Director's Report

Project Name: Avalon

Description: Final site plan approval

Date on Agenda this packet pertains to: December 4, 2025

☐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	Community Development Director	☐	☐	☐	☒	Based on comments from staff & consultants
Mike Leuffgen	DLZ	☒	☐	☒	☐	See letter dated 10/21/2025
Matteo Passalacqua	Carlisle Wortman Associates, Inc	☐	☐	☒	☐	See letter dated 10/21/2025
Jason Hanifen	WLT Fire Marshal	☐	☐	☒	☐	See letter dated 10/20/2025

DLZ
ARCHITECTURE • ENGINEERING • PLANNING
SURVEYING • CONSTRUCTION SERVICES

INNOVATIVE IDEAS
EXCEPTIONAL DESIGN
UNMATCHED CLIENT SERVICE

October 21, 2025

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

RE: The Avalon- f.k.a. White Lake Hill- Final Site Plan Review – Avalon Apartment Homes and Residence at Avalon- 3rd Review

~~**Watermain Easement (from Huron Valley Schools) Exhibit Review-1st Review**~~

Ref: DLZ No. 2145-7233-21 Design Professional: PEA Group

Dear Mr. O' Neil,

Our office has performed the above-mentioned Final Site Plan review for the revised plan dated September 30, 2025. The plan was reviewed for feasibility based on conformance with the Township Engineering Design Standards

General Site Information

This site is located on the north side of M-59 and east of Ormond Road. The property is located on both sides of Hill Road: across from former Brooks Elementary School and West of Meijers. Total site acreage is approximately 110.02 acres.

Site Improvement Information:

- Multi-Family-Avalon Apartment Homes-Construction of a ~~two (2) phase~~ Planned Development consisting of 366 total multi-family units for lease on the west side of Hill Road. Associated clubhouse and pool as part of multi-family development will also be constructed ~~as part of Phase I. It appears that currently only Phase I (219 multi-family units) is proposed.~~

- Multi-Family-Avalon Apartment Homes-Associated paved and curbed parking including three (3) ADA accessible parking spaces and maneuvering aisles for clubhouse and pool. The 2 story multi-family buildings will provide for parking via a two car garage per unit; 1 guest space is allotted in front of the garages for each unit. Single story ranch buildings shall have individual garages and driveways for parking. Internal private streets and drives are also proposed with points of access off M-59 and Hill Road.
- Single Family-Residence at Avalon- Proposes 68 single family condominium homes on the east side of Hill Road. This portion of the development will have a proposed paved and private road for the single-family condominium homes with one point of access off Hill Road.
- Site to be serviced by watermain and sanitary sewer.
- Multi-Family -Avalon Apartment Homes-Storm water runoff is proposed to be detained via a: 1) Detention basin at the northwest corner of Hill Road and M-59- with discharge to existing storm sewer south of basin; 2) Two detention basins located on the west side of Hill Road and located on the northern portion of the multi-family portion with discharge to existing culvert under Hill Road.
- Single Family-Residence at Avalon-Storm water runoff is proposed to be detained via a: 1) Detention basin on the northern portion of the site with discharge to the existing wetlands to the SW; 2) Detention basin on the southern portion with discharge to the existing wetlands to the SW.

We offer the following comments:

Note that comments from our October 11, 2022 Preliminary Site Plan review letter that were outstanding or remaining as notations are listed below:

a) *We defer to the Township as to whether 6-foot-wide sidewalk is required on both sides of Hill Road. None is proposed at this time. Township Zoning Ordinance 5.21 requires a minimum of 6 foot width for sidewalks along major roadways. Comment outstanding. We continue to defer to the Township with regard to this item. Note that an 8' wide path has now been added along a portion of the west side only of the Hill Road frontage and that two road crossings of the path have been proposed near the Hill Road entrances in order to connect the multi-family to the single-family units. The locations for the path crossings should be reviewed for proper pavement markings and pedestrian crossing signage. Comment addressed at this level of review. Per the design engineer, this item was discussed at a Township Zoom meeting on March 25, 2022. It was determined that an 8' wide path will be added along the western side of Hill Road from M-59 to the single family entrance. Paths are also now shown along the frontage for Units 81-84 and 85-87 only as the adjacent areas pose an issue*

with regulated wetlands and stream encroachment. The developer agreed at the meeting to make a contribution to the White Lake Sidewalk Fund to supplement pathway areas not installed along Hill Road. We note that single family Units 81-87 have now been eliminated and that the paths along those frontages also eliminated.

We note that portions of the proposed sidewalk along the western side of Hill Road are proposed outside the future ROW. This sidewalk locations shall be either adjusted to inside the future ROW or an easement shall be provided. In addition, our comment with respect to the proper pavement markings and pedestrian crossing signage for Hill Road crossing will need to be addressed at the time of FSP/FEP submittal.

The proposed 8' wide path along the west side of Hill Road is proposed to be constructed as part of the Phase II multi-family portion of the project. We defer to the Township as to whether the path shall be required to be constructed as part of Phase I per Township Zoning Ordinance 5.21 requirements. Comment outstanding. It appears that phasing for the development has been eliminated. Please clarify this as phasing shall impact timing of the installation of the 8' wide bike path along Hill Road. **Comment addressed. Per the design engineer, phasing for the multi- family development has been eliminated. The 8' wide path along the west side of Hill Road shall be constructed with the multi-family portion; the path on the east side shall be constructed with the single family portion.**

We note that the proposed path crossing on Hill Road is now shown much further south (than previously shown) of the proposed single-family entrance on the east side of Hill Road. Please provide the rationale for the crossing being further south as the intent is for the crossing to connect into the future sidewalk along the single-family drive entrance. **Comment addressed. Sidewalk crossing has been adjusted.**

We continue to note that the developer intends to provide a contribution to the WLT Sidewalk Fund for the portion of sidewalk along Hill Road that will not be constructed, due to wetland impacts, as per agreement with the Township. We also note that the path is now shown inside the proposed future ROW thus eliminating the need for an easement. Comment outstanding. We note that a portion of the proposed pathway on the west side of Hill Road is shown outside the proposed future ROW and that an easement for this portion shall be required. **Comment remains as a notation. In addition, an easement shall be required for a portion of the sidewalk (outside of the proposed right of way) that is proposed along the east side of Hill Road.**

b) *The following single-family lots present conflicts with either the proposed house, required grading, or the potential deck/patio encroaching into the wetlands setback:1,27,28,40,61, and 88. Impacts to the wetlands buffer will need to be removed. Comment outstanding. The wetlands setback/buffer for all wetlands was not shown on the initial Preliminary Site Plan submittal dated December 8, 2021. There are now units in the single family portion of this development as well as other areas of the development where grading is proposed in the wetlands setback/buffer which is not allowable. The following single family units will require revision with respect to grading in the wetlands setback: 1-7,20,27,28,39,40,52-54,61,75,76,84,85, and 88. In addition, the proposed retaining wall adjacent grading to the northwest of multi-family Unit 19 will also require adjustment with respect to grading in the wetlands buffer. Since the units listed border EGLE regulated wetlands, our office concurs with the recommendation by Barr Engineering, Inc Wetland Delineation Report (dated February 9, 2022) recommending that Barr's wetland boundary determination and jurisdictional opinion be reviewed by EGLE prior to undertaking any activity near or within any identified wetlands; the proposed layout as submitted may require revision, in response to EGLE's review, to unit/ lot layout in the single family phase, thus impacting the preliminary site layout. Comment addressed. Per a meeting with the Township on March 25, 2022, it was agreed that grading within the 25' wetland setback would be acceptable. A wetland restoration plan shall be required at the time of FSP submittal. Plan shall include a timeline for restoration of the wetland buffers. Note that the developer shall also be required to comply with all EGLE requirements with respect to grading and regulated wetlands. A note shall be provided on the FSP with regard to the wetland buffer restoration. In addition, a note has been added (Notes 1&2- in duplicate) to plan Sheets C-3.0 and C-3.0A that a wetland determination and jurisdictional opinion shall be done by EGLE prior to FSP approval. Please comment on the status of the above items. Comment partially addressed. Although grading plan sheets show a timeline for wetland buffer restoration and reference to the landscaping plans for the restoration plan, there is no restoration plan on the landscaping sheets. In addition, we note that there is also no landscaping plan in general for the single-family portion of this development.*

Comment partially addressed. Sheets LS-10 and LS-15 have been provided. These sheets indicated areas that are to receive wetland buffer restoration; however, please extend restoration label on Sheet LS-10 to cover buffer disturbance in the areas south of Lots 34-37 (single family portion) including the detention basin outlet and sidewalk connection from Hill Road. We note that a landscaping plan has now been submitted for the single family portion of the development.

A wetland determination and jurisdictional opinion from EGLE was provided; however, this expired on August 16, 2025 as the opinion is only valid for three years. A reassessment from EGLE shall be required. In addition, please correct date on plan Sheet C-3.30 under Development Note 1- Date

should be August 16, 2022. **The wetland determination and reassessment have now been addressed at this level of review. Per the design engineer response, EGLE has agreed that the wetland delineation is still accurate. The applicants wetland consultant shall visit the site prior to application for a wetlands permit from EGLE. The approved wetlands permit from EGLE shall be required at time of FEP approval.**

Comment above regarding date correction remains outstanding.

c) *Clarify if there is an existing drainage easement on the property south of the single-family Detention Ponds 1 and 3. An easement will be required for discharge of drainage off site. In addition, the design engineer will be required to demonstrate that there will be no downstream impacts from the proposed development in terms of stormwater discharge flows. Engineer will need to demonstrate that adequate downstream capacity exists to handle post development flow. Comment remains as a notation and can be further clarified at the time of FSP/FEP. Design engineer has stated in their February 15, 2022 review response letter: "There is not an easement in place. There is an existing stream which provides the historical drainage route through the said parcel to a box culvert under M-59. Since the development will have a 100-year detention basin and will discharge stormwater at an agricultural rate, the downstream ditch should have adequate capacity. A detailed engineering analysis will be provided to the township and MDOT during the construction plan phase." It is understood that in the event insufficient capacity is found in the box culvert that modifications may be required in terms of detention basin storage capacity which may impact site layout. Comment addressed. MDOT will need to concur regarding hydraulic calculations and the existing box culvert capacity.* **Comment remains. The design engineer notes that hydraulic calculations and other documents shall be submitted to MDOT upon MDOT ROW permit application and to DLZ on the Final Engineering Plan.**

d) *Extend the sanitary sewer to the north property line along Hill Road. Comment remains. Applicant indicated that the topography near the northern property restricts construction of the sanitary sewer at this location and would require a construction easement from the adjacent property owner. Township Ordinance requires extension to the limits of the property line, and the sanitary sewer master plan indicates that gravity sanity sewer is ultimately proposed north of this location. We defer to the Township if a variance can be granted on this requirement or if completion of this item will be a condition of approval. Comment addressed. Discussion with the Township concluded that the sewer shall not be extended to the north property line and that an easement for future sanitary sewer extension shall be provided. In addition, the developer shall be required to deposit a monetary fee or escrow with the Township as assurance to supplement the future sewer extension. Comment remains*

as a notation relative to Phase II. Comment remains. It appears that the plan as currently shown is not to be phased. Please clarify as phasing shall impact the timing of construction of portions of the sanitary sewer. In addition, it also appears as if an easement for future sewer extension is no longer required. The future sewer extension is now shown inside and 10' from the proposed 43' ROW line. Please verify. **Comment remains. Per discussion with the design engineer and our office, the sanitary sewer along Hill Road will be installed at the time of all initial infrastructure. The easement shown on the plan will be left due to the depth of the sewer at the proposed northern stub. In addition, the applicant/developer has agreed to fund future installation/extension of public sanitary sewer between the end of the proposed construction and the north property line of Avalon.**

e) *With nearly 60 feet of elevation change, the designer should ensure that sufficient pressure exists at the higher elevations for a bathroom on the 2nd story. The water may have to come from Pressure District 4 to service units with higher elevations as it appears that there will be insufficient pressure on the northern portions of the proposed development. To interconnect between the pressure districts, at least one PRV may be required. We suggest that the Township request escrow funds with regard to this item such that DLZ can model the water system to determine any deficiencies that may exist regarding water pressures and/or capacities. Our office has performed modeling of the proposed water system, see attached water model results; In all scenarios the area at the northeast corner of Aurora Circle experienced the lowest resulting pressure. There is a need for a handful of homes in this vicinity to have individual booster pumps to ensure adequate pressure given the various scenarios. It can also not be understated that the proposed design places an incredibly high criticality rating on the existing 16" watermain along M59. This is the only supply proposed to serve the nearly 500 residential units. If something were to happen to this watermain there is no second source or storage to feed this area temporarily. DLZ recommends a second water supply be installed to provide redundancy to the proposed distribution system. Please note that in order to stay within the same pressure district the source would need to be from south of the existing Pressure Reducing Valves that exist on either side of the existing Meijer store. Comment addressed at this level of review. As a condition of the Township engineer's recommendation for Preliminary Site Plan approval, the developer acknowledges the critical issue of not having a redundant source of water supply for the proposed development. The design engineer has stated that a second supply connection is being researched. We request commentary regarding the above as the current plan submittal does not demonstrate the secondary water feed. In addition, this secondary feed shall be required to be installed as part of Phase I of the development. Comment partially addressed. A secondary water feed is now shown off site as an 8" diameter line connecting into the existing 12" Meijer watermain to the east. DLZ will need to model the proposed improvements to verify if the proposed pipe size is*

sufficient or if the 8" loop should be upgraded to a larger pipe size. In addition, it appears that the plan as currently shown is not to be phased. Please clarify as phasing shall impact the timing of construction of portions of the watermain. **Comment remains. Per discussion with the design engineer and DLZ, DLZ will model the proposed improvements. In addition, the redundant watermain shall be installed with the initial infrastructure for construction of the multifamily and Hill Road portions of the development.**

f) *Sanitary sewage from this development is tributary to the existing Meijer sanitary sewer pump station located at the Northeast corner of Highland Road and Bogie Lake Road; an analysis will need to be provided that indicates there is sufficient capacity within the existing pump station, or if upgrades will be necessary to support the additional discharges.* **Comment remains and can be addressed at time of Construction Plan submittal. Design engineer states in their review response letter dated February 15, 2022: "Since an 18" sewer has been stubbed to the Hill Road/M-59 intersection, it is our understanding that the pump station and force main were designed for future development along Hill Road and Ormond Roads. A detailed analysis will be conducted during the construction plan phase." Please note that the pump station was designed for future upgrades at a time when additional flows dictate the need. Per discussion with PEA and DLZ, DLZ will confirm that no improvements will be required to the pump station. This will be done at time of Final Engineering Plan review.**

g) *Pond 2 located in the single-family section of the development (see plan Sheet P-5.1) proposes discharge to the adjacent wetlands to the west. Clarify where drainage from this wetland shall be routed as it appears from existing topography that there is no outlet from this wetland. In addition, a portion of this wetland is located off site; an off-site drainage easement would be required. Additional topographical survey information will be required for the property to the south of the wetlands in order to clarify the drainage path. The design engineer has noted that the discharge from the proposed pond (now labeled as Pond 5) will discharge at an agricultural rate and follow its natural off site drainage course. The difference in pre and post development area discharging from proposed Pond 5 to the existing wetlands is an increase of 0.2 acres. We can consider this item complete for this level of review, however the capacity for the receiving wetland to accommodate the increased runoff volume will need to be demonstrated at the time of Final Site Plan/Final Site Plan/Final Engineering Plan submittal. Comment addressed. The discharge will also need to be permitted by EGLE.* **Comment remains as a notation.**

h) *All public or Private roads are required to be built to RCOC standards.* **Comment remains as a notation. All new roads are proposed to be private.**

i) *Specify the proposed width of the shared access driveways for Lots 81-84 and 85-88 of the single-family portion. These drives shall be built to private access drive standards of White Lake as specified*

in the Zoning Ordinance Section 5.16. Section C. ii. requires two points of access for such drives to an adjacent public or private road. Section D. ii. requires that access driveways shall be able to accommodate emergency vehicles. Comment partially addressed. Two points of access for each of the drives are now proposed, however, Ordinance 5.16 C.i. requires a 30' wide easement width for an access drive; 25' is proposed for Lots 81-84 and 85-88. In addition, Zoning Ordinance Section 5.16 C. iii. regarding setbacks shall be met (Unit 85 is not in compliance). Also specify on plan that the 20' drive widths proposed are measured as 20' from the edge of the gutter line per Ordinance 5.16 C. v. Please also provide fire truck turning radius for these private access drives. Comment addressed. Fire truck movements have been provided and show that while tight, the trucks will be able to traverse the drives. **Comment rescinded. These lots as well as the configuration for these lots are no longer proposed.**

j) *End sections for the three detention basins proposed on the single-family portion will be required to be located outside the wetland setback. Comment partially addressed. Our office finds the basin outlet locations acceptable and that the outlet pipes for Basins 4 and 5 shall be constructed within the wetlands setback and the land restored to its natural preconstruction condition. Note that location of the basin end sections shall be subject to review and approval by EGLE. EGLE may require revision of the end section locations. Our office recommends the Township require a wetland setback restoration plan and that the developer be required to post a bond amount to guarantee proper and timely completion of restoration of the wetland buffer setbacks in these two areas should EGLE approve the end section locations. Comment addressed for this level of review. The design engineer notes a wetland setback restoration plan shall be provided at the time of FSP/FEP submittal. A note shall be provided on the FSP/FEP regarding wetland setback restoration. Comment outstanding relative to the Final Site Plan. A wetland restoration plan has not been submitted. Reference Comment b) of this letter. We note that a note regarding wetland restoration was added to the current plan.* **Comment addressed. Wetland buffer restoration details are now on landscape plan sheets. Please reference Comment b) of this letter for further notes/comments.**

k) *Proposed future decks or patios for Lots 12,15,82, and 83 of the single-family portion of the development appear to encroach into the proposed storm sewer easement. Please revise. Comment outstanding. A 12' wide deck or patio would only allow for 5' of easement on one side of the storm sewer relative to Units 82 and 83; 6' minimum is required. In addition, Units 9-12 would have a similar issue. Unit 80- the deck or patio could only be placed on the NE area of the rear of the house. Units 85 and 86 would not have enough space for a deck or patio without storm sewer easement encroachment. This comment remains outstanding. Since the lot numbering and count has changed and no such table has been included and no utility information included with the current submittal, we are unable to review requested changes or provide comment. All numbers for data tables will*

need to match up. Comment outstanding regarding deck placement in storm sewer easements. See Unit 10 of the single-family developmental portion. In addition, for the current multi-family building layout, rear patio/deck placements shall be evaluated now by the design engineer as it appears there are areas where a proposed 12' wide standard patio and/or deck would encroach into the storm sewer easement. Example: Building 32. **Comment partially addressed. Engineer has clarified that the ranch style apartments will not have decks and that Unit 10 (single family) will not have deck encroachment into the storm sewer easement. Please modify the note on Sheets C-3.33 and C-7.33 to include the word 'patios' in it. We note that the design engineer has indicated that language pertaining to decks (and patios) not encroaching into the storm sewer easements be included in the Master Deed.**

l) *Specify watermain diameter for the watermain proposed in the single-family portion of the development.* **Comment addressed. Watermain diameter (8") has now been specified.**

m) *Sheet C-3.3- What is the intent regarding the installation of an access drive to and overflow spillway work on the Meijer Detention basin? How does this relate to the Avalon development?* **Comment addressed. Per the design engineer: " The berm adjacent to Meijer detention basin will be restored to the original design elevations, the overflow spillway replaced, and access drive installed due to disturbance during installation of the proposed water main and as requested by Meijer as a condition of installing the water main."**

n) Please add notes to the plan regarding the timing of installation of the following:1) Sanitary sewer along Hill Road (during construction of multi-family residential); 2) 8' wide paths along Hill Road (west side with multi-family; east side with single family); 3)Off site watermain (during multifamily construction).

Watermain Easement from Huron Valley Schools- Exhibit Comments- Exhibit Prepared by PEA and dated January 26, 2023 **We note that the revised exhibit was not received as part of this submittal. The design engineer has noted that the updated exhibit will be submitted separately.**

1. *Easement description and exhibit shall be sealed and signed by a Registered Land Surveyor.*
2. *Easement description does not list an area of the easement. Please provide.*
3. *Variable Width Watermain Easement Description- Line 11- Change 'to' to 'along.'*
4. *We note that the watermain easement as shown on the Huron Valley Schools property on the current Avalon Final Site plan(Sheet C-7.3) shall match the layout shown on the easement exhibit. Currently the easement shown on the Final Site Plan does not match that shown on the easement exhibit.*

Final Site Plan Comments

Note that comments from our previous review dated September 2, 2025 are shown in *italics*. Responses to those comments are in **bold**. New comments are in standard font.

General

1. *Please provide clarification as to whether the current submittal is only for Phase I or for both Phases I and II. Comment outstanding. It appears as if submittal is now not phased. Please clarify.* **Comment addressed. Per design engineer, phasing is no longer proposed.**
2. *Sheet C-1.0 – BM- Please label BM information in box as BM 300 (reference Sheets C-1.0 and C-1.1).* **Comment outstanding. The box, located above the 'Floodplain Note' box ,that says 'Benchmark' : please include 'BM300' wording in this box.**
3. *Maintain 10' horizontal separation for watermain, sanitary sewer, and storm sewer relative to proposed trees. We note that there are some areas on the landscape plan where trees are proposed to be planted directly over utilities. Ex. Sheet LS-2- water service lead for Building 6 and Sheet LS-3- water service for Building 11. Please check the entirety of the landscape plan for such conflicts. Comment outstanding. In addition, please add a note to the cover sheet of the landscape plan regarding separation between trees and proposed watermain, sanitary sewer, and storm sewer.* **Comment partially addressed. A note regarding horizontal separation has been added to the landscape plan sheets with the exception of the following sheets: LS-3, LS-8, and LS-10. Please add this note to these sheets as well.**

Paving/Grading

1. *Sheet-3.1- We recommend that the ADA space proposed east of the clubhouse be placed on the west side (adjacent to proposed 5'wide sidewalk) of this parking lot so as to avoid crossing of interior traffic circulation lane by persons with disabilities. Is this space intended to allow ADA parking near the mailboxes? Please clarify. Comment outstanding regarding location of ADA space east of clubhouse. We also note there is an ADA space near where the mail kiosk is proposed on the west side of the clubhouse.* **Comment addressed. Space east of clubhouse is an ADA space with EV charging station.**
2. *Although the barrier free parking stall details are shown on Sheet C-13.1, neither detail corresponds with that shown on Sheet C-3.1. In addition, regular ADA spaces and van accessible space shall be per dimensions outlined in WLT Zoning Ordinance 5.11 O. ii. and iii.* **Comment addressed. Space**

dimensions meet or exceed Township width requirements for regular ADA and van accessible ADA spaces.

3. *Sheet C-3.1- Parking spaces currently shown on plan are inconsistent in terms of labeling width and depth. Please ensure at least both dimensions are shown for at least one space for each parking lot. For example, Building 47 space has been labeled with dimensions, while Building 49 has not. Comment partially addressed. Provide typical parking space width dimension for spaces located east of the clubhouse/pool.* **Comment addressed. Parking space dimensions have now been provided.**
4. *Sheet C-3.0-Multi-Family Site Data-The number of ADA spaces listed does not match that shown on this plan sheet. We count 3 van accessible spaces and 1 standard ADA space.* **Comment addressed. ADA parking count has been corrected.**

Sanitary Sewer

1. Sheet LS-11 -West side of entrance off M-59- Please relocate the portion of brick wall and pier that are inside the storm sewer easement. These structures will need to be located outside of the storm sewer easement. In addition, relocate the end pier out of the storm sewer easement on the east side of the M-59 entrance.

Stormwater Management

1. *Sheet C-12.0-Pond No. 2(multi-family-northern most next to Hill Road) is mislabeled as Pond No. 1. Please revise label.* **Comment addressed. Pond label has been corrected.**
2. *Please review and revise the Pond labels and page labels, the plans are confusing with there being multiple pond 1 and pond 2 labels (multi-unit and single family developments each have these).* **Comment addressed. Ponds have been renamed/renumbered.**

The following cursory review comments have been provided as a courtesy and can be addressed on the Final Engineering Plan. We note that the below comments do not comprise all Final Engineering comments; additional comments shall be provided at the time of Final Engineering Plan review.:

Note that comments from our previous review dated September 2, 2025 are shown in *italics*. Responses to those comments are in **bold**. New comments are in standard font.

Final Engineering Plan Comments-

General

1. *Plan shall contain notes per White Lake Township Engineering Design Standards Section A. 8. a.-d.* **Comment outstanding.**
2. *Provide at least two permanent benchmarks on NAVD 88 datum. Benchmarks are required at least every 1,200 feet.* **Comment outstanding.**
3. *Provide soil boring reports that were prepared by CTI and McDowell.* **Comment outstanding.**
4. *The topographical survey shows existing overhead electrical lines on the parcel west of Hill Road. Clarify as to whether these lines shall remain or be relocated and as to whether an easement for the lines exists. In the event the lines are to be relocated, the easements (if existing) will need to be vacated.* **Comment outstanding.**

Paving/Grading

1. *ADA accessible ramps will be required on sidewalk adjacent to ADA parking spaces. Ramp slopes shall meet ADA requirements.* **Comment outstanding.**
2. *Structural wall calculations, that have been signed and sealed by a Registered Structural Engineer, verifying the wall integrity and the ability to support lateral and vertical stresses will need to be provided for retaining walls over 30" tall.* **Comment outstanding.**
3. *Retaining walls >30" in height shall require a decorative fence or railing at the top that is a minimum of 36" in height.* **Comment outstanding.**
4. *Cover sheet- Hill Road is mislabeled as Hall Road. Sheets LS-8,9,11, and 13 – M-59 is mislabeled as Hall Road. Please revise.* **Comment partially addressed. Cover sheet road mislabeling has been corrected. Landscape sheet mislabeling remains outstanding.**

Watermain

1. *We defer to the Fire Department regarding items related to fire suppression and hydrant coverage.* **Comment remains.**
2. *Additional gate wells will be required to meet isolation requirements.* **Comment remains.**

Sanitary Sewer

1. *A manhole will need to be added along Hill Road between Manholes H and I. There is approximately 516 feet between manholes.* **Comment outstanding. An additional manhole shall be required**

between Manholes I and J as the footage between these two manholes is approximately 435'. 10 States Standards allows a maximum of 400' between manholes for sewer < 15" in diameter.

Recommendation

The majority of our comments have been addressed. We are now recommending approval subject to any remaining comments being addressed on the Final Engineering 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: Matteo Passalacqua, CWA, *via email*
Hannah Kennedy-Galley, Community Development, *via email*
Aaron Potter, DPS Director, White Lake Township, *via email*
Jason Hanifen, Fire Marshal, White Lake Township, *via email*

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Carlisle | Wortman
ASSOCIATES, INC.
117 NORTH FIRST STREET SUITE 70 ANN ARBOR, MI 48104 734.662.2200 734.662.1935 FAX

October 21, 2025

Final Site Plan Review
for
White Lake Charter Township, Michigan

Applicant:	White Lake Hill LLC
Project Name:	The Avalon Multi-Family / Single-Family Condominium
Plan Date:	July 3rd, 2024
First Revision	May 8th, 2025
Second Revision	September 30th, 2025
Location:	Northwest corner of Highland Road (M-59) and Hill Road Parcel ID: 12-20-101-003 & 12-20-126-006
Action Requested:	Final site plan review

PROJECT NARRATIVE

The Applicant is requesting final site plan approval for a new residential housing development which will include three-hundred sixty-six (366) multi-family units and sixty-eight (68) single-family home condominium, which is a permitted use in the PD Planned Development zoning district. The multi-family component of the development will offer single- and two-story buildings. Single-family condos will be detached, however no architectural renderings of models were provided.

It is important to note that the overall layout and unit count of the development has been modified since preliminary site plan approval. Notable modifications are outlined below:

- Multi-Family unit count decreased from three-hundred ninety-four (394) units to three-hundred sixty-six (366) units (5.6 units per acre).
- Internal road layouts in the southcentral portion of the site have been modified.
- Ranch style attached units have been substituted for the two story, twelve (12) unit buildings in the central portion of the site.
- Parking and mail facilities have been provided directly west of the clubhouse.

The project encompasses two (2) parcels separated by Hill Road. The multi-family development will be constructed on the west side of Hill Road on 69.0 acres. The single-family detached condominium

Benjamin R. Carlisle, *President* John L. Enos, *Vice President* Douglas J. Lewan, *Principal*
David Scurto, *Principal* Sally M. Elmiger, *Principal* R. Donald Wortman, *Principal* Craig Strong, *Principal*
Paul Montagno, *Principal* Megan Masson-Minock, *Principal* Laura Kreps, *Senior Associate*
Richard K. Carlisle, *Past President/Senior Principal*

development will be on the east side of Hill Road on 41.1 acres. The multi-family portion of the project was initially proposed in phases however the phase notes have been removed from Sheet C-3.0. The project is now proposed to be constructed under a single phase which will commence in spring of 2026 and be concluded in spring of 2029.

A Clubhouse building is proposed at the main entrance from Highland Road (M-59). It will be 5,428 sqft and offer amenities such as package delivery storage, exercise areas, pet wash and event rooms. Management offices will be located in the building along with onsite maintenance operations.

The site is currently vacant. The Planning Commission made a recommendation to the Township Board to approve the preliminary site plan at the July 7th, 2022 regular meeting. Preliminary site plan approval was granted October 18th, 2022 by the Township Board and extended in October of 2023. Phase 3 is being proposed as a condominium development and will require final site plan approval by the Township Board.

The purpose of final site plan review is to determine if the proposed use and site are consistent with Township ordinances and other applicable county, state, and federal laws and regulations and to identify reasonable conditions that may be necessary to mitigate potential negative impacts to surrounding properties and the community.

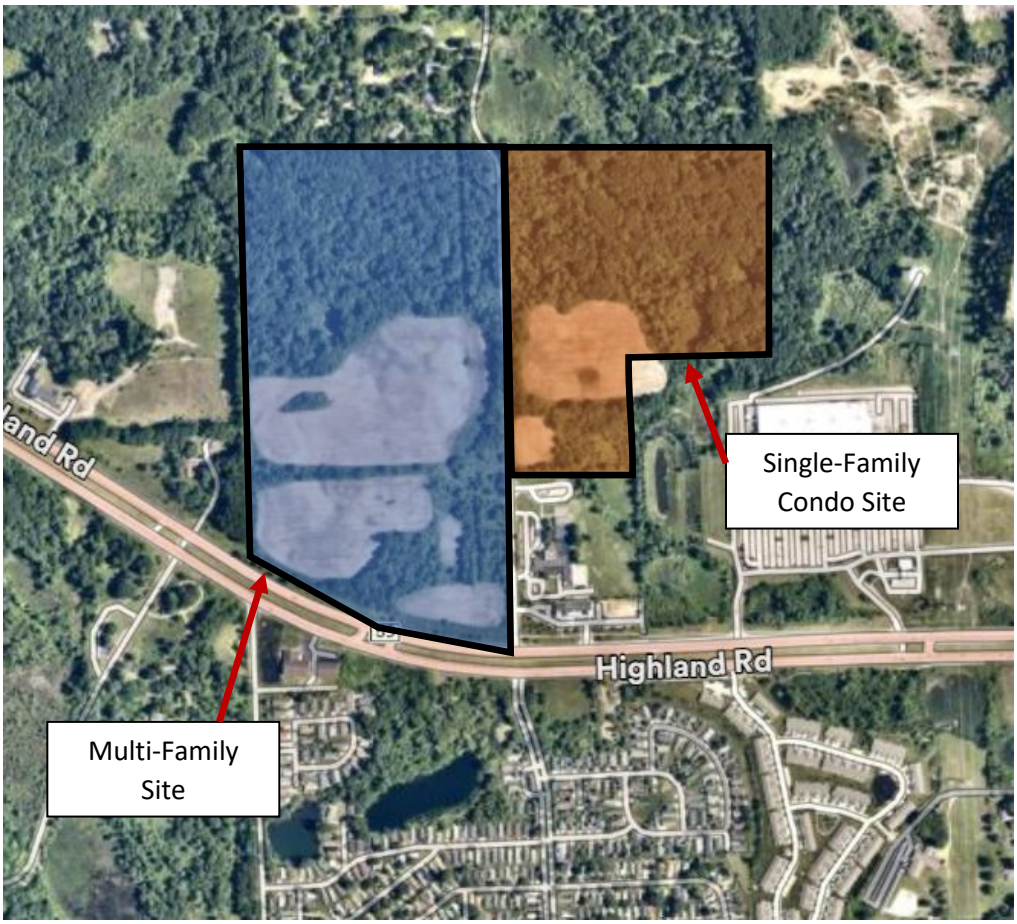
Preliminary site plans are reviewed by the Planning Commission with recommendations then provided to the Township Board for approval, approval with conditions or denial. Final site plan review and approval is conducted solely by the Planning Commission. In instances of Planned Developments, draft development agreements are required for review by the Planning Commission at final site plan review. The Planning Commission may then recommend approval or approval with conditions of the development agreement to the Township Board.

Since preliminary site approval has been granted, this review focuses on information relating to final site plan and planned development district conformance as well as any noted items of concern from prior reviews requiring attention.

SITE DESCRIPTION

Lot Area:	68.96 acres (Multi-family site) 41.06 acres (Single-family condo site)
Frontage:	Multi-Family Site Approx. 2,450 feet along Hill Road & 1,375 feet along Highland Road (M-59) Single-Family Condo Site Approx. 1,600 feet along Hill Road
Address:	TBD
Current Use:	Vacant

Aerial image of the site

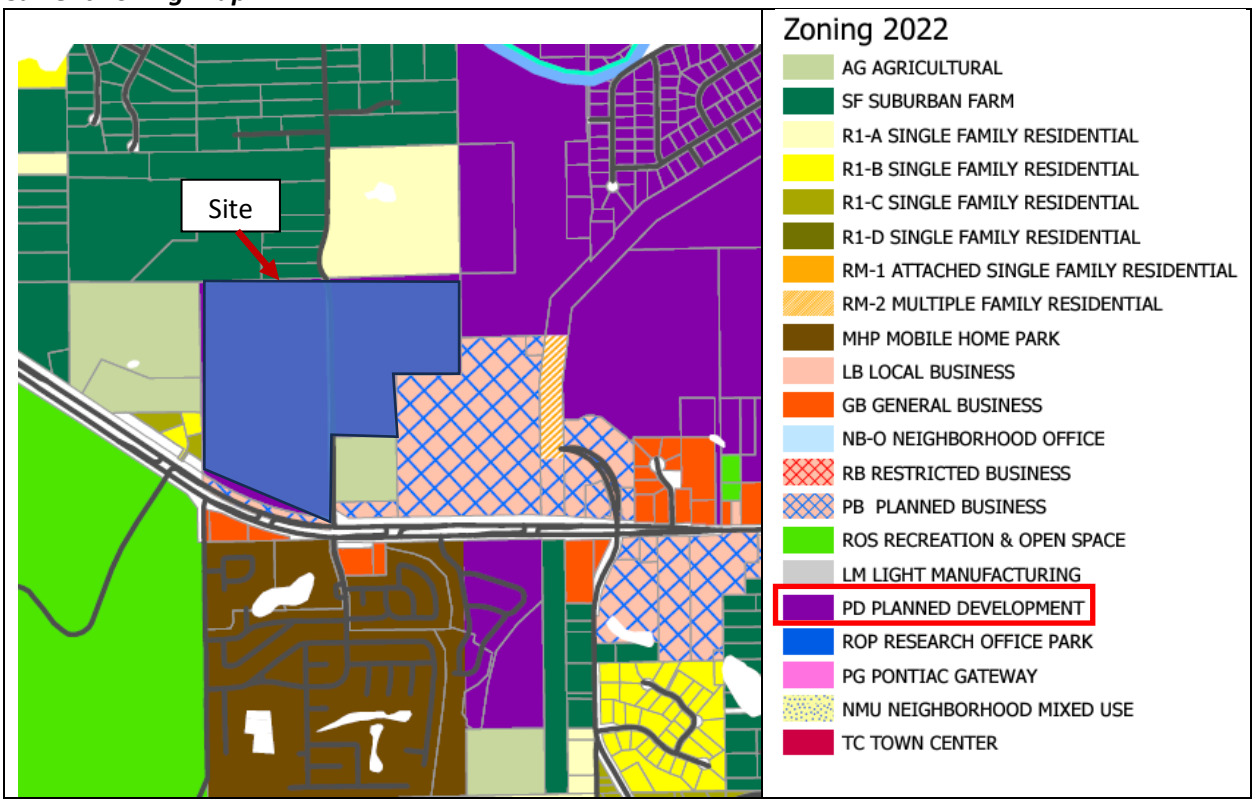


Source: NearMap June 2024

	North	East	South	West
Surrounding Zoning	*R1-A, Single Family Residential / SF, Suburban Farms*	*PB, Planned Business / PD, Planned Development / Ag Agricultural*	*PB, Planned Business / Ag Agricultural*	*Ag Agricultural / R1-B, Single Family Residential / R1-C, Single Family Residential*
Surrounding Land Uses	*Single Family Homes*	*Educational / Retail / Commercial Shopping / Vacant*	*Retail / Single Family Homes*	*Place of Worship / Vacant / Single Family Homes*
Future Land-Use Map	*Agricultural Rural Residential*	*Commercial Corridor / Agricultural Rural Residential*	*Manufactured Residential / Commercial Corridor*	*Commercial Corridor*

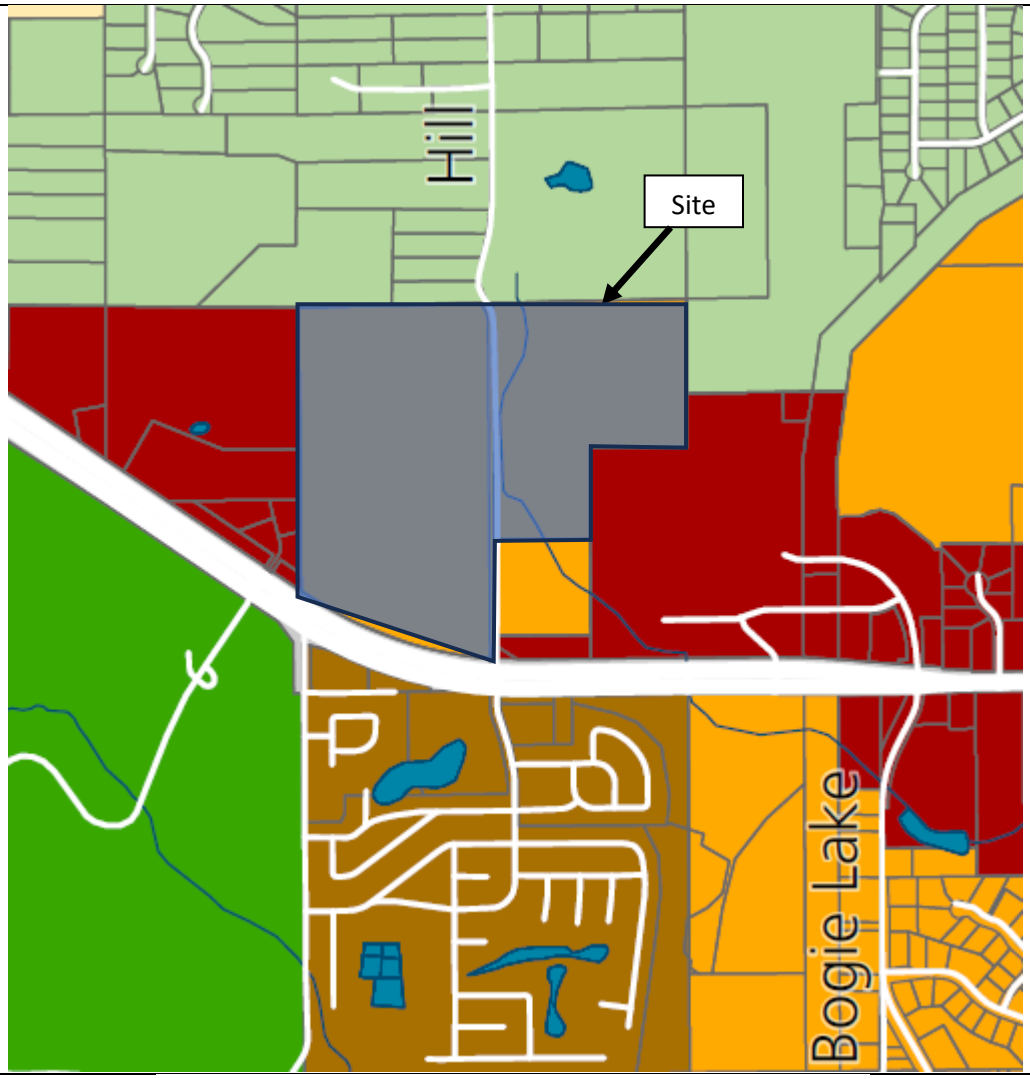
Current Zoning	**Planned Development** *The PD, Planned Development District is intended to provide for the location and various types of planned land use on large parcels held in common ownership and includes such alternate terms as cluster zoning, planned development, community unit plan, planned residential development and other similar terminology. Uses planned may include single-family detached housing, single-family attached housing, multiple-family housing, local commercial business, office uses, and similar activities. The PD District is intended to result in a unique, planned development that includes such techniques as open space preservation. A public hearing shall be held prior to formal consideration of the PD.*

Current Zoning Map



Future Land Use	**Neighborhood Residential** *Maintains existing neighborhoods and provides for denser residential development in places where there is infrastructure to support the density and ensuring density is within context of the surrounding neighborhood.*

Future Land Use Map



Future Land Use Framework

Sources: Michigan Open Data Portal, Oakland County, White Lake Township

- Recreation / Open Space
- Agriculture / Rural Residential
- Suburban Residential
- Neighborhood Residential
- Manufactured Residential
- Neighborhood Commercial
- Commercial Corridor
- Pontiac Lake Gateway
- Production / Technology

Items to be Addressed: *Draft development agreement is required at final site plan review.*

NATURAL RESOURCES

Topography: Sheets C-1.0 through C-1.3 shows existing site topography. The entire site is characterized by rolling hills and steep slopes. We note existing topographic conditions, proposed grading, and proposed soil erosion control information are not provided for the lot east of Hill Road. Proposed grading is shown on Sheets C-5.1 through C-5.33. Extensive grading is proposed throughout the site to accommodate stormwater detention ponds and shore up site roads and structures. A note on Sheet C-6.1 indicates approximately seventy point five (70.5) acres are to be disturbed. We defer to Township Engineering for any concerns with the proposed grading plans.

Wetlands: Sheets C-1.1 through C-1.33 indicate approximately eighteen (18) regulated and/or unregulated wetlands within the site located west of Hill Road. Sheet C-3.0 provides notes as it relates to wetland fill and restoration. The Multi-Family Site Data Table indicates EGLE Wetland areas to be impacted is 0.34 acres of the sites 0.64 acres of wetland identified. The Engineering review dated October 11th, 2022 highlights the required wetland fill, restoration and protection requirements for the final site plan review. An EGLE wetland identification report dated August 16, 2022 was provided showing the department's outline of regulated wetlands. The report's findings are binding for three years. The applicant has stated in a response letter dated October 2nd, 2025 that per conversations with EGLE, the WIR is still likely accurate but that the site will be inspected again prior to application for a wetland permit. The applicant states a wetland permit will be supplied to the Township once it has been issued. We defer to the Township Engineer on whether the appropriate information has been provided.

Woodland: Mature woodlands exist primarily in the northern portion of the site with open fields in the southcentral area. Landscaping plans shown on Sheet LS-1 indicate that the majority of existing woodland will be cleared with the exception of the northern border and large detention area proposed north of the Hill Road entrance into the multi-family development.

Soils: Brown sand, Clayey sand, Sandy clay and Stiff blue clay.

Water: Sheet C-1.0 provides a note stating the site is within zone "X" area determined to be outside of the 0.2% annual chance floodplain per flood insurance rate map number 26125C0318F, effective September 29, 2006. Per the Michigan Department of Environment, Great Lakes, and Energy (EGLE), wetlands are on and adjacent to the site.

Items to be Addressed:

1) *Any cited concerns from Township Engineering.*
2) *Provide updated WIR if determined necessary by EGLE.*
3) *Obtain EGLE wetland permit.*

AREA, WIDTH, HEIGHT, SETBACKS

Proposed building envelopes and setback standards are shown on Sheet C-3.0 for multi-family portion of the project. Setback, typical lot sizes and unit dimensions were not provided for the single family detached site. Measurements are taken from the property lines.

PD Planned Development District Developmental Standards

Multi-Family	Required:	Proposed:	Complies
Setbacks			
Front	40 feet	74 feet (Highland Road) 50 feet (Hill Road)	Yes
Side	25 feet / 50 feet total	50 feet (west)	Yes
Rear	105 feet	105 feet	Yes
Between Buildings	Section 3.11.G	25 feet	Complies
Building Height			
	30 foot maximum	Ranging from 16' 8.5" to 25.2"	Yes
	2 stories maximum	2 story maximum	Yes
Lot Coverage	TBD	20.3%	TBD

The single family detached portion of the development remains as presented and approved in the original preliminary site plan. Typical lot sizes range from 8,370 square feet to 22,317 square feet. Minimum lot widths are 65 feet. Setbacks are:

- 25 feet front yard
- 8 feet side yard
- 35 feet rear yard

Individual lot layouts with unit model concepts and basic floorplans are included in the final site plan. Units range from approximately 1,500 square feet to 2,700 sqft. Singel and two story models are included and offer three to four bedroom / two to two and a half bathrooms floorplans. All models include an attached two car garage.

Section 3.11.G outlines requirements for attached multi-family building spacing. Distances between separate buildings is provided on a table on Sheet C-3.0. Part U of the section specifies setbacks from sidewalks and/or roads. Structures shall have a minimum setback of twenty-five (25) feet from the back of sidewalk or twenty-five (25) feet from back of curb for developments without sidewalks. These dimensions are shown on Sheet C-3.0 from the front of multi-family buildings and the sidewalk or curb however we note the preliminary site plan provided for building setbacks from curb to be no less than 25 feet with or without sidewalks.

Items to be Addressed: *None*

ACCESS & CIRCULATION

Site access management standards are outlined in Section 6.4. The multifamily site is accessed via two ingress/egress drives. Primary access is via Highland Road (M-59). A secondary access drive is located along Hill Road. The single-family site is accessed via one boulevard located 578 feet north of the multifamily site Hill Road access.

Sheets C-3.1, 3.2, 3.30, 3.31, 3.32, and 3.33 provide internal roadway and pathways as well as egress / ingress dimensions. While the site layout and unit count for the multifamily site has changed since preliminary site plan approval, the location of access points has remained unchanged. A Traffic Impact Study dated July 30, 2025, was provided in the revised final site plan. The study indicates that the current road network and design is adequate to service the site and existing traffic. The only recommendation provided is the installation of a westbound right and turn lane into the site from Highland Road (M-59). This recommendation has been incorporated into the design.

Highland Road (M-59) entry is accommodated with a right turn deceleration lane. Egress is limited to right turn only. The Hill Road entrance will accommodate both left and right turn egress. A shoulder has been provided for traffic entering from the north. No shoulder lane is proposed for traffic to bypass vehicles turning left into the development form the south. We defer to Township Engineering on the proposed design and dimensions of both entryways as well as Highland Road (M-59) and Hill Road improvements.

The single-family site access provides a deceleration lane for northbound traffic entering the site off Hill Road.

Internal roads are proposed to be twenty-eight (28) feet wide in the multifamily site and twenty seven (27) feet wide in the single-family site. Emergency vehicle circulation plans are provided on Sheets 15.1, 15.2, and 15.30. We defer to public safety on the validity of these designs.

We note the design and layout of sidewalks and pathways in the landscaping portion of this review.

***Items to be Addressed**:*

1) *Any concerns cited by Township Engineering*
2) *Any concerns cited by Township Public Safety*

PARKING & LOADING

Section 5.11 outlines requirements for off-street parking. Sheet C-3.0 provides parking locations and calculations for residents and visitors. For multi-family developments, the zoning ordinance requires two (2) spaces per dwelling unit plus 1/4 of a space per bedroom for guest parking in common areas. The parking calculations within the Multi-Family Site Data Table indicate nine-hundred twenty-eight (928) parking spaces are required. One thousand, one hundred seventy-three (1,173) parking spaces are provided.

Seven-hundred thirty-two (732) of the spaces are garage parking for residents. Three hundred sixty-six (366) spaces are located in driveways and sixty-five (65) are located in twelve (12) unit building parking lots as well as clubhouse parking. To ensure driveways and spaces in front of garages are sufficient for

parking space standards, length and width dimensions of those parking areas have been added to the plans. All parking spaces and drive aisles met design standards.

Three (3) ADA parking spaces are provided in lots adjacent to the clubhouse. All are designated as van accessible.

A note on Sheet C.3-1 indicates all parking lot striping will conform to the dimensions provided on Sheet C.13-1.

***Items to be Addressed**: None*

ESSENTIAL SERVICES & UTILITIES

Sheets C-7.1 through C-7.33 provide overall site utility plans as well as water, sewer and storm system notes. Details for utility layouts, designs and detention ponds are provided on Sheets C-11.1 through 12.32. The site will be serviced by existing water and sewer system infrastructure. We defer to Township Engineering regarding any concerns of design, capacity and location.

The site's five (5) detention ponds will handle drainage from five (5) separate areas dedicated to each pond. A portion of the single family detached site will drain into wetland R. Calculations for the system are provided on Sheet C-11.1 and 11.2. A note on Sheet C-7.1 states that gas and electrical utilities will be installed in a manner that ensures proper placement as it relates to pavement and landscaping.

Emergency vehicle circulation is provided on Sheets C-15.1 through 15.30. We defer to Township public Safety on the validity of the sites design relating to emergency services.

Final site plan reviews require applicants to identify the location of all underground and aboveground storage tanks for such uses as fuel storage, waste, old holding tanks, collection of contaminated stormwater, and similar uses. We do not anticipate the storage of hazardous or contaminated materials onsite.

Items to be Addressed:

1) *Any cited concerns of Township Engineering.*
2) *Any cited concerns from Township Public Safety.*

LANDSCAPING & SCREENING

Landscaping and screening details are provided on Sheets LS-1 through 13. Section 5.19 outlines site landscaping requirements.

Section 5.19.D provides requirements for screening along property lines as it relates to adjacent districts. Sheet LS-1 provides the entire multi-family site landscaping requirements and proposals. Those standards are reviewed below:

Greenbelts

Property Line	Required	Provided	Complaint
North (Residential District)	Depth: 20 feet - 38 feet 1 large deciduous or evergreen tree and 4 shrubs for every 15 linear feet (83 trees and 333 shrubs)Varies between greenbelt and/or screen wall-obscuring fence. *Note: The Applicant is requesting to retain existing vegetation and natural features as the means for providing buffering and screening from the northern residential district.*	Depth: 50 feet Existing	Yes Waiver Required
East (Hill Road)	Depth: 20 feet 1 large deciduous, 1 evergreen tree and 8 shrubs for every 30 linear feet (69 trees and 553 shrubs) *Note: The Applicant is requesting to remove approximately 367 feet from greenbelt calculation in return for retaining the existing vegetation and natural features.*	Depth: 50 feet 69 large deciduous trees and 553 shrubs	Yes Waiver Required
South (Highland Road M-59)	Depth: 20 feet 1 large deciduous, 1 evergreen tree and 8 shrubs for every 30 linear feet (46 trees and 368 shrubs) *Note: The decorative wall along portions of Highland Road (M-59) serve as screening from the road.*	Depth: 50 feet 46 trees and 370+ shrubs	Yes Yes
West (Residential District)	Depth: 20 feet - 38 feet 1 large deciduous or evergreen tree and 4 shrubs for every 15 linear feet (99 trees and 395 shrubs). Varies between greenbelt and/or screen wall-obscuring fence. *Note: The Applicant is requesting to remove approximately 418 feet from greenbelt calculation in return for retaining the existing vegetation and natural features.*	Depth: 50 feet 99 large deciduous trees and 287 existing shrubs	Yes Waiver Required

Interior Landscaping

Interior landscaping areas are required to equal at least fifteen (15) percent of the total lot area. One (1) large deciduous, small ornamental deciduous, or evergreen tree and five (5) shrubs shall be planted for every three hundred (300) square feet of required interior landscaping area.

Standard	Required	Provided	Complaint
Lot Area	344,121 sqft (15%)	344,121 sqft	Yes
Deciduous Trees	1,147 trees	1,027 trees	No / Waiver Required
Shrubs	5,735 shrubs	4,492 shrubs	No / Waiver Required

Interior tree and shrub counts are deficient and require waivers as proposed.

Waivers

Per Section 5.19.B.iii and v, the Planning Commission may waive or modify certain landscaping requirements. The greenbelt areas in question contain thick mature woodlands and appear to provide natural screening from the adjacent properties or rights-of-way. Sheets C-6.1 through C-6.33 outline the limitations of earth disturbance. Interior landscaping is substantial. With the exception of open space and water detention areas, no portions of the site are void of designed landscaping. An aerial image of the site from September of 2025 is below for reference.



Source: NearMap September 2025

Residential Entranceway Landscaping

Gateway signage is proposed for both entryways to the facility. Construction materials consist of brick veneer, stone veneer, limestone capping and decorative metal fencing. Maximum heights for walls and fences is six (6) feet of which no proposed portions of the structures exceed. Signage proposed on at the entryways will be reviewed and permitted administratively by the Township.

Part F of Section 5.19 outlines requirements for residential development entryway landscaping. The first one hundred fifty (150) lineal feet of entrance drive or street shall be landscaped. Sheet LS-8 provides landscaping layouts for both entryways however no table showing planting counts dedicated to the requirements is provided. This information should be included in table form and added to Sheet LS-8 for both entrances.

Parking Lot Landscaping

Any off-street parking areas containing ten (10) or more parking spaces shall have parking lot landscaping as prescribed in the table provided in Section 5.19.G. The only portion of the site that requires this standard is the parking adjacent to the proposed clubhouse building.

Twenty-four (24) parking spaces are provided for the clubhouse building. Below, we have reviewed the parking lot landscaping against the ordinance requirements.

Multi-Family Use	Required	Provided	Complaint
Lot Area	360 sqft	405 sqft	Yes
Deciduous or Ornamental Trees	4 trees	4 trees	Yes
Shrubs	12 shrubs	12 shrubs	Yes
Curbs	6 inch concrete	2’	Yes
Lot Islands	50 sqft area minimum and at least 5 feet wide	N/A	N/A

Minimum Plant Size

All proposed plant sizes and species meet landscaping requirements.

Trash Receptacles

All requirements for trash receptacles have been satisfied.

Mechanical Equipment Screening

No ground mounted or rooftop mounted mechanical equipment is provided on the site plan. We note that if such equipment is proposed, it must be screened via the requirements set forth in Section 5.19.N.ii.

Pathways

Pathway and sidewalk standards are required for preliminary site plan review. Pathways along Highland Road (M-59) and Hill Road meet the ordinance standards however portions of the pathway near Hill Road are on the development property. An easement dedicating Township access and public use will be required for these portions of the pathway.

We note that internal five (5) foot sidewalks are required on both sides of internal development roads. Some areas of the development only provide sidewalks on one side of the road. While it is preferable to provide five (5) foot wide sidewalks to both sides of roads, we note the preliminary site plan was approved

with sidewalks on one side of the multi-family development roads. This approval may carry over to the final site plan.

Snow Storage

Snow storage areas are not provided on the site plan. The response letter dated October 2nd, 2025 states snow will be plowed to the side of the roads then moved to open space areas if needed.

Retaining Walls

We note retaining walls shown on Sheets C-5.5 through 5.8 as well as details for wall construction on Sheet 13.1. Retaining walls over thirty (30) inches in height shall require a decorative fence or railing at the top that is a minimum of thirty-six (36) inches in height. We note several areas along the proposed walls that exceed thirty (30) inches in height and will require decorative fencing or railings. Notes on Sheets C-5.5 through 5.8 indicate that all portions of retaining walls over thirty (30) inches shall contain a decorative fence or railing that is at least thirty-six (36) inches tall.

Open Space and Recreation

Sheet C-14 provides open space and recreation area layouts and calculations for the multi- and single-family housing phases. The single-family condominium development proposes open space for approximately 21.9% of the net site area. The multi-family proposed open space covers approximately 36.8% of net lot area.

Multi-family developments require recreation areas as outlined in Section 3.11.C. Five-thousand (5,000) square feet of recreation space is required for the first unit with an additional one-hundred (100) square feet for each additional unit. Three-hundred sixty-six (366) multi-family units would require 41,500 square feet of recreational space. The revised plan indicates that 150,493 square feet of recreation space is provided via the clubhouse, pool, dog park, and gazebo area. The site also offers natural preserves via protected woodlands area and open spaces predominantly between buildings 50 and 56. The Planning Commission will need to determine whether these spaces are acceptable as required recreation space. Including internal pathways that traverse the open spaces and offer pedestrian access across the development would be considered passive recreation.

Items to be Addressed:

1) *Waiver from northern buffer and screening requirements in return to retain existing woodlands and natural features as the means for providing buffering and screening from the northern residential district.*
2) *Waiver required to remove approximately three-hundred sixty-seven (367) feet from the east greenbelt calculation in return for retaining the existing woodlands and natural features.*
3) *Waiver required to remove approximately four-hundred eighteen (418) feet from the west greenbelt calculation in return for retaining the existing woodlands and natural features.*
4) *Waiver required to reduce required west greenbelt shrub count from three-hundred ninety-five (395) shrubs to two-hundred ninety-seven (297) shrubs.*
5) *Waiver to allow one thousand twenty seven (1,027) interior trees and four thousand four hundred ninety two (4,492) interior shrubs.*

6) *Entryway landscaping planting and counts should be added in table form to Sheet LS-8 for both entrances.*
7) *Planning Commission to consider if open space areas proposed as recreation space are acceptable.*
8) *Easements shall be granted to the Township for portions of the pathways that are on development property.*

LIGHTING & NOISE

Lighting Requirements

Section 5.18.G provides site lighting requirements, which are reviewed on the final site plan. Sheet LS-14provides general details and locations for site amenities.

Decorative poles and lights are shown at each road entrance with details included on Sheet LS-11. Building and bollard lighting is provided around the clubhouse. A photometric plan is provided and meets footcandle standards. The Township has the ability to require lighting where it deems it is necessary for safety and security.

Noise Requirements

We note no proposed site activity that would exceed noise levels when measured at lot lines.

Items to be Addressed: *None*

SIGNAGE

Proposed monument signage is shown in detail on Sheets LS-11, 12, and 13. No signage information was provided for the single family detached site. Locations for monument signage are at the Highland Road (M-59) main entrance, the secondary entrance off Hill Road and at the corner of the Highland Road (M-59) and Hill Road intersection. Signs are reviewed and permitted administratively by the Township however applications may be presented to the Planning Commission for review. Per Section 5.9.I, the development is eligible for two (2) monument signs at development entrances. Sign square footage shall not exceed thirty (30) sqft or be more than six (6) feet tall. We note the plaza sign will require a variance as it exceeds the maximum monument sign count allowable. The Applicant should provide lettering dimensions to determine if further variances will be necessary per sign size allowances.

Sheet C-13 provides general details and dimensions of site signage including parking, traffic, emergency vehicle, no lawnmowing zone and pedestrian crossing signs. Sheet C-3.1 and 3.2 provide proposed locations of site signage.

Items to be Addressed: *Applications for site signage will need to conform to the requirements in Section 5.9. or variances will be required from the Zoning Board of Appeals.*

ARCHITECTURE & LAYOUT

Architectural information required at final site plan review includes the types of facing materials to be used on structures.

The site plan provides both elevations and floor plans for all multi-family housing units as well as the clubhouse. Architectural information was provided for the single family detached portion of the project however no elevation of exterior construction materials was provided. A material board for the single family homes should be provided to the Planning Commission at final site plan review. We recommend that exterior construction materials and coverage should be similar to that of the attached units.

Sheet CH-6 shows the primary materials used for the clubhouse elevations will be stone and brick with horizontal vinyl siding as an accent material. Sheets 4-A and 4-B provide elevations for two (2) story twelve (12) unit buildings. Exterior materials proposed for these units are brick, horizontal siding, and shake siding. Sheets A103-106 indicate the same materials for the single story attached units highlighting a consistency amongst exterior designs and materials across the development. We note that on all residential unit buildings, the predominant side and rear exterior construction materials are horizontal siding and brick.

Sheet LS-13 provides the location of proposed amenities within the development. Fountains are to be located in the detention pond in the northcentral portion of the site as well as in the southeastern pond adjacent to the Highland Road (M-59) and Hill Road intersection. A pool is proposed in the rear yard of the clubhouse. Non-motorized amenities include decorative benches, trash and pet waste receptacles, dog walk areas and bicycle racks.

We note that no exterior construction sample materials were included in the final site plan. These materials will need to be available for the Planning Commission upon final site plan review.

Final site plan requires applicants to provide information regarding the proposed use of heavy equipment as well as the potential above or below ground storage of hazardous materials. We note that a portion of the clubhouse is dedicated to maintenance operations which is common for apartment complexes. While no information has been provided about onsite machinery or equipment, we anticipate onsite vehicles, we do not anticipate the occurrence of larger equipment being used on a regular basis. Should that change, the Applicant will need to receive prior approval from the Township.

Items to be Addressed:

1) *Exterior construction material board for both attached and detached units will be required for Planning Commission review.*
2) *We recommend that exterior construction materials and coverage for detached units should be similar to that of the attached units.*

SINGLE FAMILY CONDOMINIUM

As stated earlier in this report, the single-family condominium portion of the development was granted preliminary site plan approval October 18th, 2022 for drawings dated May 10th, 2022 and revised

September 29th, 2022. We note that no changes have been proposed to the layout or unit count for this portion of the development in the final site plan.

Design standards for condominium developments are outlined in Section 6.1 of the zoning ordinance. Below is a review of those standards relating to the single family detached site condominium portion of the development.

Streets

All internal roads are to be private. A separate application to the Township requesting the roads be private shall be required. Street designs appear compliant however the distance of each road should be added to the plan. We defer to Township Engineering regarding technical aspects of the proposed streets.

Blocks

Blocks, streets, and pedestrian designs conform to requirements.

Easements

We defer to Engineering relating to the placement of utility easements. The applicant has stated all pathways located within the developments property line will have access easement rights granted to the Township.

Condominium Lots

Lot sizes were approved in during the preliminary site plan review. Per the standard lot design proposed for the PD designation, the proposed lots meet condominium requirements.

Public Dedications

The site is not offering any public amenities such as parks or schools.

Trees and Natural Features

Sheet LS-10 provides landscaping detail for the single family detached condo site. Wetland preservation areas are shown predominantly in the northwest and southeast corner of the site. Portions south of the development footprint are indicated for preservation as well. Greenbelts are required where conflicting land uses abut each other or along major roads. The only portion of the site abutting commercial use is in the southeast corner adjacent to the Meijer development. Both lots contain mature woodlands that serve as a current visual buffer between the two sites.

The greenbelt along Hill Road is proposed to be 460 feet long of the total 1,625 foot frontage span. The Applicant is requesting to remove approximately 1,165 feet from greenbelt calculation in return for retaining the existing vegetation and natural features.

Condominium Documents

A draft master deed shall be provided during final site plan review

Items to be Addressed:

1) *Road Distances should be added to the final site plan.*
2) *Planning Commission to consider waiving screening between Meijer lot and single family condominium portion of development per existing natural woodlands that serve as a visual screen.*
3) *Planning Commission to consider waiver to remove approximately one thousand one hundred sixty five (1,165) feet from the west greenbelt along Hill Road calculation of the detached single family housing condominium in return for retaining the existing woodlands and natural features.*

SUMMARY

The final site plan is substantially complete. We recommend the site plan be placed on the Planning Commissions agenda for review. All waivers / modifications / determinations necessary from the Planning Commission for the final site plan to be approved are listed below. Potential conditions to final site plan approval are provided as well.

Waivers / Modifications / Determinations

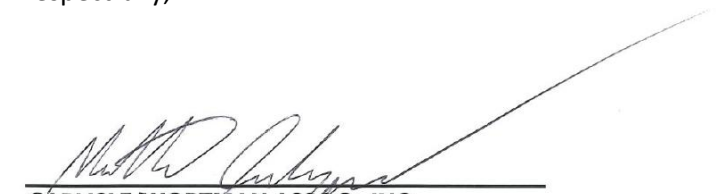
1) *Waiver from northern buffer and screening requirements in return to retain existing woodlands and natural features as the means for providing buffering and screening from the northern residential district.*
2) *Waiver to remove approximately three-hundred sixty-seven (367) feet from the east greenbelt calculation in return for retaining the existing woodlands and natural features.*
3) *Waiver to remove approximately four-hundred eighteen (418) feet from the west greenbelt calculation in return for retaining the existing woodlands and natural features.*
4) *Waiver to reduce required west greenbelt shrub count from three-hundred ninety-five (395) shrubs to two-hundred ninety-seven (297) shrubs.*
5) *Waiver to allow one thousand twenty seven (1,027) interior trees and four thousand four hundred ninety two (4,492) interior shrubs.*
6) *Waiver from screening between Meijer lot and single family condominium portion of development per existing natural woodlands that serve as a visual screen.*
7) *Waiver to remove approximately one thousand one hundred sixty five (1,165) feet from the west greenbelt along Hill Road calculation of the detached single family housing condominium in return for retaining the existing woodlands and natural features.*
8) *Planning Commission to consider if open space areas proposed as recreation space are acceptable.*

Potential Conditions

1) *Any cited concerns from Township Engineering are addressed.*
2) *Any cited concerns from Township Public Safety are addressed.*
3) *Draft development agreement is required at final site plan review.*

4) *Provide updated wetland identification report if determined necessary by EGLE*
5) *Obtain EGLE wetland permit.*
6) *Entryway landscaping planting and counts should be included in table form and added to Sheet LS-8 for both entrances.*
7) *Easements shall be granted to the Township for portions of the pathways that are on development property.*
8) *Road lengths for the single family condominium development should be added to the final site plan.*
9) *Exterior construction material board for both attached and detached units will be required for Planning Commission review.*
10) *(Optional) We recommend that exterior construction materials and coverage for detached units should be similar to that of the attached units.*

Respectfully,



CARLISLE/WORTMAN ASSOC., INC.
Matteo Passalacqua
Community Planner

Fire Department
Charter Township of White Lake

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

Site / Construction Plan Review

To: Sean O'Neil, Planning Department Director

Date: 10-20-2025

Project: Avalon

Job #: 2021-0084

Date on Plans: 09-30-2025

The Fire Department has the following comments with regards to the Final site plan for the project known as The Avalon:

1. Multifamily phase.
    a. **All proposed street names shall be submitted for approval:**
    Pending Comment from previous reviews -
    Avoid the following:
    - Name changes at jogs and curves.
    - Duplicate names.
    - Names that could be mispronounced or are difficult to pronounce.
    - Names that are spelled or pronounced close to an existing street/road name.
    Reference the Township map for guidance.
2. Until the street names have been identified, and approved, building addressing cannot be assigned.
3. Submit a current apparatus turn radius profile based on a 40' truck.
4. Courtesy Comment – Fire protection plans shall be submitted to the Building Department; this includes the Fire Department Connection (FDC) detail. The Fire Department reserves the right to make adjustments to the FDC locations during the construction plan review. All buildings requiring an FDC shall also require a "RED Rotating Flow Indication Beacon" mounted on the exterior of the wall surface, above the FDC, at minimum 10' from finished grade.

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.

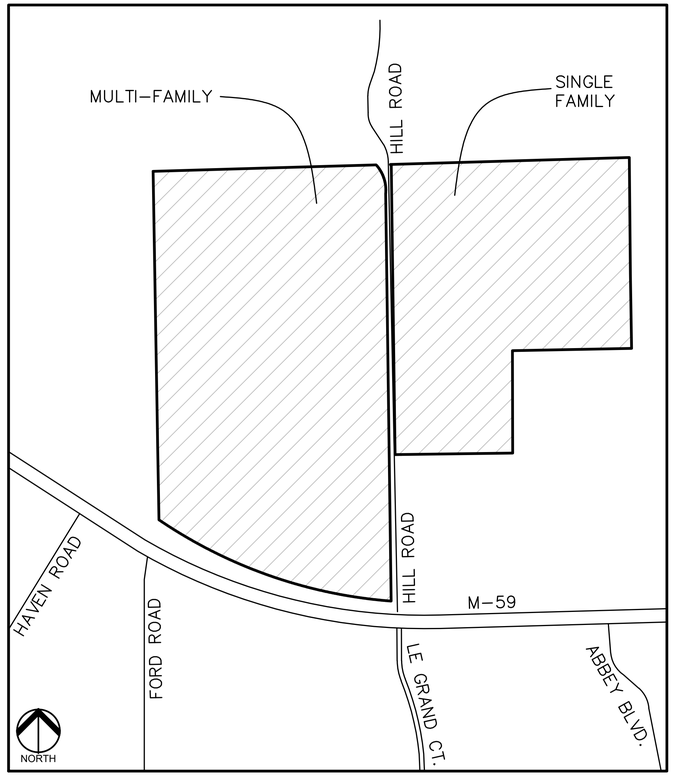
FINAL SITE PLAN

THE AVALON - PUD
AVALON APARTMENT HOMES & RESIDENCE AT AVALON

M-59 AND HILL ROAD

WHITE LAKE TOWNSHIP, OAKLAND COUNTY, MICHIGAN

PERMIT / APPROVAL SUMMARY			
DATE SUBMITTED	DATE APPROVED	PERMIT / APPROVAL	NOTES
7/3/2024		TWP FINAL SITE PLAN APPROVAL	
		TWP ENGINEERING APPROVAL	
		EGLE ACT 399 PERMIT	
		EGLE PART 41 CONSTRUCTION PERMIT	
		EGLE PART 301/303	
		RCOC R.O.W.	PRELIM REVIEW AND DISCUSSION
		OCWRC STORMWATER	
		OCWRC SESC	
		MDOT R.O.W.	PRELIM REVIEW AND DISCUSSION



LOCATION MAP
SCALE: 1" = 400'

DESIGN TEAM

OWNER/APPLICANT/DEVELOPER

WHITE LAKE HILL, LLC
31550 NORTHWESTERN HWY
FARMINGTON HILLS, MI 48334
CONTACT: DON CUCCO
PHONE: 248.687.9290
EMAIL: DCUCCO@MSHAPIROREALESTATE.COM

CIVIL ENGINEER

PEA GROUP
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ARCHITECT

ALEXANDER V . BOGAERTS + ASSOCIATES, P.C.
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PEA GROUP

INDEX OF DRAWINGS - AVALON APARTMENT HOMES	
NUMBER	TITLE
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C-1.2	TOPOGRAPHIC SURVEY - NORTH
C-1.3	TOPOGRAPHIC SURVEY - EAST
~~C-2.1~~	~~DEMOLITION PLAN - SOUTH~~
~~C-2.2~~	~~DEMOLITION PLAN - NORTH~~
~~C-2.3~~	~~DEMOLITION PLAN - EAST~~
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~~C-4.2~~	~~SOUTH WELBERY ROAD PLAN & PROFILE 11+00 - 20+00~~
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~~C-4.6~~	~~NORTH TAYLOR STREET PLAN & PROFILE 0+00 - 4+50~~
~~C-4.7~~	~~NORTH TAYLOR STREET PLAN & PROFILE 4+50 - 14+00~~
~~C-4.8~~	~~SOUTH TAYLOR STREET PLAN & PROFILE 14+00 - 23+00~~
~~C-4.9~~	~~WEST TAYLOR STREET PLAN & PROFILE 23+00 - 29+50~~
~~C-4.10~~	~~BARRETT WAY PLAN & PROFILE 0+00 - 6+50~~
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C-5.2	GRADING PLAN - 2
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C-6.5	SOIL EROSION CONTROL PLAN - 5
C-6.6	SOIL EROSION CONTROL PLAN - 6
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~~C-8.4~~	~~SANITARY SEWER PLAN & PROFILE - K TO H~~
~~C-8.5~~	~~SANITARY SEWER PLAN & PROFILE - STUB TO K~~
~~C-8.6~~	~~SANITARY SEWER PLAN & PROFILE - P TO C~~
~~C-8.7~~	~~SANITARY SEWER PLAN & PROFILE - T TO P~~
~~C-8.8~~	~~SANITARY SEWER PLAN & PROFILE - O2 TO V~~
~~C-8.9~~	~~SANITARY SEWER PLAN & PROFILE - K2 TO O~~
~~C-8.10~~	~~SANITARY SEWER PLAN & PROFILE - N TO F2~~
~~C-8.11~~	~~SANITARY SEWER PLAN & PROFILE - D3 TO F2~~
~~C-8.12~~	~~SANITARY SEWER PLAN & PROFILE - O2 TO J~~
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~~C-8.14~~	~~SANITARY SEWER PLAN & PROFILE - W2 TO Q2~~
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~~C-9.7~~	~~WATER MAIN PLAN & PROFILE - ROAD 1 17+00 TO 28+50~~
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~~C-10.2~~	~~STORM SEWER PLAN~~
~~C-10.3~~	~~STORM SEWER PLAN~~
~~C-10.4~~	~~STORM SEWER PLAN~~
~~C-10.5~~	~~STORM SEWER PROFILES~~
~~C-10.6~~	~~STORM SEWER PROFILES~~
~~C-10.7~~	~~STORM SEWER PROFILES~~
~~C-10.8~~	~~STORM SEWER PROFILES~~
~~C-10.9~~	~~STORM SEWER PROFILES~~
~~C-10.10~~	~~STORM SEWER PROFILES~~
~~C-10.11~~	~~STORM SEWER PROFILES~~
~~C-10.12~~	~~STORM SEWER PROFILES~~
~~C-10.13~~	~~STORM SEWER PROFILES~~
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1 OF 2	SANITARY SEWER DETAILS AND NOTES
2 OF 2	SANITARY SEWER DETAILS AND NOTES
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1 OF 1	STORM SEWER STANDARD DETAILS
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LS-3	LANDSCAPE PLANTING DETAIL
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A-104	BUILDING ELEVATIONS - SINGLE STORY RANCH BUILDING
A-105	BUILDING ELEVATIONS - SINGLE STORY RANCH BUILDING
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3 OF 3	SINGLE FAMILY HOME FLOOR PLANS

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C-3.33	DIMENSION AND PAVING PLAN - EAST
~~C-4.30~~	~~MORRIS BOULEVARD PLAN & PROFILE 0+00 - 3+90~~
~~C-4.31~~	~~HUNT DRIVE PLAN & PROFILE 0+00 - 10+00~~
~~C-4.32~~	~~HUNT DRIVE PLAN & PROFILE 10+00 - 13+75~~
~~C-4.33~~	~~McKEE COURT PLAN & PROFILE 13+75 - 23+00~~
~~C-4.34~~	~~McKEE COURT PLAN & PROFILE 23+00 - 31+50~~
C-5.31	GRADING PLAN - SOUTH
C-5.32	GRADING PLAN - WEST
C-5.33	GRADING PLAN - EAST
C-6.31	SOIL EROSION CONTROL PLAN - SOUTH
C-6.32	SOIL EROSION CONTROL PLAN - WEST
C-6.33	SOIL EROSION CONTROL PLAN - EAST
C-7.31	UTILITY PLAN - SOUTH
C-7.32	UTILITY PLAN - WEST
C-7.33	UTILITY PLAN - EAST
~~C-8.31~~	~~SANITARY SEWER PLAN & PROFILE - HUNT DRIVE - G TO O~~
~~C-8.32~~	~~SANITARY SEWER PLAN & PROFILE - HUNT DRIVE - O TO K~~
~~C-8.33~~	~~SANITARY SEWER PLAN & PROFILE - McKEE WAY - A TO E~~
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~~C-8.35~~	~~SANITARY SEWER PLAN & PROFILE - McKEE COURT - I TO J~~
~~C-9.30~~	~~WATER MAIN PLAN & PROFILE - MORRIS BOULEVARD~~
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~~C-9.32~~	~~WATER MAIN PLAN & PROFILE - HUNT DRIVE - 10+00 - 13+75~~
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~~C-9.35~~	~~WATER MAIN PLAN & PROFILE - McKEE COURT TO SCHOOL~~
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~~C-10.33~~	~~STORM SEWER PLAN - EAST~~
~~C-11.30~~	~~DRAINAGE PLAN~~
C-11.31	DESIGN CALCULATIONS
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C-12.33	OVERALL EXISTING DRAINAGE AREAS
C-13.31	DETAILS
~~C-14.30~~	~~OPEN SPACE PLAN~~
C-15.30	SAFETY PLAN

STATE OF MICHIGAN
BRETT STURGEON HOLLANDSWORTH
LICENSED PROFESSIONAL ENGINEER
License No. 6201064940

REVISIONS	
DESCRIPTION	DATE
ORIGINAL ISSUE DATE - DRAFT	12/4/2023
MEIJER REVISIONS	2/12/2024
ISSUED FOR FINAL SITE PLAN SUBMITTAL	7/3/2024
ISSUED FOR FINAL SITE PLAN SUBMITTAL	5/8/2025
ISSUED FOR FINAL SITE PLAN SUBMITTAL	9/30/2025



LEGEND:

- EX. OH. ELEC. POLE & GUY WIRE
- EX. U.G. CABLE TV & PEDESTAL
- EX. U.G. COMMUNICATION LINE, PEDESTAL & MANHOLE
- EX. U.G. ELEC.MANHOLE, METER & HANDHOLE
- EX. GAS LINE
- EX. GAS VALVE & GAS LINE MARKER
- EX. TRANSFORMER & IRRIGATION VALVE
- EX. WATER MAIN
- EX. HYDRANT, GATE VALVE & POST INDICATOR VALVE
- EX. WATER VALVE BOX & SHUTOFF
- EX. SANITARY SEWER
- EX. SANITARY CLEANOUT & MANHOLE
- EX. COMBINED SEWER MANHOLE
- EX. STORM SEWER
- EX. CLEANOUT & MANHOLE
- EX. SQUARE, ROUND & BEEHIVE CATCH BASIN
- EX. YARD DRAIN & ROOF DRAIN
- EX. UNIDENTIFIED STRUCTURE
- EX. MAILBOX, SIGN & LIGHTPOLE
- EX. FENCE
- EX. GUARD RAIL
- EX. DEC. TREE, CONIFEROUS TREE & SHRUB
- EX. TREE TAG, & TREE LINE
- EX. SPOT ELEVATION
- EX. CONTOUR
- EX. WETLAND
- IRON FOUND / SET
- NAIL FOUND / NAIL & CAP SET
- BRASS PLUG SET
- MONUMENT FOUND / SET
- SECTION CORNER FOUND
- R M C RECORDED / MEASURED / CALCULATED

LEGAL DESCRIPTION
(Per Hubbell, Roth & Clark, Inc.)

PARCEL ID 12-20-101-003

That part of the West ½ of the Northwest ¼ of Section 20, Township 3 North, Range 8 East, White Lake Township, Oakland County, Michigan, lying northerly of Highland Road (M-59), more particularly described as: BEGINNING at the Northwest corner of said section; thence South 89 degrees 39 minutes 41 seconds East 1331.52 feet along the north section line; thence South 01 degrees 14 minutes 20 seconds West 2443.61 feet to the northerly right of way line of Highland Road (M-59); thence along said right of way and a curve to the right 1423.36 feet, said curve having a radius of 2664.79 feet, a central angle of 30 degrees 36 minutes 14 seconds, and a chord bearing North 69 degrees 03 minutes 39 seconds West 1406.50 feet to the west section line; thence North 01 degrees 01 minutes 40 seconds East 1948.57 feet along said section line to the POINT OF BEGINNING. Said property contains 68.96 acres, more or less.

PARCEL ID 12-20-126-006

Part of the Northwest ¼ of Section 20, Township 3 North, Range 8 East, White Lake Township, Oakland County, Michigan, described as: BEGINNING at the North ¼ corner of said section; thence South 01 degrees 26 minutes 55 seconds West 1067.66 feet along the North-South ¼ line of said section; thence North 89 degrees 02 minutes 22 seconds West 665.95 feet; thence South 01 degrees 22 minutes 34 seconds West 575.58 feet; thence North 88 degrees 42 minutes 12 seconds West 660.13 feet; thence North 01 degrees 14 minutes 20 seconds East 1624.88 feet to the north line of said section; thence South 89 degrees 39 minutes 41 seconds East 1331.52 feet along said north line to the POINT OF BEGINNING. Said property contains 41.06 acres, more or less.

BENCHMARK:
ARROW ON A HYDRANT LOCATED AT THE ENTRANCE OF A MULTI-USE COMMERCIAL BUILDING, APPROX. 60' EAST FROM THE CENTERLINE OF HILL ROAD AND APPROX. 230' NORTH FROM THE CENTERLINE OF THE WEST BOUND LANE OF M-59/HIGHLAND ROAD.
ELEV. = 974.59 NAVD88 DATUM (USGS)

FLOODPLAIN NOTE:
BY GRAPHICAL PLOTTING, SITE IS WITHIN ZONE 'X', AREA DETERMINED TO BE OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOODPLAIN PER FLOOD INSURANCE RATE MAP NUMBER 26125C0318F, EFFECTIVE SEPTEMBER 29, 2006.

PEA GROUP
t: 844.813.2949
www.peagroup.com

STATE OF MICHIGAN
BRETT STURGEON HOLLANDSWORTH
LICENSED PROFESSIONAL ENGINEER
License No. 6201064949

NORTH

0 75 150 300
SCALE: 1" = 150'

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

CAUTION!!
THE LOCATIONS AND ELEVATIONS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THIS DRAWING ARE ONLY APPROXIMATE. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL BE EXCLUSIVELY RESPONSIBLE FOR DETERMINING THE LOCATIONS AND ELEVATIONS PRIOR TO THE START OF CONSTRUCTION.

KEY MAP

CLIENT
WHITE LAKE HILL, LLC
31550 NORTHWESTERN HWY
FARMINGTON HILLS, MI 48334

PROJECT TITLE
THE AVALON - MULTI FAMILY
HIGHLAND ROAD
WHITE LAKE TWP, MI

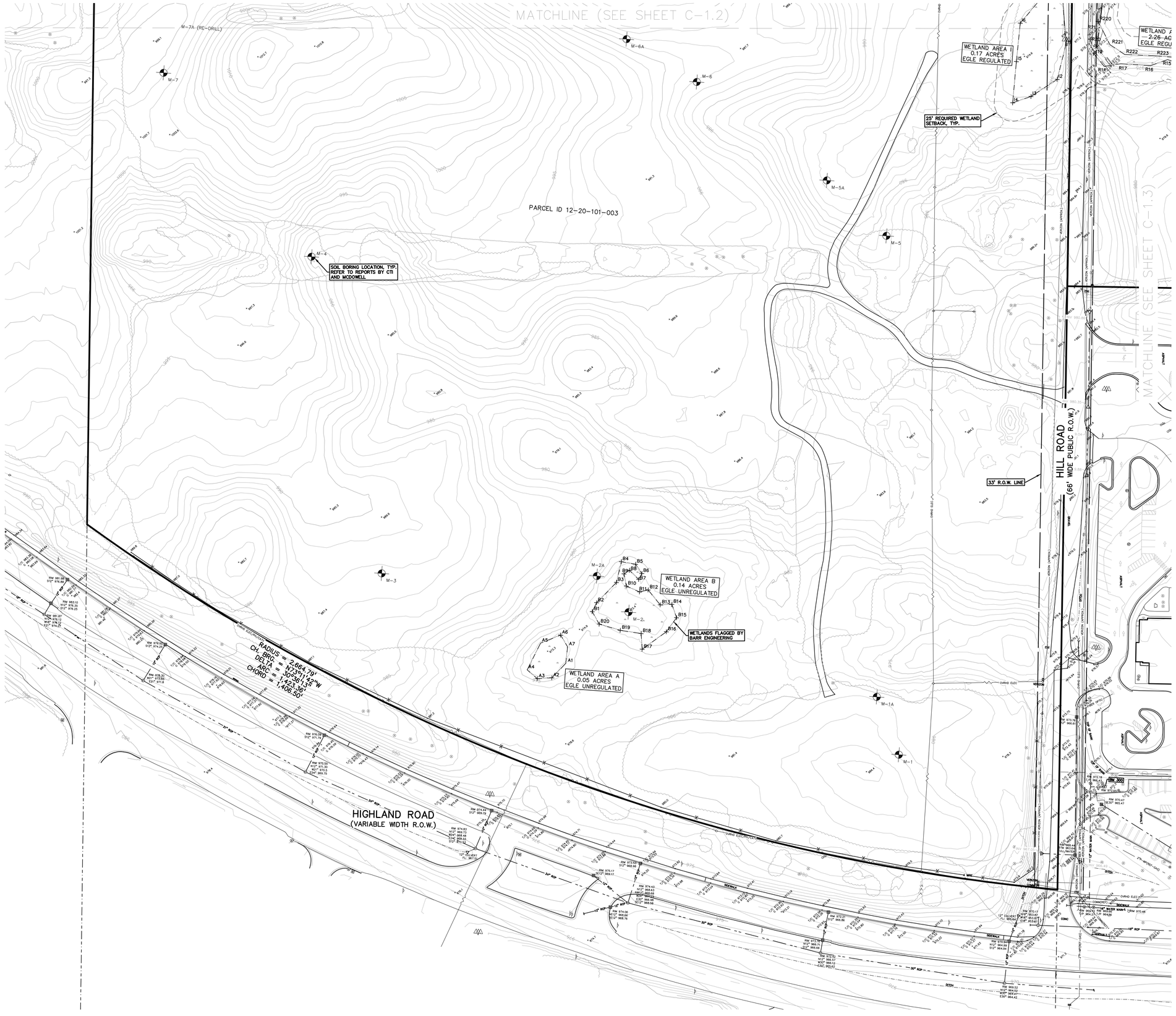
REVISIONS	
DRAFT	2/19/24
ISSUED FOR OWNER REVIEW	4/24/24
FINAL SITE PLAN REVIEW	7/3/24
FINAL SITE PLAN REVIEW	5/8/25
FINAL SITE PLAN REVIEW	9/30/25

ORIGINAL ISSUE DATE:
DECEMBER 4, 2023

DRAWING TITLE
OVERALL TOPOGRAPHIC SURVEY

PEA JOB NO.	2021-0084
P.M.	JC
DN.	BSH/JEB
DES.	BSH

DRAWING NUMBER:
C-1.0



LEGEND:

- EX. OH, ELEC, POLE & GUY WIRE
- EX. U.G. CABLE TV & PEDESTAL
- EX. U.G. COMMUNICATION LINE, PEDESTAL & MANHOLE
- EX. U.G. ELEC.MANHOLE, METER & HANDHOLE
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- EX. COMBINED SEWER MANHOLE
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- EX. YARD DRAIN & ROOF DRAIN
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- EX. MAILBOX, SIGN & LIGHTPOLE
- EX. FENCE
- EX. GUARD RAIL
- EX. DEC. TREE, CONIFEROUS TREE & SHRUB
- EX. TREE TAG, & TREE LINE
- EX. SPOT ELEVATION
- EX. CONTOUR
- EX. WETLAND

- IRON FOUND / SET
- NAIL FOUND / NAIL & CAP SET
- BRASS PLUG SET
- MONUMENT FOUND / SET
- SECTION CORNER FOUND
- R M C — RECORDED / MEASURED / CALCULATED

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STATE OF MICHIGAN
BRETT STURGEON HOLLANDSWORTH
License No. 6201064949
LICENSED PROFESSIONAL ENGINEER

NORTH

0 30 60 120
SCALE: 1" = 60'

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

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KEY MAP



CLIENT

WHITE LAKE HILL, LLC
31550 NORTHWESTERN HWY
FARMINGTON HILLS, MI 48334

PROJECT TITLE

THE AVALON - MULTI FAMILY
HIGHLAND ROAD
WHITE LAKE TWP, MI

REVISIONS	
DRAFT	2/19/24
ISSUED FOR OWNER REVIEW	4/24/24
FINAL SITE PLAN REVIEW	7/3/24
FINAL SITE PLAN REVIEW	5/8/25
FINAL SITE PLAN REVIEW	9/30/25

ORIGINAL ISSUE DATE:
DECEMBER 4, 2023

DRAWING TITLE

TOPOGRAPHIC SURVEY - SOUTH

PEA JOB NO.	2021-0084
P.M.	JC
DN.	BSH/JEB
DES.	BSH

DRAWING NUMBER:

C-1.1

N86°12'16"E 1331.52'

S03°10'26"E 1948.57'

PARCEL ID 12-20-126-006

HILL ROAD (66' WIDE PUBLIC R.O.W.)

33' R.O.W. LINE

WETLAND AREA H
0.10 ACRES
EGLE REGULATED

WETLAND AREA G
0.10 ACRES
EGLE UNREGULATED

WETLANDS FLAGGED BY BARR ENGINEERING

WETLAND AREA N
0.08 ACRES
EGLE REGULATED

WETLAND AREA Q
0.04 ACRES
EGLE UNREGULATED

WETLAND AREA P
0.01 ACRES
EGLE UNREGULATED

SOIL BORING LOCATION, TYP.
REFER TO REPORTS BY CTI AND MCDOWELL

WETLAND AREA O
0.06 ACRES
EGLE REGULATED

WETLAND AREA F
0.01 ACRES
EGLE UNREGULATED

WETLAND AREA D
2.29 ACRES
EGLE UNREGULATED

UPLAND ISLAND AREA E
0.07 ACRES
EGLE UNREGULATED

WETLAND AREA J
0.53 ACRES
EGLE REGULATED

WETLAND AREA L
0.08 ACRES
EGLE UNREGULATED

WETLAND AREA K
0.04 ACRES
EGLE REGULATED

WETLAND AREA C
0.11 ACRES
EGLE UNREGULATED

WETLAND AREA D
2.29 ACRES
EGLE UNREGULATED

WETLAND AREA M
0.06 ACRES
EGLE UNREGULATED

25' REQUIRED WETLAND SETBACK, TYP.

