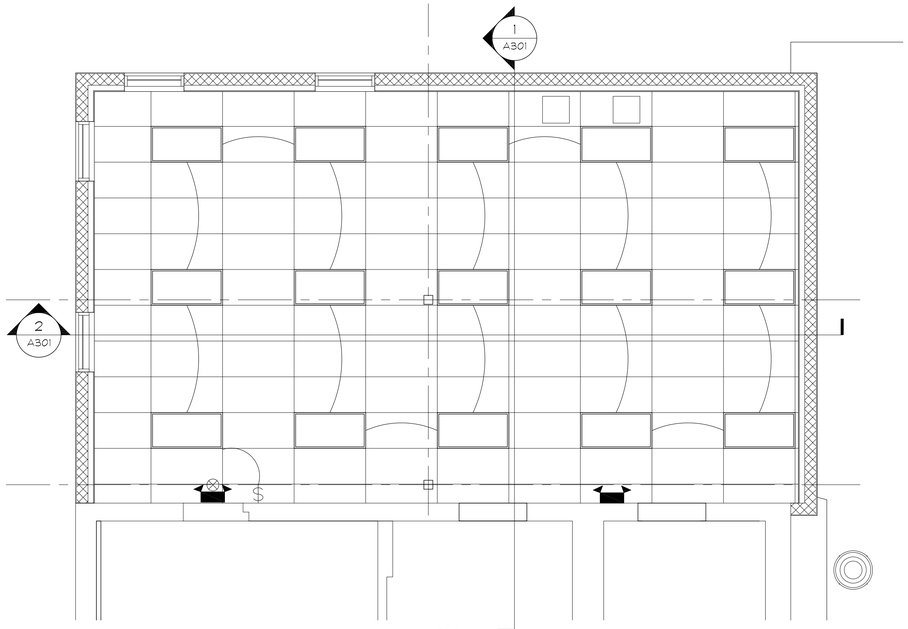
13 ALL INTERIOR FINISHES SHALL MEET THE FLAME SPREAD AND SMOKE DEVELOPED REQUIREMENTS OF MBC 2015, CHAPTER 8 "INTERIOR FINISHES".

14 ALL INTERIOR METAL STUD PARTITIONS ARE TO BE DESIGNED TO WITHSTAND A UNIFORM LATERAL LOAD OF 5 P.S.F. BRACE WALLS TO THE STRUCTURE AS REQUIRED. SUBMIT SHOP DRAWINGS TO THE ARCHITECT FOR APPROVAL PRIOR TO CONSTRUCTION.

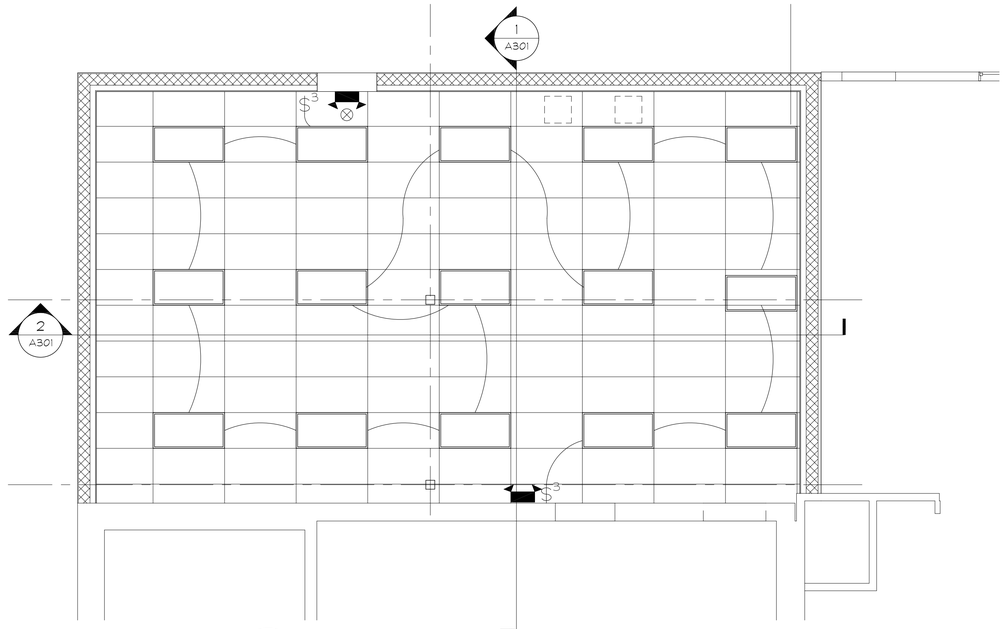
15 UNLESS NOTED OTHERWISE, PRODUCTS SHALL BE INSTALLED PER MANUFACTURERS SPECIFICATIONS. CONTRACTOR TO PROVIDE ALL PRODUCT WARRANTIES AND INFORMATION TO PROPERTY MANAGER UPON COMPLETION OF CONSTRUCTION.

16 ALL MECHANICAL/ELECTRICAL ENGINEERING SHALL BE PERFORMED ON A "DESIGN-BUILD" BASIS BY THE OWNER'S RESPECTIVE CONTRACTORS. ANY M/E ITEMS SHOWN HERE ARE FOR GENERAL REFERENCE ONLY.

17 WOOD STUD WALLS ARE TO BE FIRE-STOPPED AT CEILINGS.



3rd Flr. Reflected Ceiling
SCALE: 1/4"=1'-0"



2nd Flr. Reflected Ceiling
SCALE: 1/4"=1'-0"

0 2' 4' 8'
GRAPHIC SCALE

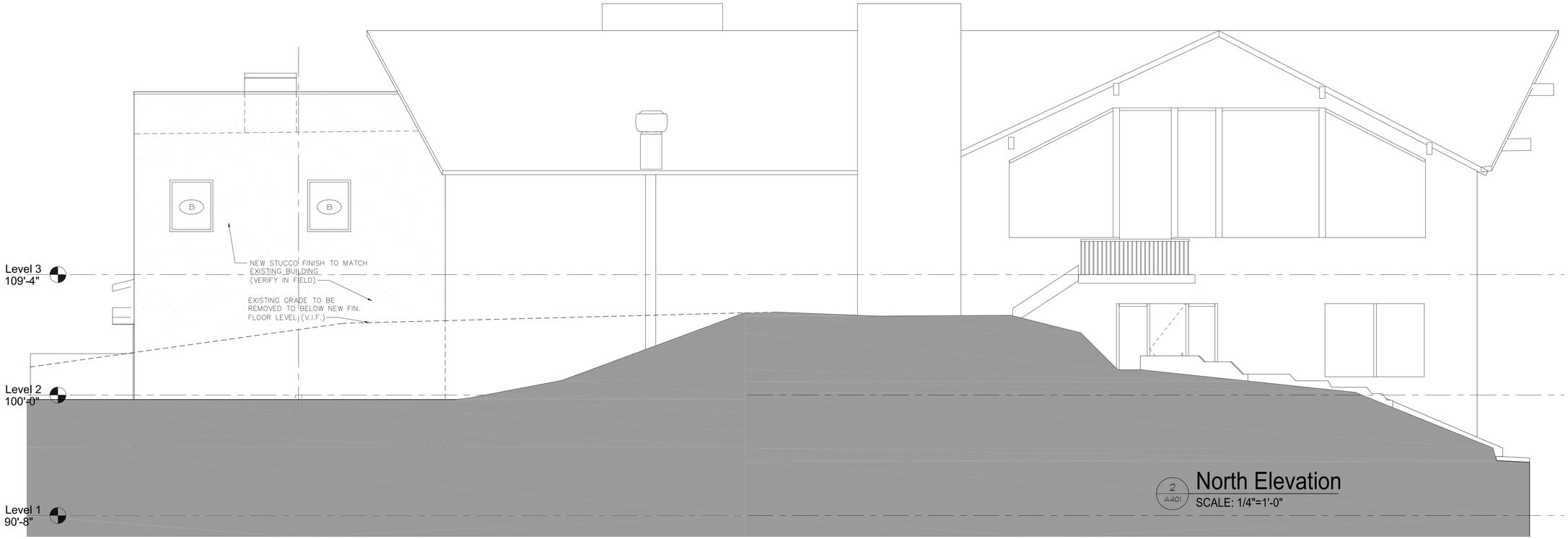
smith+schurman associates, inc.
architects ▪ planners ▪ interior designers
PO Box 1407, Southgate, MI 48195
Telephone: 248-227-9660

REFLECTED CEILING PLANS

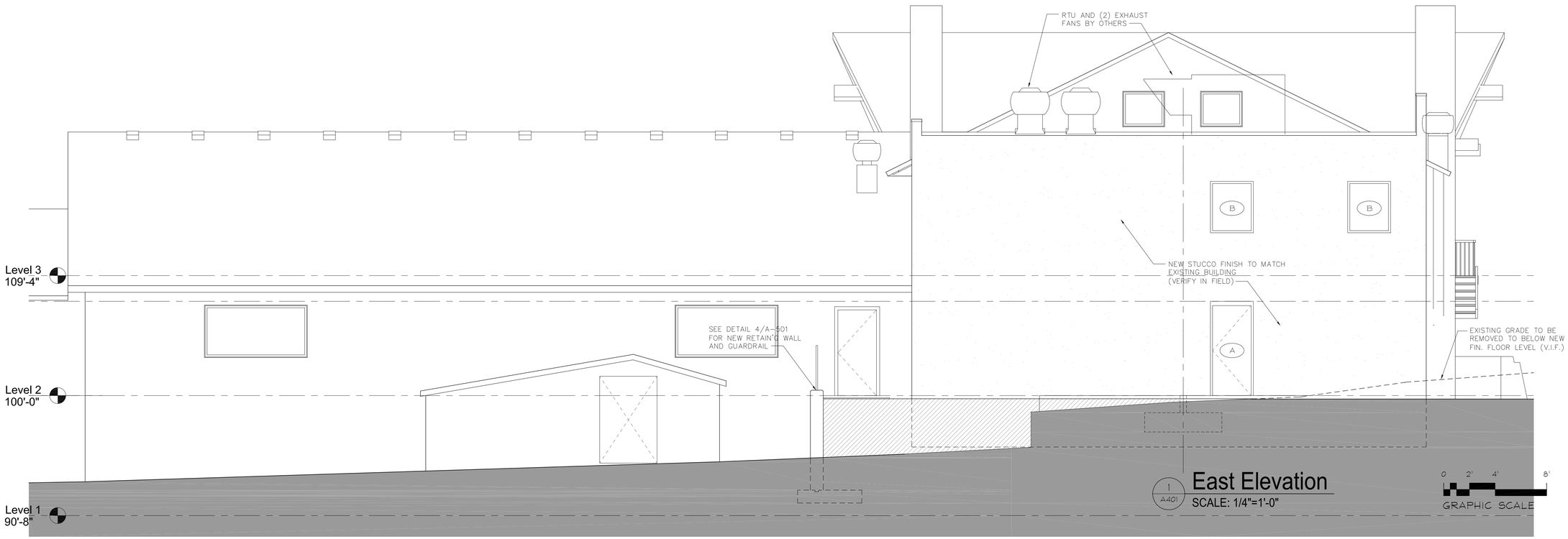
ALPINE VALLEY SKI RESORT
PROPOSED ADDITION
6775 HIGHLAND ROAD
WHITE LAKE, MICHIGAN 48383

ISSUE	DATE
SCHEME	Nov. 30, 2022
REVIEW	Dec. 19, 2022
PERMITS	Jan. 16, 2023

DRAWN BY: JN
CHECKED BY:
JOB NO: 22-9243B
SHEET NUMBER: A-301



2 A401 **North Elevation**
SCALE: 1/4"=1'-0"



1 A401 **East Elevation**
SCALE: 1/4"=1'-0"

0 2' 4' 8'
GRAPHIC SCALE

smith+schurman associates, inc.
architects ▪ planners ▪ interior designers
PO Box 1607, Southgate, MI 48195
Telephone: 248-227-9660

EXTERIOR ELEVATIONS

ALPINE VALLEY SKI RESORT
PROPOSED ADDITION
6775 HIGHLAND ROAD
WHITE LAKE, MICHIGAN 48383

ISSUE	DATE
SCHEME	Nov. 30, 2022
REVIEW	Dec. 19. 2022
PERMITS	Jan. 16, 2023

DRAWN BY: JN
CHECKED BY:
JOB NO: 22-9243B
SHEET NUMBER: A-401

SECTION & ELEVATION NOTES

1 REINFORCED CONCRETE FOOTING / FOUNDATION. SEE STRUCTURAL DRAWINGS FOR ALL INFORMATION RELATING TO SIZE AND CONFIGURATION OF FOUNDATION WORK. FOUNDATION WORK SHOWN HERE IS FOR GENERAL REFERENCE ONLY.

2 4" CONCRETE SLAB (SEE STRUCTURAL DRAWINGS BY OTHER FOR REINFORCEMENT) ON 6 MIL VAPOR BARRIER OVER 4" MIN. WALL COMPACTED GRANULAR FILL. COMPACT SAND TO UNIFORM DENSITY, MINIMUM 95%. PROVIDE 2"x24" MINIMUM PERIMETER INSULATION AT ALL EXTERIOR WALLS AS SHOWN.

3 4" CONCRETE SLAB ON METAL DECKING OVER STEEL JOISTS (SEE STRUCTURAL DRAWINGS).

4 12" WIDE x 8" HIGH x 16" LONG (NOMINAL DIMENSIONS) C.M.U. WALL (APPLY STUCCO TO EXTERIOR SIDE TO MATCH EXISTING ADJACENT BUILDINGS FINISH) W/ HORIZ. JOINT REINFORCEMENT EVERY OTHER COURSE (16"O.C. VERTICALLY). SEE STRUCTURAL DRAWINGS FOR ADDITIONAL REINFORCEMENT/ REQUIREMENTS. INSTALL MOISTURE BARRIER ON INSIDE FACE WITH 3-5/8" METAL STUDS AT 24" O.C. MAX. (AND BATT INSULATION BETWEEN STUDS) AND 5/8" GYP. BOARD ON INTERIOR SIDE (PAINTED).

5 8" WIDE x 8" HIGH x 16" LONG (NOMINAL DIMENSIONS) C.M.U. WALL (APPLY STUCCO TO EXTERIOR SIDE TO MATCH EXISTING ADJACENT BUILDINGS FINISH) W/ HORIZ. JOINT REINFORCEMENT EVERY OTHER COURSE (16"O.C. VERTICALLY). SEE STRUCTURAL DRAWINGS FOR ADDITIONAL REINFORCEMENT/ REQUIREMENTS. INSTALL MOISTURE BARRIER ON INSIDE FACE WITH 3-5/8" METAL STUDS AT 24" O.C. MAX. (AND BATT INSULATION BETWEEN STUDS) AND 5/8" GYP. BOARD ON INTERIOR SIDE (PAINTED).

6 3'-4" WIDE x 4'-0" HIGH (M.O.) ANODIZED ALUMINUM SASH WITH 1" INSULATED TINTED GLASS (VERIFY COLOR WITH PROJECT MANAGER) AND PRE-CAST STONE EXTERIOR SILL AND SOLID SURFACE MATERIAL FOR INTERIOR SILL. INSTALL SAFETY GLASS WHERE REQUIRED BY BUILDING CODES. INSTALL SHIMS (AND FOAM INSULATION AT SHIMMED VOIDS) AND CONTINUOUS FLASHING AND SEALANT AT EXTERIOR PERIMETER OF SASH FRAME PER MANUFACTURER'S RECOMMENDED SPECIFICATIONS.

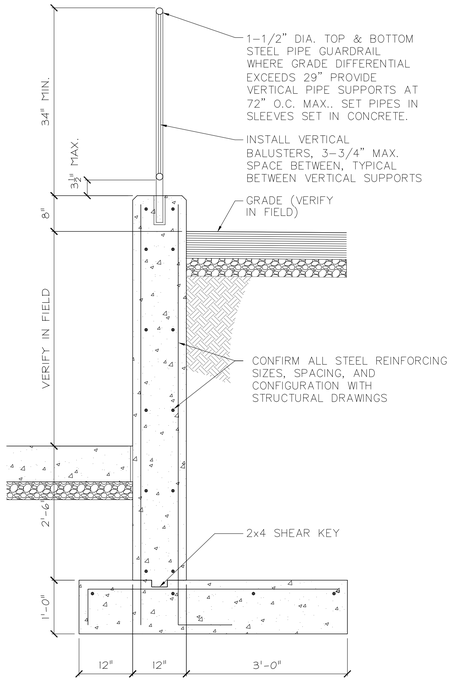
7 INSTALL CONTINUOUS FLASHING AND WEEP HOLES AT 32" O.C. MAXIMUM AT EXTERIOR MASONRY BASE OF CAVITIES. GROUT ALL VOIDS SOLID (BLOCK CORES AND AIR SPACES) AT/BELOW ADJACENT GRADES.

8 EPDM ROOFING MEMBRANE (FULLY ADHERED) OVER 6" MIN. RIGID INSULATION ON METAL DECKING WELDED TO STEEL JOISTS (SEE STRUCTURAL DRAWINGS). FLASH AT BASE OF PARAPET PER MANUFACTURER'S RECOMMENDED SPECIFICATIONS AND EXTEND UP AND UNDER METAL COPING AT PARAPET WALLS.

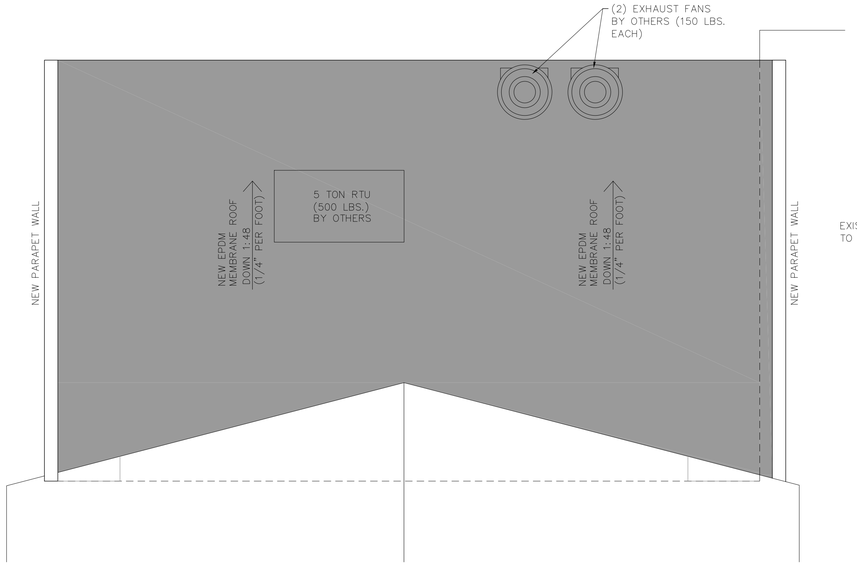
9 ROOF EDGE FLASHING OVER 3/4" EXTERIOR GRADE F.R.T. PLYWOOD. EXTEND UP WITH EPDM AND UNDER CONTINUOUS TRANSITION BAR FASTENED TO EXISTING HANGAR SIDING. CUT SIDING AND FLASH, COUNTER-FLASH, AND SEAL TRANSITION BAR PER MANUFACTURER'S RECOMMENDED SPECIFICATIONS/DETAILS. .