WETLAND AREA J
0.53 ACRES
EGLE REGULATED

WETLAND AREA R
2.26 ACRES
EGLE REGULATED

WATER

M-7A (RE-DRILL)

MATCHLINE (SEE SHEET C-1.1)

LEGEND:

- EX. OH, ELEC, POLE & GUY WIRE
- EX. U.G. CABLE TV & PEDESTAL
- EX. U.G. COMMUNICATION LINE, PEDESTAL & MANHOLE
- EX. U.G. ELEC.MANHOLE, METER & HANDHOLE
- EX. GAS LINE
- EX. GAS VALVE & GAS LINE MARKER
- EX. TRANSFORMER & IRRIGATION VALVE
- EX. WATER MAIN
- EX. HYDRANT, GATE VALVE & POST INDICATOR VALVE
- EX. WATER VALVE BOX & SHUTOFF
- EX. SANITARY SEWER
- EX. SANITARY CLEANOUT & MANHOLE
- EX. COMBINED SEWER MANHOLE
- EX. STORM SEWER
- EX. CLEANOUT & MANHOLE
- EX. SQUARE, ROUND & BEEHIVE CATCH BASIN
- EX. YARD DRAIN & ROOF DRAIN
- EX. UNIDENTIFIED STRUCTURE
- EX. MAILBOX, SIGN & LIGHTPOLE
- EX. FENCE
- EX. GUARD RAIL
- EX. DEC. TREE, CONIFEROUS TREE & SHRUB
- EX. TREE TAG, & TREE LINE
- EX. SPOT ELEVATION
- EX. CONTOUR
- EX. WETLAND

- IRON FOUND / SET
- NAIL FOUND / NAIL & CAP SET
- BRASS PLUG SET
- MONUMENT FOUND / SET
- SECTION CORNER FOUND
- R M C RECORDED / MEASURED / CALCULATED

NORTH

0 30 60 120

SCALE: 1" = 60'

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

CAUTION!!
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KEY MAP



PEA GROUP
t: 844.813.2949
www.peagroup.com

STATE OF MICHIGAN
BRETT STURGEON HOLLANDSWORTH
LICENSED PROFESSIONAL ENGINEER
License No. 6201064949

CLIENT
WHITE LAKE HILL, LLC
31550 NORTHWESTERN HWY
FARMINGTON HILLS, MI 48334

PROJECT TITLE
THE AVALON - MULTI FAMILY
HIGHLAND ROAD
WHITE LAKE TWP, MI

REVISIONS	
DRAFT	2/19/24
ISSUED FOR OWNER REVIEW	4/24/24
FINAL SITE PLAN REVIEW	7/3/24
FINAL SITE PLAN REVIEW	5/8/25
FINAL SITE PLAN REVIEW	9/30/25

ORIGINAL ISSUE DATE:
DECEMBER 4, 2023

DRAWING TITLE
TOPOGRAPHIC SURVEY - NORTH

PEA JOB NO.	2021-0084
P.M.	JC
DN.	BSH/JEB
DES.	BSH

DRAWING NUMBER:
C-1.2



LEGEND:

- EX. OH, ELEC, POLE & GUY WIRE
- EX. U.G. CABLE TV & PEDESTAL
- EX. U.G. COMMUNICATION LINE, PEDESTAL & MANHOLE
- EX. U.G. ELEC.MANHOLE, METER & HANDHOLE
- EX. GAS LINE
- EX. GAS VALVE & GAS LINE MARKER
- EX. TRANSFORMER & IRRIGATION VALVE
- EX. WATER MAIN
- EX. HYDRANT, GATE VALVE & POST INDICATOR VALVE
- EX. WATER VALVE BOX & SHUTOFF
- EX. SANITARY SEWER
- EX. SANITARY CLEANOUT & MANHOLE
- EX. COMBINED SEWER MANHOLE
- EX. STORM SEWER
- EX. CLEANOUT & MANHOLE
- EX. SQUARE, ROUND & BEEHIVE CATCH BASIN
- EX. YARD DRAIN & ROOF DRAIN
- EX. UNIDENTIFIED STRUCTURE
- EX. MAILBOX, SIGN & LIGHTPOLE
- EX. FENCE
- EX. GUARD RAIL
- EX. DEC. TREE, CONIFEROUS TREE & SHRUB
- EX. TREE TAG, & TREE LINE
- EX. SPOT ELEVATION
- EX. CONTOUR
- EX. WETLAND

- IRON FOUND / SET
- NAIL FOUND / NAIL & CAP SET
- BRASS PLUG SET
- MONUMENT FOUND / SET
- SECTION CORNER FOUND
- R M C — RECORDED / MEASURED / CALCULATED

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STATE OF MICHIGAN
BRETT STURGEON HOLLANDSWORTH
LICENSED PROFESSIONAL ENGINEER
License No. 6201064949

NORTH

0 20 40 80
SCALE: 1" = 40'

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KEY MAP



CLIENT
WHITE LAKE HILL, LLC
31550 NORTHWESTERN HWY
FARMINGTON HILLS, MI 48334

PROJECT TITLE
THE AVALON - MULTI FAMILY
HIGHLAND ROAD
WHITE LAKE TWP, MI

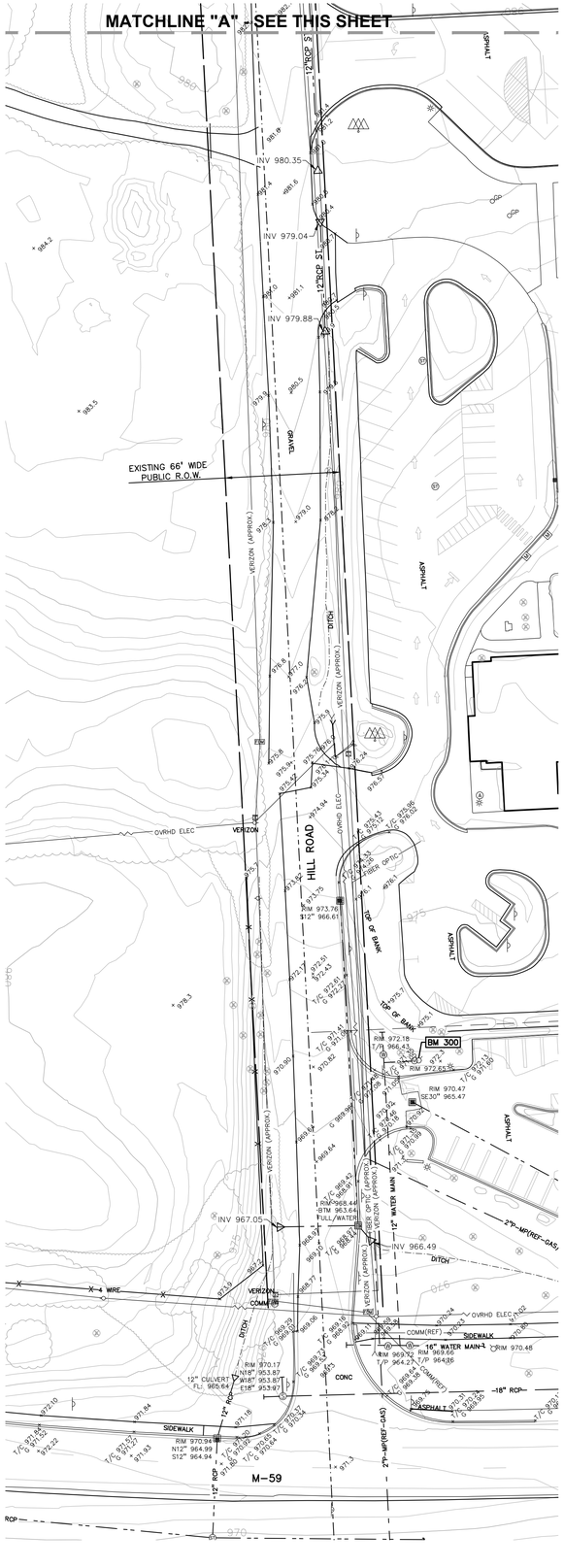
REVISIONS	
DRAFT	2/19/24
ISSUED FOR OWNER REVIEW	4/24/24
FINAL SITE PLAN REVIEW	7/3/24
FINAL SITE PLAN REVIEW	5/8/25
FINAL SITE PLAN REVIEW	9/30/25

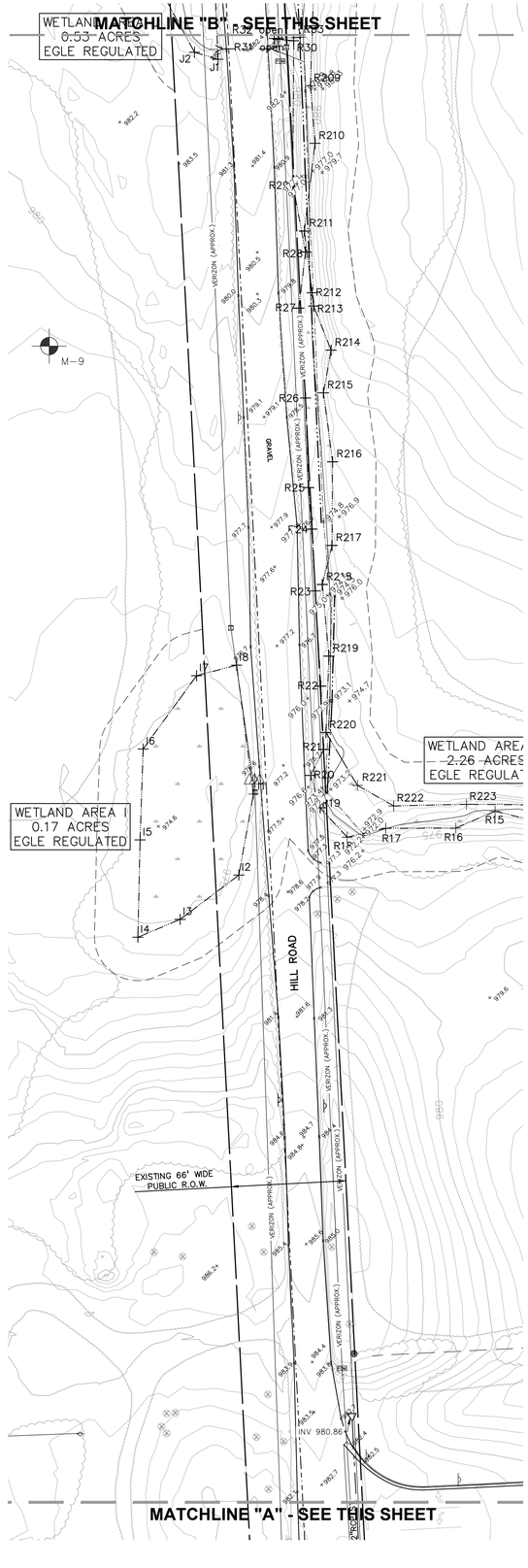
ORIGINAL ISSUE DATE:
DECEMBER 4, 2023

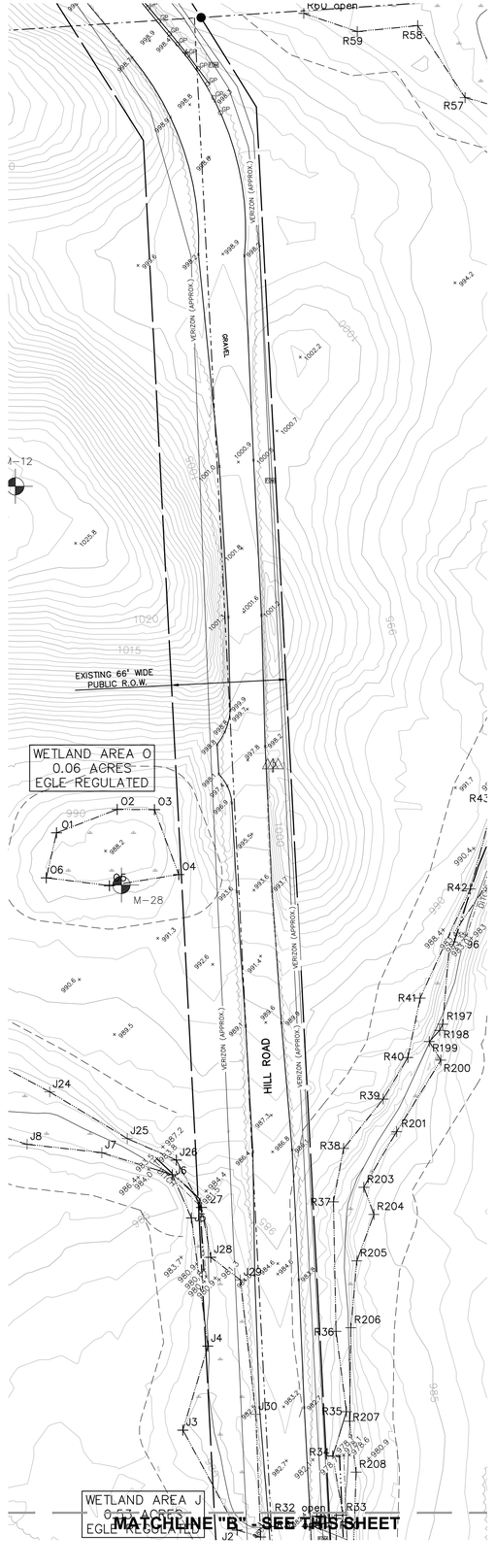
DRAWING TITLE
TOPOGRAPHIC SURVEY - EAST

PEA JOB NO.	2021-0084
P.M.	JC
DN.	BSH/JEB
DES.	BSH

DRAWING NUMBER:
C-1.3







LEGEND:

- EX. OH, ELEC, POLE & GUY WIRE
- EX. U.G. CABLE TV & PEDESTAL
- EX. U.G. COMMUNICATION LINE, PEDESTAL & MANHOLE
- EX. U.G. ELEC,MANHOLE, METER & HANDHOLE
- EX. GAS LINE
- EX. GAS VALVE & GAS LINE MARKER
- EX. TRANSFORMER & IRRIGATION VALVE
- EX. WATER MAIN
- EX. HYDRANT, GATE VALVE & POST INDICATOR VALVE
- EX. WATER VALVE BOX & SHUTOFF
- EX. SANITARY SEWER
- EX. SANITARY CLEANOUT & MANHOLE
- EX. COMBINED SEWER MANHOLE
- EX. STORM SEWER
- EX. CLEANOUT & MANHOLE
- EX. SQUARE, ROUND & BEEHIVE CATCH BASIN
- EX. YARD DRAIN & ROOF DRAIN
- EX. UNIDENTIFIED STRUCTURE
- EX. MAILBOX, SIGN & LIGHTPOLE
- EX. FENCE
- EX. GUARD RAIL
- EX. DEC. TREE, CONIFEROUS TREE & SHRUB
- EX. TREE TAG, & TREE LINE
- EX. SPOT ELEVATION
- EX. CONTOUR
- EX. WETLAND

- IRON FOUND / SET
- NAIL FOUND / NAIL & CAP SET
- BRASS PLUG SET
- MONUMENT FOUND / SET
- SECTION CORNER FOUND
- R M C — RECORDED / MEASURED / CALCULATED

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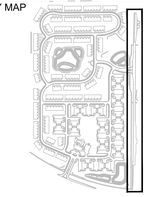
NORTH

0 20 40 80
SCALE: 1" = 40'

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

CAUTION!!
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KEY MAP



CLIENT
WHITE LAKE HILL, LLC
31550 NORTHWESTERN HWY
FARMINGTON HILLS, MI 48334

PROJECT TITLE
THE AVALON - HILL ROAD
HIGHLAND ROAD
WHITE LAKE TWP, MI

REVISIONS	
FINAL SITE PLAN REVIEW	5/8/25
FINAL SITE PLAN REVIEW	9/30/25

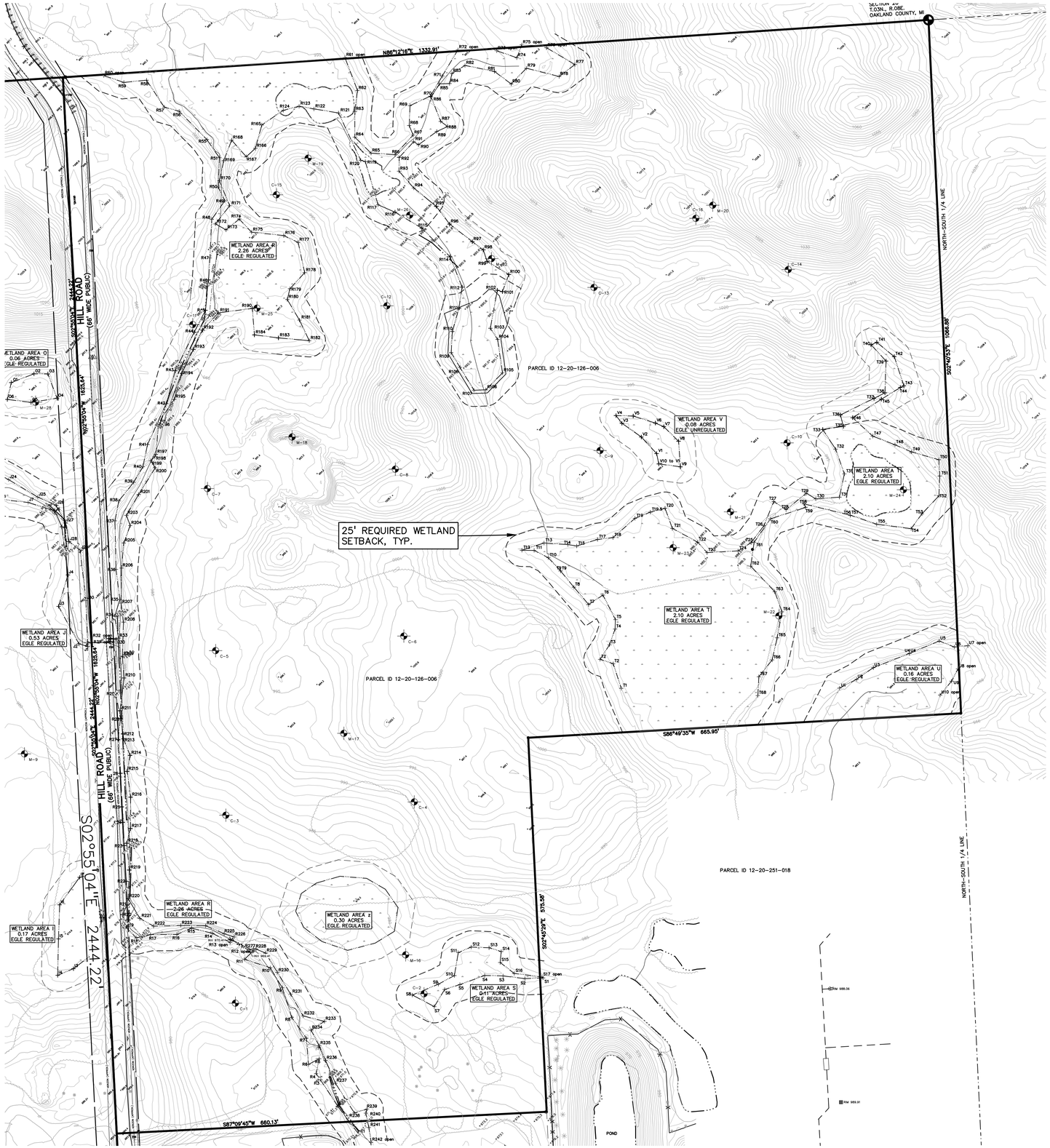
ORIGINAL ISSUE DATE:
MAY 8, 2025

DRAWING TITLE
TOPOGRAPHIC SURVEY

PEA JOB NO.	2021-0084
P.M.	JC
DN.	BSH/JEB
DES.	BSH

DRAWING NUMBER:
C-1.20

S:\PROJECTS\2021\2021-0084 WHITE LAKE MIXED USE\DWG\CONSTRUCTION\HILL ROAD\[C-1.0] TOPO-210084 HILL.dwg



LEGEND:

—OH—ELEC—O—	EX. OH. ELEC, POLE & GUY WIRE
—UG—CATV—	EX. U.G. CABLE TV & PEDESTAL
—UG—COMM—	EX. U.G. COMMUNICATION LINE, PEDESTAL & MANHOLE
—UG—ELEC—	EX. U.G. ELEC.MANHOLE, METER & HANDHOLE
— — — —	EX. GAS LINE
GV GM	EX. GAS VALVE & GAS LINE MARKER
T	EX. TRANSFORMER & IRRIGATION VALVE
— — — —	EX. WATER MAIN
W	EX. HYDRANT, GATE VALVE & POST INDICATOR VALVE
W	EX. WATER VALVE BOX & SHUTOFF
——— ———	EX. SANITARY SEWER
S	EX. SANITARY CLEANOUT & MANHOLE
C	EX. COMBINED SEWER MANHOLE
——— — — ———	EX. STORM SEWER
CO	EX. CLEANOUT & MANHOLE
	EX. SQUARE, ROUND & BEEHIVE CATCH BASIN
D	EX. YARD DRAIN, U.G. ROOF DRAIN & DOWNSPOUT
?	EX. UNIDENTIFIED STRUCTURE
M	EX. MAILBOX, SIGN, LIGHTPOLE & GUARD POST
—x—x—x—	EX. FENCE
	EX. GUARD RAIL
	EX. DEC, TREE, CONIFEROUS TREE & SHRUB
4"724	EX. TREE TAG, & TREE LINE
+696.97	EX. SPOT ELEVATION
670	EX. CONTOUR
	EX. WETLAND
	IRON FOUND / SET
	NAIL FOUND / NAIL & CAP SET
	BRASS PLUG SET
	MONUMENT FOUND / SET
	SECTION CORNER FOUND
R M C	RECORDED / MEASURED / CALCULATED
GNSS	GLOBAL NAVIGATION SATELLITE SYSTEM

REFERENCE DRAWINGS:

WATER MAIN	XXXXXXXXXX
SANITARY SEWER	XXXXXXXXXX
STORM SEWER	XXXXXXXXXX
COMBINED SEWER	XXXXXXXXXX
ELECTRIC	XXXXXXXXXX
TELEPHONE	XXXXXXXXXX
GAS	XXXXXXXXXX
PETROLEUM	XXXXXXXXXX
CATV	XXXXXXXXXX
FLOOD PLAIN	XXXXXXXXXX
OTHER	XXXXXXXXXX
OTHER	XXXXXXXXXX
OTHER	XXXXXXXXXX

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NORTH

0 20 40 80
SCALE: 1" = 40'

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KEY MAP



CLIENT
WHITE LAKE HILL, LLC
31550 NORTHWESTERN HWY
FARMINGTON HILLS, MI 48334

PROJECT TITLE
THE AVALON - SINGLE FAMILY
HIGHLAND ROAD
WHITE LAKE TWP, MI

REVISIONS	
FINAL SITE PLAN REVIEW	5/8/25
FINAL SITE PLAN REVIEW	9/30/25

ORIGINAL ISSUE DATE:
MAY 8, 2025

DRAWING TITLE
TOPOGRAPHIC SURVEY - OVERALL

PEA JOB NO.	2021-0084
P.M.	JC
DN.	BSH/JEB
DES.	BSH

DRAWING NUMBER:
C-1.30

S:\PROJECTS\2021\2021-0084 WHITE LAKE MIXED USE\DWG\CONSTRUCTION\1-SINGLE FAMILY\C-1-0 TOPO-21-0084.dwg

MATCH LINE – SEE SHEET C-1.32

MATCH LINE – SEE SHEET C-1.31

PARCEL ID 12-20-126-006

HILL ROAD
(66' WIDE PUBLIC)

S02°55'04"E 2444.22'

N02°55'04"W 1625.64'

S02°55'04"E 2444.22'

S02°45'29"E 575.58'

S87°09'45"W 660.13'

25' REQUIRED WETLAND SETBACK, TYP.

WETLAND AREA R
2.26 ACRES
EGLE REGULATED

WETLAND AREA z
0.30 ACRES
EGLE REGULATED

WETLAND AREA S
0.11 ACRES
EGLE REGULATED

AREA J
ACRES
GULATED

R13 open

R12 open

S17 open

C-1 C-2 C-3 C-4 C-5 C-6

M-16 M-17

VERIZON (APPROX.)

LEGEND:

- EX. OH. ELEC, POLE & GUY WIRE
- EX. U.G. CABLE TV & PEDESTAL
- EX. U.G. COMMUNICATION LINE, PEDESTAL & MANHOLE
- EX. U.G. ELEC.MANHOLE, METER & HANDHOLE
- EX. GAS LINE
- EX. GAS VALVE & GAS LINE MARKER
- EX. TRANSFORMER & IRRIGATION VALVE
- EX. WATER MAIN
- EX. HYDRANT, GATE VALVE & POST INDICATOR VALVE
- EX. WATER VALVE BOX & SHUTOFF
- EX. SANITARY SEWER
- EX. SANITARY CLEANOUT & MANHOLE
- EX. COMBINED SEWER MANHOLE
- EX. STORM SEWER
- EX. CLEANOUT & MANHOLE
- EX. SQUARE, ROUND & BEEHIVE CATCH BASIN
- EX. YARD DRAIN, U.G. ROOF DRAIN & DOWNSPOUT
- EX. UNIDENTIFIED STRUCTURE
- EX. MAILBOX, SIGN, LIGHTPOLE & GUARD POST
- EX. FENCE
- EX. GUARD RAIL
- EX. DEC. TREE, CONIFEROUS TREE & SHRUB
- EX. TREE TAG, & TREE LINE
- EX. SPOT ELEVATION
- EX. CONTOUR
- EX. WETLAND

- IRON FOUND / SET
- NAIL FOUND / NAIL & CAP SET
- BRASS PLUG SET
- MONUMENT FOUND / SET
- SECTION CORNER FOUND
- R M C — RECORDED / MEASURED / CALCULATED
- GNSS — GLOBAL NAVIGATION SATELLITE SYSTEM

REFERENCE DRAWINGS:

WATER MAIN	XXXXXXXXXX
SANITARY SEWER	XXXXXXXXXX
STORM SEWER	XXXXXXXXXX
COMBINED SEWER	XXXXXXXXXX
ELECTRIC	XXXXXXXXXX
TELEPHONE	XXXXXXXXXX
GAS	XXXXXXXXXX
PETROLEUM	XXXXXXXXXX
CATV	XXXXXXXXXX
FLOOD PLAIN	XXXXXXXXXX
OTHER	XXXXXXXXXX
OTHER	XXXXXXXXXX
OTHER	XXXXXXXXXX

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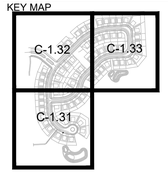
NORTH

0 20 40 80
SCALE: 1" = 40'

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KEY MAP



CLIENT

WHITE LAKE HILL, LLC
31550 NORTHWESTERN HWY
FARMINGTON HILLS, MI 48334

PROJECT TITLE

THE AVALON - SINGLE FAMILY
HIGHLAND ROAD
WHITE LAKE TWP, MI

REVISIONS	
FINAL SITE PLAN REVIEW	5/8/25
FINAL SITE PLAN REVIEW	9/30/25

ORIGINAL ISSUE DATE:
MAY 8, 2025

DRAWING TITLE

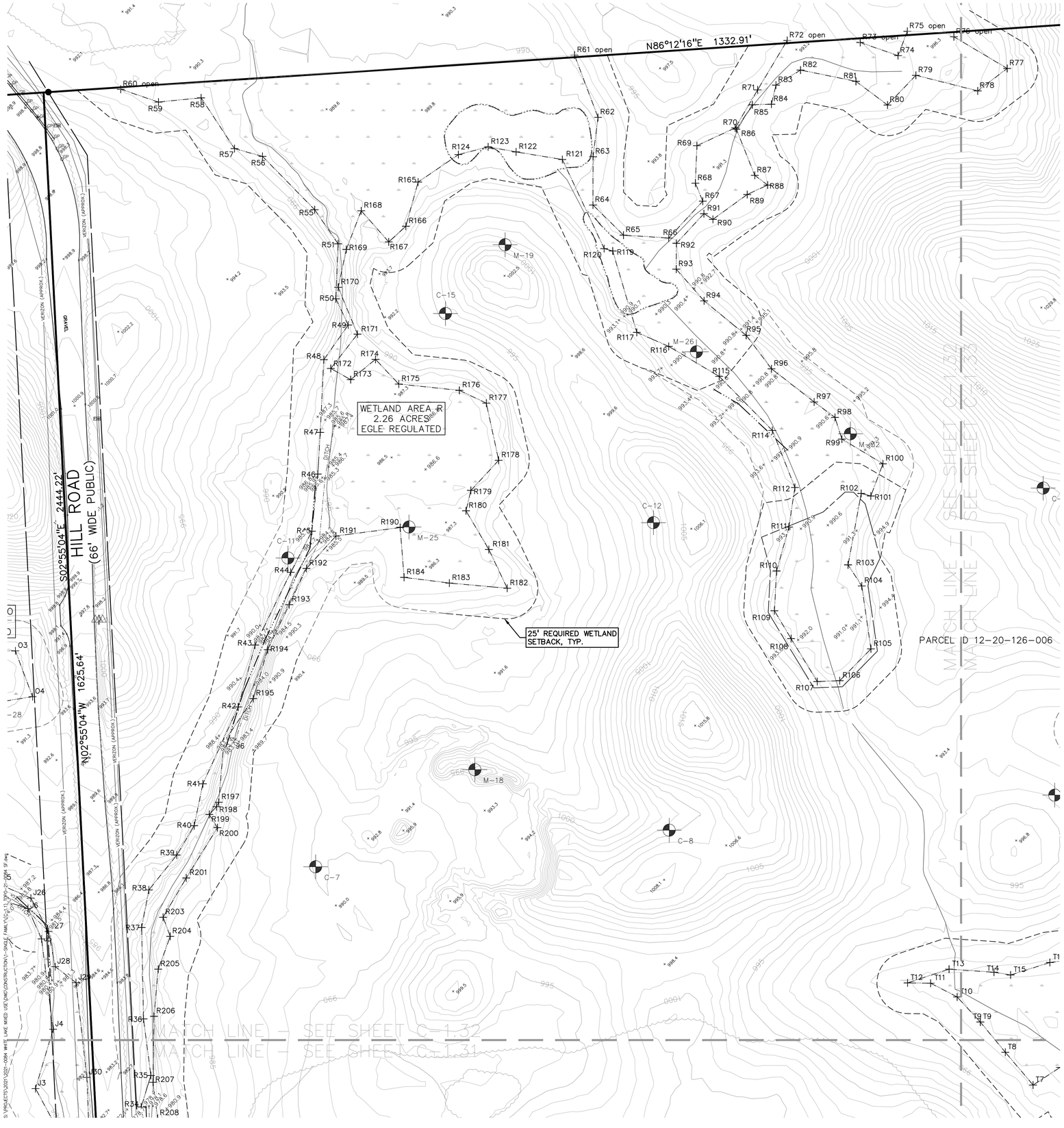
TOPOGRAPHIC SURVEY - SOUTH

PEA JOB NO.	2021-0084
P.M.	JC
DN.	BSH/JEB
DES.	BSH

DRAWING NUMBER:

C-1.31

S:\PROJECTS\2021\2021-0084 WHITE LAKE MIXED USE\DWG\CONSTRUCTION\1-SINGLE FAMILY\C-1.1 TOPO-21-0084 SF.dwg



LEGEND:

–OH–ELEC–W–	EX. OH, ELEC, POLE & GUY WIRE
–UG–CATV–TV–	EX. U.G. CABLE TV & PEDESTAL
–UG–COMM–	EX. U.G. COMMUNICATION LINE, PEDESTAL & MANHOLE
–UG–ELEC–	EX. U.G. ELEC,MANHOLE, METER & HANDHOLE
	EX. GAS LINE
GAS	EX. GAS VALVE & GAS LINE MARKER
T	EX. TRANSFORMER & IRRIGATION VALVE
	EX. WATER MAIN
	EX. HYDRANT, GATE VALVE & POST INDICATOR VALVE
	EX. WATER VALVE BOX & SHUTOFF
	EX. SANITARY SEWER
	EX. SANITARY CLEANOUT & MANHOLE
	EX. COMBINED SEWER MANHOLE
	EX. STORM SEWER
	EX. CLEANOUT & MANHOLE
	EX. SQUARE, ROUND & BEEHIVE CATCH BASIN
	EX. YARD DRAIN, U.G. ROOF DRAIN & DOWNSPOUT
	EX. UNIDENTIFIED STRUCTURE
U GAS	EX. MAILBOX, SIGN, LIGHTPOLE & GUARD POST
X	EX. FENCE
	EX. GUARD RAIL
	EX. DEC. TREE, CONIFEROUS TREE & SHRUB
+[724]	EX. TREE TAG, & TREE LINE
+998.91	EX. SPOT ELEVATION
970	EX. CONTOUR
	EX. WETLAND
	IRON FOUND / SET
	NAIL FOUND / NAIL & CAP SET
	BRASS PLUG SET
	MONUMENT FOUND / SET
	SECTION CORNER FOUND
R M C	RECORDED / MEASURED / CALCULATED
GNSS	GLOBAL NAVIGATION SATELLITE SYSTEM

REFERENCE DRAWINGS:

WATER MAIN	XXXXXXXXXXX
SANITARY SEWER	XXXXXXXXXXX
STORM SEWER	XXXXXXXXXXX
COMBINED SEWER	XXXXXXXXXXX
ELECTRIC	XXXXXXXXXXX
TELEPHONE	XXXXXXXXXXX
GAS	XXXXXXXXXXX
PETROLEUM	XXXXXXXXXXX
CATV	XXXXXXXXXXX
FLOOD PLAIN	XXXXXXXXXXX
OTHER	XXXXXXXXXXX
OTHER	XXXXXXXXXXX
OTHER	XXXXXXXXXXX

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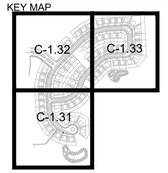
NORTH

0 20 40 80
SCALE: 1" = 40'

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KEY MAP



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PROJECT TITLE
THE AVALON - SINGLE FAMILY
HIGHLAND ROAD
WHITE LAKE TWP, MI

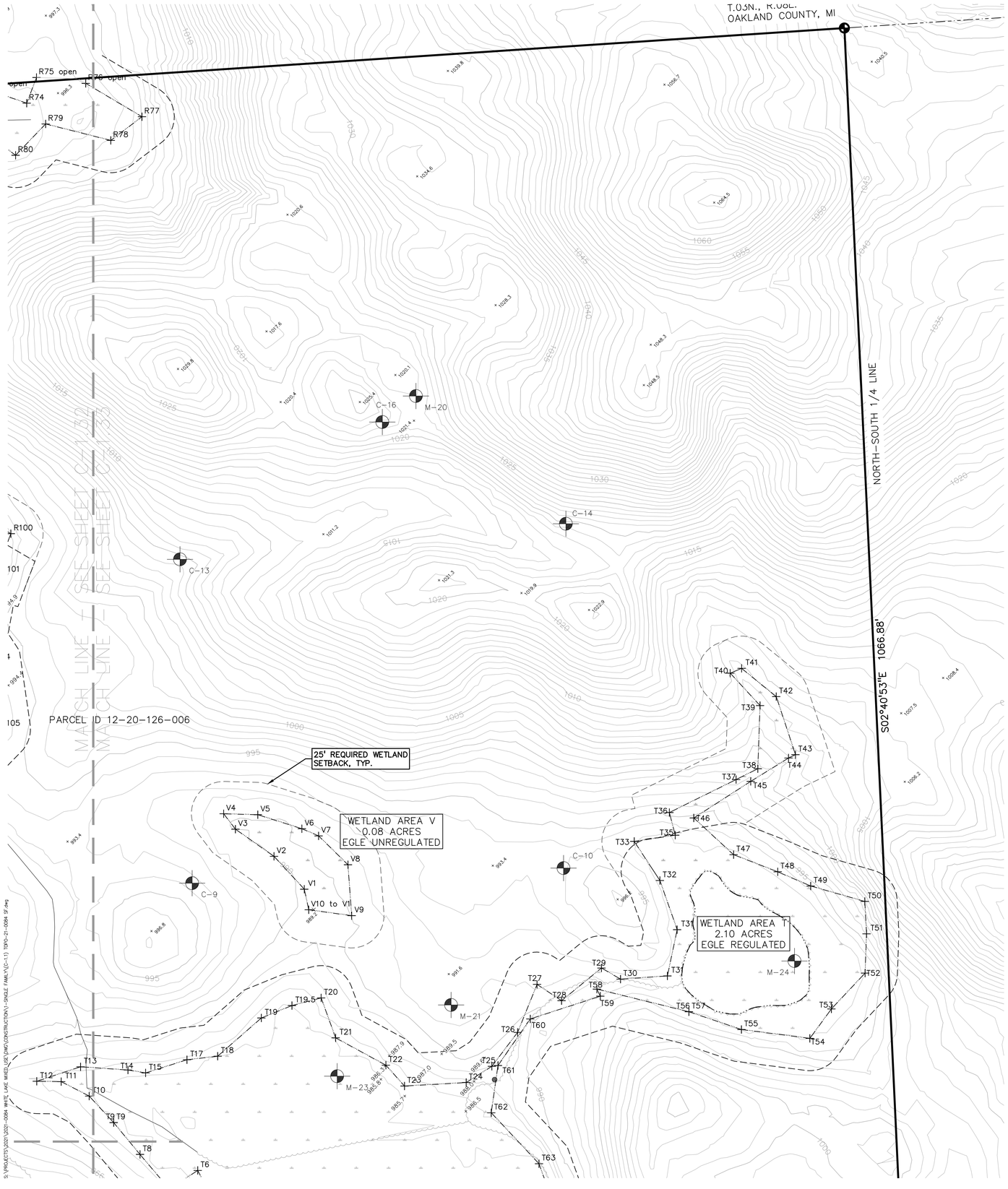
REVISIONS	
FINAL SITE PLAN REVIEW	5/8/25
FINAL SITE PLAN REVIEW	9/30/25

ORIGINAL ISSUE DATE:
MAY 8, 2025

DRAWING TITLE
TOPOGRAPHIC SURVEY - WEST

PEA JOB NO.	2021-0084
P.M.	JC
DN.	BSH/JEB
DES.	BSH

DRAWING NUMBER:
C-1.32



LEGEND:

–OH–ELEC–○–	EX. OH, ELEC, POLE & GUY WIRE
–UG–CATV–TV–	EX. U.G. CABLE TV & PEDESTAL
–UG–COMM–⊠–T–	EX. U.G. COMMUNICATION LINE, PEDESTAL & MANHOLE
–UG–ELEC–E–E–	EX. U.G. ELEC,MANHOLE, METER & HANDHOLE
– – – – –	EX. GAS LINE
GV GAS	EX. GAS VALVE & GAS LINE MARKER
T T	EX. TRANSFORMER & IRRIGATION VALVE
– – – – –	EX. WATER MAIN
	EX. HYDRANT, GATE VALVE & POST INDICATOR VALVE
W	EX. WATER VALVE BOX & SHUTOFF
	EX. SANITARY SEWER
S	EX. SANITARY CLEANOUT & MANHOLE
	EX. COMBINED SEWER MANHOLE
	EX. STORM SEWER
	EX. CLEANOUT & MANHOLE
	EX. SQUARE, ROUND & BEEHIVE CATCH BASIN
YD	EX. YARD DRAIN, U.G. ROOF DRAIN & DOWNSPOUT
	EX. UNIDENTIFIED STRUCTURE
M GAS	EX. MAILBOX, SIGN, LIGHTPOLE & GUARD POST
X	EX. FENCE
	EX. GUARD RAIL
	EX. DEC. TREE, CONIFEROUS TREE & SHRUB
(724)	EX. TREE TAG, & TREE LINE
998.7	EX. SPOT ELEVATION
670	EX. CONTOUR
	EX. WETLAND
	IRON FOUND / SET
	NAIL FOUND / NAIL & CAP SET
	BRASS PLUG SET
	MONUMENT FOUND / SET
	SECTION CORNER FOUND
R M C	RECORDED / MEASURED / CALCULATED
GNSS	GLOBAL NAVIGATION SATELLITE SYSTEM

REFERENCE DRAWINGS:

WATER MAIN	XXXXXXXXXX
SANITARY SEWER	XXXXXXXXXX
STORM SEWER	XXXXXXXXXX
COMBINED SEWER	XXXXXXXXXX
ELECTRIC	XXXXXXXXXX
TELEPHONE	XXXXXXXXXX
GAS	XXXXXXXXXX
PETROLEUM	XXXXXXXXXX
CATV	XXXXXXXXXX
FLOOD PLAIN	XXXXXXXXXX
OTHER	XXXXXXXXXX
OTHER	XXXXXXXXXX
OTHER	XXXXXXXXXX

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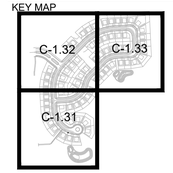
NORTH

0 20 40 80
SCALE: 1" = 40'

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

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KEY MAP



CLIENT
WHITE LAKE HILL, LLC
31550 NORTHWESTERN HWY
FARMINGTON HILLS, MI 48334

PROJECT TITLE
THE AVALON - SINGLE FAMILY
HIGHLAND ROAD
WHITE LAKE TWP, MI

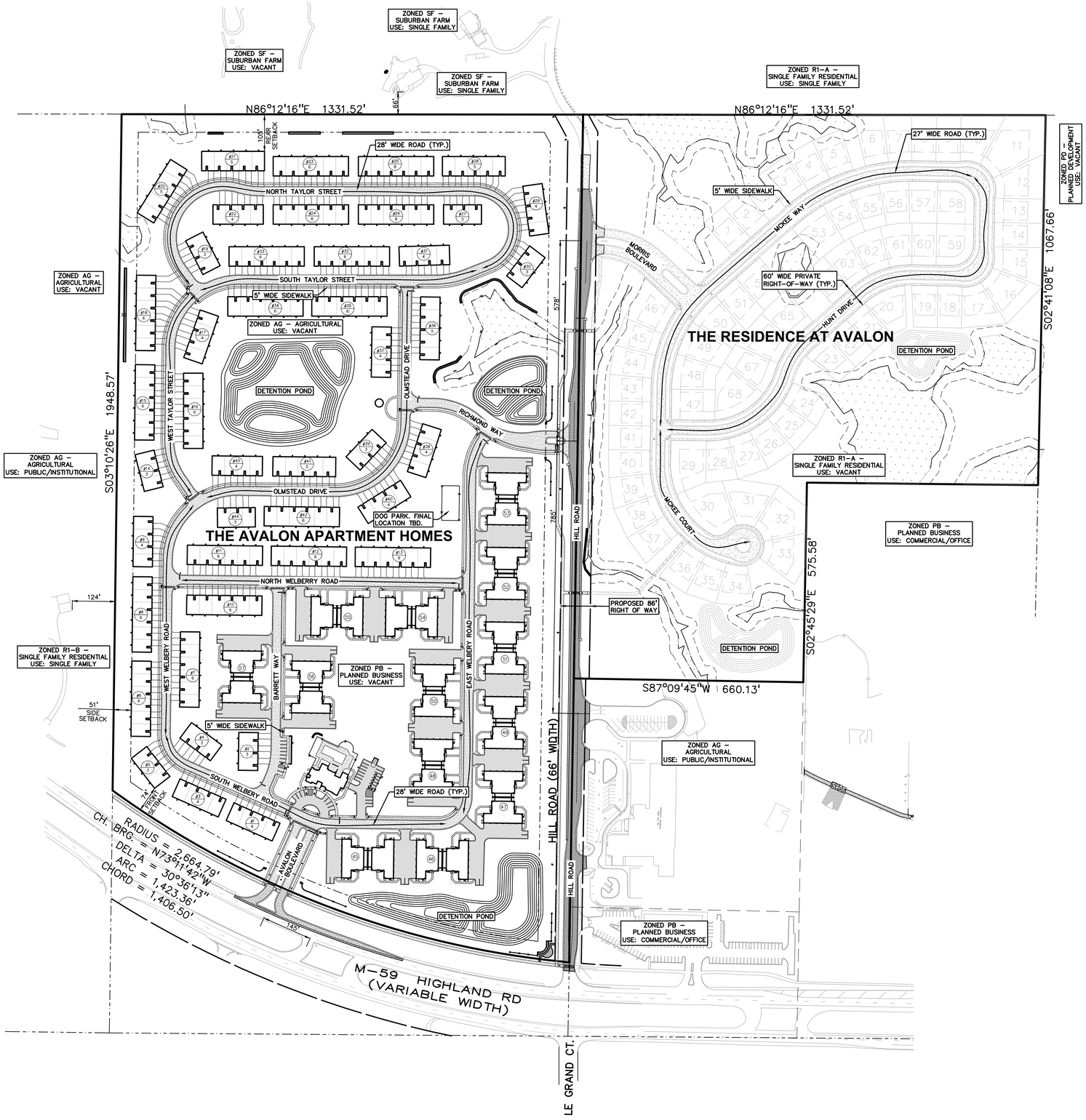
REVISIONS	
FINAL SITE PLAN REVIEW	5/8/25
FINAL SITE PLAN REVIEW	9/30/25

ORIGINAL ISSUE DATE:
MAY 8, 2025

DRAWING TITLE
TOPOGRAPHIC SURVEY - EAST

PEA JOB NO.	2021-0084
P.M.	JC
DN.	BSH/JEB
DES.	BSH

DRAWING NUMBER:
C-1.33



GENERAL NOTES:

THESE NOTES APPLY TO ALL CONSTRUCTION ACTIVITIES ON THIS PROJECT.

1. ALL DIMENSIONS SHOWN ARE TO BACK OF CURB, FACE OF SIDEWALK, OUTSIDE FACE OF BUILDING, PROPERTY LINE, CENTER OF MANHOLE/CATCH BASIN OR CENTERLINE OF PIPE UNLESS OTHERWISE NOTED.
2. 'NO PARKING–FIRE LANE' SIGNS SHALL BE POSTED ALONG ALL FIRE LANES AT 100 FOOT INTERVALS OR AS DIRECTED BY THE FIRE OFFICIAL.
3. REFER TO NOTES & DETAILS SHEET FOR ON–SITE PAVING DETAILS.
4. REFER TO NOTES & DETAILS SHEET FOR ON–SITE SIDEWALK RAMP DETAILS

TRASH COLLECTION NOTE:

ALL UNITS WILL BE SERVED BY INDIVIDUAL TRASH CARTS PROVIDED BY WASTE COLLECTION COMPANY

LEGEND:

- CONCRETE PAVEMENT (STD DUTY / HEAVY DUTY / R.O.W. ONLY)
- ASPHALT PAVEMENT (STD DUTY / HEAVY DUTY / DEEP STRENGTH)
- GRAVEL
- WETLAND
- CONCRETE CURB AND GUTTER
- REVERSE GUTTER PAN
- SETBACK LINE
- SIGN
- LIGHTPOLE
- FENCE
- GUARD RAIL

MULTI–FAMILY SITE DATA TABLE:

SITE AREA: 68.96 ACRES GROSS
0.64 WETLAND ACRES
65.88 ACRES NET (NO R.O.W. OR REMAINING WETLAND AREA)
24.22 ACRES OPEN SPACE

ZONING: EXISTING: PB, PLANNED BUSINESS
AG, AGRICULTURAL

PROPOSED: PD, PLANNED DEVELOPMENT

PROPOSED USE: 366 MULTI–FAMILY UNITS (FOR LEASE) (5.6 UNITS PER ACRE)

SCHEDULE OF DEVELOPMENT: MULTI–FAMILY SPRING 2026 – SPRING 2029

BUILDING INFORMATION:
MAXIMUM ALLOWABLE BUILDING HEIGHT = 30 FEET (2 STORIES)
PROPOSED MAX BUILDING HEIGHT: MULTI–FAMILY = 25.2 FEET (2 STORIES)

44 SINGLE STORY 3–6 UNIT RANCH BUILDINGS = 210 UNITS
15 2–STORY 12–PLEX BUILDINGS = 156 UNITS

BUILDING FOOTPRINT AREA:
SINGLE STORY RANCH BUILDINGS = 5,898–11,735 SQ.FT.
2–STORY BUILDINGS = 11,981 SQ.FT.
CLUBHOUSE = 6,658 SQ.FT.
TOTAL SF = 575,551 SQ.FT.

BUILDING LOT COVERAGE = 13.2/64.88 = 20.3%

MINIMUM LOT SIZE:
FIRST UNIT = 10,000 SF
52 – 3 BEDROOM UNITS x 4,500 SF = 234,000
314 – 2 BEDROOM UNITS x 4,000 SF = 1,256,000
MINIMUM LOT SIZE REQUIRED = 1,490,000 (34.2 ACRES)

TOTAL LOT SIZE PROVIDED =
68.96 AC. (GROSS) – 0.64 AC. (WETLAND) – 2.44 AC. (R.O.W.) – 4.98 AC. (STORM)
= 60.90 ACRES

SETBACK REQUIREMENTS:	PD:	PROPOSED:
FRONT:	40'	74'
SIDE:	25' (50' TOTAL)	50'
REAR:	105' (APPROVED PD)	105'

SEPARATION REQUIREMENTS SECTION 3.11.G.		
LENGTH	REQUIRED	MIN. PROVIDED
56'	24'	25'
109.08'	34'	51.95'
112'	36'	64'
145.08'	42'	60.66'
150.63'	44'	66.22'
181.08'	50'	N/A
217.08'	56'	58.17'

PARKING CALCULATIONS:

MULTI–FAMILY = 2 PER DWELLING UNIT + 1/4 SPACE PER BEDROOM FOR GUEST PARKING IN COMMON AREAS

TOTAL MULTI–FAMILY GUEST PARKING REQUIRED = 784 BEDROOMS/4 = 196 SPACES

TOTAL REQUIRED PARKING = 928 SPACES

TOTAL PROPOSED PARKING SPACES = 1,173 (732 RESIDENT PARKING IN GARAGE)
(366 GUEST PARKING IN DRIVEWAYS)
(65 GUEST SPACES INC. 3 H/C SPACES)
(10 MAIL SPACES IN 1 H/C SPACE)

TOTAL PARKING SPACES NOT ASSOCIATED WITH INDIVIDUAL UNITS = 75 SPACES
TOTAL REQUIRED ADA SPACES = 51–75 = 3 SPACES
TOTAL ADA SPACES PROVIDED = 4 SPACES WITH 3 VAN SPACE

OPEN SPACE:
MINIMUM OPEN SPACE REQUIRED = 15% OF NET SITE AREA
PROVIDED OPEN SPACE = 24.22/65.88 = 36.8%

WETLANDS:
EGLE WETLAND IMPACT: 0.34 ACRES

SINGLE FAMILY SITE DATA TABLE:

SITE AREA: 41.06 ACRES GROSS
4.48 WETLAND ACRES
35.00 ACRES NET (NO R.O.W. OR WETLAND AREA)
7.68 OPEN SPACE ACRES

ZONING: EXISTING: R1–A, SINGLE FAMILY RESIDENTIAL

PROPOSED: PD, PLANNED DEVELOPMENT

PROPOSED USE: 68 UNIT SINGLE FAMILY HOME CONDOMINIUM (1.9 UNITS PER ACRE)

OPEN SPACE:
MINIMUM OPEN SPACE REQUIRED = 15% OF NET SITE AREA
PROVIDED OPEN SPACE = 7.69/35.00 = 22.0%

WETLANDS:
EGLE WETLAND IMPACT: 0.72 ACRES

DEVELOPMENT NOTES:

1. EGLE COMPLETED A LEVEL 3 WETLAND IDENTIFICATION PROGRAM REPORT ON AUGUST 4, 2022.
2. UPON COMPLETION OF ANY WORK WITHIN THE WETLAND SETBACK, THE AREA SHALL BE RESTORED TO ITS NATIVE VEGETATIVE STATE.
3. A WETLAND SETBACK RESTORATION PLAN AND A WETLAND RESTORATION BOND SHALL BE REQUIRED TO ENSURE PROPER RESTORATION.
4. A SIDEWALK ALONG HILL ROAD SHALL BE CONSTRUCTED AS SHOWN ON THE SITE PLAN. TO LIMIT WETLAND IMPACTS AND REDUCE SIDEWALKS TO "NO WHERE", A CONTRIBUTION TO THE WHITE LAKE SIDEWALK FUND SHALL BE ESTABLISHED.
5. BASE ON A DETAILED ENGINEERING ANALYSIS, THE PROPOSED MAXIMUM ALLOWABLE DISCHARGE RATE FROM THE PROPOSED DEVELOPMENT DOES NOT EXCEED THE EXISTING RUNOFF FOR THE 100–YEAR STORM EVENT. THE PROPOSED CONTRIBUTING FLOW THROUGH THE CULVERT UNDER M–59 IS NOT INCREASED BY THE DEVELOPMENT.
6. THE DEVELOPER SHALL CONSTRUCT A SANITARY SEWER LINE ALONG HILL ROAD TO THE FURTHEST EXTEND POSSIBLE. TO SUPPLEMENT THE SHORTENED LENGTH A CONTRIBUTION TO THE TOWNSHIP SANITARY SEWER FUND SHALL BE MADE. IN ADDITION, A CONSTRUCTION EASEMENT SHALL BE PROVIDED TO THE TOWNSHIP AT THE NORTH END OF THE PROPERTY ALONG HILL ROAD.
7. A SECONDARY WATERMAIN CONNECTION IS TO BE PROVIDED.

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NORTH

0 75 150 300
SCALE: 1" = 150'

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KEY MAP



CLIENT
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31550 NORTHWESTERN HWY
FARMINGTON HILLS, MI 48334

PROJECT TITLE
THE AVALON - MULTI FAMILY
HIGHLAND ROAD
WHITE LAKE TWP, MI

REVISIONS

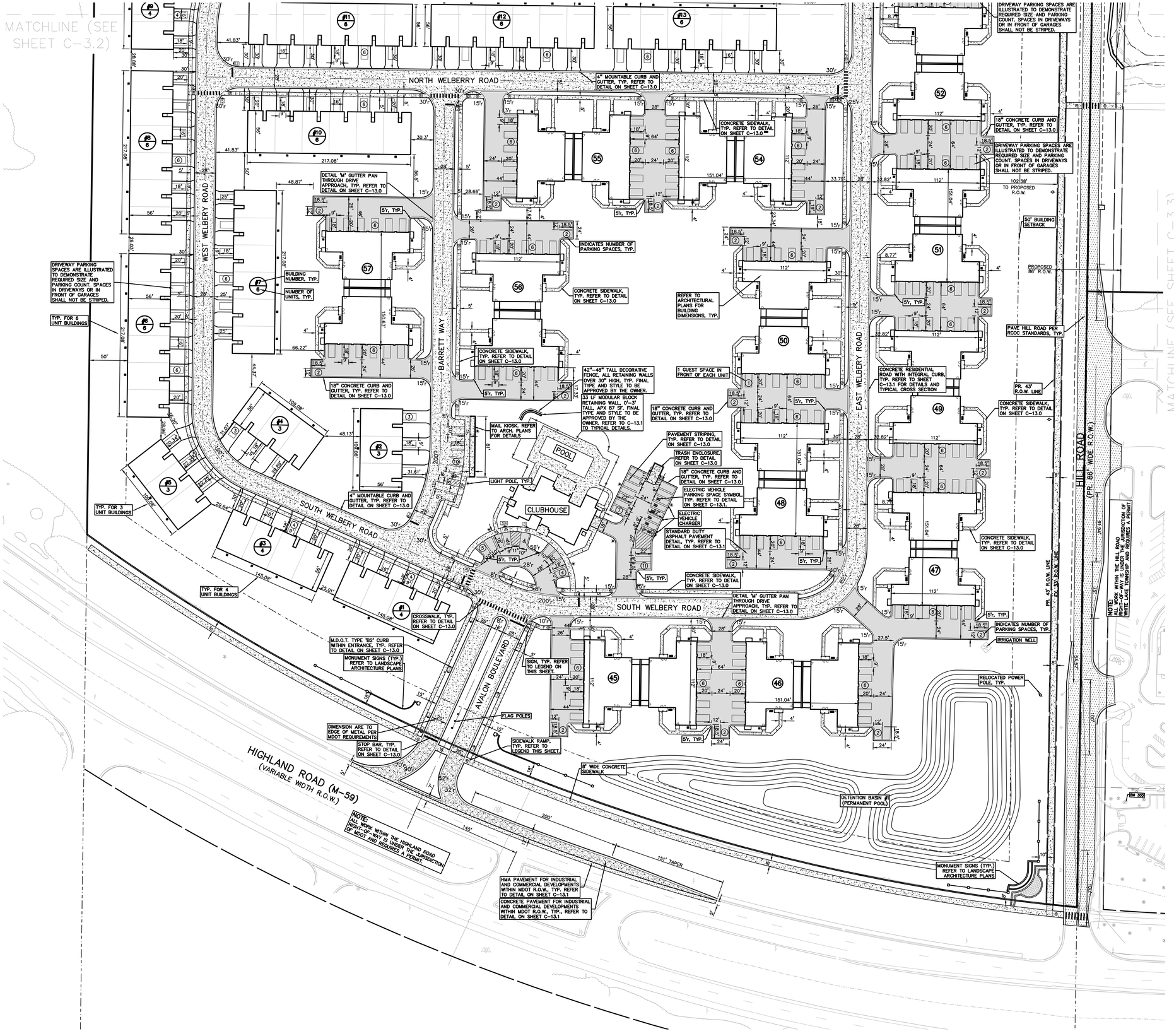
DRAFT	2/19/24
ISSUED FOR OWNER REVIEW	4/24/24
FINAL SITE PLAN REVIEW	7/3/24
FINAL SITE PLAN REVIEW	5/8/25
FINAL SITE PLAN REVIEW	9/30/25

ORIGINAL ISSUE DATE:
DECEMBER 4, 2023

DRAWING TITLE
OVERALL SITE PLAN

PEA JOB NO.	2021-0084
P.M.	JC
DN.	BSH/JEB
DES.	BSH

DRAWING NUMBER:
C-3.0



LEGEND:

- CONCRETE PAVEMENT (STD DUTY / HEAVY DUTY / R.O.W. ONLY)
- ASPHALT PAVEMENT (STD DUTY / HEAVY DUTY / DEEP STRENGTH)
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- WETLAND
- CONCRETE CURB AND GUTTER
- REVERSE GUTTER PAN
- SETBACK LINE
- SIGN
- LIGHTPOLE
- FENCE
- GUARD RAIL

SIGN LEGEND:

'NO PARKING FIRE LANE' SIGN	[1]
'STOP' SIGN	[2]
'BARRIER FREE PARKING' SIGN	[3]
'VAN ACCESSIBLE' SIGN	[4]
'CROSSWALK' SIGN	[5]
'DO NOT ENTER' SIGN	[6]
'SIDEWALK ENDS' SIGN	[7]
'NO PARKING LOADING ZONE' SIGN	[8]

REFER TO DETAIL SHEET FOR SIGN DETAILS

SIDEWALK RAMP LEGEND:

SIDEWALK RAMP 'TYPE R'	(R)
SIDEWALK RAMP 'TYPE F'	(F)
SIDEWALK RAMP 'TYPE P'	(P)
SIDEWALK RAMP 'TYPE C'	(C)
SIDEWALK RAMP 'TYPE D'	(D)
CURB DROP ONLY	(X)

REFER TO LATEST MDOT R-28 STANDARD RAMP AND DETECTABLE WARNING DETAILS

GENERAL NOTES:

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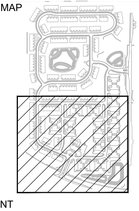
NORTH

0 30 60 120
SCALE: 1" = 60'

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PROJECT TITLE
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HIGHLAND ROAD
WHITE LAKE TWP, MI

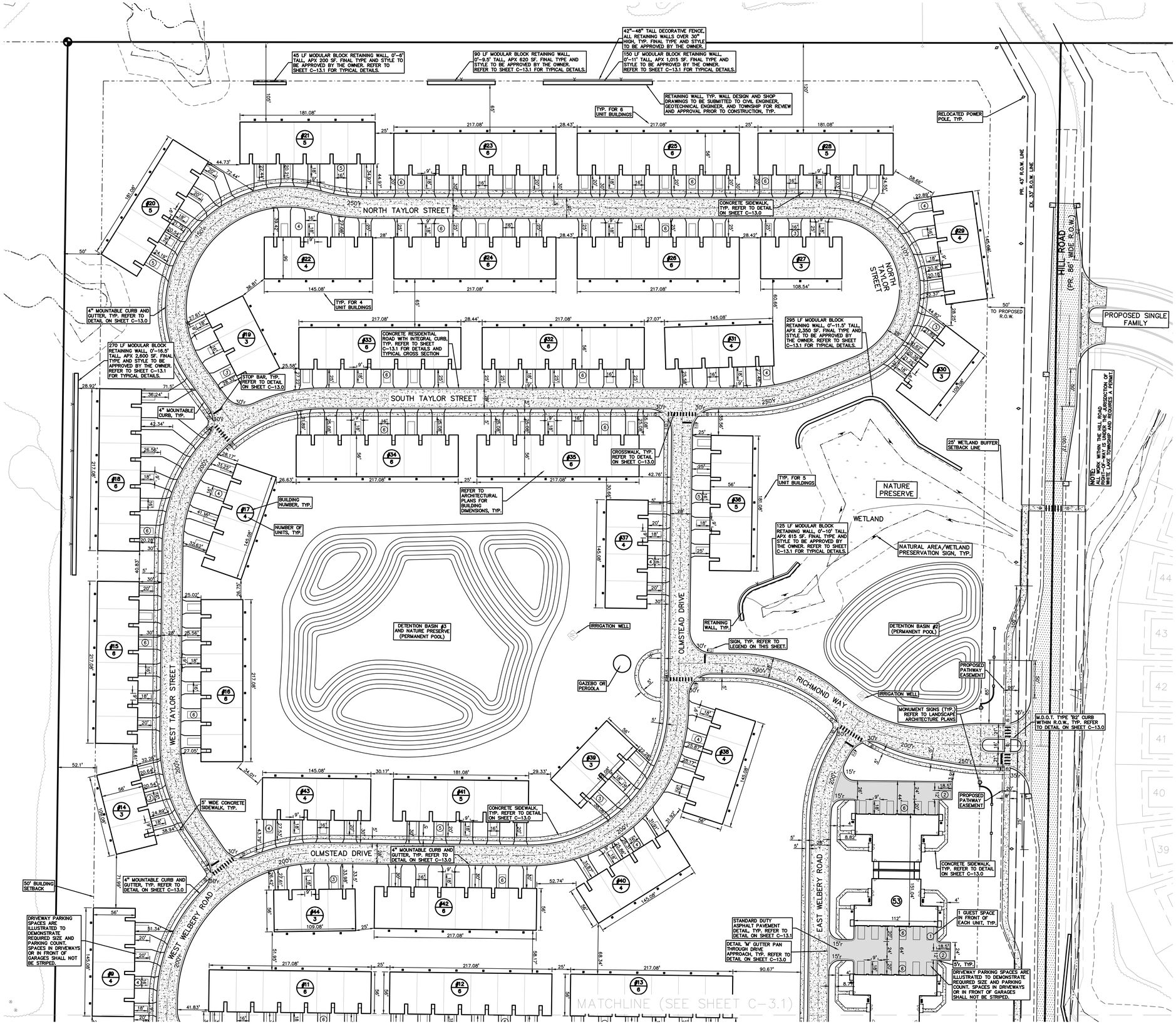
REVISIONS	
DRAFT	2/19/24
ISSUED FOR OWNER REVIEW	4/24/24
FINAL SITE PLAN REVIEW	7/3/24
FINAL SITE PLAN REVIEW	5/8/25
FINAL SITE PLAN REVIEW	9/30/25

ORIGINAL ISSUE DATE:
DECEMBER 4, 2023

DRAWING TITLE
SITE PLAN - SOUTH

PEA JOB NO.	2021-0084
P.M.	JC
DN.	BSH/JEB
DES.	BSH

DRAWING NUMBER:
C-3.1



LEGEND:

- CONCRETE PAVEMENT (STD DUTY / HEAVY DUTY / R.O.W. ONLY)
- ASPHALT PAVEMENT (STD DUTY / HEAVY DUTY / DEEP STRENGTH)
- GRAVEL
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- SETBACK LINE
- SIGN
- LIGHTPOLE
- FENCE
- GUARD RAIL

SIGN LEGEND:

'NO PARKING FIRE LANE' SIGN	[1]
'STOP' SIGN	[2]
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'VAN ACCESSIBLE' SIGN	[4]
'CROSSWALK' SIGN	[5]
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'SIDEWALK ENDS' SIGN	[7]
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SIDEWALK RAMP LEGEND:

SIDEWALK RAMP 'TYPE R'	(R)
SIDEWALK RAMP 'TYPE F'	(F)
SIDEWALK RAMP 'TYPE P'	(P)
SIDEWALK RAMP 'TYPE C'	(C)
SIDEWALK RAMP 'TYPE D'	(D)
CURB DROP ONLY	(X)

REFER TO LATEST MDOT R-28 STANDARD RAMP AND DETECTABLE WARNING DETAILS

GENERAL NOTES:

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LICENSED PROFESSIONAL ENGINEER

NORTH

0 30 60 120
SCALE: 1" = 60'

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31550 NORTHWESTERN HWY
FARMINGTON HILLS, MI 48334

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WHITE LAKE TWP, MI

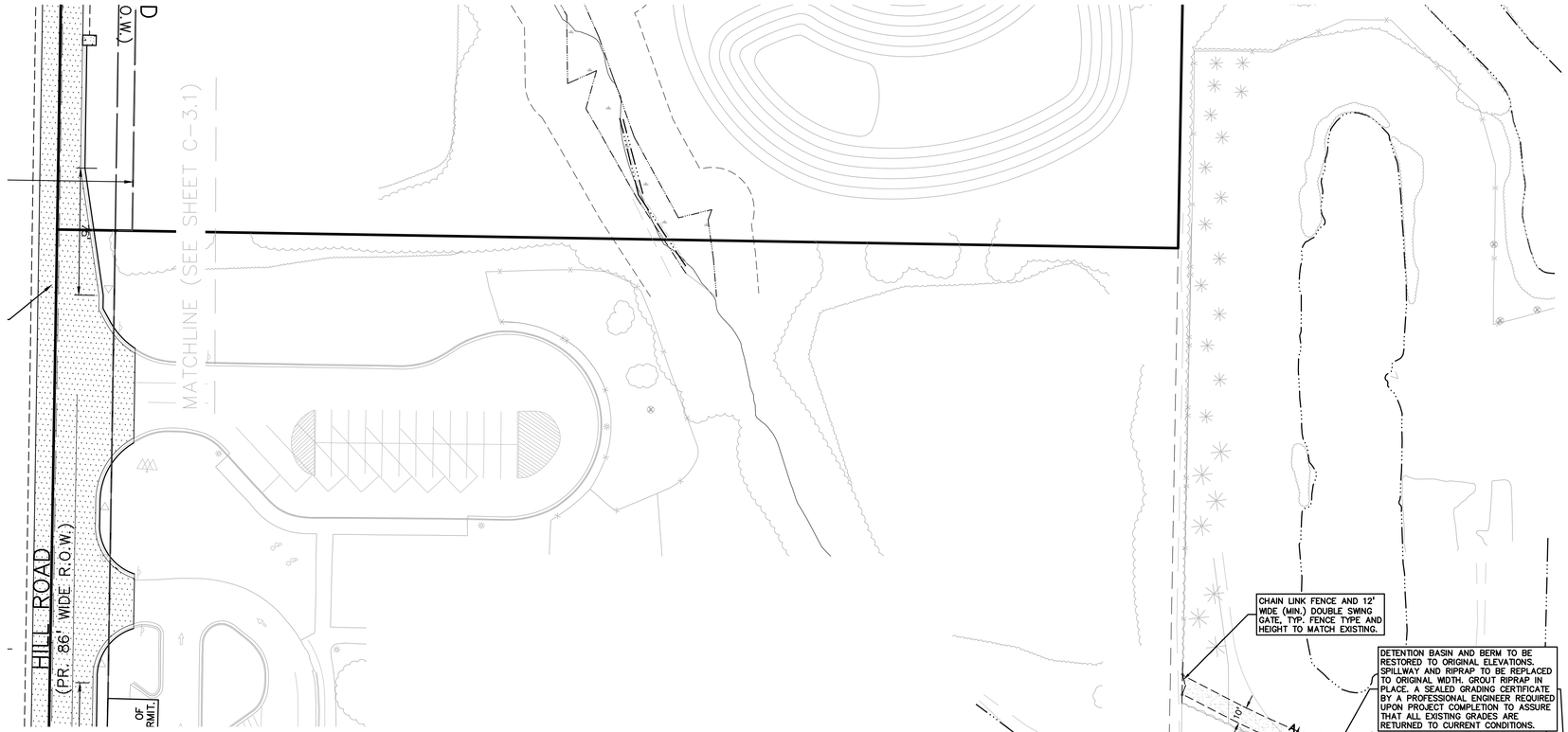
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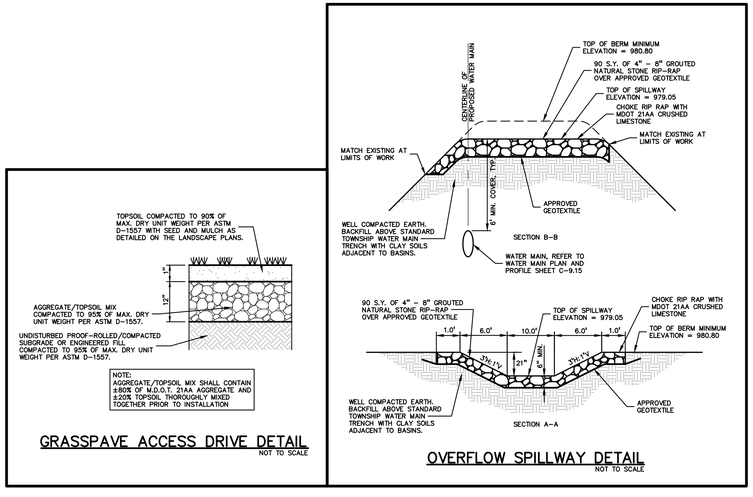
ORIGINAL ISSUE DATE:
DECEMBER 4, 2023

DRAWING TITLE
SITE PLAN - NORTH

PEA JOB NO.	2021-0084
P.M.	JC
DN.	BSH/JEB
DES.	BSH

DRAWING NUMBER:
C-3.2





GRASSPAVE ACCESS DRIVE DETAIL
NOT TO SCALE

OVERFLOW SPILLWAY DETAIL
NOT TO SCALE

LEGEND:

- CONCRETE PAVEMENT (STD DUTY, HEAVY DUTY, R.O.W. ONLY)
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NORTH

0 20 40 80
SCALE: 1" = 40'

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WHITE LAKE TWP, MI

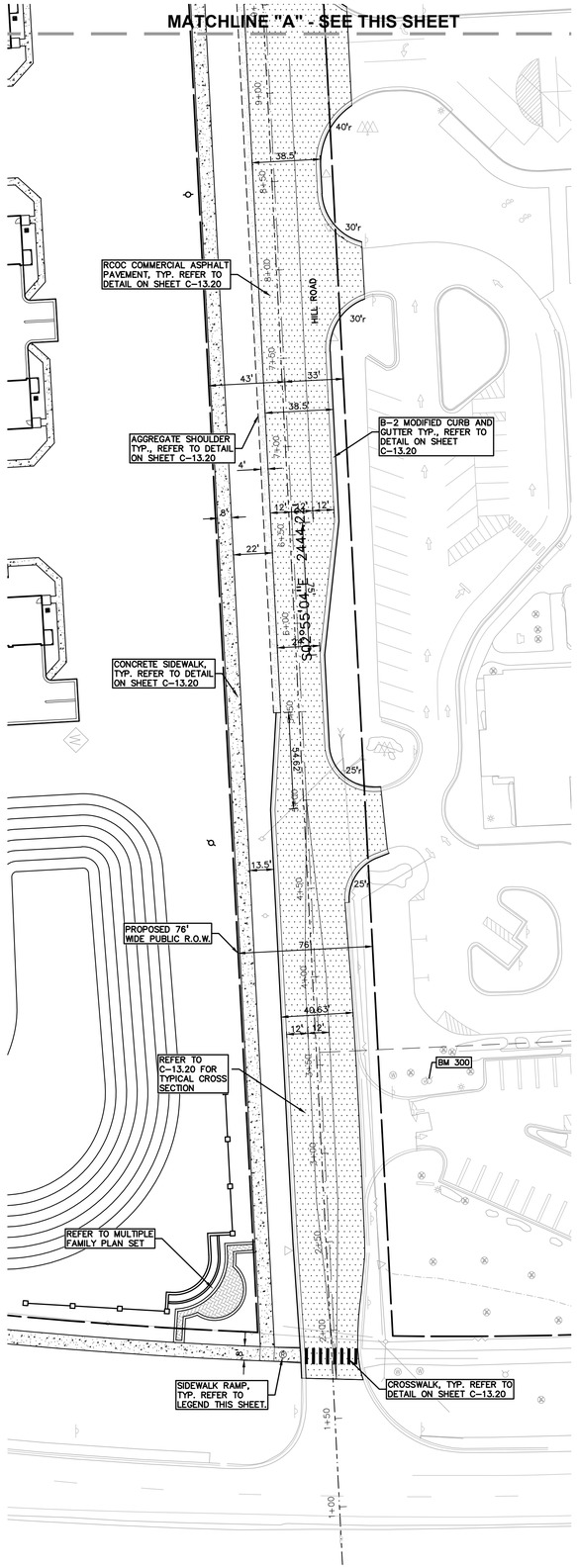
REVISIONS	
DRAFT	2/19/24
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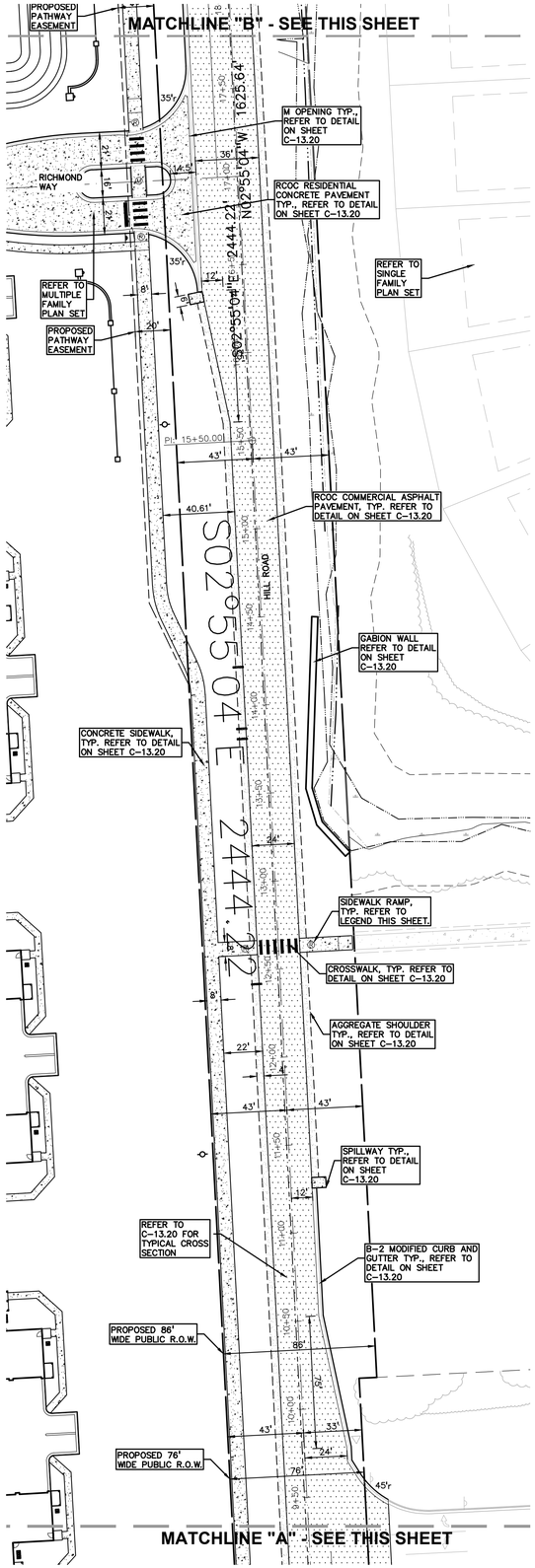
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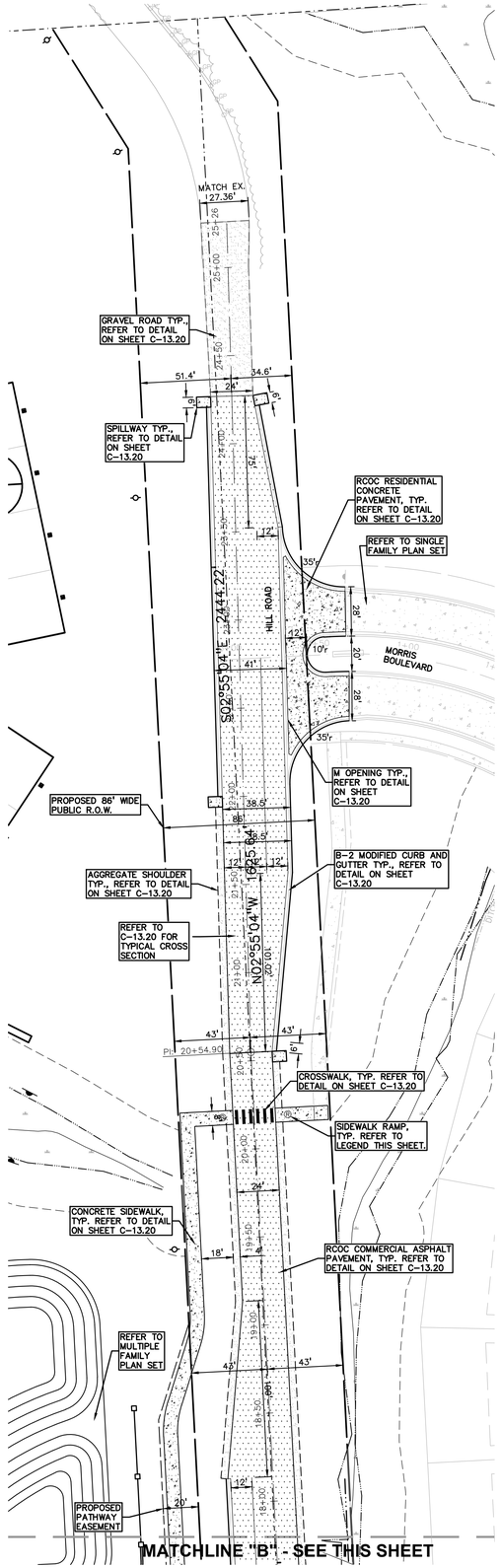
DRAWING TITLE
SITE PLAN - EAST

PEA JOB NO.	2021-0084
P.M.	JC
DN.	BSH/JEB
DES.	BSH

DRAWING NUMBER:
C-3.3







LEGEND:

- CONCRETE PAVEMENT (STD DUTY / HEAVY DUTY / R.O.W. ONLY)
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- GRAVEL
- WETLAND
- CONCRETE CURB AND GUTTER
- REVERSE GUTTER PAN
- SETBACK LINE
- SIGN
- LIGHTPOLE
- FENCE
- GUARD RAIL

SIGN LEGEND:

'NO PARKING FIRE LANE' SIGN	[1]
'STOP' SIGN	[2]
'BARRIER FREE PARKING' SIGN	[3]
'VAN ACCESSIBLE' SIGN	[4]
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'SIDEWALK ENDS' SIGN	[7]
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REFER TO DETAIL SHEET FOR SIGN DETAILS

SIDEWALK RAMP LEGEND:

SIDEWALK RAMP 'TYPE R'	(R)
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SIDEWALK RAMP 'TYPE P'	(P)
SIDEWALK RAMP 'TYPE C'	(C)
SIDEWALK RAMP 'TYPE D'	(D)
CURB DROP ONLY	(X)

REFER TO LATEST MDOT R-28 STANDARD RAMP AND DETECTABLE WARNING DETAILS

GENERAL NOTES:

THESE NOTES APPLY TO ALL CONSTRUCTION ACTIVITIES ON THIS PROJECT.

1. ALL DIMENSIONS SHOWN ARE TO BACK OF CURB, FACE OF SIDEWALK, OUTSIDE FACE OF BUILDING, PROPERTY LINE, CENTER OF MANHOLE/CATCH BASIN OR CENTERLINE OF PIPE UNLESS OTHERWISE NOTED.
2. 'NO PARKING–FIRE LANE' SIGNS SHALL BE POSTED ALONG ALL FIRE LANES AT 100 FOOT INTERVALS OR AS DIRECTED BY THE FIRE OFFICIAL.
3. REFER TO NOTES & DETAILS SHEET FOR ON–SITE PAVING DETAILS.
4. REFER TO NOTES & DETAILS SHEET FOR ON–SITE SIDEWALK RAMP DETAILS

DEVELOPMENT NOTES:

1. EGLE COMPLETED A LEVEL 3 WETLAND IDENTIFICATION PROGRAM REPORT ON AUGUST 4, 2022.
2. UPON COMPLETION OF ANY WORK WITHIN THE WETLAND SETBACK, THE AREA SHALL BE RESTORED TO ITS NATIVE VEGETATIVE STATE.
3. A WETLAND SETBACK RESTORATION PLAN AND A WETLAND RESTORATION BOND SHALL BE REQUIRED TO ENSURE PROPER RESTORATION.

PEA GROUP
t: 844.813.2949
www.peagroup.com

STATE OF MICHIGAN
BRETT STURGEON HOLLANDSWORTH
LICENSED PROFESSIONAL ENGINEER
License No. 6201064949

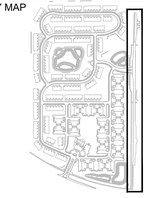
NORTH

0 20 40 80
SCALE: 1" = 40'

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

CAUTION!!
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KEY MAP



CLIENT

WHITE LAKE HILL, LLC
31550 NORTHWESTERN HWY
FARMINGTON HILLS, MI 48334

PROJECT TITLE

THE AVALON - HILL ROAD
HIGHLAND ROAD
WHITE LAKE TWP, MI

REVISIONS	
FINAL SITE PLAN REVIEW	5/8/25
FINAL SITE PLAN REVIEW	9/30/25

ORIGINAL ISSUE DATE:
MAY 8, 2025

DRAWING TITLE

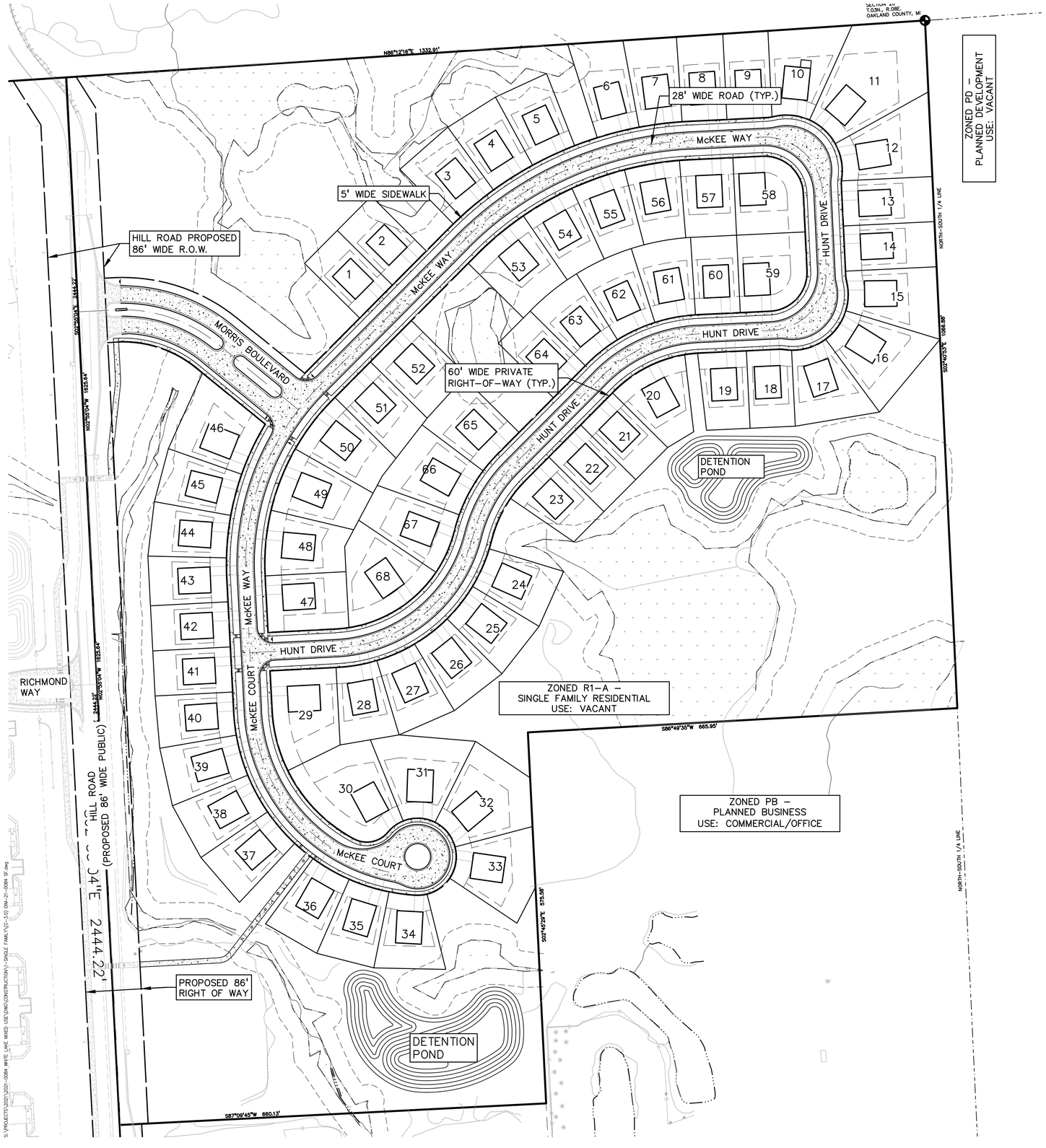
SITE PLAN

PEA JOB NO.	2021-0084
P.M.	JC
DN.	BSH/JEB
DES.	BSH

DRAWING NUMBER:

C-3.20

S:\PROJECTS\2021\2021-0084 WHITE LAKE MIXED USE\DWG\CONSTRUCTION\HILL ROAD\[C-3.1] DWG-210084 HILL.dwg



GENERAL NOTES:

THESE NOTES APPLY TO ALL CONSTRUCTION ACTIVITIES ON THIS PROJECT.

1. ALL DIMENSIONS SHOWN ARE TO BACK OF CURB, FACE OF SIDEWALK, OUTSIDE FACE OF BUILDING, PROPERTY LINE, CENTER OF MANHOLE/CATCH BASIN OR CENTERLINE OF PIPE UNLESS OTHERWISE NOTED.
2. 'NO PARKING-FIRE LANE' SIGNS SHALL BE POSTED ALONG ALL FIRE LANES AT 100 FOOT INTERVALS OR AS DIRECTED BY THE FIRE OFFICIAL.
3. REFER TO NOTES & DETAILS SHEET FOR ON-SITE PAVING DETAILS.
4. REFER TO NOTES & DETAILS SHEET FOR ON-SITE SIDEWALK RAMP DETAILS

TRASH COLLECTION NOTE:

ALL UNITS WILL BE SERVED BY INDIVIDUAL TRASH CARTS PROVIDED BY WASTE COLLECTION COMPANY

LEGEND:

- CONCRETE PAVEMENT (STD DUTY / HEAVY DUTY / R.O.W. ONLY)
- ASPHALT PAVEMENT (STD DUTY / HEAVY DUTY / DEEP STRENGTH)
- GRAVEL
- WETLAND
- CONCRETE CURB AND GUTTER
- REVERSE GUTTER PAN
- SETBACK LINE
- SIGN
- LIGHTPOLE
- FENCE
- GUARD RAIL

SIDEWALK RAMP LEGEND:

SIDEWALK RAMP 'TYPE R'	Ⓡ
SIDEWALK RAMP 'TYPE F'	Ⓕ
SIDEWALK RAMP 'TYPE P'	Ⓟ
SIDEWALK RAMP 'TYPE C'	Ⓒ
SIDEWALK RAMP 'TYPE D'	Ⓓ
CURB DROP ONLY	Ⓧ

REFER TO LATEST MDOT R-28 STANDARD RAMP AND DETECTABLE WARNING DETAILS

SIGN LEGEND:

'NO PARKING FIRE LANE' SIGN	[1]
'STOP' SIGN	[2]
'BARRIER FREE PARKING' SIGN	[3]
'VAN ACCESSIBLE' SIGN	[4]
'CROSSWALK' SIGN	[5]
'DO NOT ENTER' SIGN	[6]
'SIDEWALK ENDS' SIGN	[7]
'NO PARKING LOADING ZONE' SIGN	[8]

REFER TO DETAIL SHEET FOR SIGN DETAILS

GENERAL NOTES:

THESE NOTES APPLY TO ALL CONSTRUCTION ACTIVITIES ON THIS PROJECT.

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3. REFER TO NOTES & DETAILS SHEET FOR ON-SITE PAVING DETAILS.
4. REFER TO NOTES & DETAILS SHEET FOR ON-SITE SIDEWALK RAMP DETAILS

Parcel Area Table	
PARCEL NO.	AREA (S.F.)
1	8,640
2	8,955
3	10,620
4	9,464
5	9,451
6	10,831
7	9,986
8	9,339
9	9,328
10	12,947
11	22,384
12	13,596
13	9,873
14	9,869
15	12,273
16	13,724
17	11,232
18	8,370
19	8,592
20	10,718
21	8,400
22	8,400
23	9,196
24	9,276
25	9,276
26	9,276
27	9,276
28	9,249
29	13,814
30	17,057
31	13,816
32	15,352
33	12,715
34	9,860

Parcel Area Table	
PARCEL NO.	AREA (S.F.)
35	9,400
36	9,628
37	9,628
38	9,659
39	9,431
40	8,836
41	8,400
42	8,400
43	8,732
44	9,038
45	8,975
46	12,734
47	10,961
48	10,602
49	11,325
50	11,255
51	10,019
52	10,957
53	12,174
54	9,126
55	9,126
56	9,126
57	9,696
58	11,955
59	11,955
60	8,464
61	9,455
62	9,455
63	9,401
64	8,400
65	10,630
66	12,031
67	11,105
68	13,812

SINGLE FAMILY SITE DATA TABLE:

SITE AREA: 41.06 ACRES GROSS
4.48 WETLAND ACRES
35.00 ACRES NET (NO R.O.W. OR WETLAND AREA)
7.68 OPEN SPACE ACRES

ZONING: EXISTING: R1-A, SINGLE FAMILY RESIDENTIAL
PROPOSED: PD, PLANNED DEVELOPMENT

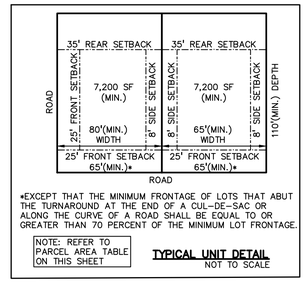
PROPOSED USE: 68 UNIT SINGLE FAMILY HOME CONDOMINIUM (1.9 UNITS PER ACRE)

OPEN SPACE:
MINIMUM OPEN SPACE REQUIRED = 15% OF NET SITE AREA
PROVIDED OPEN SPACE = 7.69/35.00 = 22.0%

WETLANDS:
EGLE WETLAND IMPACT: 0.72 ACRES

DEVELOPMENT NOTES:

1. EGLE COMPLETED A LEVEL 3 WETLAND IDENTIFICATION PROGRAM REPORT ON AUGUST 4, 2022.
2. UPON COMPLETION OF ANY WORK WITHIN THE WETLAND SETBACK, THE AREA SHALL BE RESTORED TO ITS NATIVE VEGETATIVE STATE.
3. A WETLAND SETBACK RESTORATION PLAN AND A WETLAND RESTORATION BOND SHALL BE REQUIRED TO ENSURE PROPER RESTORATION.
4. A SIDEWALK ALONG HILL ROAD SHALL BE CONSTRUCTED AS SHOWN ON THE SITE PLAN. TO LIMIT WETLAND IMPACTS AND REDUCE SIDEWALKS TO "NO WHERE", A CONTRIBUTION TO THE WHITE LAKE SIDEWALK FUND SHALL BE ESTABLISHED.
5. BASE ON A DETAILED ENGINEERING ANALYSIS, THE PROPOSED MAXIMUM ALLOWABLE DISCHARGE RATE FROM THE PROPOSED DEVELOPMENT DOES NOT EXCEED THE EXISTING RUNOFF FOR THE 100-YEAR STORM EVENT. THE PROPOSED CONTRIBUTING FLOW THROUGH THE CULVERT UNDER M-59 IS NOT INCREASED BY THE DEVELOPMENT.
6. THE DEVELOPER SHALL CONSTRUCT A SANITARY SEWER LINE ALONG HILL ROAD TO THE FURTHEST EXTEND POSSIBLE. TO SUPPLEMENT THE SHORTENED LENGTH A CONTRIBUTION TO THE TOWNSHIP SANITARY SEWER FUND SHALL BE MADE. IN ADDITION, A CONSTRUCTION EASEMENT SHALL BE PROVIDED TO THE TOWNSHIP AT THE NORTH END OF THE PROPERTY ALONG HILL ROAD.
7. A SECONDARY WATERMAIN CONNECTION IS TO BE PROVIDED.



*EXCEPT THAT THE MINIMUM FRONTAGE OF LOTS THAT ABUT THE TURNAROUND AT THE END OF A CUL-DE-SAC OR ALONG THE CURVE OF A ROAD SHALL BE EQUAL TO OR GREATER THAN 70 PERCENT OF THE MINIMUM LOT FRONTAGE.