10 18 GA. METAL COPING (FINISH/COLOR AS SELECTED BY OWNER) SECURED TO PARAPET W/ MIN. 3-1/2" DOWN ON ROOF SIDE AND 2-1/2" DOWN ON EXTERIOR SIDE. COPING TO BE PROVIDED BY METAL SIDING MANUFACTURER & INSTALLED BY ROOFING CONTRACTOR. INSTALL P.T. 2x WOOD BLOCKING SECURELY ANCHORED TO MASONRY/FRAMING WHERE SHOWN.

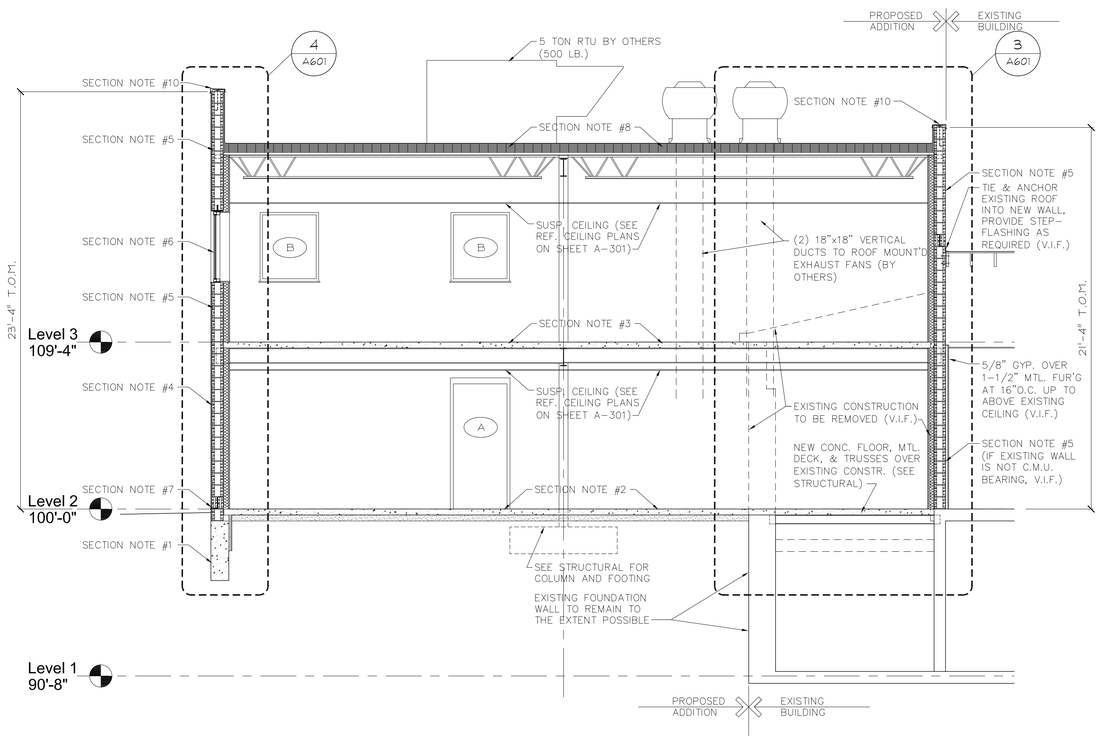
11 CONTINUOUS STEEL ANGLE OR CHANNEL AS SHOWN (SEE STRUCT'L DRAWINGS).



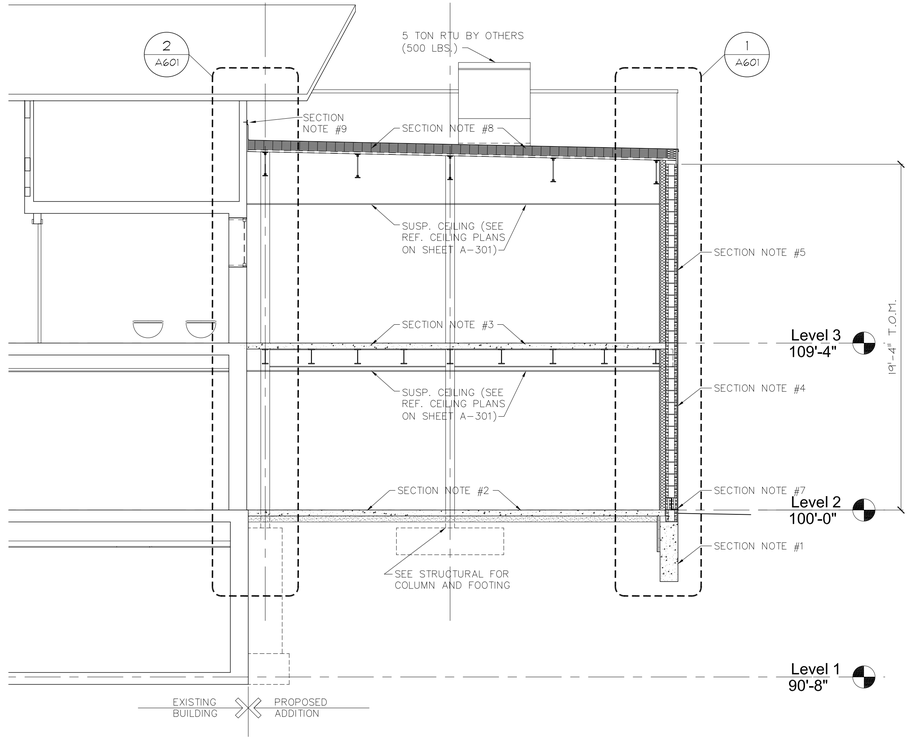
4 A-501 RETAINING WALL SECTION
SCALE: 3/4" = 1'-0"



3 A501 Roof Plan
SCALE: 1/4"=1'-0"



2 A501 Addition Section
SCALE: 1/4"=1'-0"



1 A501 Addition Section
SCALE: 1/4"=1'-0"

0 2' 4' 8'
GRAPHIC SCALE

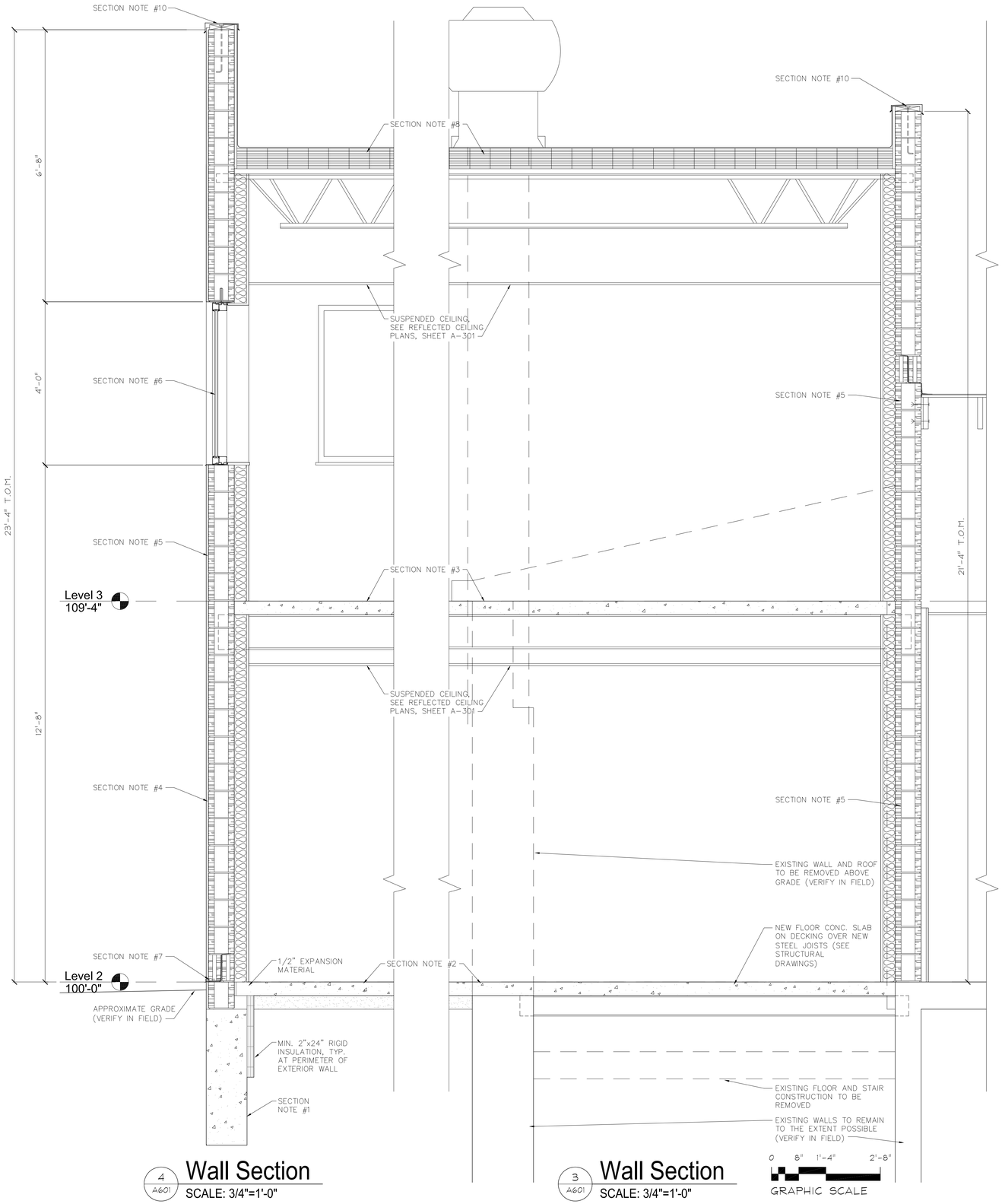
smith+schurman associates, inc.
architects • planners • interior designers
PO Box 1407, Southgate, MI 48195
Telephone: 248-227-9660

ADDITION SECTIONS & ROOF PLAN

ALPINE VALLEY SKI RESORT
PROPOSED ADDITION
6775 HIGHLAND ROAD
WHITE LAKE, MICHIGAN 48383

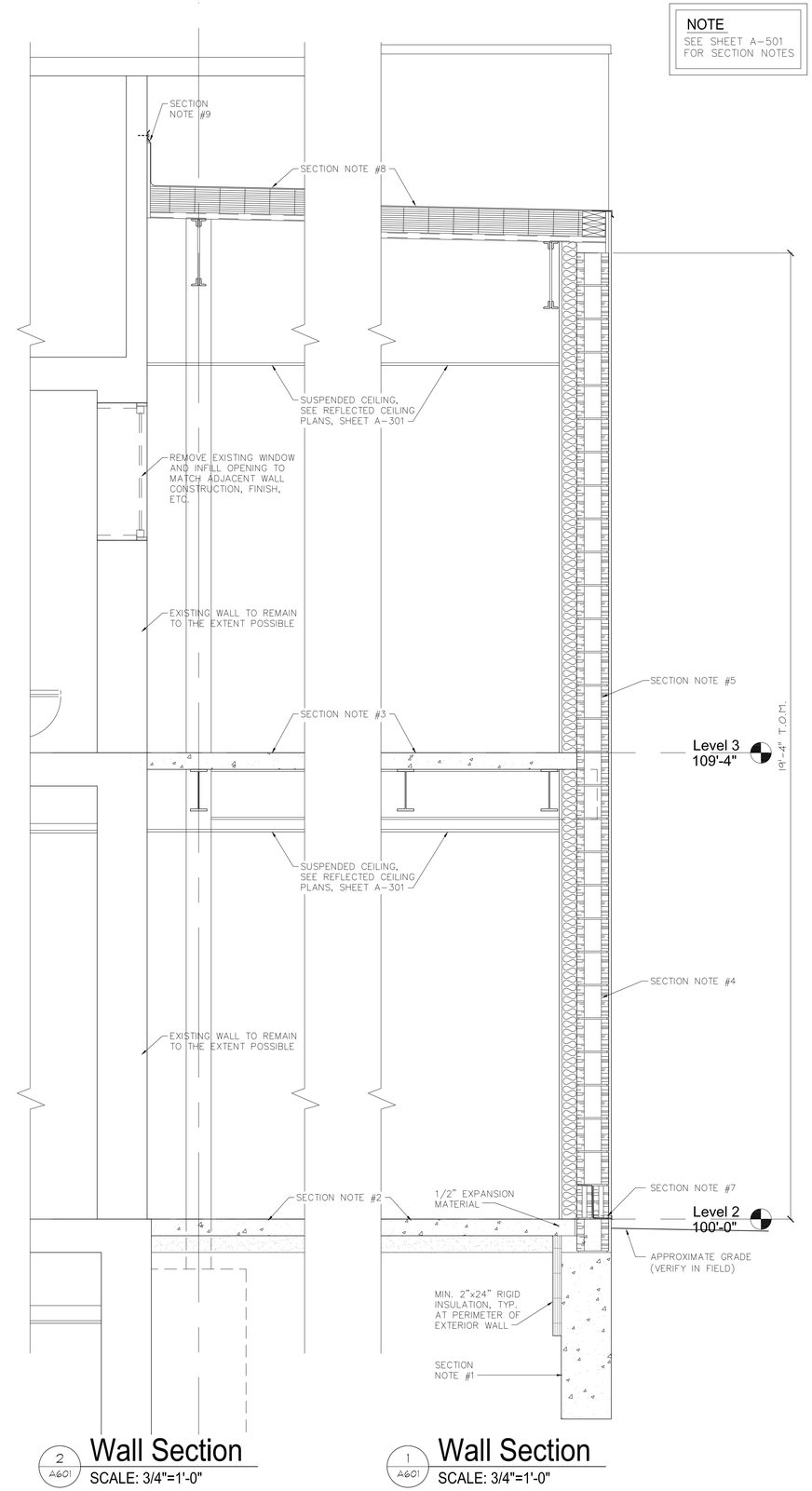
ISSUE	DATE
SCHEME	Nov. 30, 2022
REVIEW	Dec. 19, 2022
PERMITS	Jan. 16, 2023

DRAWN BY: JN
CHECKED BY:
JOB NO: 22-9243B
SHEET NUMBER: A-501



4 A601 **Wall Section**
SCALE: 3/4"=1'-0"

3 A601 **Wall Section**
SCALE: 3/4"=1'-0"



2 A601 **Wall Section**
SCALE: 3/4"=1'-0"

1 A601 **Wall Section**
SCALE: 3/4"=1'-0"

NOTE
SEE SHEET A-501 FOR SECTION NOTES

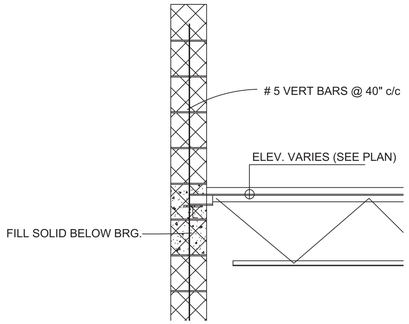
smith+schurman associates, inc.
architects ▪ planners ▪ interior designers
PO Box 1607, Southgate, MI 48195
Telephone: 248-227-9660

WALL SECTIONS

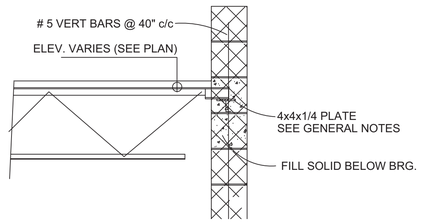
ALPINE VALLEY SKI RESORT
PROPOSED ADDITION
6775 HIGHLAND ROAD
WHITE LAKE, MICHIGAN 48383

ISSUE	DATE
SCHEME	Nov. 30, 2022
REVIEW	Dec. 19, 2022
PERMITS	Jan. 16, 2023

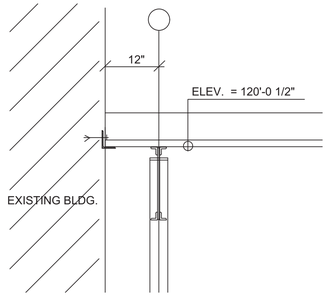
DRAWN BY: JN
CHECKED BY:
JOB NO: 22-9243B
SHEET NUMBER: A-601