NOTE: REFER TO PARCEL AREA TABLE ON THIS SHEET

TYPICAL UNIT DETAIL
NOT TO SCALE

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STATE OF MICHIGAN
BRETT STURGEON HOLLANDSWORTH
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NORTH

0 40 80 160
SCALE: 1" = 80'

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KEY MAP



CLIENT
WHITE LAKE HILL, LLC
31550 NORTHWESTERN HWY
FARMINGTON HILLS, MI 48334

PROJECT TITLE
THE AVALON - SINGLE FAMILY
HIGHLAND ROAD
WHITE LAKE TWP, MI

REVISIONS

FINAL SITE PLAN REVIEW	5/8/25
FINAL SITE PLAN REVIEW	9/30/25

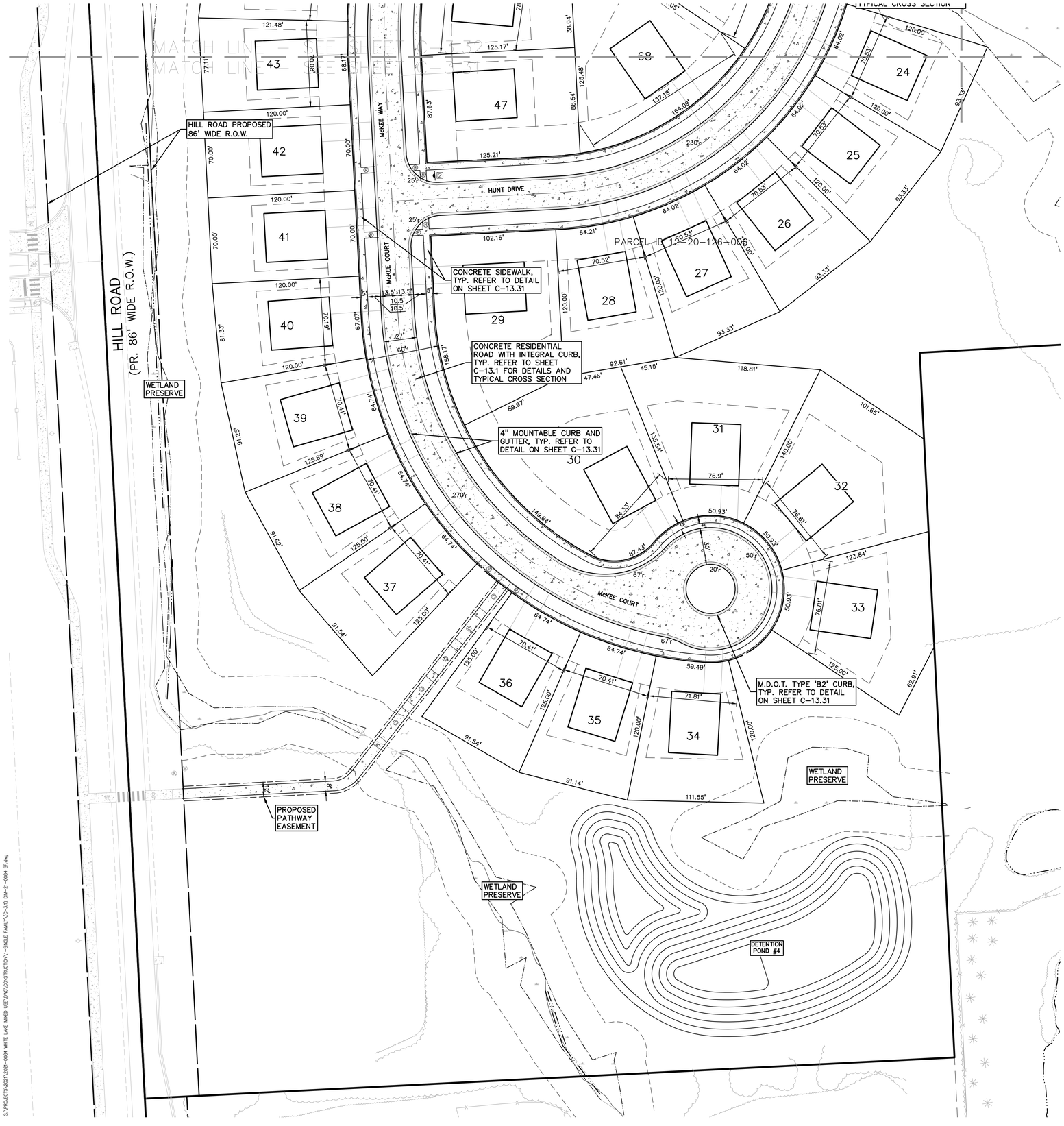
ORIGINAL ISSUE DATE:
MAY 8, 2025

DRAWING TITLE
DIMENSION AND PAVING PLAN - OVERALL

PEA JOB NO.	2021-0084
P.M.	JC
DN.	BSH/JEB
DES.	BSH

DRAWING NUMBER:
C-3.30

S:\PROJECTS\2021\2021-0084 WHITE LAKE MIXED USE\DWG\CONSTRUCTION\1-SINGLE FAMILY\(C-3.0) DIM-21-0084 SF.dwg



LEGEND:

- CONCRETE PAVEMENT (STD DUTY / HEAVY DUTY / R.O.W. ONLY)
- ASPHALT PAVEMENT (STD DUTY / HEAVY DUTY / DEEP STRENGTH)
- GRAVEL
- WETLAND
- CONCRETE CURB AND GUTTER
- REVERSE GUTTER PAN
- SETBACK LINE
- SIGN, LIGHTPOLE, FENCE, GUARD RAIL

SIDEWALK RAMP LEGEND:

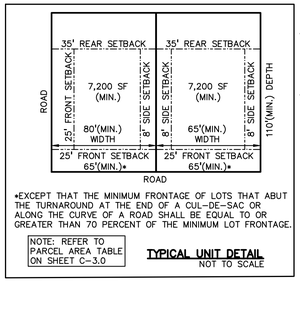
SIDEWALK RAMP 'TYPE R'	Ⓡ
SIDEWALK RAMP 'TYPE F'	Ⓕ
SIDEWALK RAMP 'TYPE P'	Ⓟ
SIDEWALK RAMP 'TYPE C'	Ⓒ
SIDEWALK RAMP 'TYPE D'	Ⓓ
CURB DROP ONLY	Ⓧ

REFER TO LATEST MDOT R-28 STANDARD RAMP AND DETECTABLE WARNING DETAILS

SIGN LEGEND:

'NO PARKING FIRE LANE' SIGN	[1]
'STOP' SIGN	[2]
'BARRIER FREE PARKING' SIGN	[3]
'VAN ACCESSIBLE' SIGN	[4]
'CROSSWALK' SIGN	[5]
'DO NOT ENTER' SIGN	[6]
'SIDEWALK ENDS' SIGN	[7]
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REFER TO DETAIL SHEET FOR SIGN DETAILS



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NOTE: REFER TO PARCEL AREA TABLE ON SHEET C-3.0

TYPICAL UNIT DETAIL
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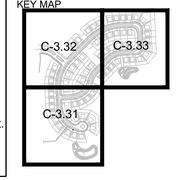
NORTH

0 20 40 80
SCALE: 1" = 40'

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KEY MAP



CLIENT
WHITE LAKE HILL, LLC
31550 NORTHWESTERN HWY
FARMINGTON HILLS, MI 48334

PROJECT TITLE
THE AVALON - SINGLE FAMILY
HIGHLAND ROAD
WHITE LAKE TWP, MI

REVISIONS	
FINAL SITE PLAN REVIEW	5/8/25
FINAL SITE PLAN REVIEW	9/30/25

ORIGINAL ISSUE DATE:
MAY 8, 2025

DRAWING TITLE
DIMENSION AND PAVING PLAN - SOUTH

PEA JOB NO.	2021-0084
P.M.	JC
DN.	BSH/JEB
DES.	BSH

DRAWING NUMBER:
C-3.31

S:\PROJECTS\2021\2021-0084 WHITE LAKE MIXED USE\DWG\CONSTRUCTION\1-SINGLE FAMILY\[C-3.1] DIM-21-0084 SF.dwg



LEGEND:

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- GRAVEL
- WETLAND
- CONCRETE CURB AND GUTTER
- REVERSE GUTTER PAN
- SETBACK LINE
- SIGN
- LIGHTPOLE
- FENCE
- GUARD RAIL

SIDEWALK RAMP LEGEND:

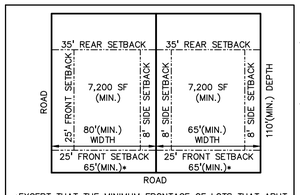
SIDEWALK RAMP 'TYPE R'	Ⓡ
SIDEWALK RAMP 'TYPE F'	Ⓕ
SIDEWALK RAMP 'TYPE P'	Ⓟ
SIDEWALK RAMP 'TYPE C'	Ⓒ
SIDEWALK RAMP 'TYPE D'	Ⓓ
CURB DROP ONLY	Ⓧ

REFER TO LATEST MDOT R-28 STANDARD RAMP AND DETECTABLE WARNING DETAILS

SIGN LEGEND:

'NO PARKING FIRE LANE' SIGN	[1]
'STOP' SIGN	[2]
'BARRIER FREE PARKING' SIGN	[3]
'VAN ACCESSIBLE' SIGN	[4]
'CROSSWALK' SIGN	[5]
'DO NOT ENTER' SIGN	[6]
'SIDEWALK ENDS' SIGN	[7]
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REFER TO DETAIL SHEET FOR SIGN DETAILS



TYPICAL UNIT DETAIL
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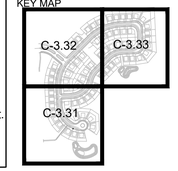
NORTH

0 20 40 80
SCALE: 1" = 40'

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KEY MAP



CLIENT
WHITE LAKE HILL, LLC
31550 NORTHWESTERN HWY
FARMINGTON HILLS, MI 48334

PROJECT TITLE
THE AVALON - SINGLE FAMILY
HIGHLAND ROAD
WHITE LAKE TWP, MI

REVISIONS	
FINAL SITE PLAN REVIEW	5/8/25
FINAL SITE PLAN REVIEW	9/30/25

ORIGINAL ISSUE DATE:
MAY 8, 2025

DRAWING TITLE
DIMENSION AND PAVING PLAN - WEST

PEA JOB NO.	2021-0084
P.M.	JC
DN.	BSH/JEB
DES.	BSH

DRAWING NUMBER:
C-3.32

T.03N., R.08E.
OAKLAND COUNTY, MI

WETLAND PRESERVE

CONCRETE RESIDENTIAL ROAD WITH INTEGRAL CURB, TYP. REFER TO SHEET C-13.31 FOR DETAILS AND TYPICAL CROSS SECTION

NOTE: DECKS SHALL NOT ENCROACH INTO THE STORM SEWER EASEMENT

McKEE WAY

HUNT DRIVE

CONCRETE SIDEWALK, TYP. REFER TO DETAIL ON SHEET C-13.31

4" MOUNTABLE CURB AND GUTTER, TYP. REFER TO DETAIL ON SHEET C-13.31

NORTH-SOUTH 1/4 LINE

DETENTION POND #5

WETLAND PRESERVE

WETLAND PRESERVE

CONCRETE RESIDENTIAL ROAD WITH INTEGRAL CURB, TYP. REFER TO SHEET C-13.31 FOR DETAILS AND TYPICAL CROSS SECTION

PARCEL ID 12-20-126-006

LEGEND:

- CONCRETE PAVEMENT (STD DUTY / HEAVY DUTY / R.O.W. ONLY)
- ASPHALT PAVEMENT (STD DUTY / HEAVY DUTY / DEEP STRENGTH)
- GRAVEL
- WETLAND
- CONCRETE CURB AND GUTTER
- REVERSE GUTTER PAN
- SETBACK LINE
- SIGN
- LIGHTPOLE
- FENCE
- GUARD RAIL

SIDEWALK RAMP LEGEND:

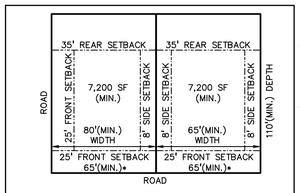
SIDEWALK RAMP 'TYPE R'	Ⓡ
SIDEWALK RAMP 'TYPE F'	Ⓕ
SIDEWALK RAMP 'TYPE P'	Ⓟ
SIDEWALK RAMP 'TYPE C'	Ⓒ
SIDEWALK RAMP 'TYPE D'	Ⓓ
CURB DROP ONLY	Ⓧ

REFER TO LATEST MDOT R-28 STANDARD RAMP AND DETECTABLE WARNING DETAILS

SIGN LEGEND:

'NO PARKING FIRE LANE' SIGN	1
'STOP' SIGN	2
'BARRIER FREE PARKING' SIGN	3
'VAN ACCESSIBLE' SIGN	4
'CROSSWALK' SIGN	5
'DO NOT ENTER' SIGN	6
'SIDEWALK ENDS' SIGN	7
'NO PARKING LOADING ZONE' SIGN	8

REFER TO DETAIL SHEET FOR SIGN DETAILS



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NOTE: REFER TO PARCEL AREA TABLE ON SHEET C-3.0

TYPICAL UNIT DETAIL
NOT TO SCALE

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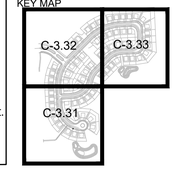
NORTH

0 20 40 80
SCALE: 1" = 40'

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KEY MAP



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FARMINGTON HILLS, MI 48334

PROJECT TITLE
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HIGHLAND ROAD
WHITE LAKE TWP, MI

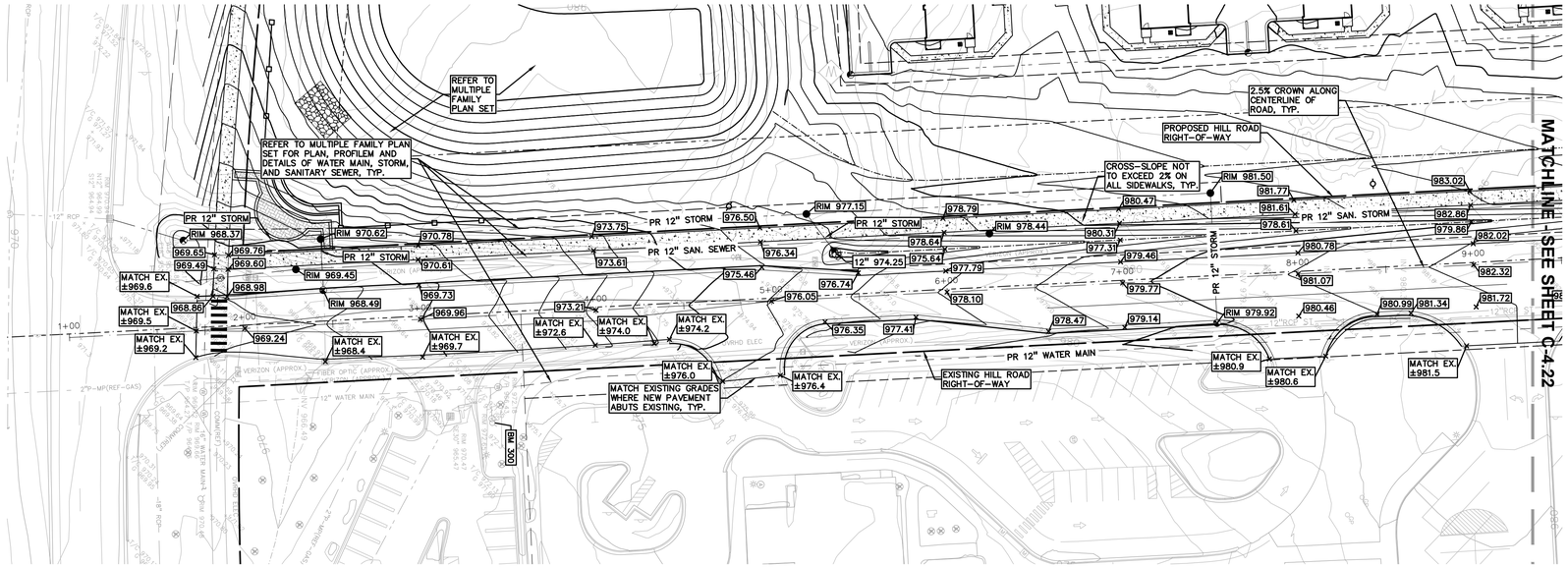
REVISIONS	
FINAL SITE PLAN REVIEW	5/8/25
FINAL SITE PLAN REVIEW	9/30/25

ORIGINAL ISSUE DATE:
MAY 8, 2025

DRAWING TITLE
DIMENSION AND PAVING PLAN - EAST

PEA JOB NO.	2021-0084
P.M.	JC
DN.	BSH/JEB
DES.	BSH

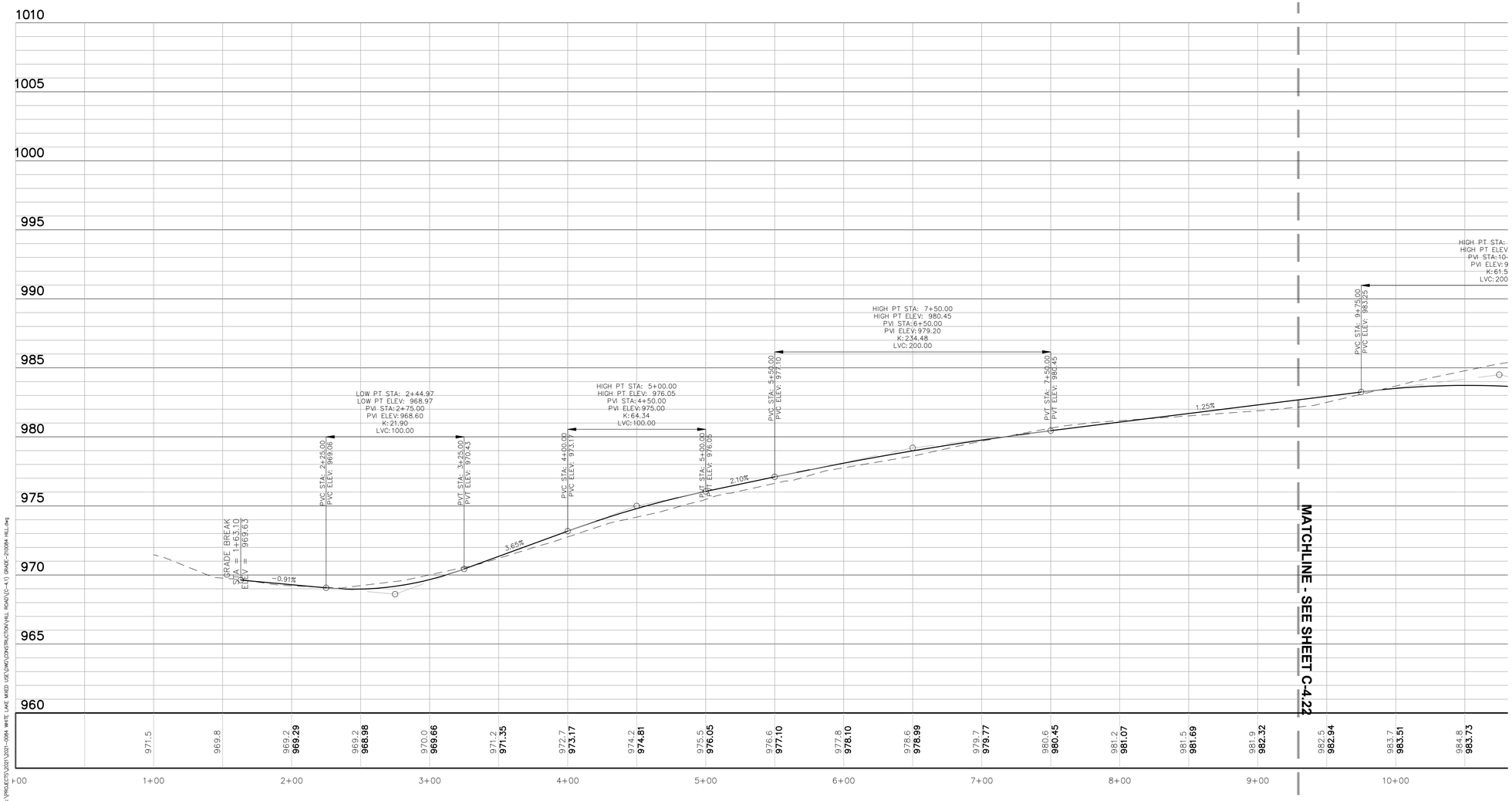
DRAWING NUMBER:
C-3.33



GENERAL GRADING AND EARTHWORK NOTES:

THESE NOTES APPLY TO ALL CONSTRUCTION ACTIVITIES ON THIS PROJECT

1. CONTRACTOR SHALL FIELD VERIFY ALL EXISTING TREES AND BRUSH AND REMOVE ALL THAT ARE NECESSARY TO GRADE SITE.
2. ALL GRADES ARE TO TOP OF PAVEMENT UNLESS OTHERWISE NOTED.
3. THE STAGING OF CONSTRUCTION ACTIVITIES SHALL OCCUR ONLY WITHIN THE SITE BOUNDARIES. ANY CONSTRUCTION ACTIVITIES OUTSIDE OF THE SITE BOUNDARIES SHALL BE AT THE SOLE RESPONSIBILITY AND RISK OF THE CONTRACTOR.
4. ALL SOIL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL MEET THE REQUIREMENTS OF THE AUTHORIZED PUBLIC AGENCY OF JURISDICTION. AN EROSION CONTROL PERMIT MUST BE SECURED FROM THE COUNTY PRIOR TO CONSTRUCTION.
5. ALL EARTHWORK AND GRADING OPERATIONS SHALL BE PERFORMED IN ACCORDANCE WITH THE SOILS INVESTIGATION AND REPORT.
6. REFER TO SOIL EROSION CONTROL PLAN FOR ADDITIONAL SOIL EROSION AND SEDIMENTATION CONTROL MEASURES AND NOTES.
7. THE DETENTION BASIN SIDE SLOPES AND ALL SLOPE EXCEEDING 1:6 MUST BE STABILIZED BY SODDING OR BY PLACING A MULCH BLANKET PEGGED IN PLACE OVER SEED.
8. ALL DISTURBED AREAS SHALL BE SEEDED AND MULCHED OR SODDED IN ACCORDANCE WITH THE LANDSCAPE PLANS. PROVIDE A MINIMUM OF 3" OF TOPSOIL IN THESE AREAS UNLESS OTHERWISE NOTED.
9. THE CONTRACTOR SHALL NOTE EXISTING UNDERGROUND UTILITIES WITHIN AND ADJACENT TO THE SITE. BACKFILL FOR EXISTING UTILITY TRENCHES SHALL BE EXAMINED CRITICALLY. ANY TRENCHES FOUND TO HAVE SOFT, UNSTABLE OR UNSUITABLE BACKFILL MATERIAL IN THE OPINION OF THE THIRD PARTY TESTING COMPANY, THAT ARE TO BE WITHIN THE ZONE OF INFLUENCE OF PROPOSED BUILDINGS OR PAVEMENT SHALL BE COMPLETELY EXCAVATED AND BACKFILLED WITH SUITABLE MATERIAL.
10. ON-SITE FILL CAN BE USED IF THE SPECIFIED COMPACTION REQUIREMENTS CAN BE ACHIEVED. IF ON-SITE SOIL IS USED, IT SHOULD BE CLEAN AND FREE OF FROZEN SOIL, ORGANICS, OR OTHER DELETERIOUS MATERIALS.
11. THE FINAL SUBGRADE/EXISTING AGGREGATE BASE SHOULD BE THOROUGHLY PROOFROLLED USING A FULLY LOADED TANDEM AXLE TRUCK OR FRONT END LOADER UNDER THE OBSERVATION OF A GEOTECHNICAL/PAVEMENT ENGINEER. LOOSE OR YIELDING AREAS THAT CANNOT BE MECHANICALLY STABILIZED SHOULD BE REINFORCED USING GEOGRIDS OR REMOVED AND REPLACED WITH ENGINEERED FILL OR AS DICTATED BY FIELD CONDITIONS.
12. SUBGRADE UNDERCUTTING, INCLUDING BACKFILLING SHALL BE PERFORMED TO REPLACE MATERIALS SUSCEPTIBLE TO FROST HEAVING AND UNSTABLE SOIL CONDITIONS. ANY EXCAVATIONS THAT MAY BE REQUIRED BELOW THE TOPSOIL IN FILL AREAS OR BELOW PROPOSED SUBGRADE IN CUT AREAS WILL BE CLASSIFIED AS SUBGRADE UNDERCUTTING.
13. SUBGRADE UNDERCUTTING SHALL BE PERFORMED WHERE NECESSARY AND THE EXCAVATED MATERIAL SHALL BECOME THE PROPERTY OF THE CONTRACTOR. ANY SUBGRADE UNDERCUTTING SHALL BE BACKFILLED AS RECOMMENDED IN THE GEOTECHNICAL ENGINEERING REPORT FOR THE PROJECT.
14. ANY SUBGRADE WATERING REQUIRED TO ACHIEVE REQUIRED DENSITY SHALL BE CONSIDERED INCIDENTAL TO THE JOB.



GRADING LEGEND:

- 670.91 / 622.50 — EXISTING SPOT ELEVATION
- PROPOSED SPOT ELEVATION: TYPICALLY TOP OF PAVEMENT IN PAVED AREAS, GUTTER GRADE IN CURB LINES.
- 670 — EXISTING CONTOUR
- 922 — PROPOSED CONTOUR
- PROPOSED REVERSE GUTTER PAN
- PROPOSED RIDGE LINE
- PROPOSED SWALE/DITCH

ABBREVIATIONS

T/C = TOP OF CURB	G = GUTTER GRADE
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T/S = TOP OF SIDEWALK	RIM = RIM ELEVATION
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REFER TO GRADING NOTES ON SHEET C-4.1.

EARTHWORK BALANCING NOTE:

THE CONTRACTOR SHALL BE RESPONSIBLE FOR IMPORTING OR EXPORTING ALL MATERIALS AS REQUIRED TO PROPERLY GRADE THIS PROJECT TO THE FINISHED ELEVATIONS SHOWN ON THE APPROVED PLANS. THE CONTRACTOR SHALL MAKE THEIR OWN DETERMINATION OF CUT AND FILL QUANTITIES AND ALLOW FOR REMOVAL OF EXCESS OR IMPORTATION OF ADDITIONAL MATERIAL AT NO ADDITIONAL COST TO THE OWNER.

NOTE:

PRIOR TO ANY CONSTRUCTION OR GRADING ON THE SITE, SILT FENCE SHALL BE INSTALLED AT THE UPLAND EDGE OF NATURAL FEATURES SETBACKS OR ANY PROPOSED LIMIT OF GRADING. THE SILT FENCING SHALL BE REMOVED AFTER CONSTRUCTIONS ONCE THE AREA IS STABILIZED AND VEGETATION HAD BEEN ESTABLISHED

RETAINING WALL NOTE:

TOP OF WALL (T/W) AND BOTTOM OF WALL (B/W) GRADES ARE THE FINISH GRADE AT THE TOP AND BOTTOM OF THE RETAINING WALL, NOT ACTUAL TOP AND BOTTOM OF THE WALL STRUCTURE.

UTILITY LEGEND:

- EX, OH, ELEC, POLE & GUY WIRE
- EX, U.G. CABLE TV & PEDESTAL
- EX, U.G. COMMUNICATION LINE, PEDESTAL & MANHOLE
- EX, U.G. ELEC,MANHOLE, METER & HANDHOLE
- EX, GAS LINE
- EX, GAS VALVE & GAS LINE MARKER
- EX, TRANSFORMER & IRRIGATION VALVE
- EX, WATER MAIN
- EX, HYDRANT, GATE VALVE & POST INDICATOR VALVE
- EX, WATER VALVE BOX & SHUTOFF
- EX, SANITARY SEWER
- EX, SANITARY CLEANOUT & MANHOLE
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- EX, CLEANOUT & MANHOLE
- EX, SQUARE, ROUND, & BEEHIVE CATCH BASIN
- EX, YARD DRAIN & ROOF DRAIN
- EX, UNIDENTIFIED STRUCTURE
- PROPOSED WATER MAIN
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STATE OF MICHIGAN
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License No. 6201064949

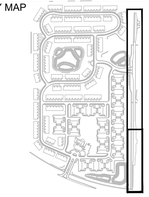
NORTH

0 20 40 80
SCALE: 1" = 40'

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KEY MAP



CLIENT
WHITE LAKE HILL, LLC
31550 NORTHWESTERN HWY
FARMINGTON HILLS, MI 48334

PROJECT TITLE
THE AVALON - HILL ROAD
HIGHLAND ROAD
WHITE LAKE TWP, MI

REVISIONS

FINAL SITE PLAN REVIEW	5/8/25
FINAL SITE PLAN REVIEW	9/30/25

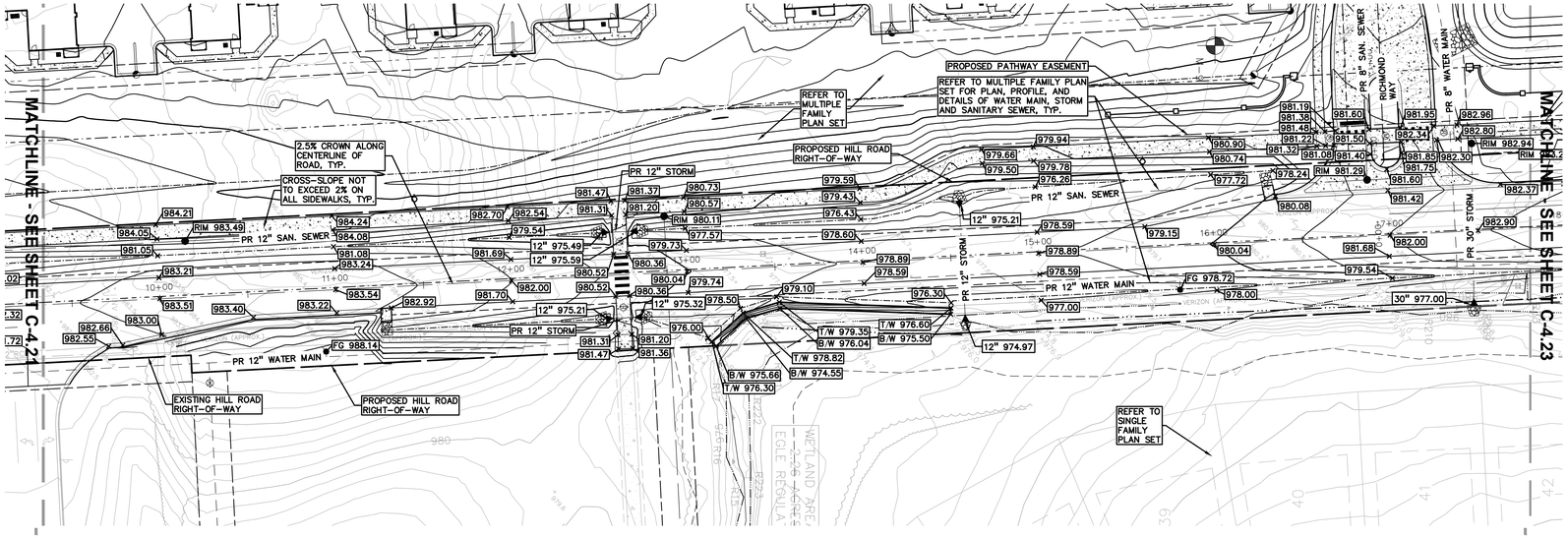
ORIGINAL ISSUE DATE:
MAY 8, 2025

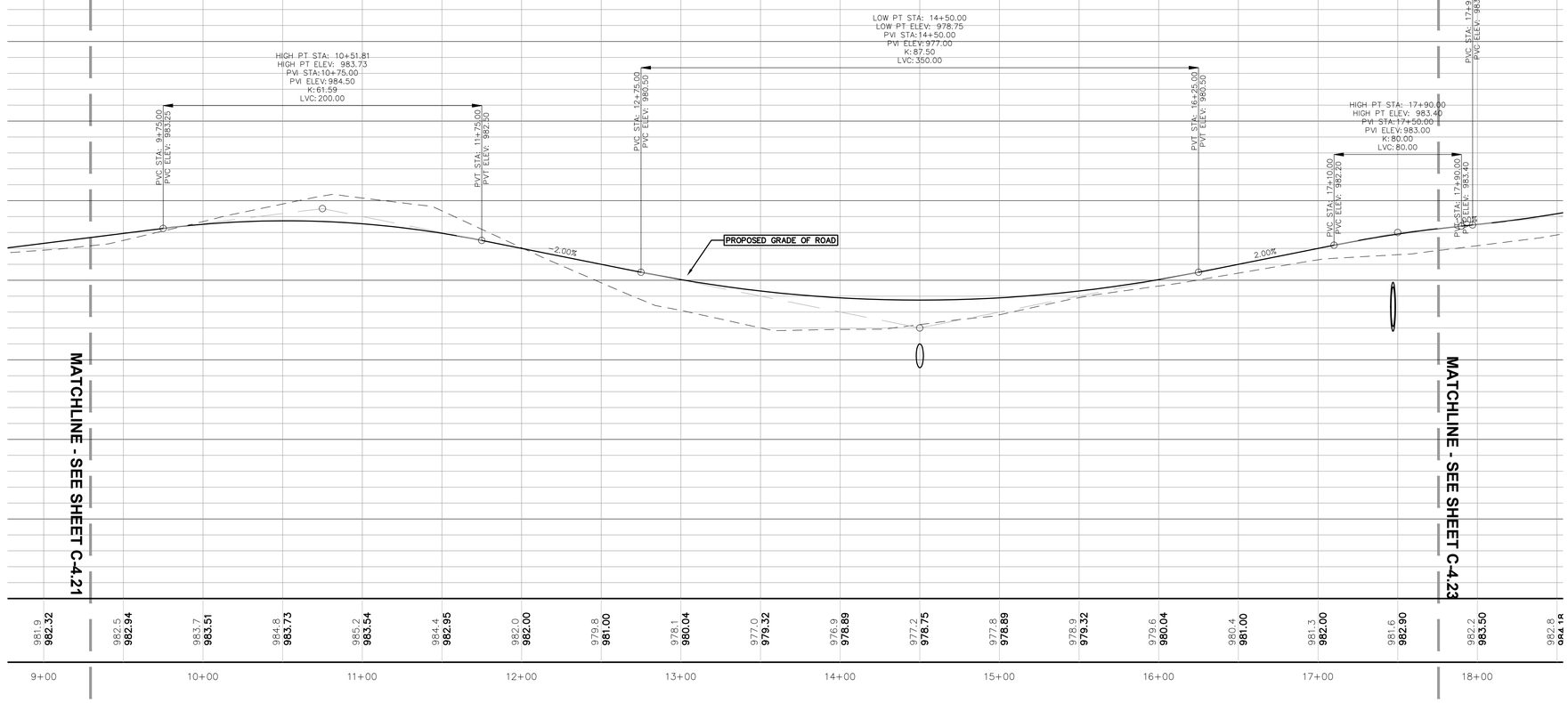
DRAWING TITLE
ROAD PLAN & PROFILE

PEA JOB NO.	2021-0084
P.M.	JC
DN.	BSH/JEB
DES.	BSH

DRAWING NUMBER:
C-4.21

S:\PROJECTS\2021\2021-0084 WHITE LAKE MIXED USE\CIVIL\CONSTRUCTION\HILL ROAD\(C-4.1) GRADE-21-0084 HILL.dwg





GRADING LEGEND:

- EXISTING SPOT ELEVATION
- 622.50 — PROPOSED SPOT ELEVATION: TYPICALLY TOP OF PAVEMENT IN PAVED AREAS, GUTTER GRADE IN CURB LINES.
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REFER TO GRADING NOTES ON SHEET C-4.1.

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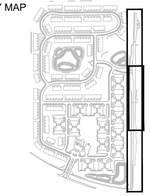
NORTH

0 20 40 80
SCALE: 1" = 40'

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KEY MAP



CLIENT
WHITE LAKE HILL, LLC
31550 NORTHWESTERN HWY
FARMINGTON HILLS, MI 48334

PROJECT TITLE
THE AVALON - HILL ROAD
HIGHLAND ROAD
WHITE LAKE TWP, MI

REVISIONS	
FINAL SITE PLAN REVIEW	5/8/25
FINAL SITE PLAN REVIEW	9/30/25

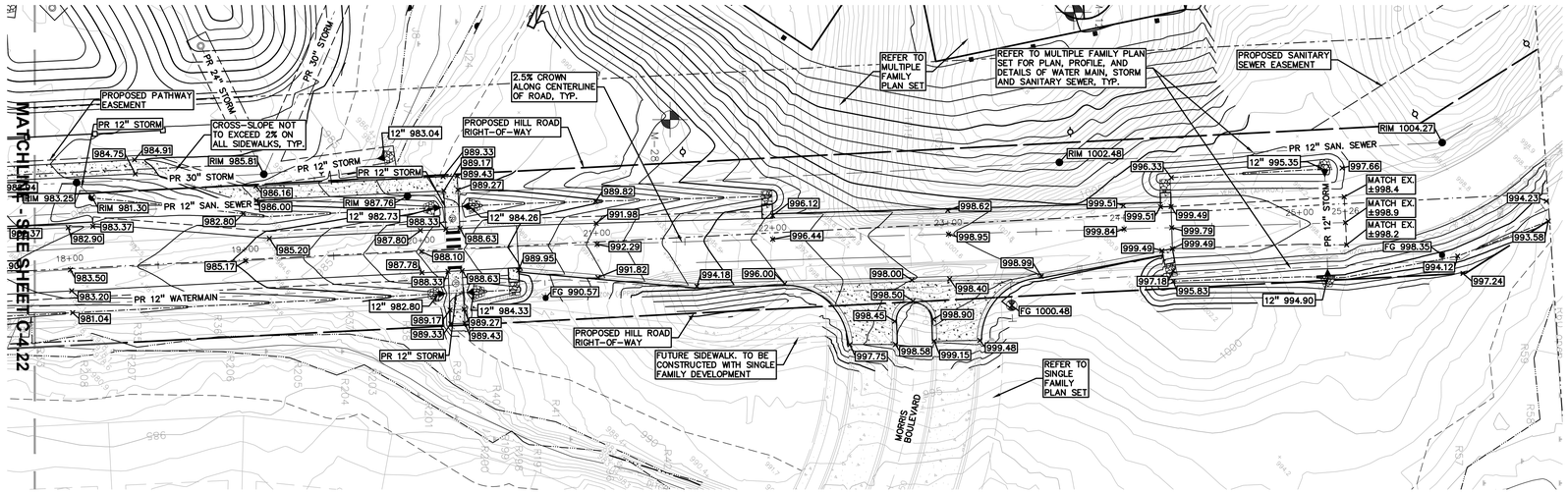
ORIGINAL ISSUE DATE:
MAY 8, 2025

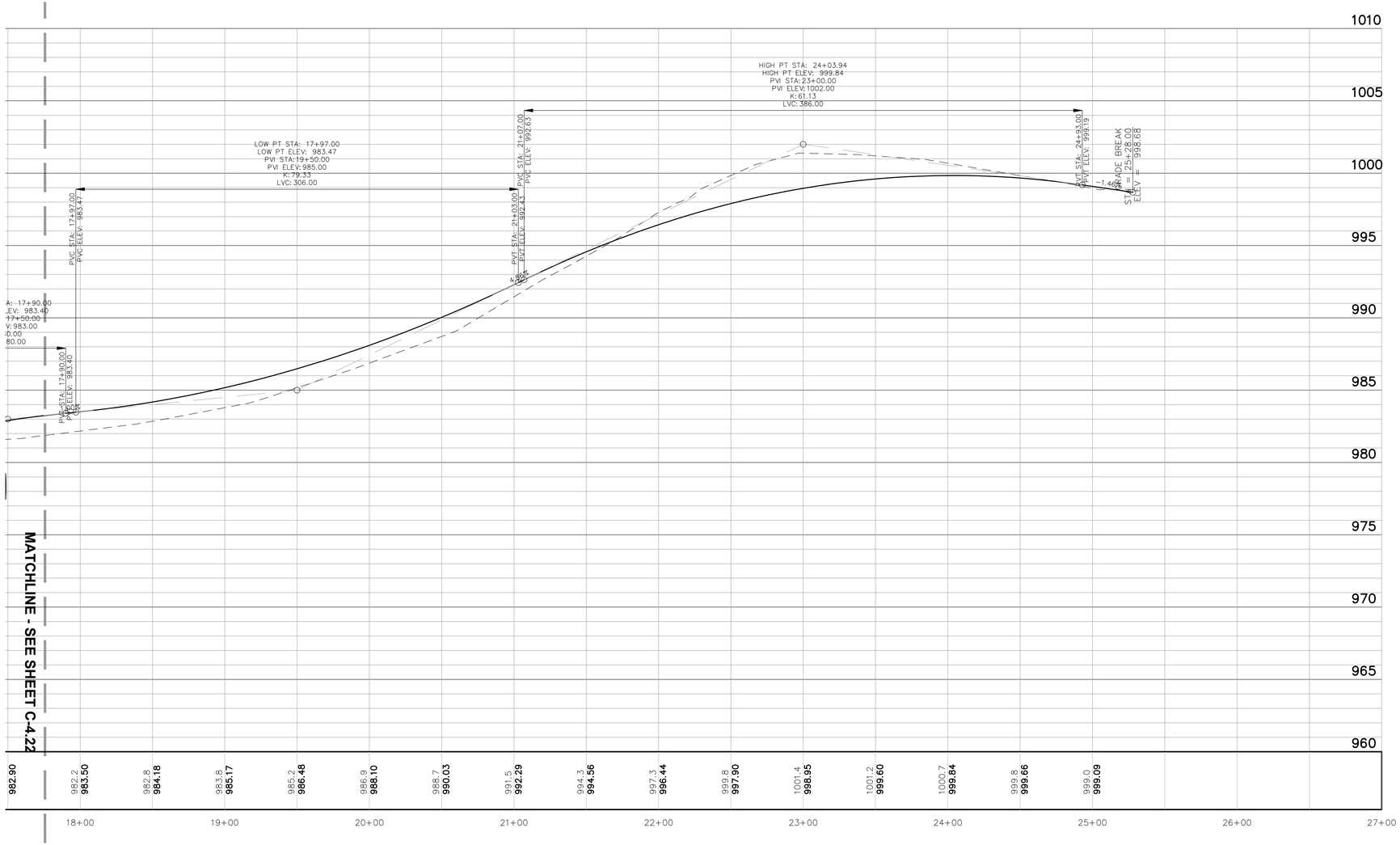
DRAWING TITLE
ROAD PLAN & PROFILE

PEA JOB NO.	2021-0084
P.M.	JC
DN.	BSH/JEB
DES.	BSH

DRAWING NUMBER:
C-4.22

S:\PROJECTS\2021-0084 WHITE LAKE MIXED USE\CIVIL\CONSTRUCTION\HILL ROAD\C-4.1 GRADE-210084 HILL.dwg





GRADING LEGEND:

- EXISTING SPOT ELEVATION
- 622.50 — PROPOSED SPOT ELEVATION: TYPICALLY TOP OF PAVEMENT IN PAVED AREAS, GUTTER GRADE IN CURB LINES.
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REFER TO GRADING NOTES ON SHEET C-4.1.

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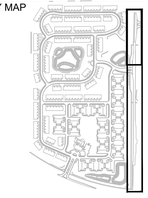
NORTH

0 20 40 80
SCALE: 1" = 40'

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KEY MAP



CLIENT
WHITE LAKE HILL, LLC
31550 NORTHWESTERN HWY
FARMINGTON HILLS, MI 48334

PROJECT TITLE
THE AVALON - HILL ROAD
HIGHLAND ROAD
WHITE LAKE TWP, MI

REVISIONS

FINAL SITE PLAN REVIEW	5/8/25
FINAL SITE PLAN REVIEW	9/30/25

ORIGINAL ISSUE DATE:
MAY 8, 2025

DRAWING TITLE
ROAD PLAN & PROFILE

PEA JOB NO.	2021-0084
P.M.	JC
DN.	BSH/JEB
DES.	BSH

DRAWING NUMBER:
C-4.23

S:\PROJECTS\2021\2021-0084 WHITE LAKE MIXED USE\DWG\CONSTRUCTION\HILL ROAD\[C-4.1] GRADE- 210084 HILL.dwg



GRADING LEGEND:

- +696.91 / 622.50 — EXISTING SPOT ELEVATION; PROPOSED SPOT ELEVATION: TYPICALLY TOP OF PAVEMENT IN PAVED AREAS, GUTTER GRADE IN CURB LINES.
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REFER TO GRADING NOTES ON SHEET C-5.1.

RETAINING WALL NOTE:

TOP OF WALL (T/W) AND BOTTOM OF WALL (B/W) GRADES ARE THE FINISH GRADE AT THE TOP AND BOTTOM OF THE RETAINING WALL, NOT ACTUAL TOP AND BOTTOM OF THE WALL STRUCTURE.

ALL RETAINING WALLS OVER 30" HIGH WILL HAVE A 42" HIGH DECORATIVE FENCE ON TOP.

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GENERAL GRADING AND EARTHWORK NOTES:

THESE NOTES APPLY TO ALL CONSTRUCTION ACTIVITIES ON THIS PROJECT

1. CONTRACTOR SHALL FIELD VERIFY ALL EXISTING TREES AND BRUSH AND REMOVE ALL THAT ARE NECESSARY TO GRADE SITE.
2. ALL GRADES ARE TO TOP OF PAVEMENT UNLESS OTHERWISE NOTED.
3. THE STAGING OF CONSTRUCTION ACTIVITIES SHALL OCCUR ONLY WITHIN THE SITE BOUNDARIES. ANY CONSTRUCTION ACTIVITIES OUTSIDE OF THE SITE BOUNDARIES SHALL BE AT THE SOLE RESPONSIBILITY AND RISK OF THE CONTRACTOR.
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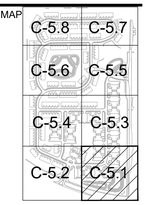
NORTH

0 15 30 60
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KEY MAP



CLIENT

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31550 NORTHWESTERN HWY
FARMINGTON HILLS, MI 48334

PROJECT TITLE

THE AVALON - MULTI FAMILY
HIGHLAND ROAD
WHITE LAKE TWP, MI

REVISIONS	
DRAFT	2/19/24
ISSUED FOR OWNER REVIEW	4/24/24
FINAL SITE PLAN REVIEW	7/3/24
FINAL SITE PLAN REVIEW	5/8/25
FINAL SITE PLAN REVIEW	9/30/25

ORIGINAL ISSUE DATE:
DECEMBER 4, 2023

DRAWING TITLE

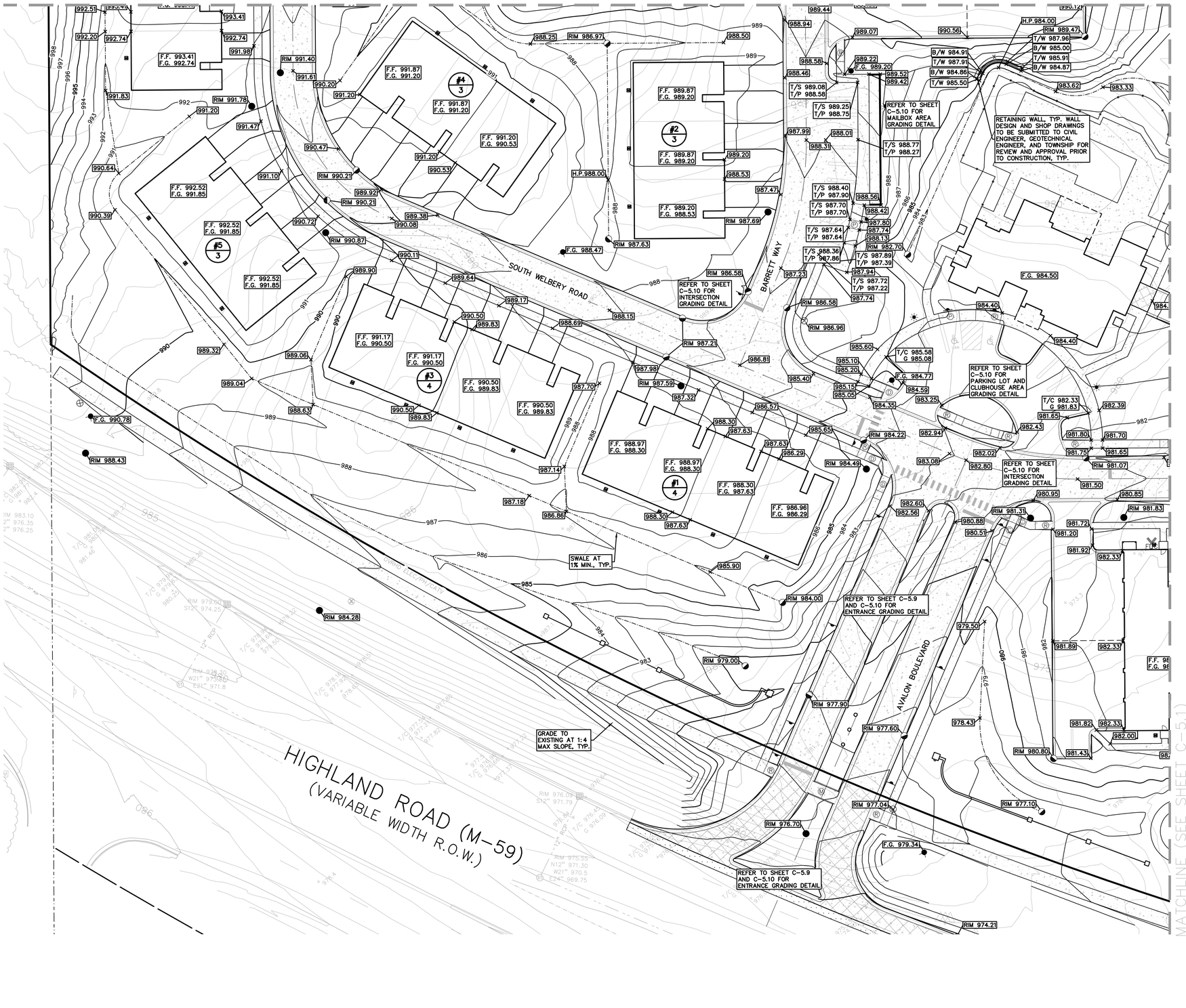
GRADING PLAN - 1

PEA JOB NO.	2021-0084
P.M.	JC
DN.	BSH/JEB
DES.	BSH

DRAWING NUMBER:

C-5.1

MATCHLINE (SEE SHEET C-5.4)



GRADING LEGEND:

+496.49	EXISTING SPOT ELEVATION
622.50	PROPOSED SPOT ELEVATION: TYPICALLY TOP OF PAVEMENT IN PAVED AREAS, GUTTER GRADE IN CURB LINES.
670	EXISTING CONTOUR
922	PROPOSED CONTOUR
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REFER TO GRADING NOTES ON SHEET C-5.1.

RETAINING WALL NOTE:
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ALL RETAINING WALLS OVER 30" HIGH WILL HAVE A 42" HIGH DECORATIVE FENCE ON TOP.

NOTE:
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www.peagroup.com

STATE OF MICHIGAN
BRETT STURGEON HOLLANDSWORTH
LICENSED PROFESSIONAL ENGINEER
License No. 6201064949

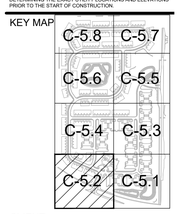
NORTH

0 15 30 60
SCALE: 1" = 30'

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

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KEY MAP



CLIENT
WHITE LAKE HILL, LLC
31550 NORTHWESTERN HWY
FARMINGTON HILLS, MI 48334

PROJECT TITLE
THE AVALON - MULTI FAMILY
HIGHLAND ROAD
WHITE LAKE TWP, MI

REVISIONS	
DRAFT	2/19/24
ISSUED FOR OWNER REVIEW	4/24/24
FINAL SITE PLAN REVIEW	7/3/24
FINAL SITE PLAN REVIEW	5/8/25
FINAL SITE PLAN REVIEW	9/30/25

ORIGINAL ISSUE DATE:
DECEMBER 4, 2023

DRAWING TITLE
GRADING PLAN - 2

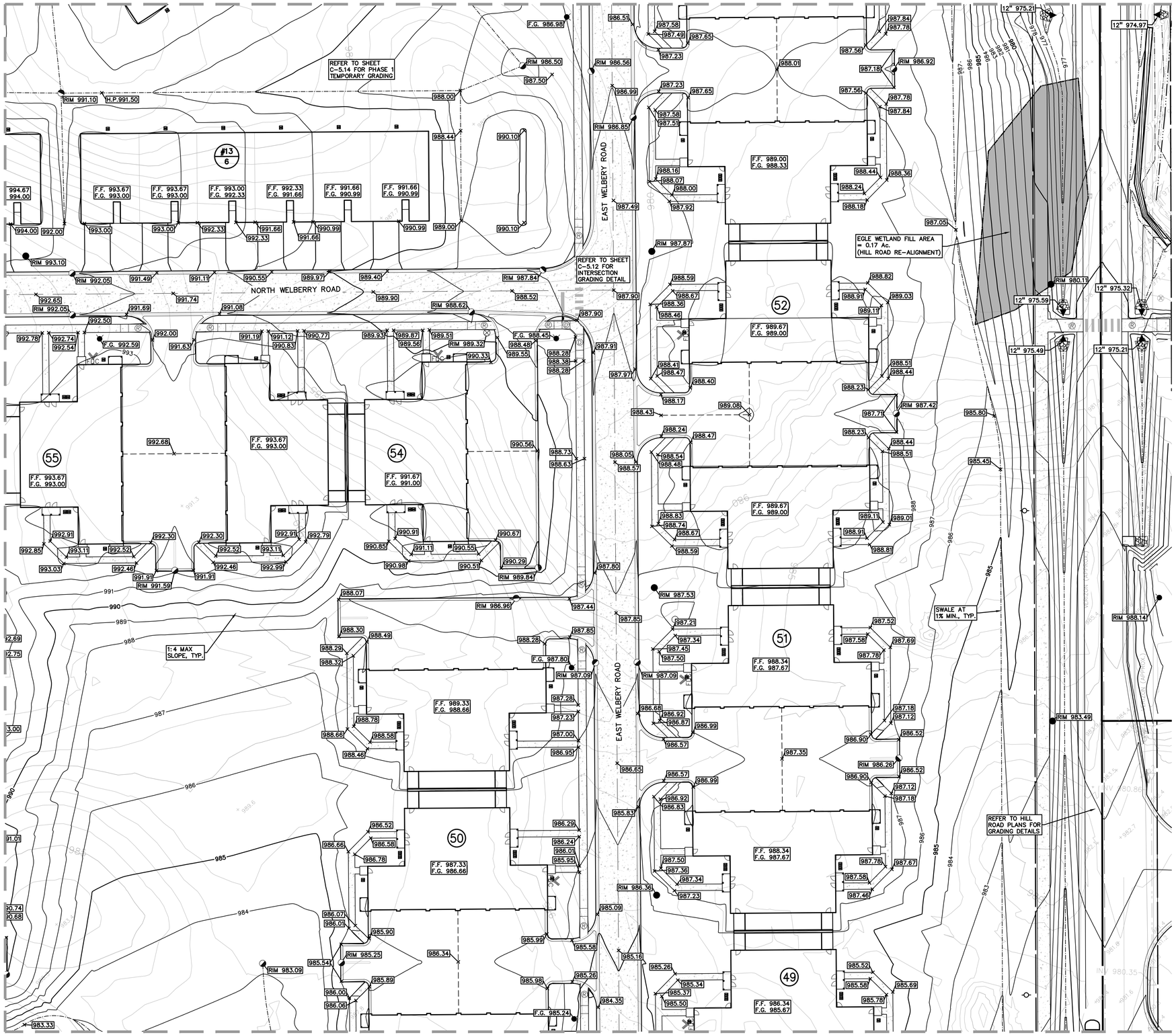
PEA JOB NO.	2021-0084
P.M.	JC
DN.	BSH/JEB
DES.	BSH

DRAWING NUMBER:
C-5.2

MATCHLINE (SEE SHEET C-5.5)

MATCHLINE (SEE SHEET C-5.4)

MATCHLINE (SEE SHEET C-5.1)



GRADING LEGEND:

- EXISTING SPOT ELEVATION
- PROPOSED SPOT ELEVATION: TYPICALLY TOP OF PAVEMENT IN PAVED AREAS, GUTTER GRADE IN CURB LINES.
- EXISTING CONTOUR
- PROPOSED CONTOUR
- PROPOSED REVERSE GUTTER PAN
- PROPOSED RIDGE LINE
- PROPOSED SWALE/DITCH

ABBREVIATIONS

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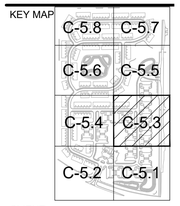
NORTH

0 15 30 60
SCALE: 1" = 30'

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PROJECT TITLE
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WHITE LAKE TWP. MI

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ORIGINAL ISSUE DATE:
DECEMBER 4, 2023

DRAWING TITLE
GRADING PLAN - 3

PEA JOB NO.	2021-0084
P.M.	JC
DN.	BSH/JEB
DES.	BSH

DRAWING NUMBER:
C-5.3

MATCHLINE (SEE SHEET C-5.6)

NORTH WELBERY ROAD

WEST WELBERY ROAD

BARRETT WAY

GRADE TO EXISTING AT PROPERTY LINE AT 1:4 MAX SLOPE, TYP.

REFER TO SHEET C-5.12 FOR INTERSECTION GRADING DETAIL

REFER TO SHEET C-5.12 FOR INTERSECTION GRADING DETAIL

SWALE AT 1% MIN., TYP.

#4 3

#5 6

#6 6

#7 6

#8 6

#9 4

#10 6

#11 6

#12 6

57

56

MATCHLINE (SEE SHEET C-5.2)

MATCHLINE (SEE SHEET C-5.3)

GRADING LEGEND:

- EXISTING SPOT ELEVATION
- PROPOSED SPOT ELEVATION: TYPICALLY TOP OF PAVEMENT IN PAVED AREAS, GUTTER GRADE IN CURB LINES.
- EXISTING CONTOUR
- PROPOSED CONTOUR
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ABBREVIATIONS

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REFER TO GRADING NOTES ON SHEET C-5.1.

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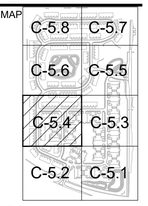
NORTH

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WHITE LAKE TWP, MI

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DRAWING TITLE
GRADING PLAN - 4

PEA JOB NO.	2021-0084
P.M.	JC
DN.	BSH/JEB
DES.	BSH

DRAWING NUMBER:
C-5.4

MATCHLINE (SEE SHEET C-5.7)

SHEET C-13.1 FOR TYPICAL DETAILS

OLMSTEAD DRIVE

RICHMOND WAY

EAST WELBERY ROAD

HILL ROAD

DETENTION BASIN #2

125 LF MODULAR BLOCK RETAINING WALL, 0'-10' TALL, APX 615 SF. FINAL TYPE AND STYLE TO BE APPROVED BY THE OWNER. REFER TO SHEET C-13.1 FOR TYPICAL DETAILS.

RETAINING WALL, TYP. WALL DESIGN AND SHOP DRAWINGS TO BE SUBMITTED TO CIVIL ENGINEER, GEOTECHNICAL ENGINEER, AND TOWNSHIP FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION, TYP.

TEMPORARY DISTURBANCE WITHIN WETLAND SETBACK FOR GRADING AND UTILITY INSTALLATION. RESTORATION SHALL BE COMPLETED WITHIN 30 DAYS OF FINAL GRADING. REFER TO LANDSCAPE PLANS FOR RESTORATION.

EGLE WETLAND FILL AREA = 0.11 Ac. (HILL ROAD RE-ALIGNMENT)

REFER TO SHEET C-5.11 FOR INTERSECTION GRADING DETAIL

REFER TO SHEET C-5.11 FOR ENTRANCE GRADING DETAIL

REFER TO HILL ROAD PLANS FOR GRADING DETAILS

SWALE AT 1% MINIMUM, TYP.

MATCHLINE (SEE SHEET C-5.6)

MATCHLINE (SEE SHEET C-5.3)

GRADING LEGEND:

- EXISTING SPOT ELEVATION
- PROPOSED SPOT ELEVATION: TYPICALLY TOP OF PAVEMENT IN PAVED AREAS, GUTTER GRADE IN CURB LINES.
- EXISTING CONTOUR
- PROPOSED CONTOUR
- PROPOSED REVERSE GUTTER PAN
- PROPOSED RIDGE LINE
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ABBREVIATIONS

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REFER TO GRADING NOTES ON SHEET C-5.1.

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NORTH

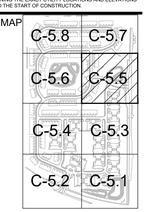
0 15 30 60

SCALE: 1" = 30'

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FINAL SITE PLAN REVIEW	9/30/25

ORIGINAL ISSUE DATE:
DECEMBER 4, 2023

DRAWING TITLE

GRADING PLAN - 5

PEA JOB NO.	2021-0084
P.M.	JC
DN.	BSH/JEB
DES.	BSH

DRAWING NUMBER:

C-5.5

MATCHLINE (SEE SHEET C-5.8)

RETAINING WALL, TYP. WALL DESIGN AND SHOP DRAWINGS TO BE SUBMITTED TO CIVIL ENGINEER, GEOTECHNICAL ENGINEER, AND TOWNSHIP FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION, TYP.

270 LF MODULAR BLOCK RETAINING WALL, 0'-16.5' TALL, APX 2,600 SF. FINAL TYPE AND STYLE TO BE APPROVED BY THE OWNER. REFER TO SHEET C-13.1 FOR TYPICAL DETAILS.

GRADE TO EXISTING AT PROPERTY LINE AT 1:4 MAX SLOPE, TYP.

WEST TAYLOR STREET

1:6 SLOPE IN DETENTION BASIN, TYP.

DETENTION BASIN #3

SWALE AT 1% MINIMUM, TYP.

OLMSTEAD DRIVE

REFER TO SHEET C-5.12 FOR INTERSECTION GRADING DETAIL

MATCHLINE (SEE SHEET C-5.4)

MATCHLINE (SEE SHEET C-5.5)

GRADING LEGEND:

- +696.91 — EXISTING SPOT ELEVATION
- 622.50 — PROPOSED SPOT ELEVATION: TYPICALLY TOP OF PAVEMENT IN PAVED AREAS, GUTTER GRADE IN CURB LINES.
- 670 — EXISTING CONTOUR
- 922 — PROPOSED CONTOUR
- PROPOSED REVERSE GUTTER PAN
- PROPOSED RIDGE LINE
- PROPOSED SWALE/DITCH

ABBREVIATIONS

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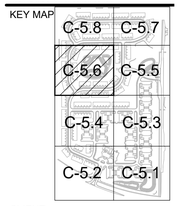
NORTH

0 15 30 60
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KEY MAP



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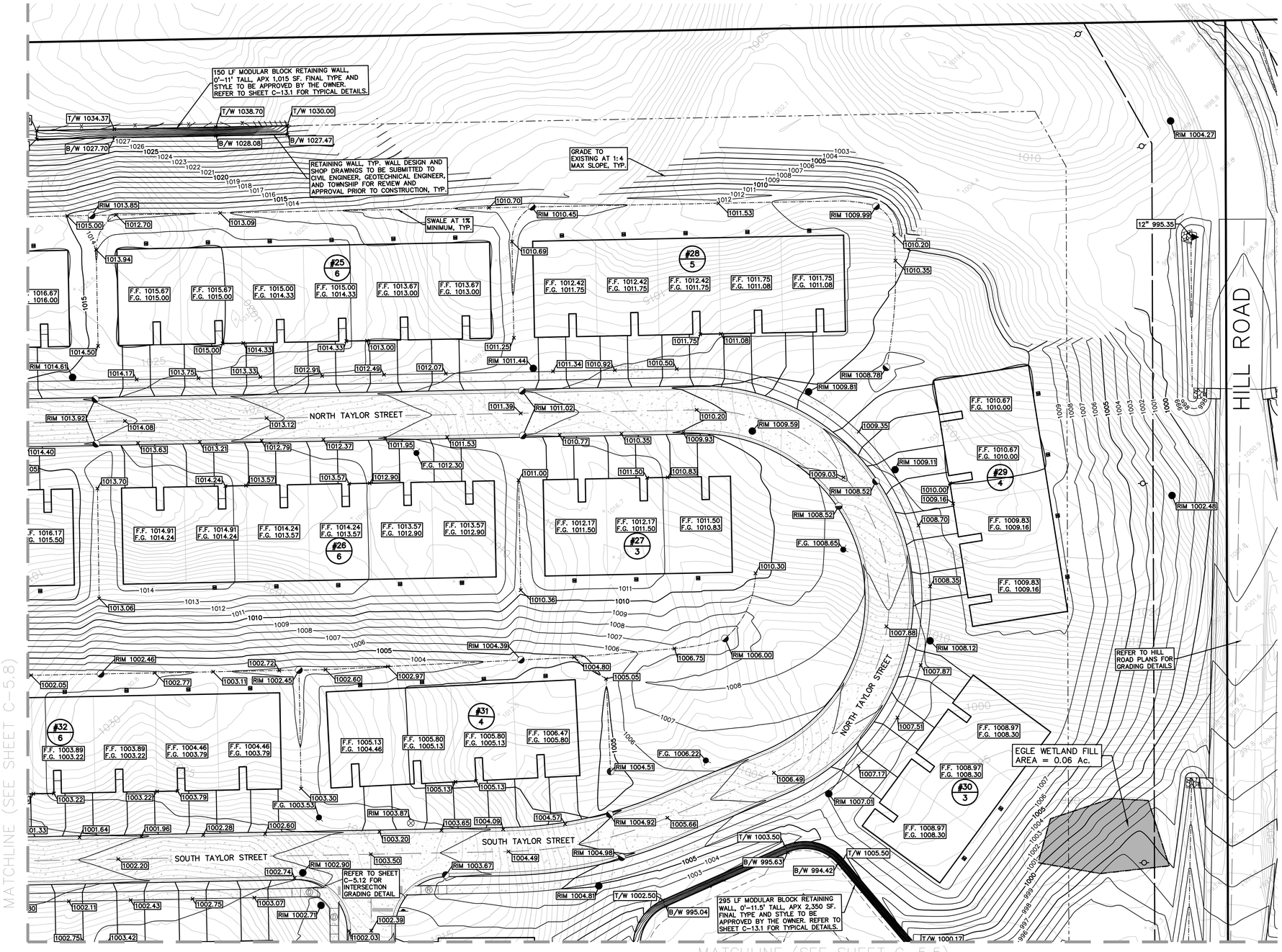
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ORIGINAL ISSUE DATE:
DECEMBER 4, 2023

DRAWING TITLE
GRADING PLAN - 6

PEA JOB NO.	2021-0084
P.M.	JC
DN.	BSH/JEB
DES.	BSH

DRAWING NUMBER:
C-5.6



GRADING LEGEND:

- EXISTING SPOT ELEVATION
- PROPOSED SPOT ELEVATION: TYPICALLY TOP OF PAVEMENT IN PAVED AREAS, GUTTER GRADE IN CURB LINES.
- EXISTING CONTOUR
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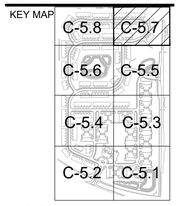
0 15 30 60

SCALE: 1" = 30'

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PROJECT TITLE

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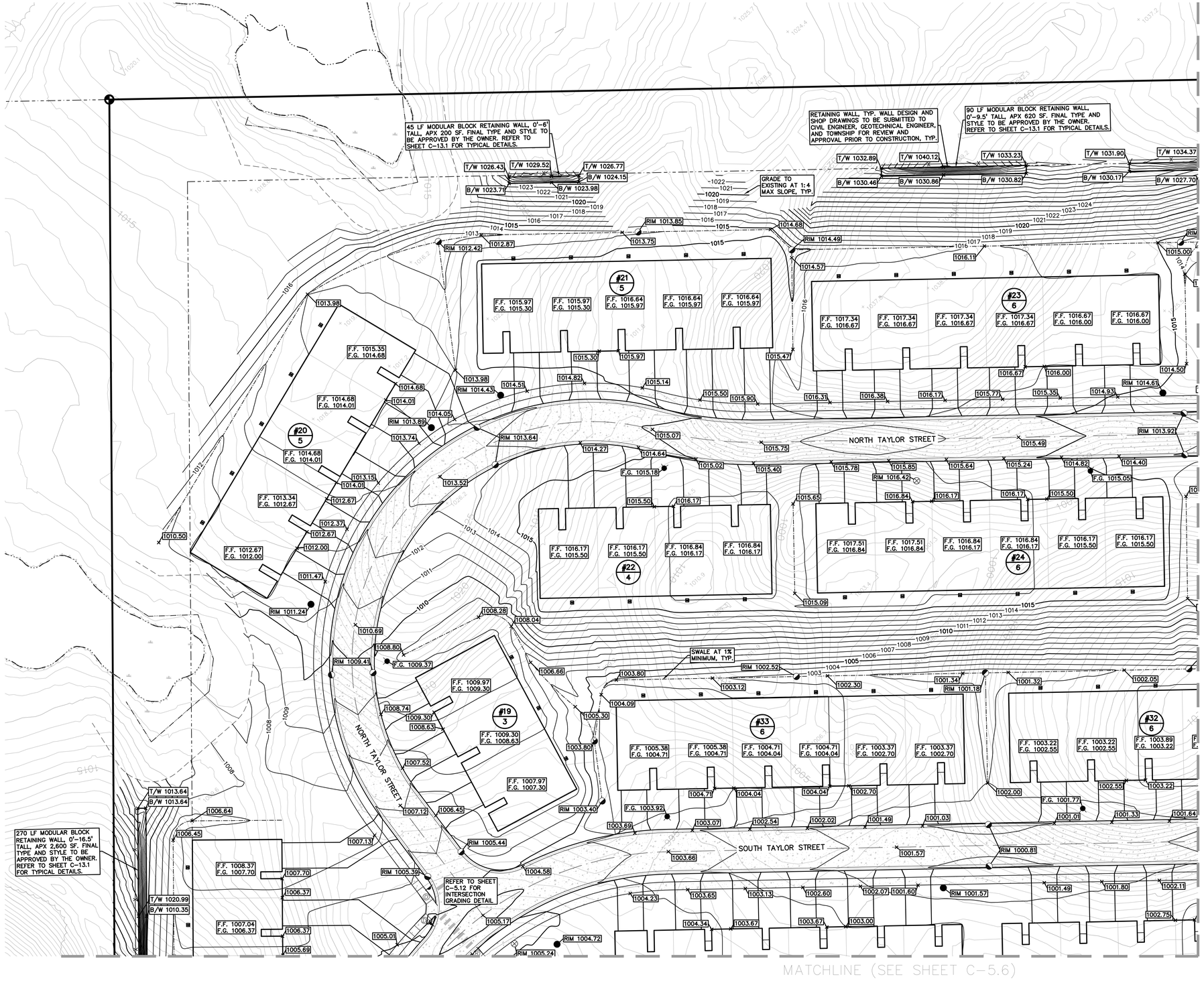
DRAWING TITLE

GRADING PLAN - 7

PEA JOB NO.	2021-0084
P.M.	JC
DN.	BSH/JEB
DES.	BSH

DRAWING NUMBER:

C-5.7



GRADING LEGEND:

- EXISTING SPOT ELEVATION (+696.91)
- PROPOSED SPOT ELEVATION: TYPICALLY TOP OF PAVEMENT IN PAVED AREAS, GUTTER GRADE IN CURB LINES. (622.50)
- EXISTING CONTOUR (670)
- PROPOSED CONTOUR (922)
- PROPOSED REVERSE GUTTER PAN
- PROPOSED RIDGE LINE
- PROPOSED SWALE/DITCH

ABBREVIATIONS

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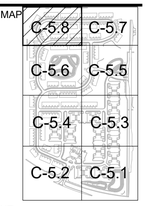
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FINAL SITE PLAN REVIEW	7/3/24
FINAL SITE PLAN REVIEW	5/8/25
FINAL SITE PLAN REVIEW	9/30/25

ORIGINAL ISSUE DATE:
DECEMBER 4, 2023

DRAWING TITLE
GRADING PLAN - 8

PEA JOB NO.	2021-0084
P.M.	JC
DN.	BSH/JEB
DES.	BSH

DRAWING NUMBER:
C-5.8



GRADING LEGEND:

- EXISTING SPOT ELEVATION
- PROPOSED SPOT ELEVATION: TYPICALLY TOP OF PAVEMENT IN PAVED AREAS, GUTTER GRADE IN CURB LINES.
- EXISTING CONTOUR
- PROPOSED CONTOUR
- PROPOSED REVERSE GUTTER PAN
- PROPOSED RIDGE LINE
- PROPOSED SWALE/DITCH

ABBREVIATIONS

T/C = TOP OF CURB	G = GUTTER GRADE
T/P = TOP OF PAVEMENT	FG = FINISH GRADE
T/S = TOP OF SIDEWALK	RIM = RIM ELEVATION
T/W = TOP OF WALL	B/W = BOTTOM OF WALL

REFER TO GRADING NOTES ON SHEET C-5.1.

NOTE:

PRIOR TO ANY CONSTRUCTION OR GRADING ON THE SITE, SILT FENCE SHALL BE INSTALLED AT THE UPLAND EDGE OF NATURAL FEATURES SETBACKS OR ANY PROPOSED LIMIT OF GRADING. THE SILT FENCING SHALL BE REMOVED AFTER CONSTRUCTIONS ONCE THE AREA IS STABILIZED AND VEGETATION HAD BEEN ESTABLISHED

GENERAL GRADING AND EARTHWORK NOTES:

THESE NOTES APPLY TO ALL CONSTRUCTION ACTIVITIES ON THIS PROJECT

1. CONTRACTOR SHALL FIELD VERIFY ALL EXISTING TREES AND BRUSH AND REMOVE ALL THAT ARE NECESSARY TO GRADE SITE.
2. ALL GRADES ARE TO TOP OF PAVEMENT UNLESS OTHERWISE NOTED.
3. THE STAGING OF CONSTRUCTION ACTIVITIES SHALL OCCUR ONLY WITHIN THE SITE BOUNDARIES. ANY CONSTRUCTION ACTIVITIES OUTSIDE OF THE SITE BOUNDARIES SHALL BE AT THE SOLE RESPONSIBILITY AND RISK OF THE CONTRACTOR.
4. ALL SOIL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL MEET THE REQUIREMENTS OF THE AUTHORIZED PUBLIC AGENCY OF JURISDICTION. AN EROSION CONTROL PERMIT MUST BE SECURED FROM THE COUNTY PRIOR TO CONSTRUCTION.
5. ALL EARTHWORK AND GRADING OPERATIONS SHALL BE PERFORMED IN ACCORDANCE WITH THE SOILS INVESTIGATION AND REPORT.
6. REFER TO SOIL EROSION CONTROL PLAN FOR ADDITIONAL SOIL EROSION AND SEDIMENTATION CONTROL MEASURES AND NOTES.
7. THE DETENTION BASIN SIDE SLOPES AND ALL SLOPE EXCEEDING 1:6 MUST BE STABILIZED BY SODDING OR BY PLACING A MULCH BLANKET PEGGED IN PLACE OVER SEED.
8. ALL DISTURBED AREAS SHALL BE SEEDED AND MULCHED OR SODDED IN ACCORDANCE WITH THE LANDSCAPE PLANS. PROVIDE A MINIMUM OF 3" OF TOPSOIL IN THESE AREAS UNLESS OTHERWISE NOTED.
9. THE CONTRACTOR SHALL NOTE EXISTING UNDERGROUND UTILITIES WITHIN AND ADJACENT TO THE SITE. BACKFILL FOR EXISTING UTILITY TRENCHES SHALL BE EXAMINED CRITICALLY. ANY TRENCHES FOUND TO HAVE SOFT, UNSTABLE OR UNSUITABLE BACKFILL MATERIAL, IN THE OPINION OF THE THIRD PARTY TESTING COMPANY, THAT ARE TO BE WITHIN THE ZONE OF INFLUENCE OF PROPOSED BUILDINGS OR PAVEMENT SHALL BE COMPLETELY EXCAVATED AND BACKFILLED WITH SUITABLE MATERIAL.
10. ON-SITE FILL CAN BE USED IF THE SPECIFIED COMPACTION REQUIREMENTS CAN BE ACHIEVED. IF ON-SITE SOIL IS USED, IT SHOULD BE CLEAN AND FREE OF FROZEN SOIL, ORGANICS, OR OTHER DELETERIOUS MATERIALS.
11. THE FINAL SUBGRADE/EXISTING AGGREGATE BASE SHOULD BE THOROUGHLY PROOFROLLED USING A FULLY LOADED TANDEM AXLE TRUCK OR FRONT END LOADER UNDER THE OBSERVATION OF A GEOTECHNICAL/PAVEMENT ENGINEER. LOOSE OR YIELDING AREAS THAT CANNOT BE MECHANICALLY STABILIZED SHOULD BE REINFORCED USING GEOGRIDS OR REMOVED AND REPLACED WITH ENGINEERED FILL OR AS DICTATED BY FIELD CONDITIONS.
12. SUBGRADE UNDERCUTTING, INCLUDING BACKFILLING SHALL BE PERFORMED TO REPLACE MATERIALS SUSCEPTIBLE TO FROST HEAVING AND UNSTABLE SOIL CONDITIONS. ANY EXCAVATIONS THAT MAY BE REQUIRED BELOW THE TOPSOIL IN FILL AREAS OR BELOW PROPOSED SUBGRADE IN CUT AREAS WILL BE CLASSIFIED AS SUBGRADE UNDERCUTTING.
13. SUBGRADE UNDERCUTTING SHALL BE PERFORMED WHERE NECESSARY AND THE EXCAVATED MATERIAL SHALL BECOME THE PROPERTY OF THE CONTRACTOR. ANY SUBGRADE UNDERCUTTING SHALL BE BACKFILLED AS RECOMMENDED IN THE GEOTECHNICAL ENGINEERING REPORT FOR THE PROJECT.
14. ANY SUBGRADE WATERING REQUIRED TO ACHIEVE REQUIRED DENSITY SHALL BE CONSIDERED INCIDENTAL TO THE JOB.

EARTHWORK BALANCING NOTE:

THE CONTRACTOR SHALL BE RESPONSIBLE FOR IMPORTING OR EXPORTING ALL MATERIALS AS REQUIRED TO PROPERLY GRADE THIS PROJECT TO THE FINISHED ELEVATIONS SHOWN ON THE APPROVED PLANS. THE CONTRACTOR SHALL MAKE THEIR OWN DETERMINATION OF CUT AND FILL QUANTITIES AND ALLOW FOR REMOVAL OF EXCESS OR IMPORTATION OF ADDITIONAL MATERIAL AT NO ADDITIONAL COST TO THE OWNER.

SIDEWALK RAMP LEGEND:

SIDEWALK RAMP 'TYPE R'	Ⓡ
SIDEWALK RAMP 'TYPE F'	Ⓕ
SIDEWALK RAMP 'TYPE P'	Ⓟ
SIDEWALK RAMP 'TYPE C'	Ⓒ
SIDEWALK RAMP 'TYPE D'	Ⓓ
CURB DROP ONLY	Ⓧ

REFER TO LATEST MDOT R-28 STANDARD RAMP AND DETECTABLE WARNING DETAILS

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www.peagroup.com

STATE OF MICHIGAN
BRETT STURGEON HOLLANDSWORTH
License No. 6201064949
LICENSED PROFESSIONAL ENGINEER

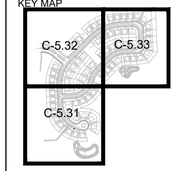
NORTH

0 20 40 80
SCALE: 1" = 40'

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

CAUTION!!
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KEY MAP



CLIENT

WHITE LAKE HILL, LLC
31550 NORTHWESTERN HWY
FARMINGTON HILLS, MI 48334

PROJECT TITLE

THE AVALON - SINGLE FAMILY
HIGHLAND ROAD
WHITE LAKE TWP, MI

REVISIONS

FINAL SITE PLAN REVIEW	5/8/25
FINAL SITE PLAN REVIEW	9/30/25

ORIGINAL ISSUE DATE:
MAY 8, 2025

DRAWING TITLE

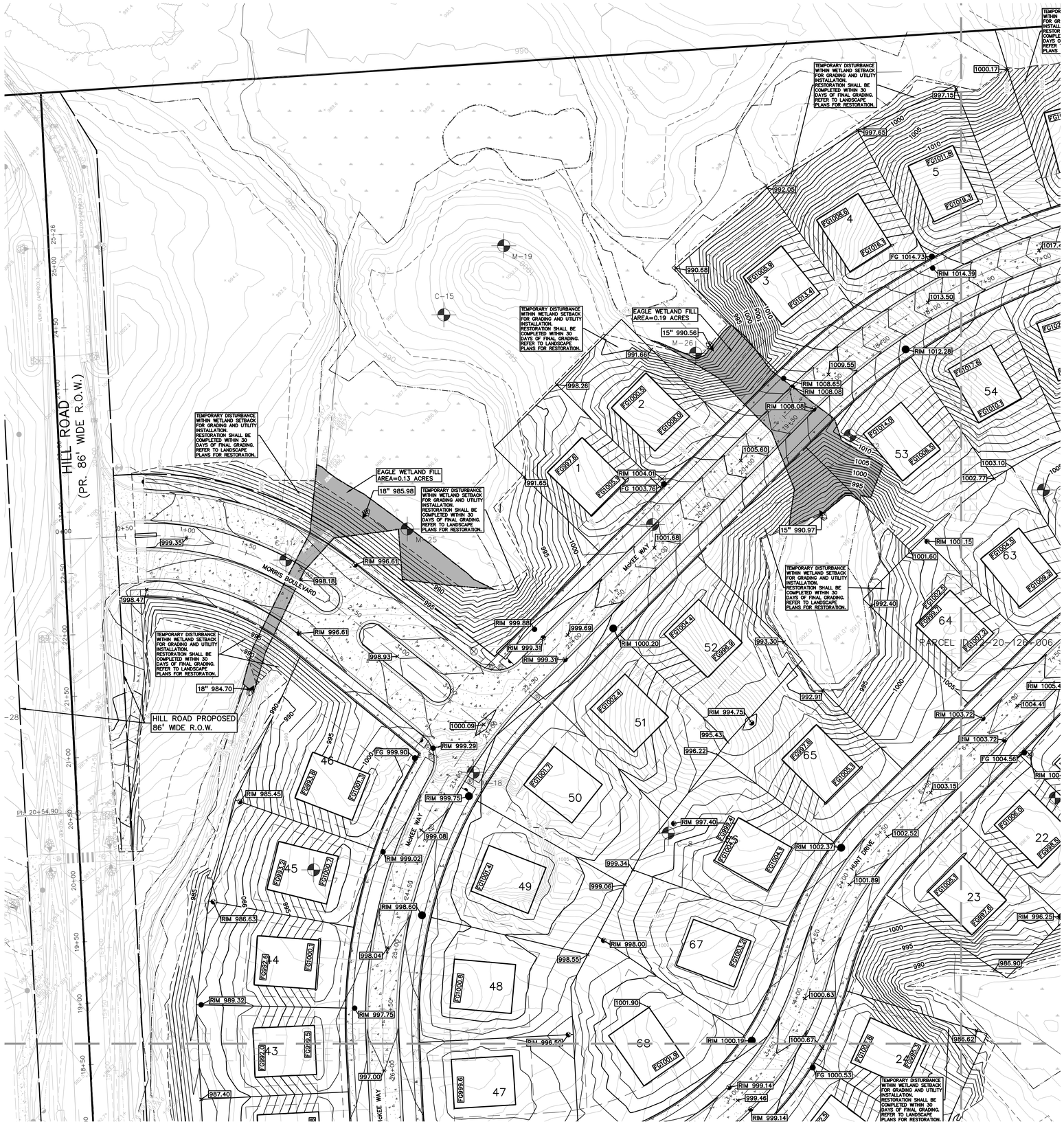
GRADING PLAN - SOUTH

PEA JOB NO.	2021-0084
P.M.	JC
DN.	BSH/JEB
DES.	BSH

DRAWING NUMBER:

C-5.31

G:\PROJECTS\2021\2021-0084 WHITE LAKE MIXED USE\DWG\CONSTRUCTION\1-SINGLE FAMILY\(C-5.0) GRADE-21-0084 9".dwg



GRADING LEGEND:

- 698.8 / 622.50 — EXISTING SPOT ELEVATION; PROPOSED SPOT ELEVATION: TYPICALLY TOP OF PAVEMENT IN PAVED AREAS, GUTTER GRADE IN CURB LINES.
- 670 — EXISTING CONTOUR
- 922 — PROPOSED CONTOUR
- PROPOSED REVERSE GUTTER PAN
- PROPOSED RIDGE LINE
- PROPOSED SWALE/DITCH

ABBREVIATIONS

T/C = TOP OF CURB	G = GUTTER GRADE
T/P = TOP OF PAVEMENT	FG = FINISH GRADE
T/S = TOP OF SIDEWALK	RIM = RIM ELEVATION
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REFER TO GRADING NOTES ON SHEET C-5.1.

SIDEWALK RAMP LEGEND:

SIDEWALK RAMP 'TYPE R'	(R)
SIDEWALK RAMP 'TYPE F'	(F)
SIDEWALK RAMP 'TYPE P'	(P)
SIDEWALK RAMP 'TYPE C'	(C)
SIDEWALK RAMP 'TYPE D'	(D)
CURB DROP ONLY	(X)

REFER TO LATEST MDOT R-28 STANDARD RAMP AND DETECTABLE WARNING DETAILS

NOTE:

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PEA GROUP
t: 844.813.2949
www.peagroup.com

STATE OF MICHIGAN — BRETT STURGEON HOLLANDSWORTH — LICENSED PROFESSIONAL ENGINEER — License No. 6201064949

NORTH

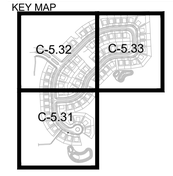
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SCALE: 1" = 40'

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KEY MAP



CLIENT

WHITE LAKE HILL, LLC
31550 NORTHWESTERN HWY
FARMINGTON HILLS, MI 48334

PROJECT TITLE

THE AVALON - SINGLE FAMILY
HIGHLAND ROAD
WHITE LAKE TWP., MI

REVISIONS	
FINAL SITE PLAN REVIEW	5/8/25
FINAL SITE PLAN REVIEW	9/30/25

ORIGINAL ISSUE DATE:
MAY 8, 2025

DRAWING TITLE

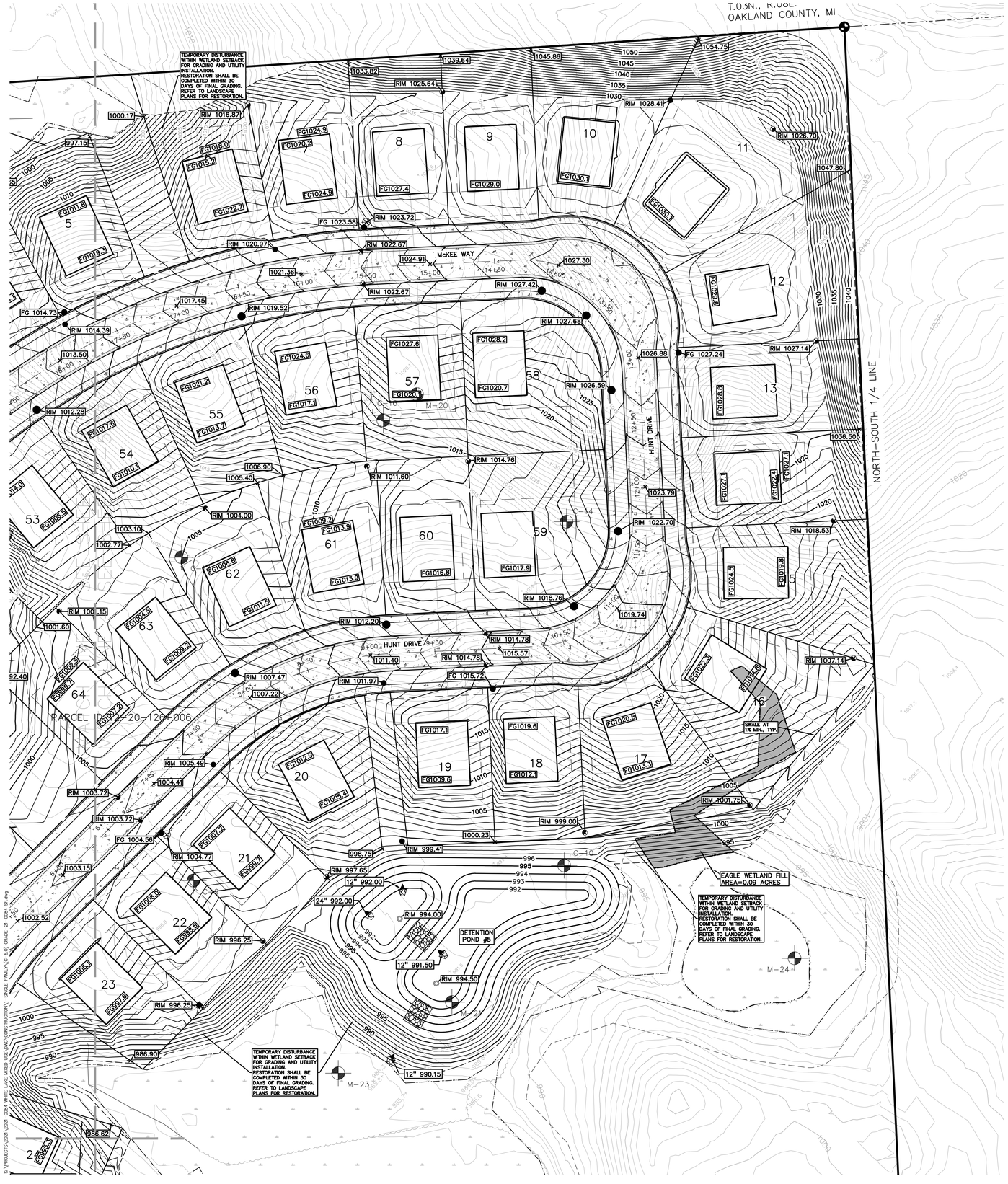
GRADING PLAN - WEST

PEA JOB NO.	2021-0084
P.M.	JC
DN.	BSH/JEB
DES.	BSH

DRAWING NUMBER:

C-5.32

S:\PROJECTS\2021\2021-0084 WHITE LAKE MIXED USE\DWG\CONSTRUCTION\1-SINGLE FAMILY\C-5.0 GRADE-21-0084 SF.dwg



GRADING LEGEND:

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REFER TO GRADING NOTES ON SHEET C-5.1.

SIDEWALK RAMP LEGEND:

SIDEWALK RAMP 'TYPE R'	Ⓡ
SIDEWALK RAMP 'TYPE F'	Ⓕ
SIDEWALK RAMP 'TYPE P'	Ⓟ
SIDEWALK RAMP 'TYPE C'	Ⓒ
SIDEWALK RAMP 'TYPE D'	Ⓓ
CURB DROP ONLY	Ⓧ

REFER TO LATEST MDOT R-28 STANDARD RAMP AND DETECTABLE WARNING DETAILS

NOTE:

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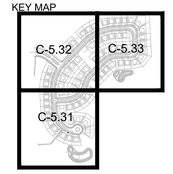
NORTH

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SCALE: 1" = 40'

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KEY MAP



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31550 NORTHWESTERN HWY
FARMINGTON HILLS, MI 48334

PROJECT TITLE

THE AVALON - SINGLE FAMILY
HIGHLAND ROAD
WHITE LAKE TWP, MI

REVISIONS

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ORIGINAL ISSUE DATE:
MAY 8, 2025

DRAWING TITLE

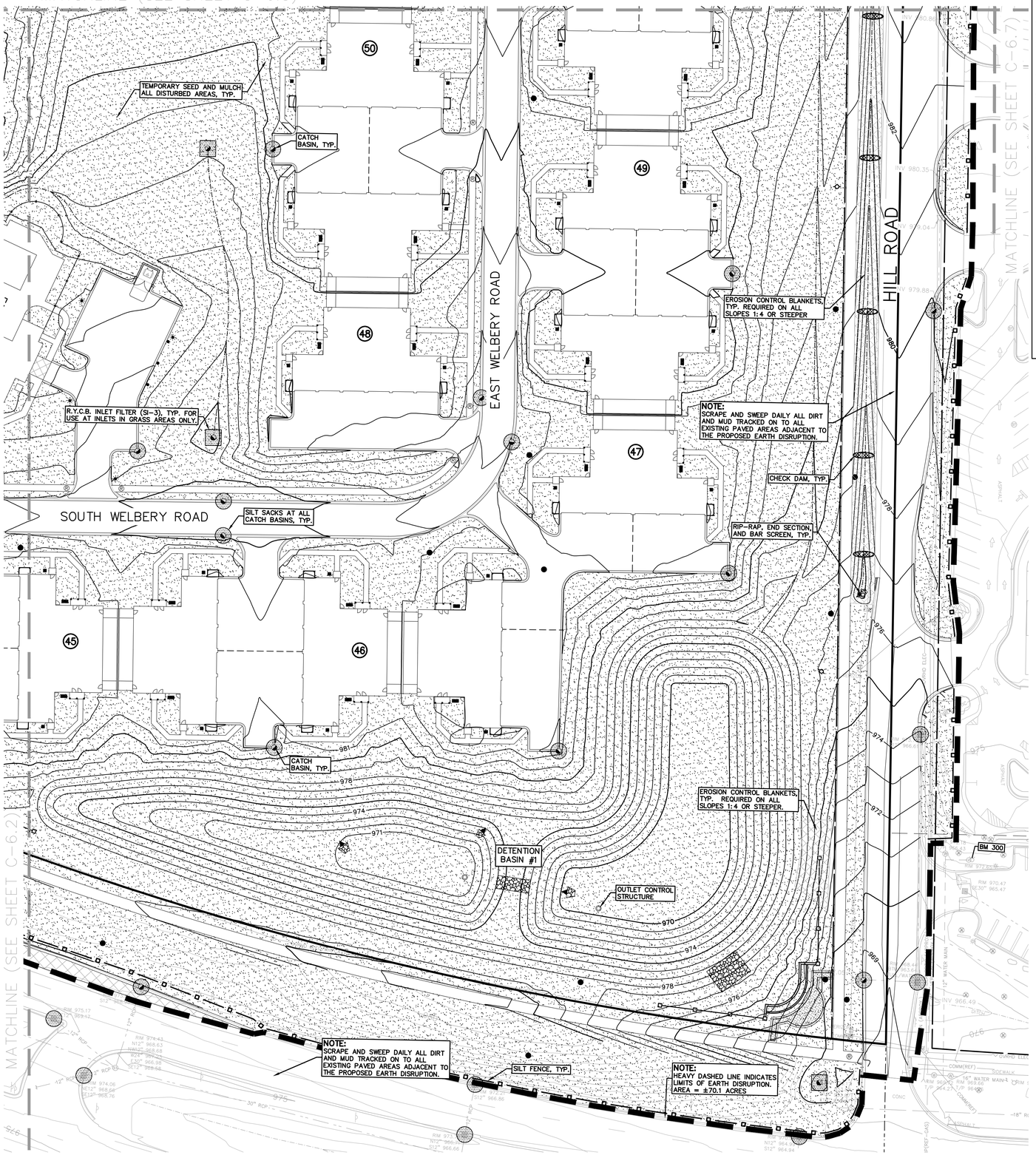
GRADING PLAN - EAST

PEA JOB NO.	2021-0084
P.M.	JC
DN.	BSH/JEB
DES.	BSH

DRAWING NUMBER:

C-5.33

G:\PROJECTS\2021\2021-0084 WHITE LAKE MIXED USE\CIVIL\CONSTRUCTION\1-SINGLE FAMILY\C-533 GRADE-21-2084 SF.dwg



SOIL EROSION AND SEDIMENTATION CONTROL SEQUENCE OF CONSTRUCTION

1. SEE OAKLAND COUNTY W.R.C. SOIL EROSION AND SEDIMENTATION CONTROL DETAILS SHEET FOR ALL SOIL EROSION CONTROL RELATED DETAILS.
2. PLACE SILT FENCE & INSTALL INLET FILTERS ON EXISTING STORM SEWER STRUCTURES, ACCORDING TO PLANS.
3. INSTALL TEMPORARY CRUSHED CONCRETE ACCESS DRIVE AT ALL CONSTRUCTION ENTRANCES. (80'x24'x8" W/MINIMUM OF 1"–3" CRUSHED CONCRETE – NO FINES).
4. REMOVE CURB, PAVEMENT, TREES, ETC. AS DIRECTED ON THE DEMOLITION PLAN.
5. STRIP AND STOCKPILE TOPSOIL FOR RESTORATION REQUIREMENTS.
6. DISPOSE OF ALL EXCESS, UNSUITABLE MATERIALS OFF SITE IN A LEGAL MANNER. NO BURN OR BURY PITS ALLOWED.
7. UNSUITABLE MATERIALS CONSIST OF, BUT ARE NOT NECESSARILY LIMITED TO THE FOLLOWING: CONCRETE, ASPHALT, TREES, BRUSH, STUMPS, ROOTS, OR OTHER MISCELLANEOUS DEBRIS OR TRASH.
8. MASS GRADE THE SITE IN ACCORDANCE WITH THE PLANS.
9. INSTALL SEED, MULCH AND EROSION CONTROL BLANKETS AS SHOWN ON THE PLAN WITHIN 5 DAYS OF COMPLETION OF MASS GRADING OR WHENEVER DISTURBED AREAS WILL REMAIN UNCHANGED FOR 30 DAYS OR GREATER. 3–4" TOPSOIL WILL BE USED WHERE VEGETATION IS REQUIRED.
10. COMPLETE ROUGH GRADING OF SITE AND INSTALL UTILITIES. PLACE INLET FILTERS AT ALL INLETS AND CATCH BASINS, AS SHOWN.
11. FINISH GRADE AND PAVE SITE AS PROPOSED TO DRAIN TO STORM SEWER SYSTEM. REPAIR INLET FILTERS AS REQUIRED.
12. APPLY TOPSOIL, SEED AND MULCH/SOD TO ALL DISTURBED AREAS UPON COMPLETION OF GRADING. THE CONTRACTOR SHALL STAGE CONSTRUCTION ACTIVITIES IN ORDER TO MINIMIZE THE EXPOSURE OF UNSTABILIZED AREAS.
13. CLEAN PAVEMENT AND STORM SEWERS. REMOVE SILT FENCE, AND INLET FILTERS ONCE VEGETATION HAS BEEN ESTABLISHED.
14. CLEAN DETENTION BASIN AND OVERFLOW SPILLWAYS AND REPAIR RIPRAP AS NECESSARY.
15. ALL DIRT AND MUD TRACKED ONTO PUBLIC ROADS SHALL BE REMOVED DAILY.
16. STREET CATCH BASINS TO BE PERIODICALLY CLEANED AND FILTER CLOTH CHANGED AND MAINTAINED.

SYMBOLS EROSION CONTROL:

- (SP-2) SILT FENCE
- (SI-2A) LOW POINT INLET FILTER
- (SI-3) RYCB INLET FILTER
- (E-3) CHECK DAM
- (SP-9) TEMPORARY STONE ACCESS DRIVE
- (E-9) EROSION CONTROL BLANKET
- (E-7) RIPRAP
- TEMPORARY SEED AND MULCH

REFER TO O.C.W.R.C. SOIL EROSION AND SEDIMENTATION CONTROL DETAILS SHEET FOR ALL DEVICE DETAILS.

EROSION CONTROL QUANTITIES:

SILT FENCE	11,891 L.F.
R.Y.C.B. INLET FILTER	37 EA.
LOW POINT INLET FILTER	102 EA.
TEMPORARY CONSTRUCTION ACCESS DRIVE	2 EA.
EROSION CONTROL BLANKETS	17,994 S.Y.
TEMPORARY SEED AND MULCH	177,263 S.Y.
CHECK DAM	29 EA.
END SECTION RIP RAP	29 EA.
SPILLWAY RIP RAP	13 EA.

SEQUENCE OF CONSTRUCTION:

START DAY	END DAY	
1	210	INSTALL CRUSHED CONCRETE ACCESS APPROACH AT SITE ROAD APPROACH.
1	239	INSTALL TEMPORARY SOIL EROSION CONTROL MEASURES, SILT FENCES, INLET PROTECTION, ETC. AS NECESSARY.
1	240	MAINTAIN A 25' BUFFER OF VEGETATION AROUND PERIMETER OF SITE WHERE POSSIBLE.
1	30	REMOVE ALL VEGETATION, TREES AND BRUSH FROM THE PROPOSED CONSTRUCTION AREA UNLESS MARKED TO REMAIN. STRIP AND STOCKPILE TOPSOIL AS REQUIRED RESTORATION. ALL STOCKPILES MUST BE GRADED AND SEEDED.
5	30	REMOVE ALL PAVEMENT, CURB, UTILITIES, ETC. AS REQUIRED TO INSTALL THE PROPOSED WORK AS SHOWN ON THE TOPOGRAPHIC SURVEY AND DEMOLITION PLAN.
5	60	DISPOSE OF ALL EXCESS/UNSUITABLE MATERIALS OFF SITE IN A LEGAL MANNER. NO ON–SITE BURN OR BURY PITS ALLOWED.
30	60	ROUGH GRADE SITE. SEED AND MULCH BLANKETS MUST BE INSTALLED AS SHOWN WITHIN 5 DAYS OF FINAL GRADE. REPAIR AND/OR RE–INSTALL ANY TEMPORARY SOIL EROSION CONTROL MEASURES THAT WERE DAMAGED DURING GRADING OPERATIONS.
60	100	INSTALL SITE UTILITIES (STORM SEWER, SANITARY SEWER, WATER MAIN ETC.). INSTALL INLET PROTECTION AT ALL PROPOSED CATCH BASINS.
60	210	TEMPORARY SEEDING MUST BE PROVIDED IN AREAS NOT TO BE WORKED ON FOR 15 DAYS OR LONGER.
100	180	BEGIN CONSTRUCTION OF BUILDING.
160	180	FINE GRADE SITE AND PREPARE FOR SITE PAVING OPERATIONS.
180	210	INSTALL ALL PAVEMENT, SIDEWALKS, CURBING AS PROPOSED. IF PERMANENT LANDSCAPING IS NOT TO BE INSTALLED SOON AFTER PAVING IS COMPLETE, ALL AREAS WITHIN 20 FEET OF BACK OF CURB MUST BE TEMPORARILY SEEDED. REPAIR INLET PROTECTION, SILT FENCE AND ANY OTHER DAMAGED SOIL EROSION CONTROL MEASURES AS NECESSARY.
210	239	FINAL GRADE, REDISTRIBUTE STOCKPILED TOPSOIL, ESTABLISH VEGETATION AND INSTALL ALL PERMANENT LANDSCAPING IN ALL DISTURBED AREAS NOT BUILT.
230	240	CLEAN PAVEMENT AND REMOVE ALL TEMPORARY SOIL EROSION CONTROL MEASURES. RE–ESTABLISH VEGETATION AS REQUIRED.
240	240	REMOVE SEDIMENTATION CONTROLS ONCE ENTIRE SITE HAS BEEN PERMANENTLY STABILIZED.

SOIL EROSION MAINTENANCE SCHEDULE AND NOTES:

1. THE SOIL EROSION CONTROLS WILL BE MAINTAINED WEEKLY AND AFTER EVERY STORM EVENT BY:

   TBD

2. IF ANY DAMAGE HAS OCCURRED AS A RESULT OF STORM WATER DISCHARGE FROM THE SITE, THE FOLLOWING STEPS SHALL BE IMPLEMENTED.
3. ANY DEBRIS OR DIRT ON ANY PAVED AREA RESULTING FROM CONSTRUCTION TRAFFIC SHALL BE CLEANED IN A PROMPT MANNER BY THE CONTRACTOR. THE CONSTRUCTION DRIVE SHALL BE CLEANED AT THE END OF EACH DAY.
4. ALL DIRT AND MUD TRACKED ONTO PAVED AREAS SHALL BE REMOVED BY THE CONTRACTOR DAILY BY SCRAPING. STREET SWEEPING IS REQUIRED WEEKLY.
5. SILT FENCE MAINTENANCE SHALL INCLUDE THE REMOVAL OF ANY BUILT UP SEDIMENT WHEN THE SEDIMENT HEIGHT ACCUMULATES TO 1/3 TO 1/2 OF THE HEIGHT OF THE FENCE. THE CONTRACTOR IS RESPONSIBLE TO REMOVE, REPLACE, RETRENCH OR REBACKFILL THE SILTATION FENCE SHOULD IT FALL OR BE DAMAGED DURING CONSTRUCTION.
6. INLET FILTER MAINTENANCE SHALL INCLUDE THE REMOVAL OF ANY ACCUMULATED SILT OR OTHER DEBRIS. THE REMOVAL OF SILT SHOULD BE WITH THE USE OF A STIFF BRISTLE BROOM OR SQUARE POINT SHOVEL. IF INLET FILTERS CAN NOT BE CLEANED OR ARE DAMAGED, THEN THE FABRIC MUST BE REPLACED.
7. CONTRACTOR SHALL PROVIDE WATER TRUCK TO WATER DOWN THE SITE ON A DAILY BASIS AS REQUIRED TO MAINTAIN DUST CONTROL.
8. IF HIGH GROUNDWATER IS ANTICIPATED OR ENCOUNTERED DURING CONSTRUCTION A DEWATERING PLAN MUST BE SUBMITTED TO THE CITY ENGINEERING DIVISION FOR REVIEW.

GENERAL SITE CONDITIONS:

1. ACCORDING TO THE GEOTECHNICAL INVESTIGATION BY MCDOWELL & ASSOCIATES DATED DECEMBER 28, 2004, THE SITE CONSISTS OF THE FOLLOWING SOIL TYPES:

   BROWN SAND, CLAYEY SAND, SANDY CLAY, AND STIFF BLUE CLAY
2. TOTAL DISTURBED AREA = ±70.5 ACRES
3. N.P.D.E.S. NOTICE OF COVERAGE IS REQUIRED

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NORTH

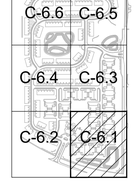
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SCALE: 1" = 40'

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KEY MAP



CLIENT

WHITE LAKE HILL, LLC
31550 NORTHWESTERN HWY
FARMINGTON HILLS, MI 48334

PROJECT TITLE

THE AVALON - MULTI FAMILY
HIGHLAND ROAD
WHITE LAKE TWP, MI

REVISIONS	
DRAFT	2/19/24
ISSUED FOR OWNER REVIEW	4/24/24
FINAL SITE PLAN REVIEW	7/3/24
FINAL SITE PLAN REVIEW	5/8/25
FINAL SITE PLAN REVIEW	9/30/25

ORIGINAL ISSUE DATE:
DECEMBER 4, 2023

DRAWING TITLE

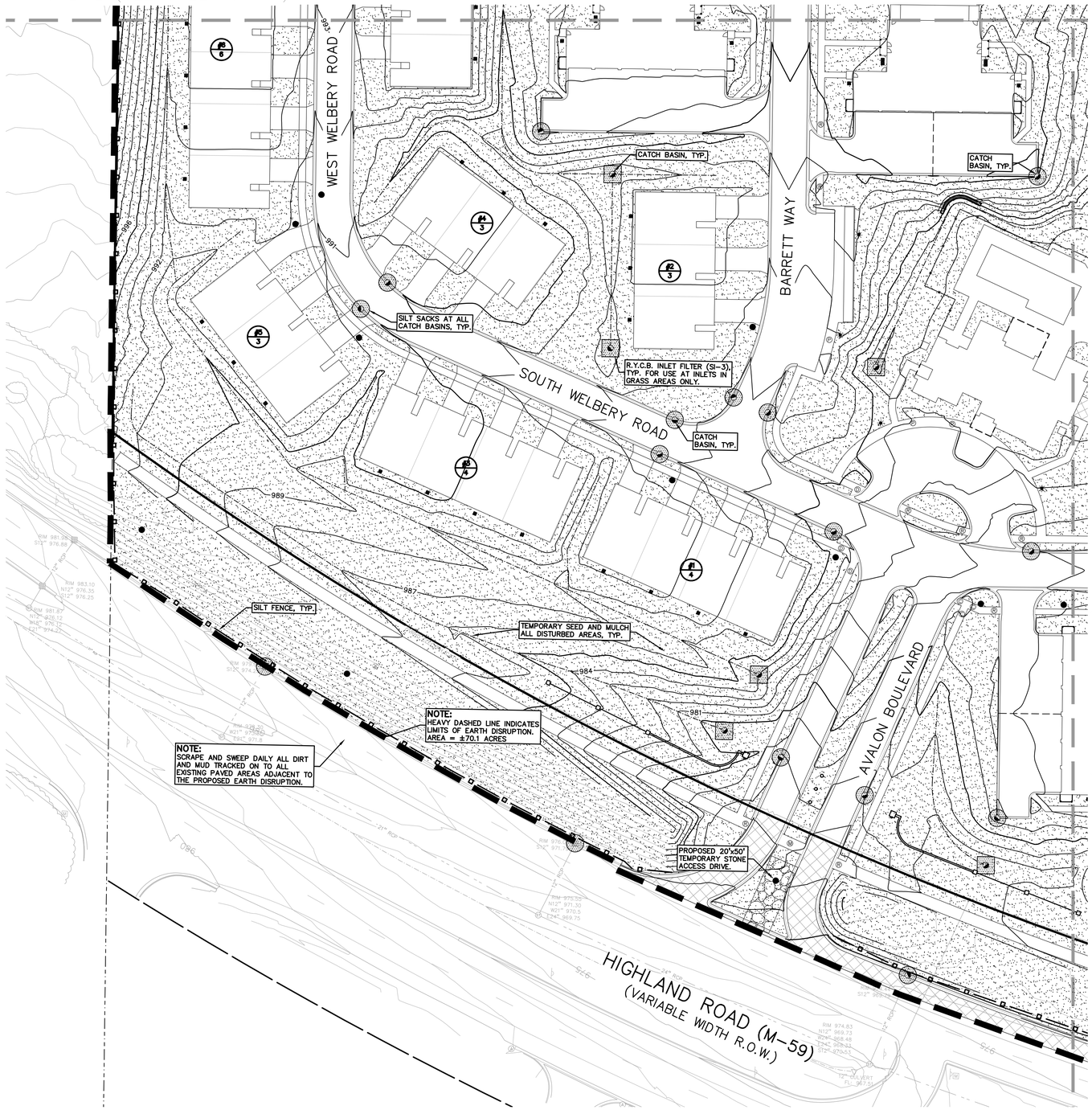
SOIL EROSION CONTROL PLAN - 1

PEA JOB NO.	2021-0084
P.M.	JC
DN.	BSH/JEB
DES.	BSH

DRAWING NUMBER:

C-6.1

MATCHLINE (SEE SHEET C-6.4)



SYMBOLS EROSION CONTROL:

- (SP-2) SILT FENCE
- (SI-2A) LOW POINT INLET FILTER
- (SI-3) RYCB INLET FILTER
- (E-3) CHECK DAM
- (SP-9) TEMPORARY STONE ACCESS DRIVE
- (E-9) EROSION CONTROL BLANKET
- (E-7) RIPRAP
- TEMPORARY SEED AND MULCH

REFER TO O.C.W.R.C. SOIL EROSION AND SEDIMENTATION CONTROL DETAILS SHEET FOR ALL DEVICE DETAILS.