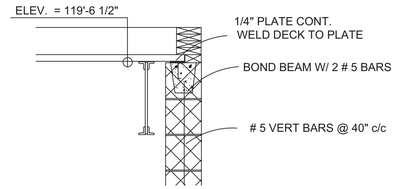
SECTION 4 / S-01



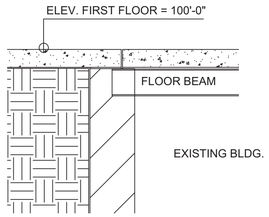
SECTION 3 / S-01



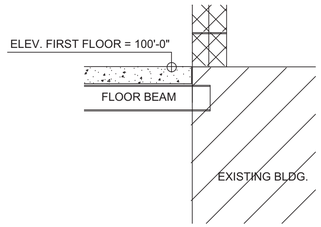
SECTION 2 / S-01



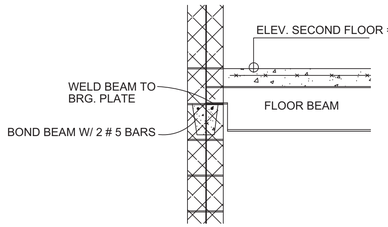
SECTION 1 / S-01



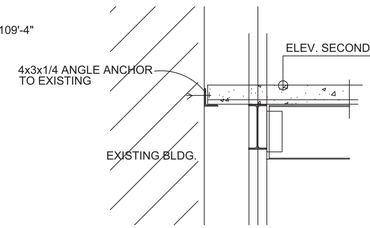
SECTION 9 / S-01



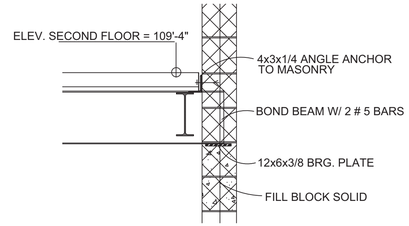
SECTION 8 / S-01



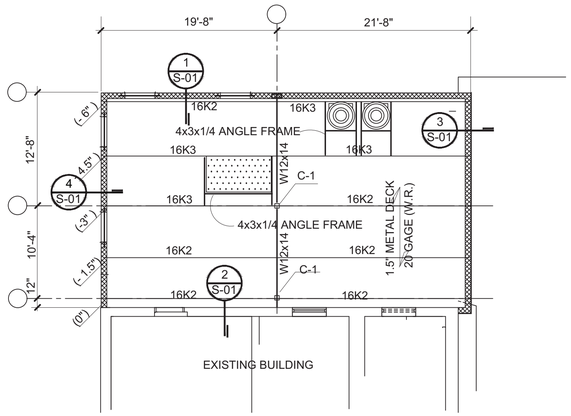
SECTION 7 / S-01



SECTION 6 / S-01



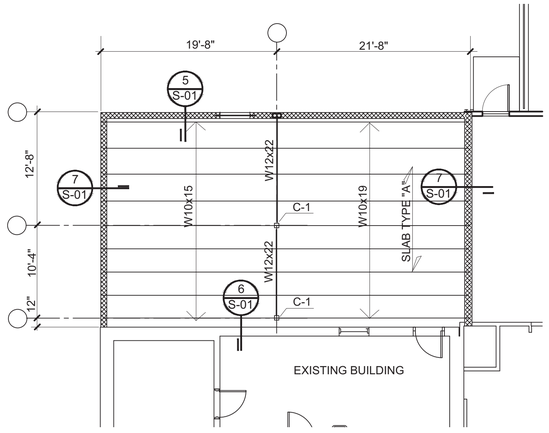
SECTION 5 / S-01



ROOF TOP OF STEEL = 120'-0 1/2"
(UNDERSIDE OF METAL DECK)
UNLESS NOTED OTHERWISE

ROOF FRAMING PLAN

HSS4x4x1/4
10x10x1 BASE PLATE



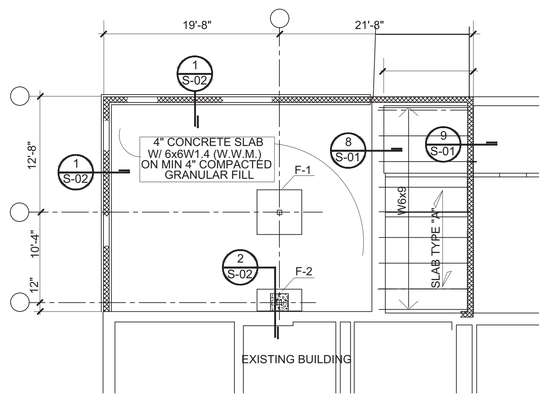
FINISH SECOND FLOOR ELEV. = 109'-4"

SECOND FLOOR FRAMING PLAN

FLOOR LIVE LOAD = 100.0 PSF

COLUMN "C-1"
HSS4x4x1/4
10x10x1 BASE PLATE

SLAB TYPE "A"
4" CONCRETE SLAB
W/ 6x6W1.4 (W.W.M.)
ON 1.0C26 METAL FORM
(GALVANIZED)



FINISH FIRST FLOOR ELEV. = 100'-0"

1st FLOOR & FOUNDATION PLAN

HSS4x4x1/4
10x10x1 BASE PLATE
4-1" x 16" DIA ANCHOR BOLTS
SEE SEC. 2/S-02

SLAB TYPE "A"
4" CONCRETE SLAB
W/ 6x6W1.4 (W.W.M.)
ON 1.0C26 METAL FORM
(GALVANIZED)

CONTRACTOR'S NOTE

ALL EXISTING CONDITIONS MUST BE FIELD VERIFIED PRIOR TO BEGINING OF CONSTRUCTION

smith+schurman associates, inc.
architects ▪ planners ▪ interior designers
PO Box 1607, Southgate, MI 48195
Telephone: 248-227-9660

STRUCTURAL
ALPINE VALLEY SKI RESORT
PROPOSED ADDITION
6775 HIGHLAND ROAD
WHITE LAKE, MICHIGAN 48383

ISSUE	DATE
PERMIT	01-16-23

DRAWN BY: GOP
CHECKED BY:
JOB NO: 22-9243B
SHEET NUMBER: S-01

MASONRY NOTES:

Contractor & all sub-trades are responsible for reviewing & complying with all applicable specifications contained herein. Where discrepancies occur between design drawings and these notes, design drawing specifications are to supersede.

GENERAL WORMANSHIP:

A: All work shall be in compliance with the latest building code requirements for masonry structures, Michigan Building Code, ACI 530/ASCE 5/TMS402 and specifications for masonry structures ACI 530.1/ASCE 6/TMS 602 and N.C.M.A. specifications.

B: The masonry contractor is responsible for the design and placement of all temporary shoring necessary for the stability of masonry structures during construction and prior to the completion of the project as shown in it's entirety in the construction documents.

C: All masonry below grade or fin. slab on grade shall be solid or have cores grouted solid.

D: Interior walls to be tied to the buildings structural steel at the top of the wall @ 48" c/c max. with a connection capable of min. 1" vert. deflection. Verify connection detail with Engineer.

MATERIALS:

A: All mortar shall be type "M" or "S".

B: All concrete masonry units shall conform to the latest version of the following:
ASTM C 90 for load bearing or reinforced concrete units.
ASTM C 744 for prefaced concrete and calcium silicate units.
ASTM C 55 Grade N for concrete brick, i.e. split face.
ASTM C 73 for calcium silicate face brick.

C: All clay or shale facing brick shall conform to ASTM C 216. All clay or shale hollow brick shall conform to ASTM C 652.

D: All masonry shall develop a 28 day minimum prism strength f'm = 1500 psi.

E: All reinforcing bars dowels, and ties shall conform to A.S.T.M. A615 grade 60. Reinforcing steel shall be continuous and have a minimum 50 bar diameter lap and be placed in accordance with ACI 530/ASCE 5/TMS402.

VERT. REINFORCEMENT:

A: All reinforcement to be #5 bars U.N.O. All bars to be placed in middle of fully grouted cell. Bars to be cont. & lapped spliced min. 31". Wire bars in place as required to maintain position during grouting.

B: All masonry vert. steel shall be lapped cont. & doweled into footings.

C: All interior C.M.U. and all exterior above grade C.M.U. walls up to 14'-0" in height shall have vertical reinforcing of @ 48" c/c. All masonry walls exceeding 14'-0" in height are to be reinforced. See structural details for specifics.

D: All C.M.U. walls are to have additional reinforced cells adjacent to all interruptions in the continuity of the wall, (i.e. doo- openings, control joints, ends of walls, etc.). Such additional reinforcement is to be of the same size vert. steel typical to that wall. Locate min. (1) reinforced cell located within 8" of all wall ends & corners & within 8" each side of control joints. For all openings provide one reinforced cell not obstructed by lintel within 16" of edge of opening plus one additional reinforced cell per side for each 4'-0" of opening width (round up to nearest number).

HORZ. REINFORCEMENT:

A: Provide Dur-O-Wall 9 gauge "Ladur" type horz. C.M.U. wall reinforcement w/16" c/c cross-rod spacing. All horz. reinforcement to be lap spliced continous btwn. control joints. Splices to share one cross rod + min. 8" of side rods each side.Typical placement to be 16" c/c vert. Above all C.M.U. openings over 7'-4" wide place additional horz. reinforcement @ 8" o/c vert. Additional reinforcement to be continous from control joint on one side to min. 32" past edge of opening on other side.

B: All masonry bond beams are to have (2) #5 bars cont. Bars are to be lap spliced 32" min., be placed @ mid-height in course & have ½" grout cover to face shell. Wire bars in place as required to maintain position during grouting. Bond beams are to be continous through control joints U.N.O.

C: All control joints are to be typ. "Michigan" shear type with strecher block head joint grouted solid. All control joints are to have min. (1) reinforced cell located within 8" each side of joint.

OPENINGS:

B: For all openings provide one reinforced cell not obstructed by lintel within 16" of edge of opening plus one additional reinforced cell per side for each 4'-0" of opening width (round up to nearest number).

C: For masonry openings up to 4'-0" wide provide (1) L4x3-1/2x1/4 for 4" masonry, (2) L4x3-1/2x1/4 for 8" C.M.U. & (2) L5x5x5/16 for 12" C.M.U. Provide 4" length of bearing each end on min. & grout solid min. 8" below.

D: For masonry openings up to 7'-4" wide provide (1) L6x3-1/2x3/8 for 4" masonry, (2) L6x3-1/2x3/8 for 8" C.M.U. & (2) L5x5x3/8 for 12" C.M.U. Provide 4" length of bearing each end on min. & grout solid min. 24" below.

STEEL BEARING:

A: All steel beams bearing on masonry other than loose angles shall have 8" of bearing past edge of masonry on ½" thk. bearing plate. Plate width to be 1-1/2" less than nominal width of C.M.U. Plate to be embedded w/(2) 3/4"x6" headed shear studs. Grout solid below brg. plate to foundation below. Provide min. (2) reinforced cells directly adjacent to brg. plate continous from foundation to top of masonry. Beam to be fastened to brg. plate w/(2) 3/4" threaded shear studs welded to plate through long slotted holes in bottom flange of lintel. Lintel shelf plates are to be stitch welded to beam w/1/4" x 2" fillet @ 12" c/c - both sides.

B: Where joists bear on masonry provide steel bearing plates w/(2) 1/2"x6" headed shear stud anchors embedded btwn. horz. steel in cont. bond beam. For "K" series use 4"x6"x3/8" plates & for "LH" series use 6"x9"x3/8". Plate edge to be located within ½" of face of wall. Weld joists to bearing plates as follows, K-Series min. (2) 1/8"x1" long fillet welds. LH-Series min. (2) 1/4"x2" long fillet welds.

C: Where joist girders bear on masonry provide steel bearing plates w/(2) 3/4"x6" headed shear studs embedded btwn. horz. steel in cont. bond beam. Use 6"x12"x3/4" plate. Plate edge to be located within ½" of face of wall. Weld girder to bearing plates w/min. (2) 1/4"x3" fillet welds. Provide min. (2) reinforced cells directly below girder brg. plate cont. to foundation.

MASONRY GROUTING GUIDE:

Slump: 8" - 11".
Compressive strength: 2000 psi min.

Preparations for grouting:

Cleanouts:	Required if pour height exceeds 5'-0".
Cleanouts Size:	3" x 3".
Cleanouts Spacing:	In bottom course at each vertical bar or 32" c/c max. if wall grouted solid.

Grout Consolidation:

Pour height 12" or less:	Mechanical vibration or puddling.
Pour height greater than 12":	Mechanical vibration and reconsolidate after water loss and settlement.

STEEL NOTES:

Contractor & all sub-trades are responsible for reviewing & complying with all applicable specifications contained herein. Where discrepancies occur between design drawings and these notes, design drawing specifications are to supersede.

STEEL JOISTS & JOIST GIRDERS:

A: All steel joists and joist girders shall be designed, fabricated and erected in accordance with the latest Steel Joist Institute Standard Specifications for "K","CS", "LH" and "DLH" and Joist Girder Series.

B: All provisions of the Recommended Code of Standard Practice of Steel Joists, as adopted by the Steel Joist Institute, shall be adhered to.

C: Extend bottom chord of joists to columns and provide stabilizer plate between bottom chord angles to prevent joist rotation (typ.).

D: Where joists bear on steel supports weld joist seats to supporting member.
See above referenced specifications for min. weld requirements. Joists 40' or more in length shall use (2) 1/2" field erection bolts to supporting member per joist seat. Holes in supporting member to be 9/16" max. Joists to be welded in place prior to deck placement.

E: Where joists bear on masonry provide steel bearing plates w/(2) 1/2"x6" shear stud anchors embedded btwn. horz. steel in cont. bond beam. For "K" series use 4"x6"x3/8" plates & for "LH" series use 6"x9"x3/8". Plate edge to be located 1/4" to 1/2" from face of wall. Weld joists to bearing plates. See above referenced specifications for min. weld requirements.

F: Where joist girders bear on masonry provide steel bearing plates w/(2) 3/4"x6" shear stud anchors embedded btwn. horz. steel in cont. bond beam. Use 6"x12"x3/4" plate. Plate edge to be located 1/4" to 1/2" from face of wall. Weld girder to bearing plates. See above referenced specifications for min. weld requirements.

G: All joist top and bottom chord concentrated loads greater than 75 lbs. not occurring at panel points shall be reinforced with (2) new L2x2x1/4 web member between the concentrated load on one chord and the nearest panel point on the opposite chord, see joist manufacturers detail.

H: Unless specified on the structural plans, no joist concentrated load greater than 150 lbs. shall be applied without the express direction of the structural engineer.

I: Joist members shall not be cut or drilled in any way, bottom chord attachments shall be made with clamps only.

J: Joists and joist girders are to be designed to resist a Net wind uplift of 20 psf (w/ASCE 7-10 Load Combinations).

STEEL ROOF DECK:

A: Basic Design Specifications of the Steel Deck Institute (SDI) shall govern.

B: Furnish deck as long as possible, but to span a minimum of (3) joist spaces, except where not possible.

C: Deck shall be reinforced as required for all openings placed in it.

D: Deck shall be welded to joists or beams it bears on w/5/8" puddle welds spaced a maximum of 12" c/c. Panels shall be sidelap fastened together w/min. (2) #10 TEK screws per span or more as required by deck manufacturer.

E: Metal closures for uncovered ends and edges: fabricate of not less than 20 gage commercial quality steel sheets, and of configuration required to provide closures at the open ends and sides of the steel deck units.

STRUCTURAL STEEL:

A: All structural steel work shall be in accordance with the latest A.I.S.C. specifications for the design, fabrication and erection of structural steel for buildings.

B: Material Specifications:

1: All W-shape structural steel shall conform to ASTM A992.
2: All miscellaneous structural steel such as C-shapes, Angles and those not specifically listed shall conform to ASTM A36 or ASTM A572 Grade 50.
3: HSS shapes shall conform to ASTM A500 grade B or C.
4: Headed Steel Shear Studs shall conform to ASTM A108.

C: Temporary guying and bracing of the structure during erection shall be the responsibility of the ERECTOR. The ARCHITECT and ENGINEER assume no responsibility for the absence, presence or adequacy of any temporary bracing.

D: The design of all structural steel connections shall be the responsibility of the STRUCTURAL STEEL FABRICATOR. Approval of the shop drawings by the ENGINEER shall not constitute approval of the adequacy of any structural steel connections.

E: All columns shall have 1" thick base plates w/(4) 1" dia. headed anchor rods conforming to ASTM F1554 grade 36 specifications w/(1) heavy hex nut tack welded in place to embedded end of each anchor rod. Anchors rods to have 16" embeddment in ftg. & 3" projection above base plate.

F: Connections for non-composite beams to be designed for end reactions noted on drawing or 1/2 of total allowable uniform load per A.I.S.C. beam tables if no reaction is given.

G: Connections for composite beams to be designed for end reactions noted on drawing or 2/3 of total allowable uniform load per A.I.S.C. beam tables if no reaction is given.

H: All beams indicated with wood nailers are to have 3/8" threaded shear studs @ 24" c/c stagged for fastening of nailer to beam.

J: Temporary erection seats shall be furnished per the recommendations of the A.I.S.C. publication "Engineering for Steel Construction".

K: The Fabricator shall neither use nor reproduce any part of the Design Drawings as part of the Shop or Erection Drawings without the written permission of this office.

L: All girts to be supported w/ 1/2" dia.sag rod @ 8'-0" c/c maximum spacing unless otherwise noted.

SHORING:

A: All shoring, underpinning, and related activities shall be performed by contractors experienced with commonly accepted safe and effective practices in such matters.

B: Before removal of existing structural supports, shore underpin, etc., all questionable areas in order to maintain structural integrity, and maintain until new structure is in place and all components are fully secured.

CONCRETE NOTES:

Contractor & all sub-trades are responsible for reviewing & complying with all applicable specifications contained herein. Where discrepancies occur between design drawings and these notes, design drawing specifications are to supersede.

A: Measuring, mixing and placing of concrete shall be in accordance with ACI 304.

B: Protection and curing of concrete shall be in accordance with ACI 305, 306 and 308.

C: All pertinent sections of ACI 318 shall apply.

D: Reinforcing steel shall be fabricated and placed in accordance with the ACI 315.

E: All reinforcing steel shall be ASTM A615 Grade 60, deformed in accordance with ASTM 305, unless otherwise noted.

F: Step all footings at a ratio of (2) horizontal to (1) vertical.

G: All footings to rest on undisturbed soil.

H: U.N.O. In concrete piers provide (8) #7 vert. bars [(3) each face] w/#4 ties @ 12" c/c max. Ties to be 2" from top & bott. of pier.

I: All columns & baseplates are to be fully encased in concrete from fin. floor to top of footing. Provide isolation joint encompassing entirity of base plate btwn. column pour & fin. floor slab.

CONCRETE MIX GUIDE

CLASS OF CONCRETE	MIN. 28 28 DAY STRENGTH (PSI)	MAX. W/C RATIO LBS. HOH/LB. CEMENT		AIR CONT. %
STANDARD EXPOSED CONCRETE	4500	0.45		6 5-1/2
STANDARD FLOOR CONCRETE	4000	0.45		3-1/2 4-1/2
STANDARD FOUNDATION CONCRETE	3000	0.55		2 1
STANDARD UNEXPOSED & FORMED	4000	0.45		1 2

DESIGN CRITERIA

2012 MICHIGAN BUILDING CODE

(2012 International Building Code & State Amendments)

ROOF LOAD CRITERIA

GROUND SNOW LOAD	(Pg) = 25.0 PSF
SNOW EXPOSURE FACTOR	(Ce) = 1.0
SNOW LOAD IMPORTANCE FACTOR	(Is) = 1.0
THERMAL FACTOR	(Ct) = 1.0
FLAT ROOF DESIGN SNOW LOAD	(Ps) = 25.0 PSF

WIND LOAD CRITERIA

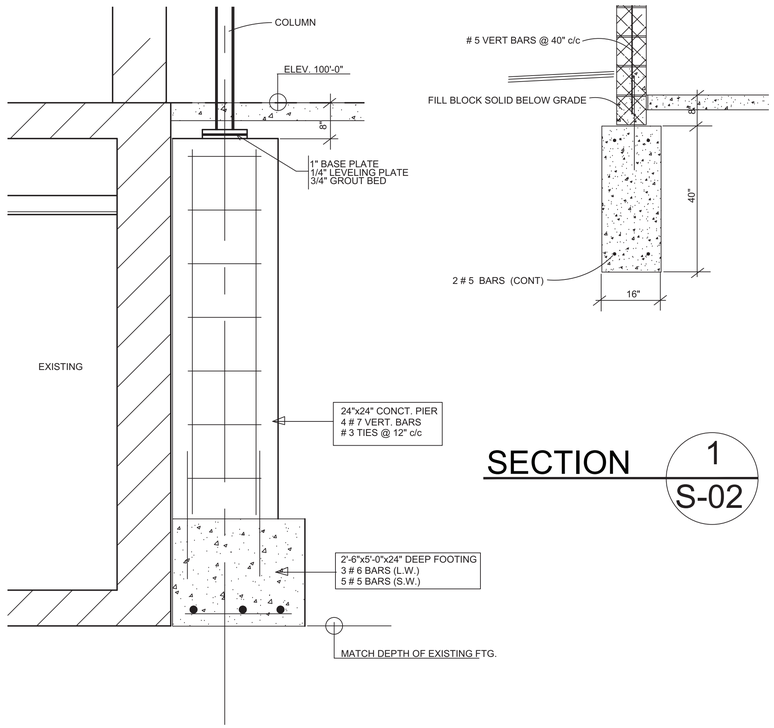
ULTIMATE DESIGN WIND SPEED	(Vult) = 115 MPH
NOMINAL DESIGN WIND SPEED	(Vasd) = 90 MPH
WIND IMPORTANCE FACTOR	(Iw) = 1.0
RISK CATEGORY	= II
WIND EXPOSURE	= B
INTERNAL PRESSURE COEFFICIENT	(GCpi) = ±0.18

COMPONENT & CLADDING
ULTIMATE DESIGN WIND PRESSURE VALUES

WALL ZONES	COMPONENT AREA	ULT. WIND PRESSURE (p.s.f.)
4	10 Sq. Ft.	= + 26.2 / -28.4
4	50 Sq. Ft.	= + 23.5 / -25.7
5	10 Sq. Ft.	= + 26.2 / -35.0
5	50 Sq. Ft.	= + 23.5 / -29.6
ROOF ZONES	COMPONENT AREA	ULT. WIND PRESSURE (p.s.f.)
1	10 Sq. Ft.	= + 16.0 / -28.7
1	50 Sq. Ft.	= + 16.0 / -27.7
2	10 Sq. Ft.	= + 16.0 / -48.1
2	50 Sq. Ft.	= + 16.0 / -36.2
2	100 Sq. Ft.	= + 16.0 / -25.8
3	10 Sq. Ft.	= + 16.0 / -72.2
3	50 Sq. Ft.	= + 16.0 / -43.5
ROOF OVERHANGS		
2	10 Sq. Ft.	= + 16.0 / -52.5
2	50 Sq. Ft.	= + 16.0 / -39.4
3	10 Sq. Ft.	= + 16.0 / -67.7
3	50 Sq. Ft.	= + 16.0 / -33.9

SEISMIC DESIGN CRITERIA

SEISMIC IMPORTANCE FACTOR	(Ie) = 1.0
SEISMIC RISK CATEGORY	= II
MAPPED SPECTRAL RESPONSE ACCELERATIONS	(Ss) = 0.0906 g (S1) = 0.0457 g
SITE CLASS	= D
SPECTRAL RESPONSE COEFFICIENTS	(Sds) = 0.097 g (Sd1) = 0.073 g
SEISMIC DESIGN CATAGORY	= B
BASIC SIESMIC FORCE RESISTING SYSTEM	= ORDINARY PLAIN MASONRY SHEAR WALLS
DESIGN BASE SHEAR	(V) = 4.3 Kips
SEISMIC RESPONSE COEFFICIENT	(Cs) = 0.0644
RESPONSE MODIFICATION FACTOR	(R) = 1.5
ANALYSIS PROCEDURE UTILIZED	= EQUIVALENT LATERAL FORCE PROCEDURE



SECTION 1 / S-02

SECTION 2 / S-02

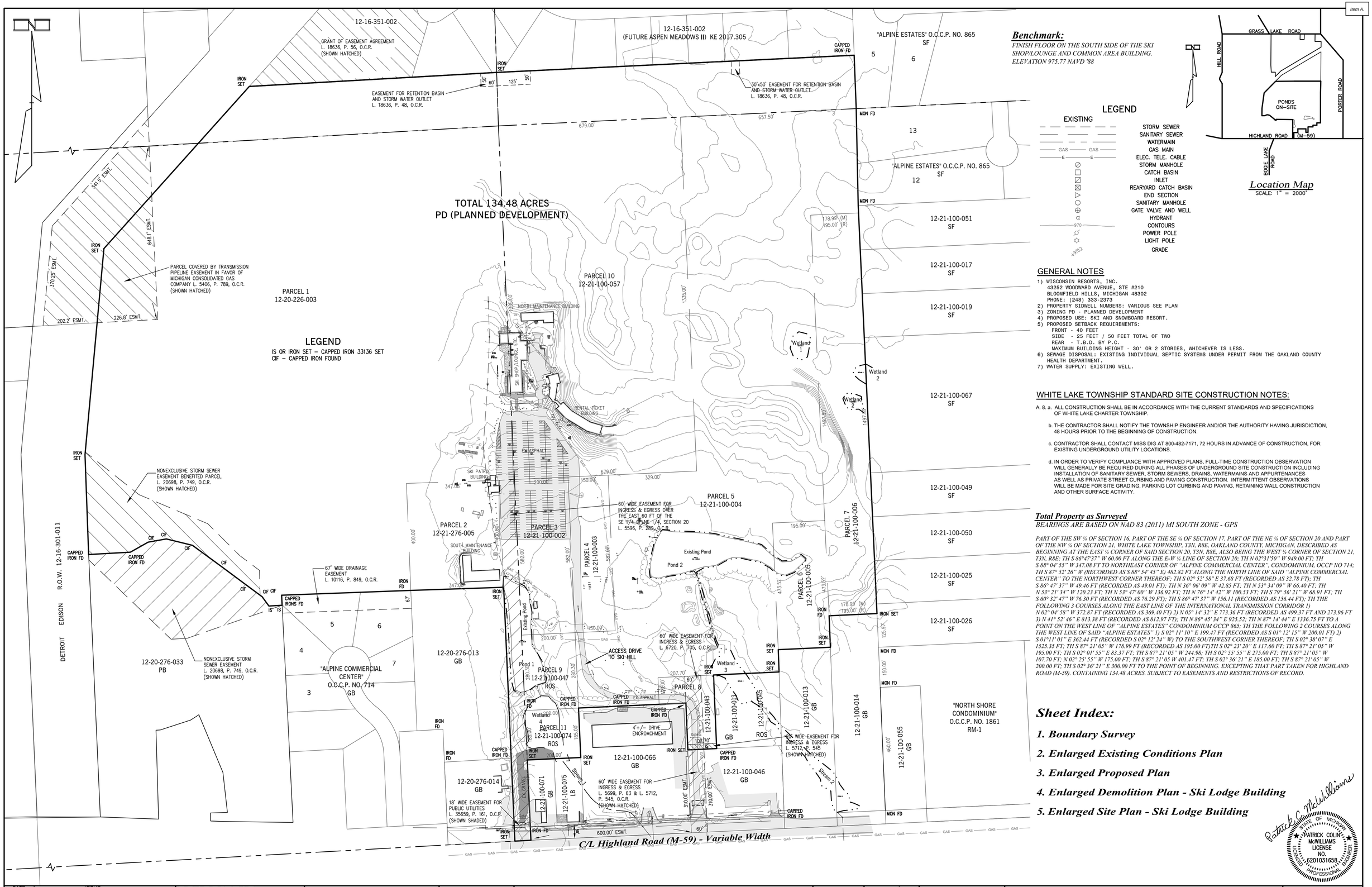
smith+schurman associates, inc.
architects ■ planners ■ interior designers
PO Box 1407, Southgate, MI 48195
Telephone: 248-227-9660

STRUCTURAL
ALPINE VALLEY SKI RESORT
PROPOSED ADDITION
6775 HIGHLAND ROAD
WHITE LAKE, MICHIGAN 48383

ISSUE	DATE
PERMIT	01-16-23

DRAWN BY: GOP
CHECKED BY:
JOB NO: 22-9243B
SHEET NUMBER: S-02

STATE OF MICHIGAN · GARY G PARADISI · ENGINEER · No. 23295 · PROFESSIONAL ENGINEER



Benchmark:

FINISH FLOOR ON THE SOUTH SIDE OF THE SKI SHOP/LOUNGE AND COMMON AREA BUILDING. ELEVATION 975.77 NAVD '88

Location Map
SCALE: 1" = 2000'

LEGEND

EXISTING

	STORM SEWER
	SANITARY SEWER
	WATERMAIN
GAS GAS	GAS MAIN
E E	ELEC. TELE. CABLE
	STORM MANHOLE
	CATCH BASIN
	INLET
	REARYARD CATCH BASIN
	END SECTION
	SANITARY MANHOLE
	GATE VALVE AND WELL
	HYDRANT
970	CONTOURS
	POWER POLE
	LIGHT POLE
+970.2	GRADE

GENERAL NOTES

1) WISCONSIN RESORTS, INC.
   43252 WOODWARD AVENUE, STE #210
   BLOOMFIELD HILLS, MICHIGAN 48302
   PHONE: (248) 333-2373
2) PROPERTY SIDWELL NUMBERS: VARIOUS SEE PLAN
3) ZONING PD - PLANNED DEVELOPMENT
4) PROPOSED USE: SKI AND SNOWBOARD RESORT.
5) PROPOSED SETBACK REQUIREMENTS:
   FRONT - 40 FEET
   SIDE - 25 FEET / 50 FEET TOTAL OF TWO
   REAR - T.B.D. BY P.C.
   MAXIMUM BUILDING HEIGHT - 30' OR 2 STORIES, WHICHEVER IS LESS.
6) SEWAGE DISPOSAL: EXISTING INDIVIDUAL SEPTIC SYSTEMS UNDER PERMIT FROM THE OAKLAND COUNTY HEALTH DEPARTMENT.
7) WATER SUPPLY: EXISTING WELL.

WHITE LAKE TOWNSHIP STANDARD SITE CONSTRUCTION NOTES:

A. 8. a. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE CURRENT STANDARDS AND SPECIFICATIONS OF WHITE LAKE CHARTER TOWNSHIP.

b. THE CONTRACTOR SHALL NOTIFY THE TOWNSHIP ENGINEER AND/OR THE AUTHORITY HAVING JURISDICTION, 48 HOURS PRIOR TO THE BEGINNING OF CONSTRUCTION.

c. CONTRACTOR SHALL CONTACT MISS DIG AT 800-482-7171, 72 HOURS IN ADVANCE OF CONSTRUCTION, FOR EXISTING UNDERGROUND UTILITY LOCATIONS.

d. IN ORDER TO VERIFY COMPLIANCE WITH APPROVED PLANS, FULL-TIME CONSTRUCTION OBSERVATION WILL GENERALLY BE REQUIRED DURING ALL PHASES OF UNDERGROUND SITE CONSTRUCTION INCLUDING INSTALLATION OF SANITARY SEWER, STORM SEWERS, DRAINS, WATERMAINS AND APPURTENANCES AS WELL AS PRIVATE STREET CURBING AND PAVING CONSTRUCTION. INTERMITTENT OBSERVATIONS WILL BE MADE FOR SITE GRADING, PARKING LOT CURBING AND PAVING, RETAINING WALL CONSTRUCTION AND OTHER SURFACE ACTIVITY.

Total Property as Surveyed

BEARINGS ARE BASED ON NAD 83 (2011) MI SOUTH ZONE - GPS

PART OF THE SW ¼ OF SECTION 16, PART OF THE SE ¼ OF SECTION 17, PART OF THE NE ¼ OF SECTION 20 AND PART OF THE NW ¼ OF SECTION 21, WHITE LAKE TOWNSHIP, T3N, R8E, OAKLAND COUNTY, MICHIGAN, DESCRIBED AS BEGINNING AT THE EAST ¼ CORNER OF SAID SECTION 20, T3N, R8E, ALSO BEING THE WEST ¼ CORNER OF SECTION 21, T3N, R8E; TH S 86°47'37" W 60.00 FT ALONG THE E-W ¼ LINE OF SECTION 20; TH N 02°31'50" W 949.00 FT; TH S 88° 04' 55" W 347.08 FT TO NORTHEAST CORNER OF "ALPINE COMMERCIAL CENTER", CONDOMINIUM, OCCP NO 714; TH S 87° 52' 26" W (RECORDED AS S 88° 54' 45" E) 482.82 FT ALONG THE NORTH LINE OF SAID "ALPINE COMMERCIAL CENTER" TO THE NORTHWEST CORNER THEREOF; TH S 02° 52' 58" E 37.68 FT (RECORDED AS 32.78 FT); TH S 86° 47' 37" W 49.46 FT (RECORDED AS 49.01 FT); TH N 36° 06' 09" W 42.85 FT; TH N 53° 34' 09" W 66.40 FT; TH N 53° 21' 34" W 120.23 FT; TH N 53° 47' 00" W 136.92 FT; TH N 76° 14' 42" W 100.53 FT; TH S 79° 56' 21" W 68.91 FT; TH S 60° 32' 47" W 76.30 FT (RECORDED AS 76.29 FT); TH S 86° 47' 37" W 156.11 (RECORDED AS 156.44 FT); TH THE FOLLOWING 3 COURSES ALONG THE EAST LINE OF THE INTERNATIONAL TRANSMISSION CORRIDOR 1) N 02° 04' 58" W 372.87 FT (RECORDED AS 369.40 FT) 2) N 05° 14' 32" E 773.36 FT (RECORDED AS 499.37 FT AND 273.96 FT 3) N 41° 52' 46" E 813.38 FT (RECORDED AS 812.97 FT); TH N 86° 45' 34" E 925.52; TH N 87° 14' 44" E 1336.75 FT TO A POINT ON THE WEST LINE OF "ALPINE ESTATES" CONDOMINIUM OCCP 865; TH THE FOLLOWING 2 COURSES ALONG THE WEST LINE OF SAID "ALPINE ESTATES" 1) S 02° 11' 10" E 199.47 FT (RECORDED AS S 01° 12' 15" W 200.01 FT) 2) S 01°11'01" E 362.44 FT (RECORDED S 02° 12' 24" W) TO THE SOUTHWEST CORNER THEREOF; TH S 02° 38' 07" E 1525.35 FT; TH S 87° 21' 05" W 178.99 FT (RECORDED AS 195.00 FT)TH S 02° 23' 20" E 117.60 FT; TH S 87° 21' 05" W 195.00 FT; TH S 02° 01' 55" E 83.37 FT; TH S 87° 21' 05" W 244.98; TH S 02° 55' 55" E 275.00 FT; TH S 87° 21' 05" W 107.70 FT; N 02° 25' 55" W 175.00 FT; TH S 87° 21' 05 W 401.47 FT; TH S 02° 36' 21" E 185.00 FT; TH S 87° 21' 05" W 200.00 FT; TH S 02° 36' 21" E 300.00 FT TO THE POINT OF BEGINNING. EXCEPTING THAT PART TAKEN FOR HIGHLAND ROAD (M-59). CONTAINING 134.48 ACRES. SUBJECT TO EASEMENTS AND RESTRICTIONS OF RECORD.

Sheet Index:

1. Boundary Survey

2. Enlarged Existing Conditions Plan

3. Enlarged Proposed Plan

4. Enlarged Demolition Plan - Ski Lodge Building

5. Enlarged Site Plan - Ski Lodge Building

DATE	ISSUE
6-5-2023	REVISED PER TOWNSHIP & DLZ (5-8-2023)

PROPRIETOR:
WISCONSIN RESORTS, INC
43252 WOODWARD AVE, STE 210
BLOOMFIELD HILLS, MICHIGAN 48302
(248) 333-2373, EXT. 102

KIEFT ENGINEERING

KIEFT ENGINEERING, INC.
PROFESSIONAL ENGINEERS AND PROFESSIONAL SURVEYORS
5852 SOUTH MAIN STREET, SUITE 1, CLARKSTON, MICHIGAN 48346
PHONE (248) 625-5251 www.kieftenq.com FAX (248) 625-7110

DATE	3-8-2023	CKD. BY	DATE
DRAWN	GF		
DESIGN	PCM		
SECTIONS	16,17,20,21	T- 3 -N. R- 8 -E.	

72 HOURS (3 WORKING DAYS) BEFORE YOU DIG CALL MISS DIG 800-482-7171 (TOLL FREE)

Boundary Survey

ALPINE VALLEY
PART OF SECTIONS 16, 17, 20, 21, T3N, R8E,
WHITE LAKE TOWNSHIP, OAKLAND COUNTY, MICHIGAN

SCALE	1" = 150'
SHEET	1 OF 5
	KE 2021.177

G:\2021\177\dwg\Alpine Valley Parking.dwg, 1 Boundary Survey, 6/5/2023 2:29:10 PM

PARCEL 10
12-21-100-057

PARCEL 4
12-21-100-003

PARCEL 3
12-21-100-002

PARCEL 1
12-20-226-003

PARCEL 2
12-21-276-005

PARCEL 8

12-21-100-043

PARCEL 9
12-21-100-047
ROS

PARCEL 11
12-21-100-074
ROS

POND 2
W.E. = 955.30

POND 1
W.E. = 955.96

Benchmark 4

Benchmark 5

Benchmark 3

Benchmark 2

EX ASPHALT

SKI SHOP/LOUNGE & COMMON AREA
#6775 HIGHLAND ROAD

SKI PATROL BUILDING

NORTH MAINTENANCE BUILDING

SOUTH MAINTENANCE BUILDING

APPROX. SEPTIC FIELD

BATHROOM

SHED

EXISTING GRAVEL

"PARKING SPACE COUNT" - (MAIN PARKING LOT)

TOTAL EXISTING STRIPED PARKING SPACES = 322 SPACES

12-20-276-013
GB

Benchmark:

FINISH FLOOR ON THE SOUTH SIDE OF THE SKI SHOP/LOUNGE AND COMMON AREA BUILDING. ELEVATION 975.77 NAVD '88

LEGEND

EXISTING

- STORM SEWER
- SANITARY SEWER
- WATERMAIN
- GAS MAIN
- ELEC. TELE. CABLE
- STORM MANHOLE
- CATCH BASIN
- INLET
- REARYARD CATCH BASIN
- END SECTION
- SANITARY MANHOLE
- GATE VALVE AND WELL
- HYDRANT
- CONTOURS
- POWER POLE
- LIGHT POLE
- GRADE

STATE OF MICHIGAN
PATRICK COLIN McWILLIAMS
LICENSE NO. 6201031658
LICENSED PROFESSIONAL ENGINEER

DATE	ISSUE
6-5-2023	REVISED PER TOWNSHIP & DLZ (5-8-2023)

PROPRIETOR:
WISCONSIN RESORTS, INC
43252 WOODWARD AVE, STE 210
BLOOMFIELD HILLS, MICHIGAN 48302
(248) 333-2373, EXT. 102

KIEFT ENGINEERING

KIEFT ENGINEERING, INC.
PROFESSIONAL ENGINEERS AND PROFESSIONAL SURVEYORS
5852 SOUTH MAIN STREET, SUITE 1, CLARKSTON, MICHIGAN 48346
PHONE (248) 625-5251 www.kiefteng.com FAX (248) 625-7110

DATE	CKD. BY	DATE
DRAWN GF		
DESIGN PCM		
SECTIONS 16,17,20,21	T- 3 -N. R- 8 -E.	