PEA GROUP
t: 844.813.2949
www.peagroup.com

STATE OF MICHIGAN
BRETT STURGEON HOLLANDSWORTH
LICENSED PROFESSIONAL ENGINEER
License No. 6201064949

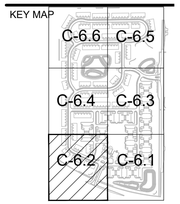
NORTH

0 20 40 80
SCALE: 1" = 40'

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KEY MAP



CLIENT
WHITE LAKE HILL, LLC
31550 NORTHWESTERN HWY
FARMINGTON HILLS, MI 48334

PROJECT TITLE
THE AVALON - MULTI FAMILY
HIGHLAND ROAD
WHITE LAKE TWP, MI

REVISIONS	
DRAFT	2/19/24
ISSUED FOR OWNER REVIEW	4/24/24
FINAL SITE PLAN REVIEW	7/3/24
FINAL SITE PLAN REVIEW	5/8/25
FINAL SITE PLAN REVIEW	9/30/25

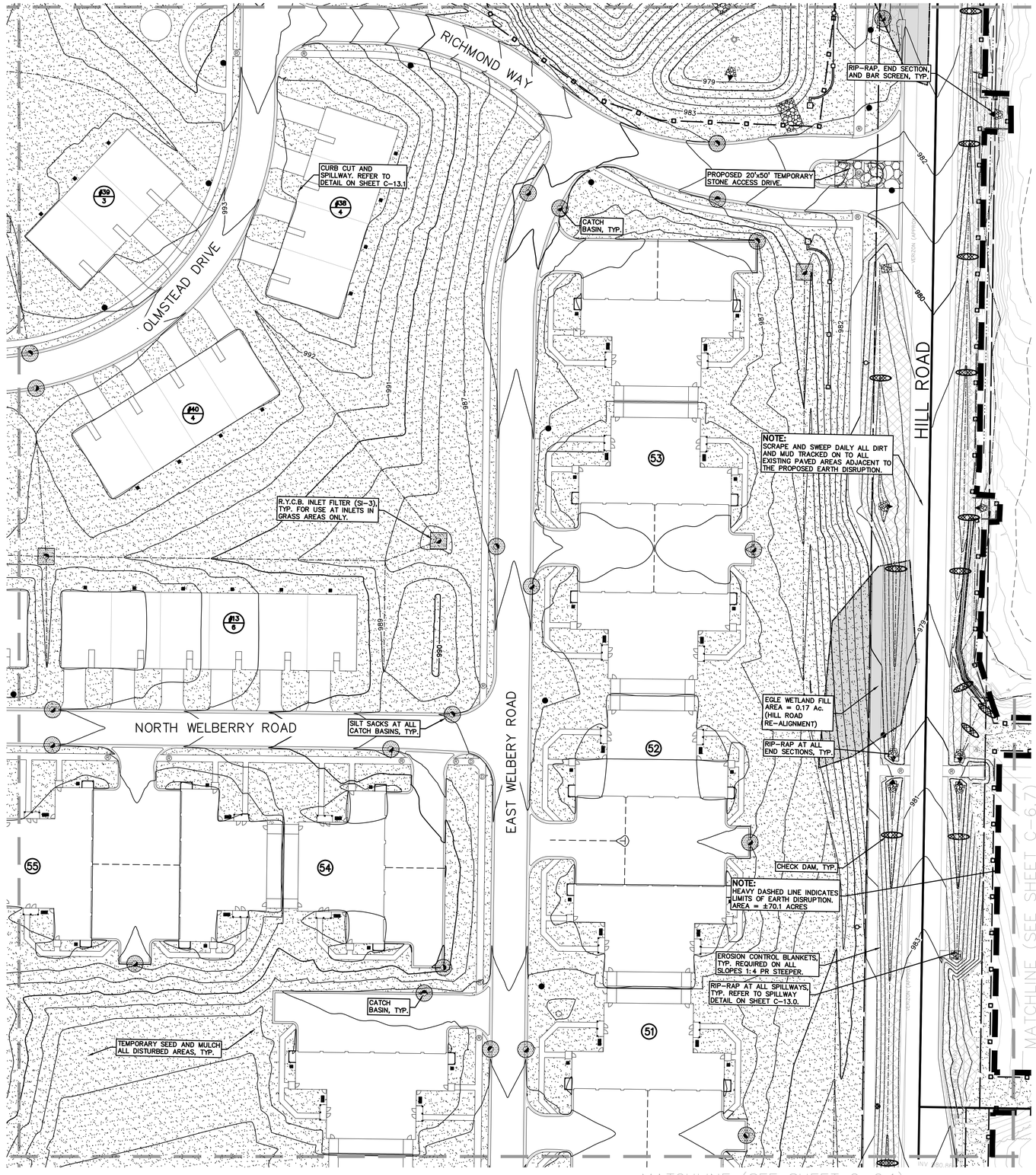
ORIGINAL ISSUE DATE:
DECEMBER 4, 2023

DRAWING TITLE
SOIL EROSION CONTROL PLAN - 2

PEA JOB NO.	2021-0084
P.M.	JC
DN.	BSH/JEB
DES.	BSH

DRAWING NUMBER:
C-6.2

MATCHLINE (SEE SHEET C-6.5)



SYMBOLS EROSION CONTROL:

- (SP-2) SILT FENCE
- (SI-2A) LOW POINT INLET FILTER
- (SI-3) RYCB INLET FILTER
- (E-3) CHECK DAM
- (SP-9) TEMPORARY STONE ACCESS DRIVE
- (E-9) EROSION CONTROL BLANKET
- (E-7) RIPRAP
- TEMPORARY SEED AND MULCH

REFER TO O.C.W.R.C. SOIL EROSION AND SEDIMENTATION CONTROL DETAILS SHEET FOR ALL DEVICE DETAILS.

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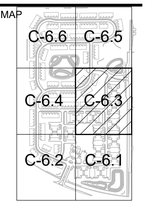
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PROJECT TITLE
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HIGHLAND ROAD
WHITE LAKE TWP, MI

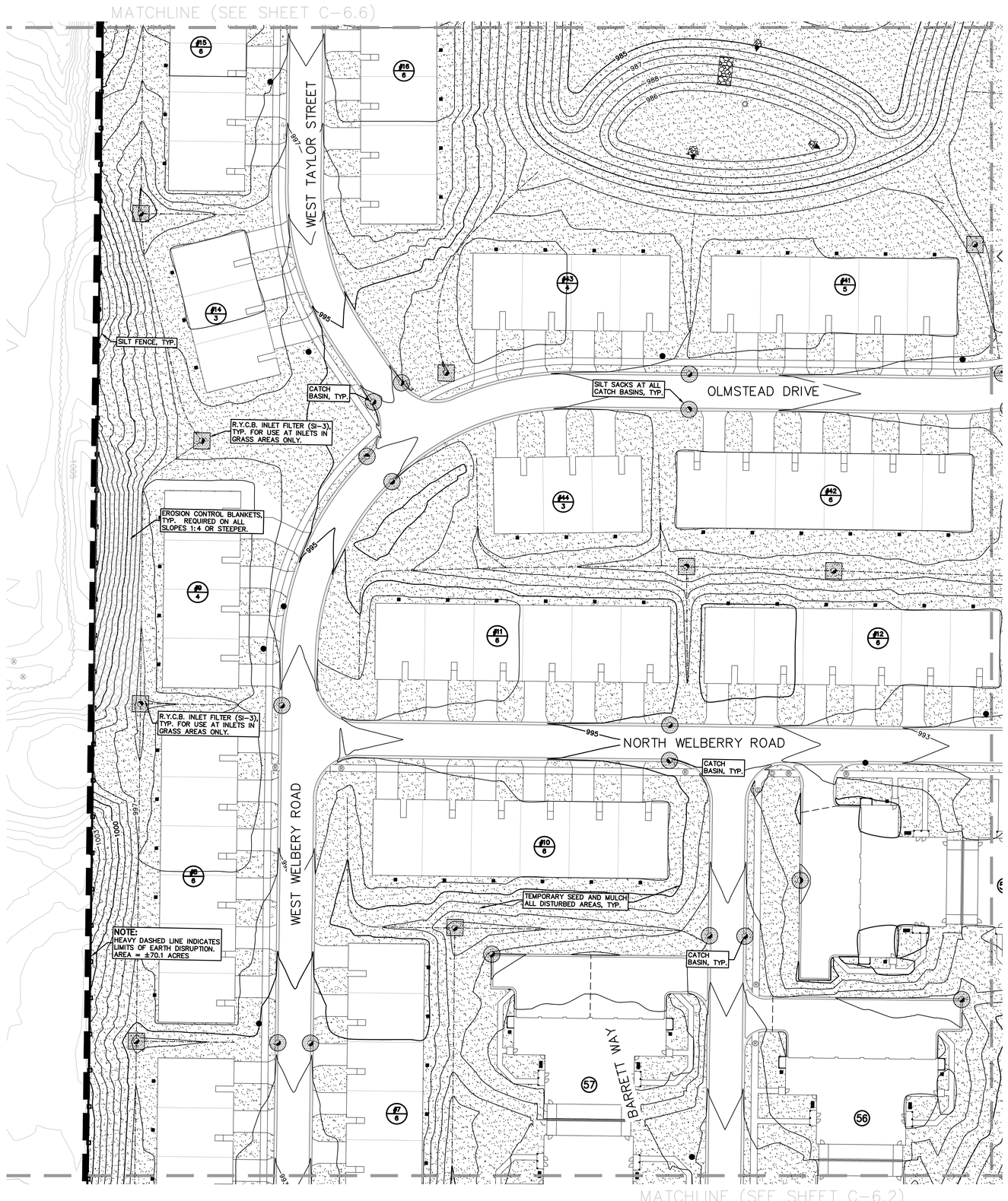
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ISSUED FOR OWNER REVIEW	4/24/24
FINAL SITE PLAN REVIEW	7/3/24
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FINAL SITE PLAN REVIEW	9/30/25

ORIGINAL ISSUE DATE:
DECEMBER 4, 2023

DRAWING TITLE
SOIL EROSION CONTROL PLAN - 3

PEA JOB NO.	2021-0084
P.M.	JC
DN.	BSH/JEB
DES.	BSH

DRAWING NUMBER:
C-6.3



SYMBOLS EROSION CONTROL:

- (SP-2) SILT FENCE
- (SI-2A) LOW POINT INLET FILTER
- (SI-3) RYCB INLET FILTER
- (E-3) CHECK DAM
- (SP-9) TEMPORARY STONE ACCESS DRIVE
- (E-9) EROSION CONTROL BLANKET
- (E-7) RIPRAP
- TEMPORARY SEED AND MULCH

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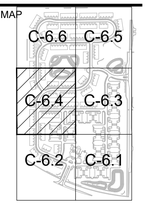
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PROJECT TITLE
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HIGHLAND ROAD
WHITE LAKE TWP, MI

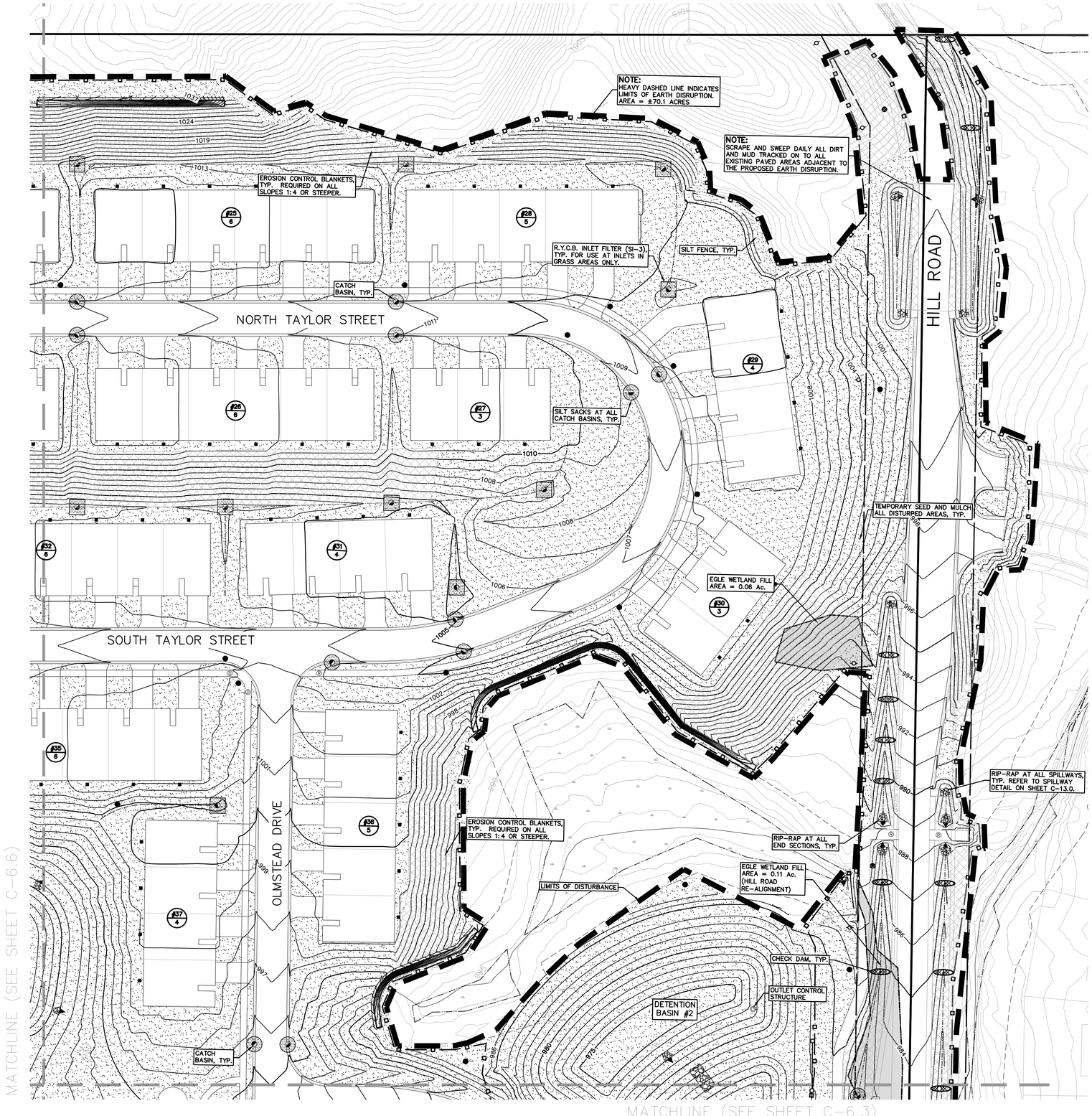
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ORIGINAL ISSUE DATE:
DECEMBER 4, 2023

DRAWING TITLE
SOIL EROSION CONTROL PLAN - 4

PEA JOB NO.	2021-0084
P.M.	JC
DN.	BSH/JEB
DES.	BSH

DRAWING NUMBER:
C-6.4



SYMBOLS EROSION CONTROL:

- (SP-2) SILT FENCE
- (SI-2A) LOW POINT INLET FILTER
- (SI-3) RYCB INLET FILTER
- (E-3) CHECK DAM
- (SP-9) TEMPORARY STONE ACCESS DRIVE
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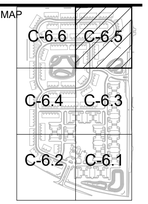
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WHITE LAKE TWP, MI

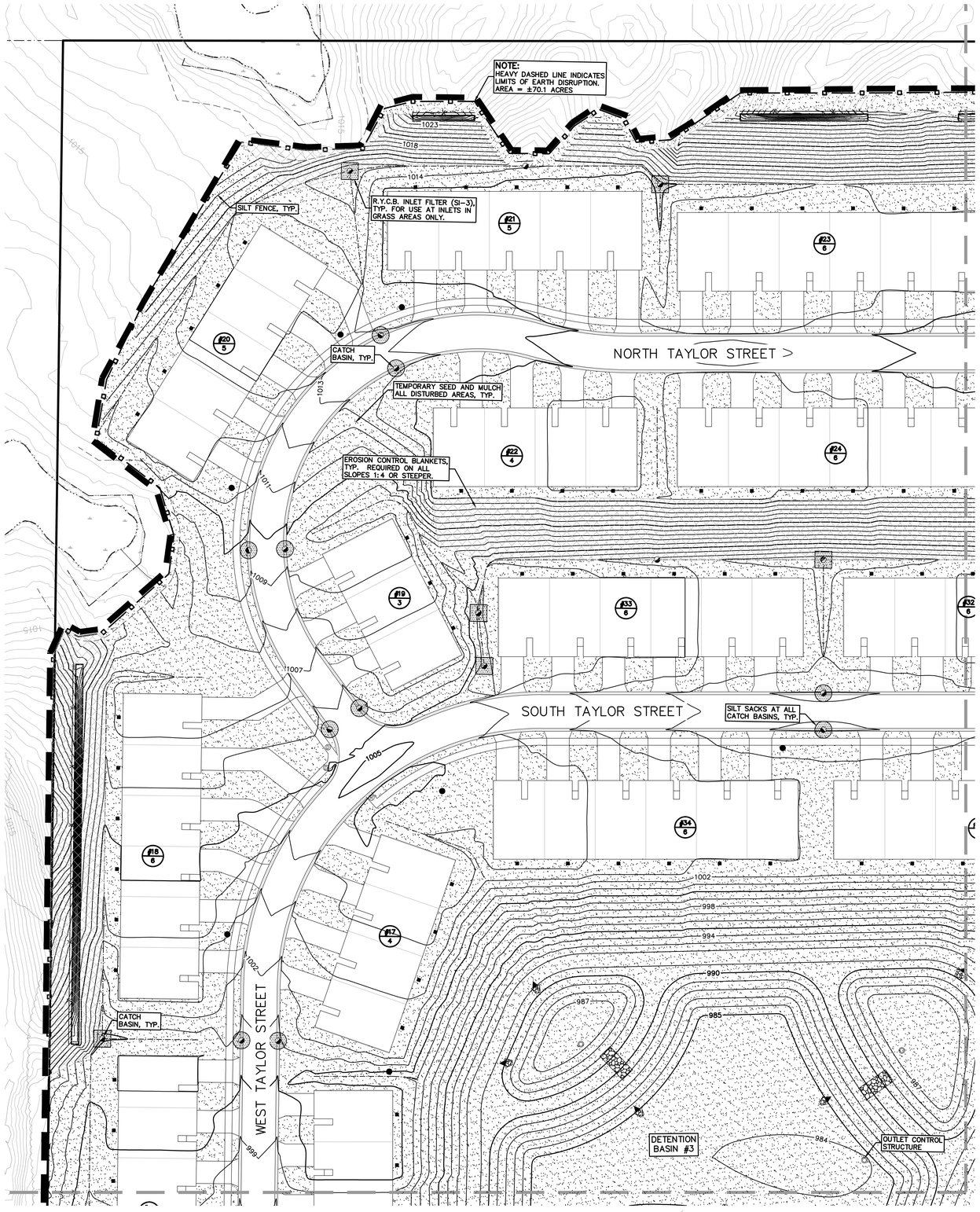
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FINAL SITE PLAN REVIEW	9/30/25

ORIGINAL ISSUE DATE:
DECEMBER 4, 2023

DRAWING TITLE
SOIL EROSION CONTROL PLAN - 5

PEA JOB NO.	2021-0084
P.M.	JC
DN.	BSH/JEB
DES.	BSH

DRAWING NUMBER:
C-6.5



SYMBOLS EROSION CONTROL:

- (SP-2) SILT FENCE
- (SI-2A) LOW POINT INLET FILTER
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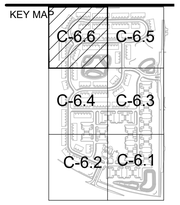
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PROJECT TITLE
THE AVALON - MULTI FAMILY
HIGHLAND ROAD
WHITE LAKE TWP, MI

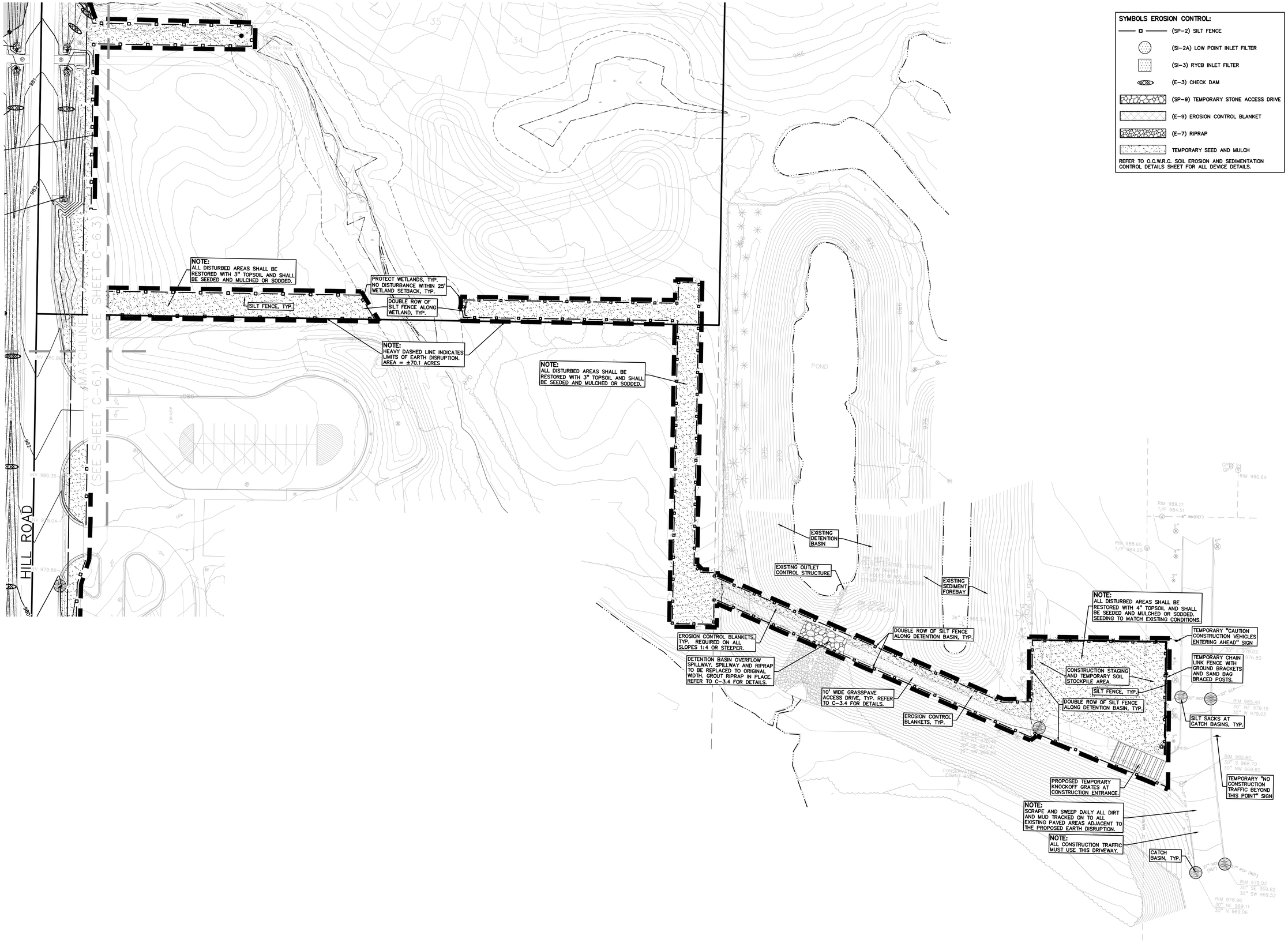
REVISIONS	
DRAFT	2/19/24
ISSUED FOR OWNER REVIEW	4/24/24
FINAL SITE PLAN REVIEW	7/3/24
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FINAL SITE PLAN REVIEW	9/30/25

ORIGINAL ISSUE DATE:
DECEMBER 4, 2023

DRAWING TITLE
SOIL EROSION CONTROL PLAN - 6

PEA JOB NO.	2021-0084
P.M.	JC
DN.	BSH/JEB
DES.	BSH

DRAWING NUMBER:
C-6.6



SYMBOLS EROSION CONTROL:

- (SP-2) SILT FENCE
- (SI-2A) LOW POINT INLET FILTER
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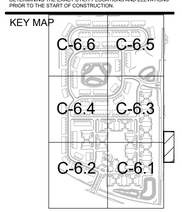
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FARMINGTON HILLS, MI 48334

PROJECT TITLE
THE AVALON - MULTI FAMILY
HIGHLAND ROAD
WHITE LAKE TWP, MI

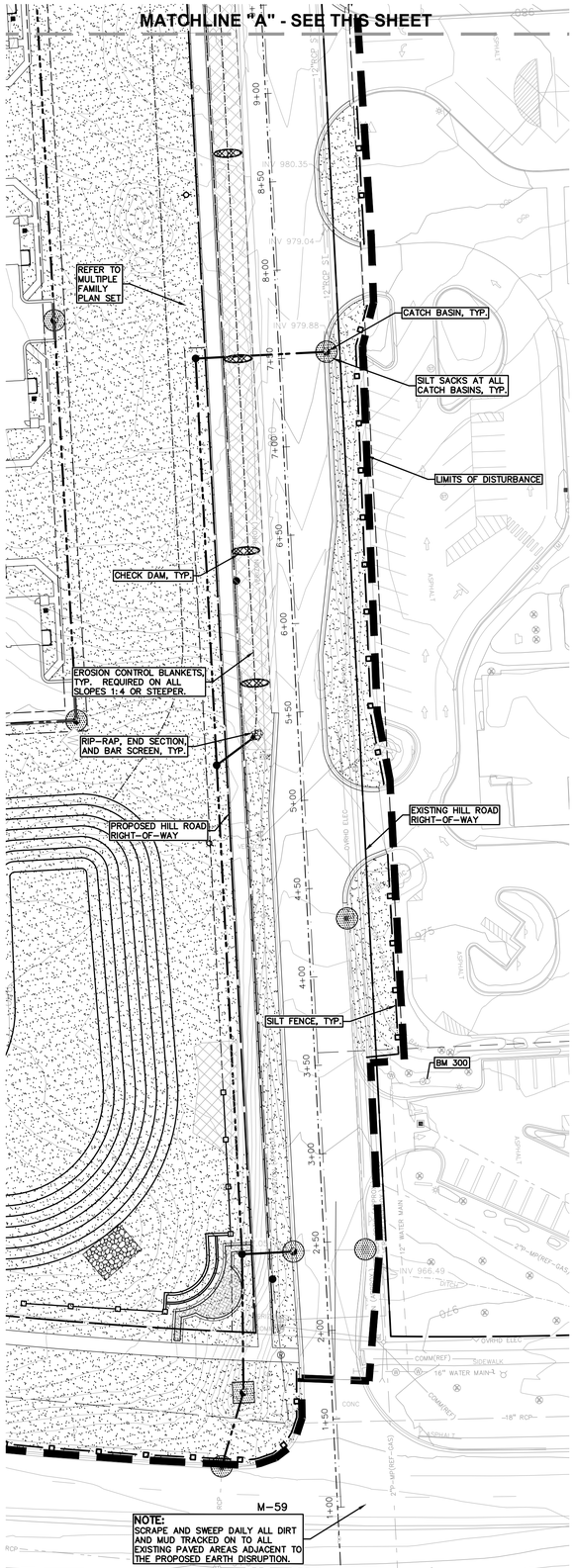
REVISIONS	
DRAFT	2/19/24
ISSUED FOR OWNER REVIEW	4/24/24
FINAL SITE PLAN REVIEW	7/3/24
FINAL SITE PLAN REVIEW	5/8/25
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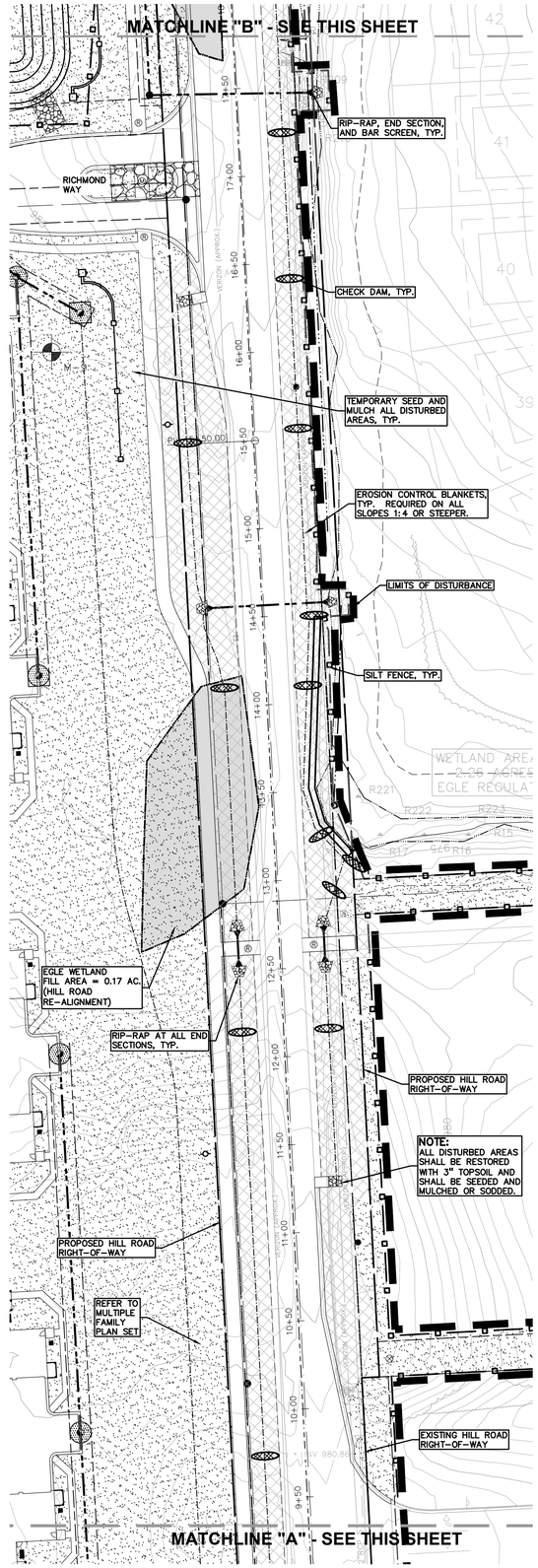
ORIGINAL ISSUE DATE:
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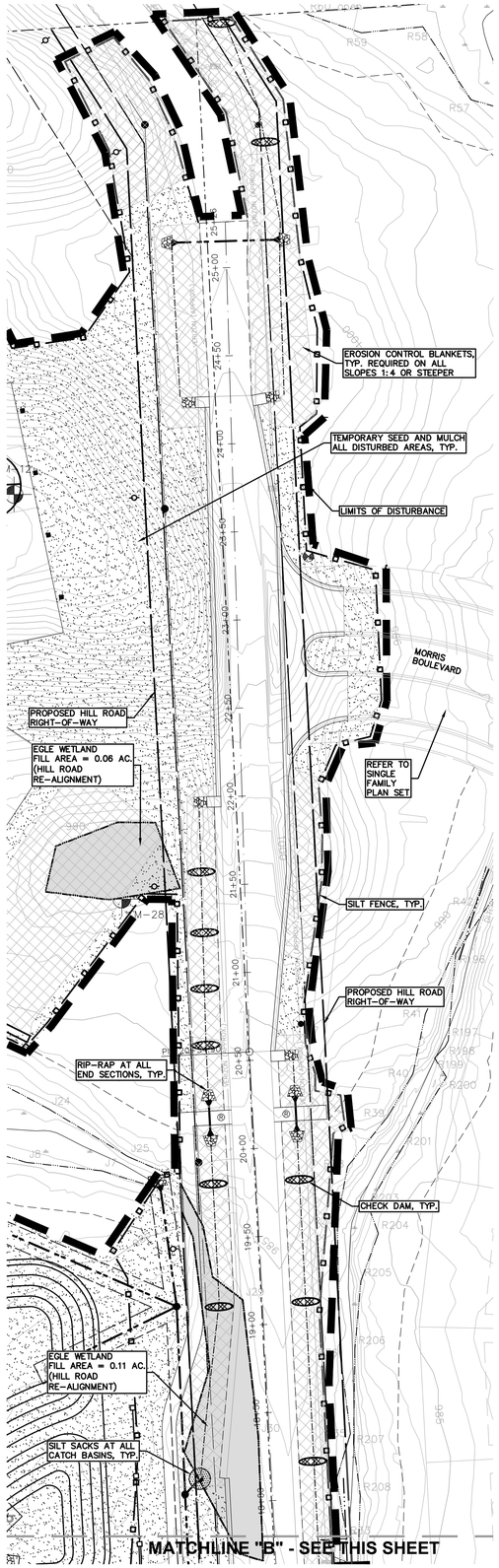
DRAWING TITLE
SOIL EROSION CONTROL PLAN - 7

PEA JOB NO.	2021-0084
P.M.	JC
DN.	BSH/JEB
DES.	BSH

DRAWING NUMBER:
C-6.7







SYMBOLS EROSION CONTROL:

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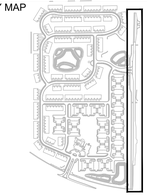
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FARMINGTON HILLS, MI 48334

PROJECT TITLE
THE AVALON - HILL ROAD
HIGHLAND ROAD
WHITE LAKE TWP, MI

REVISIONS	
FINAL SITE PLAN REVIEW	5/8/25
FINAL SITE PLAN REVIEW	9/30/25

ORIGINAL ISSUE DATE:
MAY 8, 2025

DRAWING TITLE
SOIL EROSION CONTROL PLAN

PEA JOB NO.	2021-0084
P.M.	JC
DN.	BSH/JEB
DES.	BSH

DRAWING NUMBER:
C-6.23

S:\PROJECTS\2021\2021-0084 WHITE LAKE MIXED USE\DWG\CONSTRUCTION\HILL ROAD\(C-6.1) SESC-2100H HILL.dwg



SOIL EROSION MAINTENANCE SCHEDULE AND NOTES:

1. THE SOIL EROSION CONTROLS WILL BE MAINTAINED WEEKLY AND AFTER EVERY STORM EVENT BY: TBD

2. IF ANY DAMAGE HAS OCCURRED AS A RESULT OF STORM WATER DISCHARGE FROM THE SITE, THE FOLLOWING STEPS SHALL BE IMPLEMENTED.

3. ANY DEBRIS OR DIRT ON ANY PAVED AREA RESULTING FROM CONSTRUCTION TRAFFIC SHALL BE CLEANED IN A PROMPT MANNER BY THE CONTRACTOR. THE CONSTRUCTION DRIVE SHALL BE CLEANED AT THE END OF EACH DAY.

4. ALL DIRT AND MUD TRACKED ONTO PAVED AREAS SHALL BE REMOVED BY THE CONTRACTOR DAILY BY SCRAPING. STREET SWEEPING IS REQUIRED WEEKLY.

5. SILT FENCE MAINTENANCE SHALL INCLUDE THE REMOVAL OF ANY BUILT UP SEDIMENT WHEN THE SEDIMENT HEIGHT ACCUMULATES TO 1/3 TO 1/2 OF THE HEIGHT OF THE FENCE. THE CONTRACTOR IS RESPONSIBLE TO REMOVE, REPLACE, RETRENCH OR REBACKFILL THE SILTATION FENCE SHOULD IT FALL OR BE DAMAGED DURING CONSTRUCTION.

6. INLET FILTER MAINTENANCE SHALL INCLUDE THE REMOVAL OF ANY ACCUMULATED SILT OR OTHER DEBRIS. THE REMOVAL OF SILT SHOULD BE WITH THE USE OF A STIFF BRISTLE BROOM OR SQUARE POINT SHOVEL. IF INLET FILTERS CAN NOT BE CLEANED OR ARE DAMAGED, THEN THE FABRIC MUST BE REPLACED.

7. CONTRACTOR SHALL PROVIDE WATER TRUCK TO WATER DOWN THE SITE ON A DAILY BASIS AS REQUIRED TO MAINTAIN DUST CONTROL.

8. IF HIGH GROUNDWATER IS ANTICIPATED OR ENCOUNTERED DURING CONSTRUCTION A DEWATERING PLAN MUST BE SUBMITTED TO THE CITY ENGINEERING DIVISION FOR REVIEW.

SYMBOLS: EROSION CONTROL:

- (SP-2) SILT FENCE
- (SI-2A) LOW POINT INLET FILTER
- (SI-3) RYCB INLET FILTER
- (SP-9) TEMPORARY STONE ACCESS DRIVE
- (E-9) EROSION CONTROL BLANKET
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- TEMPORARY SEED AND MULCH

REFER TO O.C.W.R.C. SOIL EROSION AND SEDIMENTATION CONTROL DETAILS SHEET FOR ALL DEVICE DETAILS.

EROSION CONTROL QUANTITIES:

SILT FENCE	7,378 LF
R.Y.C.B. INLET FILTER	31 EA.
LOW POINT INLET FILTER	22 EA.
TEMPORARY CONSTRUCTION ACCESS DRIVE	1 EA.
EROSION CONTROL BLANKETS	20,118 S.Y.
TEMPORARY SEED AND MULCH	68,919 S.Y.
END SECTION RIP RAP	13 EA.
SPILLWAY RIP RAP	4 EA.

GENERAL SITE CONDITIONS:

1. ACCORDING TO THE GEOTECHNICAL INVESTIGATION BY MCDOWELL & ASSOCIATES DATED DECEMBER 28, 2004, THE SITE CONSISTS OF THE FOLLOWING SOIL TYPES:

   BROWN SAND, CLAYEY SAND, SANDY CLAY, AND STIFF BLUE CLAY

2. TOTAL DISTURBED AREA = ±26.8 ACRES
3. N.P.D.E.S. NOTICE OF COVERAGE IS REQUIRED

SOIL EROSION AND SEDIMENTATION CONTROL SEQUENCE OF CONSTRUCTION

1. SEE OAKLAND COUNTY W.R.C. SOIL EROSION AND SEDIMENTATION CONTROL DETAILS SHEET FOR ALL SOIL EROSION CONTROL RELATED DETAILS.
2. PLACE SILT FENCE & INSTALL INLET FILTERS ON EXISTING STORM SEWER STRUCTURES, ACCORDING TO PLANS.
3. INSTALL TEMPORARY CRUSHED CONCRETE ACCESS DRIVE AT ALL CONSTRUCTION ENTRANCES. (80'x24'x8" W/MINIMUM OF 1"-3" CRUSHED CONCRETE - NO FINES).
4. REMOVE CURB, PAVEMENT, TREES, ETC. AS DIRECTED ON THE DEMOLITION PLAN.
5. STRIP AND STOCKPILE TOPSOIL FOR RESTORATION REQUIREMENTS.
6. DISPOSE OF ALL EXCESS, UNSUITABLE MATERIALS OFF SITE IN A LEGAL MANNER. NO BURN OR BURY PITS ALLOWED.
7. UNSUITABLE MATERIALS CONSIST OF, BUT ARE NOT NECESSARILY LIMITED TO THE FOLLOWING: CONCRETE, ASPHALT, TREES, BRUSH, STUMPS, ROOTS, OR OTHER MISCELLANEOUS DEBRIS OR TRASH.
8. MASS GRADE THE SITE IN ACCORDANCE WITH THE PLANS.
9. INSTALL SEED, MULCH AND EROSION CONTROL BLANKETS AS SHOWN ON THE PLAN WITHIN 5 DAYS OF COMPLETION OF MASS GRADING OR WHENEVER DISTURBED AREAS WILL REMAIN UNCHANGED FOR 30 DAYS OR GREATER. 3-4" TOPSOIL WILL BE USED WHERE VEGETATION IS REQUIRED.
10. COMPLETE ROUGH GRADING OF SITE AND INSTALL UTILITIES. PLACE INLET FILTERS AT ALL INLETS AND CATCH BASINS, AS SHOWN.
11. FINISH GRADE AND PAVE SITE AS PROPOSED TO DRAIN TO STORM SEWER SYSTEM. REPAIR INLET FILTERS AS REQUIRED.
12. APPLY TOPSOIL, SEED AND MULCH/SOD TO ALL DISTURBED AREAS UPON COMPLETION OF GRADING. THE CONTRACTOR SHALL STAGE CONSTRUCTION ACTIVITIES IN ORDER TO MINIMIZE THE EXPOSURE OF UNSTABILIZED AREAS.
13. CLEAN PAVEMENT AND STORM SEWERS. REMOVE SILT FENCE, AND INLET FILTERS ONCE VEGETATION HAS BEEN ESTABLISHED.
14. CLEAN DETENTION BASIN AND OVERFLOW SPILLWAYS AND REPAIR RIPRAP AS NECESSARY.
15. ALL DIRT AND MUD TRACKED ONTO PUBLIC ROADS SHALL BE REMOVED DAILY.
16. STREET CATCH BASINS TO BE PERIODICALLY CLEANED AND FILTER CLOTH CHANGED AND MAINTAINED.

SEQUENCE OF CONSTRUCTION:

START DAY	END DAY	
1	150	INSTALL CRUSHED CONCRETE ACCESS APPROACH AT SITE ROAD APPROACH.
1	150	INSTALL TEMPORARY SOIL EROSION CONTROL MEASURES, SILT FENCES, INLET PROTECTION, ETC. AS NECESSARY.
1	180	MAINTAIN A 25' BUFFER OF VEGETATION AROUND PERIMETER OF SITE WHERE POSSIBLE.
1	30	REMOVE ALL VEGETATION, TREES AND BRUSH FROM THE PROPOSED CONSTRUCTION AREA UNLESS MARKED TO REMAIN. STRIP AND STOCKPILE TOPSOIL AS REQUIRED. ALL STOCKPILES MUST BE GRADED AND SEEDED.
5	30	REMOVE ALL PAVEMENT, CURB, UTILITIES, ETC. AS REQUIRED TO INSTALL THE PROPOSED WORK AS SHOWN ON THE TOPOGRAPHIC SURVEY AND DEMOLITION PLAN.
5	30	DISPOSE OF ALL EXCESS/UNSUITABLE MATERIALS OFF SITE IN A LEGAL MANNER. NO ON-SITE BURN OR BURY PITS ALLOWED.
30	60	ROUGH GRADE SITE. SEED AND MULCH BLANKETS MUST BE INSTALLED AS SHOWN WITHIN 5 DAYS OF FINAL GRADE. REPAIR AND/OR RE-INSTALL ANY TEMPORARY SOIL EROSION CONTROL MEASURES THAT WERE DAMAGED DURING GRADING OPERATIONS.
60	120	INSTALL SITE UTILITIES (STORM SEWER, SANITARY SEWER, WATER MAIN ETC.). INSTALL INLET PROTECTION AT ALL PROPOSED CATCH BASINS.
60	90	TEMPORARY SEEDING MUST BE PROVIDED IN AREAS NOT TO BE WORKED ON FOR 15 DAYS OR LONGER.
180	210	FINE GRADE SITE AND PREPARE FOR SITE PAVING OPERATIONS.
210	240	INSTALL ALL PAVEMENT, SIDEWALKS, CURBING AS PROPOSED. IF PERMANENT LANDSCAPING IS NOT TO BE INSTALLED SOON AFTER PAVING IS COMPLETE, ALL AREAS WITHIN 20 FEET OF BACK OF CURB MUST BE TEMPORARILY SEEDED. REPAIR INLET PROTECTION, SILT FENCE AND ANY OTHER DAMAGED SOIL EROSION CONTROL MEASURES AS NECESSARY.
180	240	FINAL GRADE, REDISTRIBUTE STOCKPILED TOPSOIL, ESTABLISH VEGETATION AND INSTALL ALL PERMANENT LANDSCAPING IN ALL DISTURBED AREAS NOT BUILT.
240	250	CLEAN PAVEMENT AND REMOVE ALL TEMPORARY SOIL EROSION CONTROL MEASURES. RE-ESTABLISH VEGETATION AS REQUIRED.
250	250	REMOVE SEDIMENTATION CONTROLS ONCE ENTIRE SITE HAS BEEN PERMANENTLY STABILIZED.

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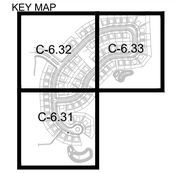
NORTH

0 20 40 80
SCALE: 1" = 40'

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KEY MAP



CLIENT

WHITE LAKE HILL, LLC
31550 NORTHWESTERN HWY
FARMINGTON HILLS, MI 48334

PROJECT TITLE

THE AVALON - SINGLE FAMILY
HIGHLAND ROAD
WHITE LAKE TWP, MI

REVISIONS	
FINAL SITE PLAN REVIEW	5/8/25
FINAL SITE PLAN REVIEW	9/30/25

ORIGINAL ISSUE DATE:
MAY 8, 2025

DRAWING TITLE

SOIL EROSION CONTROL PLAN - SOUTH

PEA JOB NO.	2021-0084
P.M.	JC
DN.	BSH/JEB
DES.	BSH

DRAWING NUMBER:

C-6.31

S:\PROJECTS\2021\2021-0084 WHITE LAKE MIXED USE\CIVIL\CONSTRUCTION\1- SINGLE FAMILY\[C-6.0] SESC-21-0084 SF.dwg



SYMBOLS: EROSION CONTROL:

- (SP-2) SILT FENCE
- (SI-2A) LOW POINT INLET FILTER
- (SI-3) RYCB INLET FILTER
- (SP-9) TEMPORARY STONE ACCESS DRIVE
- (E-9) EROSION CONTROL BLANKET
- (E-7) RIPRAP
- TEMPORARY SEED AND MULCH

REFER TO O.C.W.R.C. SOIL EROSION AND SEDIMENTATION CONTROL DETAILS SHEET FOR ALL DEVICE DETAILS.

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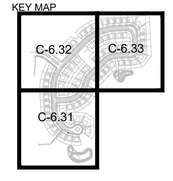
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PROJECT TITLE
THE AVALON - SINGLE FAMILY
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WHITE LAKE TWP, MI

REVISIONS

FINAL SITE PLAN REVIEW	5/8/25
FINAL SITE PLAN REVIEW	9/30/25

ORIGINAL ISSUE DATE:
MAY 8, 2025

DRAWING TITLE
SOIL EROSION CONTROL PLAN - WEST

PEA JOB NO.	2021-0084
P.M.	JC
DN.	BSH/JEB
DES.	BSH

DRAWING NUMBER:
C-6.32

S:\PROJECTS\2021-0084 WHITE LAKE MIXED USE\CIVIL\CONSTRUCTION\1-SINGLE FAMILY\C-6.0 SESC-2I-0084 SF.dwg



SYMBOLS: EROSION CONTROL:

- (SP-2) SILT FENCE
- (SI-2A) LOW POINT INLET FILTER
- (SI-3) RYCB INLET FILTER
- (SP-9) TEMPORARY STONE ACCESS DRIVE
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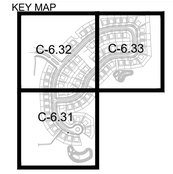
NORTH

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SCALE: 1" = 40'

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KEY MAP



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PROJECT TITLE
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HIGHLAND ROAD
WHITE LAKE TWP, MI

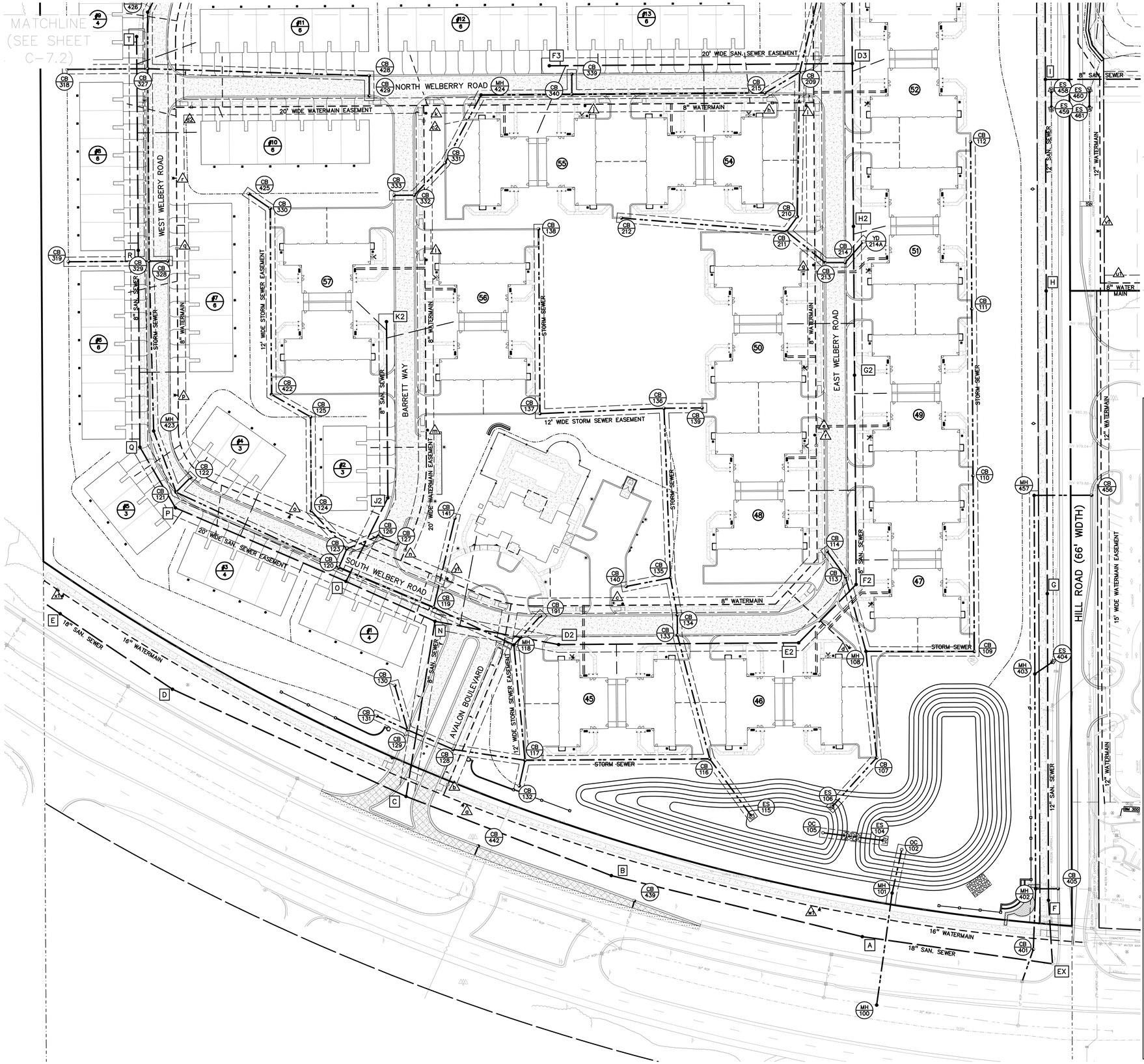
REVISIONS	
FINAL SITE PLAN REVIEW	5/8/25
FINAL SITE PLAN REVIEW	9/30/25

ORIGINAL ISSUE DATE:
MAY 8, 2025

DRAWING TITLE
SOIL EROSION CONTROL PLAN - EAST

PEA JOB NO.	2021-0084
P.M.	JC
DN.	BSH/JEB
DES.	BSH

DRAWING NUMBER:
C-6.33



UTILITY LEGEND:

- EX. OH. ELEC, POLE & GUY WIRE
- EX. U.G. CABLE TV & PEDESTAL
- EX. U.G. COMMUNICATION LINE, PEDESTAL & MANHOLE
- EX. U.G. ELEC.MANHOLE, METER & HANDHOLE
- EX. GAS LINE
- EX. GAS VALVE & GAS LINE MARKER
- EX. TRANSFORMER & IRRIGATION VALVE
- EX. WATER MAIN
- EX. HYDRANT, GATE VALVE & POST INDICATOR VALVE
- EX. WATER VALVE BOX & SHUTOFF
- EX. SANITARY SEWER
- EX. SANITARY CLEANOUT & MANHOLE
- EX. COMBINED SEWER MANHOLE
- EX. STORM SEWER
- EX. CLEANOUT & MANHOLE
- EX. SQUARE, ROUND, & BEEHIVE CATCH BASIN
- EX. YARD DRAIN & ROOF DRAIN
- EX. UNIDENTIFIED STRUCTURE
- PROPOSED WATER MAIN
- PROPOSED HYDRANT AND GATE VALVE
- PROPOSED TAPPING SLEEVE, VALVE & WELL
- PROPOSED POST INDICATOR VALVE
- PROPOSED SANITARY SEWER
- PROPOSED SANITARY CLEANOUT & MANHOLE
- PROPOSED STORM SEWER
- PROPOSED STORM SEWER CLEANOUT & MANHOLE
- PROPOSED CATCH BASIN, INLET & YARD DRAIN

NOTE: NO DECKS TO BE CONSTRUCTED WITHIN UTILITY EASEMENTS

GENERAL UTILITY NOTES:

1. ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH THE STANDARDS AND SPECIFICATIONS OF THE TOWNSHIP.
2. ALL TRENCHES UNDER OR WITHIN THREE (3) FEET OR THE FORTY-FIVE (45) DEGREE ZONE OF INFLUENCE LINE OF EXISTING AND/OR PROPOSED PAVEMENT, BUILDING PAD OR DRIVE APPROACH SHALL BE BACKFILLED WITH SAND COMPACTED TO AT LEAST NINETY-FIVE (95) PERCENT OF MAXIMUM UNIT WEIGHT (ASTM D-1557). ALL OTHER TRENCHES TO BE COMPACTED TO 90% OR BETTER.
3. WHERE EXISTING MANHOLES OR SEWER PIPE ARE TO BE TAPPED, DRILL HOLES 4" CENTER TO CENTER, AROUND PERIPHERY OF OPENING TO CREATE A PLANE OF WEAKNESS JOINT BEFORE BREAKING SECTION OUT.
4. THE LOCATIONS AND DIMENSIONS SHOWN ON THE PLANS FOR EXISTING UTILITIES ARE IN ACCORDANCE WITH AVAILABLE INFORMATION WITHOUT UNCOVERING AND MEASURING. THE DESIGN ENGINEER DOES NOT GUARANTEE THE ACCURACY OF THIS INFORMATION OR THAT ALL EXISTING UNDERGROUND FACILITIES ARE SHOWN. CONTRACTOR SHALL FIELD VERIFY UTILITIES.
5. THE CONTRACTOR SHALL COORDINATE TO ENSURE ALL REQUIRED PIPES, CONDUITS, CABLES AND SLEEVES ARE PROPERLY PLACED FOR THE INSTALLATION OF GAS, ELECTRIC, PHONE, CABLE, IRRIGATION, ETC. IN SUCH A MANNER THAT WILL FACILITATE THEIR PROPER INSTALLATION PRIOR TO THE PLACEMENT OF THE PROPOSED PAVEMENT AND LANDSCAPING.
6. PIPE LENGTHS INDICATED ARE FROM CENTER OF STRUCTURE AND TO END OF FLARED END SECTION UNLESS NOTED OTHERWISE.
7. CONTRACTOR SHALL INSPECT ALL EXISTING PUBLIC STORM SEWER, SANITARY SEWER AND WATER MAIN STRUCTURES WITHIN THE LIMITS OF CONSTRUCTION AND WITH THE GOVERNING AGENCY INSPECTOR PRIOR TO ESTABLISHING FINAL GRADE. NOTIFY THE ENGINEER, OWNER/DEVELOPER, AND GOVERNING AGENCY IF STRUCTURE IS DEEMED TO BE STRUCTURALLY UNSOUND AND/OR IN NEED OF REPAIR.

STORM SEWER NOTES:

1. ALL STORM SEWER 12" DIAMETER OR LARGER SHALL BE REINFORCED CONCRETE PIPE (RCP C-76) CLASS IV WITH MODIFIED TONGUE AND GROOVE JOINT WITH RUBBER GASKETS UNLESS SPECIFIED OTHERWISE (ASTM C-443).
2. ALL STORM SEWER LEADS SHALL BE CONSTRUCTED AT 1.00% MINIMUM SLOPE.
3. ALL STORM SEWER 10" OR LESS AND/OR LEADS SHALL BE SDR 26.
4. JOINTS FOR P.V.C. PIPE SHALL BE ELASTOMERIC (RUBBER GASKET) AS SPECIFIED IN A.S.T.M. DESIGNATION D-3212.

WATER MAIN NOTES:

1. ALL WATER MAIN SHALL BE INSTALLED WITH A MINIMUM COVER OF 6.0' BELOW FINISH GRADE. WHEN WATER MAINS MUST DIP TO PASS UNDER A STORM SEWER OR SANITARY SEWER, THE SECTIONS WHICH ARE DEEPER THAN NORMAL SHALL BE KEPT TO A MINIMUM LENGTH BY THE USE OF VERTICAL TWENTY TWO AND A HALF (22.5°) DEGREE BENDS, PROPERLY ANCHORED.
2. ALL TEES, BENDS, CONNECTIONS, ETC. ARE CONSIDERED INCIDENTAL TO THE JOB.
3. PHYSICAL CONNECTIONS SHALL NOT BE MADE BETWEEN EXISTING AND NEW WATER MAINS UNTIL REQUIRED TESTING IS SATISFACTORILY COMPLETED.
4. MAINTAIN 10' HORIZONTAL CLEARANCE BETWEEN OUTER EDGE OF WATERMAIN AND ANY SANITARY/STORM SEWER OR STRUCTURE.
5. NO PHYSICAL CONNECTION TO THE EXISTING WATER MAIN CAN BE MADE UNTIL ALL NEW WATER MAIN PASSES PRESSURE AND BACTERIOLOGICAL TESTS TO THE SATISFACTION OF THE TOWNSHIP.
6. ALL WATER MAIN AND FITTINGS (3" DIAMETER AND LARGER) SHALL BE DUCTILE IRON, CLASS 54, UNLESS OTHERWISE NOTED.
7. WATER MAIN SERVICE LEADS SHALL BE TYPE 'K' ANNEALED SEAMLESS COPPER WITH FLARED FITTINGS, UNLESS OTHERWISE NOTED.
8. ALL FIRE HYDRANTS SHALL BE EJW #5BR MODEL #250 PER TOWNSHIP STANDARDS.
9. ALL HYDRANTS TO BE A MINIMUM OF 5' FROM BACK OF CURB, TYP.
10. ALL NECESSARY FITTINGS, THRUST BLOCKS, RESTRAINING GLANDS, BLOW OFFS, ETC. FOR WATER MAIN ARE CONSIDERED INCIDENTAL TO THIS PROJECT. THE CONTRACTOR SHALL INSTALL THESE ITEMS AS NECESSARY AND AS REQUIRED BY THE TOWNSHIP.
11. THE WATER MAIN CONTRACTOR SHALL NOTIFY THE INSPECTION SECTION OF THE WHITE LAKE TOWNSHIP WATER DEPARTMENT AT 248-698-7700 AT LEAST THREE WORKING DAYS IN ADVANCE OF STARTING CONSTRUCTION.

SANITARY SEWER NOTES:

1. DOWNSPOUTS, WEEP TILE, FOOTING DRAINS OR ANY CONDUIT THAT CARRIES STORM OR GROUND WATER SHALL NOT BE ALLOWED TO DISCHARGE INTO A SANITARY SEWER.
2. ALL SANITARY LEADS SHALL BE CONSTRUCTED AT 1.00% MINIMUM SLOPE.
3. ALL SANITARY SEWER 8" OR LARGER SHALL BE P.V.C. TRUSS PIPE (ASTM D2680) AND FITTINGS, WITH ELASTOMERIC GASKET JOINTS PER ASTM D3212 UNLESS OTHERWISE NOTED.
4. ALL SANITARY SEWER LEADS SHALL BE POLYVINYL CHLORIDE (PVC) SDR 23.5 PIPE AND FITTINGS. ALL JOINTS TO BE ELASTOMERIC GASKET JOINTS PER ASTM D3212 UNLESS OTHERWISE NOTED.
5. SANITARY LEADS SHALL BE PROVIDED WITH CLEANOUTS EVERY 100 FEET AND AT EVERY BEND AS SHOWN. ALL CLEANOUTS TO BE PROVIDED WITH E.J.I.W. #1565 BOX OR EQUAL.

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NORTH

0 30 60 120
SCALE: 1" = 60'

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KEY MAP

CLIENT
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31550 NORTHWESTERN HWY
FARMINGTON HILLS, MI 48334

PROJECT TITLE
THE AVALON - MULTI FAMILY
HIGHLAND ROAD
WHITE LAKE TWP, MI

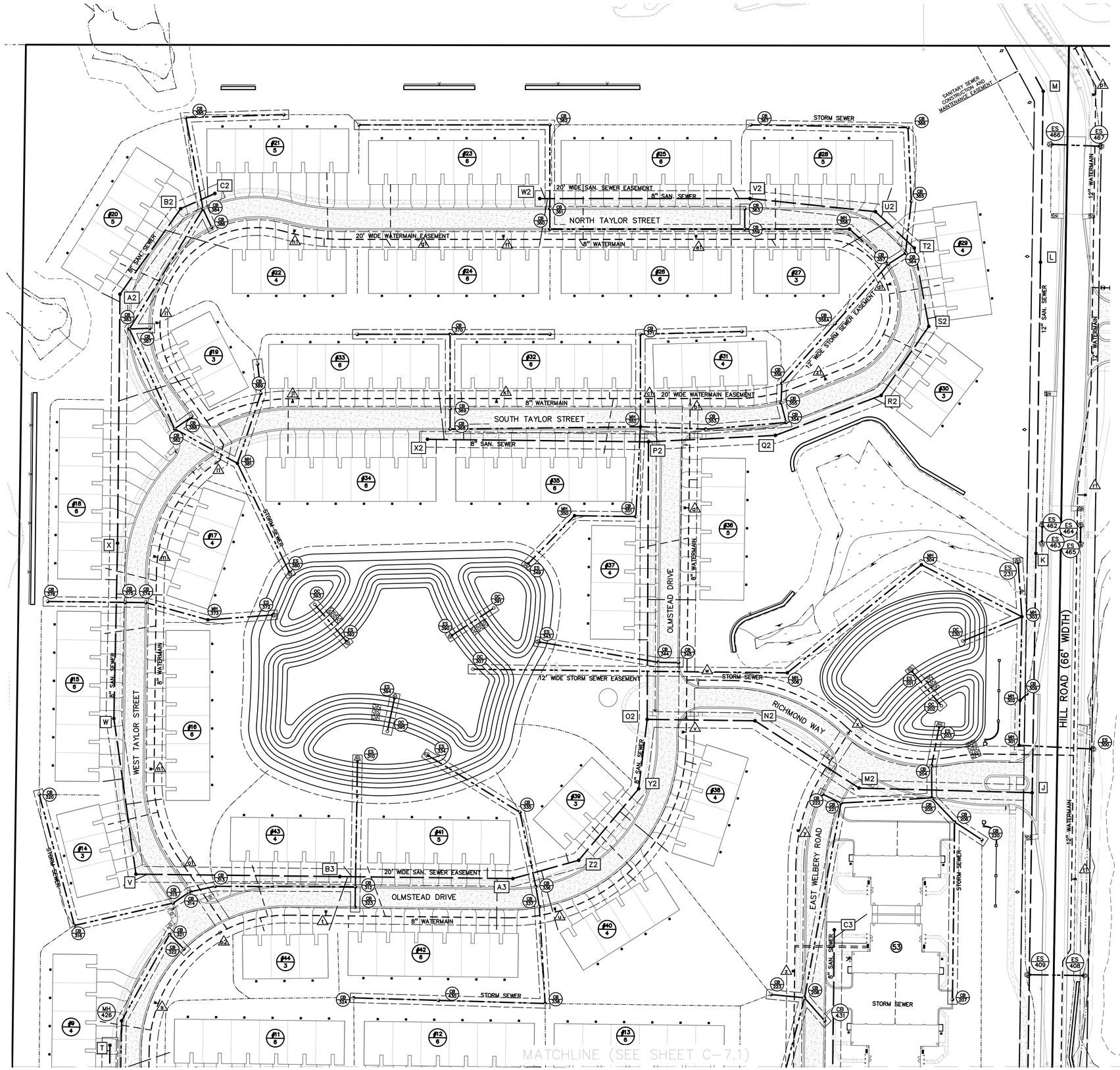
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ISSUED FOR OWNER REVIEW	4/24/24
FINAL SITE PLAN REVIEW	7/3/24
FINAL SITE PLAN REVIEW	5/8/25
FINAL SITE PLAN REVIEW	9/30/25

ORIGINAL ISSUE DATE:
DECEMBER 4, 2023

DRAWING TITLE
OVERALL UTILITY PLAN - SOUTH

PEA JOB NO.	2021-0084
P.M.	JC
DN.	BSH/JEB
DES.	BSH

DRAWING NUMBER:
C-7.1



NOTE: NO DECKS TO BE CONSTRUCTED WITHIN UTILITY EASEMENTS

UTILITY LEGEND:

- EX. OH. ELEC, POLE & GUY WIRE
- EX. U.G. CABLE TV & PEDESTAL
- EX. U.G. COMMUNICATION LINE, PEDESTAL & MANHOLE
- EX. U.G. ELEC,MANHOLE, METER & HANDHOLE
- EX. GAS LINE
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NORTH

0 30 60 120
SCALE: 1" = 60'

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WHITE LAKE TWP, MI

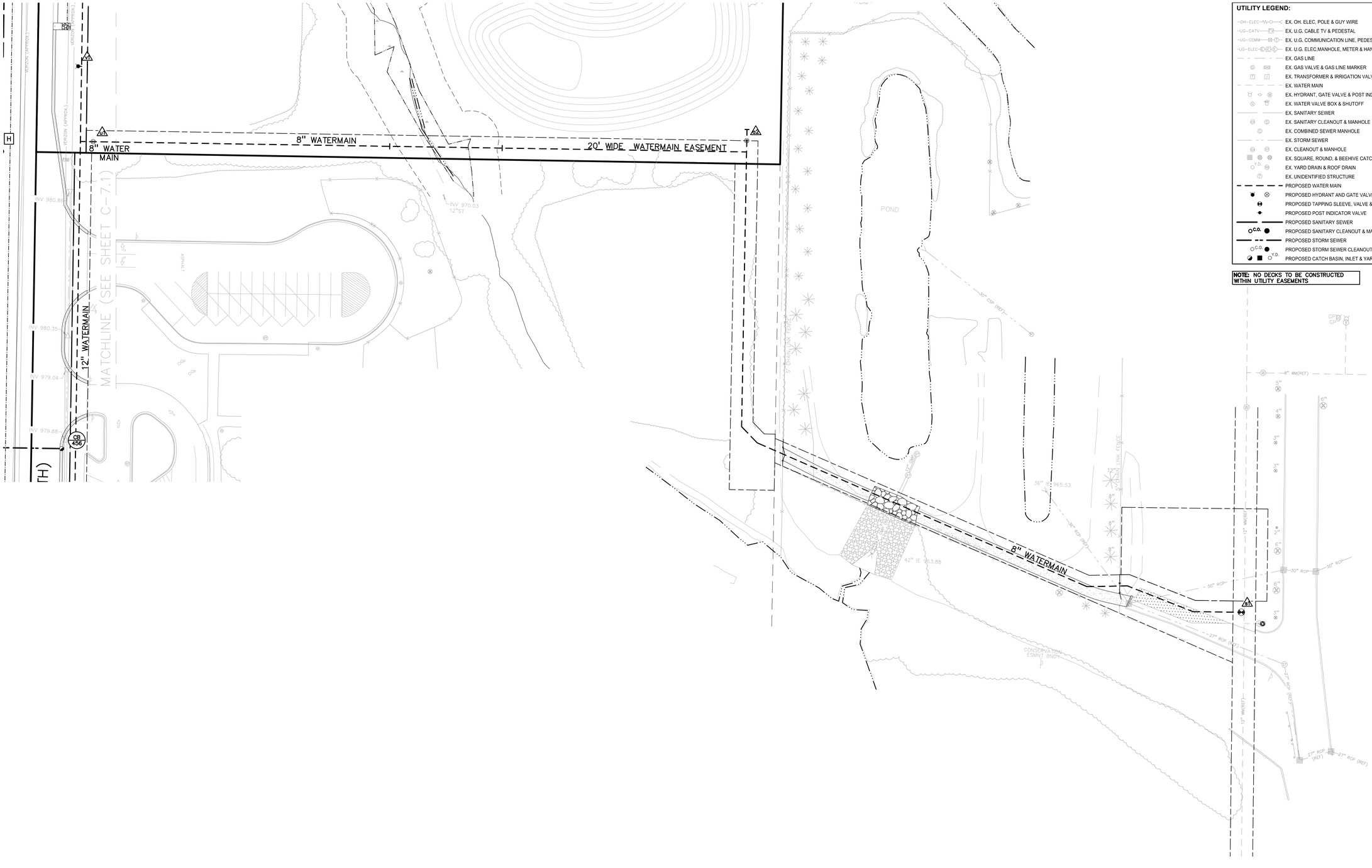
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FINAL SITE PLAN REVIEW	5/8/25
FINAL SITE PLAN REVIEW	9/30/25

ORIGINAL ISSUE DATE:
DECEMBER 4, 2023

DRAWING TITLE
OVERALL UTILITY PLAN - NORTH

PEA JOB NO.	2021-0084
P.M.	JC
DN.	BSH/JEB
DES.	BSH

DRAWING NUMBER:
C-7.2



UTILITY LEGEND:

- EX. OH. ELEC, POLE & GUY WIRE
- EX. U.G. CABLE TV & PEDESTAL
- EX. U.G. COMMUNICATION LINE, PEDESTAL & MANHOLE
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- PROPOSED CATCH BASIN, INLET & YARD DRAIN

NOTE: NO DECKS TO BE CONSTRUCTED WITHIN UTILITY EASEMENTS

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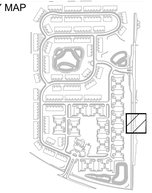
NORTH

0 20 40 80
SCALE: 1" = 40'

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FINAL SITE PLAN REVIEW	9/30/25

ORIGINAL ISSUE DATE:
DECEMBER 4, 2023

DRAWING TITLE
OVERALL UTILITY PLAN - EAST

PEA JOB NO.	2021-0084
P.M.	JC
DN.	BSH/JEB
DES.	BSH

DRAWING NUMBER:
C-7.3



UTILITY LEGEND:

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- EX. U.G. ELEC,MANHOLE, METER & HANDHOLE
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GENERAL UTILITY NOTES:

1. ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH THE STANDARDS AND SPECIFICATIONS OF THE TOWNSHIP.
2. ALL TRENCHES UNDER OR WITHIN THREE (3) FEET OR THE FORTY-FIVE (45) DEGREE ZONE OF INFLUENCE LINE OF EXISTING AND/OR PROPOSED PAVEMENT, BUILDING PAD OR DRIVE APPROACH SHALL BE BACKFILLED WITH SAND COMPACTED TO AT LEAST NINETY-FIVE (95) PERCENT OF MAXIMUM UNIT WEIGHT (ASTM D-1557). ALL OTHER TRENCHES TO BE COMPACTED TO 90% OR BETTER.
3. WHERE EXISTING MANHOLES OR SEWER PIPE ARE TO BE TAPPED, DRILL HOLES 4" CENTER TO CENTER, AROUND PERIPHERY OF OPENING TO CREATE A PLANE OF WEAKNESS JOINT BEFORE BREAKING SECTION OUT.
4. THE LOCATIONS AND DIMENSIONS SHOWN ON THE PLANS FOR EXISTING UTILITIES ARE IN ACCORDANCE WITH AVAILABLE INFORMATION WITHOUT UNCOVERING AND MEASURING. THE DESIGN ENGINEER DOES NOT GUARANTEE THE ACCURACY OF THIS INFORMATION OR THAT ALL EXISTING UNDERGROUND FACILITIES ARE SHOWN. CONTRACTOR SHALL FIELD VERIFY UTILITIES.
5. THE CONTRACTOR SHALL COORDINATE TO ENSURE ALL REQUIRED PIPES, CONDUITS, CABLES AND SLEEVES ARE PROPERLY PLACED FOR THE INSTALLATION OF GAS, ELECTRIC, PHONE, CABLE, IRRIGATION, ETC. IN SUCH A MANNER THAT WILL FACILITATE THEIR PROPER INSTALLATION PRIOR TO THE PLACEMENT OF THE PROPOSED PAVEMENT AND LANDSCAPING.
6. PIPE LENGTHS INDICATED ARE FROM CENTER OF STRUCTURE AND TO END OF FLARED END SECTION UNLESS NOTED OTHERWISE.
7. CONTRACTOR SHALL INSPECT ALL EXISTING PUBLIC STORM SEWER, SANITARY SEWER AND WATER MAIN STRUCTURES WITHIN THE LIMITS OF CONSTRUCTION AND WITH THE GOVERNING AGENCY INSPECTOR PRIOR TO ESTABLISHING FINAL GRADE. NOTIFY THE ENGINEER, OWNER/DEVELOPER, AND GOVERNING AGENCY IF STRUCTURE IS DEEMED TO BE STRUCTURALLY UNSOUND AND/OR IN NEED OF REPAIR.

STORM SEWER NOTES:

1. ALL STORM SEWER 12" DIAMETER OR LARGER SHALL BE REINFORCED CONCRETE PIPE (RCP C-76) CLASS IV WITH MODIFIED TONGUE AND GROOVE JOINT WITH RUBBER GASKETS UNLESS SPECIFIED OTHERWISE (ASTM C-443).
2. ALL STORM SEWER LEADS SHALL BE CONSTRUCTED AT 1.00% MINIMUM SLOPE.
3. ALL STORM SEWER 10" OR LESS AND/OR LEADS SHALL BE SDR 26.
4. JOINTS FOR P.V.C. PIPE SHALL BE ELASTOMERIC (RUBBER GASKET) AS SPECIFIED IN A.S.T.M. DESIGNATION D-3212.

WATER MAIN NOTES:

1. ALL WATER MAIN SHALL BE INSTALLED WITH A MINIMUM COVER OF 6.0' BELOW FINISH GRADE. WHEN WATER MAINS MUST DIP TO PASS UNDER A STORM SEWER OR SANITARY SEWER, THE SECTIONS WHICH ARE DEEPER THAN NORMAL SHALL BE KEPT TO A MINIMUM LENGTH BY THE USE OF VERTICAL TWENTY TWO AND A HALF (22.5°) DEGREE BENDS, PROPERLY ANCHORED.
2. ALL TEES, BENDS, CONNECTIONS, ETC. ARE CONSIDERED INCIDENTAL TO THE JOB.
3. PHYSICAL CONNECTIONS SHALL NOT BE MADE BETWEEN EXISTING AND NEW WATER MAINS UNTIL REQUIRED TESTING IS SATISFACTORILY COMPLETED.
4. MAINTAIN 10' HORIZONTAL CLEARANCE BETWEEN OUTER EDGE OF WATERMAIN AND ANY SANITARY/STORM SEWER OR STRUCTURE.
5. NO PHYSICAL CONNECTION TO THE EXISTING WATER MAIN CAN BE MADE UNTIL ALL NEW WATER MAIN PASSES PRESSURE AND BACTERIOLOGICAL TESTS TO THE SATISFACTION OF THE TOWNSHIP.
6. ALL WATER MAIN AND FITTINGS (3" DIAMETER AND LARGER) SHALL BE DUCTILE IRON, CLASS 54, UNLESS OTHERWISE NOTED.
7. WATER MAIN SERVICE LEADS SHALL BE TYPE 'K' ANNEALED SEAMLESS COPPER WITH FLARED FITTINGS, UNLESS OTHERWISE NOTED.
8. ALL FIRE HYDRANTS SHALL BE EJIW #5BR MODEL #250 PER TOWNSHIP STANDARDS.
9. ALL HYDRANTS TO BE A MINIMUM OF 5' FROM BACK OF CURB, TYP.
10. ALL NECESSARY FITTINGS, THRUST BLOCKS, RESTRAINING GLANDS, BLOW OFFS, ETC. FOR WATER MAIN ARE CONSIDERED INCIDENTAL TO THIS PROJECT. THE CONTRACTOR SHALL INSTALL THESE ITEMS AS NECESSARY AND AS REQUIRED BY THE TOWNSHIP.
11. THE WATER MAIN CONTRACTOR SHALL NOTIFY THE INSPECTION SECTION OF THE WHITE LAKE TOWNSHIP WATER DEPARTMENT AT 248-698-7700 AT LEAST THREE WORKING DAYS IN ADVANCE OF STARTING CONSTRUCTION.

SANITARY SEWER NOTES:

1. DOWNSPOUTS, WEEP TILE, FOOTING DRAINS OR ANY CONDUIT THAT CARRIES STORM OR GROUND WATER SHALL NOT BE ALLOWED TO DISCHARGE INTO A SANITARY SEWER.
2. ALL SANITARY LEADS SHALL BE CONSTRUCTED AT 1.00% MINIMUM SLOPE.
3. ALL SANITARY SEWER 8" OR LARGER SHALL BE P.V.C. TRUSS PIPE (ASTM D2680) AND FITTINGS, WITH ELASTOMERIC GASKET JOINTS PER ASTM D3212 UNLESS OTHERWISE NOTED.
4. ALL SANITARY SEWER LEADS SHALL BE POLYVINYL CHLORIDE (PVC) SDR 23.5 PIPE AND FITTINGS. ALL JOINTS TO BE ELASTOMERIC GASKET JOINTS PER ASTM D3212 UNLESS OTHERWISE NOTED.
5. SANITARY LEADS SHALL BE PROVIDED WITH CLEANOUTS EVERY 100 FEET AND AT EVERY BEND AS SHOWN. ALL CLEANOUTS TO BE PROVIDED WITH E.J.I.W. #1565 BOX OR EQUAL.

PEA GROUP
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STATE OF MICHIGAN
BRETT STURGEON HOLLANDSWORTH
LICENSED PROFESSIONAL ENGINEER
License No. 6201064949

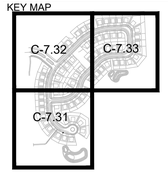
NORTH

0 20 40 80
SCALE: 1" = 40'

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KEY MAP



CLIENT
WHITE LAKE HILL, LLC
31550 NORTHWESTERN HWY
FARMINGTON HILLS, MI 48334

PROJECT TITLE
THE AVALON - SINGLE FAMILY
HIGHLAND ROAD
WHITE LAKE TWP, MI

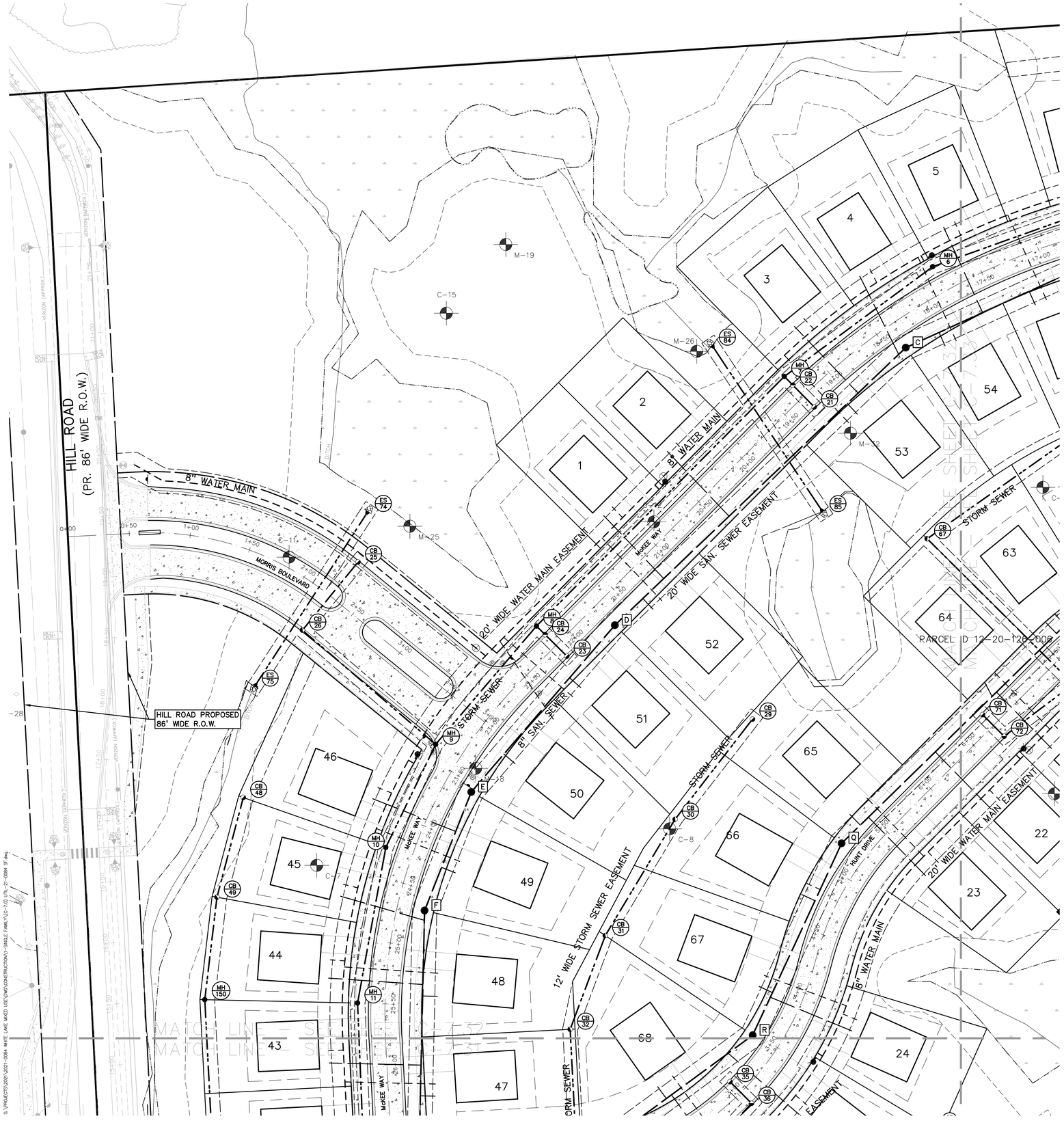
REVISIONS	
FINAL SITE PLAN REVIEW	5/8/25
FINAL SITE PLAN REVIEW	9/30/25

ORIGINAL ISSUE DATE:
MAY 8, 2025

DRAWING TITLE
UTILITY PLAN - SOUTH

PEA JOB NO.	2021-0084
P.M.	JC
DN.	BSH/JEB
DES.	BSH

DRAWING NUMBER:
C-7.31



UTILITY LEGEND:

- EX. OH, ELEC, POLE & GUY WIRE
- EX. U.G. CABLE TV & PEDESTAL
- EX. U.G. COMMUNICATION LINE, PEDESTAL & MANHOLE
- EX. U.G. ELEC,MANHOLE, METER & HANDHOLE
- EX. GAS LINE
- EX. GAS VALVE & GAS LINE MARKER
- EX. TRANSFORMER & IRRIGATION VALVE
- EX. WATER MAIN
- EX. HYDRANT, GATE VALVE & POST INDICATOR VALVE
- EX. WATER VALVE BOX & SHUTOFF
- EX. SANITARY SEWER
- EX. SANITARY CLEANOUT & MANHOLE
- EX. COMBINED SEWER MANHOLE
- EX. STORM SEWER
- EX. CLEANOUT & MANHOLE
- EX. SQUARE, ROUND, & BEEHIVE CATCH BASIN
- EX. YARD DRAIN & ROOF DRAIN
- EX. UNIDENTIFIED STRUCTURE
- PROPOSED WATER MAIN
- PROPOSED HYDRANT AND GATE VALVE
- PROPOSED TAPPING SLEEVE, VALVE & WELL
- PROPOSED POST INDICATOR VALVE
- PROPOSED SANITARY SEWER
- PROPOSED SANITARY CLEANOUT & MANHOLE
- PROPOSED STORM SEWER
- PROPOSED STORM SEWER CLEANOUT & MANHOLE
- PROPOSED CATCH BASIN, INLET & YARD DRAIN

NOTE: NO DECKS TO BE CONSTRUCTED WITHIN UTILITY EASEMENTS

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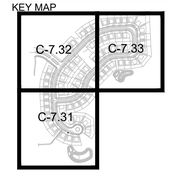
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31550 NORTHWESTERN HWY
FARMINGTON HILLS, MI 48334

PROJECT TITLE
THE AVALON - SINGLE FAMILY
HIGHLAND ROAD
WHITE LAKE TWP, MI

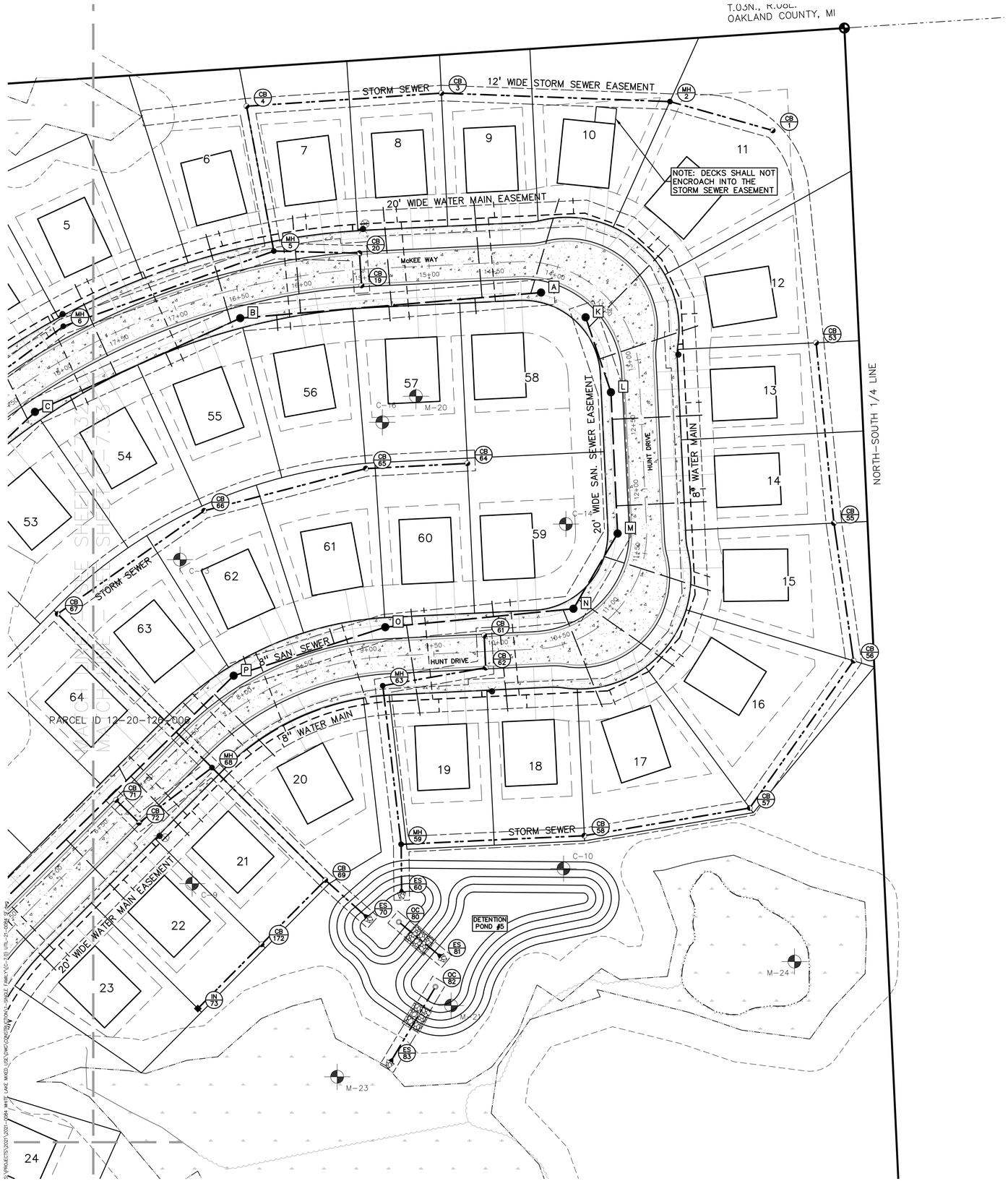
REVISIONS	
FINAL SITE PLAN REVIEW	5/8/25
FINAL SITE PLAN REVIEW	9/30/25

ORIGINAL ISSUE DATE:
MAY 8, 2025

DRAWING TITLE
UTILITY PLAN - WEST

PEA JOB NO.	2021-0084
P.M.	JC
DN.	BSH/JEB
DES.	BSH

DRAWING NUMBER:
C-7.32



UTILITY LEGEND:

- EX. OH, ELEC, POLE & GUY WIRE
- EX. U.G. CABLE TV & PEDESTAL
- EX. U.G. COMMUNICATION LINE, PEDESTAL & MANHOLE
- EX. U.G. ELEC,MANHOLE, METER & HANDHOLE
- EX. GAS LINE
- EX. GAS VALVE & GAS LINE MARKER
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NOTE: NO DECKS TO BE CONSTRUCTED WITHIN UTILITY EASEMENTS

NORTH

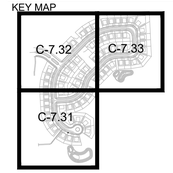
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REVISIONS

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FINAL SITE PLAN REVIEW	9/30/25

ORIGINAL ISSUE DATE:
MAY 8, 2025

DRAWING TITLE

UTILITY PLAN - EAST

PEA JOB NO.	2021-0084
P.M.	JC
DN.	BSH/JEB
DES.	BSH

DRAWING NUMBER:

C-7.33

STORM SEWER SYSTEM DESIGN

Location: Oakland County

I = B/(T+D)^E B = 50.12 D = 9.17 E = 0.81
C = varies
T = 20 (min.) Pipe "n" Value = 0.013