72 HOURS (3 WORKING DAYS) BEFORE YOU DIG CALL MISS DIG 800-482-7171 (TOLL FREE)

Enlarged Existing Conditions Plan

ALPINE VALLEY
PART OF SECTIONS 16, 17, 20, 21, T3N, R8E,
WHITE LAKE TOWNSHIP, OAKLAND COUNTY, MICHIGAN

SCALE 1" = 50'
SHEET 2 OF 5
KE 2021.177

G:\2021\177\dwg\Alpine Valley Parking.dwg, 2 Existing, 6/5/2023 2:29:20 PM

"PARKING SPACE COUNT" - (MAIN PARKING LOT)

PROPOSED STANDARD PARKING SPACES = 310 SPACES
PROPOSED ADA PARKING SPACES = 13 SPACES   NOTE: 323 x 1 ADA/25 SPACES = 12.92 = 13 SPACES REQUIRED)
PROPOSED TOTAL PARKING SPACES = 323 SPACES

LEGEND

EXISTING	LEGEND	PROPOSED
	STORM SEWER	
	SEPTIC	
	WATERMAIN	
GAS	GAS MAIN	GAS
E	ELEC. TELE. CABLE	E
OH	OVERHEAD WIRES	OH
	STORM MANHOLE	
	CATCH BASIN	
	INLET	
	REARYARD CATCH BASIN	
	END SECTION	
	SANITARY MANHOLE	
	GATE VALVE AND WELL	
	HYDRANT	
970	CONTOURS	(40)
F.F. 984.00	FINISH FLOOR	F.F. 984.00
970.2	GRADE	(82.5)
	DRAINAGE FLOW	
	MATCH ELEVATION	(M)

Benchmark:

FINISH FLOOR ON THE SOUTH SIDE OF THE SKI SHOP/LOUNGE AND COMMON AREA BUILDING. ELEVATION 975.77 NAVD '88

STATE OF MICHIGAN PATRICK COLIN McWILLIAMS LICENSE NO. 6201031658 LICENSED PROFESSIONAL ENGINEER

DATE	ISSUE
6-5-2023	REVISED PER TOWNSHIP & DLZ (5-8-2023)

PROPRIETOR:
WISCONSIN RESORTS, INC
43252 WOODWARD AVE, STE 210
BLOOMFIELD HILLS, MICHIGAN 48302
(248) 333-2373, EXT. 102

KIEFT ENGINEERING

KIEFT ENGINEERING, INC.
PROFESSIONAL ENGINEERS AND PROFESSIONAL SURVEYORS
5852 SOUTH MAIN STREET, SUITE 1, CLARKSTON, MICHIGAN 48346
PHONE (248) 625-5251 www.kiefteng.com FAX (248) 625-7110

DATE 3-8-2023 | CKD. BY | DATE
DRAWN GF
DESIGN PCM
SECTIONS 16,17,20,21 T- 3 -N. R- 8 -E.

72 HOURS (3 WORKING DAYS) BEFORE YOU DIG CALL MISS DIG 800-482-7171 (TOLL FREE)

Enlarged Proposed Plan
ALPINE VALLEY
PART OF SECTIONS 16, 17, 20, 21, T3N, R8E, WHITE LAKE TOWNSHIP, OAKLAND COUNTY, MICHIGAN

SCALE 1" = 50'
SHEET 3 OF 5
KE 2021.177

G:\2021\177\dwg\Alpine Valley Parking.dwg, 3 Proposed, 6/5/2023 2:29:30 PM

DATE	ISSUE
6-5-2023	REVISED PER TOWNSHIP & DLZ (5-8-2023)

PROPRIETOR:
WISCONSIN RESORTS, INC
43252 WOODWARD AVE, STE 210
BLOOMFIELD HILLS, MICHIGAN 48302
(248) 333-2373, EXT. 102

KIEFT ENGINEERING

KIEFT ENGINEERING, INC.
PROFESSIONAL ENGINEERS AND PROFESSIONAL SURVEYORS
5852 SOUTH MAIN STREET, SUITE 1, CLARKSTON, MICHIGAN 48346
PHONE (248) 625-5251 www.kiefteng.com FAX (248) 625-7110

DATE 3-8-2023	CKD. BY	DATE
DRAWN GF		
DESIGN PCM		
SECTIONS 16,17,20,21	T- 3 -N. R- 8 -E.	

72 HOURS (3 WORKING DAYS) BEFORE YOU DIG CALL MISS DIG 800-482-7171 (TOLL FREE)

Enlarged Demolition Plan - Ski Lodge Building

ALPINE VALLEY
PART OF SECTIONS 16, 17, 20, 21, T3N, R8E,
WHITE LAKE TOWNSHIP, OAKLAND COUNTY, MICHIGAN

SCALE 1" = 20'
SHEET 4 OF 5
KE 2021.177

STATE OF MICHIGAN PATRICK COLIN McWILLIAMS LICENSE NO. 6201031658 LICENSED PROFESSIONAL ENGINEER

G:\2021\177\dwg\Alpine Valley Parking.dwg, 4 Demo, 6/5/2023 2:29:46 PM

LEGEND

EXISTING		PROPOSED
	STORM SEWER	
	SANITARY SEWER	
	WATERMAIN	
GAS	GAS MAIN	
E	ELEC. TELE. CABLE	
	STORM MANHOLE	
	CATCH BASIN	
	INLET	
	REARYARD CATCH BASIN	
	END SECTION	
	SANITARY MANHOLE	
	GATE VALVE AND WELL	
	HYDRANT	
970	CONTOURS	(80)
	POWER POLE	
	LIGHT POLE	
+970.2	GRADE	(82.5)
	DRAINAGE FLOW	

NOTES:
1. SEE ARCHITECTURAL PLANS FOR NOTES AND DETAILS.
2. BESIDES SOME MINOR GRADING, DRAINAGE PATTERNS REMAIN THE SAME WITH NEW ADDITION.

Benchmark:
FINISH FLOOR ON THE SOUTH SIDE OF THE SKI SHOP/LOUNGE AND COMMON AREA BUILDING. ELEVATION 975.77 NAVD '88

PARCEL 1
12-20-226-003

PARCEL 10
12-21-100-057

EX CB
R 985.55
6" N 977.23
10" S 976.01

974.7' TO NORTH P/L

NORTH MAINTENANCE BUILDING
PROPOSED TRANSFORMER
F.F. 989.29
O.H. DOOR 987.12
PEDISTOL 986.89
O.H. DOOR 987.14
O.H. DOOR 987.27

PUMP STATION
WATER TANK

EX 131'-10" STM @ 1.75%

1257.5' TO EAST P/L

EX DECK 993.0
F.F. 983.88
F.F. 993.12

Proposed Addition
F.F. 984.00
926 SF

EX YD
R 990.10

F.F. 993.20
MAN DOOR 984.00
40.67'+/-
F.F. 984.00
F.F. 982.14
F.F. 983.6
MAN DOOR 983.81

DTE BORE
(MAINTAIN) EX ASPHALT
APPROX. SEPTIC FIELD
EX 8" STORM
EX END 8" W 979.45

SWALE
SPILLWAY
RETAINING WALL W/GUARDRAIL (SEE ARCHITECTURAL PLANS)
LL ENTRANCE

EX CB
R 976.00
10" N 973.72
10" S 973.72

EX C.O. 974.41
EX C.O. 974.35
F.F. 974.47
EX C.O. 975.55
EX C.O. 975.42

ROCK WALL T/W 975.8
CONC WALL T/W 976.2
EX CONCRETE

EX SEPTIC LID 972.67
EX SEPTIC LID 973.46
TOP TANK=973.30

EX 178'-10" STM @ 3.56%

APPROXIMATE SEPTIC FIELD

SKI SHOP/LOUNGE & COMMON AREA BUILDING
#6775 HIGHLAND ROAD

EX ASPHALT (MAINTAIN)
EX ASPHALT
AC 978.02
AC 977.89
6 SPRUCE 978.6
6 SPRUCE 978.4
4 SPRUCE 979.0
6 SPRUCE 978.0
6 SPRUCE 977.9
F.F. 977.10
DE LINE 976.60
CO 976.48
F.F. 976.83
F.F. 977.02
EX SEPTIC LIDS N R 977.18 S R 978.35
6 SPRUCE 976.2
12 SPRUCE 978.3
12 SPRUCE 978.4
6 SPRUCE 977.9
F.F. 976.57
GAS METER 975.74
PP 977.3
F.F. 975.77
PEDISTOL 975.59
PEDISTOL 978.76
EX CONC. PAVER WALL
EX PAVERS
4' WD FENCE
24" PINE 970.9
16 PINE 970.0
20 PINE 969.6
14 PINE 974.2
8 SPRUCE 974.3
8 SPRUCE 974.6
6 SPRUCE 975.0

EX CB
R 969.50
10" N 967.38
12" S 967.25

TIMBERS
TIMBERS 978.4
PEDISTOL 978.87
F.F. 978.86
PROPOSED TRANSFORMER
EX CB
R 975.80
6" S 974.62
F.F. 978.84
AC 978.14
CO 977.87
20 PINE 977.2
20 PINE 976.6
20 PINE 976.8
4X4 SIGN 977.51
F.F. 978.57
PEDISTOL 978.48
EX ASPHALT 974.32
WOOD SIGN

PATRICK COLIN McWILLIAMS LICENSE NO. 6201031658 PROFESSIONAL ENGINEER STATE OF MICHIGAN REGISTERED

DATE	ISSUE
6-5-2023	REVISED PER TOWNSHIP & DLZ (5-8-2023)

PROPRIETOR:
WISCONSIN RESORTS, INC
43252 WOODWARD AVE, STE 210
BLOOMFIELD HILLS, MICHIGAN 48302
(248) 333-2373, EXT. 102

KIEFT ENGINEERING, INC.
PROFESSIONAL ENGINEERS AND PROFESSIONAL SURVEYORS
5852 SOUTH MAIN STREET, SUITE 1, CLARKSTON, MICHIGAN 48346
PHONE (248) 625-5251 www.kiefteng.com FAX (248) 625-7110

DATE	CKD. BY	DATE
DRAWN GF		
DESIGN PCM		
SECTIONS 16,17,20,21 T- 3 -N. R- 8 -E.		

72 HOURS (3 WORKING DAYS) BEFORE YOU DIG CALL MISS DIG 800-482-7171 (TOLL FREE)

Enlarged Site Plan - Ski Lodge Building

ALPINE VALLEY
PART OF SECTIONS 16, 17, 20, 21, T3N, R8E,
WHITE LAKE TOWNSHIP, OAKLAND COUNTY, MICHIGAN

SCALE 1" = 20'
SHEET 5 OF 5
KE 2021.177

G:\2021\177\dwg\Alpine Valley Parking.dwg, 5 Site Ski, 6/5/2023 2:29:56 PM

MLS EAST

G:\2021\177\dwg\Alpine Valley Parking.dwg, Ex MW N, 5/26/2023 3:36:30 PM

DATE	ISSUE

PROPRIETOR:
WISCONSIN RESORTS, INC
43252 WOODWARD AVE, STE 210
BLOOMFIELD HILLS, MICHIGAN 48302
(248) 333–2373, EXT. 102

KIEFT ENGINEERING

KIEFT ENGINEERING, INC.
PROFESSIONAL ENGINEERS AND PROFESSIONAL SURVEYORS
5852 SOUTH MAIN STREET, SUITE 1, CLARKSTON, MICHIGAN 48346
PHONE (248) 625–5251 www.kiefteng.com FAX (248) 625–7110

DATE 3–8–2023
DRAWN GF
DESIGN PCM
SECTIONS 16,17,20,21
CKD. BY | DATE
T– 3 –N. R– 8 –E.

72 HOURS (3 WORKING DAYS) BEFORE YOU DIG CALL MISS DIG 800–482–7171 (TOLL FREE)

Existing Conditions Plan - West North

ALPINE VALLEY

PART OF SECTIONS 16, 17, 20, 21, T3N, R8E,
WHITE LAKE TOWNSHIP, OAKLAND COUNTY, MICHIGAN

SCALE 1" = 30'
SHEET
KE 2021.177

Schedule

Symbol	Label	Image	QTY	Manufacturer	Catalog	Description	Number Lamps	Lamp Output	LLF	Input Power	Polar Plot
	T90		4	EXO	ASL1-135-4W-ASQU		1	17571	1	266.2	Max: 14955cd
	T180		5	EXO	ASL1-135-4W-ASQU		1	17571	1	266.2	Max: 14955cd
	Quad		2	EXO	ASL1-135-4W-ASQU		1	17571	1	532.4	Max: 14955cd

Plan View
Scale - 1" = 35ft

Statistics

Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
Parking Lot	+	2.4 fc	5.7 fc	0.1 fc	57.0:1	24.0:1

Alpine Valley
LED Lighting Calculations
White Lake, MI

Designer
BG
Date
05/31/2023
Scale
Not to Scale
Drawing No.
001
Summary

EXO OUTDOOR LIGHTING

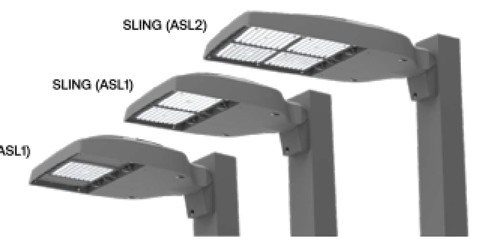
SLING Micro Strike

AREA/SITE/ROAD LIGHTER

DATE:	LOCATION:
TYPE:	PROJECT:
CATALOG #:	

FEATURES

- Compact sleek design with multiple LED configurations and simple installation
- The SLING includes a universal mounting block for easy pole installation or mast arm option for 2-3/8 ft OD roadway brackets
- Capable of replacing up to 1000w HID luminaires
- Micro Strike optical distributions of Type 2, 3, 4F, 4W or 5QW
- Tool-less entry option for easy installation and maintenance
- 1.5G rated for high vibration applications including bridges and overpasses



See Certification Specifications

10-DAY QUICK SHIP PROGRAM

QS

SPECIFICATIONS

CONSTRUCTION
- Die-cast housing with hidden vertical heat fins that are optimal for heat dissipation while keeping a clean smooth outer surface
- Corrosion resistant, die-cast aluminum housing with powder coat paint finish
- Separate optical and electrical compartment for improved thermal management and optimum component operation
- TGIC thermoset polyester powder paint finish applied at nominal 2.5 mil thickness

OPTICS
- Entire optical aperture illuminates to create a larger luminous surface area resulting in a low glare appearance without sacrificing optical performance
- Premium engineered individual acrylic lenses deliver IES Type 2, 3, 4F, 4W and 5QW distributions
- Lens distributions are field rotatable (in 90° increments) or exchangeable for job site fine-tuning
- 3000K, 4000K, or 5000K (70 CRI) CCT
- 80, 160, or 320 midpower LEDs
- 3000K, 4000K or 5000K (70 CRI) CCT
- Zero uplight at 0 degrees of tilt
- Field rotatable optics

INSTALLATION
- Tool-less entry to wiring/driver compartment optional
- Arm mounting works with S2 drill pattern
- Fixture ships with slotted mounting block to accommodate wide range of drill patterns for easy retrofit opportunities
- Mast arm fitter accessory or option available for 2-3/8" OD brackets with vertical tilt of +3°, 0° or -3°

ELECTRICAL
- Universal 120-277 VAC or 347-480 VAC input voltage, 50/60 Hz
- Ambient operating temperature -40° C to 40° C
- Drivers have greater than 90% power factor and less than 20% THD
- LED drivers have output power over-voltage, over-current protection and short circuit protection with auto recovery
- Field replaceable surge protection device provides 20KA and 10KV protection meeting ANSI/IEEE C62.41.2 Category C High and Surge Location Category C3; Automatically takes fixture off-line for protection when device is consumed

CONTROLS
- Photo control, occupancy sensor and Zigbee wireless available for complete on/off and dimming control
- 7-pin ANSI C136.41-2013 photocontrol receptacle option available for twist lock photocontrols or wireless control modules (control accessories sold separately)
- Dimming Drivers are standard and dimming leads are extended out of the luminaire unless control options require connection to the dimming leads. Must specify if wiring leads are to be greater than the 6
- Please consult brand or sales representative when combining control and electrical options as some combinations may not operate as anticipated depending on your application

CERTIFICATIONS
- Listed to UL1598 and CSA C22.2#250.0-24 for wet locations and 40°C ambient temperatures

CERTIFICATIONS (CONTINUED)
- DLC® (DesignLights Consortium Qualified), with some Premium Qualified configurations. Not all product variations on this page are DLC Qualified. Refer to http://www.designlights.org/ for the most up-to-date list.
- 1.5G rated for ANSI C136.31 high vibration applications
- IP65 optical assembly
- Meets IDA recommendations using 3K CCT configuration at 0 degrees of tilt
- This product qualifies as a "designated country construction material" per FAR 52.225-11 Buy American-Construction Materials under Trade Agreements effective 04/23/2020.