FROM STR	TO STR	AREA (A) (Acres)	COEF. C	A x C	TOTAL AREA (AxC)	TOTAL AREA (Acres)	TIME t (min.)	INT. I (in/hr)	FLOW Q (cfs)	PIPE CAP. (cfs)	PIPE DIA. (in.)	PIPE LENGTH (ft.)	PIPE SLOPE (%)	MIN HG PER "Q"	VEL. FULL (ft./sec)	TIME FLOW (min.)	H.G.L. ELEV. UP STREAM	H.G.L. ELEV. DOWN STREAM	RIM ELEV. UP STREAM	RIM ELEV. DOWN STREAM	INVERT ELEV. UP STREAM	INVERT ELEV. DOWN STREAM	PIPE COVER UP STREAM	PIPE COVER DOWN STREAM	HGL COVER UP STREAM	HGL COVER DOWN STREAM
112	111	0.17	0.60	0.10	0.10	0.17	20.00	3.26	0.33	2.52	12	215	0.50	0.01%	3.2	1.1	983.64	982.57	987.27	986.26	982.84	981.77	3.26	3.33	3.63	3.69
111	110	0.33	0.60	0.20	0.30	0.50	21.10	3.17	0.94	3.38	12	215	0.90	0.07%	4.3	0.8	982.57	980.63	986.26	984.26	981.77	979.83	3.33	3.26	3.69	3.63
110	109	0.33	0.60	0.20	0.49	0.82	21.90	3.10	1.53	3.38	12	227	0.90	0.18%	4.3	0.9	980.63	978.69	984.26	982.14	979.83	977.79	3.26	3.18	3.63	3.45
109	108	0.25	0.60	0.15	0.64	1.07	22.80	3.03	1.95	2.20	12	140	0.38	0.30%	2.8	0.8	978.69	978.27	982.14	982.36	977.79	977.26	3.18	3.93	3.45	4.08
108	107	0.00	0.00	0.00	1.42	2.37	23.60	2.97	4.22	4.09	12	138	1.32	1.41%	5.2	0.4	978.27	976.34	982.36	981.75	977.26	975.44	3.93	5.14	4.08	5.41
107	106	0.36	0.60	0.21	1.64	2.73	24.00	2.94	4.81	4.66	12	84	1.71	1.82%	5.9	0.2	976.34	974.80	981.75	975.34	975.44	974.00	5.14	0.17	5.41	0.54
114	113	0.61	0.60	0.37	0.37	0.61	20.00	3.26	1.19	2.11	12	41	0.35	0.11%	2.7	0.3	978.82	978.77	982.32	982.21	977.90	977.76	3.25	3.29	3.50	3.44
113	108	0.69	0.60	0.41	0.78	1.30	20.30	3.23	2.52	2.52	12	99	0.50	0.50%	3.2	0.5	978.77	978.27	982.21	982.36	977.76	977.26	3.29	3.93	3.44	4.08
322	321	0.13	0.60	0.08	0.08	0.13	20.00	3.26	0.25	2.25	12	26	0.40	0.00%	2.9	0.2	990.21	990.10	994.04	994.04	989.41	989.30	3.46	3.57	3.83	3.93
321	426	0.38	0.60	0.23	0.31	0.51	20.20	3.24	1.00	2.25	12	126	0.40	0.08%	2.9	0.7	990.10	989.60	994.04	995.65	989.30	988.80	3.57	5.69	3.93	6.05
426	327	0.00	0.00	0.00	0.31	0.51	20.90	3.18	1.00	2.25	12	73	0.40	0.08%	2.9	0.4	989.60	989.31	995.65	996.19	988.80	988.51	5.69	6.52	6.05	6.88
327	329	0.00	0.00	0.00	1.14	2.01	21.30	3.15	3.58	4.09	15	248	0.40	0.31%	3.3	1.2	989.31	988.32	996.19	994.18	988.31	987.32	6.44	5.42	6.88	5.86
329	423	0.32	0.60	0.19	1.60	2.79	22.50	3.05	4.89	5.00	15	219	0.60	0.57%	4.1	0.9	988.32	987.00	994.18	991.40	987.32	986.00	5.42	3.96	5.86	4.40
423	121	0.00	0.00	0.00	1.60	2.79	23.40	2.98	4.89	5.00	15	84	0.60	0.57%	4.1	0.3	987.00	986.50	991.40	990.21	986.00	985.50	3.96	3.27	4.40	3.71
121	120	0.55	0.60	0.33	2.12	3.65	23.70	2.96	6.27	7.91	15	231	1.50	0.94%	6.5	0.6	986.50	983.03	990.21	987.21	985.50	982.03	3.27	3.75	3.71	4.18
120	119	0.31	0.60	0.18	4.47	7.56	24.30	2.92	13.04	13.29	18	132	1.60	1.54%	7.5	0.3	982.53	980.41	987.21	984.22	981.33	979.21	4.18	3.31	4.68	3.81
119	118	0.49	0.60	0.29	4.95	8.36	24.60	2.90	14.33	22.62	24	114	1.00	0.40%	7.2	0.3	978.41	977.27	984.22	981.31	976.81	975.67	5.16	3.39	5.81	4.04
118	117	0.00	0.00	0.00	5.23	8.83	24.90	2.88	15.04	15.89	30	149	0.15	0.13%	3.2	0.8	974.27	974.05	981.31	980.80	972.27	972.05	6.25	5.96	7.04	6.76
117	116	0.20	0.60	0.12	6.73	11.33	25.70	2.82	19.00	20.51	30	238	0.25	0.21%	4.2	0.9	974.05	973.45	980.80	980.61	972.05	971.45	5.96	6.37	6.76	7.16
116	115	0.34	0.60	0.20	10.21	17.13	26.60	2.76	28.22	29.00	30	90	0.50	0.47%	5.9	0.3	973.45	973.00	980.61	974.08	971.45	971.00	6.37	0.28	7.16	1.08
429	428	0.41	0.60	0.25	0.25	0.41	20.00	3.26	0.81	2.52	12	26	0.50	0.05%	3.2	0.1	990.86	990.73	994.46	994.46	990.06	989.93	3.23	3.36	3.60	3.73
428	327	0.37	0.60	0.22	0.47	0.78	20.10	3.25	1.53	2.52	12	285	0.50	0.18%	3.2	1.5	990.73	989.31	994.46	996.19	989.93	988.51	3.36	6.52	3.73	6.88
318	327	0.71	0.50	0.36	0.36	0.71	20.00	3.26	1.17	2.11	12	104	0.35	0.11%	2.7	0.6	991.67	991.31	995.43	996.19	990.87	990.51	3.39	4.52	3.76	4.88
319	329	0.33	0.60	0.20	0.20	0.33	20.00	3.26	0.65	2.11	12	104	0.35	0.03%	2.7	0.6	989.68	989.32	993.48	994.18	988.88	988.52	3.43	4.49	3.80	4.86
328	329	0.13	0.60	0.08	0.08	0.13	20.00	3.26	0.26	2.11	12	24	0.35	0.01%	2.7	0.1	990.40	990.32	994.18	994.18	989.60	989.52	3.41	3.49	3.78	3.86
122	121	0.31	0.60	0.18	0.18	0.31	20.00	3.26	0.60	2.52	12	26	0.50	0.03%	3.2	0.1	986.63	986.50	990.21	990.21	985.83	985.70	3.21	3.34	3.58	3.71
425	330	0.74	0.60	0.45	0.45	0.74	20.00	3.26	1.45	3.56	12	33	1.00	0.17%	4.5	0.1	987.31	986.97	991.34	992.62	986.51	986.17	3.66	5.28	4.03	5.65
330	422	0.12	0.60	0.07	0.52	0.86	20.10	3.25	1.69	3.56	12	240	1.00	0.22%	4.5	0.9	986.97	984.57	992.62	991.68	986.17	983.77	5.28	6.74	5.65	7.11
422	125	0.00	0.00	0.00	0.52	0.86	21.00	3.17	1.69	5.04	12	58	2.00	0.22%	6.4	0.2	984.57	983.41	991.68	986.97	983.77	982.61	6.74	3.19	7.11	3.56
125	124	0.96	0.60	0.58	1.09	1.82	21.20	3.16	3.45	4.09	15	121	0.40	0.29%	3.3	0.6	983.41	982.93	986.97	987.63	982.41	981.93	3.12	4.27	3.56	4.71
124	123	0.17	0.60	0.10	1.20	1.99	21.80	3.11	3.71	6.64	18	67	0.40	0.13%	3.8	0.3	982.93	982.66	987.63	987.21	981.73	981.46	4.20	4.04	4.71	4.55
123	120	0.21	0.60	0.12	2.17	3.61	22.10	3.08	6.68	7.43	18	26	0.50	0.40%	4.2	0.1	982.66	982.53	987.21	987.21	981.46	981.33	4.04	4.18	4.55	4.68
127	126	0.52	0.60	0.31	0.31	0.52	20.00	3.26	1.03	2.11	12	26	0.35	0.08%	2.7	0.2	983.01	982.92	986.58	986.58	982.21	982.12	3.20	3.29	3.57	3.66
126	123	0.89	0.60	0.53	0.85	1.41	20.20	3.24	2.75	2.76	12	44	0.60	0.59%	3.5	0.2	982.92	982.66	986.58	987.21	982.12	981.86	3.29	4.18	3.66	4.55
141	119	0.31	0.60	0.18	0.18	0.31	20.00	3.26	0.60	2.11	12	118	0.35	0.03%	2.7	0.7	978.82	978.41	982.70	984.22	978.02	977.61	3.51	5.45	3.87	5.81
191	118	0.47	0.60	0.28	0.28	0.47	20.00	3.26	0.92	2.11	12	51	0.35	0.07%	2.7	0.3	977.45	977.27	981.07	981.31	976.65	976.47	3.26	3.68	3.62	4.04
130	129	1.31	0.60	0.79	0.79	1.31	20.00	3.26	2.57	7.47	12	60	4.40	0.52%	9.5	0.1	976.99	974.73	984.00	977.90	976.19	973.57	6.64	3.16	7.01	3.17
129	128	0.00	0.00	0.00	1.23	2.05	20.10	3.25	4.00	4.09	15	64	0.40	0.38%	3.3	0.3	974.73	974.49	977.90	977.60	973.37	973.11	3.09	3.05	3.17	3.11
128	117	0.25	0.60	0.15	1.38	2.30	20.40	3.23	4.45	4.57	15	94	0.50	0.47%	3.7	0.4	974.49	974.05	977.60	980.80	973.11	972.65	3.05	6.72	3.11	6.76
131	129	0.74	0.60	0.44	0.44	0.74	20.00	3.26	1.44	5.63	12	43	2.50	0.16%	7.2	0.1	975.45	974.73	979.00	977.90	974.65	973.57	3.18	3.16	3.55	3.17
132	117	0.00	0.00	0.00	0.00	0.00	20.00	3.26	0.00	2.11	12	34	0.35	0.00%	2.7	0.2	974.05	974.05	977.10	980.80	972.86	972.75	3.07	6.89	3.05	6.76
138	137	0.39	0.60	0.23	0.23	0.39	20.00	3.26	0.76	3.19	12	238	0.80	0.05%	4.1	1.0	986.69	984.79	991.07	989.47	985.89	983.99	4.01	4.32	4.38	4.68
137	136	0.14	0.60	0.09	0.32	0.53	21.00	3.17	1.01	4.22	12	160	1.40	0.08%	5.4	0.5	981.79	979.55	989.47	983.09	980.99	978.75	7.32	3.17	7.68	3.54
136	135	1.72	0.60	1.03	1.55	2.59	21.50	3.13	4.86	4.91	12	219	1.90	1.86%	6.3	0.6	979.55	975.40	983.09	979.36	978.75	974.60	3.17	3.59	3.54	3.96
135	134	0.85	0.60	0.51	2.40	3.99	22.10	3.08	7.38	7.57	18	49	0.52	0.49%	4.3	0.2	975.40	975.14	979.36	979.30	974.20	973.94	3.45	3.64	3.96	4.15
134	133	0.69	0.60	0.42	2.81	4.69	22.30	3.07	8.62	8.66	18	26	0.68	0.67%	4.9	0.1	975.14	974.97	979.30	979.31	973.94	973.77	3.64	3.83	4.15	4.34
133	116	0.77	0.60	0.46	3.27	5.45	22.40	3.06	10.01	10.08	18	165	0.92	0.91%	5.7	0.5	974.97	973.45	979.31	980.61	973.77	972.25	3.83	6.65	4.34	7.16
139	136	0.34	0.60	0.20	0.20	0.34	20.00	3.26	0.66	7.13	12	49	4.00	0.03%	9.1	0.1	981.51	979.55	985.57	983.09	980.71	978.75	3.69	3.17	4.05	3.54
140	135	0.56	0.60	0.33	0.33	0.56	20.00	3.26	1.09	5.96	12	58	2.80	0.09%	7.6	0.1	977.03	975.40	981.00	979.36	976.23	974.60	3.61	3.59	3.97	3.96
333	332	0.13	0.60	0.08	0.08	0.13	20.00	3.26	0.25	2.52	12	26	0.50	0.01%	3.2	0.1	988.74	988.61	992.56	992.35	987.94	987.81	3.45	3.37	3.82	3.73
332	331	0.18	0.60	0.11	0.18	0.31	20.10	3.25	0.60	2.11	12	58	0.35	0.03%	2.7	0.4	988.61	988.41	992.35	993.80	987.81	987.61	3.37	5.02	3.73	5.39
331	424	0.20	0.60	0.12	0.30	0.50	20.50	3.22	0.97	2.52	12	99	0.50	0.07%	3.2	0.5	988.41	987.92	993.80	993.29	987.61	987.12	5.02	5.00	5.39	5.37
424	340	0.00	0.00	0.00	0.30	0.50	21.00	3.17	0.97	2.98	12	117	0.70	0.07%	3.8	0.5	987.92	987.10	993.29	992.05	987.12	986.30	5.00	4.58	5.37	4.95
340	215	0.29	0.60	0.17	0.70	1.17	21.50	3.13	2.19	4.06	12	249	1.30	0.38%	5.2	0.8	987.10	983.87	992.05	988.62	986.30	983.07	4.58	4.39	4.95	4.75
215	209	0.53	0.60	0.32	1.02	1.69	22.30	3.07	3.12	7.56	12	52	4.50	0.77%	9.6	0.1	983.87	981.54	988.62	987.84	983.07	980.74	4.39	5.94	4.75	6.31
209	208	0.39	0.60	0.23	1.91	3.18	22.40	3.06	5.83	6.64	18	128	0.40	0.31%	3.8	0.6	981.54	981.02	987.84	986.56	980.34	979.82	5.80	5.03	6.31	5.54
208	221	0.39	0.60	0.23	3.21	5.35	23.00	3.01	9.67	10.12	24	253	0.20	0.18%	3.2	1.3	981.02	980.52	986.56	984.35	979.42	978.92	4.89	3.18	5.54	3.83
221	205	0.50	0.60	0.30	3.97	6.62	24.30	2.92	11.59	12.39	24	116	0.30	0.26%	3.9	0.5	980.52	980.17	984.35	983.50	978.92	978.57	3.18	2.68	3.83	3.33
205	204	0.45	0.60	0.27	4.85	8.08	24.80	2.88	13.97	14.31	24	41	0.40	0.38%	4.6	0.2	980.17	980.01	983.50	983.55	978.57	978.41	2.68	2.89	3.33	3.54
204	203	0.15	0.60	0.09	4.94	8.23	25.00	2.87	14.17	14.48	24	51	0.41	0.39%	4.6	0.2	980.01	979.80	983.55	980.68	978.41	978.20	2.89	0.23	3.54	0.88
339	340	0.37	0.60	0.22	0.22	0.37	20.00	3.26	0.73	2.11	12	26	0.35	0.04%	2.7	0.2	987.19	987.10	992.05	992.05	986.39	986.30	4.49	4.58	4.86	4.95
212	211	0.18	0.60	0.11	0.11	0.18	20.00	3.26	0.35	5.16	12	214	2.10	0.01%	6.6	0.5	987.59	983.10	991.59	986.96	986.79	982.30	3.63	3.49	4.00	3.85
211	210	0.42	0.60	0.25	0.60	1.00	20.50	3.22	1.92	2.11	12	24	0.35	0.29%	2.7	0.1	983.10	983.02	986.96	989.84	982.30	982.22	3.49	6.45	3.85	6.81
210	209	0.10	0.60	0.06	0.66	1.10	20.60	3.21	2.11	3.19	12	186	0.80	0.35%	4.1	0.8	983.02	981.54	989.84	987.84	982.22	980.74	6.45	5.94	6.81	6.31
214	213	0.26	0.60	0.15	0.15	0.26	20.00	3.26	0.51	2.11	12	26	0.35	0.02%	2.7	0.2	983.42	983.33	987.09	987.09	982.62	982.53	3.30	3.40	3.67	3.76
213	211	0.14	0.60	0.09	0.24	0.40	20.20	3.24	0.78	2.11	12	64	0.35	0.05%	2.7	0.4	983.33	983.10	987.09	986.96	982.53	982.30	3.40	3.49	3.76	3.85
431	208	0.55	0.60	0.33	0.33	0.55	20.00	3.26	1.07	3.56	12	39	1.00	0.09%	4.5	0.1	982.91	982.52	986.85	986.56	982.11	981.72	3.57	3.67	3.93	4.04
223	208	1.24	0.60	0.74	0.74	1.24	20.00	3.26	2.42	3.56	12	43	1.00	0.46%	4.5	0.2	982.45	982.02	986.50	986.56	981.65	981.22	3.68	4.17	4.05	4.54
222	221	0.77	0.60	0.46	0.46	0.77	20.00	3.26	1.51	2.11	12	26	0.35	0.18%	2.7	0.2	980.61	980.52	984.35	984.35	979.81	979.72	3.37	3.46	3.74	3.83
207	206	0.16	0.60	0.10	0.10	0.16	20.00	3.26	0.32	3.56	12	227	1.00	0.01%	4.5	0.8	983.49	981.22	986.92	986.50	982.69	980.42	3.07	4.91	3.43	5.28
206	205	0.23	0.60	0.14	0.60	1.00	20.80	3.19	1.92	2.11	12	42	0.35	0.29%	2.7	0.3	980.30	980.17	986.50	983.50	979.42	979.27	5.91	3.06	6.20	3.33
220	206	0.61	0.60	0.36	0.36	0.61	20.00	3.26	1.19	2.11	12	42	0.35	0.11%	2.7	0.3	980.37	980.30	984.00	986.50	979.57	979.42	3.27	5.91	3.63	6.20
320	316	0.64	0.53	0.34	0.34	0.64	20.00	3.26	1.10	2.52	12	173	0.50	0.10%	3.2	0.9	990.85	989.98	994.74	995.09	990.05	989.18	3.52	4.74	3.89	5.11
316	315	0.53	0.60	0.32	0.66	1.17	20.90	3.18	2.09	2.52	12	129	0.50	0.35%	3.2	0.7	989.98	989.33	995.09	993.83	989.18	988.53	4.74	4.12	5.11	4.49
315	314	0.74	0.60	0.44	1.10	1.91	21.60	3.12	3.44	5.75	18	25	0.30	0.11%	3.3	0.1	988.33	988.26	993.83	993.76	987.13	987.06	4.98	4.99	5.49	5.50
314	313	0.40	0.60	0.24	1.34	2.31	21.70	3.12	4.18	5.75	18	34	0.30	0.16%	3.3	0.2	988.26	988.16	993.76	992.91	987.06	986.96	4.99	4.24	5.50	4.75
313	312	0.24	0.60	0.14	1.49	2.55	21.90	3.10	4.61	5.75	18	179	0.30	0.19%	3.3	0.9	988.16	987.62	992.91	992.40	986.96	986.42	4.24	4.26	4.75	4.77
312	310	0.27	0.60	0.16	1.82	3.11	22.80	3.03	5.51	10.12	24	161	0.20	0.06%	3.2	0.8	987.62	987.30	992.40	988.03	986.02	985.70	4.12	0.08	4.77	0.73
323	312	0.28	0.60	0.17	0.17	0.28	20.00	3.26	0.55	2.11	12	26	0.35	0.02%	2.7	0.2	987.71	987.62	992.40	992.40	986.91	986.82	4.31	4.41	4.68	4.77
324	430	0.86	0.60	0.51	0.51	0.86	20.00	3.26	1.68	2.02	12	108	0.32	0.22%	2.6	0.7	988.10	987.86	991.10	991.10	987.15	986.80	2.79	3.13	3.00	3.24
430	338	0.32	0.60	0.19	0.71	1.18	20.70	3.20	2.26	3.23	15	136	0.25	0.12%	2.6	0.9	987.86	987.70	991.10	991.10	986.70	986.36	2.96	3.30	3.24	3.40
338	337	0.36	0.60	0.21	0.92	1.53	21.60	3.12	2.87	3.23	15	124	0.25	0.20%	2.6	0.8	987.70	987.45	991.10	991.10	986.36	986.05	3.30	3.61	3.40	3.65
337	336	0.87	0.60	0.52	1.44	2.40	22.40	3.06	4.41	4.46	18	26	0.18	0.18%	2.5	0.2	987.45	987.41	991.10	991.10	985.95	985.91	3.44	3.49	3.65	3.69
336	335	0.73	0.60	0.44	1.88	3.13	22.60	3.04	5.72	8.16	24	97	0.13	0.06%	2.6	0.6	987.41	987.28	991.10	991.30	985.81	985.68	3.04	3.37	3.69	4.02
335	334	0.24	0.60	0.14	2.02	3.37	23.20	3.00	6.07	8.16	24	138	0.13	0.07%	2.6	0.9	987.28	987.10	991.30	987.98	985.68	985.50	3.37	0.23	4.02	0.88
362	361	0.45	0.55	0.25	0.25	0.45	20.00	3.26	0.82	2.25	12	107	0.40	0.05%	2.9	0.6	1009.50	1009.08	1013.85	1013.92	1008.70	1008.28	3.98	4.48	4.34	4.84

NOTE:

STORM SEWER AND DETENTION CALCULATIONS USE AN AVERAGE C FACTOR OF 0.60 FOR MULTIPLE FAMILY DEVELOPMENTS PER TOWNSHIP ENGINEERING DESIGN STANDARDS

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

CAUTION!!
THE LOCATIONS AND ELEVATIONS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THIS DRAWING ARE ONLY APPROXIMATE. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL BE EXCLUSIVELY RESPONSIBLE FOR DETERMINING THE EXACT LOCATIONS AND ELEVATIONS PRIOR TO THE START OF CONSTRUCTION.

KEY MAP



CLIENT
WHITE LAKE HILL, LLC
31550 NORTHWESTERN HWY
FARMINGTON HILLS, MI 48334

PROJECT TITLE
THE AVALON - MULTI FAMILY
HIGHLAND ROAD
WHITE LAKE TWP, MI

REVISIONS

DRAFT	2/19/24
ISSUED FOR OWNER REVIEW	4/24/24
FINAL SITE PLAN REVIEW	7/3/24
FINAL SITE PLAN REVIEW	5/8/25
FINAL SITE PLAN REVIEW	9/30/25

ORIGINAL ISSUE DATE:
DECEMBER 4, 2023

DRAWING TITLE
STORM SEWER CALCULATIONS

PEA JOB NO.	2021-0084
P.M.	JC
DN.	BSH/JEB
DES.	BSH

DRAWING NUMBER:
C-11.1

STORM SEWER SYSTEM DESIGN

Location: Oakland County

I = B/(T+D)^E B = 50.12 D = 9.17 E = 0.81
C = varies
T = 20 (min.) Pipe "n" Value = 0.013

FROM STR	TO STR	AREA (A) (Acres)	COEF. C	A x C	TOTAL AREA (AxC)	TOTAL AREA (Acres)	TIME t (min.)	INT. I (in/hr)	FLOW Q (cfs)	PIPE CAP. (cfs)	PIPE DIA. (in.)	PIPE LENGTH (ft.)	PIPE SLOPE (%)	MIN HG PER "Q"	VEL. FULL (ft./sec)	TIME FLOW (min.)	H.G.L. ELEV. UP STREAM	H.G.L. ELEV. DOWN STREAM	RIM ELEV. UP STREAM	RIM ELEV. DOWN STREAM	INVERT ELEV. UP STREAM	INVERT ELEV. DOWN STREAM	PIPE COVER UP STREAM	PIPE COVER DOWN STREAM	HGL COVER UP STREAM	HGL COVER DOWN STREAM
361	360	0.30	0.60	0.18	0.43	0.75	20.60	3.21	1.38	2.25	12	26	0.40	0.15%	2.9	0.2	1009.08	1008.97	1013.92	1013.92	1008.28	1008.17	4.48	4.58	4.84	4.95
360	359	0.28	0.60	0.17	0.60	1.03	20.80	3.19	1.91	3.82	12	248	1.15	0.29%	4.9	0.9	1008.97	1006.12	1013.92	1011.02	1008.17	1005.32	4.58	4.54	4.95	4.90
359	358	0.34	0.60	0.20	1.03	1.74	21.70	3.12	3.20	3.77	12	134	1.12	0.81%	4.8	0.5	1006.12	1004.62	1011.02	1009.59	1005.32	1003.82	4.54	4.61	4.90	4.97
358	357	0.00	0.00	0.00	1.03	1.74	22.20	3.07	3.20	4.58	12	67	1.65	0.81%	5.8	0.2	1004.62	1003.52	1009.59	1008.52	1003.82	1002.72	4.61	4.63	4.97	5.00
357	356A	0.21	0.60	0.13	2.26	3.97	22.40	3.06	6.92	9.14	15	102	2.00	1.15%	7.4	0.2	1003.52	1001.49	1008.52	1006.00	1002.52	1000.49	4.56	4.08	5.00	4.51
356A	356	0.00	0.00	0.00	2.26	3.97	22.60	3.04	6.92	9.14	15	102	2.00	1.15%	7.4	0.2	1001.49	999.44	1006.00	1004.51	1000.49	998.44	4.08	4.62	4.51	5.06
356	355	0.43	0.60	0.26	2.52	4.40	22.80	3.03	7.64	8.76	15	25	1.84	1.40%	7.1	0.1	999.44	998.99	1004.51	1004.92	998.44	997.99	4.62	5.50	5.06	5.94
355	354	0.14	0.60	0.08	2.61	4.54	22.90	3.02	7.87	9.14	15	26	2.00	1.49%	7.4	0.1	998.99	998.47	1004.92	1004.98	997.99	997.47	5.50	6.08	5.94	6.51
354	353	0.42	0.60	0.25	2.86	4.96	23.00	3.01	8.61	11.51	18	103	1.20	0.67%	6.5	0.3	998.47	997.23	1004.98	1003.67	997.27	996.03	6.01	5.93	6.51	6.44
353	352	0.06	0.60	0.03	2.89	5.02	23.30	2.99	8.64	14.85	18	83	2.00	0.68%	8.4	0.2	997.23	995.57	1003.67	1002.90	996.03	994.37	5.93	6.82	6.44	7.33
352	351	0.00	0.00	0.00	5.29	9.01	23.50	2.98	15.73	25.29	24	115	1.25	0.48%	8.1	0.2	995.57	994.13	1002.90	999.72	993.97	992.53	6.68	4.94	7.33	5.59
351	350	0.18	0.60	0.11	5.39	9.19	23.70	2.96	15.97	25.29	24	78	1.25	0.50%	8.1	0.2	994.13	993.16	999.72	1000.50	992.53	991.56	4.94	6.70	5.59	7.35
350	349	0.00	0.00	0.00	5.39	9.19	23.90	2.95	15.97	18.24	24	86	0.65	0.50%	5.8	0.2	993.16	992.60	1000.50	993.49	991.56	991.00	6.70	0.24	7.35	0.89
363	359	0.37	0.60	0.22	0.22	0.37	20.00	3.26	0.73	2.11	12	26	0.35	0.04%	2.7	0.2	1006.21	1006.12	1011.02	1011.02	1005.41	1005.32	4.45	4.54	4.81	4.90
367	366	1.21	0.52	0.63	0.63	1.21	20.00	3.26	2.04	2.98	12	200	0.70	0.33%	3.8	0.9	1006.08	1004.68	1010.45	1009.99	1005.28	1003.88	3.99	4.94	4.36	5.31
366	365	0.24	0.60	0.14	0.77	1.44	20.90	3.18	2.44	2.52	12	94	0.50	0.47%	3.2	0.5	1004.68	1004.21	1009.99	1008.78	1003.88	1003.41	4.94	4.20	5.31	4.56
365	364	0.21	0.60	0.12	0.89	1.65	21.40	3.14	2.80	2.87	12	67	0.65	0.62%	3.7	0.3	1004.21	1003.78	1008.78	1008.52	1003.41	1002.98	4.20	4.37	4.56	4.74
364	357	0.36	0.60	0.22	1.11	2.01	21.70	3.12	3.45	3.56	12	26	1.00	0.94%	4.5	0.1	1003.78	1003.52	1008.52	1008.52	1002.98	1002.72	4.37	4.63	4.74	5.00
370	369	1.38	0.60	0.83	0.83	1.38	20.00	3.26	2.70	2.76	12	95	0.60	0.58%	3.5	0.5	997.32	996.75	1001.18	1000.81	996.52	995.95	3.50	3.70	3.86	4.06
369	368	1.02	0.60	0.61	1.44	2.40	20.50	3.22	4.63	6.21	18	26	0.35	0.19%	3.5	0.1	996.75	996.66	1000.81	1000.81	995.55	995.46	3.55	3.65	4.06	4.15
368	352	0.86	0.60	0.52	1.96	3.26	20.60	3.21	6.28	7.05	18	243	0.45	0.36%	4.0	1.0	996.66	995.57	1000.81	1002.90	995.46	994.37	3.65	6.82	4.15	7.33
371	352	0.73	0.60	0.44	0.44	0.73	20.00	3.26	1.44	2.11	12	118	0.35	0.16%	2.7	0.7	998.98	998.57	1002.45	1002.90	998.18	997.77	3.10	3.97	3.47	4.33
385	384	1.84	0.47	0.87	0.87	1.84	20.00	3.26	2.85	2.11	12	119	0.35	0.64%	2.7	0.7	1009.30	1008.54	1012.42	1013.64	1008.15	1007.74	3.10	4.73	3.12	5.10
384	383	0.41	0.60	0.25	1.32	2.58	20.70	3.20	4.22	5.96	12	180	2.80	1.40%	7.6	0.4	1008.54	1003.51	1013.64	1009.41	1007.74	1002.71	4.73	5.53	5.10	5.90
383	382	0.33	0.60	0.20	1.55	2.97	21.10	3.17	4.90	6.17	12	140	3.00	1.90%	7.9	0.3	1003.51	999.31	1009.41	1005.39	1002.71	998.51	5.53	5.70	5.90	6.07
382	381	0.18	0.60	0.11	1.76	3.32	21.40	3.14	5.54	6.17	12	91	3.00	2.42%	7.9	0.2	999.31	996.57	1005.39	1004.72	998.51	995.77	5.70	7.78	6.07	8.14
381	380	0.00	0.00	0.00	1.99	3.70	21.60	3.12	6.22	6.27	12	154	3.10	3.05%	8.0	0.3	996.57	991.80	1004.72	992.25	995.77	991.00	7.78	0.08	8.14	0.45
386	384	0.33	0.60	0.20	0.20	0.33	20.00	3.26	0.65	3.56	12	26	1.00	0.03%	4.5	0.1	1009.80	1009.54	1013.64	1013.64	1009.00	1008.74	3.47	3.73	3.84	4.10
387	383	0.05	0.60	0.03	0.03	0.05	20.00	3.26	0.11	3.56	12	26	1.00	0.00%	4.5	0.1	1005.77	1005.51	1009.41	1009.41	1004.97	1004.71	3.27	3.53	3.64	3.90
388	382	0.18	0.60	0.11	0.11	0.18	20.00	3.26	0.35	2.11	12	26	0.35	0.01%	2.7	0.2	1001.91	1001.81	1005.44	1005.39	1001.11	1001.01	3.17	3.20	3.54	3.57
389	381	0.38	0.60	0.23	0.23	0.38	20.00	3.26	0.74	3.56	12	94	1.00	0.04%	4.5	0.3	999.51	998.57	1003.40	1004.72	998.71	997.77	3.52	5.78	3.89	6.14
376	375	0.60	0.60	0.36	0.36	0.60	20.00	3.26	1.18	2.25	12	99	0.40	0.11%	2.9	0.6	996.38	995.99	999.82	1000.57	995.58	995.19	3.07	4.22	3.44	4.59
375	374	0.50	0.59	0.29	0.65	1.10	20.60	3.21	2.09	2.44	12	26	0.47	0.34%	3.1	0.1	995.99	995.86	1000.57	1000.57	995.19	995.06	4.22	4.34	4.59	4.71
374	373	0.29	0.60	0.17	0.82	1.39	20.70	3.20	2.64	3.06	12	82	0.74	0.55%	3.9	0.4	995.86	995.26	1000.57	999.97	995.06	994.46	4.34	4.34	4.71	4.71
373	372	0.00	0.00	0.00	0.82	1.39	21.10	3.17	2.64	5.04	12	83	2.00	0.55%	6.4	0.2	993.46	991.80	999.97	992.25	992.66	991.00	6.14	0.08	6.51	0.45
345	344	0.34	0.60	0.21	0.21	0.34	20.00	3.26	0.67	2.11	12	26	0.35	0.04%	2.7	0.2	992.03	991.94	995.43	995.43	991.23	991.14	3.04	3.13	3.40	3.49
344	343	0.25	0.60	0.15	0.36	0.59	20.20	3.24	1.15	2.11	12	154	0.35	0.10%	2.7	1.0	991.94	991.40	995.43	991.85	991.14	990.60	3.13	0.08	3.49	0.45
404	403	0.68	0.60	0.41	0.41	0.68	20.00	3.26	1.33	6.00	12	27	2.84	0.14%	7.6	0.1	975.05	974.29	975.29	977.15	974.25	973.49	-0.13	2.49	0.24	2.86
403	402	0.00	0.00	0.00	0.41	0.68	20.10	3.25	1.33	5.63	12	277	2.50	0.14%	7.2	0.6	973.27	966.35	977.15	970.62	972.47	965.55	3.51	3.90	3.88	4.27
402	401	0.00	0.00	0.00	0.69	1.15	20.70	3.20	2.22	2.25	12	78	0.40	0.39%	2.9	0.5	966.35	966.04	970.62	968.37	965.55	965.24	3.90	1.97	4.27	2.33
401	400	0.24	0.60	0.15	0.84	1.40	21.20	3.16	2.65	2.67	12	44	0.56	0.55%	3.4	0.2	966.04	965.79	968.37	966.97	965.24	964.99	1.97	0.81	2.33	1.18
405	402	0.48	0.60	0.29	0.29	0.48	20.00	3.26	0.93	2.11	12	29	0.35	0.07%	2.7	0.2	966.50	966.40	968.49	970.62	965.70	965.60	1.62	3.85	1.99	4.22
409	408	1.49	0.60	0.89	0.89	1.49	20.00	3.26	2.91	2.11	12	69	0.35	0.67%	2.7	0.4	976.23	975.77	976.46	976.22	975.21	974.97	0.08	0.08	0.23	0.45
449	371	0.00	0.00	0.00	0.00	0.00	20.00	3.26	0.00	2.11	12	129	0.35	0.00%	2.7	0.8	999.43	998.98	1004.39	1002.45	998.63	998.18	4.59	3.10	4.96	3.47
451	370	0.00	0.00	0.00	0.00	0.00	20.00	3.26	0.00	2.11	12	127	0.35	0.00%	2.7	0.8	997.77	997.32	1002.46	1001.18	996.97	996.52	4.32	3.50	4.69	3.86
452	370	0.00	0.00	0.00	0.00	0.00	20.00	3.26	0.00	2.11	12	118	0.35	0.00%	2.7	0.7	997.73	997.32	1002.52	1001.18	996.93	996.52	4.42	3.50	4.79	3.86
453	389	0.00	0.00	0.00	0.00	0.00	20.00	3.26	0.00	2.11	12	38	0.35	0.00%	2.7	0.2	999.65	999.51	1003.80	1003.40	998.85	998.71	3.79	3.52	4.15	3.89
454	385	0.00	0.00	0.00	0.00	0.00	20.00	3.26	0.00	2.11	12	125	0.35	0.00%	2.7	0.8	1009.39	1009.30	1013.85	1012.42	1008.59	1008.15	4.09	3.10	4.46	3.12
455	362	0.00	0.00	0.00	0.00	0.00	20.00	3.26	0.00	2.11	12	243	0.35	0.00%	2.7	1.5	1010.36	1009.50	1014.49	1013.85	1009.56	1008.70	3.77	3.98	4.14	4.34
456	457	0.00	0.00	0.00	0.00	0.00	20.00	3.26	0.00	2.11	12	74	0.35	0.00%	2.7	0.5	976.29	976.03	980.14	981.50	975.49	975.23	3.48	5.11	3.85	5.47
457	403	0.00	0.00	0.00	0.00	0.00	20.50	3.22	0.00	3.90	12	230	1.20	0.00%	5.0	0.8	976.03	973.27	981.50	977.15	975.23	972.47	5.11	3.51	5.47	3.88
FOREBAY TO POND																										
105	104	0.00	0.00	0.00	0.00	0.00	20.00	3.26	0.24	2.11	12	78	0.35	0.00%	2.7	0.5	0.00	0.00	974.74	972.33	970.00	969.73	3.57	1.44	974.74	972.33
202	201	0.00	0.00	0.00	0.00	0.00	20.00	3.26	0.07	2.11	12	58	0.35	0.00%	2.7	0.4	0.00	0.00	981.50	976.14	978.00	977.80	2.33	-2.83	981.50	976.14
231	303	2.54	0.60	1.52	1.52	2.54	20.00	3.26	4.97	6.17	12	69	3.00	1.95%	7.9	0.1	0.00	0.00	984.29	985.81	983.04	980.97	0.08	3.67	0.00	0.00
391	390	0.00	0.00	0.00	0.00	0.00	20.00	3.26	0.09	2.52	12	64	0.50	0.00%	3.2	0.3	0.00	0.00	989.80	983.08	985.32	985.00	3.31	-3.08	989.80	983.08
393	392	0.00	0.00	0.00	0.00	0.00	20.00	3.26	0.04	2.52	12	62	0.50	0.00%	3.2	0.3	0.00	0.00	989.30	983.08	985.31	985.00	2.82	-3.09	989.30	983.08
395	394	0.00	0.00	0.00	0.00	0.00	20.00	3.26	0.08	2.25	12	44	0.40	0.00%	2.9	0.3	0.00	0.00	987.50	983.08	985.00	984.83	1.33	-2.92	987.50	983.08
POND OUTLETS																										
102	101	4.85	0.60	2.91	2.91	4.85	20.00	3.26	2.45	3.56	12	57	1.00	0.47%	4.5	0.2	0.00	0.00	977.00	978.00	968.03	967.46	7.80	9.38	0.00	0.00
101	100	0.00	0.00	0.00	2.91	4.85	20.20	3.24	2.45	3.56	12	146	1.00	0.47%	4.5	0.5	0.00	0.00	978.00	972.04	967.46	966.00	9.38	4.87	0.00	0.00

NOTE:

STORM SEWER AND DETENTION CALCULATIONS USE AN AVERAGE C FACTOR OF 0.60 FOR MULTIPLE FAMILY DEVELOPMENTS PER TOWNSHIP ENGINEERING DESIGN STANDARDS

PEA GROUP
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STATE OF MICHIGAN
BRETT STURGEON HOLLANDSWORTH
LICENSED PROFESSIONAL ENGINEER
License No. 6201064949

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

CAUTION!!
THE LOCATIONS AND ELEVATIONS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THIS DRAWING ARE ONLY APPROXIMATE. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL BE EXCLUSIVELY RESPONSIBLE FOR DETERMINING THE EXACT LOCATIONS AND ELEVATIONS PRIOR TO THE START OF CONSTRUCTION.

KEY MAP



CLIENT
WHITE LAKE HILL, LLC
31550 NORTHWESTERN HWY
FARMINGTON HILLS, MI 48334

PROJECT TITLE
THE AVALON - MULTI FAMILY
HIGHLAND ROAD
WHITE LAKE TWP, MI

REVISIONS

DRAFT	2/19/24
ISSUED FOR OWNER REVIEW	4/24/24
FINAL SITE PLAN REVIEW	7/3/24
FINAL SITE PLAN REVIEW	5/8/25
FINAL SITE PLAN REVIEW	9/30/25

ORIGINAL ISSUE DATE:
DECEMBER 4, 2023

DRAWING TITLE
STORM SEWER CALCULATIONS

PEA JOB NO.	2021-0084
P.M.	JC
DN.	BSH/JEB
DES.	BSH

DRAWING NUMBER:
C-11.2

STORM SEWER SYSTEM DESIGN

Region Michigan
Location: Oakland County

I = B/(T+D)^E B = 175.00 D = 25.00 E = 1.00
C = varies
T = 20 (min.) Pipe "n" Value = 0.013

FROM STR	TO STR	AREA (A) (Acres)	COEF. C	A x C	TOTAL AREA (AxC)	TOTAL AREA (Acres)	TIME t (min.)	INT. I (in/hr)	FLOW Q (cfs)	PIPE CAP. (cfs)	PIPE DIA. (in.)	PIPE LENGTH (ft.)	PIPE SLOPE (%)	MIN HG PER "Q"	VEL. FULL (ft./sec)	TIME FLOW (min.)	H.G.L. ELEV. UP STREAM	H.G.L. ELEV. DOWN STREAM	RIM ELEV. UP STREAM	RIM ELEV. DOWN STREAM	INVERT ELEV. UP STREAM	INVERT ELEV. DOWN STREAM	PIPE COVER UP STREAM	PIPE COVER DOWN STREAM	HGL COVER UP STREAM	HGL COVER DOWN STREAM
1	2	0.66	0.35	0.23	0.23	0.66	20.00	3.89	0.89	3.56	12	83	1.00	0.06%	4.5	0.3	1022.80	1021.98	1026.70	1028.41	1022.00	1021.18	3.53	6.06	3.90	6.43
2	3	0.00	0.00	0.00	0.23	0.66	20.30	3.86	0.89	3.56	12	177	1.00	0.06%	4.5	0.6	1021.98	1020.21	1028.41	1025.64	1021.18	1019.41	6.06	5.07	6.43	5.43
3	4	0.43	0.35	0.15	0.38	1.09	20.90	3.81	1.45	7.13	12	151	4.00	0.17%	9.1	0.3	1020.21	1014.17	1025.64	1016.87	1019.41	1013.37	5.07	2.34	5.43	2.71
4	5	0.35	0.35	0.12	0.51	1.44	21.20	3.79	1.91	2.11	12	114	0.35	0.29%	2.7	0.7	1014.17	1013.77	1016.87	1020.97	1013.37	1012.97	2.34	6.83	2.71	7.20
5	6	0.00	0.00	0.00	0.68	1.94	21.90	3.73	2.54	5.04	12	173	2.00	0.51%	6.4	0.4	1013.77	1010.31	1020.97	1014.39	1012.97	1009.51	6.83	3.71	7.20	4.08
6	7	0.00	0.00	0.00	0.68	1.94	22.30	3.70	2.54	7.56	12	151	4.50	0.51%	9.6	0.3	1010.31	1003.52	1014.39	1008.65	1009.51	1002.72	3.71	4.77	4.08	5.13
7	8	0.00	0.00	0.00	1.01	2.89	22.60	3.68	3.71	6.22	12	288	3.05	1.09%	7.9	0.6	1003.52	994.74	1008.65	999.88	1002.72	993.94	4.77	4.77	5.13	5.14
8	9	0.00	0.00	0.00	1.26	3.60	23.20	3.63	4.57	4.79	15	127	0.55	0.50%	3.9	0.5	994.74	994.04	999.88	999.29	993.74	993.04	4.70	4.80	5.14	5.24
9	10	0.00	0.00	0.00	1.50	4.28	23.70	3.59	5.38	5.59	15	94	0.75	0.70%	4.6	0.3	988.04	987.34	999.29	999.02	987.04	986.34	10.80	11.24	11.24	11.68
10	11	0.00	0.00	0.00	1.50	4.28	24.00	3.57	5.38	5.59	15	129	0.75	0.70%	4.6	0.5	987.34	986.37	999.02	997.75	986.34	985.37	11.24	10.94	11.68	11.37
11	12	0.00	0.00	0.00	1.50	4.28	24.50	3.54	5.38	6.46	15	110	1.00	0.70%	5.3	0.3	986.37	985.28	997.75	996.61	985.37	984.28	10.94	10.90	11.37	11.34
12	13	0.00	0.00	0.00	1.79	5.12	24.80	3.51	6.30	6.46	15	61	1.00	0.95%	5.3	0.2	985.28	984.67	996.61	995.53	984.28	983.67	10.90	10.43	11.34	10.87
13	14	0.22	0.35	0.08	3.07	8.76	25.00	3.50	10.73	16.61	18	165	2.50	1.04%	9.4	0.3	984.67	980.53	995.53	991.24	983.47	979.33	10.36	10.20	10.87	10.71
14	15	0.29	0.35	0.10	4.01	11.45	25.30	3.48	13.94	16.61	18	131	2.50	1.76%	9.4	0.2	980.53	977.25	991.24	987.89	979.33	976.05	10.20	10.13	10.71	10.64
15	16	0.00	0.00	0.00	4.36	12.47	25.50	3.47	15.12	27.71	24	131	1.50	0.45%	8.8	0.2	977.25	975.38	987.89	979.21	975.65	973.69	9.99	3.27	10.64	3.83
16	17	0.27	0.35	0.09	5.04	14.39	25.70	3.45	17.38	18.24	24	34	0.65	0.59%	5.8	0.1	975.38	975.18	979.21	979.00	973.69	973.47	3.27	3.28	3.83	3.82
17	86	0.13	0.35	0.05	5.08	14.52	25.80	3.44	17.50	18.24	24	179	0.65	0.60%	5.8	0.5	975.18	974.10	979.00	977.19	973.37	972.20	3.38	2.74	3.82	3.09
86	18	0.36	0.35	0.13	5.21	14.88	26.30	3.41	17.76	20.51	30	40	0.25	0.19%	4.2	0.2	974.10	974.00	977.19	974.25	972.10	972.00	2.30	-0.54	3.09	0.25
19	20	0.21	0.35	0.07	0.07	0.21	20.00	3.89	0.28	3.56	12	25	1.00	0.01%	4.5	0.1	1017.59	1017.34	1022.67	1022.67	1016.79	1016.54	4.71	4.96	5.08	5.33
20	5	0.29	0.35	0.10	0.17	0.50	20.10	3.88	0.67	5.04	12	66	2.00	0.04%	6.4	0.2	1017.34	1016.02	1022.67	1020.97	1016.54	1015.22	4.96	4.58	5.33	4.95
21	22	0.45	0.35	0.16	0.16	0.45	20.00	3.89	0.61	3.56	12	25	1.00	0.03%	4.5	0.1	1003.97	1003.72	1008.08	1008.08	1003.17	1002.92	3.74	3.99	4.11	4.36
22	7	0.50	0.35	0.17	0.33	0.94	20.10	3.88	1.28	5.04	12	10	2.00	0.13%	6.4	0.0	1003.72	1003.52	1008.08	1008.65	1002.92	1002.72	3.99	4.77	4.36	5.13
23	24	0.39	0.35	0.13	0.13	0.39	20.00	3.89	0.52	3.56	12	25	1.00	0.02%	4.5	0.1	995.19	994.94	999.31	999.31	994.39	994.14	3.75	4.00	4.11	4.36
24	8	0.32	0.35	0.11	0.25	0.71	20.10	3.88	0.96	5.04	12	10	2.00	0.07%	6.4	0.0	994.94	994.74	999.31	999.88	994.14	993.94	4.00	4.77	4.36	5.14
25	26	0.34	0.35	0.12	0.12	0.34	20.00	3.89	0.46	3.56	12	72	1.00	0.02%	4.5	0.3	991.48	990.76	996.61	996.61	990.68	989.96	4.76	5.48	5.12	5.84
26	9	0.35	0.35	0.12	0.24	0.68	20.30	3.86	0.93	2.52	12	144	0.50	0.07%	3.2	0.7	990.76	990.04	996.61	999.29	989.96	989.24	5.48	8.88	5.84	9.24
27	28	0.43	0.35	0.15	0.15	0.43	20.00	3.89	0.58	3.56	12	25	1.00	0.03%	4.5	0.1	991.23	990.98	996.04	996.04	990.43	990.18	4.45	4.70	4.81	5.06
28	12	0.42	0.35	0.15	0.29	0.84	20.10	3.88	1.14	5.04	12	10	2.00	0.10%	6.4	0.0	990.98	990.78	996.04	996.61	990.18	989.98	4.70	5.47	5.06	5.84
29	30	0.66	0.35	0.23	0.23	0.66	20.00	3.89	0.90	2.52	12	104	0.50	0.06%	3.2	0.5	991.30	990.79	994.75	997.40	990.50	989.99	3.08	6.25	3.45	6.61
30	31	0.20	0.35	0.07	0.30	0.86	20.50	3.85	1.16	2.11	12	111	0.35	0.11%	2.7	0.7	990.79	990.40	997.40	998.00	989.99	989.60	6.25	7.24	6.61	7.60
31	32	0.52	0.35	0.18	0.48	1.38	21.20	3.79	1.83	2.11	12	82	0.35	0.27%	2.7	0.5	990.40	990.11	998.00	996.50	989.60	989.31	7.24	6.02	7.60	6.39
32	33	0.50	0.35	0.18	0.66	1.88	21.70	3.75	2.47	2.52	12	140	0.50	0.48%	3.2	0.7	990.11	989.41	996.50	998.07	989.31	988.61	6.02	8.29	6.39	8.65
33	34	0.00	0.00	0.00	0.97	2.77	22.40	3.69	3.58	3.82	15	113	0.35	0.31%	3.1	0.6	987.07	986.72	998.07	996.87	985.91	985.52	10.72	9.91	11.00	10.15
34	13	0.00	0.00	0.00	1.20	3.42	23.00	3.65	4.36	5.25	18	61	0.25	0.17%	3.0	0.3	986.72	986.57	996.87	995.53	985.52	985.37	9.64	8.46	10.15	8.97
35	36	0.48	0.35	0.17	0.17	0.48	20.00	3.89	0.65	3.56	12	25	1.00	0.03%	4.5	0.1	993.52	993.27	999.14	999.14	992.72	992.47	5.25	5.50	5.62	5.87
36	37	0.41	0.35	0.14	0.31	0.89	20.10	3.88	1.21	2.52	12	62	0.50	0.11%	3.2	0.3	993.27	992.96	999.14	999.10	992.47	992.16	5.50	5.78	5.87	6.14
37	33	0.00	0.00	0.00	0.31	0.89	20.40	3.85	1.21	3.56	12	105	1.00	0.11%	4.5	0.4	992.96	991.91	999.10	998.07	992.16	991.11	5.78	5.79	6.14	6.15
38	39	0.29	0.35	0.10	0.10	0.29	20.00	3.89	0.40	3.56	12	25	1.00	0.01%	4.5	0.1	991.42	991.17	996.29	996.29	990.62	990.37	4.51	4.76	4.87	5.12
39	34	0.36	0.35	0.12	0.23	0.65	20.10	3.88	0.88	5.04	12	10	2.00	0.06%	6.4	0.0	991.17	990.97	996.29	996.87	990.37	990.17	4.76	5.53	5.12	5.90
40	41	0.34	0.35	0.12	0.12	0.34	20.00	3.89	0.46	4.36	12	186	1.50	0.02%	5.6	0.6	989.61	986.82	993.43	990.50	988.81	986.02	3.46	3.31	3.82	3.68
41	45	0.26	0.35	0.09	0.21	0.60	20.60	3.84	0.81	7.13	12	54	4.00	0.05%	9.1	0.1	985.32	983.17	990.50	986.88	984.52	982.37	4.81	3.35	5.18	3.71
45	42	0.73	0.35	0.25	0.47	1.33	20.70	3.83	1.78	2.11	12	208	0.35	0.25%	2.7	1.3	983.17	982.44	986.88	985.50	982.37	981.64	3.35	2.69	3.71	3.06
42	43	1.07	0.35	0.37	0.84	2.40	22.00	3.72	3.13	3.23	15	107	0.25	0.23%	2.6	0.7	982.44	982.17	985.50	990.67	981.44	981.17	2.62	8.06	3.06	8.50
43	44	0.00	0.00	0.00	0.84	2.40	22.70	3.67	3.13	3.23	15	25	0.25	0.23%	2.6	0.2	982.17	982.11	990.67	990.67	981.17	981.11	8.06	8.12	8.50	8.56
44	14	0.00	0.00	0.00	0.84	2.40	22.90	3.65	3.13	3.23	15	10	0.25	0.23%	2.6	0.1	982.11	982.08	990.67	991.24	981.11	981.08	8.12	8.72	8.56	9.16
46	47	0.44	0.35	0.15	0.15	0.44	20.00	3.89	0.59	3.56	12	33	1.00	0.03%	4.5	0.1	981.00	980.67	985.79	985.99	980.20	979.87	4.42	4.95	4.79	5.32
47	15	0.58	0.35	0.20	0.36	1.02	20.10	3.88	1.39	3.56	12	92	1.00	0.15%	4.5	0.3	980.67	979.75	985.99	987.89	979.87	978.95	4.95	7.77	5.32	8.14
48	49	0.29	0.35	0.10	0.10	0.29	20.00	3.89	0.39	3.56	12	84	1.00	0.01%	4.5	0.3	982.04	981.20	985.45	986.63	981.24	980.40	3.04	5.06	3.41	5.43
49	150	0.31	0.35	0.11	0.21	0.60	20.30	3.86	0.81	2.11	12	84	0.35	0.05%	2.7	0.5	981.20	980.91	986.63	989.32	980.40	980.11	5.06	8.05	5.43	8.42
150	50	0.00	0.00	0.00	0.21	0.60	20.80	3.82	0.81	2.52	12	147	0.50	0.05%	3.2	0.8	980.91	980.17	989.32	985.90	980.11	979.37	8.05	5.36	8.42	5.73
50	51	0.33	0.35	0.12	0.33	0.93	21.60	3.76	1.22	2.52	12	151	0.50	0.12%	3.2	0.8	980.17	979.42	985.90	985.60	979.37	978.62	5.36	5.82	5.73	6.18
51	52	0.34	0.35	0.12	0.44	1.27	22.40	3.69	1.64	5.04	12	179	2.00	0.21%	6.4	0.5	979.42	975.83	985.60	981.30	978.62	975.03	5.82	5.10	6.18	5.47
52	16	0.38	0.35	0.13	0.58	1.65	22.90	3.65	2.11	2.52	12	109	0.50	0.35%	3.2	0.6	975.83	975.38	981.30	979.21	975.03	974.49	5.10	3.56	5.47	3.83
53	55	0.17	0.35	0.06	0.06	0.17	20.00	3.89	0.23	7.56	12	140	4.50	0.00%	9.6	0.2	1020.74	1014.43	1027.14	1018.53	1019.94	1013.63	6.03	3.73	6.40	4.10
55	56	0.37	0.35	0.13	0.19	0.54	20.20	3.87	0.73	7.56	12	108	4.50	0.04%	9.6	0.2	1008.43	1003.59	1018.53	1007.14	1007.63	1002.79	9.73	3.18	10.10	3.55
56	57	0.31	0.35	0.11	0.30	0.85	20.40	3.85	1.15	7.13	12	139	4.00	0.10%	9.1	0.3	1003.59	998.02	1007.14	1001.75	1002.79	997.22	3.18	3.36	3.55	3.73
57	58	0.22	0.35	0.08	0.38	1.07	20.70	3.83	1.44	5.04	12	130	2.00	0.16%	6.4	0.3	998.02	995.43	1001.75	999.00	997.22	994.63	3.36	3.21	3.73	3.57
58	59	0.22	0.35	0.08	0.45	1.29	21.00	3.80	1.72	3.19	12	142	0.80	0.23%	4.1	0.6	995.43	994.29	999.00	999.41	994.63	993.49	3.21	4.76	3.57	5.12
59	60	0.00	0.00	0.00	0.78	2.22	21.60	3.76	2.92	7.13	12	37	4.00	0.67%	9.1	0.1	994.29	992.80	999.41	993.25	993.49	992.00	4.76	0.08	5.12	0.45
61	62	0.27	0.35	0.10	0.10	0.27	20.00	3.89	0.37	3.56	12	25	1.00	0.01%	4.5	0.1	1009.93	1009.68	1014.78	1014.78	1009.13	1008.88	4.49	4.74	4.86	5.11
62	63	0.66	0.35	0.23	0.33	0.93	20.10	3.88	1.26	6.67	12	81	3.50	0.13%	8.5	0.2	1009.68	1006.85	1014.78	1011.97	1008.88	1006.05	4.74	4.76	5.11	5.13
63	59	0.00	0.00	0.00	0.33	0.93	20.30	3.86	1.26	7.56	12	123	4.50	0.13%	9.6	0.2	1000.85	995.29	1011.97	999.41	1000.05	994.49	10.76	3.76	11.13	4.12
64	65	0.46	0.35	0.16	0.16	0.46	20.00	3.89	0.63	7.13	12	79	4.00	0.03%	9.1	0.1	1010.37	1007.23	1014.76	1011.60	1009.57	1006.43	4.02	4.01	4.39	4.37
65	66	0.34	0.35	0.12	0.28	0.80	20.10	3.88	1.09	7.13	12	129	4.00	0.09%	9.1	0.2	1006.23	1001.05	1011.60	1004.89	1005.43	1000.25	5.01	3.47	5.37	3.83
66	67	0.55	0.35	0.19	0.47	1.35	20.30	3.86	1.82	5.04	12	139	2.00	0.26%	6.4	0.4	1001.05	998.28	1004.89	1001.15	1000.25	997.48	3.47	2.50	3.83	2.87
67	68	0.65	0.35	0.23	0.70	1.99	20.70	3.83	2.67	3.23	15	169	0.25	0.17%	2.6	1.1	998.28	997.86	1001.15	1005.49	997.28	996.86	2.43	7.19	2.87	7.63
68	69	0.00	0.00	0.00	0.98	2.80	21.80	3.74	3.66	10.21	15	123	2.50	0.32%	8.3	0.2	996.76	993.67	1005.49	997.65	995.76	992.67	8.29	3.54	8.73	3.98
69	70	0.11	0.35	0.04	1.13	3.24	22.00	3.72	4.22	9.33	24	43	0.17	0.03%	3.0	0.2	993.67	993.60	997.65	993.79	992.07	992.00	3.33	-0.46	3.98	0.19
71	72	0.43	0.35	0.15	0.15	0.43	20.00	3.89	0.58	3.56	12	25	1.00	0.03%	4.5	0.1	999.36	999.11	1003.72	1003.72	998.56	998.31	3.99	4.24	4.35	4.60
72	68	0.38	0.35	0.13	0.28	0.81	20.10	3.88	1.10	2.52	12	71	0.50	0.09%	3.2	0.4	999.11	998.76	1003.72	1005.49	998.31	997.96	4.24	6.36	4.60	6.73
73	172	0.08	0.35	0.03	0.03	0.08	20.00	3.89	0.11	2.11	12	70	0.35	0.00%	2.7	0.4	993.68	993.68	996.25	996.25	992.56	992.32	2.52	2.76	2.57	2.57
172	69	0.24	0.35	0.09	0.11	0.32	20.40	3.85	0.44	2.11	12	70	0.35	0.02%	2.7	0.4	993.68	993.67	996.25	997.65	992.32	992.07	2.76	4.41	2.57	3.98
74	75	0.00	0.00	0.00	0.00	0.00	20.00	3.89	0.00	9.10	18	170	0.75	0.00%	5.2	0.6	987.18	985.90	0.75	0.75	985.98	984.70	-986.93	-985.66	-986.43	-985.15
76	77	0.18	0.35	0.06	5.27	15.06	20.00	3.89	20.50	4.65	12	59	1.70	33.13%	5.9	0.2	991.36	971.80	973.17	973.75	972.00	971.00	0.00	1.58	-18.19	1.95
78	79	1.94	0.35	0.68	5.95	16.99	20.00	3.89	23.13	5.56	18	89	0.28	4.85%	3.1	0.5	976.26	971.95	972.71	971.35	971.00	970.75	0.00	-1.10	-3.55	-0.60
80	81	0.32	0.35	0.11	2.02	5.78	20.00	3.89	7.87	3.90	12	42	1.20	4.89%	5.0	0.1	994.35	992.30	993.17	992.95	992.00	991.50	0.00	0.28	-1.18	0.65
82	83	0.62	0.35	0.22	2.24	6.40	20.00	3.89	8.71	5.04	12	67	2.00	5.99%	6.4	0.2	994.99	990.95	992.67	988.24	991.50	990.15	0.00	-3.08	-2.32	-2.71
85	84	0.80	0.35	0.28	0.28	0.80	20.00	3.89	1.08	3.23	15	163	0.25	0.03%	2.6	1.0	991.97	991.56	0.75	0.75	990.97	990.56	-991.66	-991.25	-991.22	-990.81
91	90	0.00	0.00	0.00	0.00	0.00	20.00	3.89	0.00	7.32	12	27	4.22	0.00%	9.3	0.0	978.71	977.58	978.50	977.37	977.91	976.78	-0.58	-0.58	-0.21	-0.21

S:\PROJECTS\2021\2021-0084 WHITE LAKE MIXED USE\PWO\CONSTRUCTION\1-SINGLE FAMILY\[C-11.0 DRAINAGE-2-2-0084 SF.dwg

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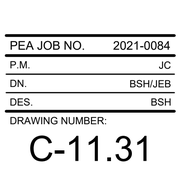
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NORTH

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CAUTION!!
THE LOCATIONS AND ELEVATIONS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THIS DRAWING ARE ONLY APPROXIMATE. NO REPRESENTATION IS EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL BE EXCLUSIVELY RESPONSIBLE FOR DETERMINING THE EXACT UTILITY LOCATIONS AND ELEVATIONS PRIOR TO THE START OF CONSTRUCTION.

KEY MAP



CLIENT

WHITE LAKE HILL, LLC
31550 NORTHWESTERN HWY
FARMINGTON HILLS, MI 48334

PROJECT TITLE

THE AVALON - SINGLE FAMILY
HIGHLAND ROAD
WHITE LAKE TWP, MI

REVISIONS

FINAL SITE PLAN REVIEW	5/8/25
FINAL SITE PLAN REVIEW	9/30/25

ORIGINAL ISSUE DATE:
MAY 8, 2025

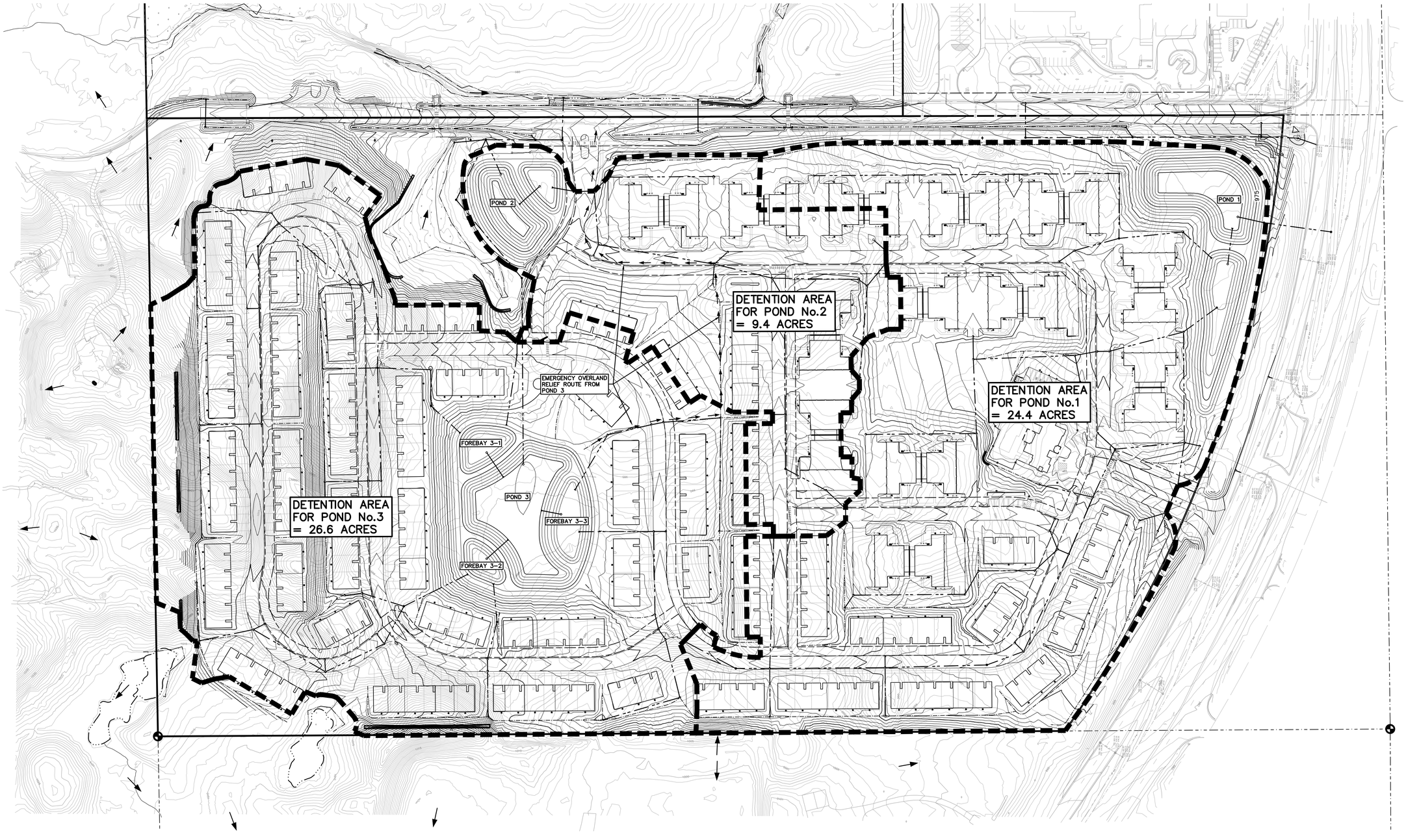
DRAWING TITLE

DESIGN CALCULATIONS

PEA JOB NO.	2021-0084
P.M.	JC
DN.	BSH/JEB
DES.	BSH

DRAWING NUMBER:

C-11.31



NOTE:

STORM SEWER AND DETENTION CALCULATIONS USE AN AVERAGE C FACTOR OF 0.60 FOR MULTIPLE FAMILY DEVELOPMENTS PER TOWNSHIP ENGINEERING DESIGN STANDARDS

PEA GROUP
t: 844.813.2949
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STATE OF MICHIGAN
BRETT STURGEON HOLLANDSWORTH
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NORTH

0 50 100 200
SCALE: 1" = 100'

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KEY MAP



CLIENT
WHITE LAKE HILL, LLC
31550 NORTHWESTERN HWY
FARMINGTON HILLS, MI 48334

PROJECT TITLE
THE AVALON - MULTI FAMILY
HIGHLAND ROAD
WHITE LAKE TWP, MI

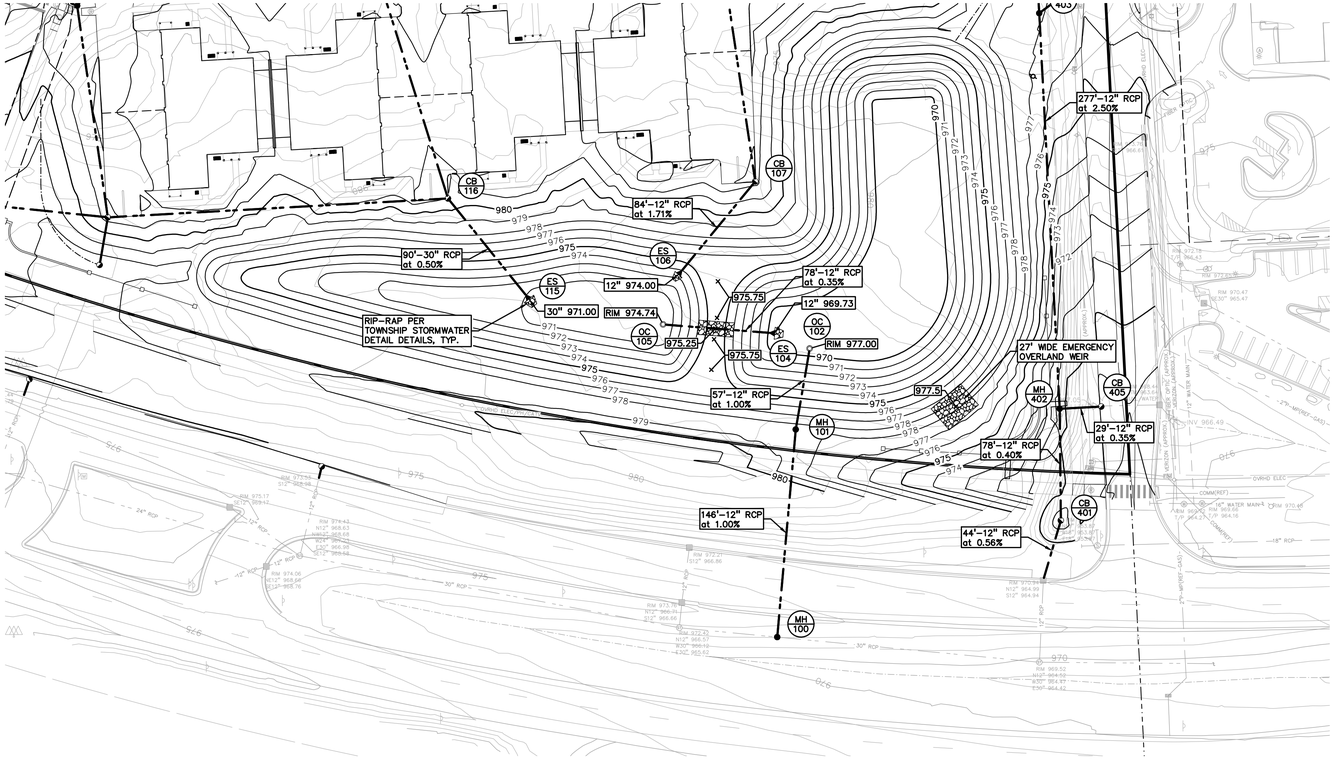
REVISIONS	
DRAFT	2/19/24
ISSUED FOR OWNER REVIEW	4/24/24
FINAL SITE PLAN REVIEW	7/3/24
FINAL SITE PLAN REVIEW	5/8/25
FINAL SITE PLAN REVIEW	9/30/25

ORIGINAL ISSUE DATE:
DECEMBER 4, 2023

DRAWING TITLE
OVERALL DRAINAGE AREAS

PEA JOB NO.	2021-0084
P.M.	JC
DN.	BSH/JEB
DES.	BSH

DRAWING NUMBER:
C-12.0



Detention Basin		
Contributing Area (A):	24.5	acre
Allowable Discharge (Qa)	2.45	cfs (0.1*area)
Coefficient of Runoff (Cr):	0.60	
Forebay Storage Volume Required (1-yr Design Storm)		
Qo = ((Qa)/(A)(Cr):	0.17	cfs/acre impervious
T = -25 + ((2700/Qo))^0.5:	101.03	minutes
Vs = (4320(T)/(T+25)) - 40Qo(T):	2,776	cf/acre impervious
Vt = (Vs)(A)(Cr):	40,807	cf
Detention Storage Volume Required (100-yr Design Storm)		
Qo = ((Qa)/(A)(Cr):	0.17	cfs/acre impervious
T = -25 + ((10312.5/Qo))^0.5:	221.30	minutes
Vs = (16500(T)/(T+25)) - 40Qo(T):	13,320	cf/acre impervious
Vt = (Vs)(A)(Cr):	195,804	cf
Storage Provided in Forebay		
1-yr Storage Elevation:	974.74	

Elev. (ft)	Area (sf)	Vol. (cf)	Total Vol. (cf)
970.0	0	0	0
971.0	3,495	1,748	1,748
972.0	7,040	5,268	7,015
973.0	10,635	8,838	15,853
974.0	14,565	12,600	28,453
975.0	18,920	16,743	45,195

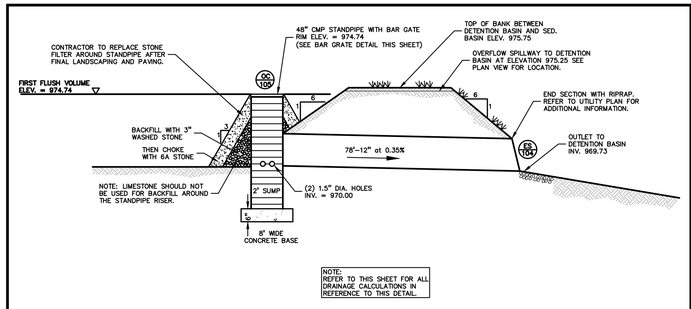
Forebay Restriction Design		
Basin Outlet Elevation:	970.00	
Storage Elevation:	974.74	
Avg. Head over Orifice (Hw):	2.37	ft
Allowable Discharge (Qa): (48 hrs)	0.24	cfs
Standpipe Restriction Hole Dia:	1.50	in
Standpipe Restriction Hole Area:	0.0123	sft
Number of Restriction Holes:	2	
Total Hole Area:	0.0245	sft
Actual Discharge (Q)	0.19	cfs
Q = 0.62 * A * (2 * G * Hw)^0.5		
Drain Time:	60	hrs
Detention Volume minus Forebay:	**154,997**	**cf**
100-yr Storage Elevation:	976.00	Calc.
100-yr Storage Elevation:	977.00	Provided

Elev. (ft)	Area (sf)	Vol. (cf)	Total Vol. (cf)
969	0	0	0
970	11,595	5,798	5,798
971	14,990	13,293	19,090
972	18,620	16,805	35,895
973	22,485	20,553	56,448
974	26,570	24,528	80,975
975	30,880	28,725	109,700
976	60,300	45,590	155,290
977	68,980	64,640	219,930

100-yr Detention Basin Restriction Design		
Basin Outlet Elevation:	969.00	
Storage Elevation:	977.00	
Avg. Head over Orifice: (2/3h)	5.33	ft
Allowable Discharge (Qa)	2.45	cfs
Standpipe Restriction Hole Dia.:	6	in
Standpipe Restriction Hole Area:	0.1963	sft
Number of Restriction Holes:	1	
Total Hole Area:	0.1963	sft
Actual Discharge (Q)	2.25	cfs
Q = 0.62 * A * (2 * G * Hw)^0.5		
100 Year Emergency Overflow Weir		
Flow (Q): 215/(t+25) x A x C	37.2	cfs
Time (T): Overland, Storm & Fill Pond	60	min
Length of Spillway (L):	31	ft
Depth of Water over Spillway (H):	0.50	ft
Uses Cipoletti Weir Equation (Q=3.367 * L * H^3/2)		

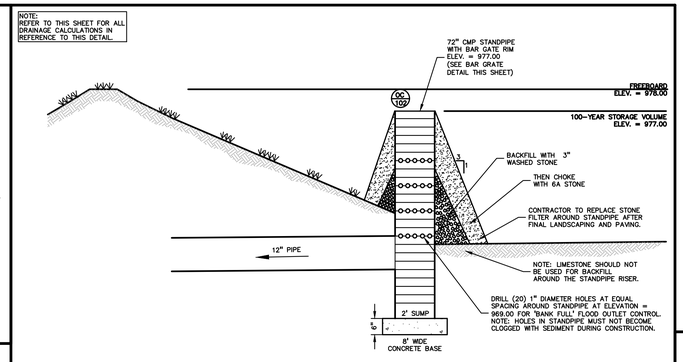
NOTE:

STORM SEWER AND DETENTION CALCULATIONS USE AN AVERAGE C FACTOR OF 0.60 FOR MULTIPLE FAMILY DEVELOPMENTS PER TOWNSHIP ENGINEERING DESIGN STANDARDS



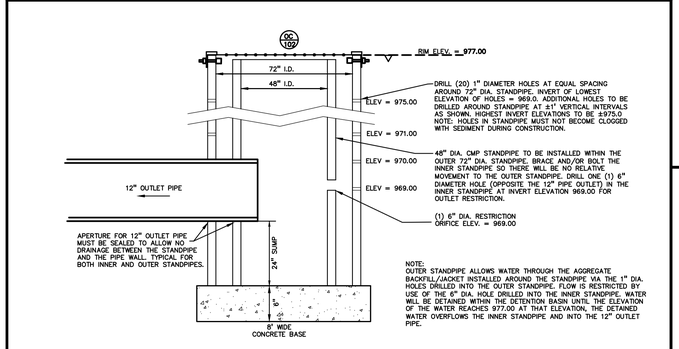
SEDIMENTATION BASIN RISER DETAIL (FOREBAY)

NOT TO SCALE



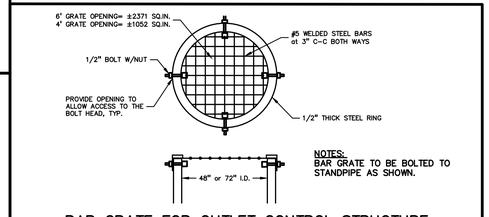
DETENTION BASIN OUTLET CONTROL STRUCTURE DETAIL

NOT TO SCALE



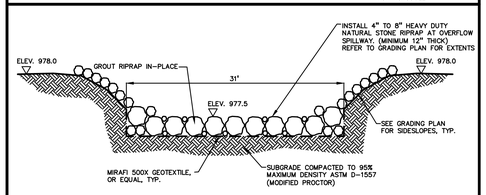
OUTLET CONTROL STANDPIPE DETAIL (OC102)

NOT TO SCALE



BAR GRATE FOR OUTLET CONTROL STRUCTURE

NOT TO SCALE



RIP-RAP OVERFLOW WEIR DETAIL

NOT TO SCALE

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0 25 50 100
SCALE: 1" = 50'

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KEY MAP



CLIENT

WHITE LAKE HILL, LLC
31550 NORTHWESTERN HWY
FARMINGTON HILLS, MI 48334

PROJECT TITLE

THE AVALON - MULTI FAMILY
HIGHLAND ROAD
WHITE LAKE TWP, MI

REVISIONS	
DRAFT	2/19/24
ISSUED FOR OWNER REVIEW	4/24/24
FINAL SITE PLAN REVIEW	7/3/24
FINAL SITE PLAN REVIEW	5/8/25
FINAL SITE PLAN REVIEW	9/30/25

ORIGINAL ISSUE DATE:
DECEMBER 4, 2023

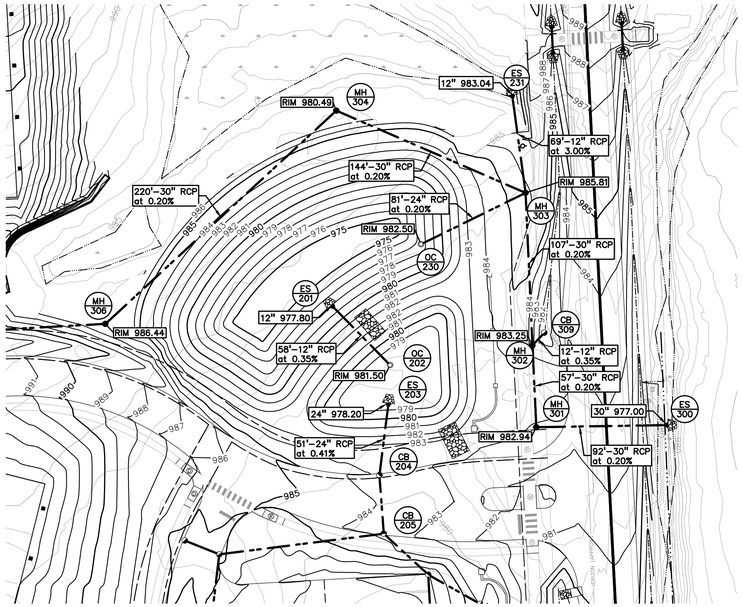
DRAWING TITLE

DETENTION POND 1

PEA JOB NO.	2021-0084
P.M.	JC
DN.	BSH/JEB
DES.	BSH

DRAWING NUMBER:

C-12.1



Detention Basin		
Contributing Area (A):	9.5	acre
Allowable Discharge (Qa)	1.90	cfs (0.2*area)
Coefficient of Runoff (Cr):	0.60	
Forebay Storage Volume Required (1-yr Design Storm)		
Qo = ((Qa)/(A)(Cr):	0.33	cfs/acre impervious
T = -25 + ((2700/Qo))^0.5:	65.45	minutes
Vs = (4320(T)/(T+25)) - 40Qo(T):	2,262	cf/acre impervious
Vt = (Vs)(A)(Cr):	12,893	cf
Detention Storage Volume Required (100-yr Design Storm)		
Qo = ((Qa)/(A)(Cr):	0.33	cfs/acre impervious
T = -25 + ((10312.5/Qo))^0.5:	151.78	minutes
Vs = (16500(T)/(T+25)) - 40Qo(T):	12,163	cf/acre impervious
Vt = (Vs)(A)(Cr):	69,329	cf
Detention Volume minus Forebay:	**56,436**	**cf**
Storage Provided in Detention Basin		
1-yr Storage Elevation:	981.34	
100-yr Storage Elevation:	981.69	Calc.
100-yr Storage Elevation:	982.00	Provided

Elev. (ft)	Area (sf)	Vol. (cf)	Total Vol. (cf)
978.2	1,740	0	0
979.0	2,775	1,806	1,806
980.0	4,300	3,538	5,343
981.0	6,000	5,150	10,493
982.0	7,940	6,970	17,463

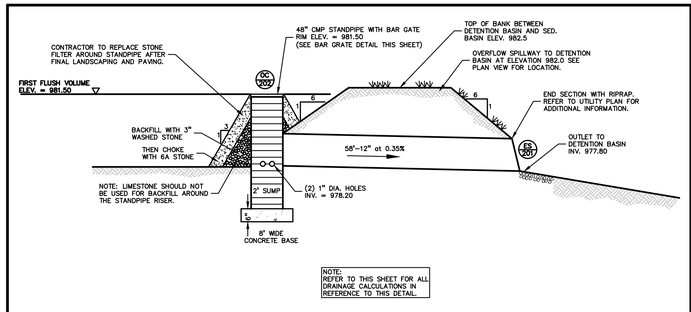
Forebay Restriction Design		
Basin Outlet Elevation:	978.20	
Storage Elevation:	981.34	
Avg. Head over Orifice (Hw):	1.57	ft
Allowable Discharge (Qa): (48 hrs)	0.07	cfs
Standpipe Restriction Hole Dia:	1.00	in
Standpipe Restriction Hole Area:	0.0055	sft
Number of Restriction Holes:	2	
Total Hole Area:	0.0109	sft
Actual Discharge (Q)	0.07	cfs
Q = 0.62 * A * (2 * G * Hw)^0.5		
Drain Time:	53	hrs

Elev. (ft)	Area (sf)	Vol. (cf)	Total Vol. (cf)
978	9,542	0	0
979	12,242	10,892	10,892
980	15,160	13,701	24,593
981	18,300	16,730	41,323
982	21,670	19,985	61,308
982.5	33,194	15,701	77,009

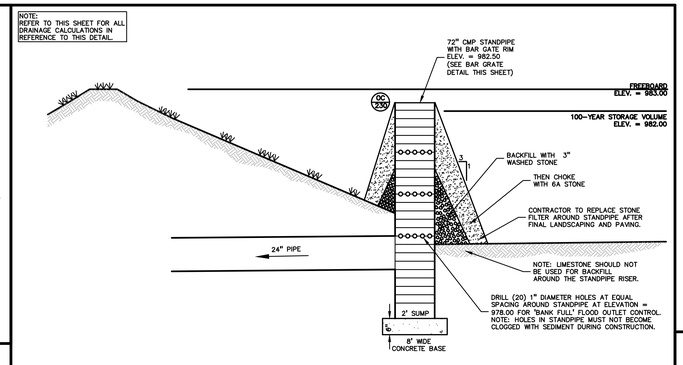
100-yr Detention Basin Restriction Design		
Basin Outlet Elevation:	978.00	
Storage Elevation:	982.00	
Avg. Head over Orifice: (2/3h)	2.67	ft
Allowable Discharge (Qa)	1.90	cfs
Standpipe Restriction Hole Dia.:	6.5	in
Standpipe Restriction Hole Area:	0.2303	sft
Number of Restriction Holes:	1	
Total Hole Area:	0.2303	sft
Actual Discharge (Q)	1.87	cfs
Q = 0.62 * A * (2 * G * Hw)^0.5		
100 Year Emergency Overflow Weir		
Flow (Q): 215/(t+25) x A x C	17.5	cfs
Time (T): Overland, Storm & Fill Pond	45	min
Length of Spillway (L):	15	ft
Depth of Water over Spillway (H):	0.50	ft
Uses Cipoletti Weir Equation (Q=3.367 * L * H^3/2)		

NOTE:

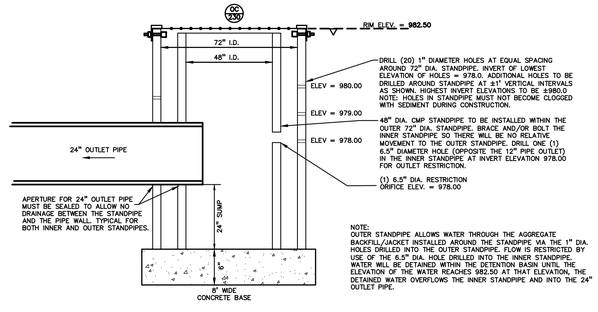
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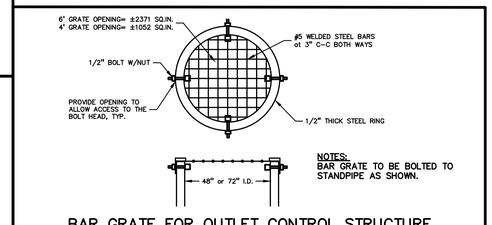
SEDIMENTATION BASIN RISER DETAIL (FOREBAY)
NOT TO SCALE



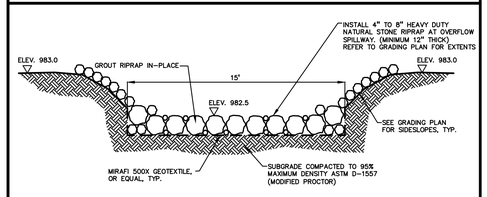
DETENTION BASIN OUTLET CONTROL STRUCTURE DETAIL
NOT TO SCALE



OUTLET CONTROL STANDPIPE DETAIL (OC230)
NOT TO SCALE



BAR GRATE FOR OUTLET CONTROL STRUCTURE
NOT TO SCALE



RIP-RAP OVERFLOW WEIR DETAIL
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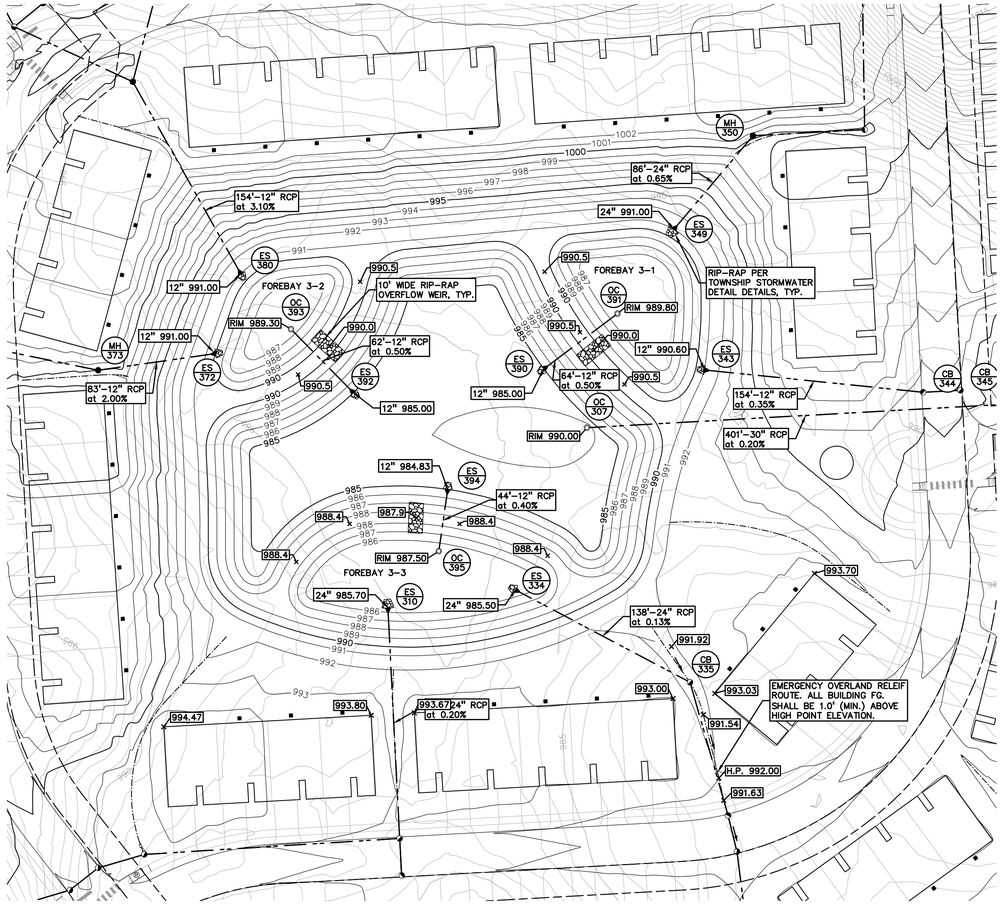
REVISIONS	
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ORIGINAL ISSUE DATE:
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DRAWING TITLE
DETENTION POND 2

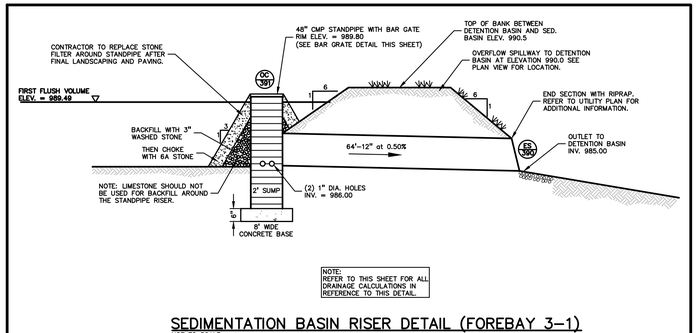
PEA JOB NO.	2021-0084
P.M.	JC
DN.	BSH/JEB
DES.	BSH

DRAWING NUMBER:
C-12.2

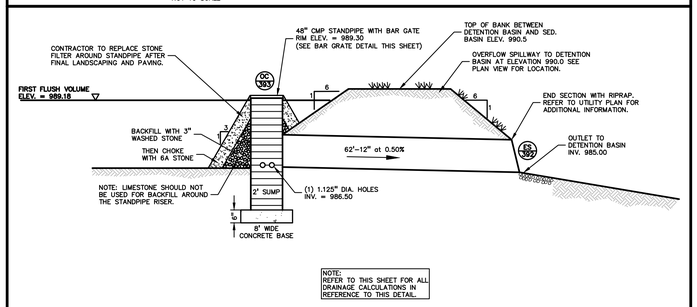


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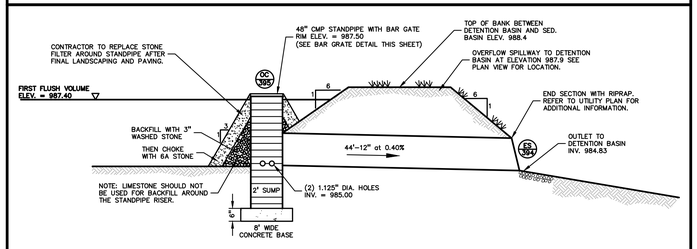
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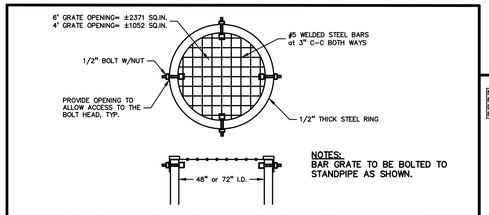
SEDIMENTATION BASIN RISER DETAIL (FOREBAY 3-1)
NOT TO SCALE



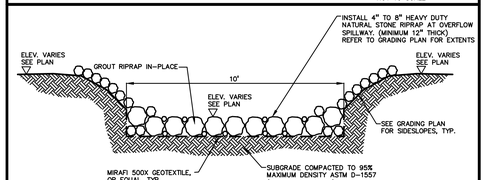
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NOT TO SCALE



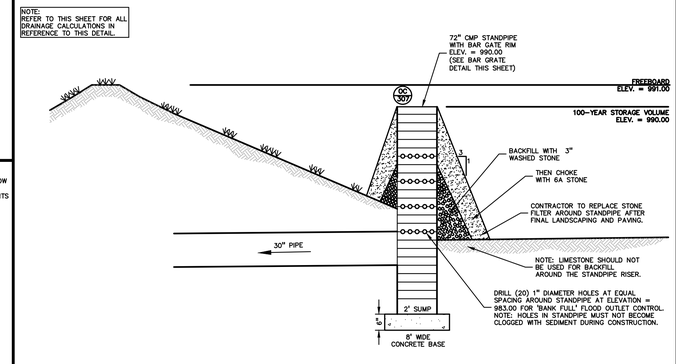
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NOT TO SCALE



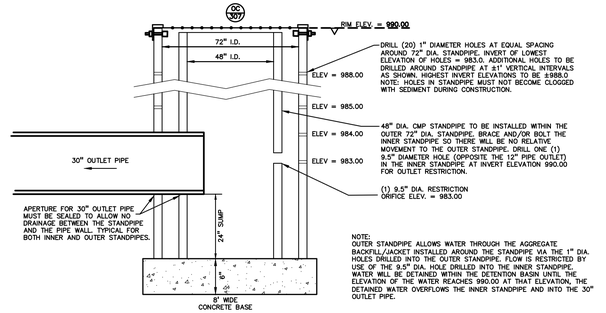
BAR GRATE FOR OUTLET CONTROL STRUCTURE
NOT TO SCALE



RIP-RAP OVERFLOW WEIR DETAIL
NOT TO SCALE



DETENTION BASIN OUTLET CONTROL STRUCTURE DETAIL
NOT TO SCALE



OUTLET CONTROL STANDPIPE DETAIL (OC230)
NOT TO SCALE

Detention Basin

Contributing Area (A):	26.8	acre
Allowable Discharge (Qa)	5.36	cfs (0.2*area)
Coefficient of Runoff (Cr):	0.60	

Foreby 3-1 Storage Volume Required (1-yr Design Storm)

Contributing Area (A1):	11.00	acre
Allowable Discharge (Qa)	2.20	cfs (0.2*area)
Qo = ((Qa)/(A)(Cr):	0.33	cfs/acre impervious
T = -25 + ((2700/Qo))^0.5:	65.45	minutes
Vs = (4320(T)/(T+25)) - 40Qo(T):	2,262	cf/acre impervious
Vt = (Vs)(A)(Cr):	14,929	cf

Foreby 3-2 Storage Volume Required (1-yr Design Storm)

Contributing Area (A1):	5.30	acre
Allowable Discharge (Qa)	1.06	cfs (0.2*area)
Qo = ((Qa)/(A)(Cr):	0.33	cfs/acre impervious
T = -25 + ((2700/Qo))^0.5:	65.45	minutes
Vs = (4320(T)/(T+25)) - 40Qo(T):	2,262	cf/acre impervious
Vt = (Vs)(A)(Cr):	7,193	cf

Foreby 3-3 Storage Volume Required (1-yr Design Storm)

Contributing Area (A1):	10.50	acre
Allowable Discharge (Qa)	2.10	cfs (0.2*area)
Qo = ((Qa)/(A)(Cr):	0.33	cfs/acre impervious
T = -25 + ((2700/Qo))^0.5:	65.45	minutes
Vs = (4320(T)/(T+25)) - 40Qo(T):	2,262	cf/acre impervious
Vt = (Vs)(A)(Cr):	14,251	cf

Detention Storage Volume Required (100-yr Design Storm)

Qo = ((Qa)/(A)(Cr):	0.33	cfs/acre impervious
T = -25 + ((10312.5/Qo))^0.5:	151.78	minutes
Vs = (16500(T)/(T+25)) - 40Qo(T):	12,163	cf/acre impervious
Vt = (Vs)(A)(Cr):	195,581	cf

Storage Provided in Detention Basin

Foreby 3-1: 1-yr Storage Elevation:	989.49
Foreby 3-2: 1-yr Storage Elevation:	989.18
Foreby 3-3: 1-yr Storage Elevation:	987.40
100-yr Storage Elevation:	

Foreby 3-1

Elev. (ft)	Area (sf)	Vol. (cf)	Total Vol. (cf)
986.0	0	0	0
987.0	3,004	1,502	1,502
988.0	4,754	3,879	5,381
989.0	6,678	5,716	11,097
990.0	8,828	7,753	18,850

Forebay Restriction Design

Basin Outlet Elevation:	986.00	
Storage Elevation:	989.49	
Avg. Head over Orifice (Hw):	1.75	ft
Allowable Discharge (Qa): (48 hrs)	0.09	cfs
Standpipe Restriction Hole Dia:	1.000	in
Standpipe Restriction Hole Area:	0.0055	sft
Number of Restriction Holes:	2	
Total Hole Area:	0.0109	sft
Actual Discharge (Q)	0.07	cfs
Q = 0.62 * A * (2 * G * Hw)^0.5		
Drain Time:	58	hrs

Foreby 3-2

Elev. (ft)	Area (sf)	Vol. (cf)	Total Vol. (cf)
986.5	0	0	0
987.0	1,618	405	405
988.0	2,889	2,254	2,658
989.0	4,329	3,609	6,267
990.0	5,995	5,162	11,429

Forebay Restriction Design

Basin Outlet Elevation:	986.50	
Storage Elevation:	989.18	
Avg. Head over Orifice (Hw):	1.34	ft
Allowable Discharge (Qa): (48 hrs.)	0.04	cfs
Standpipe Restriction Hole Dia:	1.125	in
Standpipe Restriction Hole Area:	0.0069	sft
Number of Restriction Holes:	1	
Total Hole Area:	0.0069	sft
Actual Discharge (Q)	0.04	cfs
Q = 0.62 * A * (2 * G * Hw)^0.5		
Drain Time:	50	hrs

Foreby 3-3

Elev. (ft)	Area (sf)	Vol. (cf)	Total Vol. (cf)
985.0	0	0	0
986.0	6,179	3,090	3,090
987.0	8,447	7,313	10,403
988.0	10,941	9,694	20,097

Forebay Restriction Design

Basin Outlet Elevation:	985.00	
Storage Elevation:	987.40	
Avg. Head over Orifice (Hw):	1.20	ft
Allowable Discharge (Qa)	0.08	cfs
Standpipe Restriction Hole Dia.:	1.125	in
Standpipe Restriction Hole Area:	0.0069	sft
Number of Restriction Holes:	2	
Total Hole Area:	0.0138	sft
Actual Discharge (Q)	0.08	cfs
Q = 0.62 * A * (2 * G * Hw)^0.5		
Drain Time:	55	hrs

100-yr Detention Basin Restriction Design

Detention Required:	195,581	cf
Detention minus forebay volume:	159,208	cf

Elev. (ft)	Area (sf)	Vol. (cf)	Total Vol. (cf)
985	28,698	0	0
986	31,207	29,953	29,953
987	36,371	33,789	63,742
988	41,761	39,066	102,808
989	47,377	44,569	147,377
990	53,219	50,298	197,675
991	91,148	85,328	283,003

100-yr Storage Elevation:	989.24	
Volume Safety Factor: (Use)	990.00	

100-yr Detention Basin Restriction Design

Basin Outlet Elevation:	983.00	
Storage Elevation:	990.00	
Avg. Head over Orifice (2/3h):	4.67	ft
Allowable Discharge (Qa)	5.36	cfs
Standpipe Restriction Hole Dia.:	9.5	in
Standpipe Restriction Hole Area:	0.4920	sft
Number of Restriction Holes:	1	
Total Hole Area:	0.4920	sft
Actual Discharge (Q)	5.29	cfs
Q = 0.62 * A * (2 * G * Hw)^0.5		

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WHITE LAKE TWP, MI

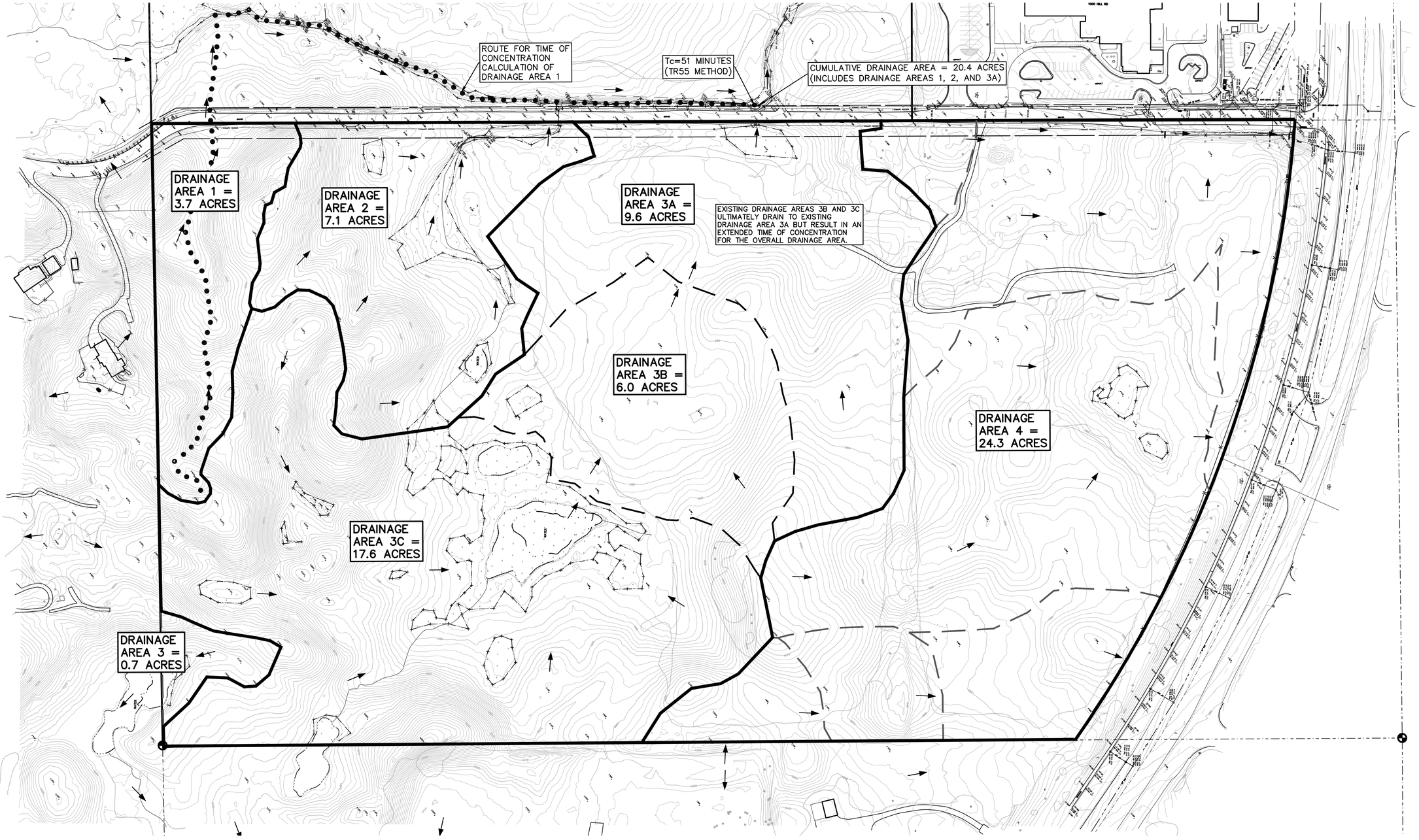
REVISIONS	
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FINAL SITE PLAN REVIEW	7/3/24
FINAL SITE PLAN REVIEW	5/8/25
FINAL SITE PLAN REVIEW	9/30/25

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DRAWING TITLE
DETENTION POND 3

PEA JOB NO.	2021-0084
P.M.	JC
DN.	BSH/JEB
DES.	BSH

DRAWING NUMBER:
C-12.3



EXISTING PEAK RUNOFF

OAKLAND COUNTY 100-YEAR DESIGN STORM
I = B/(T+D)^E; B=83.18, D=9.17, E=0.81
AT T=51 MINUTES, I=3.01 IN/HR

Q = C * I * A; C=0.20 FOR GREEN SPACE, A=20.4 ACRES
Q = EXISTING 100-YEAR PEAK RUNOFF = 12.29 CFS

PROPOSED DISCHARGE TO EXISTING CREEK
WHITE LAKE TOWNSHIP MAXIMUM ALLOWABLE DISCHARGE RATE = 0.2 CFS/ACRE
POND 2 CONTRIBUTING DRAINAGE AREA = 9.5 ACRES
POND 3 CONTRIBUTING DRAINAGE AREA = 26.8 ACRES

100-YEAR MAXIMUM ALLOWABLE DISCHARGE RATE FROM POND 2 = 1.90 CFS
100-YEAR MAXIMUM ALLOWABLE DISCHARGE RATE FROM POND 3 = 5.36 CFS
100-YEAR TOTAL ALLOWABLE DISCHARGE RATE FROM PONDS 2 AND 3 = 7.26 CFS

OAKLAND COUNTY 100-YEAR DESIGN STORM
I = B/(T+D)^E; B=83.18, D=9.17, E=0.81
AT T=151 MINUTES (PER WHITE LAKE TOWNSHIP DETENTION CALCULATIONS), I=1.36 IN/HR

ADDITIONAL UNIMPROVED (EXISTING WETLAND TO REMAIN) AND HILL ROAD DRAINAGE NOT ROUTED THROUGH DETENTION BASINS = 6.75 ACRES
Q = C * I * A; C=0.20 FOR GREEN SPACE, A=6.75 ACRES
Q = EXISTING 100-YEAR PEAK RUNOFF = 1.84 CFS

TOTAL PEAK DISCHARGE RATE FROM SITE = 9.1 CFS

PROPOSED PEAK RUNNOFF/DISCHARGE RATE

THE PROPOSED MAXIMUM ALLOWABLE DISCHARGE RATE FROM PROPOSED DEVELOPMENT DOES NOT EXCEED THE EXISTING RUNOFF FOR THE 100-YEAR STORM EVENT. THE PROPOSED CONTRIBUTING FLOW THROUGH THE CULVERT UNDER M-59 IS NOT INCREASED BY THE DEVELOPMENT.

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STATE OF MICHIGAN
BRETT STURGEON HOLLANDSWORTH
License No. 6201064949
LICENSED PROFESSIONAL ENGINEER

NORTH

0 50 100 200
SCALE: 1" = 100'

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KEY MAP

CLIENT
WHITE LAKE HILL, LLC
31550 NORTHWESTERN HWY
FARMINGTON HILLS, MI 48334

PROJECT TITLE
THE AVALON - MULTI FAMILY
HIGHLAND ROAD
WHITE LAKE TWP, MI

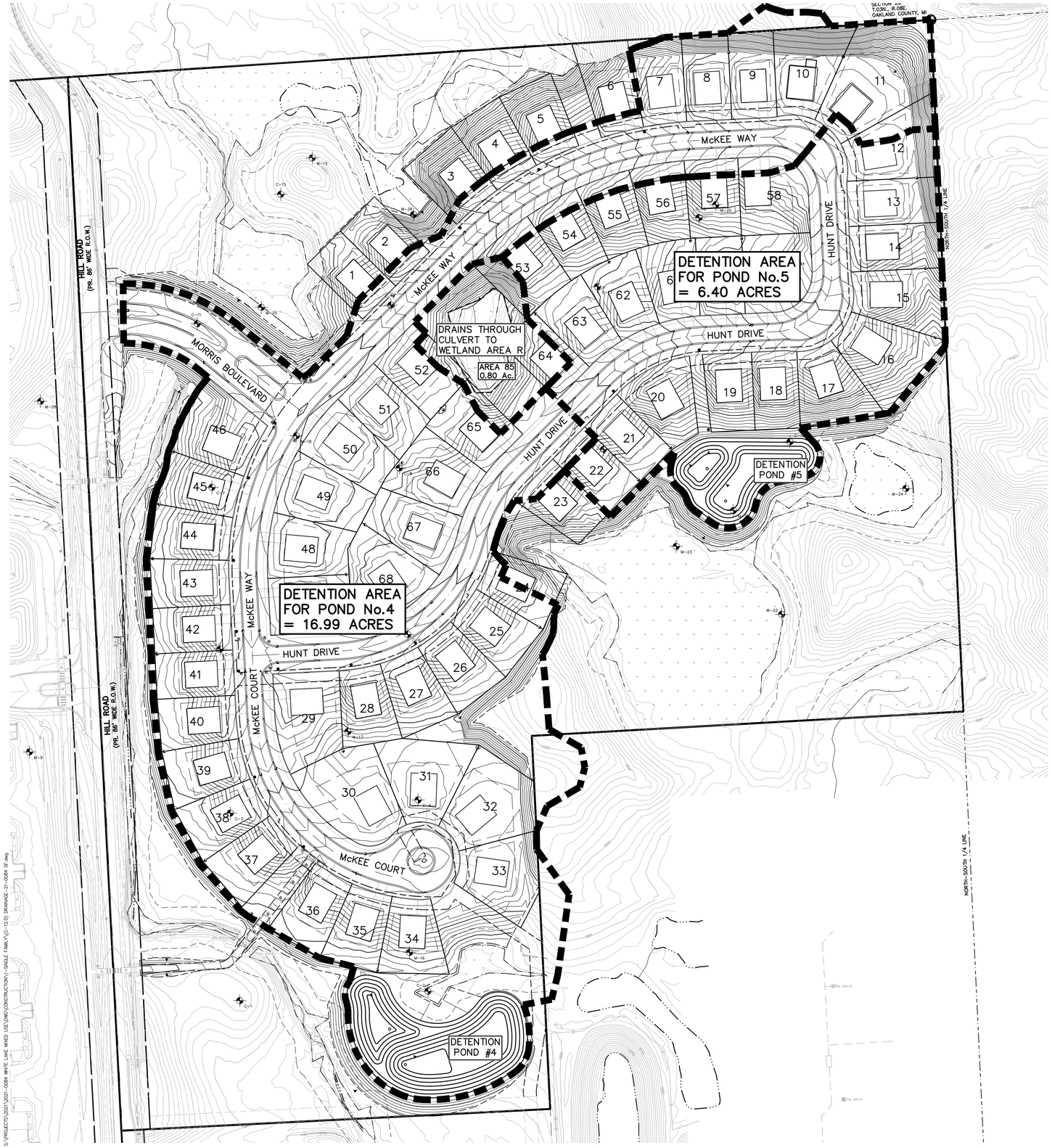
REVISIONS	
DRAFT	2/19/24
ISSUED FOR OWNER REVIEW	4/24/24
FINAL SITE PLAN REVIEW	7/3/24
FINAL SITE PLAN REVIEW	5/8/25
FINAL SITE PLAN REVIEW	9/30/25

ORIGINAL ISSUE DATE:
DECEMBER 4, 2023

DRAWING TITLE
OVERALL EXISTING DRAINAGE AREAS

PEA JOB NO.	2021-0084
P.M.	JC
DN.	BSH/JEB
DES.	BSH

DRAWING NUMBER:
C-12.4



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t: 844.813.2949
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NORTH

0 40 80 160
SCALE: 1" = 80'

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KEY MAP

CLIENT
WHITE LAKE HILL, LLC
31550 NORTHWESTERN HWY
FARMINGTON HILLS, MI 48334

PROJECT TITLE
THE AVALON - SINGLE FAMILY
HIGHLAND ROAD
WHITE LAKE TWP, MI

REVISIONS	
FINAL SITE PLAN REVIEW	5/8/25
FINAL SITE PLAN REVIEW	9/30/25

ORIGINAL ISSUE DATE:
MAY 8, 2025

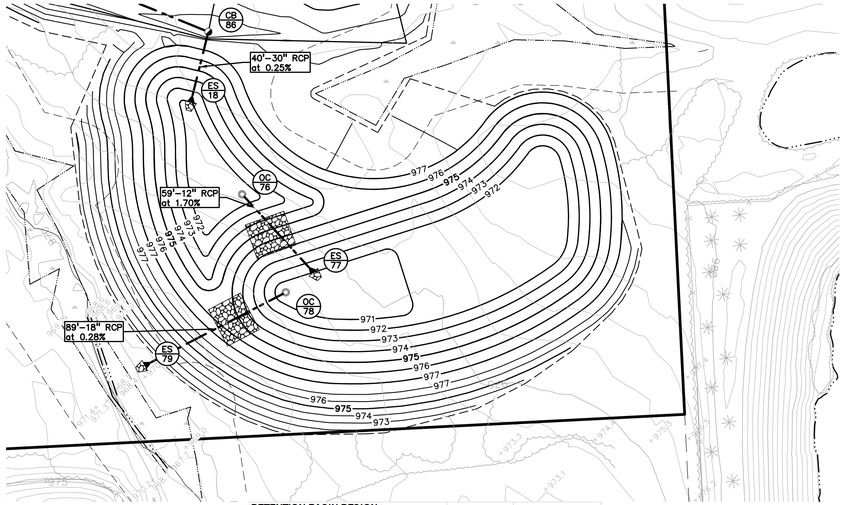
DRAWING TITLE
OVERALL DRAINAGE PLAN

PEA JOB NO.	2021-0084
P.M.	JC
DN.	BSH/JEB
DES.	BSH

DRAWING NUMBER:
C-12.30

S:\PROJECTS\2021\2021-0084 WHITE LAKE MIXED USE\DWG\CONSTRUCTION\1-SINGLE FAMILY\[C-12.0] DRAINAGE-21-0084 9".dwg

POND #4



DETENTION BASIN DESIGN
(PER WHITE LAKE TOWNSHIP STANDARDS)

Detention Basin		
Contributing Area (A):	17.0	acre
Allowable Discharge (Qa)	3.40	cfs (0.2*area)
Coefficient of Runoff (Cr):	0.35	
Forebay Storage Volume Required (1-yr Design Storm)		
Qo = ((Qa)/(A)(Cr):	0.57	cfs/acre impervious
T = -25 + ((2700/Qo))^0.5:	43.82	minutes
Vs = (4320(T)/(T+25)) - 40Qo(T):	1,752	cf/acre impervious
Vt = (Vs)A)(Cr):	10,424	cf
Detention Storage Volume Required (100-yr Design Storm)		
Qo = ((Qa)/(A)(Cr):	0.57	cfs/acre impervious
T = -25 + ((10312.5/Qo))^0.5:	109.51	minutes
Vs = (16500(T)/(T+25)) - 40Qo(T):	10,936	cf/acre impervious
Vt = (Vs)A)(Cr):	65,069	cf
Storage Provided in Forebay		
1-yr Storage Elevation:	974.89	

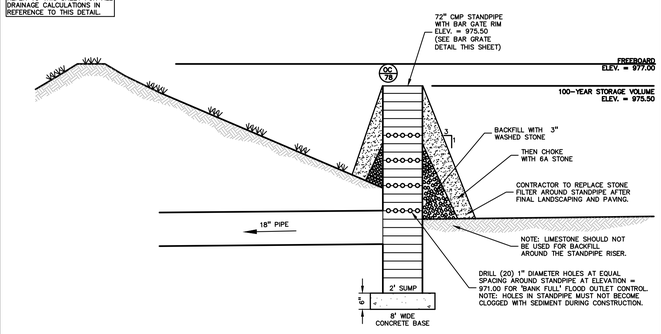
Elev. (ft)	Area (sf)	Vol. (cf)	Total Vol. (cf)
972	1,400	0	0
973	2,700	2,050	2,050
974	4,400	3,550	5,600
975	6,400	5,400	11,000

Forebay Restriction Design		
Basin Outlet Elevation:	972.00	
Storage Elevation:	974.89	
Avg. Head over Orifice (Hw):	1.45	ft
Allowable Discharge (Qa): (48 hrs)	0.06	cfs
Standpipe Restriction Hole Dia:	1.35	in
Standpipe Restriction Hole Area:	0.0099	sft
Number of Restriction Holes:	1	
Total Hole Area:	0.0099	sft
Actual Discharge (Q)	0.06	cfs
Q = 0.62 * A * (2 * G * Hw)^0.5		
Drain Time:	49	hrs
Detention Volume minus Forebay:	**54,645**	**cf**
100-yr Storage Elevation:	975.41	Calc.
100-yr Storage Elevation:	975.50	Provided

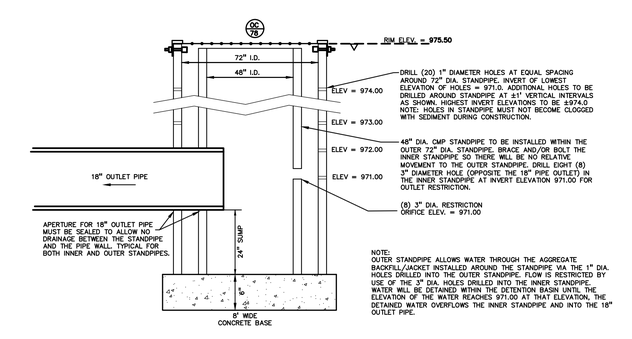
Elev. (ft)	Area (sf)	Vol. (cf)	Total Vol. (cf)
971	2,000	0	0
972	8,500	5,250	5,250
973	11,200	9,850	15,100
974	14,200	12,700	27,800
975	17,300	15,750	43,550
975	24,800	0	43,550
976	29,400	27,100	70,650

100-yr Detention Basin Restriction Design		
Basin Outlet Elevation:	971.00	
Storage Elevation:	975.50	
Avg. Head over Orifice: (2/3h)	3.00	ft
Allowable Discharge (Qa)	3.40	cfs
Standpipe Restriction Hole Dia.:	3	in
Standpipe Restriction Hole Area:	0.0491	sft
Number of Restriction Holes:	8	
Total Hole Area:	0.3925	sft
Actual Discharge (Q)	3.38	cfs
Q = 0.62 * A * (2 * G * Hw)^0.5		
100 Year Emergency Overflow Weir		
Flow (Q): 215/(t+25) x A x C	15.1	cfs
Time (T): Overland, Storm & Fill Pond	60	min
Length of Spillway (L):	13	ft
Depth of Water over Spillway (H):	0.50	ft
Uses Cipoletti Weir Equation (Q=3.367 * L * H^3/2)		
Emergency Overflow Weir Elevation:	976.50	Provided
Top of Berm Elevation:	977.00	Provided

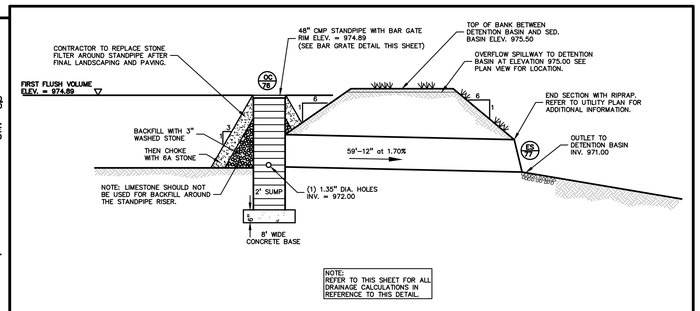
NOTE:
REFER TO THIS SHEET FOR ALL DRAINAGE CALCULATIONS IN REFERENCE TO THIS DETAIL.



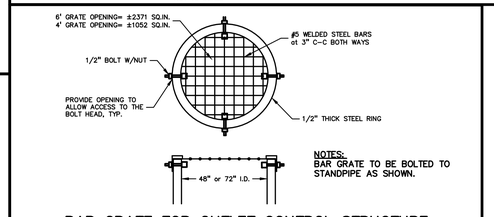
DETENTION BASIN OUTLET CONTROL STRUCTURE DETAIL
NOT TO SCALE



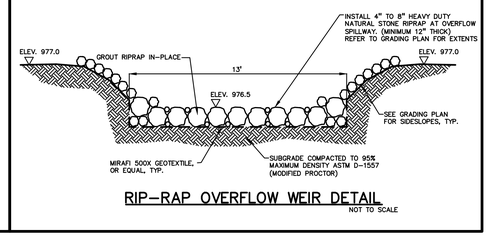
OUTLET CONTROL STANDPIPE DETAIL (OC102)
NOT TO SCALE



SEDIMENTATION BASIN RISER DETAIL (FOREBAY)
NOT TO SCALE



BAR GRATE FOR OUTLET CONTROL STRUCTURE
NOT TO SCALE



RIP-RAP OVERFLOW WEIR DETAIL
NOT TO SCALE

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LICENSED PROFESSIONAL ENGINEER

NORTH

0 20 40 80
SCALE: 1" = 40'

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KEY MAP



CLIENT
WHITE LAKE HILL, LLC
31550 NORTHWESTERN HWY
FARMINGTON HILLS, MI 48334

PROJECT TITLE
THE AVALON - SINGLE FAMILY
HIGHLAND ROAD
WHITE LAKE TWP, MI

REVISIONS

FINAL SITE PLAN REVIEW	5/8/25
FINAL SITE PLAN REVIEW	9/30/25

ORIGINAL ISSUE DATE:
MAY 8, 2025

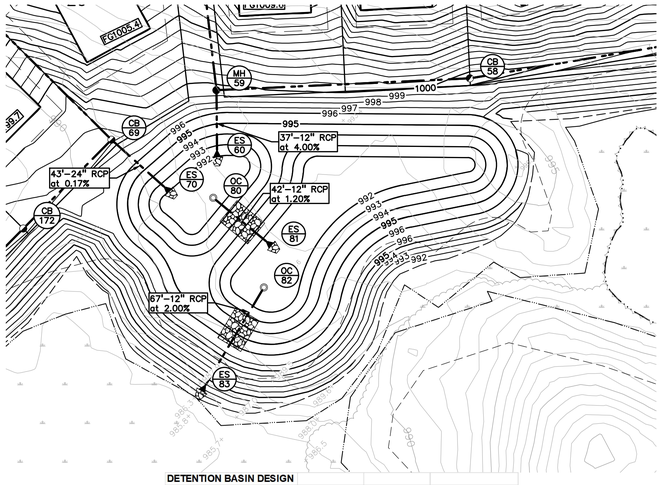
DRAWING TITLE
DETENTION POND 4

PEA JOB NO.	2021-0084
P.M.	JC
DN.	BSH/JEB
DES.	BSH

DRAWING NUMBER:
C-12.31

S:\PROJECTS\2021\2021-0084 WHITE LAKE MIXED USE\DWG\CONSTRUCTION\1-SINGLE FAMILY\C-12.31 POND DETAILS-P1-0084.dwg

POND #5



DETENTION BASIN DESIGN
(PER WHITE LAKE TOWNSHIP STANDARDS)

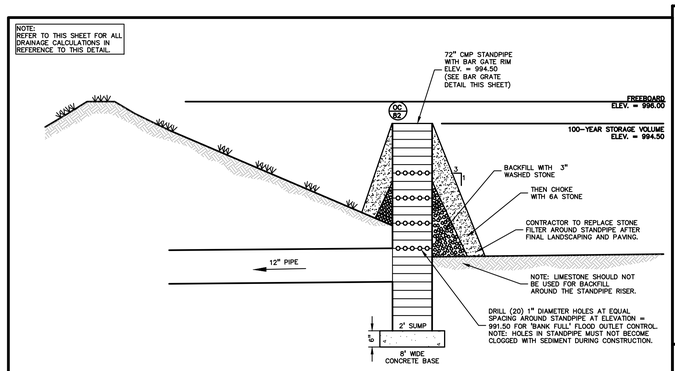
Detention Basin		
Contributing Area (A):	6.5	acre
Allowable Discharge (Qa)	1.30	cfs (0.2*area)
Coefficient of Runoff (Cr):	0.35	
Forebay Storage Volume Required (1-yr Design Storm)		
Qo = ((Qa)/(A)(Cr):	0.57	cfs/acre impervious
T = -25 + ((2700/Qo))^0.5:	43.82	minutes
Vs = (4320(T)/(T+25)) - 40Qo(T):	1,752	cf/acre impervious
Vt = (Vs)(A)(Cr):	3,986	cf
Detention Storage Volume Required (100-yr Design Storm)		
Qo = ((Qa)/(A)(Cr):	0.57	cfs/acre impervious
T = -25 + ((10312.5/Qo))^0.5:	109.51	minutes
Vs = (16500(T)/(T+25)) - 40Qo(T):	10,936	cf/acre impervious
Vt = (Vs)(A)(Cr):	24,879	cf
Storage Provided in Forebay		
1-yr Storage Elevation:	993.88	

Elev. (ft)	Area (sf)	Vol. (cf)	Total Vol. (cf)
992	1,200	0	0
993	2,100	1,650	1,650
994	3,200	2,650	4,300

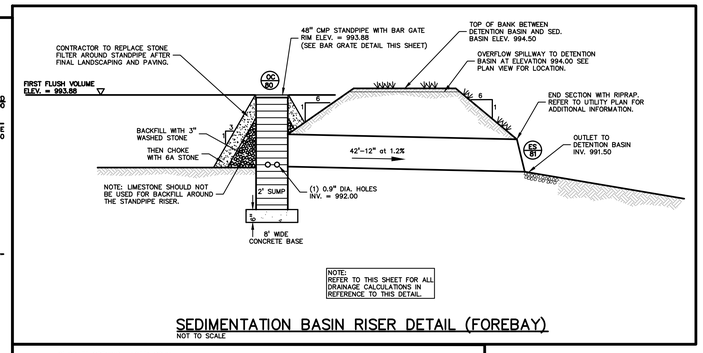
Forebay Restriction Design		
Basin Outlet Elevation:	992.00	
Storage Elevation:	993.88	
Avg. Head over Orifice (Hw):	0.94	ft
Allowable Discharge (Qa): (48 hrs)	0.02	cfs
Standpipe Restriction Hole Dia:	0.90	in
Standpipe Restriction Hole Area:	0.0044	sft
Number of Restriction Holes:	1	
Total Hole Area:	0.0044	sft
Actual Discharge (Q)	0.02	cfs
Q = 0.62 * A * (2 * G * Hw)^0.5		
Drain Time:	52	hrs
Detention Volume minus Forebay:	**20,894**	**cf**
100-yr Storage Elevation:	994.50	Calc.
100-yr Storage Elevation:	994.50	Provided

Elev. (ft)	Area (sf)	Vol. (cf)	Total Vol. (cf)
991.5	2,700	0	0
992	3,700	1,600	1,600
993	6,000	4,850	6,450
994	8,500	7,250	13,700
994	12,900	0	13,700
995	16,000	14,450	28,150

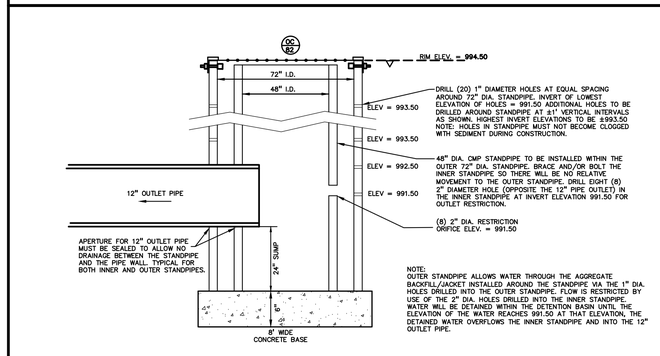
100-yr Detention Basin Restriction Design		
Basin Outlet Elevation:	991.50	
Storage Elevation:	994.50	
Avg. Head over Orifice: (2/3h)	2.00	ft
Allowable Discharge (Qa)	1.30	cfs
Standpipe Restriction Hole Dia.:	2	in
Standpipe Restriction Hole Area:	0.0218	sft
Number of Restriction Holes:	8	
Total Hole Area:	0.1744	sft
Actual Discharge (Q)	1.23	cfs
Q = 0.62 * A * (2 * G * Hw)^0.5		
100 Year Emergency Overflow Weir		
Flow (Q): 215/(t+25) x A x C	5.8	cfs
Time (T): Overland, Storm & Fill Pond	60	min
Length of Spillway (L):	5	ft
Depth of Water over Spillway (H):	0.50	ft
Uses Cipoletti Weir Equation (Q=3.367 * L * H^3/2)		
Emergency Overflow Weir Elevation:	995.50	Provided
Top of Berm Elevation:	996.00	Provided



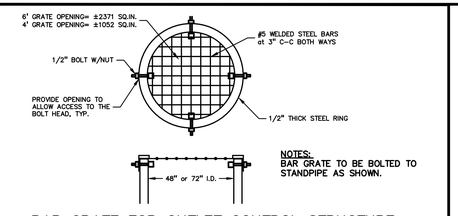
DETENTION BASIN OUTLET CONTROL STRUCTURE DETAIL
NOT TO SCALE



SEDIMENTATION BASIN RISER DETAIL (FOREBAY)
NOT TO SCALE

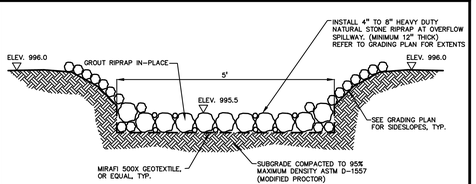


OUTLET CONTROL STANDPIPE DETAIL (OC102)
NOT TO SCALE



NOTES:
BAR GRATE TO BE BOLTED TO STANDPIPE AS SHOWN.

BAR GRATE FOR OUTLET CONTROL STRUCTURE
NOT TO SCALE



RIP-RAP OVERFLOW WEIR DETAIL
NOT TO SCALE

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LICENSED PROFESSIONAL ENGINEER

NORTH

0 20 40 80
SCALE: 1" = 40'

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KEY MAP



CLIENT
WHITE LAKE HILL, LLC
31550 NORTHWESTERN HWY
FARMINGTON HILLS, MI 48334

PROJECT TITLE
THE AVALON - SINGLE FAMILY
HIGHLAND ROAD
WHITE LAKE TWP, MI

REVISIONS	
FINAL SITE PLAN REVIEW	5/8/25
FINAL SITE PLAN REVIEW	9/30/25

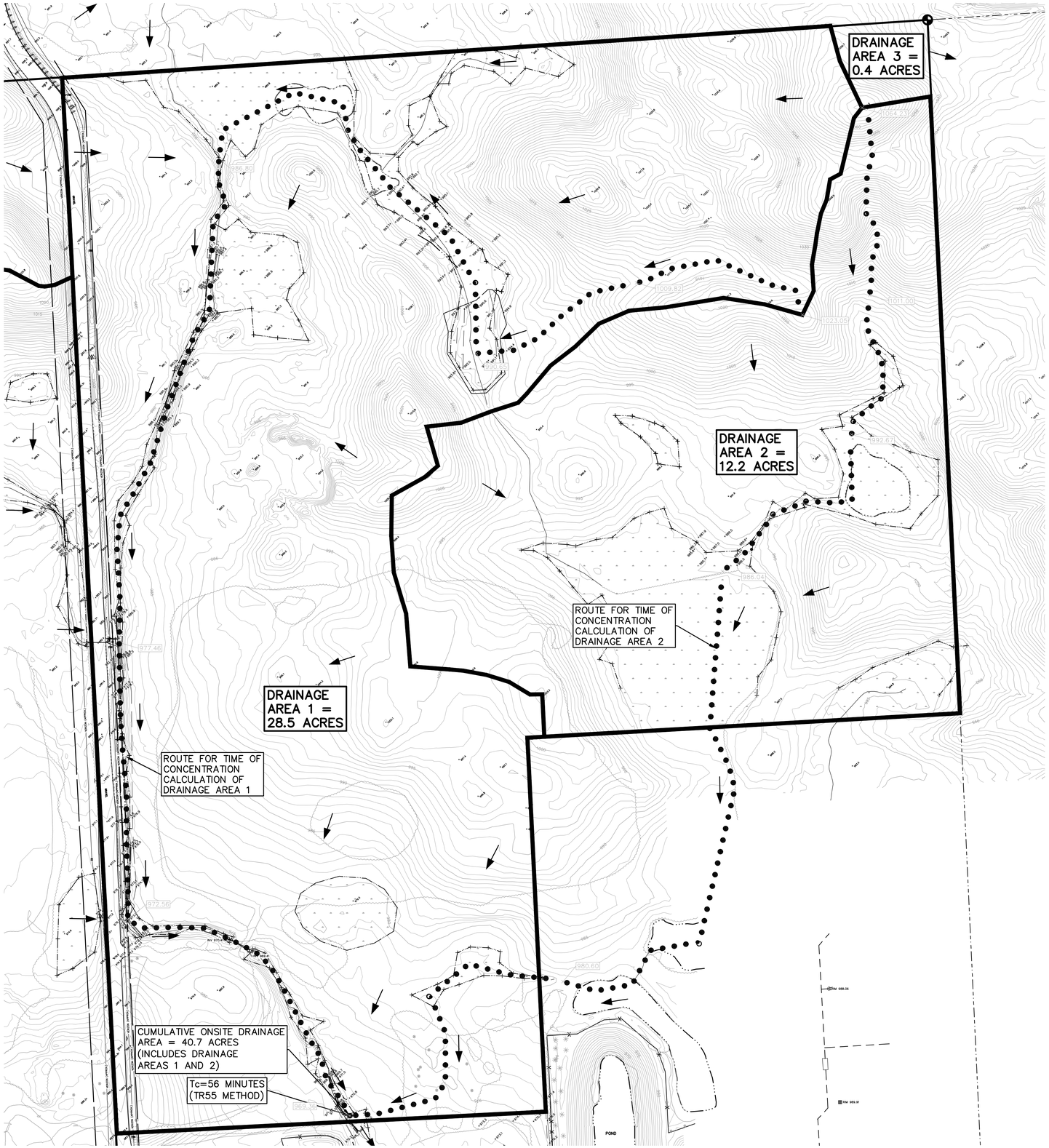
ORIGINAL ISSUE DATE:
MAY 8, 2025

DRAWING TITLE
DETENTION POND 5

PEA JOB NO.	2021-0084
P.M.	JC
DN.	BSH/JEB
DES.	BSH

DRAWING NUMBER:
C-12.32

S:\PROJECTS\2021\2021-0084 WHITE LAKE MIXED USE\DWG\CONSTRUCTION\-SINGLE FAMILY\(C-12) POND DETAILS-2-25-0084 SF.dwg



EXISTING PEAK RUNOFF

OAKLAND COUNTY 100-YEAR DESIGN STORM
I = B/(T+D)^E; B=83.18, D=9.17, E=0.81
AT T=56 MINUTES, I=2.82 IN/HR

Q = C * I * A; C=0.20 FOR GREEN SPACE, A=40.7 ACRES
Q = EXISTING 100-YEAR PEAK RUNOFF = 22.95 CFS

PROPOSED DISCHARGE TO EXISTING CREEK
WHITE LAKE TOWNSHIP MAXIMUM ALLOWABLE DISCHARGE RATE = 0.2 CFS/ACRE
POND 1 CONTRIBUTING DRAINAGE AREA = 17.0 ACRES
POND 2 CONTRIBUTING DRAINAGE AREA = 6.5 ACRES

100-YEAR MAXIMUM ALLOWABLE DISCHARGE RATE FROM POND 1 = 3.40 CFS
100-YEAR MAXIMUM ALLOWABLE DISCHARGE RATE FROM POND 2 = 1.30 CFS
100-YEAR TOTAL ALLOWABLE DISCHARGE RATE FROM PONDS 1 AND 2 = 4.70 CFS

OAKLAND COUNTY 100-YEAR DESIGN STORM
I = B/(T+D)^E; B=83.18, D=9.17, E=0.81
AT T=109 MINUTES (PER WHITE LAKE TOWNSHIP DETENTION CALCULATIONS), I=1.74 IN/HR

ADDITIONAL UNIMPROVED (EXISTING WETLAND TO REMAIN) AND HILL ROAD DRAINAGE NOT ROUTED THROUGH DETENTION BASINS = 17.3 ACRES
Q = C * I * A; C=0.20 FOR GREEN SPACE, A=17.3 ACRES
Q = EXISTING 100-YEAR PEAK RUNOFF = 6.02 CFS

TOTAL PEAK DISCHARGE RATE FROM SITE = 10.72 CFS

PROPOSED PEAK RUNNOFF/DISCHARGE RATE

THE PROPOSED MAXIMUM ALLOWABLE DISCHARGE RATE FROM PROPOSED DEVELOPMENT DOES NOT EXCEED THE EXISTING RUNOFF FOR THE 100-YEAR STORM EVENT. THE PROPOSED CONTRIBUTING FLOW THROUGH THE CULVERT UNDER M-59 IS NOT INCREASED BY THE DEVELOPMENT.

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STATE OF MICHIGAN
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LICENSED PROFESSIONAL ENGINEER

NORTH

0 40 80 160
SCALE: 1" = 80'

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KEY MAP

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31550 NORTHWESTERN HWY
FARMINGTON HILLS, MI 48334

PROJECT TITLE
THE AVALON - SINGLE FAMILY
HIGHLAND ROAD
WHITE LAKE TWP, MI

REVISIONS	
FINAL SITE PLAN REVIEW	5/8/25
FINAL SITE PLAN REVIEW	9/30/25

ORIGINAL ISSUE DATE:
MAY 8, 2025

DRAWING TITLE
OVERALL EXISTING DRAINAGE AREAS

PEA JOB NO.	2021-0084
P.M.	JC
DN.	BSH/JEB
DES.	BSH

DRAWING NUMBER:
C-12.33

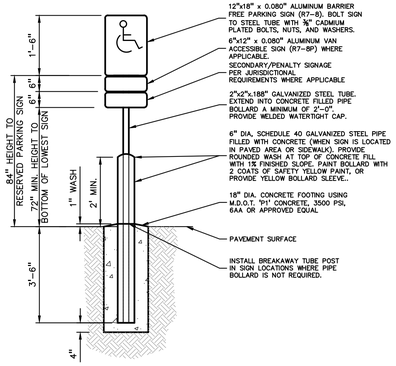
CONSTRUCTION MATERIAL SUBMITTALS

UNLESS REQUIRED OTHERWISE IN THE PROJECT SPECIFICATIONS, THE CONTRACTOR SHALL ONLY SUBMIT THE FOLLOWING CONSTRUCTION MATERIAL SUBMITTALS, AS APPLICABLE TO THE PLANS, FOR REVIEW BY THE ENGINEER. UNLESS APPROVED IN ADVANCE AND IN WRITING BY THE ENGINEER, ANY MATERIAL SUBMITTALS PROVIDED TO THE ENGINEER FOR REVIEW IN ADDITION TO THIS LIST SHALL BE RETURNED TO THE CONTRACTOR WITHOUT A REVIEW BEING PERFORMED.

1. SOIL EROSION AND SEDIMENTATION CONTROL MEASURES
2. UTILITY TRENCH BACKFILL MATERIAL WITH ALL MATERIAL DATA INCLUDED IN THE SUBMITTAL BEING DATED WITHIN 60 DAYS OF THE SUBMITTAL UNLESS APPROVED OTHERWISE BY THE ENGINEER
3. RIP RAP MATERIAL WITH ALL MATERIAL DATA INCLUDED IN THE SUBMITTAL BEING DATED WITHIN 60 DAYS OF THE SUBMITTAL UNLESS APPROVED OTHERWISE BY THE ENGINEER
4. STORM AND SANITARY SEWER PIPING INCLUDING JOINTS
5. STORM AND SANITARY SEWER STRUCTURES
6. STORM AND SANITARY SEWER STRUCTURE FRAME AND COVERS INCLUDING CLEAN OUTS
7. WATER DISTRIBUTION SYSTEM PIPING INCLUDING JOINTS
8. WATER DISTRIBUTION SYSTEM STRUCTURES
9. WATER DISTRIBUTION SYSTEM STRUCTURE FRAME AND COVERS
10. WATER DISTRIBUTION SYSTEM SHUT OFF BOXES
11. WATER DISTRIBUTION SYSTEM FIRE HYDRANTS
12. WATER DISTRIBUTION SYSTEM GATE VALVES
13. STORM WATER MANAGEMENT OUTLET CONTROL STRUCTURES INCLUDING COVERS OR GRATES
14. STORM WATER MANAGEMENT OUTLET SEDIMENTATION BASIN RISERS INCLUDING GRATES
15. STORM WATER MANAGEMENT MECHANICAL PRE-TREATMENT UNITS INCLUDING COVERS
16. STORM WATER MANAGEMENT OIL/GREASE SEPARATORS
17. STORM WATER MANAGEMENT UNDERGROUND DETENTION SYSTEM MATERIAL AND SHOP DRAWINGS DEPICTING THE LAYOUT OF THE SYSTEM
18. PAVEMENT AGGREGATE BASE MATERIAL WITH ALL MATERIAL DATA INCLUDED IN THE SUBMITTAL BEING DATED WITHIN 60 DAYS OF THE SUBMITTAL UNLESS APPROVED OTHERWISE BY THE ENGINEER
19. PAVEMENT UNDERDRAIN MATERIAL AND BACKFILL WITH ALL BACKFILL MATERIAL DATA INCLUDED IN THE SUBMITTAL BEING DATED WITHIN 60 DAYS OF THE SUBMITTAL UNLESS APPROVED OTHERWISE BY THE ENGINEER
20. PAVEMENT MIX DESIGNS SUBMITTED FOR REVIEW BY THE ENGINEER MUST FOLLOW THE CURRENT MDOT REVIEW CHECKLISTS AS SUMMARIZED BELOW AND ALL MATERIAL DATA INCLUDED IN THE SUBMITTAL BEING DATED WITHIN 60 DAYS OF THE SUBMITTAL UNLESS APPROVED OTHERWISE BY THE ENGINEER:
    - 8.1. CONCRETE MIX DESIGN REVIEW CHECKLIST (FORM 2000)
    - 8.2. SUPERPAVE MIX DESIGN CHECKLIST (FORM 1862)
    - 8.3. MARSHALL MIX DESIGN CHECKLIST (FORM 1849)
21. SITE FENCING AND GATES INCLUDING FOOTINGS
22. SITE RAILINGS INCLUDING FOOTING OR EMBEDMENTS
23. ANY ITEMS SHOWN IN THE PLANS OR DETAIL SHEETS THAT SPECIFICALLY STATE FOR THE CONTRACTOR TO SUBMIT A SHOP DRAWING TO THE ENGINEER FOR REVIEW. THESE ITEMS INCLUDE, BUT ARE NOT LIMITED TO:
    - •• RETAINING WALL MATERIAL AND STRUCTURAL CALCULATIONS
    - •• TRENCH DRAIN MATERIAL AND SHOP DRAWING DEPICTING THE LAYOUT OF THE SYSTEM
    - •• ANY SPECIALITY ITEMS SHOWN IN THE PLANS OR DETAIL SHEETS THAT SPECIFICALLY DO NOT STATE FOR THE CONTRACTOR SHALL SUBMIT A SHOP DRAWING TO THE ENGINEER FOR REVIEW BUT THE CONTRACTOR REQUESTS TO BE REVIEWED. THE CONTRACTOR'S REQUEST FOR REVIEW MUST BE IN WRITING AND APPROVED BY THE ENGINEER PRIOR TO SUBMITTING THE INFORMATION.

BARRIER FREE SIGN NOTES:

1. ONE SIGN IS REQUIRED AT EACH BARRIER FREE PARKING SPACE.
2. ALL SIGNS SHALL COMPLY WITH THE LATEST STANDARDS OF THE MICHIGAN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MMUTCD).
3. WHEN TWO BARRIER FREE PARKING SPACES ARE ADJACENT AND FACING EACH OTHER, TWO SIGNS ARE REQUIRED, BUT CAN BE MOUNTED ON THE SAME POST.
4. SIGN POSTS SHALL BE 2" NOM. SQUARE 14-GAUGE GALVANIZED STEEL TUBE WITH 7/16" HOLES AT 1" CENTERS. POSTS SHALL TELESCOPE INSIDE ANCHOR POSTS A MINIMUM OF 12".
5. ANCHOR POSTS SHALL BE 2.25" NOM. SQUARE 12-GAUGE GALVANIZED STEEL POST, A MINIMUM OF 3 FEET LONG.
6. IF THESE NOTES AND DETAILS CONFLICT WITH LOCAL CODES AND ORDINANCES, THE STRICTER REQUIREMENT SHOULD BE USED.
7. ALTERNATE MATERIALS MAY BE USED IF IN COMPLIANCE WITH A.D.A. GUIDELINES AND LOCAL REQUIREMENTS.



BARRIER FREE SIGN AND POST DETAIL
NOT TO SCALE



DET 2 — 12" x 18" (R7-8) GREEN BORDER AND LEGEND WHITE SYMBOL, BLUE BACKGROUND. REFLECTORIZED

BARRIER FREE PARKING SIGN DETAIL
NOT TO SCALE

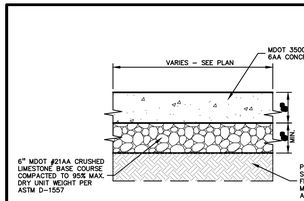


12" x 18" (R7-8) GREEN BORDER AND LEGEND WHITE SYMBOL, BLUE BACKGROUND. REFLECTORIZED

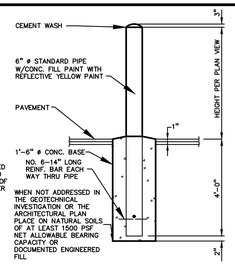
NOTE: MAY ONLY BE USED AT 11' WIDE SPACES LOCATED ON THE LEFT SIDE OF A 5' WIDE AISLE, OR 8' WIDE SPACES LOCATED TO THE LEFT OF 8' WIDE AISLES

6" x 12" (R7-8P) GREEN BORDER AND LEGEND REFLECTORIZED

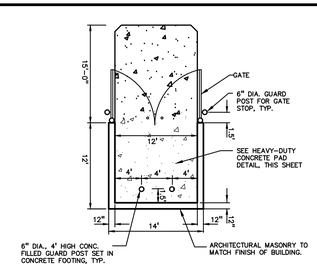
DET 3 — VAN ACCESSIBLE PARKING SIGN DETAIL
NOT TO SCALE



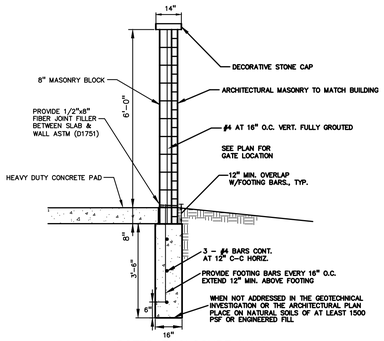
HEAVY DUTY CONCRETE PAD DETAIL
NOT TO SCALE



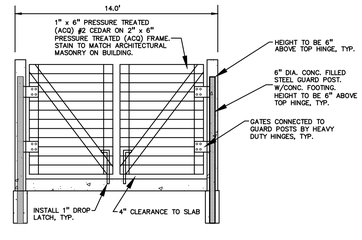
6" DIA. GUARD POST DETAIL
NOT TO SCALE



SINGLE DUMPSTER ENCLOSURE DETAIL
NOT TO SCALE

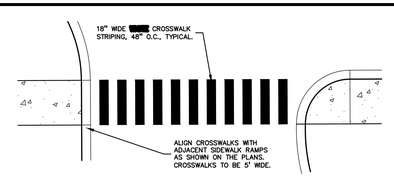


DUMPSTER ENCLOSURE WALL CROSS SECTION
NOT TO SCALE

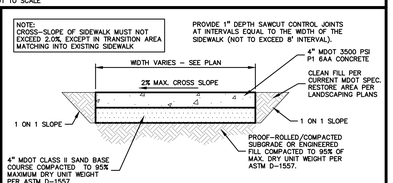


TRASH ENCLOSURE GATE DETAIL
NOT TO SCALE

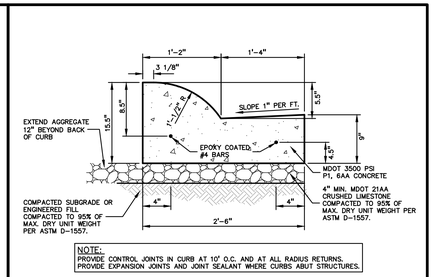
SINGLE TRASH ENCLOSURE DETAILS
NOT TO SCALE



STRIPED CROSSWALK DETAIL
NOT TO SCALE

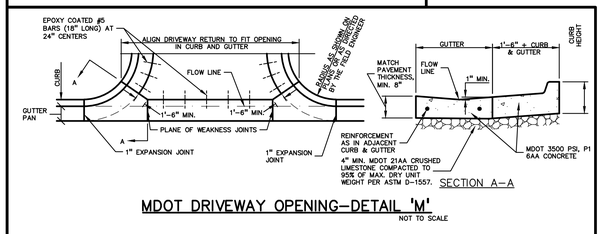


CONCRETE SIDEWALK
NOT TO SCALE

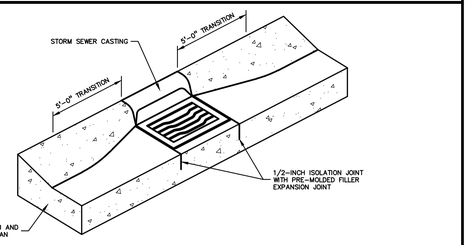


NOTE:
PROVIDE CONTROL JOINTS IN CURB AT 10' O.C. AND AT ALL RADIUS RETURNS.
PROVIDE EXPANSION JOINTS AND JOINT SEALANT WHERE CURBS ABUT STRUCTURES.

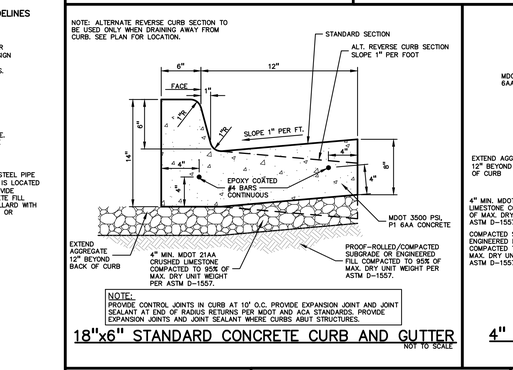
MDOT CURB DETAIL "B-2" (MODIFIED)
NOT TO SCALE



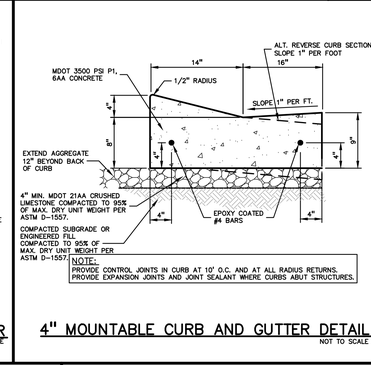
MDOT DRIVEWAY OPENING-DETAIL 'M'
NOT TO SCALE



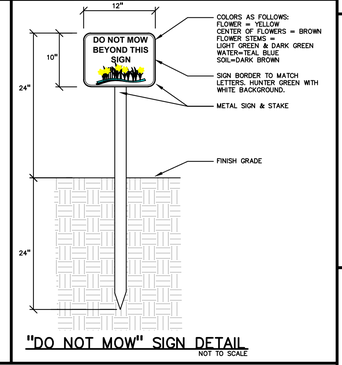
CURB TRANSITION DETAIL FOR ROLL CURB/MOUNTABLE CURB TO STRAIGHT CURB AND GUTTER AT DRAINAGE STRUCTURE
NOT TO SCALE



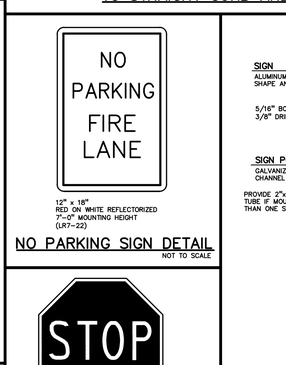
18"x6" STANDARD CONCRETE CURB AND GUTTER
NOT TO SCALE



4" MOUNTABLE CURB AND GUTTER DETAIL
NOT TO SCALE

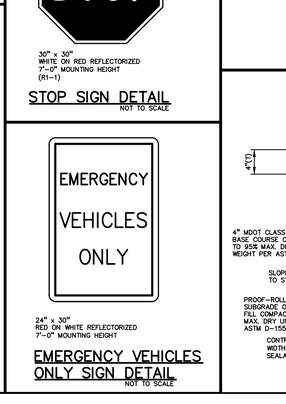


"DO NOT MOW" SIGN DETAIL
NOT TO SCALE



12" x 18" RED ON WHITE REFLECTORIZED 7'-0" MOUNTING HEIGHT (LR7-22)

NO PARKING SIGN DETAIL
NOT TO SCALE

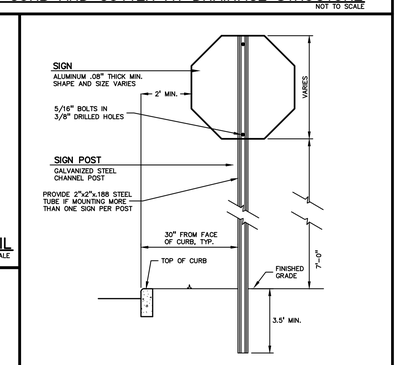


30" x 30" WHITE ON RED REFLECTORIZED 7'-0" MOUNTING HEIGHT (R1-1)

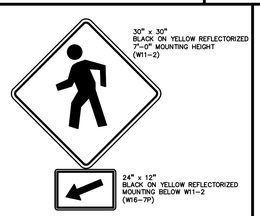
STOP SIGN DETAIL
NOT TO SCALE

24" x 30" RED ON WHITE REFLECTORIZED 7'-0" MOUNTING HEIGHT

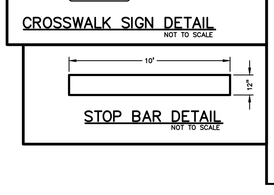
EMERGENCY VEHICLES ONLY SIGN DETAIL
NOT TO SCALE



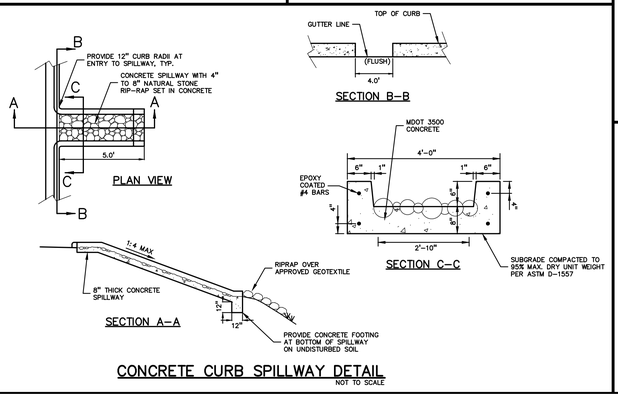
SIGN AND POST INSTALLATION IN LANDSCAPED AREAS
NOT TO SCALE



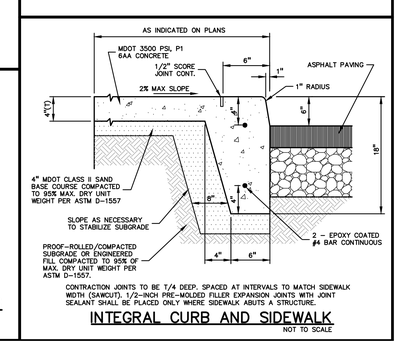
CROSSWALK SIGN DETAIL
NOT TO SCALE



STOP BAR DETAIL
NOT TO SCALE



CONCRETE CURB SPILLWAY DETAIL
NOT TO SCALE



INTEGRAL CURB AND SIDEWALK
NOT TO SCALE

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

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KEY MAP



CLIENT
WHITE LAKE HILL, LLC
31550 NORTHWESTERN HWY
FARMINGTON HILLS, MI 48334

PROJECT TITLE
THE AVALON - MULTI FAMILY
HIGHLAND ROAD
WHITE LAKE TWP, MI

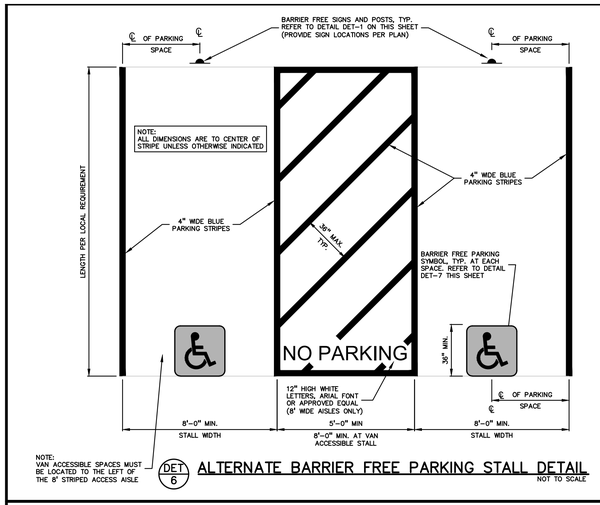
REVISIONS	
DRAFT	2/19/24
ISSUED FOR OWNER REVIEW	4/24/24
FINAL SITE PLAN REVIEW	7/3/24
FINAL SITE PLAN REVIEW	5/8/25
FINAL SITE PLAN REVIEW	9/30/25

ORIGINAL ISSUE DATE:
DECEMBER 4, 2023

DRAWING TITLE
NOTES AND DETAILS - 1

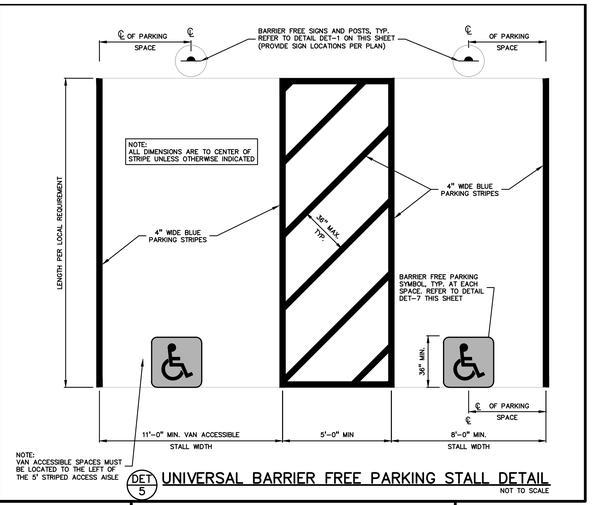
PEA JOB NO.	2021-0084
P.M.	JC
DN.	BSH/JEB
DES.	BSH

DRAWING NUMBER:
C-13.0



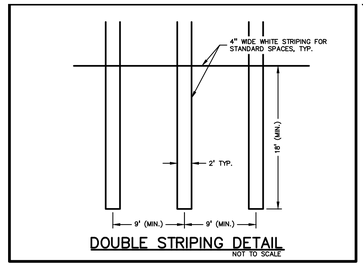
ALTERNATE BARRIER FREE PARKING STALL DETAIL

NOT TO SCALE



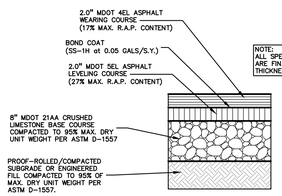
UNIVERSAL BARRIER FREE PARKING STALL DETAIL

NOT TO SCALE



DOUBLE STRIPING DETAIL

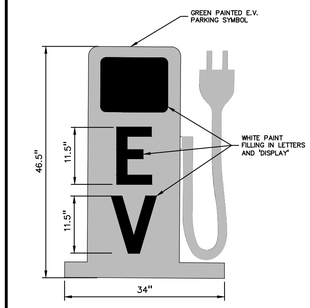
NOT TO SCALE



STANDARD DUTY ASPHALT DETAIL

(NOT FOR USE IN THE RIGHT-OF-WAY)

NOT TO SCALE



EV PARKING SYMBOL

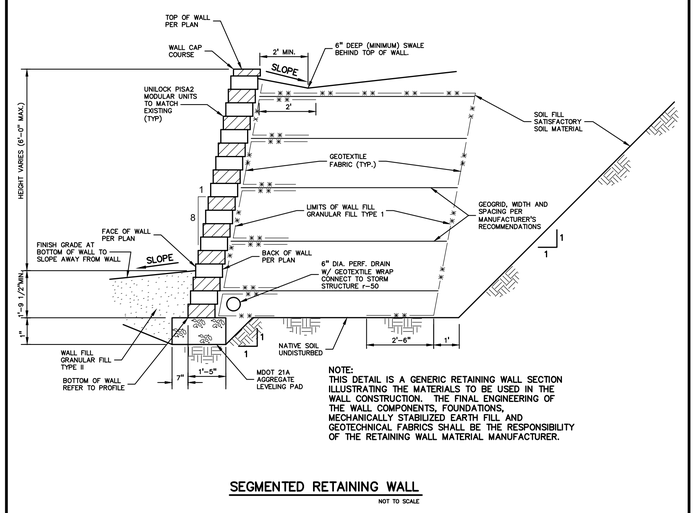
NOT TO SCALE

AGGREGATE BASE NOTE:
THIS PAVEMENT SECTION DESIGN ASSUMES THE USE OF MDOT 21AA CRUSHED LIMESTONE BASE MATERIAL THAT MEETS THE REQUIREMENTS OF MDOT STANDARD SPECIFICATION SECTION 902 FOR AGGREGATES. IF CRUSHED CONCRETE AGGREGATE BASE IS PROPOSED IN LIEU OF THE SPECIFIED CRUSHED LIMESTONE MATERIAL, PEA GROUP WILL REQUIRE A MINIMUM 25% INCREASE IN BASE THICKNESS. HOWEVER, IF TESTING DOCUMENTATION IS PROVIDED TO PEA GROUP THAT SHOWS THAT THE CRUSHED CONCRETE MATERIAL MEETS ALL REQUIREMENTS OF MDOT SPECIFICATION SECTION 902, THEN THE 25% INCREASE IN THICKNESS MAY BE REEVALUATED.

ASPHALT MATERIAL NOTES:
HOT-MIX ASPHALT MIXTURES UTILIZING RECYCLED ASPHALT PAVEMENT (RAP) MUST MEET MDOT SPECIAL PROVISION 12SP502(E). THE BINDER GRADE FOR THIS WORK IS PG64-28. IF ASPHALT MIXES CONTAINING RAP ARE TO BE SUPPLIED FOR THIS PROJECT, THE ASPHALT BINDER MUST BE REVISED PER MDOT "TIER 1" OR "TIER 2" REQUIREMENTS (RAP CONTENT UP TO 27% MAXIMUM). TIER 3 MIXES ARE NOT ACCEPTABLE ON THIS PROJECT. AN ASPHALT MIX DESIGN FOR ALL SPECIFIED MIXES SHOULD BE FORWARDED TO PEA GROUP FOR REVIEW PRIOR TO CONSTRUCTION

ASPHALT MIX DESIGN CHART

COMMERCIAL ADT 0-300	COMMERCIAL ADT 301-1000	COMMERCIAL ADT 1001-3400	COMMERCIAL ADT 3401	APPLICATION RATE (LB/YD²), MINIMUM - MAXIMUM	COURSE APPLICATION
2EL	2EML	2EMH	2EH	435-550	BASE
3EL	3EML	3EMH	3EH	330-410	BASE AND/OR LEVELING
4EL	4EML	4EMH	4EH	220-275	LEVELING AND/OR TOP
5EL	5EML	5EMH	5EH	165-220	TOP
PG 58-28	PG 64-28	PG 64-28	PG 70-28P		

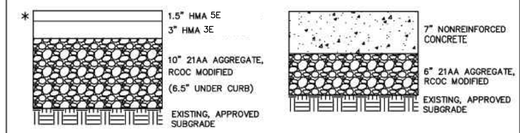


NOTE:
THIS DETAIL IS A GENERIC RETAINING WALL SECTION ILLUSTRATING THE MATERIALS TO BE USED IN THE WALL CONSTRUCTION. THE FINAL ENGINEERING OF THE WALL COMPONENTS, FOUNDATIONS, MECHANICALLY STABILIZED EARTH FILL AND GEOTECHNICAL FABRICS SHALL BE THE RESPONSIBILITY OF THE RETAINING WALL MATERIAL MANUFACTURER.

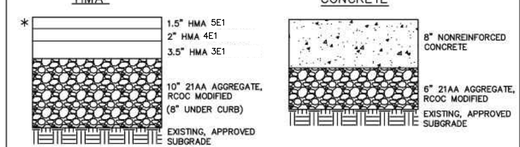
SEGMENTED RETAINING WALL

NOT TO SCALE

SINGLE FAMILY RESIDENTIAL SUBDIVISIONS



INDUSTRIAL AND COMMERCIAL DEVELOPMENTS COLLECTOR STREETS



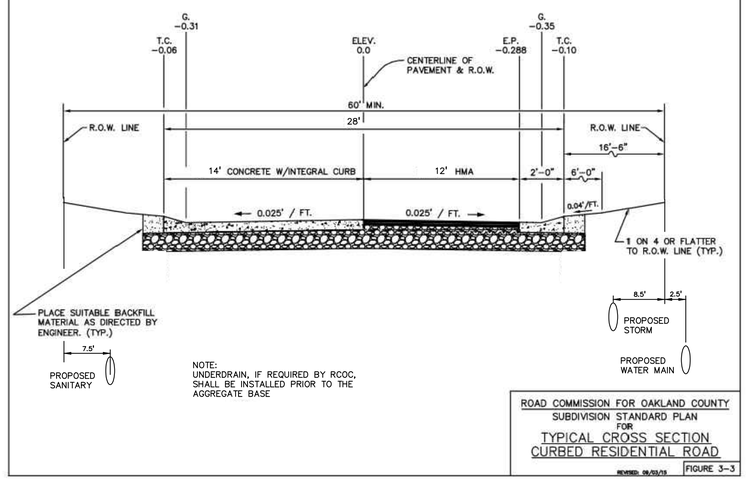
•OR AS APPROVED BY GEOTECH ANALYSIS

* SS - 1H @ 0.10/GAL./SYD. BETWEEN LIFTS COMMERICAL A.D.T. COULD WARRANT A DIFFERENT TYPE HMA MIXTURE

HMA

- TOP COURSE AWI = 260
- 5% MIN. A.C. CONTENT
- TARGET AIR VOIDS = 3%

ROAD COMMISSION FOR OAKLAND COUNTY
SUBDIVISION STANDARD PLAN FOR
STREET PAVEMENT
REVISED: 09/03/15 | FIGURE 3-5



NOTE:
UNDERDRAIN, IF REQUIRED BY RCOC, SHALL BE INSTALLED PRIOR TO THE AGGREGATE BASE

ROAD COMMISSION FOR OAKLAND COUNTY
SUBDIVISION STANDARD PLAN FOR
TYPICAL CROSS SECTION CURBED RESIDENTIAL ROAD
REVISED: 09/03/15 | FIGURE 3-3

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PROJECT TITLE
THE AVALON - MULTI FAMILY
HIGHLAND ROAD
WHITE LAKE TWP, MI

REVISIONS

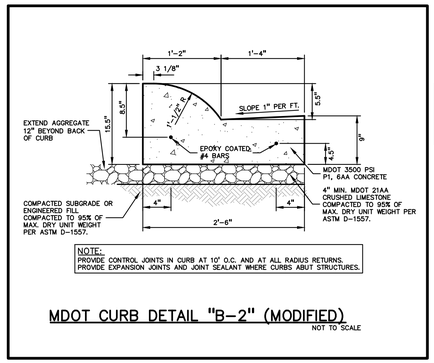
DRAFT	2/19/24
ISSUED FOR OWNER REVIEW	4/24/24
FINAL SITE PLAN REVIEW	7/3/24
FINAL SITE PLAN REVIEW	5/8/25
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ORIGINAL ISSUE DATE:
DECEMBER 4, 2023

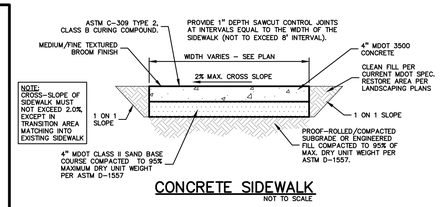
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NOTES AND DETAILS - 2

PEA JOB NO.	2021-0084
P.M.	JC
DN.	BSH/JEB
DES.	BSH

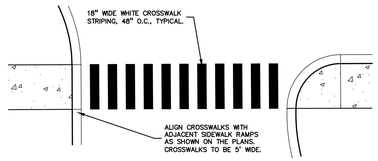
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C-13.1



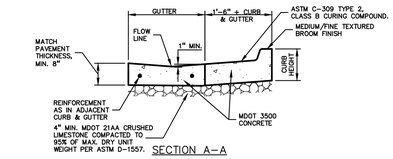
MDOT CURB DETAIL "B-2" (MODIFIED)
NOT TO SCALE



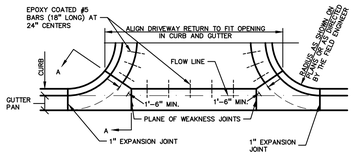
CONCRETE SIDEWALK
NOT TO SCALE



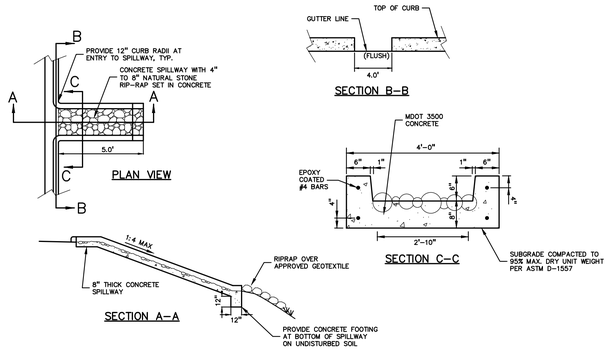
STRIPED CROSSWALK DETAIL
NOT TO SCALE



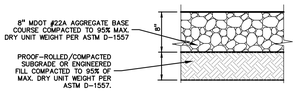
SECTION A-A



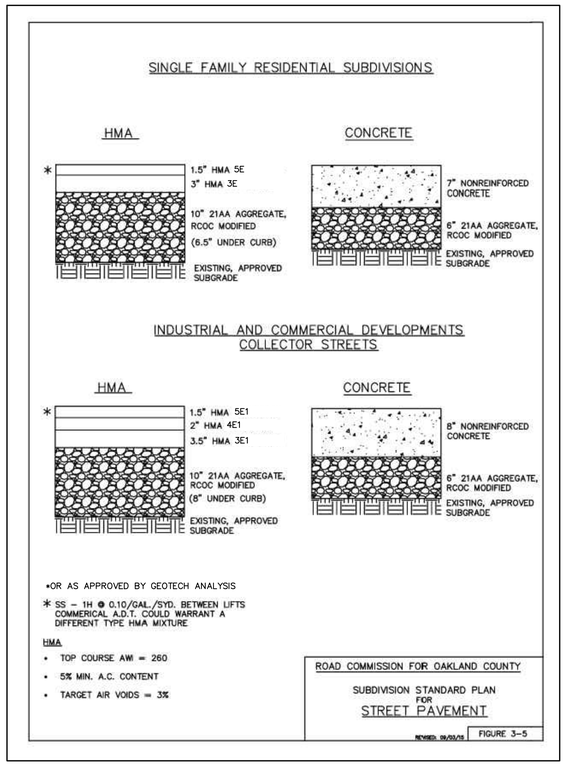
MDOT DRIVEWAY OPENING-DETAIL 'M'
NOT TO SCALE

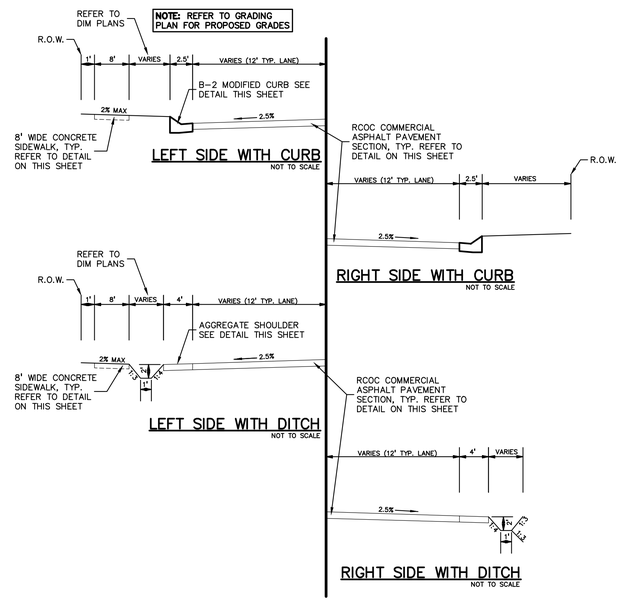


CONCRETE CURB SPILLWAY DETAIL
NOT TO SCALE



GRAVEL SHOULDER DETAIL
NOT TO SCALE





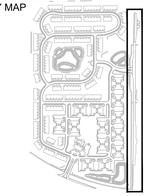
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STATE OF MICHIGAN
BRETT STURGEON HOLLANDSWORTH
License No. 6201064949
LICENSED PROFESSIONAL ENGINEER

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KEY MAP



CLIENT
WHITE LAKE HILL, LLC
31550 NORTHWESTERN HWY
FARMINGTON HILLS, MI 48334

PROJECT TITLE
THE AVALON - HILL ROAD
HIGHLAND ROAD
WHITE LAKE TWP, MI

REVISIONS	
FINAL SITE PLAN REVIEW	5/8/25
FINAL SITE PLAN REVIEW	9/30/25

ORIGINAL ISSUE DATE:
MAY 8, 2025

DRAWING TITLE
NOTES AND DETAILS

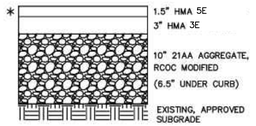
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P.M.	JC
DN.	BSH/JEB
DES.	BSH

DRAWING NUMBER:
C-13.20

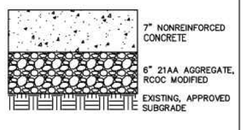
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SINGLE FAMILY RESIDENTIAL SUBDIVISIONS

HMA

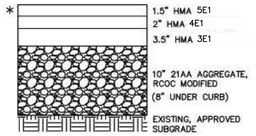


CONCRETE

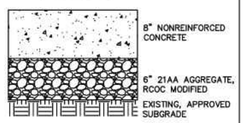


INDUSTRIAL AND COMMERCIAL DEVELOPMENTS COLLECTOR STREETS

HMA



CONCRETE



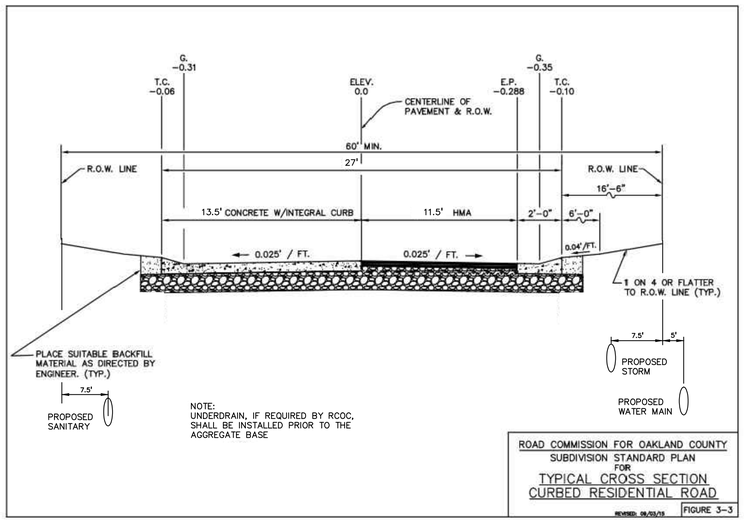
*OR AS APPROVED BY GEOTECH ANALYSIS

* SS – 1H @ 0.10/GAL./SYD. BETWEEN LIFTS COMMERICAL A.D.T. COULD WARRANT A DIFFERENT TYPE HMA MIXTURE

HMA

- TOP COURSE AWI = 260
- 5% MIN. A.C. CONTENT
- TARGET AIR VOIDS = 3%

ROAD COMMISSION FOR OAKLAND COUNTY
SUBDIVISION STANDARD PLAN FOR
STREET PAVEMENT
REVISED: 09/03/15 FIGURE 3-5

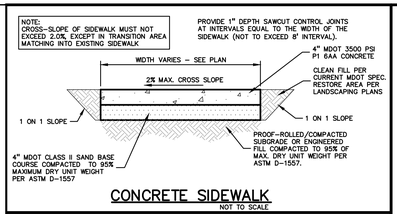


NOTE:
UNDERDRAIN, IF REQUIRED BY RCOC, SHALL BE INSTALLED PRIOR TO THE AGGREGATE BASE

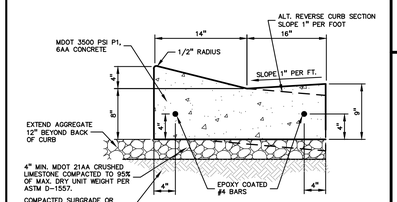
ROAD COMMISSION FOR OAKLAND COUNTY
SUBDIVISION STANDARD PLAN FOR
TYPICAL CROSS SECTION CURBED RESIDENTIAL ROAD
REVISED: 09/03/15 FIGURE 3-3

NOTE:
CROSS-SLOPE OF SIDEWALK MUST NOT EXCEED 2.0%, EXCEPT IN TRANSITION AREA MATCHING INTO EXISTING SIDEWALK

PROVIDE 1" DEPTH SAWCUT CONTROL JOINTS AT INTERVALS EQUAL TO THE WIDTH OF THE SIDEWALK (NOT TO EXCEED 8' INTERVAL).

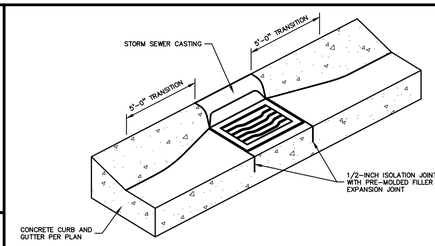


CONCRETE SIDEWALK
NOT TO SCALE

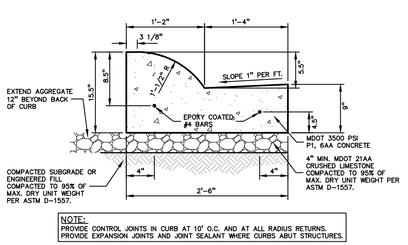


NOTE:
PROVIDE CONTROL JOINTS IN CURB AT 10' O.C. AND AT ALL RADIUS RETURNS.
PROVIDE EXPANSION JOINTS AND JOINT SEALANT WHERE CURBS ABUT STRUCTURES.

4" MOUNTABLE CURB AND GUTTER DETAIL
NOT TO SCALE



CURB TRANSITION DETAIL FOR ROLL CURB/MOUNTABLE CURB TO STRAIGHT CURB AND GUTTER AT DRAINAGE STRUCTURE
NOT TO SCALE



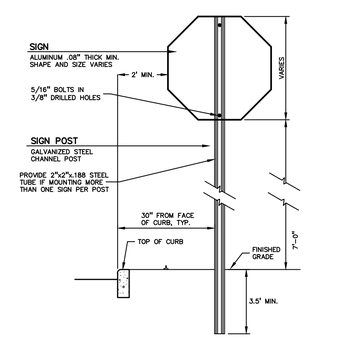
NOTE:
PROVIDE CONTROL JOINTS IN CURB AT 10' O.C. AND AT ALL RADIUS RETURNS.
PROVIDE EXPANSION JOINTS AND JOINT SEALANT WHERE CURBS ABUT STRUCTURES.

MDOT CURB DETAIL "B-2" (MODIFIED)
NOT TO SCALE



30" x 30"
WHITE ON RED REFLECTORIZED
7'-0" MOUNTING HEIGHT
(R1-1)

STOP SIGN DETAIL
NOT TO SCALE



SIGN AND POST INSTALLATION IN LANDSCAPED AREAS
NOT TO SCALE

PEA GROUP
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STATE OF MICHIGAN
BRETT STURGEON HOLLANDSWORTH
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LICENSED PROFESSIONAL ENGINEER

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KEY MAP



CLIENT
WHITE LAKE HILL, LLC
31550 NORTHWESTERN HWY
FARMINGTON HILLS, MI 48334

PROJECT TITLE
THE AVALON - SINGLE FAMILY
HIGHLAND ROAD
WHITE LAKE TWP, MI

REVISIONS	
FINAL SITE PLAN REVIEW	5/8/25
FINAL SITE PLAN REVIEW	9/30/25

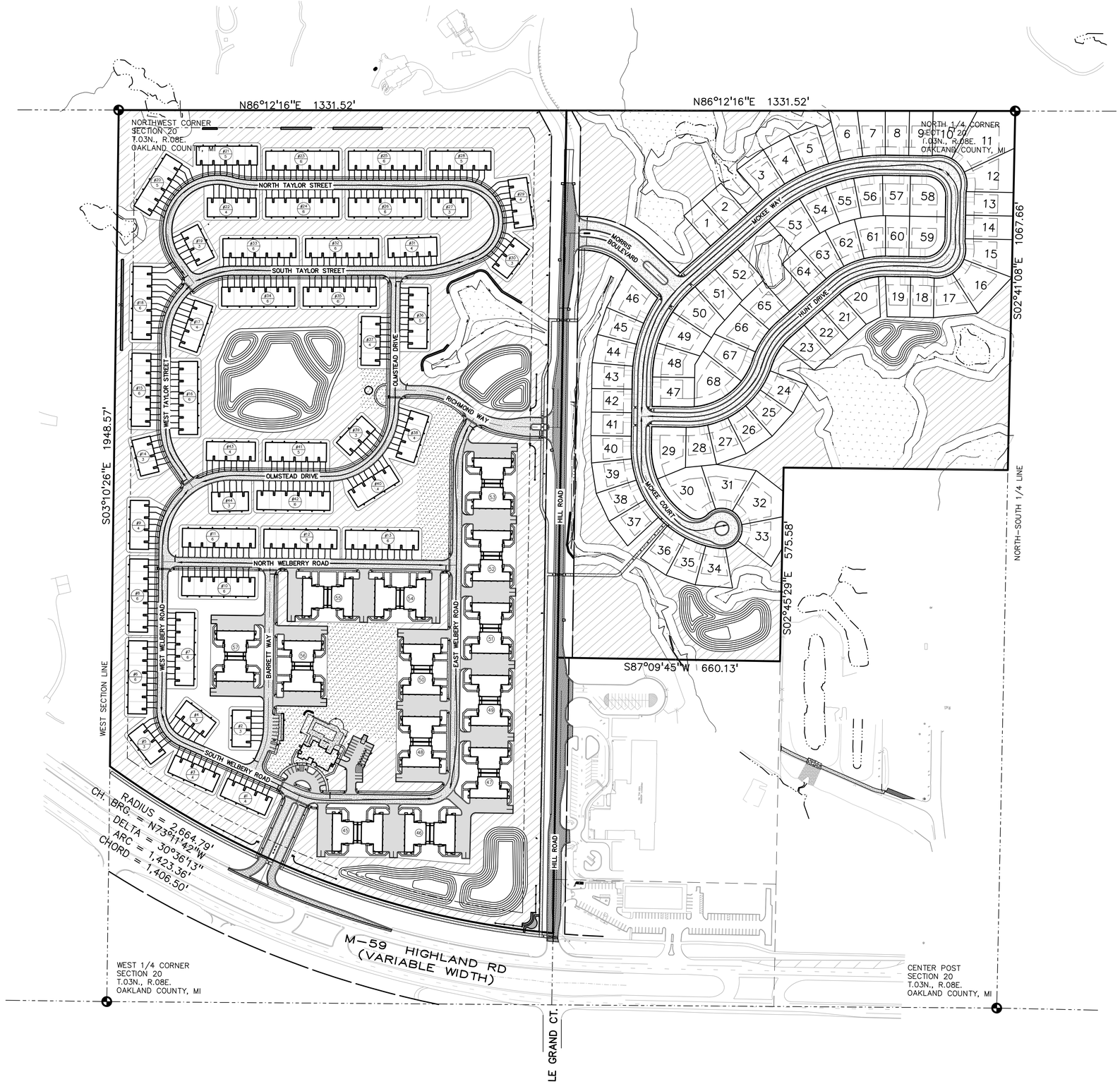
ORIGINAL ISSUE DATE:
MAY 8, 2025

DRAWING TITLE
DETAILS

PEA JOB NO.	2021-0084
P.M.	JC
DN.	BSH/JEB
DES.	BSH

DRAWING NUMBER:
C-13.31

S:\PROJECTS\2021\2021-0084 WHITE LAKE MIXED USE\DWG\CONSTRUCTION\1-SINGLE FAMILY\(C-13.0) NOTES AND DETAILS-21-0084 SF.dwg



LEGEND

- IRON FOUND
- IRON SET
- NAIL FOUND
- NAIL & CAP SET
- BRASS PLUG SET
- MONUMENT FOUND
- MONUMENT SET
- SEC. CORNER FOUND
- R RECORDED
- M MEASURED
- C CALCULATED

EXISTING / PROPOSED

- ELEC., PHONE OR CABLE TV O.H. LINE, POLE & GUY WIRE
- UNDERGROUND CABLE TV, CATV PEDESTAL
- TELEPHONE U.G. CABLE, PEDESTAL & MANHOLE
- ELECTRIC U.G. CABLE, MANHOLE, METER & HANDHOLE
- GAS MAIN, VALVE & GAS LINE MARKER
- WATERMAIN, HYD., GATE VALVE, TAPPING SLEEVE & VALVE
- SANITARY SEWER, CLEANOUT & MANHOLE
- STORM SEWER, CLEANOUT & MANHOLE
- COMBINED SEWER & MANHOLE
- SQUARE, ROUND & BEEHIVE CATCH BASIN, YARD DRAIN
- POST INDICATOR VALVE
- WATER VALVE BOX/HYDRANT VALVE BOX, SERVICE SHUTOFF
- MAILBOX, TRANSFORMER, IRRIGATION CONTROL VALVE
- UNIDENTIFIED STRUCTURE
- SPOT ELEVATION
- CONTOUR LINE
- FENCE
- GUARD RAIL
- STREET LIGHT
- SIGN
- CONCRETE
- ASPHALT
- GRAVEL SHOULDER
- WETLAND

STD DUTY / HEAVY DUTY / R.O.W. ONLY

STD DUTY / HEAVY DUTY / DEEP STRENGTH

SINGLE FAMILY OPEN SPACE TABLE:

SITE AREA: 41.06 ACRES GROSS
4.48 WETLAND ACRES
35.00 ACRES NET (NO R.O.W. OR WETLAND AREA)
7.68 OPEN SPACE ACRES

ZONING: EXISTING: R1-A, SINGLE FAMILY RESIDENTIAL

PROPOSED: PD, PLANNED DEVELOPMENT

PROPOSED USE: 68 UNIT SINGLE FAMILY HOME CONDOMINIUM (1.9 UNITS PER ACRE)

OPEN SPACE:
MINIMUM OPEN SPACE REQUIRED = 15% OF NET SITE AREA
PROVIDED OPEN SPACE = 7.69/35.00 = 22.0%

WETLANDS:
EGLE WETLAND IMPACT: 0.72 ACRES

MULTI-FAMILY OPEN SPACE TABLE:

SITE AREA: 68.96 ACRES GROSS
0.64 WETLAND ACRES
65.88 ACRES NET (NO R.O.W. OR WETLAND AREA)
24.22 ACRES OPEN SPACE

ZONING: EXISTING: PB, PLANNED BUSINESS
AG, AGRICULTURAL

PROPOSED: PD, PLANNED DEVELOPMENT

PROPOSED USE: 366 MULTI-FAMILY UNITS FOR LEASE (5.6 UNITS PER ACRE)

OPEN SPACE:
MINIMUM OPEN SPACE REQUIRED = 15% OF NET SITE AREA
PROVIDED OPEN SPACE = 24.22/65.88 = 36.8%
RECREATION SPACE REQUIRED = 5,000 SF FIRST UNIT + 100 SF/EA ADDITIONAL UNIT X 365 UNITS = 41,500 SF
RECREATION SPACE PROVIDED = 150,493 SF (CLUBHOUSE, POOL, DOG PARK, & GAZEBO AREA)

WETLANDS:
EGLE WETLAND IMPACT: 0.34 ACRES

LEGEND:

- OPEN SPACE
- RECREATIONAL SPACE

NORTH

0 75 150 300

SCALE: 1" = 150'

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KEY MAP



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BRETT STURGEON HOLLANDSWORTH
LICENSED PROFESSIONAL ENGINEER
License No. 6201064949

CLIENT
WHITE LAKE HILL, LLC
31550 NORTHWESTERN HWY
FARMINGTON HILLS, MI 48334

PROJECT TITLE
THE AVALON - MULTI FAMILY
HIGHLAND ROAD
WHITE LAKE TWP, MI

REVISIONS	
DRAFT	2/19/24
ISSUED FOR OWNER REVIEW	4/24/24
FINAL SITE PLAN REVIEW	7/3/24
FINAL SITE PLAN REVIEW	5/8/25
FINAL SITE PLAN REVIEW	9/30/25

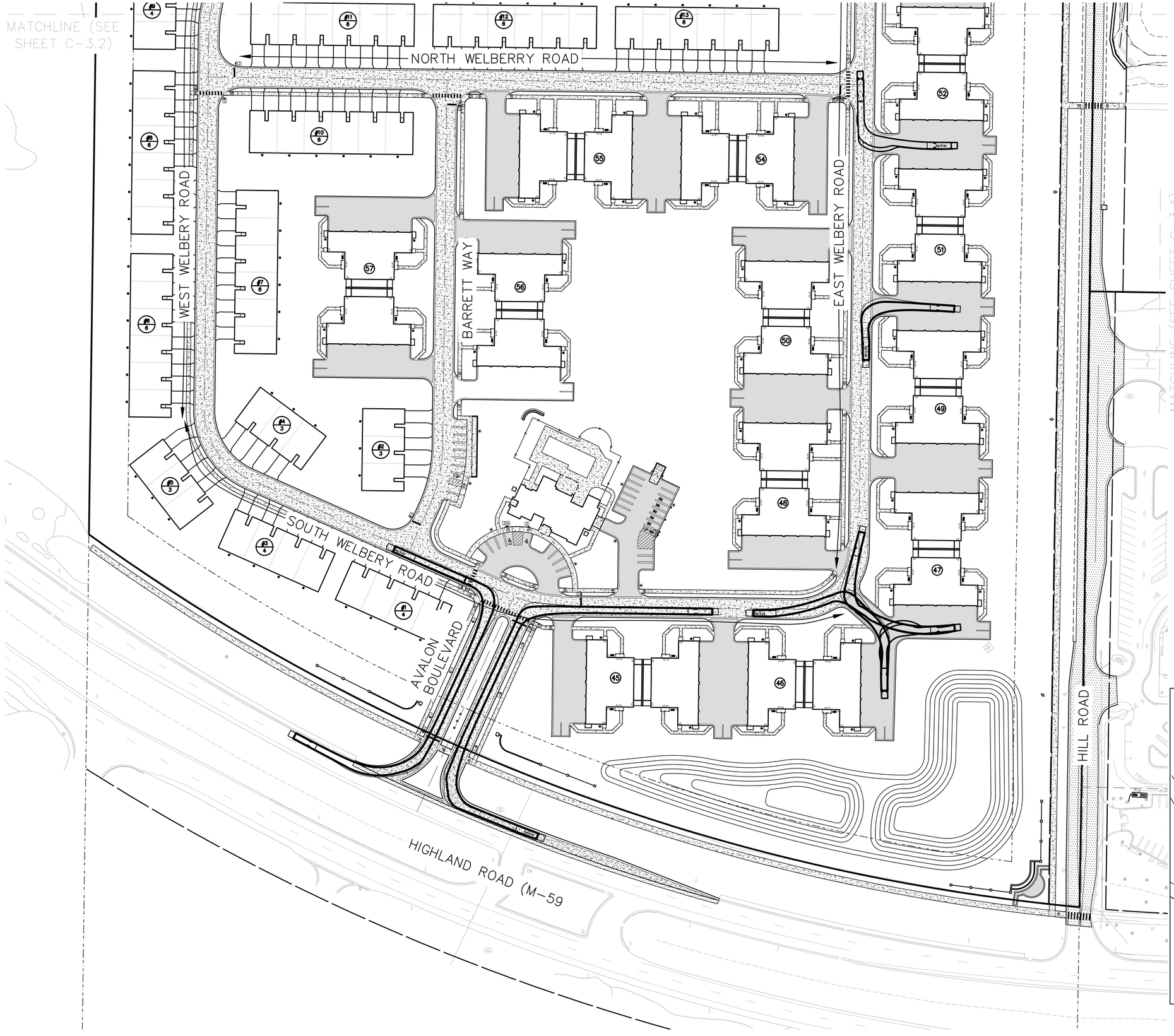
ORIGINAL ISSUE DATE:
DECEMBER 4, 2023

DRAWING TITLE
OPEN SPACE PLAN

PEA JOB NO.	2021-0084
P.M.	JC
DN.	BSH/JEB
DES.	BSH

DRAWING NUMBER:
C-14.0

MATCHLINE (SEE SHEET C-3.2)



MATCHLINE (SEE SHEET C-3.4)

LEGEND:

- CONCRETE PAVEMENT (STD DUTY / HEAVY DUTY / R.O.W. ONLY)
- ASPHALT PAVEMENT (STD DUTY / HEAVY DUTY / DEEP STRENGTH)
- GRAVEL
- WETLAND
- CONCRETE CURB AND GUTTER
- REVERSE GUTTER PAN
- SETBACK LINE
- SIGN
- LIGHTPOLE
- FENCE
- GUARD RAIL

SIGN LEGEND:

'NO PARKING FIRE LANE' SIGN	[1]
'STOP' SIGN	[2]
'BARRIER FREE PARKING' SIGN	[3]
'VAN ACCESSIBLE' SIGN	[4]
'CROSSWALK' SIGN	[5]
'DO NOT ENTER' SIGN	[6]
'SIDEWALK ENDS' SIGN	[7]
'NO PARKING LOADING ZONE' SIGN	[8]

REFER TO DETAIL SHEET FOR SIGN DETAILS

SIDEWALK RAMP LEGEND:

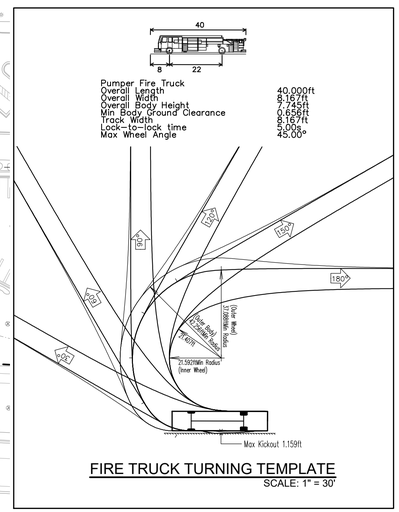
SIDEWALK RAMP 'TYPE R'	(R)
SIDEWALK RAMP 'TYPE F'	(F)
SIDEWALK RAMP 'TYPE P'	(P)
SIDEWALK RAMP 'TYPE C'	(C)
SIDEWALK RAMP 'TYPE D'	(D)
CURB DROP ONLY	(X)

REFER TO LATEST MDOT R-28 STANDARD RAMP AND DETECTABLE WARNING DETAILS

GENERAL NOTES:

THESE NOTES APPLY TO ALL CONSTRUCTION ACTIVITIES ON THIS PROJECT.