WARRANTY
- 5 Year warranty

KEY DATA	
Lumen Range	3,200–36,000
Wattage Range	25–255
Efficacy Range (LPW)	118–148
Weight lbs. (kg)	14.5–17.5 (6.6–8.0)

EXO OUTDOOR LIGHTING

SLING Micro Strike

AREA/SITE/ROAD LIGHTER

DATE:	LOCATION:
TYPE:	PROJECT:
CATALOG #:	

= Service Program Limit of 15 luminaires QS

ORDERING GUIDE

Example: ASL1-80L-50-3K7-2-UNV-ASQU-BLT-7PRMD-40F

CATALOG #

ORDERING INFORMATION

Series	# LEDs	CCT/CRI	Distribution	Voltage	Mounting
ASL1 ASL Microstrike Series	80L-25 3,000 lm	3K7 3000K, 70 CRI	2 Type II	UNV Universal 120-277V	A Arm for Square poles with S2 drill pattern
	80L-39 4,500 lm	4K7 4000K, 70 CRI	3 Type III	120 120V	A3 AS with 3.5-4.13" OD RPA3 & UM
	80L-50 6,000 lm	5K7 5000K, 70 CRI	4F Type 4F	208 208V	A4 AS with 4.18-5.25" OD RPA4 & U
	160L-70 9,000 lm		4W Type 4W	240 240V	A5 AS with 5.5-6.5" OD RPA5 & UM
	160L-100 12,000 lm		5QW Type 5QW	277 277V	MAF Mast Arm Fitter for 2-3/8" OD
	160L-115 15,000 lm			347 347V	
	160L-135 18,000 lm			480 480V	
ASL2 ASL Microstrike Series	320L-145 21,000 lm				
	320L-170 24,000 lm				
	320L-185 27,000 lm				
	320L-210 30,000 lm				
	320L-235 33,000 lm				
	320L-255 35,000 lm				

Control Options Other	
7PR	7 Pin Receptacle
7PR-SC	7 Pin Receptacle with shorting cap
7PR-MD8F	7 pin receptacle with low voltage sensor at 8' mounting for external control accessory
7PR-MD40F	7 pin receptacle with low voltage sensor at 40' mounting for external control accessory
7PR-TL	7 Pin Receptacle with Photocontrol
Sensors	
BTS_F	Bluetooth Programmable, PIR Occupancy/Daylight Sensor, 360° lens [2]
BTSO_F	Bluetooth Programmable, PIR Occupancy/Daylight Sensor, 360° lens, up to 12' mounting height [3]

Options	
F[1]	Fusing
BC	Backlight Control

Color	
BLT	Black Matte Textured
BLS	Black Gloss Smooth
DBT	Dark Bronze Matte Textured
DBS	Dark Bronze Gloss Smooth
GTT	Graphite Matte Textured
LGS	Light Grey Gloss Smooth
LGT	Light Grey Matte Textured
PSS	Platinum Silver Smooth
WHT	White Matte Textured
WHS	White Gloss Smooth
VGT	Verde Green Textured
Color Option	
CC	Custom Color

Notes:
1 Must specify Voltage
2 Replace "_" with "14" for up to 14' mounting height, "40F" for 15-40' mounting height
3 Replace "_" with "12" for up to 12' mounting height

EXO OUTDOOR LIGHTING

SLING Micro Strike

AREA/SITE/ROAD LIGHTER

DATE:	LOCATION:
TYPE:	PROJECT:
CATALOG #:	

PROJECTED LUMEN MAINTENANCE

Ambient Temperature	OPERATING HOURS					
	0	25,000	TM-21-11[1] L96 60,000	50,000	100,000	L70 (Hours)
25°C / 77°F	1.00	0.97	0.96	0.95	0.91	408,000
40°C / 104°F	0.99	0.96	0.95	0.94	0.89	356,000

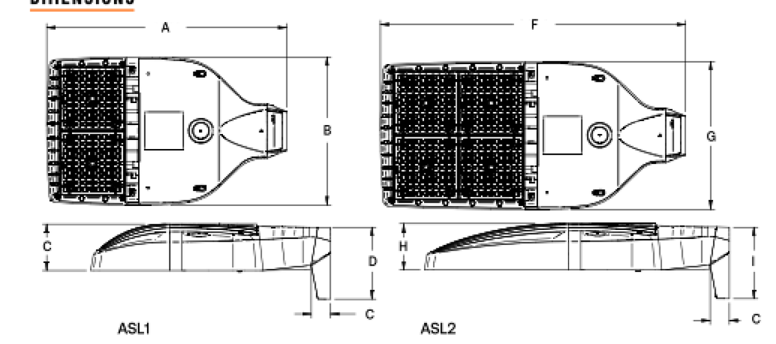
1. Projected per IESNA TM-21-11 (* Cree XP-L, 2100mA, 105°C Ts, 6,000hrs)

LUMINAIRE AMBIENT TEMPERATURE FACTOR (LATF)

Ambient Temperature		Lumen Multiplier
0° C	32° F	1.06
10° C	50° F	1.03
20° C	68° F	1.01
25° C	77° F	1.00
30° C	86° F	0.99
40° C	104° F	0.97

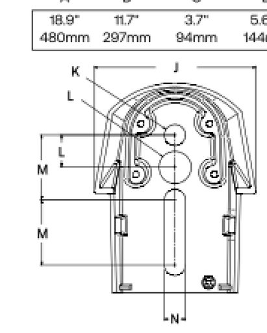
Use these factors to determine relative lumen output for average ambient temperatures from 0-40°C (32-104°F).

DIMENSIONS



Weight	
ASL1	14.47 lbs (6.56 kgs)
ASL2	17.47 lbs (7.92 kgs)

A	B	C	D	E	F	G	H	I	ASL1 EPA@0°	ASL2 EPA@0°	ASL1 w/ HSS	ASL2 w/ HSS
18.9" 480mm	11.7" 297mm	3.7" 94mm	5.65" 144mm	1.5" 38mm	24.0" 610mm	11.7" 297mm	3.7" 94mm	5.62" 143mm	.46 ft.² .14 m²	.56 ft.² .17 m²	.73 ft.² .22 m²	1.01 ft.² .31 m²



J	K	L	M	N
4.33" 480mm	.562" 297mm	.875" 94mm	1.75" 610mm	.562" 297mm

PHOTOMETRY

The following diagrams represent the general distribution options offered for this product. For detailed information on specific product configurations, see website photometric test reports.

CMT A valmont BRAND | STRAIGHT SQUARE COMPOSITE POLES

MARATHON™

Composite Poles - ZA and ZB Series

(Anchor Base and Direct Burial)

Straight Square Composite Poles offer a unique solution to today's demanding requirements for lighting standards that enhance design.

Their contemporary look is favored by architects, engineers and planners.

BENEFITS
Will not rust, rot or corrode
Ease of installation
Lightweight for easy handling
Dent resistant
Non-conductive

4" SQUARE

- 4"x 4" Straight Square
- Mounting Heights to 25'
- Smooth Finish
- Multiple Color Options
- Tenon Top or Capped for Side Drilling
- Anchor Bolts Included (5/8"x 21"x 3")
- Base Cover Included
- 8" - 12.5" Bolt Circle

5" SQUARE

- 5"x 5" Straight Square
- Mounting Heights to 30'
- Smooth Finish
- Multiple Color Options
- Tenon Top or Capped for Side Drilling
- Anchor Bolts Included (3/4"x 30"x 3")
- Base Cover Included
- 10"-12.5" Bolt Circle

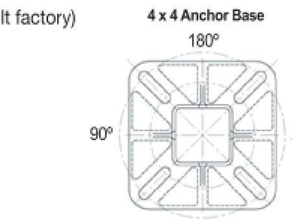
CMT A valmont BRAND | STRAIGHT SQUARE COMPOSITE POLES

ZA4: Straight Square Composite Pole 4" Profile						Anchor Base (ZA4A-)		Direct Burial (ZA4B-)	
Anchor Base (A) or Direct Burial (B)	Mounting Height (ft)	Effective Projected Area (sq ft)				Anchor Base		Direct Burial	
		90 MPH	100 MPH	110 MPH	120 MPH	Bolt Hole Circle (in)	Weight (lbs)	Shaft Length (ft)	Weight (lbs)
ZA4_ - 10	10'	21.5	17.0	13.7	11.1	8" - 12.5"	27#	13'	28#
ZA4_ - 15	15'	12.9	9.8	7.5	5.7	8" - 12.5"	37#	19'	40#
ZA4_ - 20	20'	7.4	5.2	3.5	2.3	8" - 12.5"	47#	25'	55#
ZA4_ - 25	25'	3.8	2.1	0.8	-	8" - 12.5"	57#	30'	70#
ZA5: Straight Square Composite Pole 5" Profile						**Anchor Base (ZA5A-)**		**Direct Burial (ZA5B-)**	
ZA5_ - 15	15'	28.7	22.1	17.3	13.6	10" - 12.5"	99#	19'	97#
ZA5_ - 20	20'	17.5	12.7	9.2	6.5	10" - 12.5"	125#	25'	123#
ZA5_ - 25	25'	10.2	6.5	3.8	1.7	10" - 12.5"	150#	30'	154#
ZA5_ - 30	30'	5.0	2.0	-	-	10" - 12.5"	176#	35'	180#

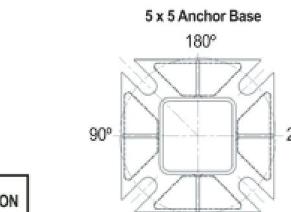
Product improvements may be made without prior notice.

- Reduced lead time for fast delivery (higher quantities may alter lead time, consult factory)
- 30' Poles require shipment by flatbed and will ship first available flatbed.
- Freight allowed $2,000.00, prepaid and add under $2,000.00
- ZA includes base cover and pre-shipped anchor bolts, are prepaid and add
- Standard colors are Black, Bronze and Grey
- Standard tenon sizes are 2 3/8" and 3"
- For cut down poles use full length pole price (Ex. ZA22 use ZA25 price)
- Contact factory for pricing regarding options or modifications
- Advise Size, Location and Orientation of Drilling Requirements (Ref. Drawings)

4 x 4 Anchor Base



5 x 5 Anchor Base



ZA 5 A - 20 BZ 3T

- **ZA**: STRAIGHT SQUARE
- **5**: SERIES — **5** = 5" Square; **4** = 4" Square
- **A**: **A** = Anchor Base; **B** = Direct Burial
- **20**: MOUNTING HEIGHT — **10** = 10' *; **15** = 15'; **20** = 20'; **25** = 25'; **30** = 30' ** (*Available in 4" only; **Avaiable in 5" only)
- **BZ**: COLOR — **BK** = Black; **GR** = Grey; **BZ** = Bronze (*Other Colors Available for Additional Charges)
- **3T**: POLE TOP CONFIGURATION — **2T** = 2 3/8" x 3 3/4" Tenon; **3T** = 3" x 3 3/4" Tenon; **19** = 1 @ 90 Degree; **29** = 2 @ 90 Degree; **39** = 3 @ 90 Degree; **49** = 4 @ 90 Degree; **28** = 2 @ 180 Degree; **ND** = Capped (No Drilling)

MARATHON™

TMP8303_2 05/18

Item A.

MLS EAST

Alpine Valley
LED Lighting Calculations
White Lake, MI

Designer BG
Date 05/31/2023
Scale Not to Scale
Drawing No. 001
Summary

DATE	ISSUE

PROPRIETOR:
WISCONSIN RESORTS, INC
43252 WOODWARD AVE, STE 210
BLOOMFIELD HILLS, MICHIGAN 48302
(248) 333-2373, EXT. 102

KIEFT ENGINEERING

KIEFT ENGINEERING, INC.
PROFESSIONAL ENGINEERS AND PROFESSIONAL SURVEYORS
5852 SOUTH MAIN STREET, SUITE 1, CLARKSTON, MICHIGAN 48346
PHONE (248) 625-5251 www.kiefteng.com FAX (248) 625-7110

DATE 3-8-2023	CKD. BY	DATE
DRAWN GF		
DESIGN PCM		
SECTIONS 16,17,20,21	T- 3 -N. R- 8 -E.	

72 HOURS (3 WORKING DAYS) BEFORE YOU DIG CALL MISS DIG 800-482-7171 (TOLL FREE)

Existing Conditions Plan - Northwest

ALPINE VALLEY
PART OF SECTIONS 16, 17, 20, 21, T3N, R8E,
WHITE LAKE TOWNSHIP, OAKLAND COUNTY, MICHIGAN

SCALE 1" = 30'
SHEET
KE 2021.177

Schedule

Symbol	Label	Image	QTY	Manufacturer	Catalog	Description	Number Lamps	Lamp Output	LLF	Input Power	Polar Plot
	T90		2	EXO	ASL1-135-4W-ASQU		1	17571	1	266.2	Max: 14955cd
	T180		2	EXO	ASL1-135-4W-ASQU		1	17571	1	266.2	Max: 14955cd
	Quad		3	EXO	ASL1-135-4W-ASQU		1	17571	1	532.4	Max: 14955cd

Plan View
Scale - 1" = 35ft

Statistics

Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
Parking and Asphalt	+	2.1 fc	5.7 fc	0.1 fc	57.0:1	21.0:1

MLS EAST

Alpine Valley
LED Lighting Calculations
White Lake, MI

Designer
BG
Date
05/31/2023
Scale
Not to Scale
Drawing No.
002
Summary

LAND PLANNING SOLUTIONS

WETLAND DELINEATION AND DETERMINATION REPORT

For

Alpine Valley Site
White Lake Township
Oakland County, Michigan

Prepared for:

Alpine Valley Ski Area, Inc.
43252 Woodward Ave, Ste.210
Bloomfield Hills, MI 48302

May 22, 2023

LPS Project No. 23-107

TABLE OF CONTENTS

Section ..... **Page**

EXECUTIVE SUMMARY ..... **iii**

1.0 INTRODUCTION & METHODS **1**

2.0 AVAILABLE MAPPING & DATA **1**

2.1 USGS Topographic Map 1

2.2 National Wetland Inventory 1

2.3 NRCS Soils Map 2

3.0 RESULTS **2**

3.1 Wetland Conditions & Streams 2

3.2 Upland Conditions 3

4.0 REGULATORY CONSIDERATIONS & CONCLUSIONS **3**

4.1 Wetland Regulations by the State of Michigan 3

4.2 Inland Lakes and Streams Regulation by the State of Michigan 4

4.3 Floodplain Regulations 4

4.4 Local Regulations 5

4.5 Conclusions 5

5.0 REFERENCES **7**

TABLES

Table 1. NRCS Soil Map Units 2

Table 2. Wetland Summary Data: Wetland Type & Regulatory Status ..... **Error! Bookmark not defined.**

APPENDIX A: SITE MAPPING

Site Location Map
USGS Topographic Map
National Wetlands Inventory Map
NRCS Soils Map
Site Features Map
FEMA Floodplain Map

APPENDIX B: SITE PHOTOGRAPHS

APPENDIX C: WETLAND DATA FORMS

EXECUTIVE SUMMARY

Land Planning Solutions, LLC (LPS) was contracted by Alpine Valley Ski Area, Inc. to perform a wetland delineation and determination for an approximately 140+/-acre property located in Section 20 (T03N, R08E) White Lake Township, Oakland County, Michigan.

On April 27, 2023, LPS conducted a field investigation to identify, delineate, and characterize wetlands and water features and assess their regulatory status. The Area of Investigation (AOI) consists of thirteen, irregularly shaped legal parcels located at and surrounding the Alpine Valley Ski Area. The subject site is currently occupied by maintenance buildings, parking areas, ski lodging, ski slopes and lifts, and other operations buildings. The unoccupied portion of the AOI is comprised partly of open vegetation (loosely maintained grass) and partly with mature deciduous oak-hickory forest. The southernmost portion of the AOI appears to be highly disturbed historically and consists of dense invasive shrubs and herbaceous vegetation. Two manmade ponds, two streams, and four wetlands are found in the southern and eastern portions of the AOI. The AOI is also characterized with moderately to very steep rolling topographic relief, with the highest elevations on the western edge of the AOI with steep slopes to the southeast.

Based on the criteria outlined in Part 301, Inland Lakes and Streams, and Part 303, Wetland Protection, and Part 31, Floodplains, of the NREPA of 1994 (1994 P.A. 451, as amended), it is the opinion of LPS that Wetlands 3 and 4, and Streams 1 and 2 found within the AOI should be considered regulated by the EGLE. Ponds 1 and 2 may be considered non-regulated by EGLE based on their historic construction in upland, deep water depths, and current use as pumped water storage areas for snow making operations. LPS recommends that this determination be verified by EGLE prior to any construction activities within Ponds 1 and 2. White Lake Township administers a local wetland ordinance and Wetland 3 and 4, and Streams 1 and 2 appear subject to local regulation under this ordinance.

Table 1. Wetland Summary Data: Wetland Type & Regulatory Status

ID	Type	Status	Reason
Stream 1		Regulated	Meets the regulatory definition of a stream
Stream 2		Regulated	Meets the regulatory definition of a stream
Wetland 1	EM/SS	Non-Regulated	Not contiguous, < 1 acre in size, greater than 500 feet from a waterbody
Wetland 2	FO	Non-Regulated	Not contiguous, < 1 acre in size, greater than 500 feet from a waterbody
Wetland 3	EM/SS	Regulated	Direct surface water connection to a stream
Wetland 4	EM	Regulated	Direct surface water connection to a stream
Pond 1	OW	Non-Regulated	Basin created in upland for the sole purpose of storing water
Pond 2	OW/SS	Non-Regulated	Basin created in upland for the sole purpose of storing water

FO = Forested, EM = Emergent, SS = Scrub-shrub, OW = Open Water

If regulated wetland impacts are proposed, LPS recommends the determinations contained in this report be verified by the EGLE through an on-site pre-application meeting or submittal of an EGLE/USACE Joint Permit Application (JPA). Obtaining a permit is warranted for construction activities within regulated wetlands and regulated watercourses. It is unlawful to deposit fill, dredge material, drain surface water, or place structures in a regulated wetland without a permit from the EGLE.

Wetlands in Michigan are regulated by the EGLE, in coordination with the U.S. Army Corps of Engineers (USACE), and the Environmental Protection Agency (EPA). These agencies make their own determinations regarding wetlands in the state of Michigan and have the final decision in matters of jurisdiction and delineation.

1.0 INTRODUCTION & METHODS

Land Planning Solutions, LLC (LPS) was contracted by Alpine Valley Ski Area, Inc. to perform a wetland delineation and determination for an approximately 140+/-acre property located in Section 20 (T03N, R08E) White Lake Township, Oakland County, Michigan.

The Area of Investigation (AOI) consists of thirteen, irregularly shaped legal parcels located at and surrounding the Alpine Valley Ski Area. The subject site is currently occupied by maintenance buildings, parking areas, ski lodging, ski slopes and lifts, and other operations buildings. The unoccupied portion of the AOI is comprised partly of open vegetation (loosely maintained grass) and partly with mature deciduous oak-hickory forest. The southernmost portion of the AOI appears to be highly disturbed historically and consists of dense invasive shrubs and herbaceous vegetation. Two manmade ponds, two streams and four wetlands are found in the southern and eastern portions of the AOI. The AOI is also characterized with moderately to very steep rolling topographic relief, with the highest elevations on the western edge of the AOI with steep slopes to the southeast.

On April 27, 2023, LPS conducted a field investigation to identify, delineate, and characterize wetlands and water features and assess their regulatory status.

The methodology used to identify wetlands described herein was consistent with Michigan Department of Environment, Great Lakes and Energy (EGLE) and the U.S. Army Corps of Engineers (USACE) wetland delineation rules as outlined in the USACE's *Wetlands Delineation Manual – Technical Report Y-87-1* and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual*: *Northcentral and Northeast Region* (Environmental Laboratory 1987; USACE 2012).

Wetlands are characterized according to three diagnostic parameters: vegetation, soils, and hydrology. Plant species associated with wetland versus upland conditions were identified and checked against the *National List of Plant Species* (Lichvar et al. 2016). Soil profiles were examined by using a tile spade to dig to a depth of approximately 14 inches below the ground surface. Horizon thickness, color, texture, and presence of hydromorphic (water-formed) features were noted and compared against the U.S. Department of Agriculture, Natural Resources Conservation Service's (USDA-NRCS) *Field Indicators of Hydric Soils in the United States* (USDA-NRCS 2017). Primary and secondary indicators of hydrology, as described in the USACE's *87 Manual* and *Regional Supplement*, were used to confirm wetland hydrology.

2.0 AVAILABLE MAPPING & DATA

2.1 USGS Topographic Map

The U.S. Geological Survey (USGS) indicates that the AOI has significant contour relief change, ranging in elevation of approximately 1200 to 950-feet above mean sea level with the highest elevations on the western edge of the AOI (USGS Topographic Map, **Appendix A**). The topographic map depicts the AOI as vegetated in the northeast corner, with the remainder mapped as sparsely vegetated. One pond and two streams are shown on the southern portion of the property. Field investigation found a generally similar configuration of the vegetation distribution and waterbodies, with additional small wetlands found in the deciduous forested portion of the AOI. USGS topographic maps typically show only the more distinct wetland and water features and should be utilized for preliminary analysis only. Field mapping is necessary to determine the actual existence, type, and boundaries of wetlands and water features.

2.2 National Wetland Inventory

The U.S. Fish & Wildlife Service (USFWS) National Wetland Inventory (NWI) maps, a national wetland mapping program, was reviewed prior to the site inspection (NWI Map, **Appendix A**). The NWI map depicts the presence of two emergent wetlands, two ponds and two streams mapped on the eastern and southern

portion of the AOI, the streams continuing off-site to the southeast (USFWS 2023). The field investigation confirmed a similar pattern of wetlands and streams on the property, as well as fringe wetland habitat along the streams. NWI maps are remotely compiled from aerial photography and may not show all wetlands in a given area, nor accurately characterize all wetlands shown. These maps should be used only for preliminary analysis and field mapping is necessary to determine the actual existence, type, and boundaries of wetlands.

2.3 NRCS Soils Map

The USDA-NRCS Soil Survey was reviewed prior to the site inspection. Seven (7) soil map units are mapped as comprising the AOI (NRCS Soil Map, **Appendix A**), one of which is considered a hydric type soil by the USDA-NRCS (Table 1). A hydric soil is a soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (USDA-NRCS 2017). Hydric soils are one of three diagnostic criteria used to determine whether or not an area is a wetland.

Table 2. NRCS Soil Map Units

Symbol	Soil Unit Name	Drainage Class	Hydric
13	Oshtemo-Boyer loamy sands	Well drained	No
18	Fox sandy loam	Well drained	No
40	Udorthents, loamy, rolling	Well drained	No
41	Aquents, sandy, loamy	Very poorly drained	Yes
44	Riddles sandy loam	Well drained	No
45	Arkport loamy fine sand	Well drained	No
50	Udipsamments, rolling to steep	Excessively drained	No

3.0 RESULTS

3.1 Wetland Conditions & Streams

Wetlands are defined by P.A. 451 of 1994, as:

"...land characterized by the presence of water at a frequency and duration sufficient to support and that under normal circumstances does support wetland vegetation or aquatic life and is commonly referred to as a bog, swamp, or marsh..."

During the site inspection, four wetlands, two ponds and two streams were identified within the AOI (Site Features Map, **Appendix A**).

Wetlands 1 and 2 are small hydrologically isolated vernal pools located in the deciduous forested portion of the AOI. Vegetation includes American elm (*Ulmus americana*), silky dogwood (*Cornus amomum*), and reed-canary grass (*Phalaris arundinacea*), among others. Wetland hydrology was indicated by saturated and inundated hydric soils, watermarks on trees, position in the landscape, water-stained leaves, and passing of the FAC neutral test.

Wetland 3 is a complex which includes a narrow stream (Stream 2), fringe wetland areas, and a small impoundment pond. Water from Wetlands 3 flows in pipes under Highland Road into off-site streams and then to Brendel Lake to the southeast. Common vegetation includes common reed (*Phragmites australis*), purple loosestrife (*Lythrum salicaria*), broad-leaved cattail (*Typha latifolia*), sensitive fern (*Onoclea sensibilis*), cottonwood (*Populus deltoides*), silver maple (*Acer saccharinum*), and black willow (*Salix nigra*), among others. Wetland hydrology was indicated by saturated and inundated hydric soils, watermarks on trees, position in the landscape, water-stained leaves, and passing of the FAC neutral test.

Wetland 4 is an emergent wetland system along the southern edge of the AOI. The vegetative community is completely dominated by dense common reed (*Phragmites australis*). Near the property line a stream channel (Stream 1) begins to form which continues off-site to the southeast and under Highland Road. Wetland hydrology was indicated by saturated and inundated hydric soils, watermarks on trees, position in the landscape, water-stained leaves, and passing of the FAC neutral test.

Ponds 1 and 2 appear to be former sand/gravel burrow areas excavated to depths capable of holding permanent water throughout the year. Infrastructure present in and around both appears to be utilized in pumping water for snow making operations. Both are open water ponds; Pond 2 includes a fringe of trees and shrubs. Both ponds appear to have been excavated in former upland areas in the late 1960's or early 1970's. Pond 2 appears to have been created adjacent to a former stream.

A Wetland Flagging Map is provided in **Appendix A**, Site Photographs depicting site conditions at the time of the site investigation are provided in **Appendix B** and Wetland Data Forms are provided in **Appendix C**.

3.2 Upland Conditions

Upland conditions comprise the majority of the AOI, corresponding with the higher elevations (Site Characteristics Map, **Appendix A**). Uplands consist of an open, partly maintained grass on the ski slopes, mature deciduous forest in the northeast portion of the AOI, and disturbed dense shrubby areas in the southern extents of the AOI.

Common vegetation in the forested areas includes white oak (*Quercus alba*), northern red oak (*Quercus rubra*), black cherry (*Prunus serotina*), quaking aspen (*Populus tremuloides*), shagbark hickory (*Carya ovata*), red maple (*Acer rubrum*), red cedar (*Juniperus virginiana*), and Pennsylvania sedge (*Carex pennsylvanica*), among others.

Disturbed shrubby uplands in the southern portion of the AOI include vegetation such as common buckthorn (*Rhamnus cathartica*), box-elder (*Acer negundo*), scotch pine (*Pinus sylvestris*), multiflora rose (*Rosa multiflora*), black raspberry (*Rubus occidentalis*), common blackberry (*Rubus allegheniensis*), amur honeysuckle (*Lonicera maackii*), common burdock (*Arctium minus*), riverbank grape (*Vitis riparia*), black cherry (*Prunus serotina*), among others. Upland areas are higher in elevation than the mapped wetlands and contain browner, drier soils than those found in wetland areas. Soils were generally sandy and lacked the redoximorphic features found in hydric soils.

4.0 REGULATORY CONSIDERATIONS & CONCLUSIONS

4.1 Wetland Regulations by the State of Michigan

Wetlands are protected under Part 303 Wetland Protection, of P.A. 451 of 1994, the Natural Resources and Environmental Protection Act (NREPA, as amended). The EGLE assumes authority over wetlands that are 5 acres or greater in area; contiguous (directly adjacent to) to an inland lake, pond, or stream; within 500 feet of an inland lake, pond, or stream; or within 1,000 feet of a Great Lake, Lake Saint Clair, Saint Mary's River, Saint Clair River, or Detroit River.

The EGLE may also exert regulatory control over isolated wetlands less than five acres in size: "...if the department determines that protection of the area is essential to the preservation of the natural resources of the state from pollution, impairment, or destruction and the department has so notified the owner."
The following activities are prohibited within regulated wetlands without a EGLE permit:

1. The placement of fill material,
2. Dredging,
3. Construction within, and/or

4. The draining of surface water from a wetland.

Table 3. Wetland Summary Data: Wetland Type & Regulatory Status

ID	Type	Status	Reason
Stream 1		Regulated	Meets the regulatory definition of a stream
Stream 2		Regulated	Meets the regulatory definition of a stream
Wetland 1	EM/SS	Non-Regulated	Not contiguous, < 1 acre in size, greater than 500 feet from a waterbody
Wetland 2	FO	Non-Regulated	Not contiguous, < 1 acre in size, greater than 500 feet from a waterbody
Wetland 3	EM/SS	Regulated	Direct surface water connection to a stream
Wetland 4	EM	Regulated	Direct surface water connection to a stream
Pond 1	OW	Non-Regulated	Basin created in upland for the sole purpose of storing water
Pond 2	OW/SS	Non-Regulated	Basin created in upland for the sole purpose of storing water

FO = Forested, EM = Emergent, SS = Scrub-shrub, OW = Open Water

4.2 Inland Lakes and Streams Regulation by the State of Michigan

Inland lakes and streams are protected under Part 301 Inland Lakes and Streams, of the NERPA. The EGLE assumes regulatory authority over natural or artificial inland lakes that are greater than five acres in size, and natural or created streams that have definite banks, a bed, and visible evidence of a continued flow or continued occurrence of water.

The following activities are prohibited within regulated inland lakes and streams without an EGLE permit:

- Dredging or filling bottomland;
- Constructing, enlarging, extending, removing or placing a structure on bottomland;
- Erecting, maintaining or operating a marina;
- Creating, enlarging or diminishing an inland lake or stream;
- Structurally interfering with the natural flow of an inland lake or stream;
- Constructing, dredging, commencing, extending or enlarging an artificial canal, channel, ditch, lagoon, pond, lake, or similar waterway where the purpose is ultimate connection with an existing inland lake or stream, or where any part of the artificial waterway is located within 500 feet of the ordinary high-water mark of an existing inland lake or stream;
- Connecting any natural or artificially constructed waterway, canal, channel, ditch, lagoon, pond, lake or similar water with an existing inland lake or stream for navigation or any other purpose.

Streams 1 and 2 found within Wetlands 3 and 4 meet the characteristics of regulated watercourses pursuant to Part 301 of the NREPA.

4.3 Floodplain Regulations

Part 31, Water Resources Protection of the NREPA regulates activities within the 100-year floodplain of a river, stream or drain with an upstream watershed drainage area of two square miles or larger. EGLE does not regulate the 100-year floodplain of inland lakes.

A preliminary review of Flood Insurance Studies and Flood Insurance Rate Maps (FIRMs), as prepared by the Federal Emergency Management Agency (FEMA), indicate no 100-year floodplains within the AOI.

4.4 Local Regulations

Charter Township of White Lake

As described in Article V.-Wetlands, within the Charter Township of White Lake Township Code of Ordinances, the Township regulates wetlands that are:

1. Contiguous to any lake, pond, river, or stream

2. Not contiguous to any lake, pond, river or stream; and more than two (2) acres in size

3. Not contiguous to any lake, pond, river or stream; and (2) acres or less in size if the Michigan Department of Environmental Quality (MDEQ, now called EGLE) determines that the protection of the area is essential to the preservation of the natural resources of the state from pollution, impairment, or destruction and the MDEQ has so notified the owner.

The definition of "contiguous" by White Lake township is similar to the definition put forth by the EGLE. The Township also regulates wetlands that appear on the White Lake Township Official Wetlands Map. This map serves as a general guide for possible regulated wetlands.

In addition, the White Lake Township Zoning Ordinance states that "No building shall be located closer than 25 feet to any regulated wetland, submerged land, watercourse, pond, stream, lake or like body of water. The setback shall be measured from the edge of the established wetland boundary as reviewed and approved by the Township."

4.5 Conclusions

Wetlands in Michigan are regulated by the EGLE, in coordination with the USACE, and the EPA. These agencies make their own determinations as to what is or is not wetland and have the final decision in matters of jurisdiction and delineation. Variability in boundary determinations may be due to, but not limited to, the agency representative conducting the determination, wetland policy, and the time of year the site was examined. In addition, the wetland boundaries and extent on a site can change over time depending upon numerous factors including, but not limited to, changes in vegetation, drainage, weather patterns, and activities on adjacent parcels that may alter the pattern of the wetland on the subject property. The identification of wetland or water features herein is based on the condition of the site at the time of our investigation, our past experiences with regulatory agencies, and current regulatory policy.

Based on the criteria outlined in Part 301, Inland Lakes and Streams, and Part 303, Wetland Protection, and Part 31, Floodplains, of the NREPA of 1994 (1994 P.A. 451, as amended), it is the opinion of LPS that Wetlands 3 and 4, and Streams 1 and 2 found within the AOI should be considered regulated by the EGLE. Ponds 1 and 2 may be considered non-regulated by EGLE based on their historic construction in upland, deep water depths, and current use as pumped water storage areas for snow making operations. LPS recommends that this determination be verified by EGLE prior to any construction activities within Ponds 1 and 2.

If regulated wetland impacts are proposed, LPS recommends the determinations contained in this report be verified by the EGLE through an on-site pre-application meeting or submittal of an EGLE/USACE Joint Permit Application (JPA). Obtaining a permit is warranted for construction activities within regulated wetlands and regulated watercourses. It is unlawful to deposit fill, dredge material, drain surface water, or place structures in a regulated wetland without a permit from the EGLE.

Respectfully submitted,

LAND PLANNING SOLUTIONS

Matthew Carmer
Professional Wetland Scientist #1746
Principal Scientist

5.0 REFERENCES

Environmental Laboratory. 1987. "Corps of Engineers Wetlands Delineation Manual. Wetlands Research Program - Technical Report Y-87-1." U.S. Army Corps of Engineers.

Federal Emergency Management Agency (FEMA). 2021. Floodplain Insurance Rate Maps (FIRM).2006. https://msc.fema.gov/webapp/wcs/stores/servlet/mapstore/homepage/MapSearch.html.

Lichvar, RW, DL Blanks, WN Kirchner, and NC Melvin. 2016. "The National Wetland Plant List: 2016 Wetland Ratings. Phytoneuron 2016-30:1-17. Published 28 April 2016. ISSN 2153 733X. (Northcentral and Northeast Regional Wetland Plant List)." U.S. Army Corps of Engineers.

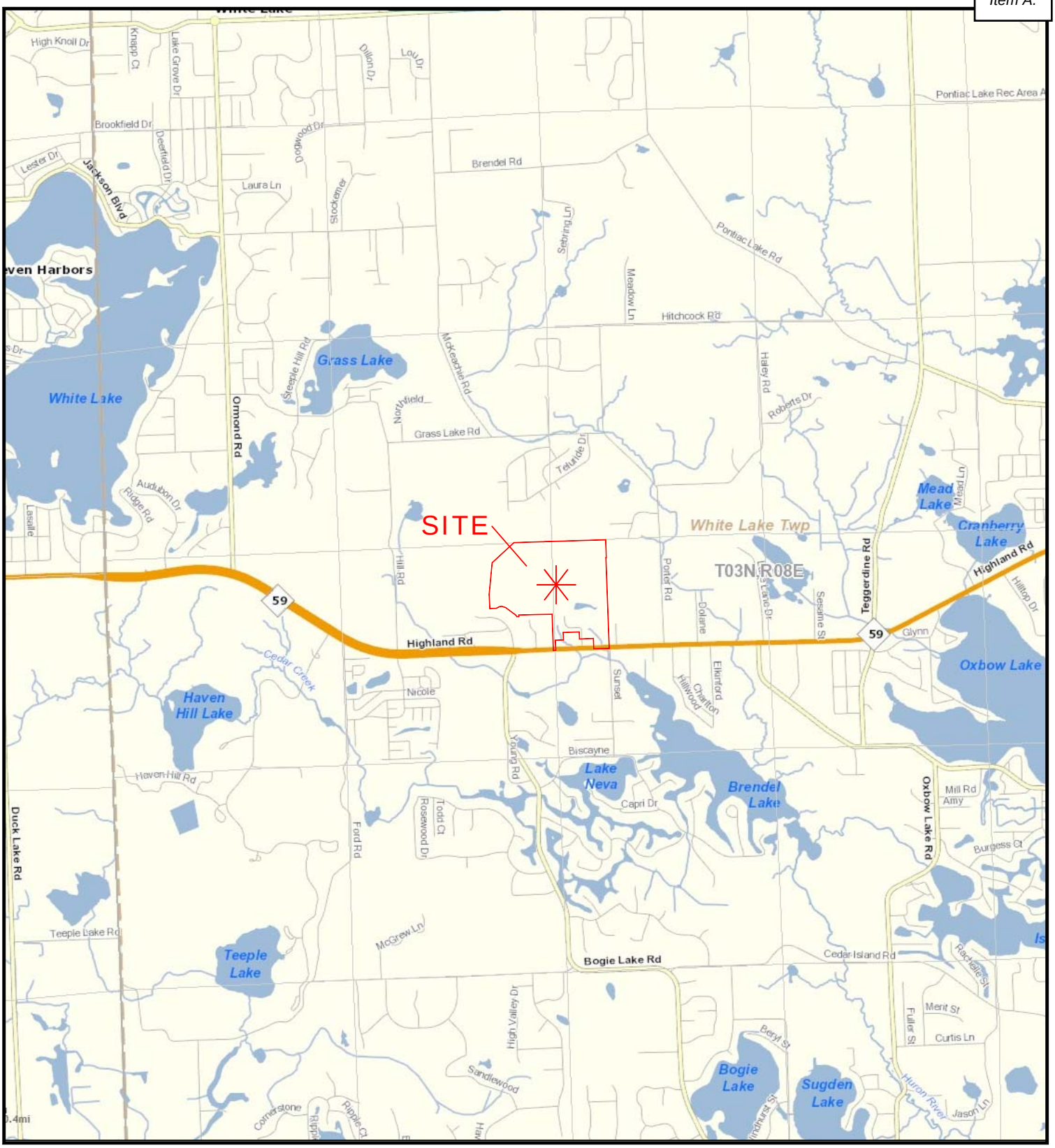
USACE. 2012. "Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region. (Version 2.0)." ERDC/EL TR-12-1. U.S. Army Corps of Engineers. http://www.usace.army.mil/Portals/2/docs/civilworks/regulatory/reg_supp/NCNE_suppv2.pdf.