1. **ALL DIMENSIONS SHOWN ARE TO BACK OF CURB, FACE OF SIDEWALK, OUTSIDE FACE OF BUILDING, PROPERTY LINE, CENTER OF MANHOLE/CATCH BASIN OR CENTERLINE OF PIPE UNLESS OTHERWISE NOTED.**
2. **'NO PARKING-FIRE LANE' SIGNS SHALL BE POSTED ALONG ALL FIRE LANES AT 100 FOOT INTERVALS OR AS DIRECTED BY THE FIRE OFFICIAL.**
3. **REFER TO NOTES & DETAILS SHEET FOR ON-SITE PAVING DETAILS.**
4. **REFER TO NOTES & DETAILS SHEET FOR ON-SITE SIDEWALK RAMP DETAILS**



FIRE TRUCK TURNING TEMPLATE
SCALE: 1" = 30'

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NORTH

0 30 60 120
SCALE: 1" = 60'

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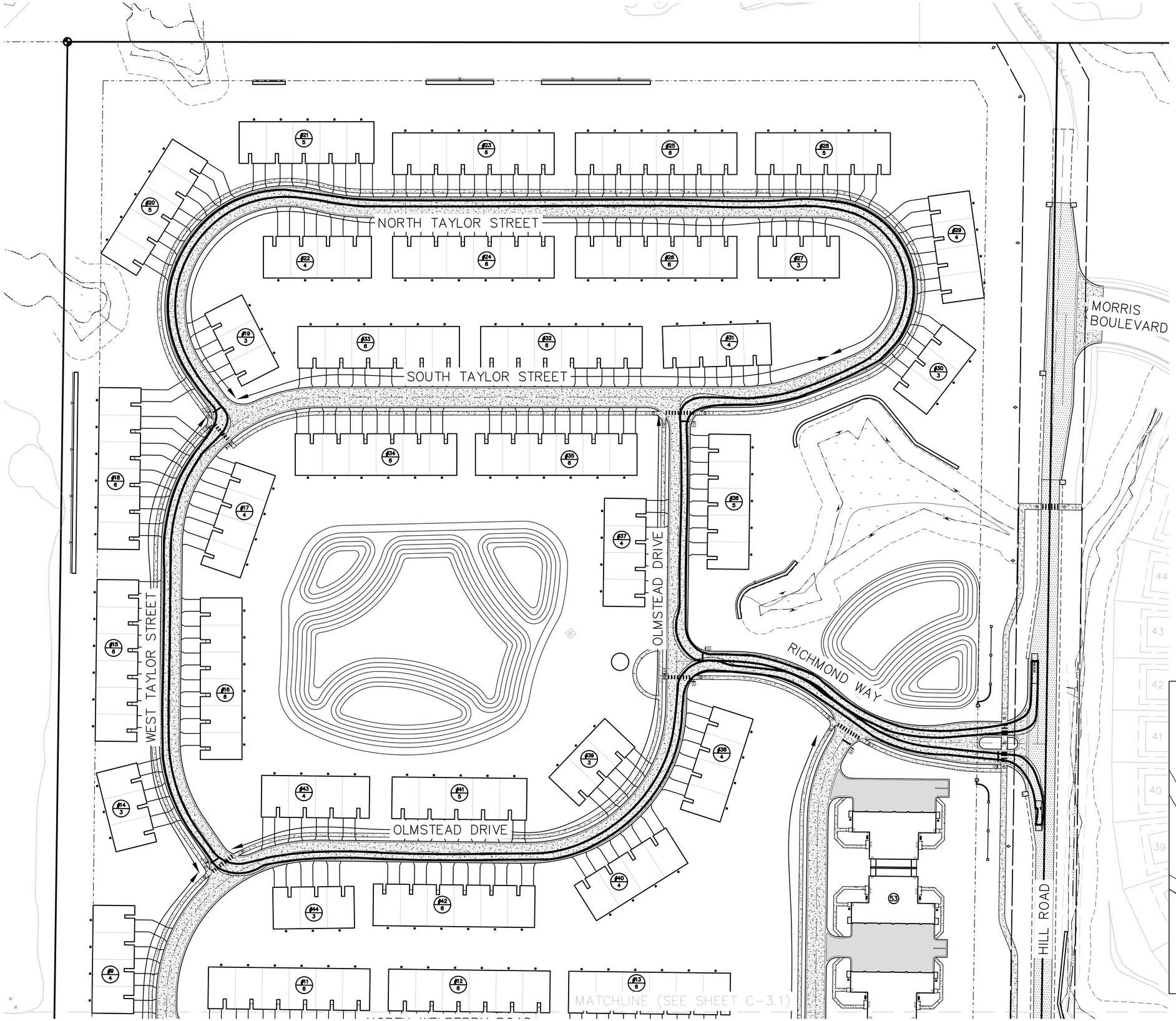
REVISIONS	
DRAFT	2/19/24
ISSUED FOR OWNER REVIEW	4/24/24
FINAL SITE PLAN REVIEW	7/3/24
FINAL SITE PLAN REVIEW	5/8/25
FINAL SITE PLAN REVIEW	9/30/25

ORIGINAL ISSUE DATE:
DECEMBER 4, 2023

DRAWING TITLE
FIRE SAFETY PLAN - SOUTH

PEA JOB NO.	2021-0084
P.M.	JC
DN.	BSH/JEB
DES.	BSH

DRAWING NUMBER:
C-15.1



LEGEND:

- CONCRETE PAVEMENT (STD DUTY / HEAVY DUTY / R.O.W. ONLY)
- ASPHALT PAVEMENT (STD DUTY / HEAVY DUTY / DEEP STRENGTH)
- GRAVEL
- WETLAND
- CONCRETE CURB AND GUTTER
- REVERSE GUTTER PAN
- SETBACK LINE
- SIGN
- LIGHTPOLE
- FENCE
- GUARD RAIL

SIGN LEGEND:

'NO PARKING FIRE LANE' SIGN	[1]
'STOP' SIGN	[2]
'BARRIER FREE PARKING' SIGN	[3]
'VAN ACCESSIBLE' SIGN	[4]
'CROSSWALK' SIGN	[5]
'DO NOT ENTER' SIGN	[6]
'SIDEWALK ENDS' SIGN	[7]
'NO PARKING LOADING ZONE' SIGN	[8]

REFER TO DETAIL SHEET FOR SIGN DETAILS

SIDEWALK RAMP LEGEND:

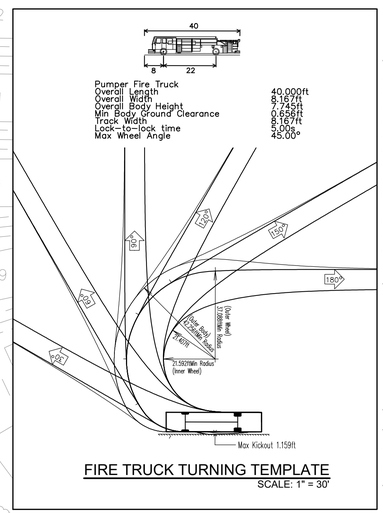
SIDEWALK RAMP 'TYPE R'	(R)
SIDEWALK RAMP 'TYPE F'	(F)
SIDEWALK RAMP 'TYPE P'	(P)
SIDEWALK RAMP 'TYPE C'	(C)
SIDEWALK RAMP 'TYPE D'	(D)
CURB DROP ONLY	(X)

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2. 'NO PARKING–FIRE LANE' SIGNS SHALL BE POSTED ALONG ALL FIRE LANES AT 100 FOOT INTERVALS OR AS DIRECTED BY THE FIRE OFFICIAL.
3. REFER TO NOTES & DETAILS SHEET FOR ON–SITE PAVING DETAILS.
4. REFER TO NOTES & DETAILS SHEET FOR ON–SITE SIDEWALK RAMP DETAILS



FIRE TRUCK TURNING TEMPLATE
SCALE: 1" = 30'

PEA GROUP
t: 844.813.2949
www.peagroup.com

STATE OF MICHIGAN
BRETT STURGEON HOLLANDSWORTH
LICENSED PROFESSIONAL ENGINEER
License No. 6201064949

NORTH

0 30 60 120
SCALE: 1" = 60'

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

CAUTION!!
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KEY MAP

CLIENT
WHITE LAKE HILL, LLC
31550 NORTHWESTERN HWY
FARMINGTON HILLS, MI 48334

PROJECT TITLE
THE AVALON - MULTI FAMILY
HIGHLAND ROAD
WHITE LAKE TWP, MI

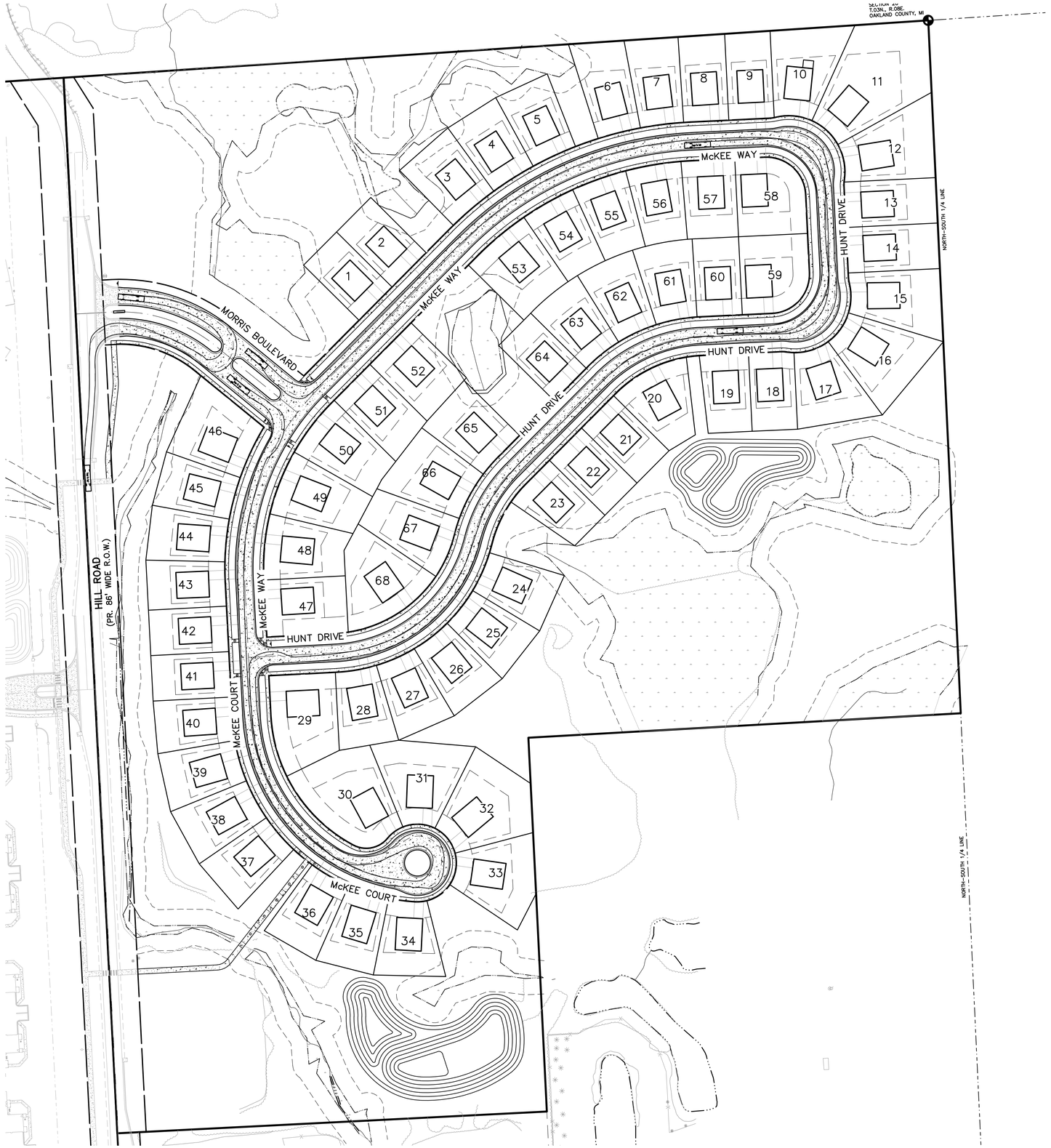
REVISIONS	
DRAFT	2/19/24
ISSUED FOR OWNER REVIEW	4/24/24
FINAL SITE PLAN REVIEW	7/3/24
FINAL SITE PLAN REVIEW	5/8/25
FINAL SITE PLAN REVIEW	9/30/25

ORIGINAL ISSUE DATE:
DECEMBER 4, 2023

DRAWING TITLE
FIRE SAFETY PLAN - NORTH

PEA JOB NO.	2021-0084
P.M.	JC
DN.	BSH/JEB
DES.	BSH

DRAWING NUMBER:
C-15.2



S:\PROJECTS\2021\2021-0084 WHITE LAKE MIXED USE\DWG\CONSTRUCTION\1-SINGLE FAMILY\C-15-01 SAFETY-21-0084 SP.dwg

LEGEND:

- CONCRETE PAVEMENT (STD DUTY / HEAVY DUTY / R.O.W. ONLY)
- ASPHALT PAVEMENT (STD DUTY / HEAVY DUTY / DEEP STRENGTH)
- GRAVEL
- WETLAND
- CONCRETE CURB AND GUTTER
- REVERSE GUTTER PAN
- SETBACK LINE
- SIGN
- LIGHTPOLE
- FENCE
- GUARD RAIL

SIGN LEGEND:

'NO PARKING FIRE LANE' SIGN	[1]
'STOP' SIGN	[2]
'BARRIER FREE PARKING' SIGN	[3]
'VAN ACCESSIBLE' SIGN	[4]
'CROSSWALK' SIGN	[5]
'DO NOT ENTER' SIGN	[6]
'SIDEWALK ENDS' SIGN	[7]
'NO PARKING LOADING ZONE' SIGN	[8]

REFER TO DETAIL SHEET FOR SIGN DETAILS

SIDEWALK RAMP LEGEND:

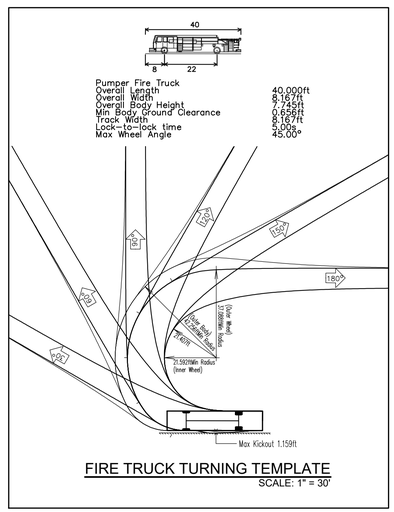
SIDEWALK RAMP 'TYPE R'	(R)
SIDEWALK RAMP 'TYPE F'	(F)
SIDEWALK RAMP 'TYPE P'	(P)
SIDEWALK RAMP 'TYPE C'	(C)
SIDEWALK RAMP 'TYPE D'	(D)
CURB DROP ONLY	(X)

REFER TO LATEST MDOT R-28 STANDARD RAMP AND DETECTABLE WARNING DETAILS

GENERAL NOTES:

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4. REFER TO NOTES & DETAILS SHEET FOR ON-SITE SIDEWALK RAMP DETAILS



FIRE TRUCK TURNING TEMPLATE
SCALE: 1" = 30'

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STATE OF MICHIGAN
BRETT STURGEON HOLLANDSWORTH
LICENSED PROFESSIONAL ENGINEER
License No. 6201064949

NORTH

0 40 80 160
SCALE: 1" = 80'

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KEY MAP



CLIENT
WHITE LAKE HILL, LLC
31550 NORTHWESTERN HWY
FARMINGTON HILLS, MI 48334

PROJECT TITLE
THE AVALON - SINGLE FAMILY
HIGHLAND ROAD
WHITE LAKE TWP, MI

REVISIONS

FINAL SITE PLAN REVIEW	5/8/25
FINAL SITE PLAN REVIEW	9/30/25

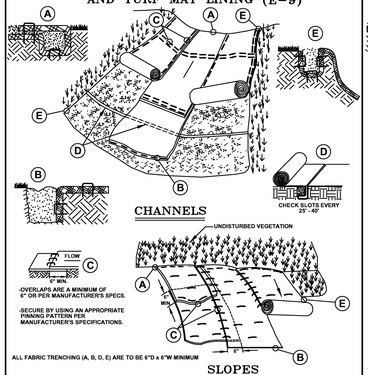
ORIGINAL ISSUE DATE:
MAY 8, 2025

DRAWING TITLE
SAFETY PLAN

PEA JOB NO.	2021-0084
P.M.	JC
DN.	BSH/JEB
DES.	BSH

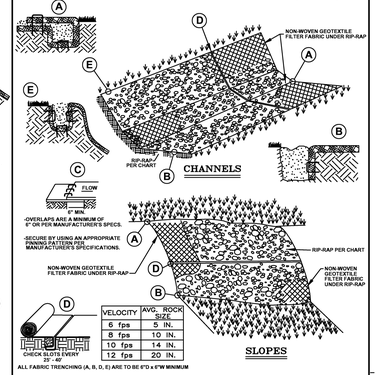
DRAWING NUMBER:
C-15.30

EROSION CONTROL BLANKETS AND TURF MAT LINING (E-9)



DEPENDING ON THE VELOCITY, SLOPE, SOILS, USE PROPER BLANKET OR TURF MAT LINING PER MANUFACTURER'S SPECIFICATIONS TO HANDLE THE SHEER STRESSES OF THE SLOPE/CHANNEL.

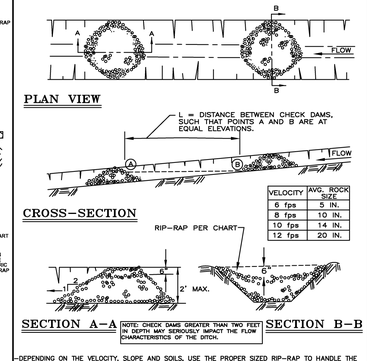
RIP-RAP: CHANNELS AND SLOPES (E-10)



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)



VELOCITY	AVG. ROCK SIZE
6 fps	5 IN.
8 fps	10 IN.
10 fps	14 IN.
12 fps	20 IN.

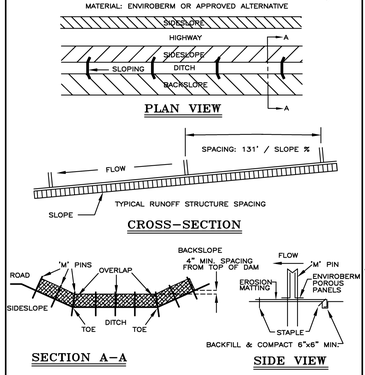
NOTE: CHECK DAMS GREATER THAN TWO FEET IN DEPTH MAY SERIOUSLY IMPACT THE FLOW CHARACTERISTICS OF THE DITCH.

-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)

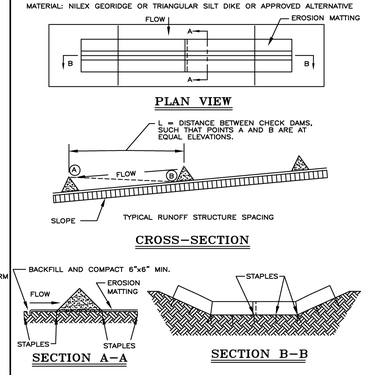
MATERIAL: ENVIROBERM OR APPROVED ALTERNATIVE



-FOR SLOPE AND/OR CHANNEL PROTECTION SEE OTHER BMP'S ON THIS SHEET OR IN THE WRC SOIL EROSION MANUAL.

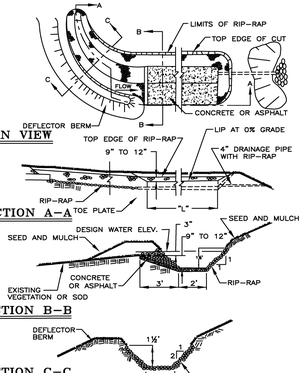
CHECK DAMS ALTERNATIVE "B" (E-3B)

MATERIAL: NILEX GEORIDGE OR TRIANGULAR SILT DIKE OR APPROVED ALTERNATIVE

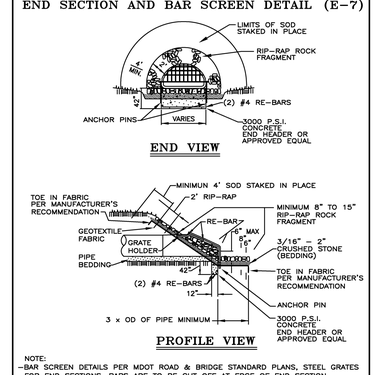


-FOR SLOPE AND/OR CHANNEL PROTECTION SEE OTHER BMP'S ON THIS SHEET OR IN THE WRC SOIL EROSION MANUAL.

LEVEL SPREADER (E-4)



RIP-RAP, END SECTION AND BAR SCREEN DETAIL (E-7)

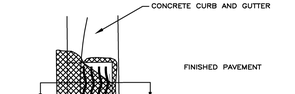


NOTE:
-BAR SCREEN DETAILS PER MDOT ROAD & BRIDGE STANDARD PLANS, STEEL GRATES FOR END SECTIONS. BARS ARE TO BE CUT OFF AT EDGE OF END SECTION.
-FOR SLOPE AND/OR CHANNEL PROTECTION SEE OTHER BMP'S ON THIS SHEET OR IN THE WRC SOIL EROSION MANUAL.

VEGETATIVE BUFFER ZONE (SP-1)

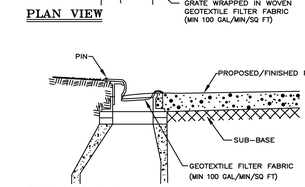
THE GRAPH SHOWN BELOW IS USED TO DETERMINE THE ADEQUACY OF AN EXISTING VEGETATIVE BUFFER ZONE FOR USE AS A SEDIMENT FILTER. THIS GRAPH IS ONLY APPLICABLE IF THE VEGETATION IS 90% DENSE AND AT LEAST 1" IN LENGTH OVER EVERY SQUARE FOOT OF DISTURBED SOIL. AN AREA COVERED WITH WEEDS, OR BUSHES AND TREES WITHOUT A GOOD GROUND COVER IS NOT ACCEPTABLE.

EXAMPLE



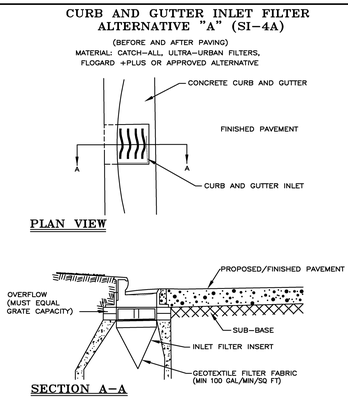
LENGTH OF BUFFER ZONE ?
% OF SLOPE OF BUFFER ZONE = 5%
WHAT IS THE ACCEPTABLE LENGTH OF THE BUFFER ZONE?

PLOT IN GRAPH BELOW
BUFFER ZONE IS ACCEPTABLE AT 65'



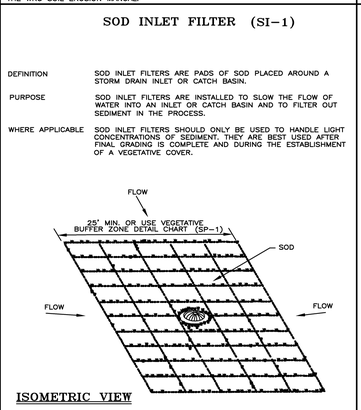
SILT FENCE (SP-2)

(MATERIAL: AMOCO PRO PEX 2130 OR APPROVED EQUIVALENT)



SILT FENCE ALTERNATIVE "A" (SP-2A)

(MATERIAL: SILT SHIELD OR APPROVED EQUIVALENT)



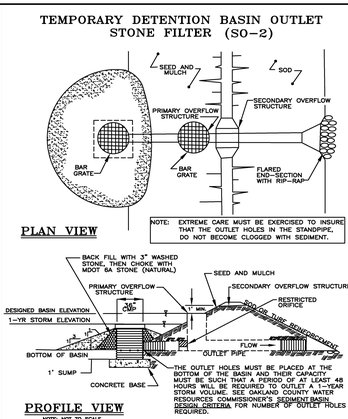
2% GRADE MAXIMUM SLOPE

Splicing Procedure:
Splicing EXTRUDED SEDIMENT FILTER FENCE is achieved beginning with an overlap of a min. of 6" of the EXTRUDED SEDIMENT FILTER FENCE ends positioned with the use of two plastic retainer type push-in fasteners to locate through the top and bottom, vertically, at least 3" from each edge of the splice.

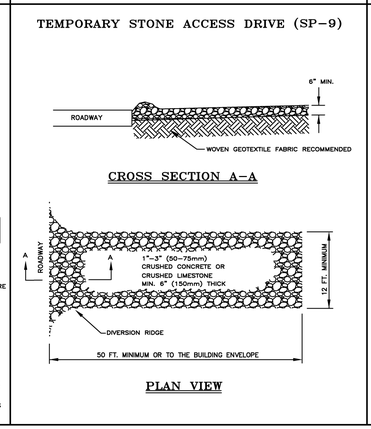
Optional Heat Splicing:
Overlap a minimum of 6" inches. Melt a thin layer of EXTRUDED SEDIMENT FILTER FENCE with torch from top to bottom, immediately press both layers together for a minimum of .5 second. Check for total lamination from top to bottom of material. (Do not apply heat to filter)

WINTER/FROZEN GROUND SILT FENCE (SP-2W)

(MATERIAL: AMOCO PRO PEX 2130 OR APPROVED EQUIVALENT)

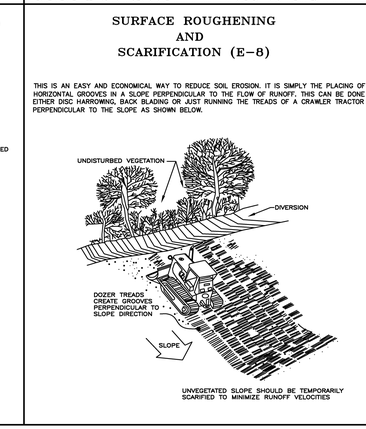


RYCB INLET FILTER (SI-3)



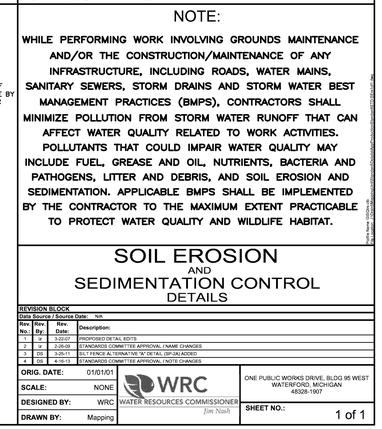
NOTE: MATERIAL IS NOT SILT FENCE MATERIAL

RYCB INLET FILTER ALTERNATIVE "A" (SI-3A)



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.)

EARTH DIVERSION BERM WITH STONE OUTLET FILTER (SP-4)

-PLACE GEOTEXTILE FABRIC UNDER STONE WITH 6 INCH MIN. OVERLAP AND TRENCHED IN 6 INCH MIN.

EARTH DIVERSION BERM (E-2)

GRAVEL INTERCEPTOR DIKE (SP-6)

-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.

LOW POINT INLET FILTER ALT. "A" (SI-2A)

MATERIAL: CATCH-ALL, ULTRA-URBAN FILTERS, FLOGARD +PLUS OR APPROVED ALTERNATIVE

SILT FENCE GRAVEL FILTER (SP-3)

-PLACE GEOTEXTILE FABRIC UNDER STONE WITH 6 INCH MIN. OVERLAP AND TRENCHED IN 6 INCH MIN.

DITCH SEDIMENT TRAP (SO-4)

NOTE:
FOR SLOPE AND/OR CHANNEL PROTECTION SEE OTHER BMP'S ON THE SHEET OR IN THE WRC SOIL EROSION MANUAL.

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.

CURB AND GUTTER INLET FILTER ALTERNATIVE "A" (SI-4A)

(BEFORE AND AFTER PAVING)

MATERIAL: CATCH-ALL, ULTRA-URBAN FILTERS, FLOGARD +PLUS OR APPROVED ALTERNATIVE

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.

TEMPORARY DETENTION BASIN OUTLET STONE FILTER (SO-2)

TEMPORARY STONE ACCESS DRIVE (SP-9)

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.

UNVEGETATED SLOPE SHOULD BE TEMPORARILY SCARIFIED TO MINIMIZE RUNOFF VELOCITIES

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

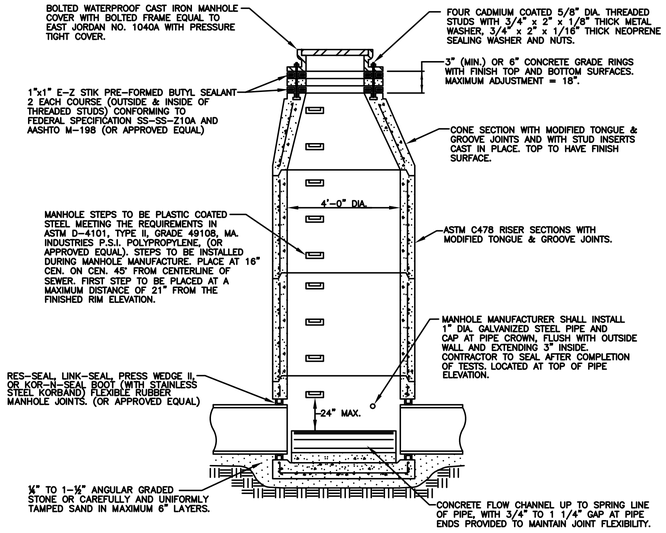
REVISION BLOCK			
Date Source / Source Date:		N/A	
Rev. No.	Rev. By	Rev. Date:	Description:
1	K	3-22-07	PROPOSED DETAIL EDITS
2	LK	2-26-09	STANDARDS COMMITTEE APPROVAL / NAME CHANGES
3	DS	3-25-11	SILT FENCE ALTERNATIVE "A" DETAIL (SP-2A) ADDED
4	DS	4-15-13	STANDARDS COMMITTEE APPROVAL / NOTE CHANGES

ORIG. DATE:	01/01/01
SCALE:	NONE
DESIGNED BY:	WRC
DRAWN BY:	Mapping

WRC WATER RESOURCES COMMISSIONER — Jim Nash

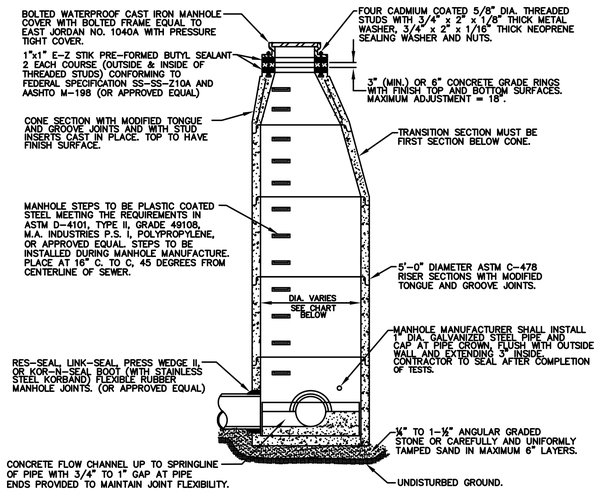
ONE PUBLIC WORKS DRIVE, BLDG 95 WEST
WATERFORD, MICHIGAN
48328-1907

SHEET NO.: 1 of 1



STANDARD MANHOLE

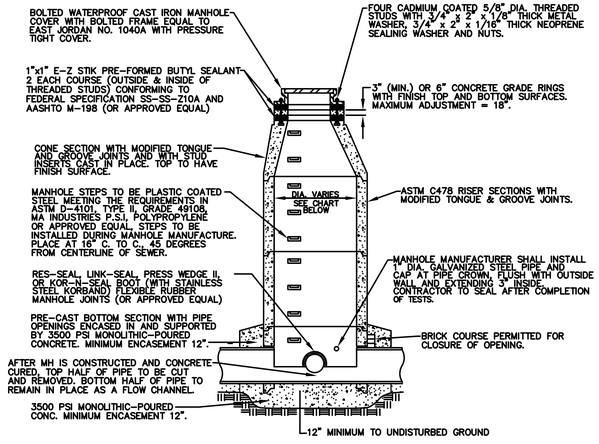
MAX. PIPE SIZE FOR STRAIGHT THRU INSTALLATION	MAX. PIPE SIZE FOR RIGHT ANGLE INSTALLATION
24"	18"



STANDARD OVERSIZED MANHOLE

MANHOLE SIZING CHART

MANHOLE DIAMETER	MAX. PIPE SIZE FOR STRAIGHT THRU INST.	MAX. PIPE SIZE FOR RIGHT ANGLE INST.
5'	36"	24"
6'	42"	36"
7'	60"	42"



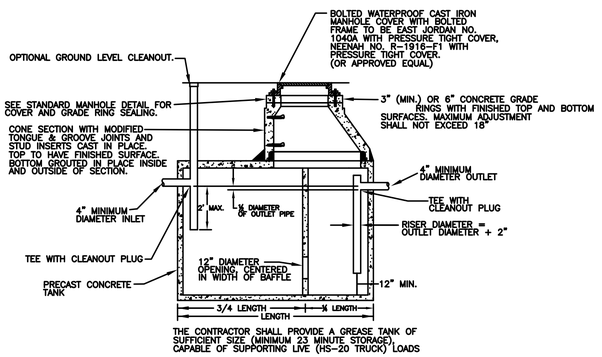
MANHOLE CONSTRUCTED OVER EXISTING SEWER

MANHOLE SIZING CHART

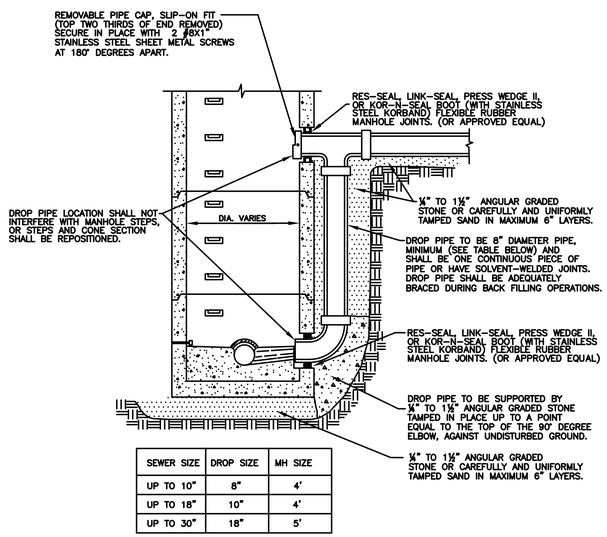
MANHOLE DIAMETER	MAX. PIPE SIZE FOR STRAIGHT THRU INST.
4'	24"
5'	36"
6'	42"
7'	60"

SANITARY SEWER CONSTRUCTION NOTES

1. ALL CONSTRUCTION SHALL CONFORM TO THE CURRENT STANDARDS AND SPECIFICATIONS OF THE LOCAL UNIT OF GOVERNMENT AND THE WATER RESOURCES COMMISSIONER (WRC). ALL SANITARY SEWER CONSTRUCTION SHALL HAVE FULL-TIME INSPECTION SUPERVISED BY A STATE OF MICHIGAN LICENSED PROFESSIONAL ENGINEER PROVIDED BY, OR CAUSED TO BE PROVIDED BY, THE LOCAL UNIT OF GOVERNMENT.
2. AT ALL CONNECTIONS TO WRC SEWERS OF EXTENSIONS, AND BEFORE START OF CONSTRUCTION, THE CONTRACTOR MUST OBTAIN A SEWER INSPECTION PERMIT ISSUED BY WRC. GRAVITY SEWER PERMIT CHANGES ARE $250 FOR EACH CONNECTION PLUS $25 FOR EACH MANHOLE CONSTRUCTED. PRESSURE SEWER PERMIT CHARGES ARE $250 PER 2,460 L.F. OF FORCE MAIN WITH A MINIMUM PERMIT FEE OF $250. 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 WRC A $5,000 SURETY BOND AND $500 CASH DEPOSIT. THE CONTRACTOR SHALL NOTIFY THE LOCAL UNIT OF GOVERNMENT AND WRC (248-858-1105) 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 248-858-1105.
3. NO SEWER INSTALLATION SHALL HAVE AN INFILTRATION 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 WATER RESOURCES COMMISSIONER STANDARDS. ONLY PIPE AND PIPE JOINTS APPROVED BY WRC MAY BE USED FOR SANITARY SEWER CONSTRUCTION.
4. LOCATED IN THE FIRST MANHOLE UPSTREAM FROM THE POINT OF ALL CONNECTIONS TO AN EXISTING WRC 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 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 SIDE OF THE SUMP MANHOLE.
5. AT ALL TIMES WHEN LAYING OF NEW PIPE IS NOT ACTUALLY IN PROGRESS, THE UPSTREAM OPEN END OF THE PIPE SHALL BE CLOSED BY TEMPORARY WATERTIGHT PLUGS OR BY OTHER APPROVED MEANS. IF WATER IS IN THE TRENCH WHEN WORK IS RESUMED, THE PLUG SHALL NOT BE REMOVED UNTIL THE DANGER OF WATER ENTERING THE PIPE HAS PASSED.
6. ALL BUILDING LEADS AND RISERS SHALL BE SIX INCH SDR 23.5 ABS PIPE WITH CHEMICALLY FUSED JOINTS OR AN APPROVED EQUAL PIPE AND JOINT. BUILDING LEADS TO BE FURNISHED WITH REMOVABLE AIRTIGHT AND WATERTIGHT STOPPERS.
7. 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 WRC SPECIFICATIONS.
8. ALL NEW MANHOLES SHALL HAVE WRC APPROVED FLEXIBLE, WATERTIGHT SEALS WHERE PIPES PASS THROUGH WALLS. MANHOLES SHALL BE OF PRE CAST SECTIONS WITH MODIFIED GROOVE TONGUE AND RUBBER GASKET TYPE JOINTS. PRE CAST MANHOLE CONE SECTIONS SHALL BE WRC APPROVED MODIFIED ECCENTRIC CONE TYPE. ALL MANHOLES SHALL BE PROVIDED WITH BOLTED, WATERTIGHT COVERS.
9. AT ALL CONNECTIONS TO MANHOLES ON WRC SEWERS, OR EXTENSIONS THERETO, DROP CONNECTIONS WILL BE REQUIRED WHEN THE DIFFERENCE IN INVERT ELEVATIONS EXCEEDS 18 INCHES.
10. TAPS TO EXISTING MANHOLES SHALL BE MADE BY CORING. THE CONTRACTOR SHALL PLACE A KOR-N-SEAL BOOT (OR WRC APPROVED EQUAL) AFTER CORING IS COMPLETED. BLIND DRILLING WILL ONLY BE PERMITTED IN LIEU OF CORING WITH PRIOR WRC APPROVAL.
11. MANHOLES CONSTRUCTED DIRECTLY ON WRC SEWERS SHALL BE PROVIDED WITH COVERS READING "WATER RESOURCES COMMISSIONER-SANITARY" IN RAISED LETTERS.
12. NO GROUND WATER, STORM WATER, CONSTRUCTION WATER, DOWN SPOUT DRAINAGE OR WEEP TILE DRAINAGE SHALL BE ALLOWED TO ENTER ANY SANITARY SEWER INSTALLATION.
13. PRIOR TO ANY EXCAVATION, THE CONTRACTOR SHALL TELEPHONE MISS DIG (800-482-7171) FOR THE LOCATION OF UNDERGROUND PIPELINE AND CABLE FACILITIES AND SHALL ALSO NOTIFY REPRESENTATIVES OF OTHER UTILITIES LOCATED IN THE VICINITY OF THE WORK.
14. AN 18 INCH MINIMUM VERTICAL SEPARATION AND A 10 FOOT MINIMUM HORIZONTAL SEPARATION MUST BE MAINTAINED BETWEEN SANITARY SEWER AND WATER MAIN.
15. NEW MANHOLES BUILT OVER AN EXISTING SANITARY SEWER SHALL HAVE MONOLITHIC POURED BOTTOMS.
16. IF THE STRUCTURE FALLS WITHIN THE ROADBED OF A GRAVEL ROAD OR WITHIN THE UNPAVED SHOULDER OF A PAVED ROAD, THE COVER SHALL BE SIX (6") INCHES BELOW THE FINISHED GRAVEL SURFACE.



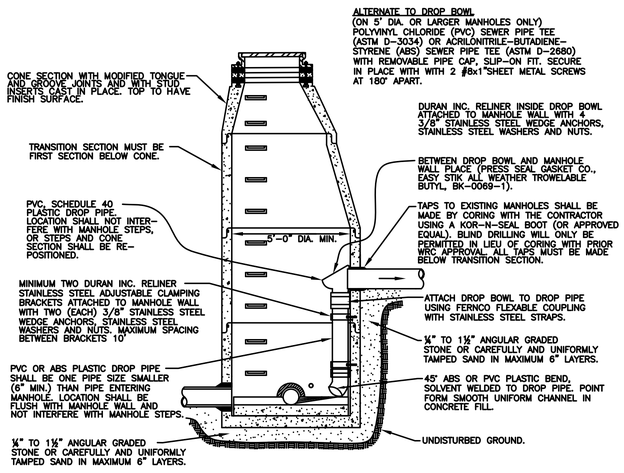
DOUBLE-COMPARTMENT GREASE INTERCEPTOR TANK FOR OUTLET PIPE BURIAL 42" AND DEEPER



SEWER SIZE	DROP SIZE	MH SIZE
UP TO 10"	8"	4'
UP TO 18"	10"	4'
UP TO 30"	18"	5'

EXTERIOR DROP CONNECTION

(REQUIRES ADVANCED APPROVAL BY WRC)



INTERIOR DROP CONNECTION

REVISION BLOCK			
Parcel Base / Source Date: N/A			
Rev. No.:	Rev. By:	Rev. Date:	Description:
1	RRH	8-31-10	FIXED NOTES THAT HAD "GROOVE TONGUE" TO READ "TONGUE AND GROOVE"
2	DS	3-23-11	REMOVED STANDARD MONITORING MANHOLE
3	KB	6-21-16	ADDED NOTE "REQUIRES ADVANCED APPROVAL BY WRC" AND UPDATE PHONE # IN NOTE #2
4	KB	7-22-20	UPDATED MH STEPS TO ASTM# D-4101

SANITARY SEWER DETAILS AND NOTES

ORIG. DATE:	08/21/02
SCALE:	NO SCALE
DESIGNED BY:	WRC
DRAWN BY:	WRC Mapping

WRC WATER RESOURCES COMMISSIONER
Jim Nash

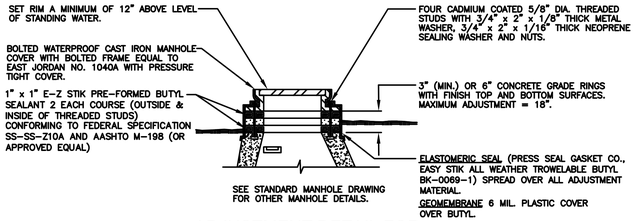
ONE PUBLIC WORKS DRIVE, BLDG 95 WEST
WATERFORD, MICHIGAN
48328-1907

SHEET NO.: 1 of 2

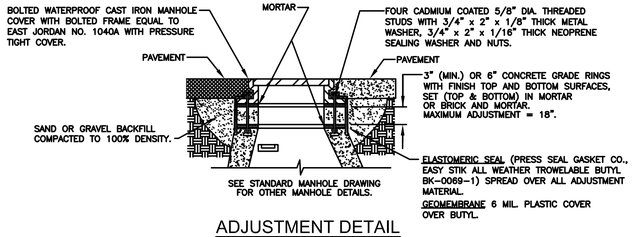
Plotfile Name: d3SDtn.ctb
File Location: J:\Drafti\Mapping\cad\STANDARDS\ETANDARDS\Products\Standard Sheets\dwg\d3SDtn.dwg

MANHOLE RIM ADJUSTMENT CHART

MANHOLE LOCATION	SET RIM ELEVATION
DITCH	12" ABOVE FINISH GRADE
FLOOD PLAIN	12" ABOVE STANDING WATER
GRAVEL ROAD / SHOULDER	6" BELOW FINISH GRADE
PAVEMENT / GREENBELT	FLUSH WITH FINISH GRADE



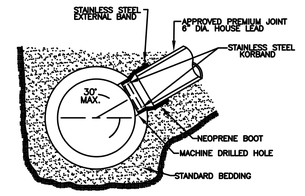
ADJUSTMENT DETAIL FOR
MANHOLE TOPS WITHIN FLOOD PRONE AREAS



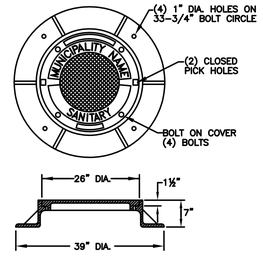
ADJUSTMENT DETAIL
MANHOLE TOPS WITHIN PAVEMENT AREAS

WATER RESOURCES COMMISSIONER
GRAVITY BUILDING LEAD REQUIREMENTS AND DETAILS

1. ALL BUILDING LEAD WORK MUST BE PERFORMED UNDER WATER RESOURCES COMMISSIONER (WRC) AND/OR LOCAL UNIT OF GOVERNMENT INSPECTION.
2. FOR ALL WRC-OPERATED SYSTEMS, CALL 248-858-1110 24-HOURS IN ADVANCE OR WORK TO SCHEDULE INSPECTION.
3. NO SANITARY SEWER MAY BE USED AS A CLEANOUT OF DEWATERING OUTLET.
4. WHERE AN EXISTING BUILDING LEAD IS BEING EXTENDED, DISSIMILAR TYPES AND SIZES OF PIPE SHALL BE JOINED USING AN WRC APPROVED ADAPTER.
5. APPROVED BUILDING LEAD PIPE FOR GRAVITY SEWER LEADS:
   A. ABS PLASTIC, ASTM D2751, SDR 23.5.
   B. PVC PLASTIC, ASTM D3034, SDR 23.5 OR ASTM D2665, SCHEDULE 40.
   C. DUCTILE IRON PIPE, AMERICAN WATER WORKS ASSOCIATION (AWWA) C-104/A21.4, CLASS 54. JOINTS SHALL BE SUPER BEL TITE, TYTON, TY-SEAL, MULTI-TITE, DUAL-TITE, OR VERI-TITE.
   D. ANY DEVIATIONS FROM SPECIFIED ABOVE REQUIRE APPROVAL BY WRC.
6. ALLOWABLE TYPES OF SEWER PIPE ADAPTERS:
   A. FERNCO ADAPTER/REDUCER DONUTS.
   B. FERNCO FLEXIBLE COUPLING.
   C. MISSION CLAY BAND-SEAL COUPLING.
   D. SMITH-BLAIR STAINLESS STEEL REPAIR CLAMP.
   E. HURON-CLINTON O-RING ADAPTER.
   F. HAMILTON-KENT GEAR GRIP ADAPTER.
   G. PLANT FABRICATED JOINT CONVERSION PIPE.

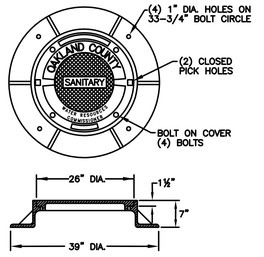


KOR-N-TEE TAP FOR CONCRETE PIPE



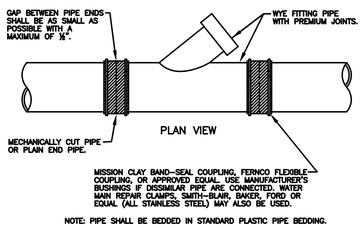
EAST JORDAN IRON WORKS
HEAVY DUTY MATERIAL ASTM A48 CL.35
COVER WT., 150 LBS., CATALOG NO. 1040A
PATTERN NO. 1040A, PRODUCT NO. 1040XX OAKCOSTD.
2" RAISED LETTERS, 1" RAISED LETTERS
ALL RECESSED FLUSH.

LOCAL MUNICIPALITIES MANHOLE COVER

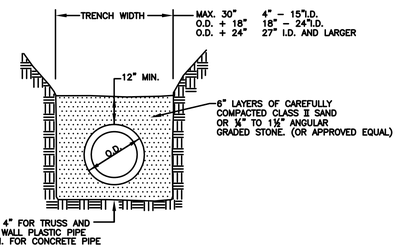


EAST JORDAN IRON WORKS
HEAVY DUTY MATERIAL ASTM A48 CL.35
COVER WT., 150 LBS., CATALOG NO. 1040APT
PATTERN NO. 1040A, PRODUCT NO. NCR09-1280 C
2" RAISED LETTERS, 1" RAISED LETTERS, 3/4" RAISED LETTERS
ALL RECESSED FLUSH.

W.R.C. LETTERED MANHOLE COVER

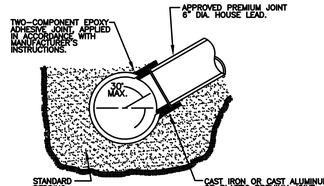


WYE PIPE INSERTION WITH FLEXIBLE COUPLINGS
(RIGID PIPE)



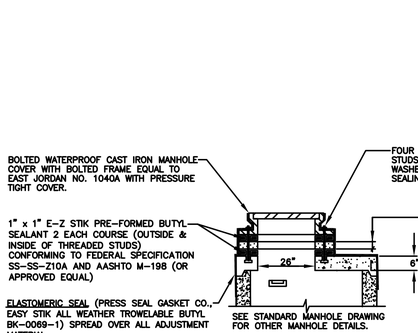
NOTE:
APPROVAL MAY BE GIVEN TO ALTERNATE MATERIALS AND METHODS TO ACHIEVE CLASS B BEDDING.

STANDARD BEDDING
(CLASS B)

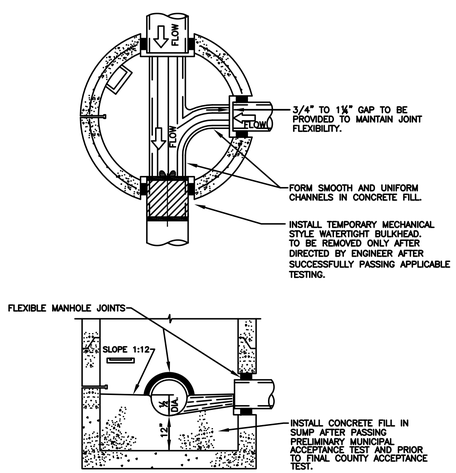


NOTE: SURFACE OF MAIN SEWER SHALL BE CLEANED WITH AN ABRASIVE GRINDER PRIOR TO EPOXY APPLICATION. DUE TO VARIATION OF SET-UP TIME OF EPOXY ADHESIVE WITH TEMPERATURE, ANCHOR STRAPS SHALL BE USED TO SECURE SADDLE IN POSITION IN COLD WEATHER OR WHENEVER WORK IS TO PROCEED PRIOR TO COMPLETE CURE OF EPOXY.

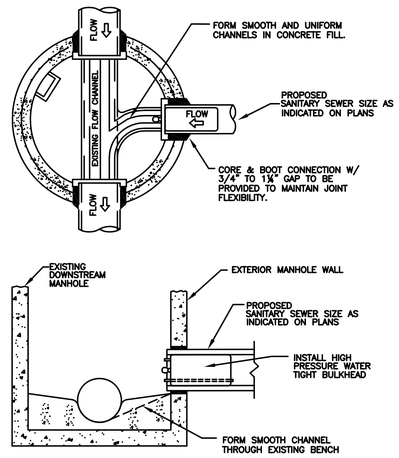
SEWER TAP-ALL SIZES OF MAIN SEWER PIPES
VITRIFIED CLAY



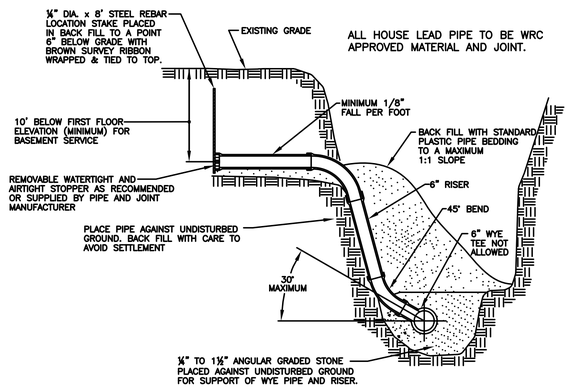
FLAT TOP MANHOLE



SUMP MANHOLE FOR TESTING,
CLEANING AND DEWATERING



TESTING BULKHEAD WITH PIPE TAP



HOUSE LEAD DETAIL

REVISION BLOCK			
Parcel Base / Source Date: N/A			
Rev. No.:	Rev. By:	Rev. Date:	Description:
1	DS	06/28/06	ADDED TESTING BULKHEAD WITH PIPE TAP DETAIL
2	tz	05/28/09	MOVED DETAILS FROM SHEET 1 ONTO SHEET 2
3	tz	07/14/09	STANDARDS COMMITTEE APPROVAL FOR DETAIL CHANGES
4	DS	02/03/14	REPLACE/UPDATE OCDC WITH WRC FOR THE MANHOLE COVER DETAIL

SANITARY SEWER DETAILS AND NOTES

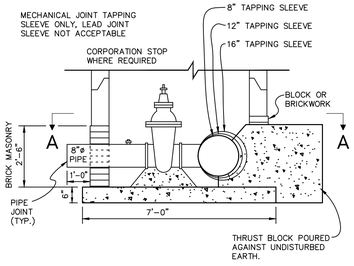
ORIG. DATE:	05-09-03
SCALE:	NO SCALE
DESIGNED BY:	MWD
DRAWN BY:	Mapping Staff

WRC WATER RESOURCES COMMISSIONER
Jim Nash

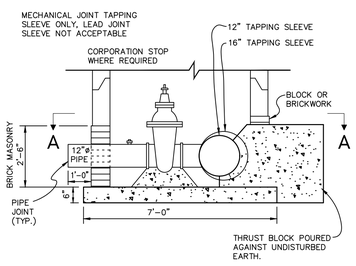
ONE PUBLIC WORKS DRIVE, BLDG 95 WEST
WATERFORD, MICHIGAN
48328-1907

SHEET NO.: 2 of 2

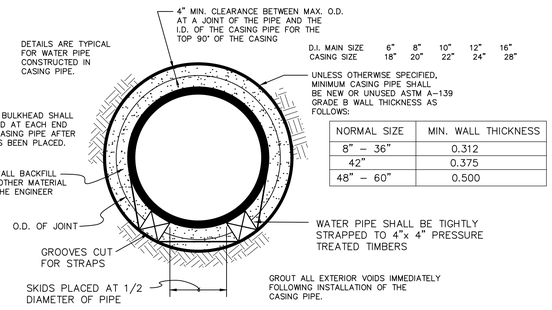
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File Location: J:\Data\Mapping\CAD\STANDARDS\DETAILS\Apr\Public\Sanitary\Sheet\SanDet2.dwg



16" X 8", 12" X 8", 8" X 8"
TAPPING SLEEVE, VALVE & WELL
(B-B)



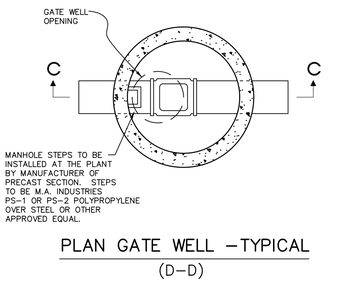
16" X 12", 12" X 12"
TAPPING SLEEVE, VALVE & WELL
(B-B)



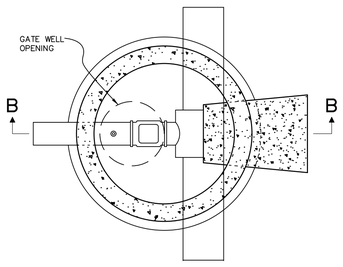
NORMAL SIZE	MIN. WALL THICKNESS
8" – 36"	0.312
42"	0.375
48" – 60"	0.500

Drawing not to scale.

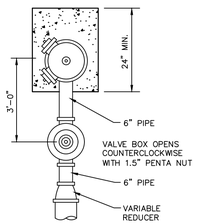
PIPE BARREL SUPPORT FOR WATER MAIN
CONSTRUCTED IN CASING

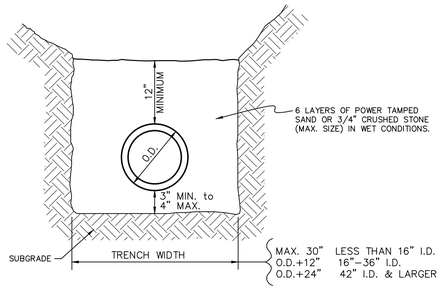


PLAN GATE WELL – TYPICAL
(D-D)

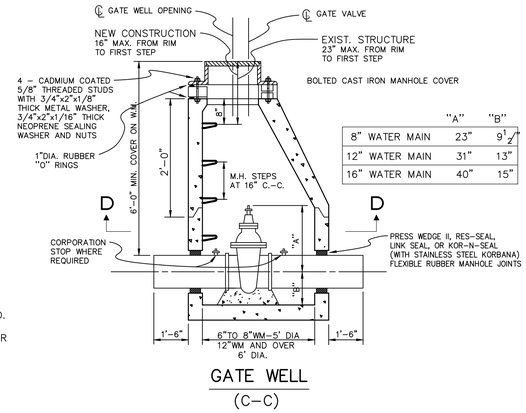


PLAN TAPPING SLEEVE, VALVE & WELL – TYPICAL
(A-A)





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)

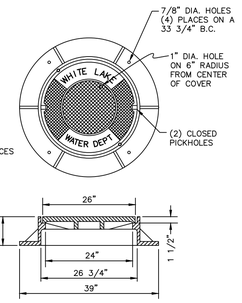
WATER MAIN NOTES

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.

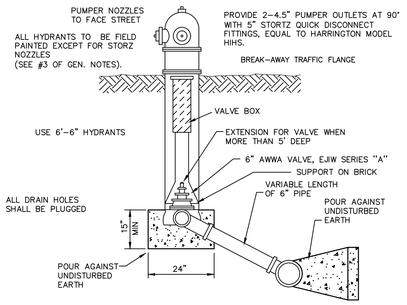
    Plastic water service pipes shall be traced with two #10 copper tracer wires or two #12 copper coated steel or stainless steel wires insulated with a minimum of 30 mils of polyethylene insulation. The tracer wires shall be terminated to supply line so as to be locatable at the building and the curb box without digging.

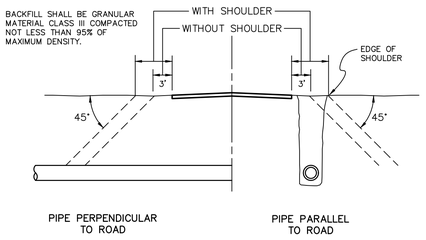
    Water services sizes 3" and greater shall be Class 54 cement lined ductile iron with push on joints or HDPE DR–9 (200 PSI rated) with fusion welded joints and fittings, DIPS (Ductile Iron Pipe Size).

    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.

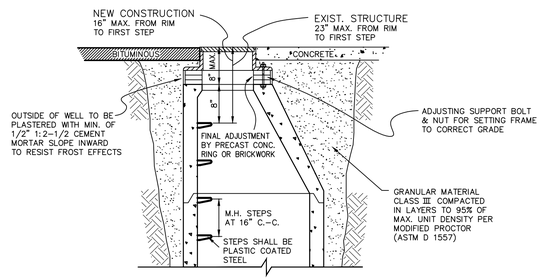


GATE WELL COVER & FRAME

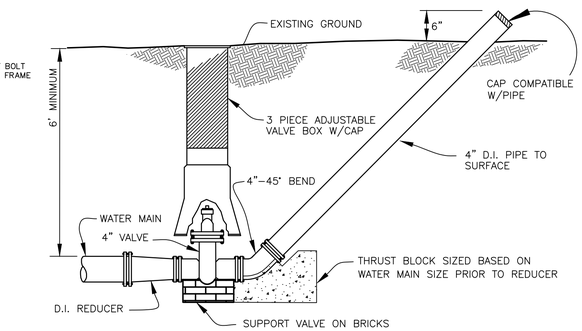




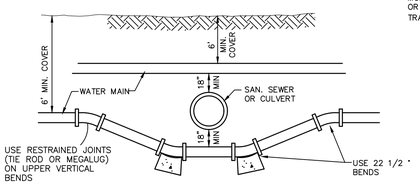
BACKFILL IN THE AREA OF STREETS,
ALLEYS, SIDEWALKS, DRIVES & PARKING AREAS



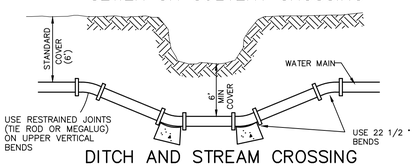
GATE WELL TOPS WITHIN PAVEMENT AREAS



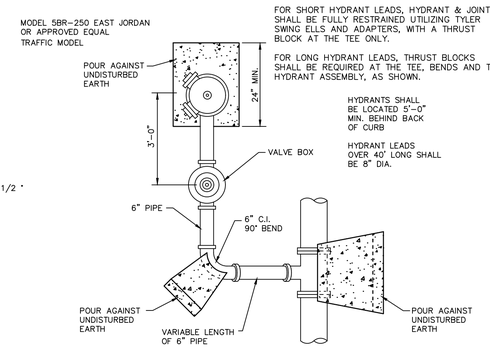
TEMPORARY BLOWOFF ASS'Y



SEWER OR CULVERT CROSSING

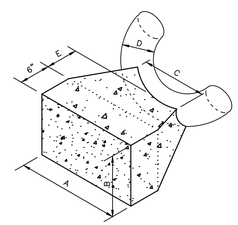


DITCH AND STREAM CROSSING



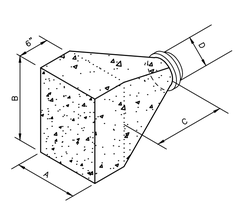
DETAIL OF HYDRANT SETTINGS

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.



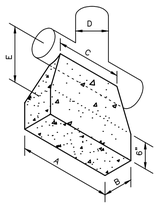
FOR 90° BENDS OR SMALLER

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

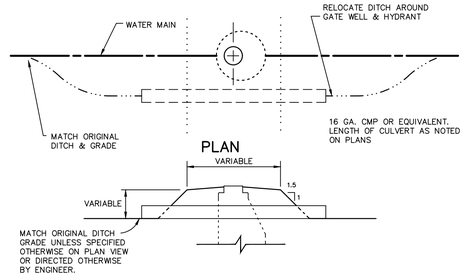
D	A	B	C MIN
20"	7'	5'	2.5'
16"	4.8'	4.8'	2'
12"	4.3'	3'	1.75'
10"	3'	2'	1.5'
8"	2.8'	2.5'	1.5'
6"	1.5'	1.5'	0.25'



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

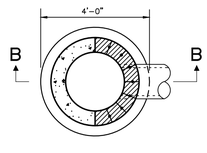
REVISIONS	MARK	ADDENDUM/CHANGE ORDER	DATE	MARK	ADDENDUM/CHANGE ORDER	DATE	MARK	ADDENDUM/CHANGE ORDER	DATE	MARK	ADDENDUM/CHANGE ORDER	DATE
		GENERAL REVISION TO CAD	12/29/95		GW & NUT SIZE	07/23/98		CLARIFY HYD. SPEC	02/07/01		REV. HYD, THRUST, AIR REL.	03/29/04
		ADD NOTE 17	11/04/97		PIPE CIVER & FLANGE 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

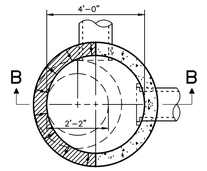
White Lake Township
7525 Highland Road (M-59)
White Lake, Michigan 48383
248-698-3300

WATER MAIN STANDARD DETAILS

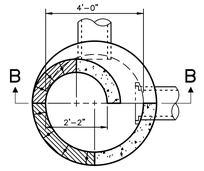
JOB NO.
DATE ISSUED
SHEET NO.



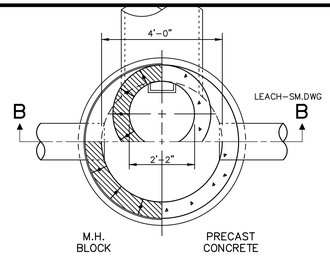
SECTION A–A



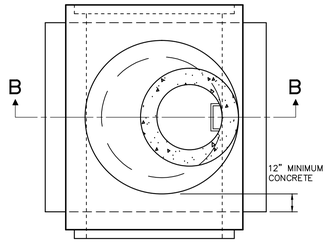
SECTION A–A



SECTION A–A

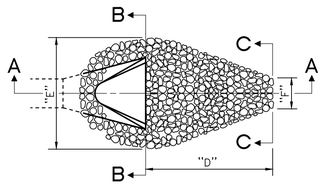


SECTION A–A



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



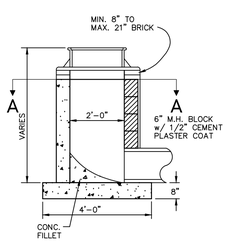
PLAN VIEW

STORM SEWER NOTES

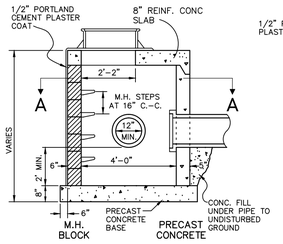
1. PRECAST CONC. RISERS SHALL MEET A.S.T.M. C478
2. DIAMETER OF CONC. BASE: I.D. + 2(WALL) + 8"
3. MANHOLE STEP SPACING SHALL MEET MIOSHA REQUIREMENTS. NO MORE THAN 21" FROM RIM TO FIRST STEP. MAX. 16" O.C. STEPS SHALL BE CAST POLYPROPYLENE REINFORCED WITH A 1/2" STEEL ROD.
4. WALL THICKNESS OF BLOCK STRUCTURES SHALL BE:

DEPTH	THICKNESS
0–8'	6"
8–15'	8"
OVER 15'	12"

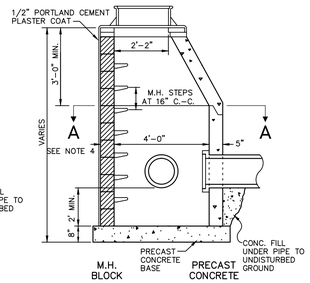
5. MINIMUM I.D. OF STRUCTURE FOR: 36"to 42" = 5'–0"
   48"to 54" = 6'–0"
   LARGER DIAMETER STRUCTURES MAY BE REQUIRED DEPENDING ON PIPING CONFIGURATION.
6. ALL LIFTING HOLES AND VOIDS IN INTERIOR JOINTS SHALL BE FILLED BY MORTAR.
7. THE FINGER DRAIN DETAIL SHALL BE USED AT ALL LOW POINT CATCH BASINS 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



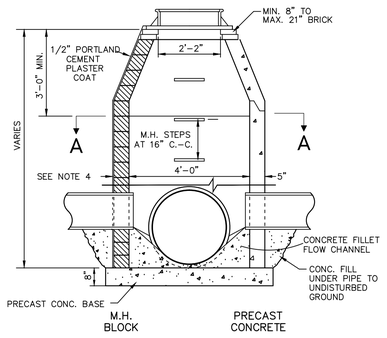
SECTION B–B
24" INLET



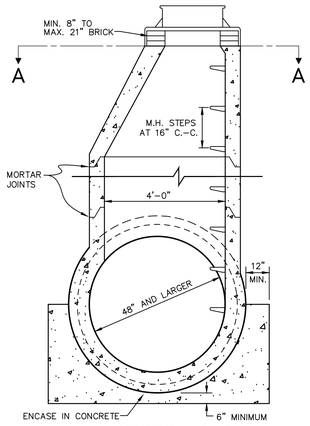
SECTION B–B
STRUCTURE WITH SLAB COVER
(CATCH BASIN SHOWN)



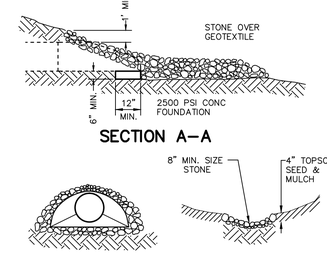
SECTION B–B
STANDARD CATCH BASIN



SECTION B–B
STANDARD STORM MANHOLE

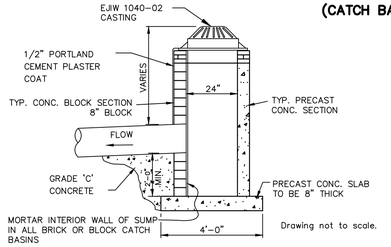


SECTION B–B
STANDARD PRECAST CONCRETE MANHOLE TEE

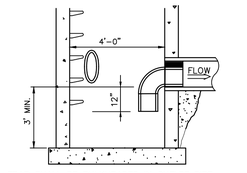


SECTION A–A

SECTION B–B SECTION C–C
PLAIN STONE RIP–RAP



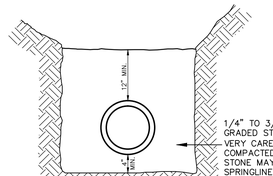
STANDARD REAR YARD CATCH BASIN



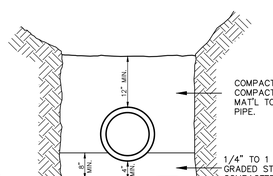
TRAP SHALL BE BULKHEADED IN OUTLET PIPE AND SHALL BE A SCH 40 PVC ASSY WITH A PIPE AREA NO LESS THAN 50% OF THE OUTLET PIPE.

ALTERNATE: USE "THE SNOUT" BASIN TRAP SYSTEM

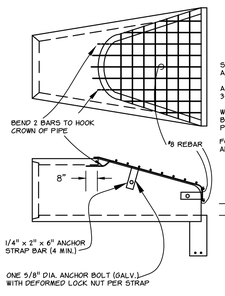
TRAPPED CATCH BASIN



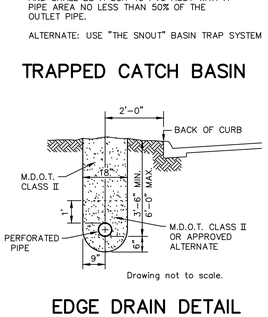
PIPE BEDDING
FOR PLASTIC PIPE



CLASS "B" BEDDING
FOR SEWER PIPE
LESS THAN 48"

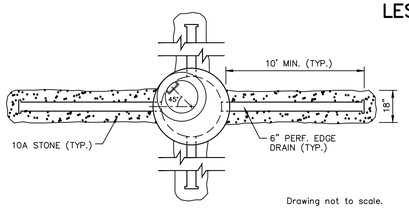


BAR SCREEN DETAIL



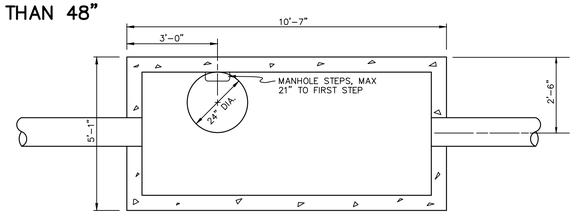
Drawing not to scale.

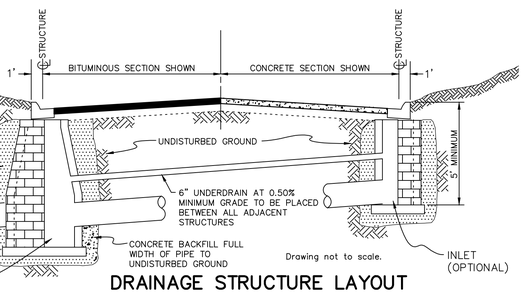
EDGE DRAIN DETAIL



Drawing not to scale.

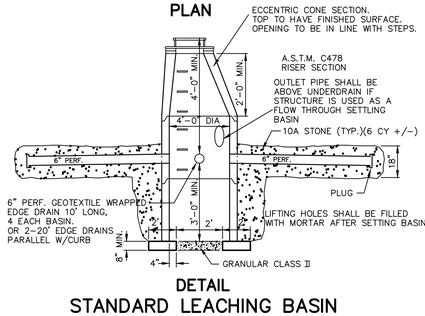
PLAN



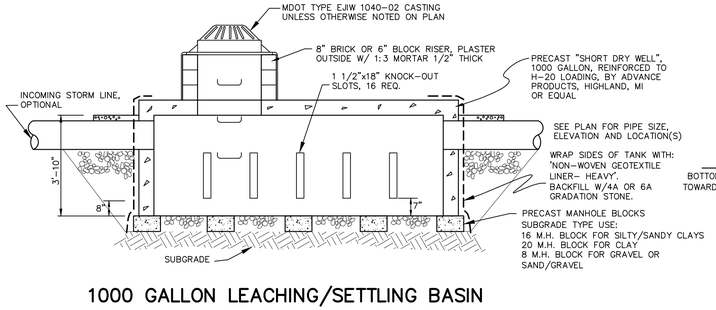


Drawing not to scale.

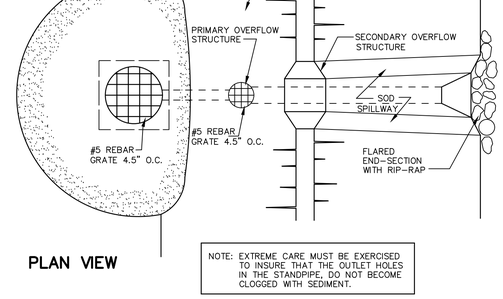
DRAINAGE STRUCTURE LAYOUT



DETAIL
STANDARD LEACHING BASIN

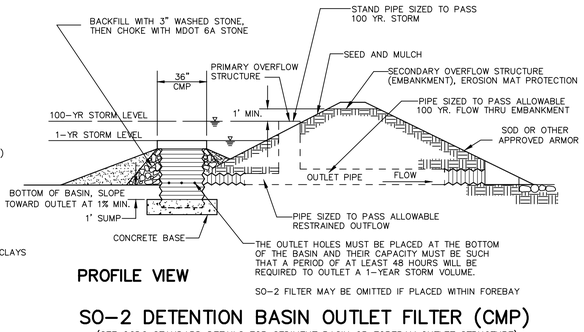


1000 GALLON LEACHING/SETTLING BASIN



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

SO–2 DETENTION BASIN OUTLET FILTER (CMP)

(SEE OCDC STANDARD DETAILS FOR SEDIMENT BASIN OR FOREBAY OUTLET STRUCTURE)

DRAWN: CAD
DESIGN: OA
CHECKED: –

SCALE: VERT. –
HORZ. AS NOTED

REVISIONS

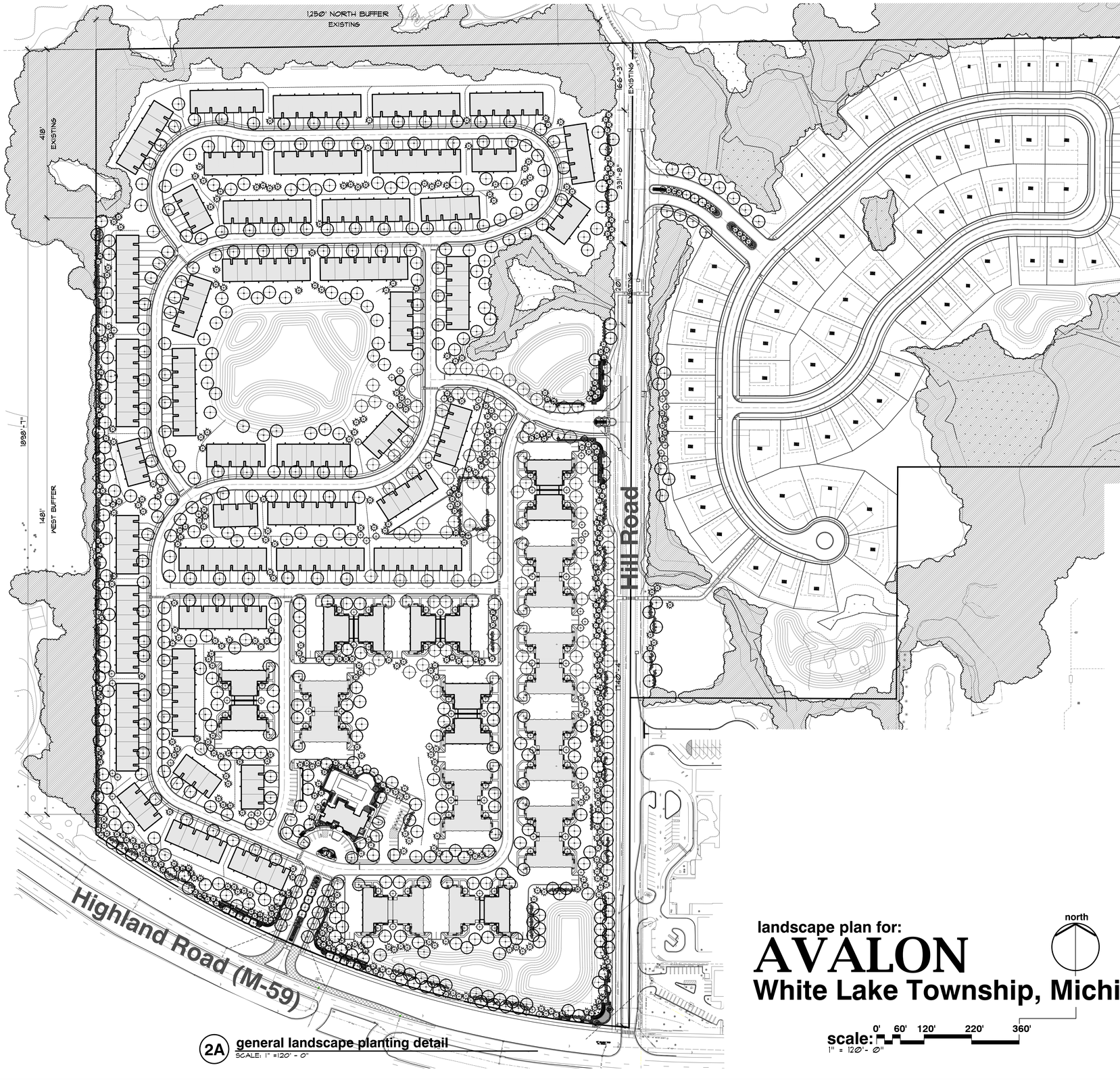
MARK	ADDENDUM/CHANGE ORDER	DATE	MARK	ADDENDUM/CHANGE ORDER	DATE	MARK	ADDENDUM/CHANGE ORDER	DATE
	FIRST ISSUE	08/16/95		REVISE	10–03–02		REVISE	06–01–07
	ADD SO–1	06–17–96		REVISE	12–17–03		UPDATED TITLE BLOCK	04/30/13
	NEW BAR GRATE	11–03–97		SEC REFERENCE	05–17–05			

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.



2A **general landscape planting detail**
SCALE: 1" =120' - 0"

sheet index

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LS-2	LANDSCAPE PLANTING DETAIL (MULTI- FAMILY)
LS-3	LANDSCAPE PLANTING DETAIL (MULTI- FAMILY)
LS-4	LANDSCAPE PLANTING DETAIL (MULTI- FAMILY)
LS-5	LANDSCAPE PLANTING DETAIL (MULTI- FAMILY)
LS-6	LANDSCAPE PLANTING DETAIL (MULTI- FAMILY)
LS-7	LANDSCAPE PLANTING DETAIL (MULTI- FAMILY)
LS-8	ENTRANCE LANDSCAPE PLANTING DETAIL
LS-9	CLUBHOUSE AND BUILDING FOUNDATION LANDSCAPE PLANTING DETAIL
LS-10	LANDSCAPE PLANTING DETAIL (SINGLE FAMILY)
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residential landscape requirements:

greenbelt multi-family (Highland Road M-59)	REQUIRED	PROVIDED
TOTAL LN.FT. OF GREENBELT FRONTAGE 1,380'±		
ONE (1) DECIDUOUS OR EVERGREEN TREE PER 30 LN.FT. (1,380' LN.FT. / 30 LN.FT. = 46 TREES)	46	46
EIGHT (8) SHRUB PER 30 LN.FT. (1,380' LN.FT. / 30 LN.FT. = 46 x 8-SHRUBS = 368 SHRUBS)	368	370+

greenbelt multi-family (Hill Road)	REQUIRED	PROVIDED
TOTAL LN.FT. OF GREENBELT FRONTAGE 2,072'±		
ONE (1) DECIDUOUS OR EVERGREEN TREE PER 30 LN.FT. (2,072' LN.FT. / 30 LN.FT. = 69.06 TREES)	69	69
EIGHT (8) SHRUB PER 30 LN.FT. (2,072 LN.FT. / 30 LN.FT. =69.01 x 8-SHRUBS = 552.5 SHRUBS)	553	553

residential buffer (north property line)	REQUIRED	PROVIDED
TOTAL LN.FT. OF NORTH PROPERTY LINE 1,250'±		
ONE (1) DECIDUOUS OR EVERGREEN TREE PER 15 LN.FT. (1,250 LN.FT. / 15 LN.FT. = 83.33 TREES)	83	EXISTING
FOUR (4) SHRUB PER 15 LN.FT. (1,250 LN.FT. / 15 LN.FT. = 83.33 X 4 = 333.33 SHRUBS)	333	EXISTING

residential buffer (west property line)	REQUIRED	PROVIDED
TOTAL LN.FT. OF WEST PROPERTY LINE 1,481'±		
ONE (1) DECIDUOUS OR EVERGREEN TREE PER 15 LN.FT. (1,481 LN.FT. / 15 LN.FT. = 98.73 TREES)	99	99 + 287 EXISTING
FOUR (4) SHRUB PER 15 LN.FT. (1,481 LN.FT. / 15 LN.FT. =98.73 X 4 SHRUBS = 394.93 SHRUBS)	395	EXISTING

interior landscape (multi-family)		
TOTAL SITE AREA (LESS R.O.W. AREA) 2,896,910 SQ.FT. (66.50 AC.) ±		
INTERNAL ROAD AREA 260,724 SQ.FT. (5.98 AC.) ±		
GREEN BELT AND BUFFER AREA 342,044 SQ.FT. (7.85 AC.) ±		
TOTAL LANDSCAPE SITE AREA 2,294,142 SQ.FT. (52.66 AC.) ±		
INTERIOR LANDSCAPE AREA 344,121 SQ.FT. ± (15% OF 2,294,142 SQ.FT.) = 344,121.3 SQ.FT.+)		
	REQUIRED	PROVIDED
ONE (1) DECIDUOUS, ORNAMENTAL OR EVERGREEN TREE PER 300 SQ.FT. (344,141 SQ.FT. / 300 SQ.FT. = 1,147.13 TREES)	1,147	1027
FIVE (5) SHRUBS PER 300 SQ.FT. (344,141 SQ.FT. / 300 SQ.FT. = 1,147.13 X 5 = 5735.65	5735	4492

greenbelt-single family (Hill Road)	REQUIRED	PROVIDED
TOTAL LN.FT. OF GREENBELT FRONTAGE 1,625'± (1,625' - 1,165 EXISTING WOODS AND VEGETATION = 460')		
ONE (1) DECIDUOUS OR EVERGREEN TREE PER 30 LN.FT. (460' LN.FT. / 30 LN.FT. = 15.33 TREES)	16	20+
EIGHT (8) SHRUB PER 30 LN.FT. (460 LN.FT. / 30 LN.FT. =15.33 x 8-SHRUBS = 122.67 SHRUBS)	123	125+

north

landscape plan for:

AVALON

White Lake Township, Michigan

scale: 0' 60' 120' 220' 360'
1" = 120'- 0"

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Community Land Planner and registered Landscape Architect
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Farmington Hills, MI 48336
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fax. (248) 557-5416

seal:
STATE OF MICHIGAN
FELINO A. PASCUAL
LANDSCAPE ARCHITECT
No. 4133
REGISTERED LANDSCAPE ARCHITECT

client:
WHITE LAKE HILL, LLC
31550 Northwestern Hwy
Farmington Hills, Michigan

project:
AVALON
A PLANNED MIXED USE RESIDENTIAL COMMUNITY

project location:
White Lake Twp. Michigan
Highland Road & Hill Road

sheet title:
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drawn by: **JP, JM, LA**
checked by: **FP**
date: **4-15-2025**

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project no: **LS25.047.04**

sheet no: **LS-1** of 16

LAWN AREAS TO RECEIVE SEEDING ON FINISH GRADES. PROVIDE POSITIVE DRAINAGE. SEE SHT LS-14 FOR DETAILS

LAWN AREAS TO RECEIVE IRRIGATION AND SOD ON FINISH GRADES, PROVIDE POSITIVE DRAINAGE. SEE SHT LS-14 FOR DETAILS

FRONT YARD LAWN AREAS TO RECEIVE IRRIGATION AND SOD ON FINISH GRADES, PROVIDE POSITIVE DRAINAGE. SEE SHT LS-14 FOR DETAILS

PROPOSED UNDERGROUND UTILITIES-SEE ENGINEERING PLAN FOR FINAL LOCATIONS, SIZES, TYPES, ELEVATIONS AND DETAILS

FRONT YARD LAWN AREAS TO RECEIVE IRRIGATION AND SOD ON FINISH GRADES, PROVIDE POSITIVE DRAINAGE. SEE SHT LS-14 FOR DETAILS

ROW AND GREENBELT LAWN AREAS TO RECEIVE IRRIGATION AND SOD ON FINISH GRADES, PROVIDE POSITIVE DRAINAGE. SEE SHT LS-14 FOR DETAILS

ENTRANCE MONUMENT -SEE SHT. LS-11 FOR DETAILS

25' VEHICULAR CLEARVIEW SIGHT LINE

50' GREENBELT BUFFER ZONE

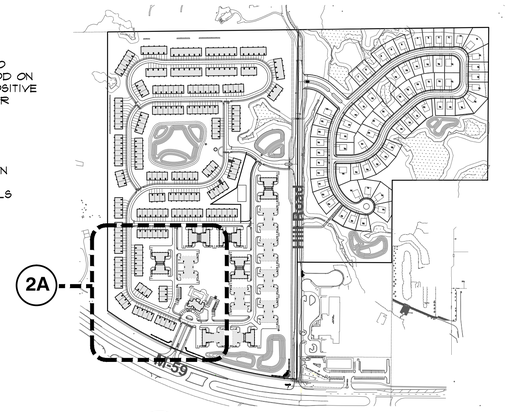
Highland Road (M-59)

mailbox kiosk

Pool

Clubhouse

2A general landscape planting detail
SCALE: 1" =40' -0"



key reference location map
NO SCALE

plant material list

key	quant. 2A	botanical name	common name	size	comments
		DECIDUOUS TREES			
LT	13	LIRIODENDRON TULIPIFERA	TULIPTREE	2 1/2" BB	
GT	9	GLEDITSIA TRI. INERMIS 'SKYCOLE'	SKYLINE LOCUST	2 1/2" BB	
TR	11	TILIA AMERICANA 'REDMOND'	REDMOND LINDEN	2 1/2" BB	
CO	11	CELTIS OCCIDENTALIS	NORTHERN HACKBERRY	2 1/2" BB	
TC	8	TILIA CORDATA 'GREENSPIRE'	GREENSPIRE LINDEN	2 1/2" BB	
AF	9	ACER X. FREEMANII'	AUTUMN BLAZE RED MAPLE	2 1/2" BB	
AR	10	ACER RUBRUM	RED MAPLE	2 1/2" BB	
ARA	12	ACER RUBRUM 'ARMSTRONG'	ARMSTRONG RED MAPLE	2 1/2" BB	
LS	6	LIQUIDAMBAR STYRACIFLUA	AMERICAN SWEETGUM	2 1/2" BB	
QR	2	QUERCUS RUBRA	RED OAK	2 1/2" BB	
PX	2	PLATANUS X ACERFOLIA	LONDON PLANETREE	2 1/2" BB	
AS	10	ACER SACCHARUM	SUGAR MAPLE	2 1/2" BB	
QB	6	QUERCUS 'BICOLOR'	SWAMP WHITE OAK	2 1/2" BB	
ZS	14	ZELKOVA SERATA 'GREENVASE'	GREENVASE ZELKOVA	2 1/2" BB	
CB	8	CARPINUS BETULUS 'FASTIGIATA'	COLUMNAR EUROPEAN HORNBEAM	2 1/2" BB	
MF	8	MALUS FLORIBUNDA	JAPANESE FLOWERING CRABAPPLE	2" BB	
AC	5	AMECHANCIER CANADENSIS	AUTUMN BRILLIANCE SERVICEBERRY	8' BB	
CK	2	CORNUS KOUSA	KOUSA DOGWOOD	2" BB	
MS	14	MALUS SNOWDRIFT	SNOWDRIFT CRABAPPLE	2" BB	
MR	6	MALUS RED VELVET	RED VELVET CRABAPPLE	2" BB	
		EVERGREEN TREES			
AW	23	ABIES CONCOLOR	CONCOLOR WHITE FIR	8' BB	
PP	18	PICEA PUNGENS	COLORADO GREEN SPRUCE	8' BB	
PS	9	PSEUDOTSUGA MENZIESII	DOUGLAS FIR	8' BB	
PD	22	PICEA GLAUCA 'DENSATA'	BLACK HILL SPRUCE	8' BB	
PA	25	PICEA ABIES	NORWAY SPRUCE	8' BB	
PSL	14	PSEUDOTSUGA MENZIESII	DOUGLAS FIR	10' BB	
		SHRUBS			
FI	46	FORSYTHIA INTERMEDIA	BORDER FORSYTHIA	30" CONT.	60" O.C. SPACING
AM	27	ARONIA MELANOCARPA	BLACK CHOKEBERRY	30" CONT.	60" O.C. SPACING
VD	50	VIBURNUM D. 'SYNNESTVEDT'	CHICAGO LUSTRE VIBURNUM	30" CONT.	60" O.C. SPACING
SK	10	SYRINGA PATULA 'MISS KIM'	MISS KIM LILAC	30" CONT.	60" O.C. SPACING

ALL TREES WILL BE PLANTED NO CLOSER THAN FOUR (4') FEET FROM PROPERTY LINES.

WHERE POSSIBLE, TREES TO BE LOCATED OUTSIDE OF PUBLIC UTILITY EASEMENT (SANITARY SEWER, WATER MAIN) AND STORM SEWER. IN NO CASE SHALL TREES BE PLANTED CLOSER THAN 5 FEET FROM THESE UTILITIES"

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fax. (248) 557-5416

seal:

STATE OF MICHIGAN — FELINO A. PASCUAL — LANDSCAPE ARCHITECT — No. 4333 — REGISTERED LANDSCAPE ARCHITECT

client:

WHITE LAKE HILL, LLC
31550 Northwestern Hwy
Farmington Hills, Michigan

project:

AVALON
A PLANNED MIXED USE RESIDENTIAL COMMUNITY

project location:

White Lake Twp. Michigan
Highland Road & Hill Road

sheet title:

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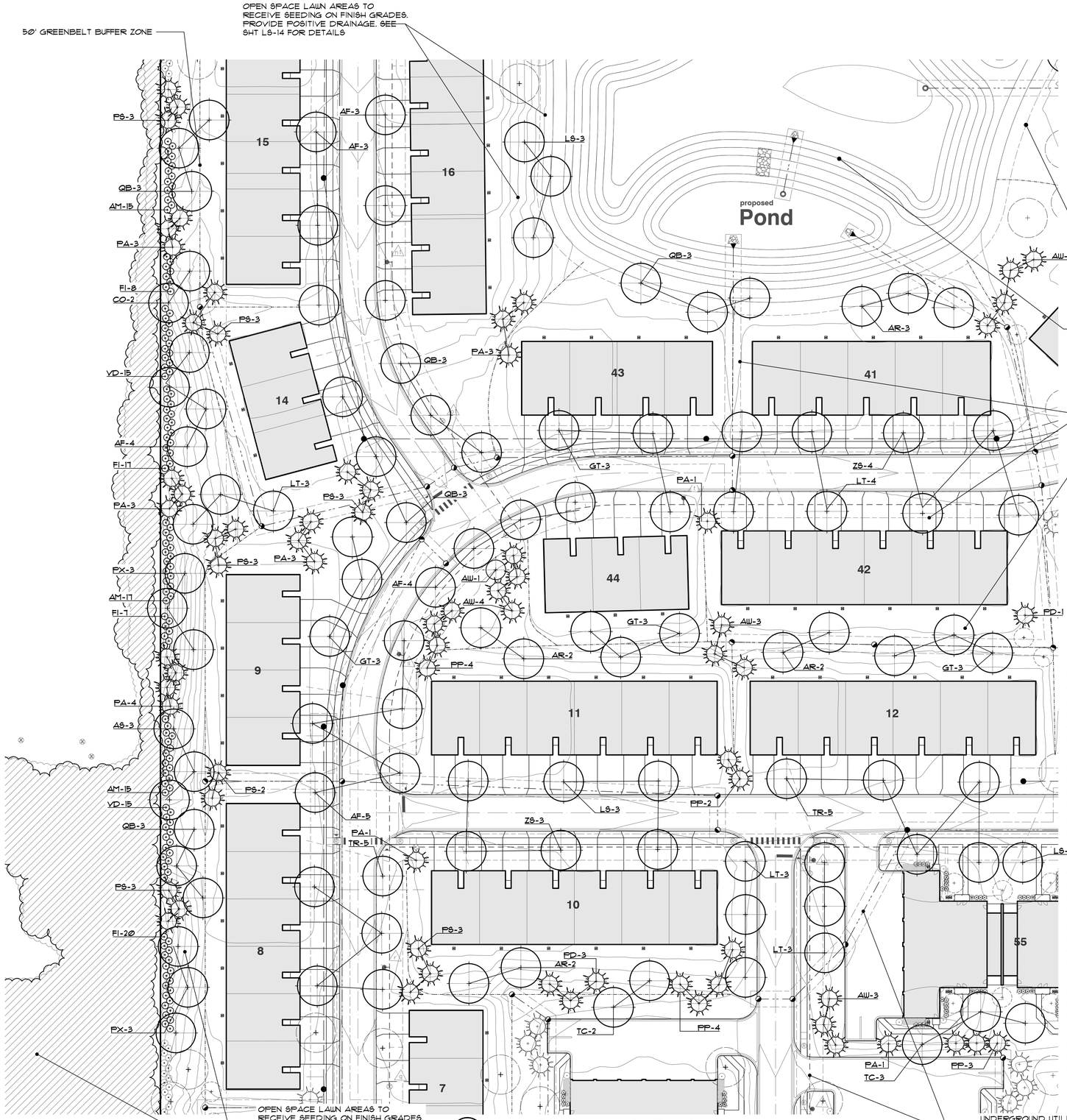
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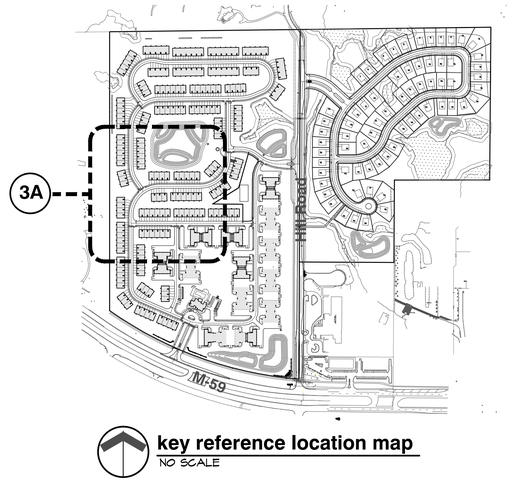
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project no: LS25.047.04

sheet no: LS-2 of 16



3A **general landscape planting detail**
SCALE: 1" =40' - 0"



key reference location map
NO SCALE

plant material list

key	quant. 4A	botanical name	common name	size	comments
		DECIDUOUS TREES			
LT	13	LIRIODENDRON TULIPIFERA	TULIPTREE	2 1/2" BB	
GT	12	GLEDITSIA TRI. INERMIS 'SKYCOLE'	SKYLINE LOCUST	2 1/2" BB	
TR	10	TILIA AMERICANA 'REDMOND'	REDMOND LINDEN	2 1/2" BB	
CO	2	CELTIS OCCIDENTALIS	NORTHERN HACKBERRY	2 1/2" BB	
AF	18	ACER X. 'FREEMANII'	AUTUMN BLAZE RED MAPLE	2 1/2" BB	
AR	9	ACER RUBRUM	RED MAPLE	2 1/2" BB	
TC	10	TILIA CORDATA 'GLENLEVEN'	GLENLEVEN LINDEN	2 1/2" BB	
LS	7	LIQUIDAMBAR STYRACIFLUA	AMERICAN SWEETGUM	2 1/2" BB	
QR	-	QUERCUS RUBRA	RED OAK	2 1/2" BB	
AS	3	ACER SACCHARUM	SUGAR MAPLE	2 1/2" BB	
QB	15	QUERCUS 'BICOLOR'	SWAMP WHITE OAK	2 1/2" BB	
ZS	7	ZELKOVA SERATA 'GREENVASE'	GREENVASE ZELKOVA	2 1/2" BB	
PX	6	PLATINUS X ACERIFOLIA	LONDON PLANETREE	2 1/2" BB	
CC	1	CERCIS CANADENSIS	EASTERN REDBUD	8' BB	
		EVERGREEN TREES			
AW	14	ABIES CONCOLOR	CONCOLOR WHITE FIR	8' BB	
PP	13	PICEA PUNGENS	COLORADO GREEN SPRUCE	8' BB	
PS	20	PSEUDOTSUGA MENZIESII	DOUGLAS FIR	8' BB	
PD	4	PICEA GLAUCA 'DENSATA'	BLACK HILL SPRUCE	8' BB	
PA	18	PICEA ABIES	NORWAY SPRUCE	8' BB	
		SHRUBS			
FI	52	FORSYTHIA INTERMEDIA	BORDER FORSYTHIA	30" CONT.	60" O.C. SPACING
AM	47	ARONIA MELANOCARPA	BLACK CHOKEBERRY	30" CONT.	60" O.C. SPACING
VD	30	VIBURNUM D. 'SYNNESTVEDT'	CHICAGO LUSTRE VIBURNUM	30" CONT.	60" O.C. SPACING

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drawn by: **JP, JM, LA**
checked by: **FP**
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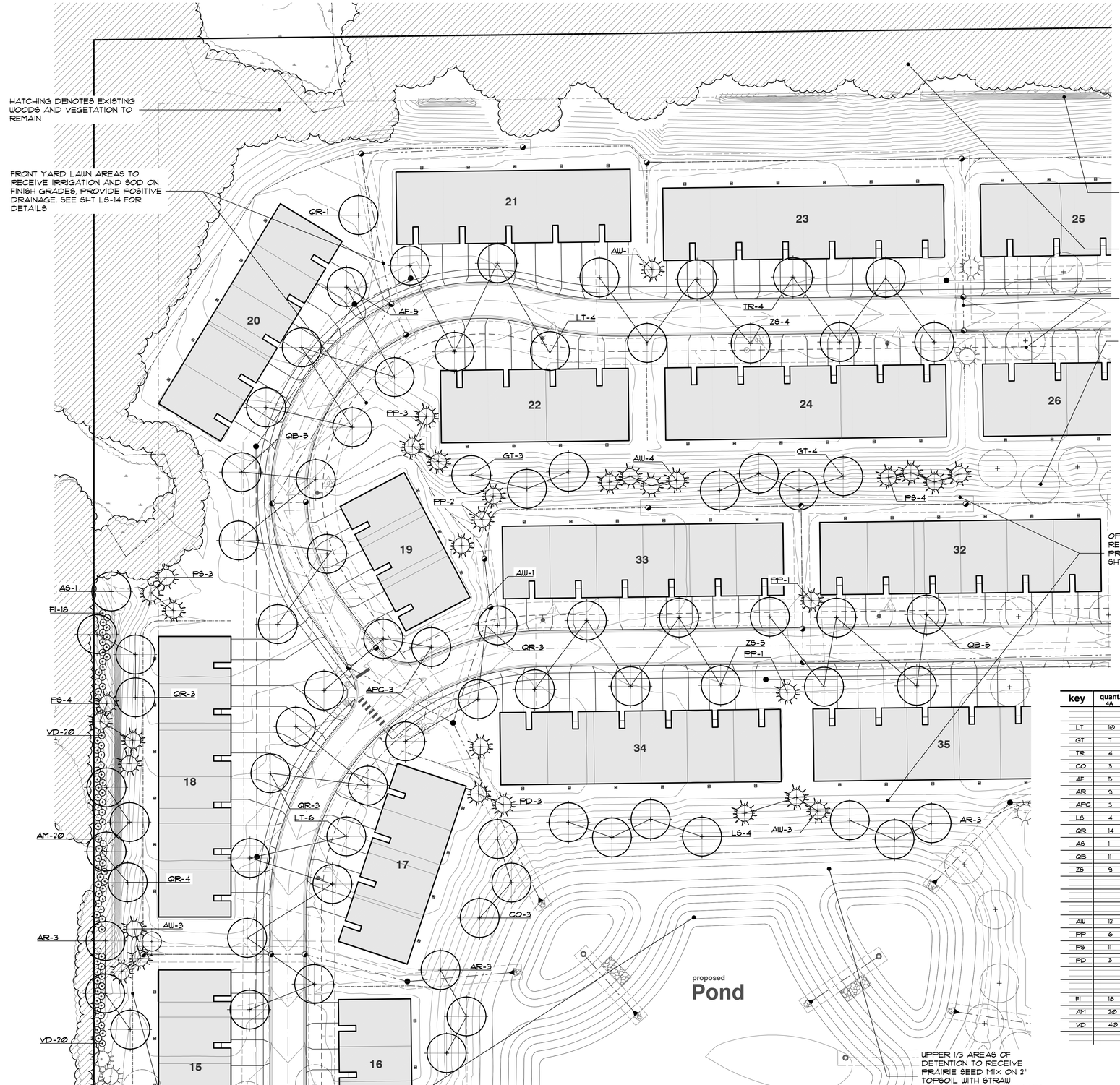
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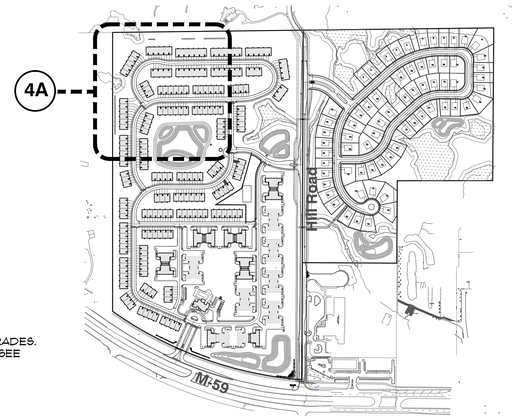
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project no: **LS25.047.04**

sheet no: **LS-3** of 16



4A **general landscape planting detail**
SCALE: 1" =40' - 0"



key reference location map
NO SCALE

plant material list

key	quant. 4A	botanical name	common name	size	comments
		DECIDUOUS TREES			
LT	10	LIRIODENDRON TULIPIFERA	TULIPTREE	2 1/2" BB	
GT	7	GLEDITSIA TRI. INERMIS 'SKYCOLE'	SKYLINE LOCUST	2 1/2" BB	
TR	4	TILIA AMERICANA 'REDMOND'	REDMOND LINDEN	2 1/2" BB	
CO	3	CELTIS OCCIDENTALIS	NORTHERN HACKBERRY	2 1/2" BB	
AF	5	ACER X. FREEMANII'	AUTUMN BLAZE RED MAPLE	2 1/2" BB	
AR	9	ACER RUBRUM	RED MAPLE	2 1/2" BB	
APC	3	ACER PLATANOIDES 'CRIMSON KING'	CRIMSON KING NORWAY MAPLE	2 1/2" BB	
LS	4	LIQUIDAMBAR STYRACIFLUA	AMERICAN SWEETGUM	2 1/2" BB	
QR	14	QUERCUS RUBRA	RED OAK	2 1/2" BB	
AS	1	ACER SACCHARUM	SUGAR MAPLE	2 1/2" BB	
QB	11	QUERCUS 'BICOLOR'	SWAMP WHITE OAK	2 1/2" BB	
ZS	9	ZELKOVA SERATA 'GREENVASE'	GREENVASE ZELKOVA	2 1/2" BB	
		EVERGREEN TREES			
AW	12	ABIES CONCOLOR	CONCOLOR WHITE FIR	8' BB	
PP	6	PICEA PUNGENS	COLORADO GREEN SPRUCE	8' BB	
PS	11	PSEUDOTSUGA MENZIESII	DOUGLAS FIR	8' BB	
PD	3	PICEA GLAUCA 'DENSATA'	BLACK HILL SPRUCE	8' BB	
		SHRUBS			
FI	18	FORSYTHIA INTERMEDIA	BORDER FORSYTHIA	30" CONT.	60" O.C. SPACING
AM	20	ARONIA MELANOCARPA	BLACK CHOKEBERRY	30" CONT.	60" O.C. SPACING
VD	40	VIBURNUM D. 'SYNNESTVEDT'	CHICAGO LUSTRE VIBURNUM	30" CONT.	60" O.C. SPACING

ALL TREES WILL BE PLANTED NO CLOSER THAN FOUR (4) FEET FROM PROPERTY LINES.

WHERE POSSIBLE, TREES TO BE LOCATED OUTSIDE OF PUBLIC UTILITY EASEMENTS (SANITARY SEWER, WATER MAIN AND STORM SEWER). IN NO CASE SHALL TREES BE PLANTED CLOSER THAN 5 FEET FROM THESE UTILITIES.

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seal:
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FELINO A. PASCUAL
LANDSCAPE ARCHITECT
No. 4833
REGISTERED LANDSCAPE ARCHITECT

client:

WHITE LAKE HILL, LLC
31550 Northwestern Hwy
Farmington Hills, Michigan

project:

AVALON
A PLANNED MIXED USE RESIDENTIAL COMMUNITY

project location:

White Lake Twp. Michigan
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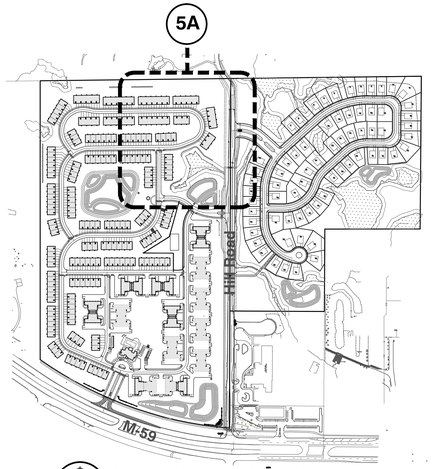
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project no: **LS25.047.04**

sheet no: **LS-4 of 16**



key reference location map
NO SCALE

RETAINING WALL. SEE ENGINEERING PLAN FOR DETAILS

FRONT YARD LAWN AREAS TO RECEIVE IRRIGATION AND SOD ON FINISH GRADES, PROVIDE POSITIVE DRAINAGE. SEE SHT LS-14 FOR DETAILS

OPEN SPACE LAWN AREAS TO RECEIVE SEEDING ON FINISH GRADES. PROVIDE POSITIVE DRAINAGE. SEE SHT LS-14 FOR DETAILS

ADJACENT LANDSCAPE PLANTINGS. SEE SHT. LS-4 FOR DETAILS

UNDERGROUND UTILITIES-SEE ENGINEERING PLAN FOR FINAL LOCATIONS, SIZES, TYPES, ELEVATIONS AND DETAILS

HATCHING DENOTES EXISTING WOODS AND VEGETATION TO REMAIN

50' GREENBELT BUFFER ZONE

R.O.W. AND GREENBELT LAWN AREAS TO RECEIVE IRRIGATION AND SOD ON FINISH GRADES, PROVIDE POSITIVE DRAINAGE. SEE SHT LS-14 FOR DETAILS

RETAINING WALL. SEE ENGINEERING PLAN FOR DETAILS

HATCHING DENOTES EXISTING WOODS AND VEGETATION TO REMAIN

AREAS TO RECEIVE DETENTION POND SEED MIX ON 4" TOP SOIL WITH STRAW BLANKET ON FINISH GRADES. SEE SHT LS-14 FOR DETAILS

UPPER 1/3 AREAS OF DETENTION TO RECEIVE FRAIRIE SEED MIX ON 2" TOPSOIL WITH STRAW BLANKET ON FINISH GRADES. SEE SHT LS-14 FOR DETAILS

proposed Pond

Hill Road

Meadow Lark Lane

Meadow Lark Lane

ALL TREES WILL BE PLANTED NO CLOSER THAN FOUR (4') FEET FROM PROPERTY LINES.

WHERE POSSIBLE, TREES TO BE LOCATED OUTSIDE OF PUBLIC UTILITY EASEMENT (SANITARY SEWER, WATER MAIN AND STORM SEWER). IN NO CASE SHALL TREES BE PLANTED CLOSER THAN 5 FEET FROM THESE UTILITIES"

plant material list

key	quant. 5A	botanical name	common name	size	comments
		DECIDUOUS TREES			
GT	6	GLEDITSIA TRI. INERMIS 'SKYCOLE'	SKYLINE LOCUST	2 1/2" BB	
TR	7	TILIA AMERICANA 'REDMOND'	REDMOND LINDEN	2 1/2" BB	
CO	2	CELTIS OCCIDENTALIS	NORTHERN HACKBERRY	2 1/2" BB	
AF	8	ACER X. 'FREEMANII'	AUTUMN BLAZE RED MAPLE	2 1/2" BB	
AR	10	ACER RUBRUM	RED MAPLE	2 1/2" BB	
LS	3	LIQUIDAMBAR STYRACIFLUA	AMERICAN SWEETGUM	2 1/2" BB	
QR	5	QUERCUS RUBRA	NORTHERN RED OAK	2 1/2" BB	
QB	15	QUERCUS 'BICOLOR'	SWAMP WHITE OAK	2 1/2" BB	
ZS	8	ZELKOVA SERATA 'GREENVASE'	GREENVASE ZELKOVA	2 1/2" BB	
APC	2	ACER PLATANOIDES 'CRIMSON KING'	CRIMSON KING NORWAY MAPLE	2 1/2" BB	
OV	7	OSTRYA VIRGINIANA	AMERICAN HOPHORNBEAM	2 1/2" BB	
AS	3	ACER SACCHARUM	SUGAR MAPLE	2 1/2" BB	
MF	2	MALUS FLORIBUNDA	JAPANESE FLOWERING CRABAPPLE	2" BB	
		EVERGREEN TREES			
AW	16	ABIES CONCOLOR	CONCOLOR WHITE FIR	8' BB	
PP	13	PICEA PUNGENS	COLORADO GREEN SPRUCE	8' BB	
PD	17	PICEA GLAUCA 'DENSATA'	BLACK HILL SPRUCE	8' BB	
		SHRUBS			
FI	13	FORSYTHIA INTERMEDIA	BORDER FORSYTHIA	30" CONT.	60" O.C. SPACING
VD	28	VIBURNUM D. 'SYNNESTVEDT'	CHICAGO LUSTRE VIBURNUM	30" CONT.	60" O.C. SPACING

5A general landscape planting detail
SCALE: 1" =40' - 0"

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fax. (248) 557-5416

seal:
STATE OF MICHIGAN
FELINO A. PASCUAL
LANDSCAPE ARCHITECT
No. 4333
REGISTERED LANDSCAPE ARCHITECT

client:

WHITE LAKE HILL, LLC
31550 Northwestern Hwy
Farmington Hills, Michigan

project:

AVALON
A PLANNED MIXED USE RESIDENTIAL COMMUNITY

project location:

White Lake Twp. Michigan
Highland Road & Hill Road

sheet title:

GENERAL LANDSCAPE PLANTING DETAIL

job no./issue/revision date:

LP22.056.07	REVIEW	7-27-2022
LP22.056.08	REVIEW	8-18-2022
LP22.056.08	TWP. REV.	8-25-2022
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LS25.047.09	TWP COMMENTS, SITE PLAN UPDATES	9-23-2025

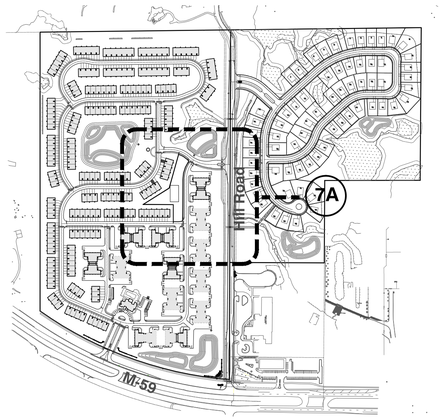
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checked by: **FP**
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For free location of public utility lines

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project no:
LS25.047.04

sheet no:
LS-5 of 16



key reference location map
NO SCALE

plant material list

key	quant. 4A	botanical name	common name	size	comments
		DECIDUOUS TREES			
LT	6	LIRIODENDRON TULIPIFERA	TULIPTREE	2 1/2" BB	
GT	11	GLEDITSIA TRI. INERMIS 'SKYCOLE'	SKYLINE LOCUST	2 1/2" BB	
TC	13	TILIA CORDATA 'GREENSPIRE'	GREENSPIRE LINDEN	2 1/2" BB	
TR	9	TILIA AMERICANA 'REDMOND'	REDMOND LINDEN	2 1/2" BB	
CO	6	CELTIS OCCIDENTALIS	NORTHERN HACKBERRY	2 1/2" BB	
AF	14	ACER X. 'FREEMANII'	AUTUMN BLAZE RED MAPLE	2 1/2" BB	
AR	10	ACER RUBRUM	RED MAPLE	2 1/2" BB	
APC	2	ACER PLATANOIDES 'CRIMSON KING'	CRIMSON KING NORWAY MAPLE	2 1/2" BB	
LS	6	LIQUIDAMBAR STYRACIFLUA	AMERICAN SWEETGUM	2 1/2" BB	
QR	4	QUERCUS RUBRA	NORTHERN RED OAK	2 1/2" BB	
QB	18	QUERCUS 'BICOLOR'	SWAMP WHITE OAK	2 1/2" BB	
PX	7	PLATANUS X ACERIFOLIA	LONDON PLANE TREE	2 1/2" BB	
ZS	7	ZELKOVA SERATA 'GREENVASE'	GREENVASE ZELKOVA	2 1/2" BB	
AS	9	ACER SACCHARUM	SUGAR MAPLE	2 1/2" BB	
LTF	1	LIRIODENDRON TULIPIFERA 'FASTIGATIA'	COLUMNAR TULIPTREE	2 1/2" BB	
MS	12	MALUS 'SNOWDRIFT'	SNOWDRIFT CRAB	2" BB	
MF	9	MALUS FLORIBUNDA	JAPANESE FLOWERING CRABAPPLE	2" BB	
CC	11	CERCIS CANADENSIS	EASTERN REDBUD	8' BB	MULTI-STEM
AC	4	AMELANCHIER X.G. 'AUTUMN BRILLIANCE'	AUTUMN BRILLIANCE SERVICEBERRY	8' BB	MULTI-STEM
		EVERGREEN TREES			
AW	19	ABIES CONCOLOR	CONCOLOR WHITE FIR	8' BB	
PP	22	PICEA PUNGENS	COLORADO GREEN SPRUCE	8' BB	
PS	9	PSEUDOTSUGA MENZIESII	DOUGLAS FIR	8' BB	
PSL	9	PSEUDOTSUGA MENZIESII	DOUGLAS FIR	10' BB	
PA	22	PICEA ABIES	NORWAY SPRUCE	8' BB	
PD	14	PICEA GLAUCA 'DENSATA'	BLACK HILL SPRUCE	8' BB	
		SHRUBS			
FI	57	FORSYTHIA INTERMEDIA	BORDER FORSYTHIA	30" CONT.	60" O.C. SPACING
AM	20	ARONIA MELANOCARPA	BLACK CHOKEBERRY	30" CONT.	60" O.C. SPACING
VD	30	VIBURNUM D. 'SYNNESTVEDT'	CHICAGO LUSTRE VIBURNUM	30" CONT.	60" O.C. SPACING
VMK	15	VIBURNUM D. 'X BURKWOOD!! MOHAWK	MOHAWK VIBURNUM	30" CONT.	60" O.C. SPACING
SK	25	SYRINGA PATULA 'MISS KIM'	MISS KIM LILAC	30" CONT.	60" O.C. SPACING

OPEN SPACE LAWN AREAS TO RECEIVE SEEDING ON FINISH GRADES. PROVIDE POSITIVE DRAINAGE. SEE SHT LS-14 FOR DETAILS

ADJACENT BLDG. FOUNDATION PLANTINGS. SEE SHT. LS-9 FOR DETAILS

FRONT AND SIDE YARD LAWN AREAS TO RECEIVE IRRIGATION AND SOD ON FINISH GRADES. PROVIDE POSITIVE DRAINAGE. SEE SHT LS-14 FOR DETAILS

OPEN SPACE LAWN AREAS TO RECEIVE SEEDING ON FINISH GRADES. PROVIDE POSITIVE DRAINAGE. SEE SHT LS-14 FOR DETAILS

OPEN SPACE LAWN AREAS TO RECEIVE SEEDING ON FINISH GRADES. PROVIDE POSITIVE DRAINAGE. SEE SHT LS-14 FOR DETAILS

proposed **Pond**

proposed **Dog Run**

PROPOSED DECORATIVE ENTRY MONUMENT. SEE SHT. LS-12 FOR DETAILS

LAWN AREAS TO RECEIVE IRRIGATION AND SOD ON FINISH GRADES. PROVIDE POSITIVE DRAINAGE. SEE SHT LS-14 FOR DETAILS

50' GREENBELT BUFFER ZONE

FRONT AND SIDE YARD LAWN AREAS TO RECEIVE IRRIGATION AND SOD ON FINISH GRADES. PROVIDE POSITIVE DRAINAGE. SEE SHT LS-14 FOR DETAILS

R.O.W. AND GREENBELT LAWN AREAS TO RECEIVE IRRIGATION AND SOD ON FINISH GRADES. PROVIDE POSITIVE DRAINAGE. SEE SHT LS-14 FOR DETAILS

ADJACENT BLDG. FOUNDATION PLANTINGS. SEE SHT. LS-9 FOR DETAILS

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Hill Road

6A general landscape planting detail
SCALE: 1" =40' - 0"

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seal:
STATE OF MICHIGAN — FELINO A. PASCUAL — LANDSCAPE ARCHITECT — No. 4333 — REGISTERED LANDSCAPE ARCHITECT

client:
WHITE LAKE HILL, LLC
31550 Northwestern Hwy
Farmington Hills, Michigan

project:
AVALON
A PLANNED MIXED USE RESIDENTIAL COMMUNITY

project location:
White Lake Twp. Michigan
Highland Road & Hill Road

sheet title:
GENERAL LANDSCAPE PLANTING DETAIL

job no./issue/revision date:

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LS25.047.09	TWP COMMENTS SITE PLAN UPDATES	9-23-2025

drawn by: **JP, JM, LA**
checked by: **FP**
date: **4-15-2025**
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project no: **LS25.047.04**

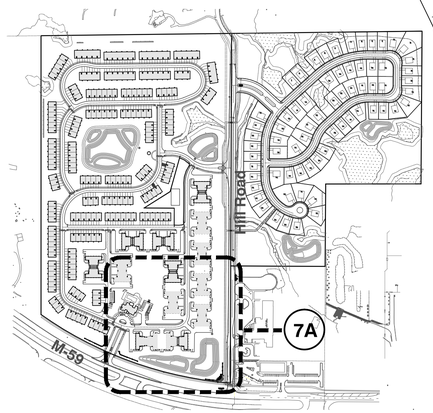
sheet no: **LS-6 of 16**

OPEN SPACE LAWN AREAS TO RECEIVE SEEDING ON FINISH GRADES. PROVIDE POSITIVE DRAINAGE. SEE SHT LS-14 FOR DETAILS

PROPOSED UNDERGROUND UTILITIES-SEE ENGINEERING PLAN FOR FINAL LOCATIONS, SIZES, TYPES, ELEVATIONS AND DETAILS

SEE SHT. LS-9 FOR ADJACENT CLUBHOUSE FOUNDATION LANDSCAPE PLANTING DETAILS.

MAIL BOX KIOSH LOCATION



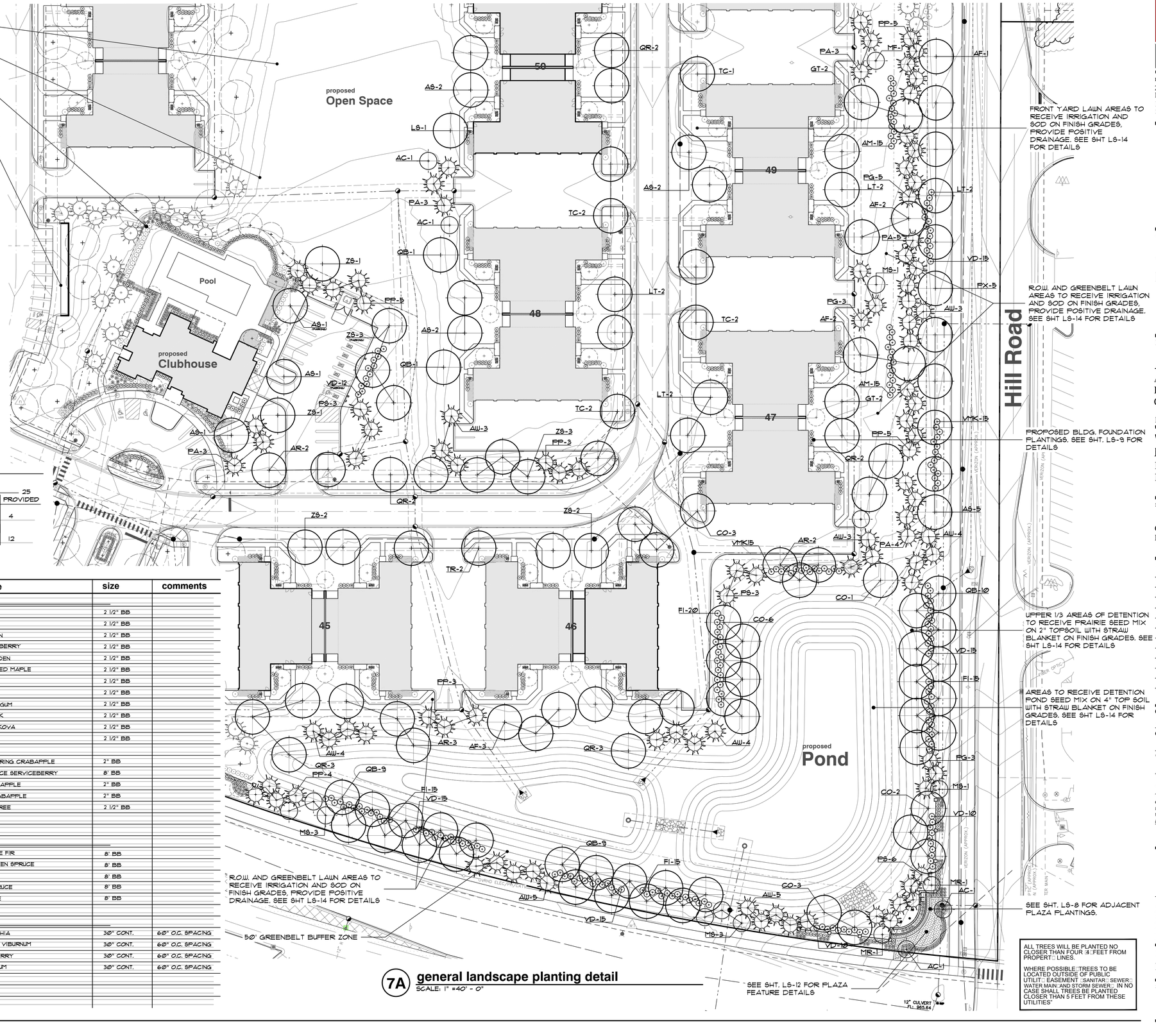
key reference location map
NO SCALE

parking lot landscape plantings (clubhouse)

	REQUIRED	PROVIDED
PARKING LOT LANDSCAPE AREA (15 SQ.FT. PER SPACES (27 SPACES X 15 SQ.FT = 405 SQ.FT.)		25
ONE (1) DECIDUOUS, ORNAMENTAL OR EVERGREEN TREE PER 100 SQ.FT. (405 SQ.FT. / 100 SQ.FT. = 4.05 TREES)	4	4
THREE (3) SHRUBS PER 100 SQ.FT. (SEE SHT LS-9) (405 SQ.FT. / 100 SQ.FT. = 4.05 X 3 = 12.15 SHRUBS)	12	12

plant material list

key	quant. 7A	botanical name	common name	size	comments
		DECIDUOUS TREES			
LT	6	LIRIODENDRON TULIPIFERA	TULIPTREE	2 1/2" BB	
GT	4	GLEDITSIA TRI. INERMIS 'SKYCOLE'	SKYLINE LOCUST	2 1/2" BB	
TR	2	TILIA AMERICANA 'REDMOND'	REDMOND LINDEN	2 1/2" BB	
CO	12	CELTIS OCCIDENTALIS	NORTHERN HACKBERRY	2 1/2" BB	
TC	7	TILIA CORDATA 'GREENSPIRE'	GREENSPIRE LINDEN	2 1/2" BB	
AF	8	ACER X. FREEMANII'	AUTUMN BLAZE RED MAPLE	2 1/2" BB	
AR	8	ACER RUBRUM	RED MAPLE	2 1/2" BB	
AS	14	ACER SACCHARUM	SUGAR MAPLE	2 1/2" BB	
LS	1	LIQUIDAMBAR STYRACIFLUA	AMERICAN SWEETGUM	2 1/2" BB	
QB	30	QUERCUS 'BICOLOR'	SWAMP WHITE OAK	2 1/2" BB	
ZS	12	ZELKOVA SERATA 'GREENVASE'	GREENVASE ZELKOVA	2 1/2" BB	
QR	11	QUERCUS RUBRA	RED OAK	2 1/2" BB	
MF	1	MALUS FLORIBUNDA	JAPANESE FLOWERING CRABAPPLE	2" BB	
AC	4	AMECHANCIER CANADENSIS	AUTUMN BRILLIANCE SERVICEBERRY	8' BB	
MS	8	MALUS SNOWDRIFT	SNOWDRIFT CRABAPPLE	2" BB	
MR	2	MALUS RED VELVET	RED VELVET CRABAPPLE	2" BB	
PX	5	PLATINUS X ACERIFOLIA	LONDON PLANETREE	2 1/2" BB	
		EVERGREEN TREES			
AW	31	ABIES CONCOLOR	CONCOLOR WHITE FIR	8' BB	
PP	25	PICEA PUNGENS	COLORADO GREEN SPRUCE	8' BB	
PS	12	PSEUDOTSUGA MENZIESII	DOUGLAS FIR	8' BB	
PG	11	PICEA GLAUCA 'DENSATA'	BLACK HILL SPRUCE	8' BB	
PA	18	PICEA ABIES	NORWAY SPRUCE	8' BB	
		SHRUBS			
FI	65	FORSYTHIA INTERMEDIA	BORDER FORSYTHIA	30" CONT.	60" O.C. SPACING
VD	80	VIBURNUM D. 'SYNNESTVEDT'	CHICAGO LUSTRE VIBURNUM	30" CONT.	60" O.C. SPACING
AM	30	ARONIA MELANOCARPA	BLACK CHOKEBERRY	30" CONT.	60" O.C. SPACING
VMK	30	VIBURNUM D. 'X BURKWOODII' MOHAWK	MOHAWK VIBURNUM	30" CONT.	60" O.C. SPACING



7A general landscape planting detail
SCALE: 1" =40' - 0"

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Community Land Planner and registered Landscape Architect
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client:
WHITE LAKE HILL, LLC
1550 Northwestern Hwy
armington Hills, Michigan

project:
AVALON
A PLANNED MIXED USE RESIDENTIAL COMMUNITY

project location:
White Lake Twp.
Michigan
Highland Road & Hill Road

sheet title:
GENERAL LANDSCAPE PLANTING DETAIL

job no./issue/revision date:

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drawn by:
JP, JM, LA
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FP
date:
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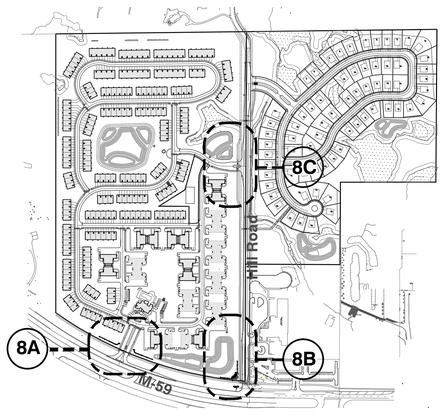
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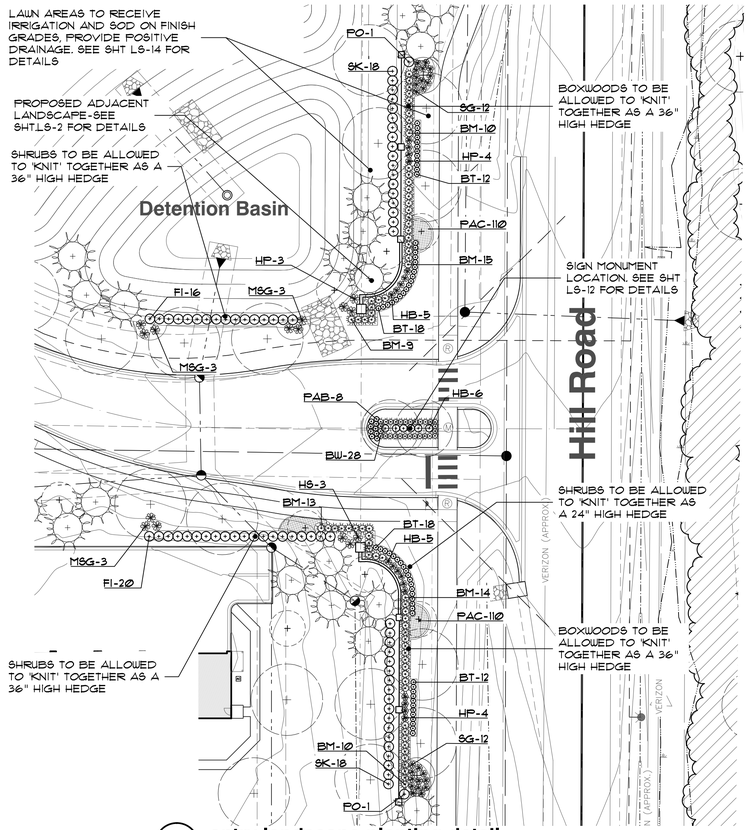
sheet no:
LS-7 of 16

plant material list

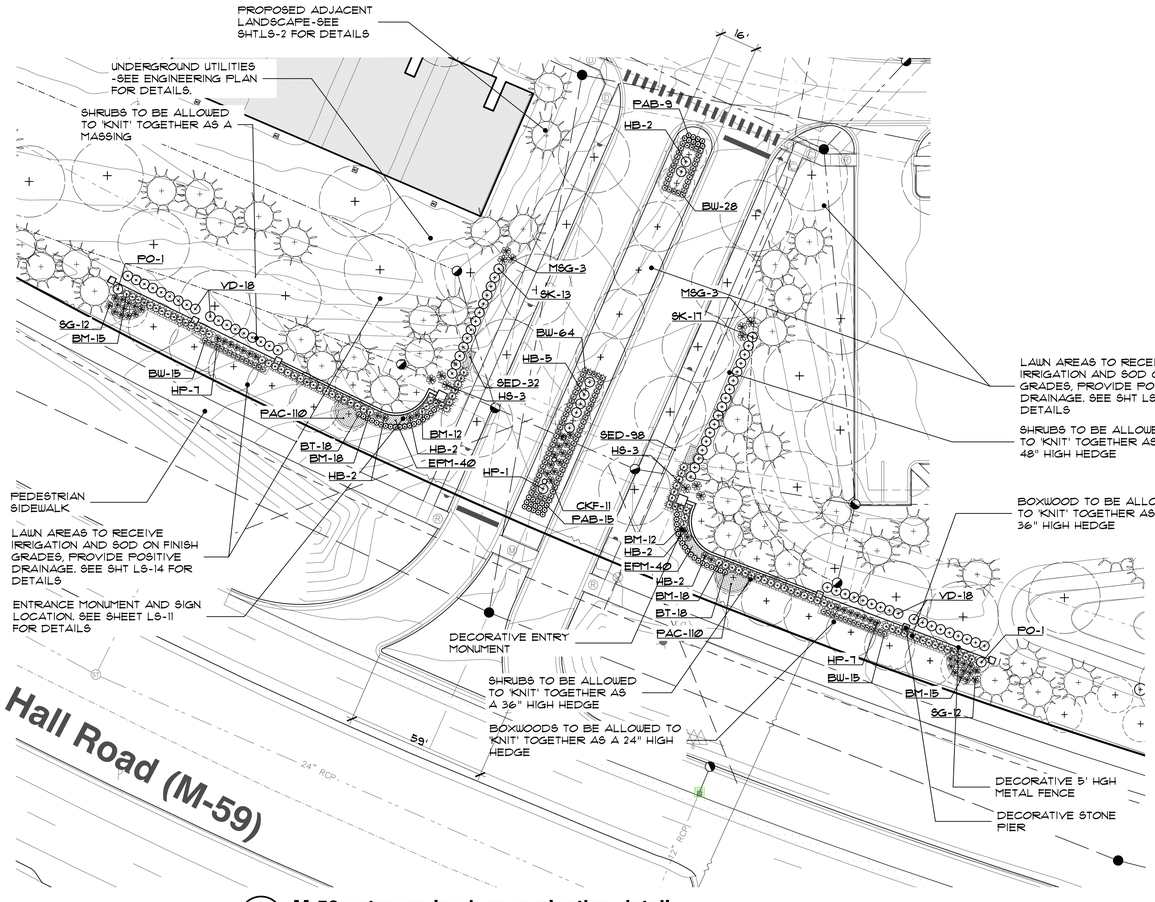
key	quant. 5A	quant. 5B	quant. 5C	botanical name	common name	size	comments
				SHRUBS			
BW	122	26	48	BUXUS X 'GREEN VELVET'	GREEN VELET BOXWOOD	18" CONT	24" O.C. SPACING
BM	108	43	51	BUXUS X 'GREEN MOUNTAIN'	GREEN MOUNTAIN BOXWOOD	30" CONT	36" O.C. SPACING
VD	36	-	-	VIBURNUM DENSATA 'SYNNESTVEDT'	CHICAGO LUSTRE VIBURNUM	#3 CONT.	60" O.C. SPACING
FI	-	-	36	FORSYTHIA INTERMEDIA	BORDER FORSYTHIA	#5 CONT	60" O.C. SPACING
BT	18	25	60	BERBERIS THUNBERGII 'CRIMSON PYGMY'	CRIMSON PYGMY BARBERRY	#3 CONT.	24" O.C. SPACING
HP	15	-	11	HYDRANGEA P. 'BULK'	QUICK FIRE HYDRANGEA	#5 CONT.	36" O.C. SPACING
HB	15	8	16	HYDRANGEA P. 'ILVOBO'	BOBO HYDRANGEA	#5 CONT	36" O.C. SPACING
HS	6	-	3	HIBISCUS SYRIACUS 'ALTHEA'	ALTHEA SHARON OF SHARON	#5 CONT.	60" O.C. SPACING
SG	24	24	48	PHYSOCARPUS OPULIFOLIUS 'SEWARD'	SUMMER WINE NINEBARK	#5 CONT.	42" O.C. SPACING
PO	2	4	2	SPIRAEA X.B. BUMALDA 'GOLDFLAME'	GOLDFLAME SPIREA	#5 CONT	36" O.C. SPACING
SK	30	-	36	SYRINGA PATULA 'MISS KIM'	MISS KIM LILAC		48" O.C. SPACING
	376	130	311	BIT TOTAL			
				PERENNIALS AND GRASSES			
MSG	6	-	9	MISCANTHUS SINENSIS 'GRACILLIMUS'	JAPANESE SILVER MAIDEN GRASS	#3 CONT.	36" O.C. SPACING
EPM	80	-	-	ECHINACEA 'PIXIE MEADOWBRITE'	'PIXIE MEADOWBRITE' PURPLE CONEFLOWERS	32/FLAT	10" O.C. SPACING
PAC	220	-	220	GERANIUM 'DILY'S'	DILY'S HARDY GERANIUM	32/FLAT	10" O.C. SPACING
PAB	24	-	8	PACHYSANDRA TERMINALIS 'GREEN CARPET'	GREEN CARPET PACHYSANDRA	#3 CONT.	10" O.C. SPACING
CKF	11	12	-	CALAMAGROSTIS ACUTIFLORA 'KARL FOERSTER'	KARL FOERSTER FEATHER REED GRASS	#3 CONT.	36" O.C. SPACING
PAH		17		PENNISETUM ALOPECUROIDES 'HAMELN'	HAMELN DWARF FOUNTAIN GRASS	#3 CONT.	36" O.C. SPACING
HOS	-	9	-	HOSTA 'PATRIOT'	PATRIOT HOSTA	#1 CONT.	18" O.C. SPACING



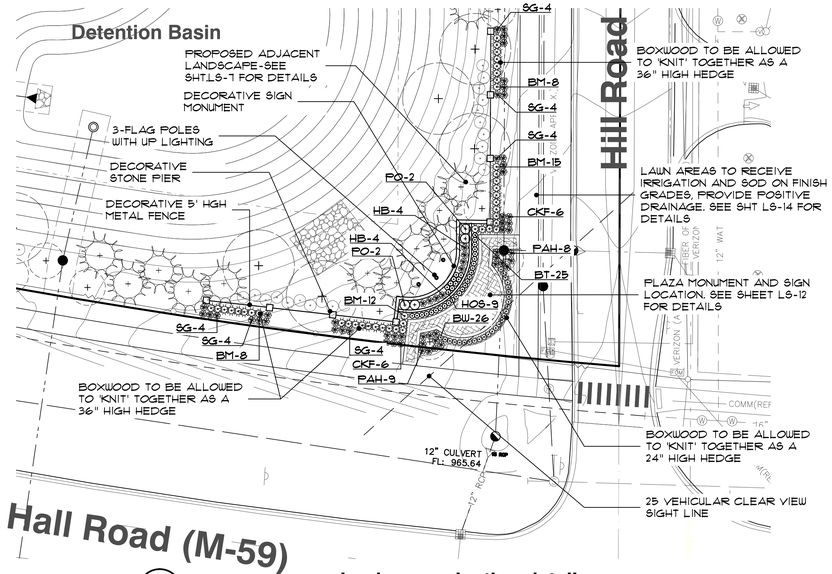
key reference location map
NO SCALE



8C entry landscape planting detail
SCALE: 1" =30' - 0"



8A M-59 entrance landscape planting detail
SCALE: 1" =40' - 0"



8B corner entrance landscape planting detail
SCALE: 1" =30' - 0"

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seal:
STATE OF MICHIGAN FELINO A. PASCUAL LANDSCAPE ARCHITECT No. 4333 REGISTERED LANDSCAPE ARCHITECT

client:

WHITE LAKE HILL, LLC
31550 Northwestern Hwy
Farmington Hills, Michigan

project:

AVALON
A PLANNED MIXED USE RESIDENTIAL COMMUNITY

project location:

White Lake Twp. Michigan
Highland Road & Hill Road

sheet title:

ENTRANCE LANDSCAPE PLANTING DETAIL

job no./issue/revision date:

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drawn by:
JP, JM, LA

checked by:
FP

date:
4-15-2025

notice:

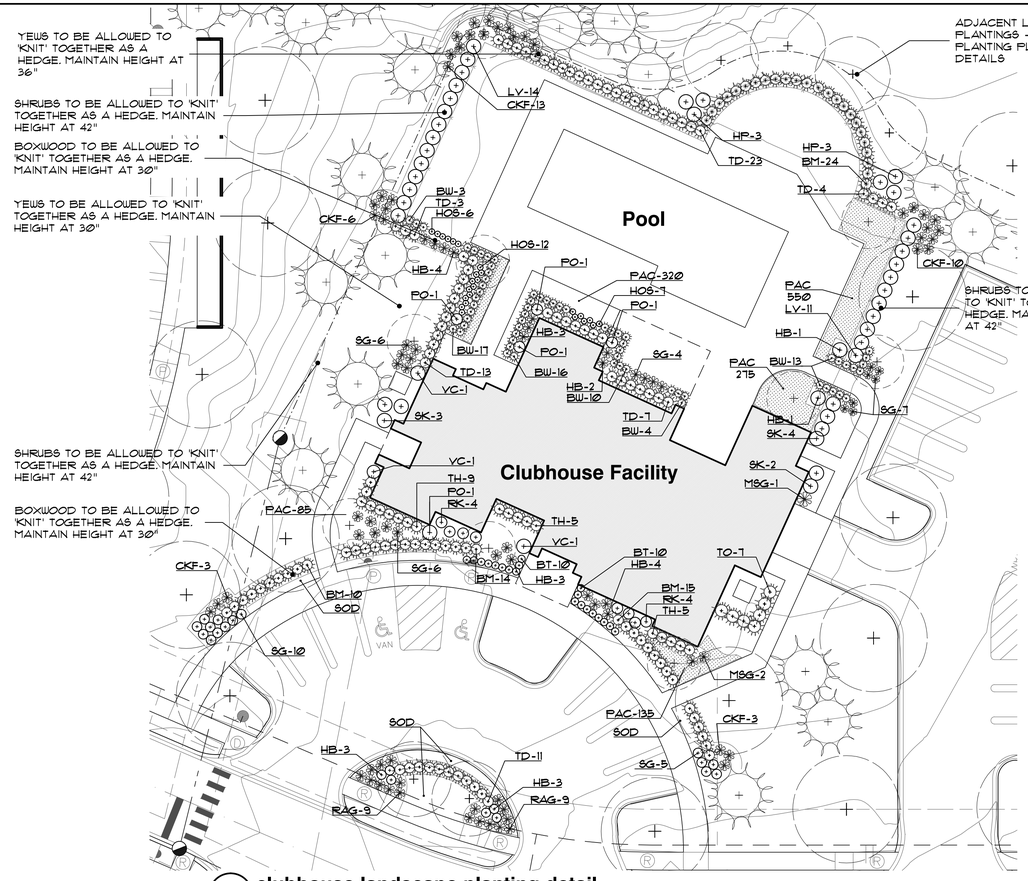
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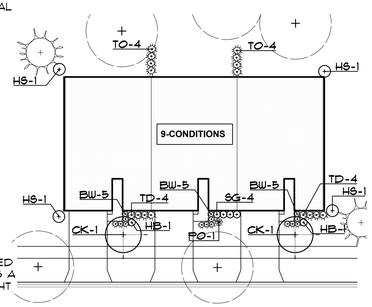
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project no:
LS25.047.04

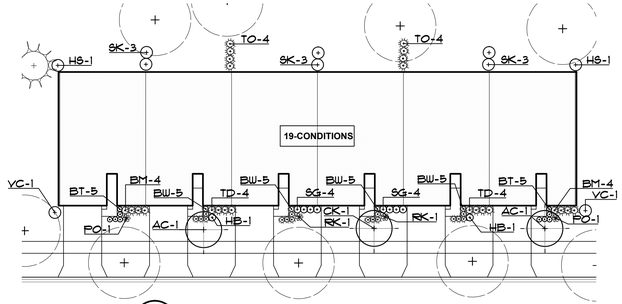
sheet no:
LS-8 of 16



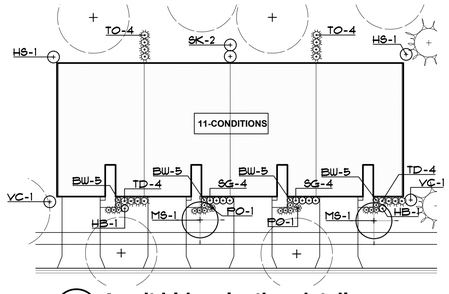
9A clubhouse landscape planting detail
SCALE: 1" =20' - 0"



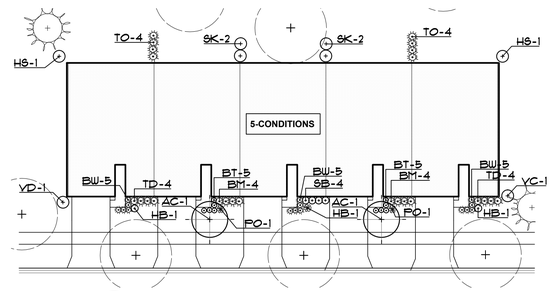
9B 3-unit bldg. planting detail
SCALE: 1" =30' - 0"



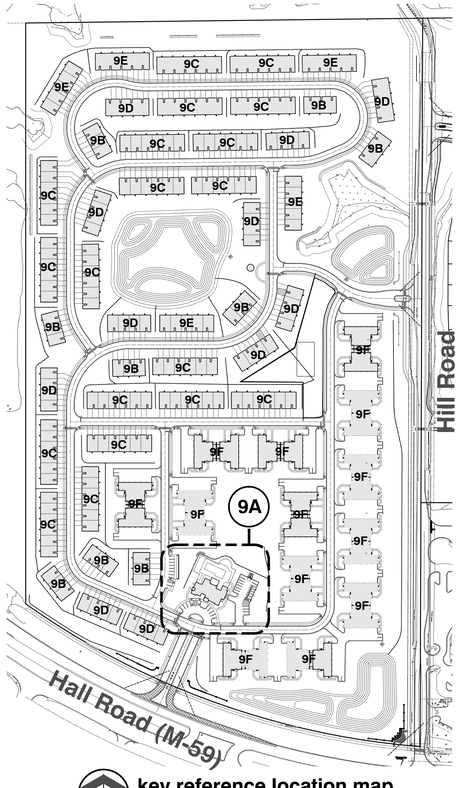
9C 6-unit bldg. planting detail
SCALE: 1" =30' - 0"



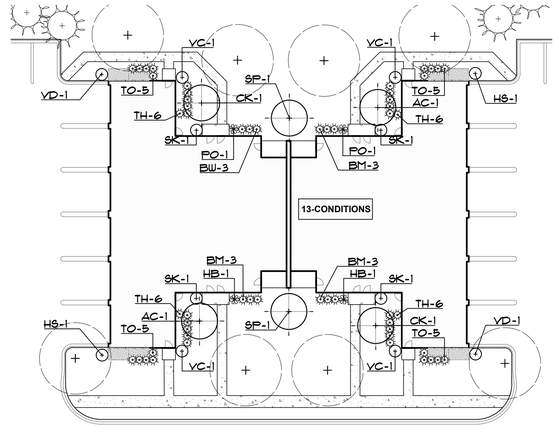
9D 4-unit bldg. planting detail
SCALE: 1" =30' - 0"



9E 5-unit bldg. planting detail
SCALE: 1" =30' - 0"



key reference location map
NO SCALE



9F 12-unit bldg. planting detail
SCALE: 1" =30' - 0"

LANDSCAPE BEDS ADJACENT AND NEXT TO BUILDING SHALL BE EXCAVATED OF ALL BUILDING MATERIALS AND POOR SOILS A MIN. OF 12"-16" DEPTH. BACK FILL WITH GOOD, MEDIUM TEXTURED PLANTING SOILS. ADD A MIN. 4" OF TOPSOIL OVERFILL TO FINISH GRADE. PROVIDE POSITIVE DRAINAGE.

plant material list

key	quant. 9A	quant. 9B	quant. 9C	quant. 9D	quant. 9E	quant. 9F	botanical name	common name	size	comments
							ORNAMENTAL TREES			
SP	-	-	-	-	-	26	SYRINGA RETICULA 'IVORY SILK'	IVORY SILK JAPANESE TREE LILAC	2" BB	
MS	-	-	-	22	-	-	MALUS SARGENTII	SARGENT CRAB	2" BB	
AC	-	-	38	-	10	26	AMELANCHIER X.G. 'AUTUMN BRILLIANCE'	AUTUMN BRILLIANCE SERVISBERRY	8' BB	MULTI-STEM
CK	-	18	19	-	-	26	CORNUS KOUSA	KOUSA DOGWOOD	2" BB	
TOTALS	-	18	57	22	10	78	185-ORNAMENTAL TREES			
							SHRUBS			
TD	61	72	152	88	40	-	TAXUS X.M. DENSIFORMIS	JAPANESE DENSE YEWS	24" CONT.	36" O.C. SPACING
BM	63	-	152	-	75	156	BUXUS 'GREEN MOUNTAIN'	GREEN MOUNTAIN BOXWOOD	30" CONT	36" O.C. SPACING
BW	63	135	380	220	50	-	BUXUS 'VARDAR VALLEY'	VARDAR VALLEY BOXWOOD	30" CONT	36" O.C. SPACING
VD	-	-	-	-	5	26	VIBURNUM DENSATA 'SYNNESTVEDT'	CHICAGO LUSTRE VIBURNUM	36" CONT.	60" O.C. SPACING
LV	25	-	-	-	-	-	LIGUSTRUM X. 'VICARYI'	VICARY PRIVET	36" CONT.	60" O.C. SPACING
RAG	18	-	-	-	-	-	RHUS AROMATICA 'GRO-LOW'	GRO-LOW FRAGRANT SUMAC	24" CONT	42" O.C. SPACING
BT	20	-	190	-	50	-	BERBERIS THUNBERGII 'CRIMSON PYGMY'	CRIMSON PYGMY BARBERRY	15" CONT.	24" O.C. SPACING
HP	6	-	-	-	-	-	HYDRANGEA P. 'BULK'	QUICK FIRE HYDRANGEA	30" CONT.	36" O.C. SPACING
HB	24	18	38	22	15	26	HYDRANGEA P. 'ILVOBO'	BOBO HYDRANGEA	30" CONT	36" O.C. SPACING
HS	-	36	38	22	10	26	HIBISCUS SYRIACUS 'ALTHEA'	ALTHEA SHARON OF SHARON	36" CONT.	48" O.C. SPACING
TO	7	72	152	88	40	260	THUJA OCCIDENTALIS 'TECHNY'	TECHNY ARBORVITAE	6' BB	48" O.C. SPACING
VC	3	-	38	22	5	52	VIBURNUM CARLESII	KOREAN SPICE VIBURNUM	36" CONT	48" O.C. SPACING
RK	8	-	38	-	-	-	ROSA X OSA EASY 'DOUBLE RED'	OSO EASY DOUBLE RED RED ROSA	30" CONT.	48" O.C. SPACING
PO	6	9	38	22	10	26	PHYSOCARPUS OPULIFOLIUS 'SEWARD'	SUMMER WINE NINEBARK	30" CONT.	42" O.C. SPACING
SG	32	36	152	88	-	-	SPIRAEA X.B. 'BUMALDA' 'GOLDFLAME'	GOLDFLAME SPIREA	24" CONT	36" O.C. SPACING
SK	9	-	171	22	20	52	SYRINGA PATULA 'MISS KIM'	MISS KIM DWARF LILAC	3 'BB	48" O.C. SPACING
TH	19	-	-	-	-	312	TAXUS X.M. 'HICKSII'	HICKS YEWS	24" CONT.	36" O.C. SPACING
TOTALS	364	378	1,539	594	320	936	4,131-SHRUBS			
							PERENNIALS AND GRASSES			
MSG	3	-	-	-	-	-	MISCANTHUS SINENSIS 'GRACILLIMUS'	JAPANESE SILVER MAIDEN GRASS	#3 CONT.	36" O.C. SPACING
PAH	-	-	-	-	-	-	PENNISETUM ALOPECUROIDES 'HAMELN'	DWARF FOUNTAIN GRASS	#3 CONT.	36" O.C. SPACING
CKF	35	-	-	-	-	-	CALAMAGROSTIS ACUTIFLORA 'KARL FOERSTER'	KARL FOERSTER FEATHER REED GRASS	#3 CONT.	36" O.C. SPACING
HOS	25	-	-	-	-	-	HOSTA 'PATRIOT'	PATRIOT HOSTA	#1 CONT.	18" O.C. SPACING
PAC	1365	-	-	-	-	-	PACHYSANDRA TERMINALIS 'GREEN CARPET'	GREEN CARPET PACHYSANDRA	32/FLAT	10" O.C. SPACING
DLY	-	-	-	-	-	-	HEMEROCALLIS 'HAPPY RETURN'	HAPPY RETURN DAYLILY	#1 CONT.	18" O.C. SPACING

FPA
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seal:



client:

WHITE LAKE HILL, LLC
31550 Northwestern Hwy
Farmington Hills, Michigan

project:

AVALON
A PLANNED MIXED USE RESIDENTIAL COMMUNITY

project location:

White Lake Twp. Michigan
Highland Road & Hill Road

sheet title:

CLUBHOUSE & BUILDING FOUNDATION LANDSCAPE PLANTING PLAN

job no./issue/revision date:

LP22.056.07	REVIEW	7-27-2022
LP22.056.08	REVIEW	8-18-2022
LP22.056.08	TWP. REV.	8-25-2022
LP23.104.10	SITE UPDATE	10-2-2023
LS24.030.04	REVIEW	4-8-2024
LS24.030.05	SPA	5-20-2024
LS25.047.04	SPA	4-15-2025
LS25.047.09	TWP COMMENTS, SITE PLAN UPDATES	9-23-2025

drawn by: **JP, JM, LA**
checked by: **FP**
date: **4-15-2025**

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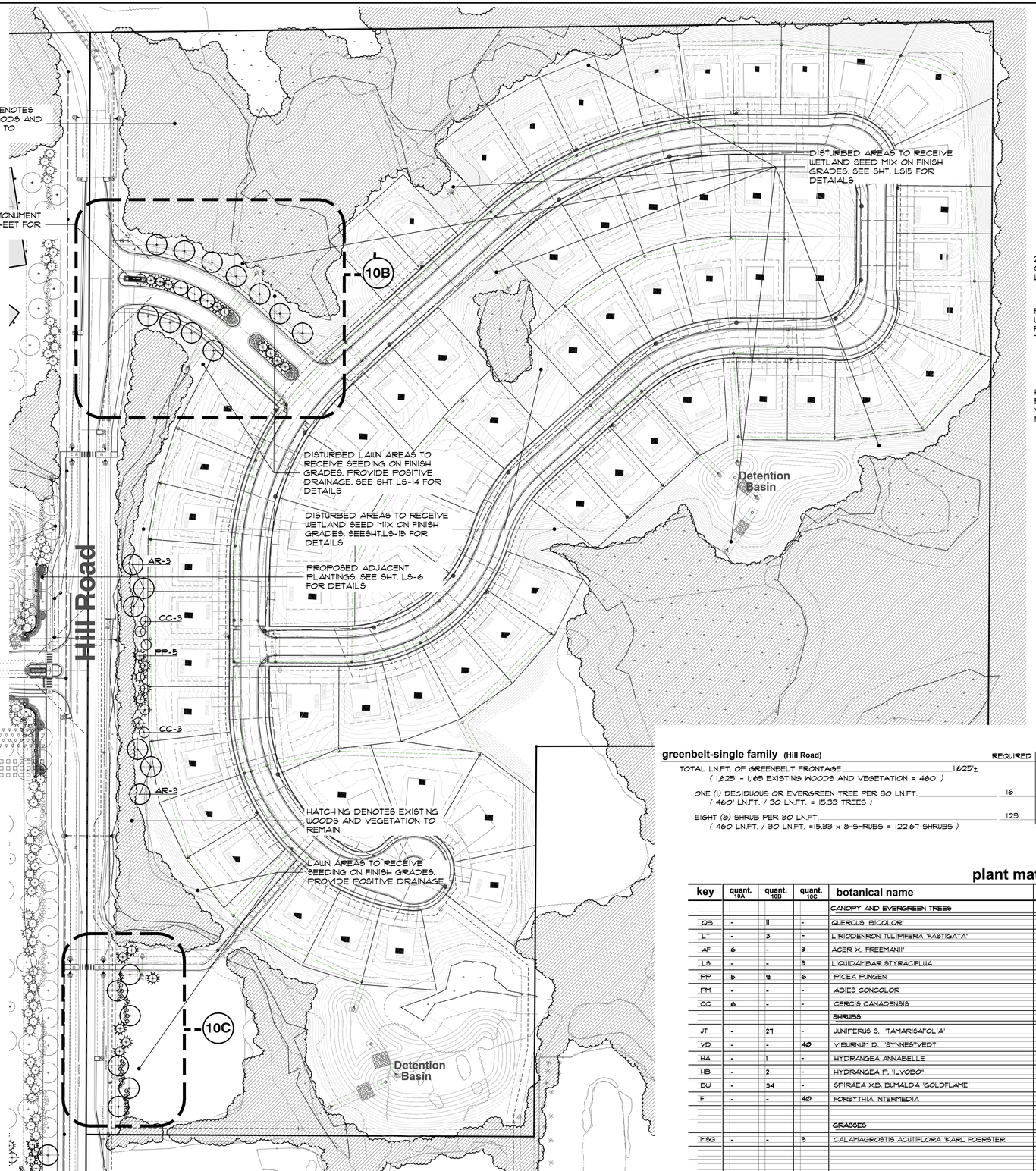
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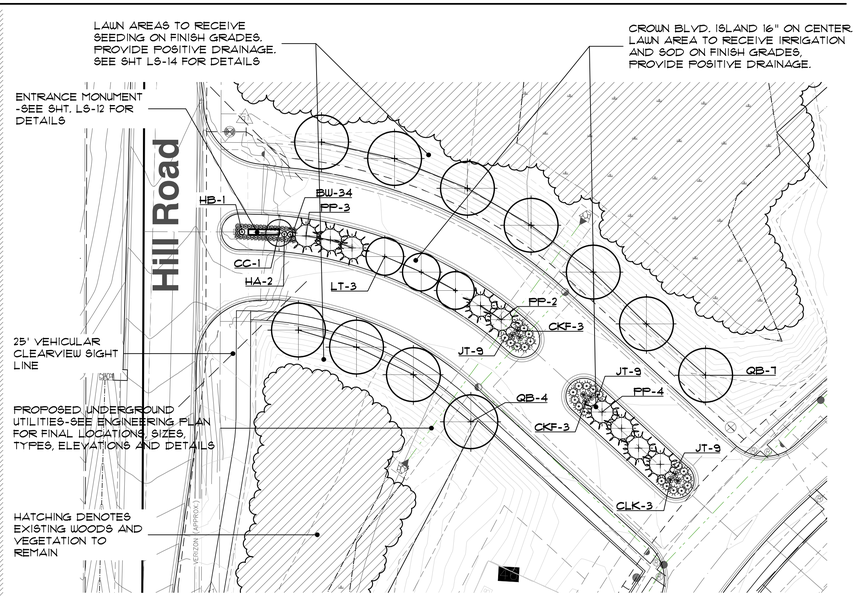
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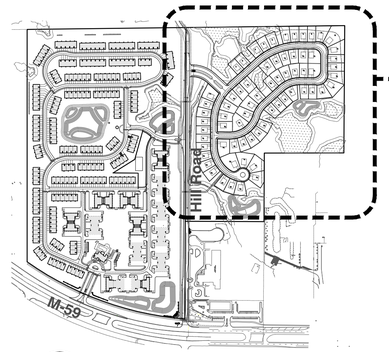
sheet no: **LS-9** of 16



10A general planting detail
SCALE: 1" =80' - 0"



10B greenbelt planting detail
SCALE: 1" =40' - 0"



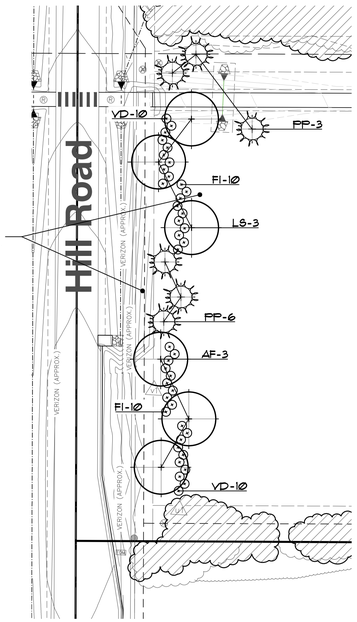
key reference location map
NO SCALE

greenbelt-single family (Hill Road)

	REQUIRED	PROVIDED
TOTAL LN.FT. OF GREENBELT FRONTAGE 1,625'± (1,625' - 1,165 EXISTING WOODS AND VEGETATION = 460')		
ONE (1) DECIDUOUS OR EVERGREEN TREE PER 30 LN.FT. (460' LN.FT. / 30 LN.FT. = 15.33 TREES)	16	20+
EIGHT (8) SHRUB PER 30 LN.FT. (460 LN.FT. / 30 LN.FT. =15.33 x 8-SHRUBS = 122.67 SHRUBS)	123	125+

plant material list

key	quant. 10A	quant. 10B	quant. 10C	botanical name	common name	size	comments
				CANOPY AND EVERGREEN TREES			
QB	-	11	-	QUERCUS 'BICOLOR'	SWAMP WHITE OAK	2 1/2" BB	
LT	-	3	-	LIRIODENRON TULIPIFERA 'FASTIGATA'	COLUMNAR TULIP TREE	2 1/2" BB	
AF	6	-	3	ACER X. 'FREEMANII'	AUTUMN BLAZE RED MAPLE	2 1/2" BB	
LS	-	-	3	LIQUIDAMBAR STYRACIFLUA	AMERICAN SWEETGUM	2 1/2" BB	
FP	5	9	6	PICEA PUNGEN	COLORADO GREEN SPRUCE	6' BB	
FM	-	-	-	ABIES CONCOLOR	DOUGLAS FIR	6' BB	
CC	6	-	-	CERCIS CANADENSIS	EASTERN REDBUD	6' BB	
				SHRUBS			
JT	-	21	-	JUNIPERUS S. 'TAMARISAPOLIA'	TAM'S JUNIPER	30" CONT.	42" O.C. SPACING
VD	-	-	40	VIBURNUM D. 'SYNNESTVEDT'	CHICAGO LUSTRE VIBURNUM	36" CONT.	60" O.C. SPACING
HA	-	1	-	HYDRANGEA ANNABELLE	ANNABELLE HYDRANGEA	30" CONT.	42" O.C. SPACING
HB	-	2	-	HYDRANGEA P. 'ILVOBO'	BOBO HYDRANGEA	30" CONT.	42" O.C. SPACING
BW	-	34	-	SPIRAEA X.B. BUMALDA 'GOLDFLAME'	GREEN VELVET BOXWOOD	18 CONT	24" O.C. SPACING
FI	-	-	40	FORSYTHIA INTERMEDIA	BORDER FORSYTHIA	36" CONT.	60" O.C. SPACING
				GRASSES			
M&G	-	-	9	CALAMAGROSTIS ACUTIFLORA 'KARL FOERSTER'	KARL FOERSTER FEATHER REED GRASS	#3 CONT.	36" O.C. SPACING



10C greenbelt planting detail
SCALE: 1" =40' - 0"

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seal:



client:

WHITE LAKE HILL, LLC
31550 Northwestern Hwy
Farmington Hills, Michigan

project:

AVALON
A PLANNED MIXED USE RESIDENTIAL COMMUNITY

project location:

White Lake Twp. Michigan
Highland Road & Hill Road

sheet title:

SINGLE FAMILY PLANTING DETAIL

job no./issue/revision date:

LP22.056.07	REVIEW	7-27-2022
LP22.056.08	REVIEW	8-18-2022
LP22.056.08	TWP. REV.	8-25-2022
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LS25.047.09	TWP COMMENTS SITE PLAN UPDATES	9-23-2025

drawn by:
JP, JM, LA

checked by:
FP

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4-15-2025

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project no:
LS25.047.04

sheet no:
LS-10 of 16

general landscape notes:

1. LANDSCAPE CONTRACTOR SHALL VISIT THE SITE, INSPECT EXISTING CONDITIONS, REVIEW PROPOSED PLANTINGS AND RELATED WORK, CONTACT THE OWNER AND/OR LANDSCAPE ARCHITECT WITH ANY CONCERNS OR DISCREPANCY BETWEEN THE PLAN, PLANT MATERIAL LIST, AND/OR SITE CONDITIONS.

2. PRIOR TO BEGINING OF CONSTRUCTION ON ANY WORK, CONTRACTORS SHALL VERIFY LOCATIONS OF ALL ON SITE UTILITIES, GAS, ELECTRIC, TELEPHONE, CABLE TO BE LOCATED BY CONTACTING MISS DIG 1-800-482-7171. ANY DAMAGE OR INTERRUPTION OF SERVICES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. COORDINATE ALL RELATED WORK ACTIVITIES WITH OTHER TRADES AND REPORT ANY UNACCEPTABLE JOB CONDITIONS TO OWNER PRIOR TO COMMENCING

3. NUMERICAL VALUE ON THE LANDSCAPE QUANTITIES SPECIFIED ON THE PLAN TAKE PRECEEDENCE OVER GRAPHIC REPRESENTATION. VERIFY ANY CONCERN-DISCREPANCY WITH LANDSCAPE ARCHITECT.

4. ALL CONSTRUCTION AND PLANT MATERIAL LOCATION TO BE ADJUSTED ON SITE IF NECESSARY

5. ALL SUBSTITUTIONS OR DEVIATIONS FROM THE LANDSCAPE PLAN MUST BE APPROVED BY WHITE LAKE TOWNSHIP AND LANDSCAPE ARCHITECT

6. ALL LARGE TREES AND EVERGREENS TO BE STAKED, GUYED AND WRAPPED AS DETAIL SHOWN ON PLAN.

7. PLANT BEDS TO BE DRESSED WITH MIN. 4" OF FINELY DOUBLE SHREDDED HARDBARK MULCH.

8. DIG SHRUB PITS 1' LARGER THAN SHRUB ROOT BALLS AND TREE PITS 2' LARGER THAN ROOT BALL. BACK FILL WITH ONE PART TOP SOIL AND ONE PART SOIL FROM EXCAVATED PLANTING HOLE.

9. NATURAL COLOR, FINELY SHREDDED HARDWOOD BARK MULCH REQUIRED FOR ALL PLANTINGS.

10. REMOVE ALL TWINE, WIRE AND BURLAP FROM TREE AND SHRUB EARTH BALLS, AND FROM TREE TRUNKS. 4" THICK BARK MULCH FOR TREES IN 4' DIA. CIRCLE WITH 3" PULLED AWAY FROM TRUNK , 4" THICK BARK MULCH FOR SHRUBS AND 4" THICK BARK MULCH FOR PERENNIALS.

11. PLANT MATERIAL QUALITY & INSTALLATION SHALL BE IN ACCORDANCE WITH THE CURRENT AMERICAN ASSOCIATION OF NURSERYTMEN LANDSCAPE STANDARDS.

12. PROVIDE PEAT SOD FOR ALL NEW AND DISTURBED LAWN AREAS UNLESS NOTED OTHERWISE.

13. ALL PLANTING AREAS TO BE PREPARED WITH APPROPRIATE SOIL MIXTURES AND FERTILIZER BEFORE PLANT INSTALLATION.

14. PLANT TREES AND SHRUBS GENERALLY NO CLOSER THEN THE FOLLOWING DISTANCES FROM SIDEWALKS, CURBS AND PARKING STALLS:

a). SHADE TREES_____5 FT.
b). ORNAMENTAL AND EVERGREEN TREES (CRABS, PINE, SPRUCE, ETC.)_____10 FT.
c). SHRUBS THAT ARE LESS THAN 1 FOOT TALL AND WIDE AT MATURITY_____2 FT.

15. NO TREES OR EVERGREENS TO BE INSTALLED OVER ANY PROPOSED OR EXISTING UTILITY LINES AS SHOWN ON THE OVERALL LANDSCAPE PLAN. SEE ENGINEERING PLANS FOR LOCATION AND DETAILS.

16. TREES OR EVERGREENS TO BE INSTALLED MUST MAINTAIN A MINIMUM DISTANCE OF 4' FROM ANY PROPERTY LINES

17. ALL LAWN AREAS AND LANDSCAPE BEDS TO BE FULLY IRRIGATED WITH A AUTOMATIC UNDERGROUND SYSTEMS. IRRIGATION SYSTEM TO HAVE SEPARATE ZONES FOR LAWN AREAS, PARKING ISLANDS, AND SHRUB BEDS WITH DIFFERENT CONTROL MOISTURE LEVEL ADJUSTMENT PER ZONE AS REQUIRED

18. UNLESS NOTED OTHERWISE, LANDSCAPE BEDS ADJACENT TO LAWN TO RECIEVE EDGING. EDGING SHALL BE 4" X 1/8" METAL (FINISH BLACK OR GREEN) OR APPROVED EQUAL AND TO BE INSTALLED WITH HORIZONTAL METAL STAKES AT 32" O.C. OR PER MANUFACTERER'S SPECIFICATION.

19. ALL NEW PARKING ISLANDS AND LANDSCAPE BEDS ADJACENT AND NEXT TO BUILDING SHALL BE EXCAVATED OF ALL BUILDING MATERIALS AND POOR SOILS A MIN. OF 16"-18" DEPTH. BACK FILL WITH GOOD, MEDIUM TEXTURED PLANTING SOILS. ADD A MIN. 4" OF TOPSOIL OVERFILL TO FINISH GRADE. PROVIDE POSITIVE DRAINAGE.

20. WATERING OF ALL PLANTS AND TREES TO BE PROVIDED IMMEDIATELY AND MULCHING WITHIN 24 HOURS AFTER INSTALLATION.

21. ALL TREE PITS TO BE TESTED FOR PROPER DRAINAGE PRIOR TO TREE PLANTING. PROVIDE APPROPERATES DRAINAGE SYSTEM AS REQUIRED IF THE TREE PIT DOES NOT DRAIN SUFFICIENTLY.

22. THE LANDSCAPE CONTRACTOR SHALL GUARANTEE ALL LANDSCAPE PLANT MATERIALS AND IRRIGATION INSTALLATION FOR A PERIOD OF TWO YEAR BEGINNING AFTER THE COMPLETION OF LANDSCAPE INSTALLTION DATE APPROVED BY THE CITY OR LANDSCAPE ARCHITECT. THE CONTRACTOR SHALL REPLACE DURING AND AT THE END OF THE GUARANTEE PERIOD, ANY DEAD OR UNACCEPTABLE PLANTS, AS DETERMINED BY THE TOWNSHIP OR LANDSCAPE ARCHITECT, WITHOUT COST TO THE OWNER.

planting landscape notes:

GENERAL NOTES:

1. PLANT MATERIALS TO BE INSTALLED ACCORDING TO THE WHITE LAKE TOWNSHIP AND CURRENT AMERICAN ASSOCIATION OF NURSERYMEN'S STANDARDS.

2. PLANT MATERIALS TO BE GUARANTEED FOR 2 YEARS. REPLACE FALLING MATERIAL WITHIN 1 YEAR, OR THE NEXT APPROPRIATE PLANTING PERIOD.

3. PLANT MATERIALS TO BE OF PREMIUM QUALITY, NO. 1 GRADE NORTHERN NURSURY GROWN, IN HEALTHY CONDITION, FREE OF PESTS AND DISEASES.

4. MULCH IS TO BE NATURAL COLORED, FINELY SHREDDED HARDWOOD BARK OF 4" THICK BARK MULCH FOR TREES IN 4' DIA. CIRCLE W/3" PULLED AWAY FROM TRUNK, 3" THICK BARK MULCH FOR SHRUBS AND 2" THICK BARK MULCH FOR PERRENIALS.

5. CALL MISS DIG AT 1-800-482-7171 PRIOR TO ANY CONSTRUCTION.

DECIDUOUS & EVERGREEN TREE:

1. TREE SHALL BE INSTALLED SAME RELATIONSHIP TO FINISH GRADE AS IT BORE ORIGINALLY OR SLIGHTLY HIGHER THAN FINISH GRADE UP TO 6" ABOVE GRADE, IF DIRECTED BY LANDSCAPE ARCHITECT FOR HEAVY CLAY SOIL AREAS.
2. DO NOT PRUNE TERMINAL LEADER. PRUNE ONLY DEAD OR BROKEN BRANCHES.
3. REMOVE ALL TAGS, STRING, PLASTICS AND OTHER MATERIALS THAT ARE UNSLIGHTLY AND COULD CAUSE GIRDLING.
4. REMOVE TREE STAKES, GUY WIRES AND TREE WRAP AFTER ONE WINTER SEASON.

SHRUB:

1. SHRUB SHALL BE INSTALLED SAME RELATIONSHIP TO FINISH GRADE AS IT BORE ORIGINALLY OR SLIGHTLY HIGHER THAN FINISH GRADE UP TO 6" ABOVE GRADE, IF DIRECTED BY LANDSCAPE ARCHITECT FOR HEAVY CLAY SOIL AREAS.
2. DO NOT PRUNE TERMINAL LEADER. PRUNE ONLY DEAD OR BROKEN BRANCHES.
3. REMOVE ALL TAGS, STRING, PLASTICS AND OTHER MATERIALS THAT ARE UNSLIGHTLY AND COULD CAUSE GIRDLING.

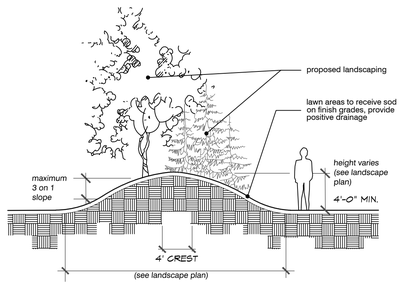
landscape maintenance notes:

LANDSCAPE MAINTENANCE PROCEDURES AND FREQUENCIES TO BE FOLLOWED SHALL BE SPECIFIED ON THE LANDSCAPE PLAN, ALONG WITH THE MANNER IN WHICH THE EFFECTIVENESS, HEALTH AND INTENDED FUNCTIONS OF THE VARIOUS LANDSCAPE AREAS ON THE SITE WILL BE ENSURED.

1. LANDSCAPING SHALL BE KEPT IN A NEAT, ORDERLY AND HEALTHY GROWING CONDITION, FREE FROM DEBRIS AND REFUSE.

2. PRUNING SHALL BE MINIMAL AT THE TIME OF INSTALLATION, ONLY TO REMOVE DEAD OR DISEASED BRANCHES, SUBSEQUENT PRUNING SHALL ASSURE PROPER MATURATION OF PLANTS TO ACHIEVE THEIR APPROVED PURPOSE.

3. ALL DEAD OR DISEASED PLANT MATERIAL SHALL BE REMOVED AND REPLACED WITHIN SIX (6) MONTHS AFTER IT DIES, OR IN THE NEXT PLANTING SEASON, WHICHEVER OCCURS FIRST. THE PLANTING SEASON FOR DECIDUOUS PLANTS SHALL BE BETWEEN MARCH 15 AND NOVEMBER 15 OR UNTIL THE PREPARED SOIL BECOMES FROZEN. THE PLANTING SEASON FOR EVERGREEN PLANTS SHALL BE BETWEEN MARCH 1 AND JUNE 1. PLANT MATERIAL INSTALLED TO REPLACE DEAD OR DISEASED MATERIAL SHALL BE AS CLOSE AS PRACTICAL TO THE SIZE OF THE MATERIAL IT IS INTENDED TO REPLACE.



berm planting detail
no scale

detention basin seed mix

A WETLAND SEED MIX FOR SATURATED SOILS IN A DETENTION POND OR FOR SEEDING A SATURATED BASIN□THIS MIX WILL TOLERATE HIGHL□ FLUCTUATING WATER LE□ELS AND POOR WATER □UALIT□ ASSOCIATED WITH URBAN STORMWATER WETLANDS AND PONDS. FOR DETENTION BASINS THAT EXPERIENCE LONG□DR□ PERIODS□USE THE ECONOM□ PRAIRIE SEED MIX IN THE UPPER THIRD TO HALF OF THE BASIN AREA IN COMBINATION WITH THIS MIX. THIS SEED MIX INCLUDES AT LEAST 10 OF 12 NATI□E PERMANENT GRASS AND SEDGE SPECIES AND 13 OF 17 NATI□E FORB SPECIES. APPL□ AT 36.22 PLS POUNDS PER ACRE.

BOTANICAL NAME	COMMON NAME	PLS O□/ACRE
PERMANENT GRASSES/SEDGES		
BOLBOSCHOENUS FLU□IATILIS	RI□ER BULRUSH	1.00
CAREX CRISTATELLA	CRESTED O□AL SEDGE	0.50
CAREX LURIDA	BOTTLEBRUSH SEDGE	3.00
CAREX □ULPINOIDEA	BROWN FOX SEDGE	2.00
EL□MUS □IRGINICUS	□IRGINIA WILD R□E	24.00
GL□CERIA STRIATA	FOWL MANNA GRASS	1.00
□UNCUS EFFUSUS	COMMON RUSH	1.00
LEERSIA OR□□OIDES	RICE CUT GRASS	1.00
PANICUM □IRGATUM	SWITCH GRASS	2.00
SCHOENOPLECTUS TABERNAEMONTANI	GREAT BULRUSH	3.00
SCIRPUS ATRO□IRENS	DARK GREEN RUSH	2.00
SCIRPUS C□PERINUS	WOOL GRASS	1.00
	TOTAL	41.50
TEMPORARY COVER		
A□ENA SATI□A	COMMON OAT	512.00
	TOTAL	512.00
FORBS		
ALISMA SUBCORDATUM	COMMON WATER PLANTAIN	2.50
ASCLEPIAS INCARNATA	SWAMP MILKWEED	2.00
BIDENS SPP. BIDENS	SPECIES	2.00
EUPATORIUM PERFOLIATUM	COMMON BONESET	1.00
HELENIUM AUTUMNALE	SNEE□EWEED	2.00
IRIS □IRGINICA □. SHRE□EI	BLUE FLAG	4.00
L□COPUS AMERICANUS	COMMON WATER HOREHOUND	0.50
MIMULUS RINGENS	MONKE□ FLOWER	1.00
PENTHORUM SEDOIDES	DITCH STONECROP	0.50
PERSICARIA SPP.	PINKWEED SPECIES	2.00
RUDBECKIA SUBTOMENTOSA	SWEET BLACK-E□ED SUSAN	1.00
RUDBECKIA TRILOBA	BROWN-E□ED SUSAN	1.50
SAGITTARIA LATIFOLIA	COMMON ARROWHEAD	1.00
SENNA HEBECARPA	WILD SENNA	2.00
S□MPH□OTRICHUM LANCEOLATUM	PANICLED ASTER	0.50
S□MPH□OTRICHUM NO□AE-ANGLIAE	NEW ENGLAND ASTER	0.50
THALICTRUM DAS□CARPUM	PURPLE MEADOW RUE	2.00
	TOTAL	26.00

lawn area:

SOD LAWN AREAS SHALL BE KENTUCKY BLUE GRASS BLEND GRASS IN A SOD NURSERY ON LOAM SOIL. SOD TO BE INSTALLED ON MINIMUM 4" TOPSOIL.

SEEDED LAWN AREAS SHALL CONSIST OF THE FOLLOWING TYPES AND PROPORTIONS:

5% PERENNIAL RYE GRASS
10% RED FESCUE
25% CHEWING FESCUE
60% KENTUCKY BLUE GRASS

SEED MIX SHALL BE APPLIED AT A RATE OF 200 POUNDS PER ACRE AND WEED CONTENT SHALL NOT EXCEED 1%. SEED, PROVIDE A MINIMUM 4" TOP SOIL ON ALL SEEDED LAWN AREA

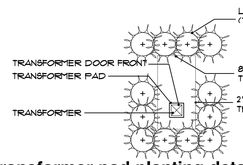
ALL TREES WILL BE PLANTED NO CLOSER THAN FOUR (4□FEET FROM PROPERT□ LINES.

WHERE POSSIBLE□TREES TO BE LOCATED OUTSIDE OF PUBLIC UTILIT□ EASEMENT □SANITAR□ SEWER□ WATER MAIN□AND STORM SEWER□, IN NO CASE SHALL TREES BE PLANTED CLOSER THAN 5 FEET FROM THESE UTILITIES"

economy prairie seed mix

THIS PRAIRIE SEED MIX OFFERS AN ECONOMICAL WA□ TO ESTABLISH A PRAIRIE. IN ADDITION TO NATI□E PRAIRIE GRASSES□FLOWERING SPECIES PRO□IDE COLOR THROUGHOUT THE GROWING SEASON AND FOOD SOURCES FOR BIRDS AND BUTTERFLIES. ADDING SEED OR PLANT PLUGS AT A LATER DATE IS A WONDERFUL WAY TO INCREASE A PRAIRIE'S RICHNESS AND DIVERSITY. THIS SEED MIX INCLUDES AT LEAST 6 OF 7 NATI□E PERMANENT GRASS AND SEDGE SPECIES AND 10 OF 13 NATI□E FORB SPECIES. APPL□ AT 40.95 PLS POUNDS PER ACRE.

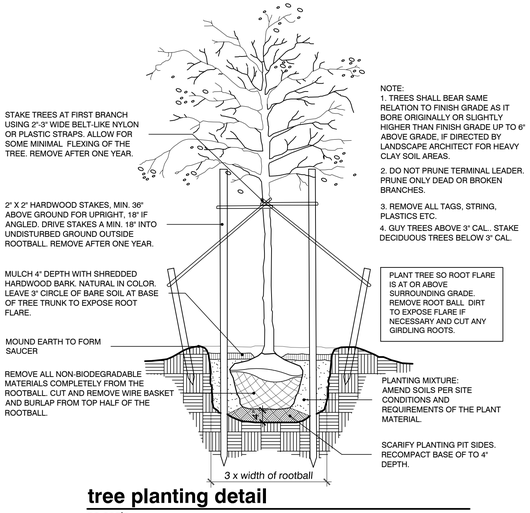
BOTANICAL NAME	COMMON NAME	PLS O□/ACRE
PERMANENT GRASSES/SEDGES		
ANDROPOGON GERARDII	BIG BLUESTEM	12.00
BOUTELOUA CURTIPENDULA	SIDE-OATS GRAMA	16.00
CAREX SPP.	PRAIRIE SEDGE SPECIES	3.00
EL□MUS CANADENSIS	CANADA WILD R□E	24.00
PANICUM □IRGATUM	SWITCH GRASS	2.50
SCHI□ACH□RIUM SCOPARIUM	LITTLE BLUESTEM	32.00
SORGHASTRUM NUTANS	INDIAN GRASS	12.00
	TOTAL	101.50
TEMPORARY COVER		
A□ENA SATI□A	COMMON OAT 512.00	
	TOTAL	512.00
FORBS		
ASCLEPIAS S□RIACA	COMMON MILKWEED	1.00
ASCLEPIAS TUBEROSA	BUTTERFL□ WEED	1.00
CHAMAECRISTA FASCICULATA	PARTRIDGE PEA	10.00
COREOPSIS LANCEOLATA	SAND COREOPSIS	6.00
ECHINACEA PURPUREA	BROAD-LEA□ED PURPLE CONEFLOWER	8.00
HELIOPSIS HELIANTHOIDES	FALSE SUNFLOWER	0.25
MONARDA FISTULOSA	WILD BERGAMOT	0.50
PENSTEMON DIGITALIS	FOXGLO□E BEARD TONGUE	1.00
RATIBIDA PINNATA	□ELLOW CONEFLOWER	4.00
RUDBECKIA HIRTA	BLACK-E□ED SUSAN	8.00
SOLIDAGO SPECIOSA	SHOW□ GOLDENROD	0.50
S□MPH□OTRICHUM LAE□E	SMOOTH BLUE ASTER	1.00
S□MPH□OTRICHUM NO□AE-ANGLIAE	NEW ENGLAND ASTER	0.50
	TOTAL	41.75



transformer pad planting detail
SCALE 1"=20'-0"

A MINIMUM OF 2' SEPARATION BETWEEN TRANSFORMER AND FULL GROWN SHRUBS AND TREES. GROUND COVERS ALLOWED UP TO TRANSFORMER PAD IF MAINTAINED BELOW 4" FULL GROWTH. IF TRANSFORMER FACES TOWARDS THE HOUSE, THEN THE SAME CONDITIONS EXIST. NO FULL GROWTH IN FRONT OF THE TRANSFORMER FOR AT LEAST A MINIMUM OF 8'. THERE ARE NO WAIVERS GRANTED TO THE ABOVE CONDITION. DETAIL PER THE DETROIT EDISON COMPANY-SERVICE PLANNING DEPARTMENT (9-11-98)

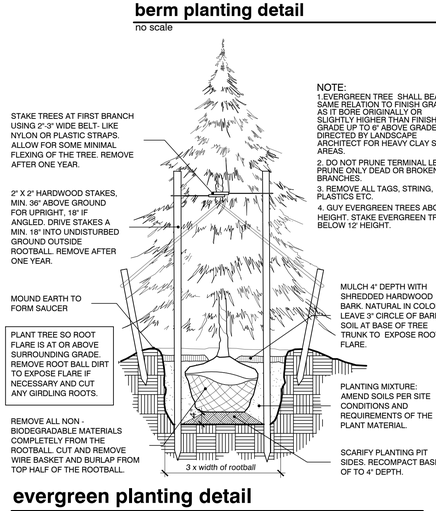
SEE ENGINEERING PLANS FOR PROPOSED LOCATIONS, TOTAL NUMBER OF TRANSFORMERS AND FINAL LOCATION PER DETROIT EDISON REQUIREMENTS.



NOTE:
1. TREES SHALL BEAR SAME RELATION TO FINISH GRADE AS IT BORE ORIGINALLY OR SLIGHTLY HIGHER THAN FINISH GRADE UP TO 6" ABOVE GRADE, IF DIRECTED BY LANDSCAPE ARCHITECT FOR HEAVY CLAY SOIL AREAS.
2. DO NOT PRUNE TERMINAL LEADER. PRUNE ONLY DEAD OR BROKEN BRANCHES.
3. REMOVE ALL TAGS, STRING, PLASTICS ETC.
4. GUY TREES ABOVE 3" CAL.. STAKE DECIDUOUS TREES BELOW 3" CAL.

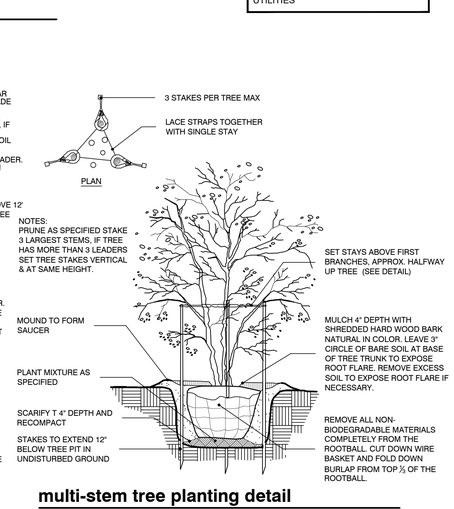
PLANT TREE SO ROOT FLARE IS AT OR ABOVE SURROUNDING GRADE. REMOVE ROOT BALL DIRT TO EXPOSE FLARE IF NECESSARY AND CUT ANY GIRDLING ROOTS.

tree planting detail
no scale

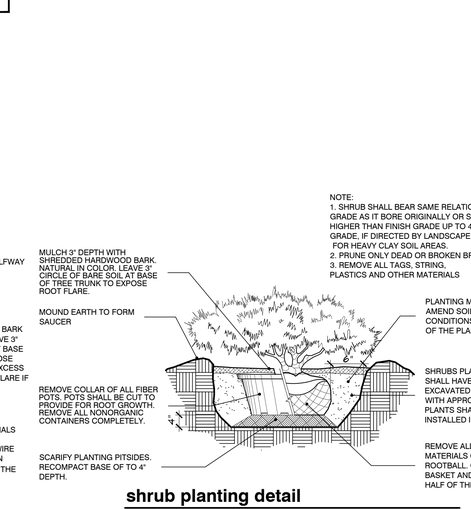


NOTE:
1.EVERGREEN TREE SHALL BEAR SAME RELATION TO FINISH GRADE AS IT BORE ORIGINALLY OR SLIGHTLY HIGHER THAN FINISH GRADE UP TO 6" ABOVE GRADE, IF DIRECTED BY LANDSCAPE ARCHITECT FOR HEAVY CLAY SOIL AREAS.
2. DO NOT PRUNE TERMINAL LEADER. PRUNE ONLY DEAD OR BROKEN BRANCHES.
3. REMOVE ALL TAGS, STRING, PLASTICS ETC.
4. GUY EVERGREEN TREES ABOVE 12' HEIGHT. STAKE EVERGREEN TREE BELOW 12' HEIGHT.

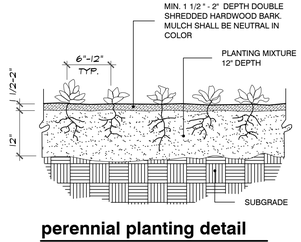
evergreen planting detail
no scale



multi-stem tree planting detail
no scale



shrub planting detail
no scale



perennial planting detail
no scale

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client:
WHITE LAKE HILL, LLC
31550 Northwestern Hwy
Farmington Hills, Michigan

project:
AVALON
A PLANNED MIXED USE RESIDENTIAL COMMUNITY

project location:
White Lake Twp. Michigan
Highland Road & Hill Road

sheet title:
LANDSCAPE MATERIAL LIST, PLANT DETAILS & NOTES

job no./issue/revision date:

LP22.056.07	REVIEW	7-27-2022
LP22.056.08	REVIEW	8-18-2022
LP22.056.08	TWP. REV.	8-25-2022
LP23.104.10	SITE UPDATE	10-2-2023
LS24.030.04	REVIEW	4-8-2024
LS24.030.05	SPA	5-20-2024
LS25.047.04	SPA	4-15-2025
LS25.047.09	TWP COMMENTS, SITE PLAN UPDATES	9-23-2025

drawn by: **JP, JM, LA**
checked by: **FP**
date: **4-15-2025**

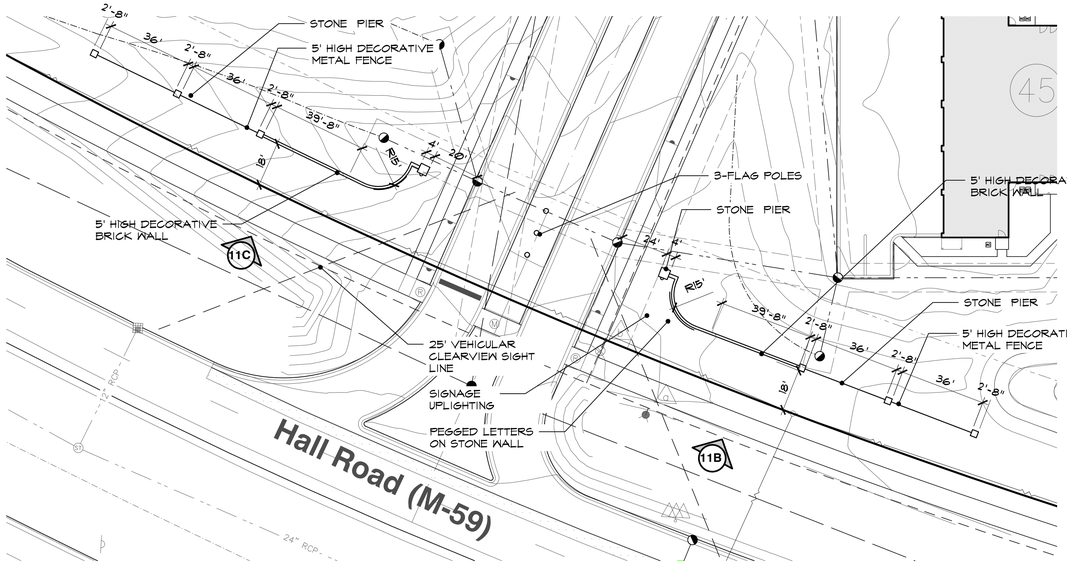
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The location and elevations of existing underground utilities as shown on this drawing are only approximate, no guarantee is either expressed or implied as to the completeness of accuracy, contractor shall be exclusively responsible for determining the exact location and elevation prior to the start of construction

project no:
LS25.047.04

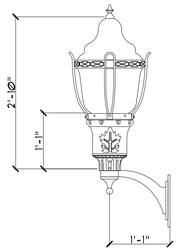
sheet no:
LS-10A of 16



11A entry sign monument site plan
SCALE: 1" =30' - 0"

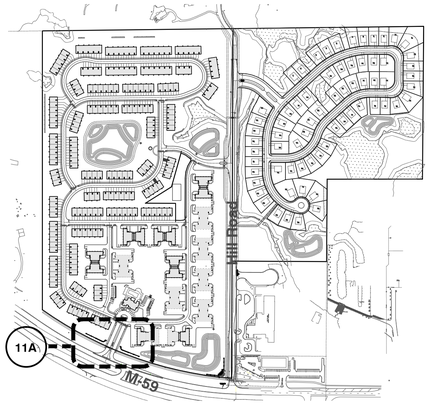
entry wall monument / pier/ signage / notes:

1. LOCATE AND STAKE ALL EXISTING AND PROPOSED UTILITIES PRIOR TO CONSTRUCTION. COORDINATE ANY ADJUSTMENTS WITH LANDSCAPE ARCHITECT.
2. ALL ENTRY WALL LIGHTING SHALL BE CONTROLLED WITH A 'PHOTO-EYE' SWITCH. ALL LIGHTING SHALL BE SHIELDED FROM PUBLIC ROW.'S AND ADJACENT PROPERTIES.
3. SEE LANDSCAPE PLAN FOR PROPOSED PLANTINGS ADJACENT TO PROPOSED ENTRY SIGN MONUMENT ON SHT. L9-8
4. VERIFY SOIL BEARING CAPACITY PRIOR TO TO ENTRY SIGN MONUMENT & PIER CONSTRUCTION. IF SOIL BEARING CAPACITY FALLS BELOW STANDARD REQUIREMENTS, CONSULT STRUCTURAL ENGINEER FOR RECOMMENDATION OF FINAL ENTRY MONUMENT & PIER FOOTING DESIGN.
5. SIGN TEXT AND LOGO TO BE BACK LIGHTED DIMENSIONAL LETTERS. PRIOR TO SIGN INSTALLATION, PERMITS TO BE OBTAINED PER WHITE LAKE TOWNSHIP REQUIREMENTS AND APPROVALS.
6. ALL INFORMATION CONTAINED HEREIN IS SUBJECT TO APPROVAL, AND PERMITS PERMITS TO BE OBTAINED PRIOR TO CONSTRUCTION.
7. FOOTINGS SHALL BEAR ON FIRM, UNDISTURBED SOIL WITH AN ASSUMED SAFE BEARING CAPACITY OF 2000 P.S.I. IF SOIL OF THIS CAPACITY IS NOT FOUND AT THE ELEVATIONS INDICATED, FOOTINGS SHALL BE ENLARGED OR LOWERED AT THE DIRECTION OF THE ARCHITECT. VERIFY FOUNDATION SOIL BEARING PRESSURE IN FIELD BY SOILS ENGINEER.
8. MINIMUM CONCRETE STRENGTH TO BE 3000 P.S.I. @ 28 DAYS, U.O.N.: SLABS SHALL BE 3500 P.S.I. MIN. U.O.N.: EXPOSED CONCRETE SHALL BE 4000 P.S.I. WITH 6% ± 1% ENTRAINED AIR U.O.N.
9. ALL CONCRETE WORK AND PLACEMENT SHALL CONFORM TO THE LATEST RECOMMENDATIONS OF A.C.I.
10. PROVIDE DOWELS INTO FOUNDATION TO MATCH SIZE AND SPACING OF VERTICAL REINFORCEMENT AT ALL WALLS, UNLESS OTHERWISE NOTED.
11. PROVIDE MINIMUM 3" CONCRETE COVER FOR REINFORCEMENT BARS BELOW GRADE AND MINIMUM 2" CONCRETE COVER FOR REINFORCEMENT BARS ABOVE GRADE.

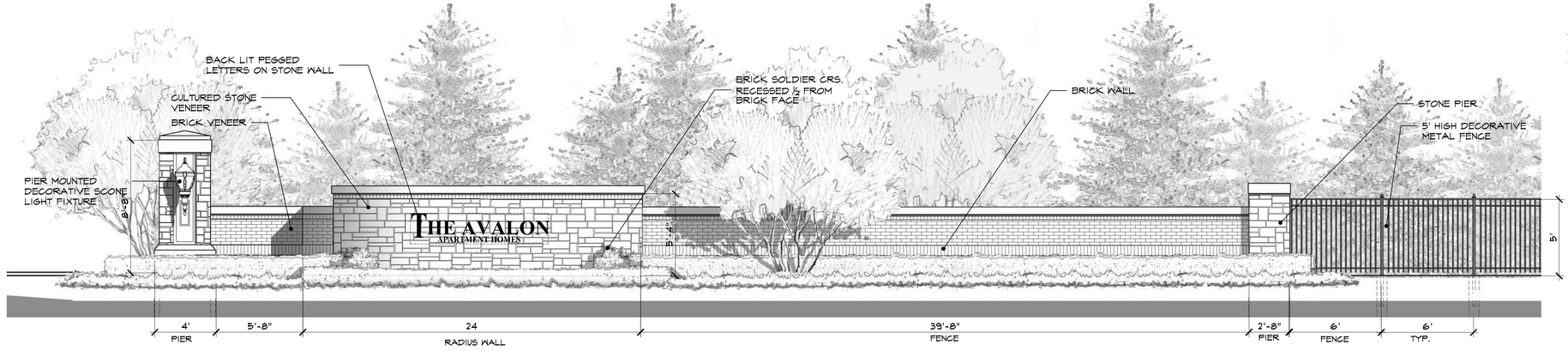


decorative acorn light fixture
(2-CONDITIONS)

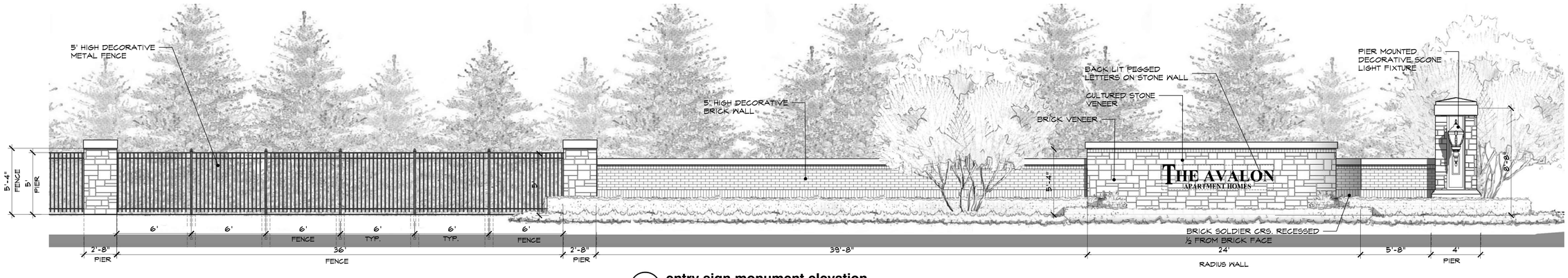
LIGHTING SHALL BE AN APPROVED FIXTURE BY THE INTERNATIONAL DARK SKY ASSOCIATION (IDA) AS A DARK SKY FRIENDLY LIGHT.



key reference location map
NO SCALE



11B entry sign monument elevation
SCALE: 1/4" =1' - 0"



11C entry sign monument elevation
SCALE: 1/4" =1' - 0"

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client:
WHITE LAKE HILL, LLC
31550 Northwestern Hwy
Farmington Hills, Michigan

project:
AVALON
A PLANNED MIXED USE RESIDENTIAL COMMUNITY

project location:
White Lake Twp. Michigan
Highland Road & Hill Road

sheet title:
ENTRANCE SIGN MONUMENT

job no./issue/revision date:

LP22.056.07	REVIEW	7-27-2022
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LP22.056.08	TWP. REV.	8-25-2022
LP23.104.10	SITE UPDATE	10-2-2023
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LS25.047.09	TWP COMMENTS, SITE PLAN UPDATES	9-23-2025

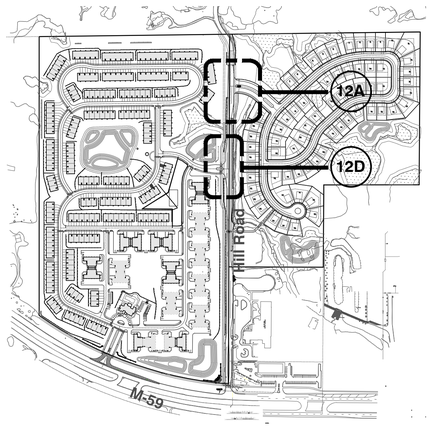
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checked by: FP
date: 4-15-2025

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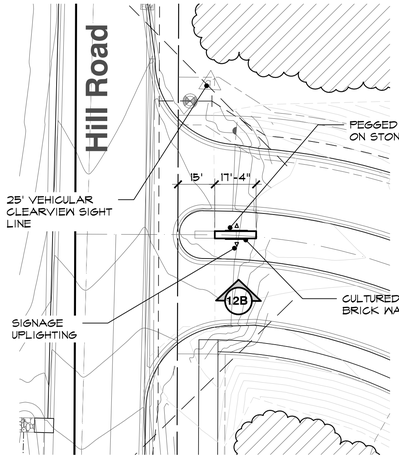
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project no: LS25.047.04

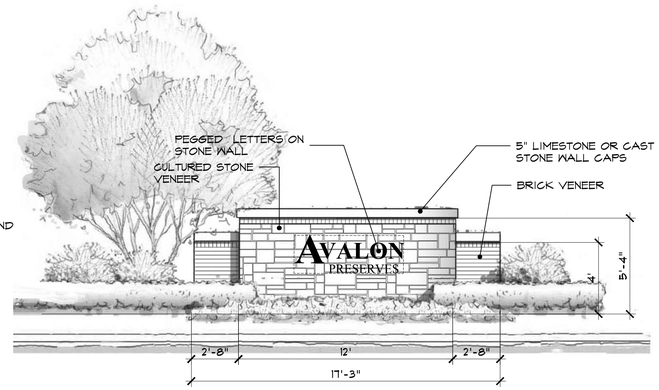
sheet no: LS-11 of 16



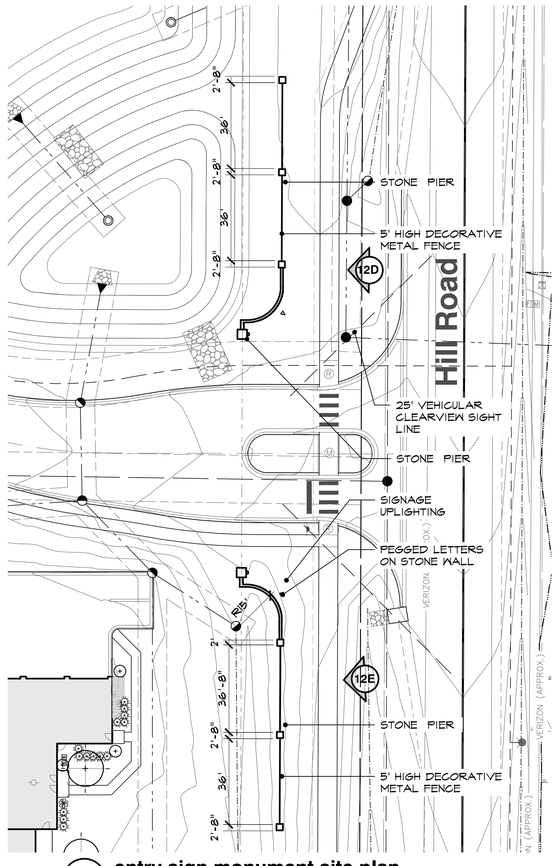
key reference location map
NO SCALE