USDA-NRCS. 2017. "Field Indicators of Hydric Soils in the United States: A Guide for Identifying and Delineating Hydric Soils, Version 8.1, 2017." Edited by LM Vasilas, GW Hurt, and JF Berkowitz. US Dep. of Agriculture (USDA) - Natural Resources Conservation Service (NRCS). https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_053171.pdf.

USFWS. 2023. "NWI." National Wetlands Inventory - Wetlands Mapper (Last Modified Ocotber 2020). 2021. https://www.fws.gov/wetlands/data/Mapper.html.

USGS. 1968. "Quadrangle, Michigan-Clarkston." U.S. Geological Service Topographic Map.

APPENDIX A: Mapping



Source: EGLE, 2023

Site Location Map For:

Alpine Valley Ski Area

Sec. 20, White Lake Twp. (T03N, R08E) Oakland Co., MI

N
W E
S
Not to Scale

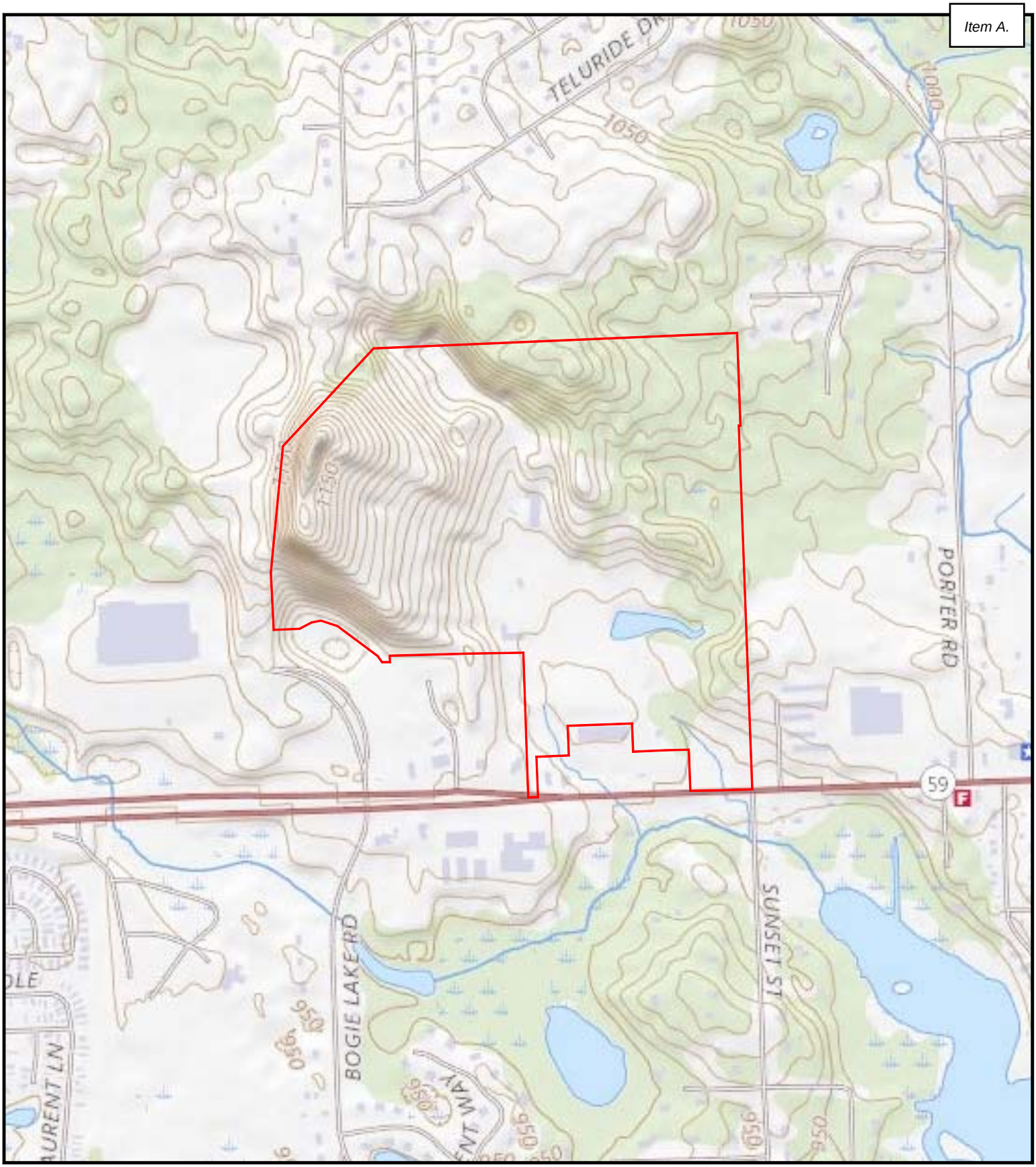
Land Planning Solutions, LLC

1991 Seeley Road
Cadillac, MI 49601
248-890-7612

SHEET NAME
Site Location

PROJECT NUMBER
161

05-18-2023



Source: EGLE, 2023

0 400' 800'

Area of Investigation (AOI)

USGS Topo Map For:

Alpine Valley Ski Area

Sec. 20, White Lake Twp. (T03N, R08E) Oakland Co., MI

N W E S

Approx. Scale = 1" = 800'

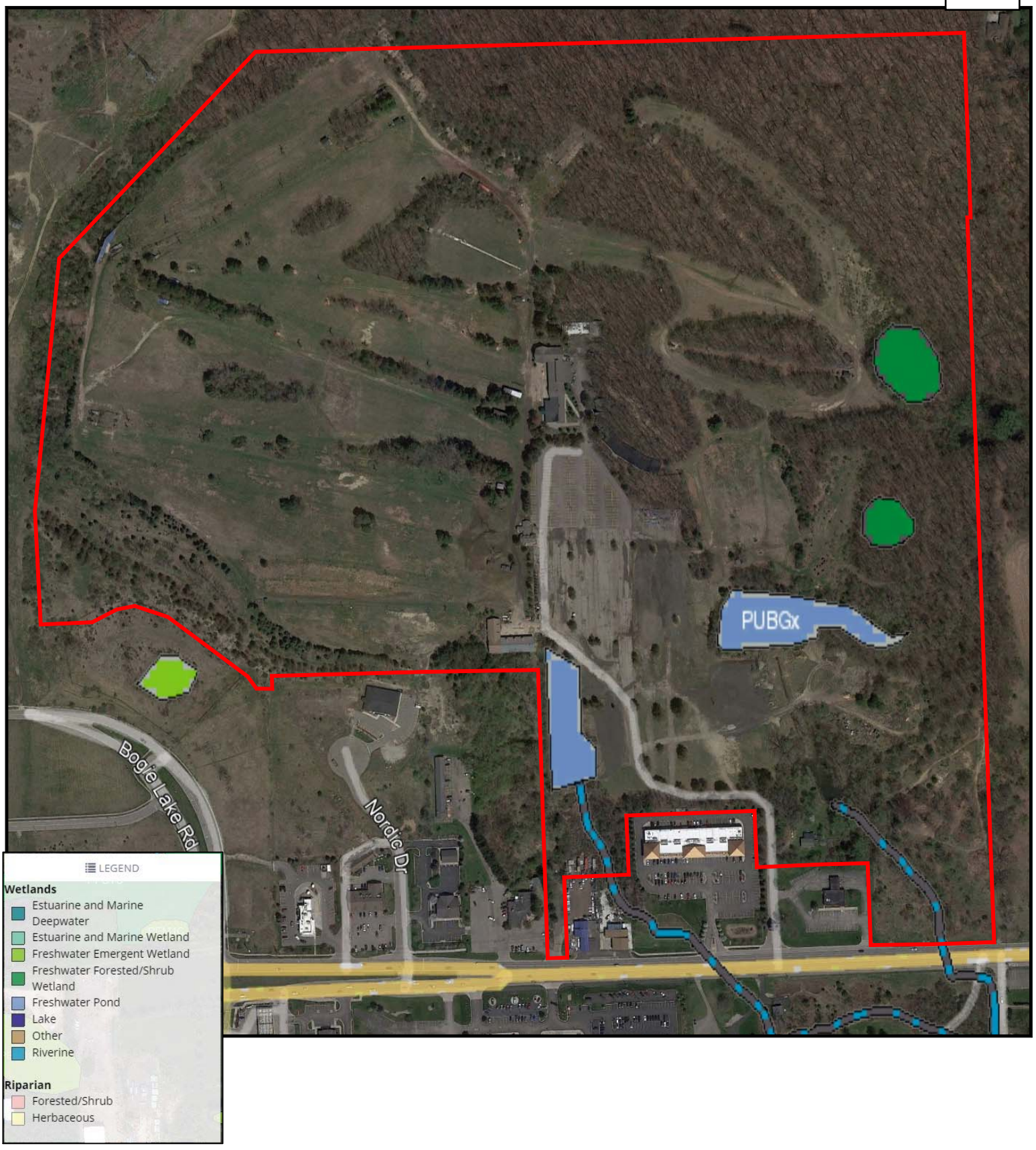
Land Planning Solutions, LLC

1991 Seeley Road
Cadillac, MI 49601
248-890-7612

SHEET NAME
USGS Topo

PROJECT NUMBER
2
162

05-18-2023



Source: USFWS, 2023

0 200' 400'

Area of Investigation (AOI)

National Wetlands Inventory Map For:

Alpine Valley Ski Area

Sec. 20, White Lake Twp. (T03N, R08E) Oakland Co., MI

N W E S

Approx. Scale = 1" = 400'

Land Planning Solutions, LLC

1991 Seeley Road
Cadillac, MI 49601
248-890-7612

SHEET NAME
NWI Map

PROJECT NUMBER
2
163

05-18-2023

Symbol	Unit Name	Description
13C	Oshtemo-Boyer loamy sands	6-12% slopes, Well drained
13E	Oshtemo-Boyer loamy sands	12-40% slopes, Well drained
18C	Fox sandy loam	6-12% slopes, Well drained
18D	Fox sandy loam	12-25% slopes, Well drained
40C	Udorthents, loamy, rolling	Well drained
41B*	Aquents, sandy, loamy	Very poorly drained
44C	Riddles sandy loam	6-12% slopes, Well drained
45D	Arkport loamy fine sand	12-25% slopes, Well drained
50B	Udipsamments	Undulating, Exessively drained
50D	Udipsamments	Rolling to steep, Excessively drained

* Hydric Soil

Source: NRCS/Google, 2023

0 250' 500'

Area of Investigation (AOI)

NRCS Soils Map For:

Alpine Valley Ski Area

Sec. 20, White Lake Twp. (T03N, R08E) Oakland Co., MI

N W E S

Approx. Scale = 1" = 500'

Land Planning Solutions, LLC

1991 Seeley Road
Cadillac, MI 49601
248-890-7612

SHEET NAME
NRCS Soils

PROJECT NUMBER
164

05-18-2023

LEGEND	
	Area of Investigation
	Wetland Boundary
	Stream or Waterbody
	Upland Drainage Feature
	Upland Conditions

Source: Oakland County, 2020 Aerial

0 200' 400'

Site Features Map For:

Alpine Valley Ski Area

Sec. 20, White Lake Twp. (T03N, R08E) Oakland Co., MI

N W E S

Approx. Scale = 1" = 400'

Land Planning Solutions, LLC

1991 Seeley Road
Cadillac, MI 49601
248-890-7612

SHEET NAME
Site Features & Flagging Map

PROJECT NUMBER
165

05-18-2023

APPENDIX B: Photographic Log

Photo 1. Typical steep gradient (ski slope) upland areas found within the Area of Investigation (AOI).

Photo 2. Mature forested uplands found throughout large portions of the AOI.

Photo 3. View of Wetland 1, facing north.

Photo 4. View of Wetland 2, facing east.

Photo 5. View of hydric soils found within Wetland 2.

Photo 6. View of high-water table within Wetland 2.

Photo 7. View of constructed upland ditch on the eastern edge of the AOI.

Photo 8. Additional view of upland constructed ditch on the eastern edge of the AOI.

Photo 9. View of sandy upland soils found within the constructed ditch and throughout upland portions of the AOI.

Photo 10. View of the eastern portion of Pond 2, facing west.

Photo 11. Overview of Pond 2, facing north.

Photo 12. View of wetland ditch, part of Wetland 3, facing south.

Photo 13. View of Phragmites dominated portion of Wetland 3, south edge of the AOI, facing west.

Photo 14. View of hydric soils found within Wetland 3.

Photo 15. View of Wetland 4, facing south.

Photo 16. View of constructed Pond 1, facing north.

APPENDIX C: Wetland Data Forms

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Alpine Valley Site | City/County: White Lake Twp / Oakland | Sampling Date: 4/27/2023

Applicant/Owner: Alpine Valley Ski Area, Inc. | State: MI | Sampling Point: Wetland 1

Investigator(s): M. Carmer | Section, Township, Range: Section 20, T3N, R8E

Landform (hillside, terrace, etc.): Depression | Local relief (concave, convex, none): Convex

Slope (%): _____ | Lat: 42.653939 | Long: -83.518855 | Datum: WGS 84

Soil Map Unit Name: Udipsamments | NWI classification: n/a

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation N, Soil N, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** **Yes** X **No** _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 10m)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Ulmus americana*	30	Yes	FACW
2.			
3.			
4.			
5.			
	30	=Total Cover	
Sapling/Shrub Stratum (Plot size: 10m)			
1. *Cornus amomum*	90	Yes	FACW
2.			
3.			
4.			
5.			
	90	=Total Cover	
Herb Stratum (Plot size: 1m)			
1. *Phalaris arundinacea*	30	Yes	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	30	=Total Cover	
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
		=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	150	x 2 =	300
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	150 (A)		300 (B)

Prevalence Index = B/A = 2.00

Hydrophytic Vegetation Indicators:

_____ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

_____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

_____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** _____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: Wetland 1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 2/1						Loamy/Clayey	
4-16	10YR 4/1	90	10YR 5/6	10	C	M	Sandy	Prominent redox concentrations

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- X Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** ____

Remarks:

This data form is revised from Midwest Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- x Surface Water (A1)
- x High Water Table (A2)
- x Saturation (A3)
- x Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- x Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- x Geomorphic Position (D2)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No ____ Depth (inches): ____

Water Table Present? Yes ____ No ____ Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes ____ No ____ Depth (inches): ____

Wetland Hydrology Present? **Yes** X **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Alpine Valley Site | City/County: White Lake Twp / Oakland | Sampling Date: 4/27/2023

Applicant/Owner: Alpine Valley Ski Area, Inc. | State: MI | Sampling Point: Wetland 3

Investigator(s): M. Carmer | Section, Township, Range: Section 20, T3N, R8E

Landform (hillside, terrace, etc.): Riparian | Local relief (concave, convex, none): Convex

Slope (%): _____ | Lat: 42.649986 | Long: -83.519112 | Datum: WGS 84

Soil Map Unit Name: Udipsamments | NWI classification: Riparian

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation N, Soil N, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** **Yes** X **No** _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Herb Stratum (Plot size: _____)			
1. *Phragmites australis*	80	Yes	FACW
2. *Lythrum salicaria*	20	Yes	OBL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 =Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	=Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	20	x 1 =	20
FACW species	80	x 2 =	160
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		180 (B)

Prevalence Index = B/A = 1.80

Hydrophytic Vegetation Indicators:

_____ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

_____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

_____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** _____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: Wetland 3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 2/1						Loamy/Clayey	
4-16	10YR 4/1	90	10YR 5/6	10	C	M	Sandy	Prominent redox concentrations

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- X Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** ____

Remarks:

This data form is revised from Midwest Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- x Surface Water (A1)
- x High Water Table (A2)
- x Saturation (A3)
- x Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- x Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- x Geomorphic Position (D2)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No ____ Depth (inches): ____

Water Table Present? Yes ____ No ____ Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes ____ No ____ Depth (inches): ____

Wetland Hydrology Present? **Yes** X **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Alpine Valley Site | City/County: White Lake Twp / Oakland | Sampling Date: 4/27/2023

Applicant/Owner: Alpine Valley Ski Area, Inc. | State: MI | Sampling Point: Upland 1

Investigator(s): M. Carmer | Section, Township, Range: Section 20, T3N, R8E

Landform (hillside, terrace, etc.): Riparian | Local relief (concave, convex, none): Convex

Slope (%): _____ | Lat: 42.650716 | Long: -83.518956 | Datum: WGS 84

Soil Map Unit Name: Udipsamments | NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation N, Soil N, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No X	**Is the Sampled Area within a Wetland?** **Yes** _____ **No** X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes _____	No X	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 10m)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Quercus rubrum*	40	Yes	UPL
2. *Prunus serotina*	20	Yes	FACU
3.			
4.			
5.			
	60	=Total Cover	
Sapling/Shrub Stratum (Plot size: 10m)			
1. *Rhamnus cathartica*	60	Yes	FAC
2.			
3.			
4.			
5.			
	60	=Total Cover	
Herb Stratum (Plot size: 1m)			
1. *Phalaris arundinacea*	30	Yes	FACW
2. *Lonicera maackii*	30	Yes	UPL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	60	=Total Cover	
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
		=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 40.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	30	x 2 =	60
FAC species	60	x 3 =	180
FACU species	20	x 4 =	80
UPL species	70	x 5 =	350
Column Totals:	180 (A)		670 (B)
Prevalence Index = B/A =			3.72

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** _____ **No** _____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: Upland 1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 3/2	100					Sandy	
6-14	10YR 4/3	100					Sandy	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

This data form is revised from Midwest Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ___ Depth (inches): ___

Water Table Present? Yes ___ No ___ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No ___ Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: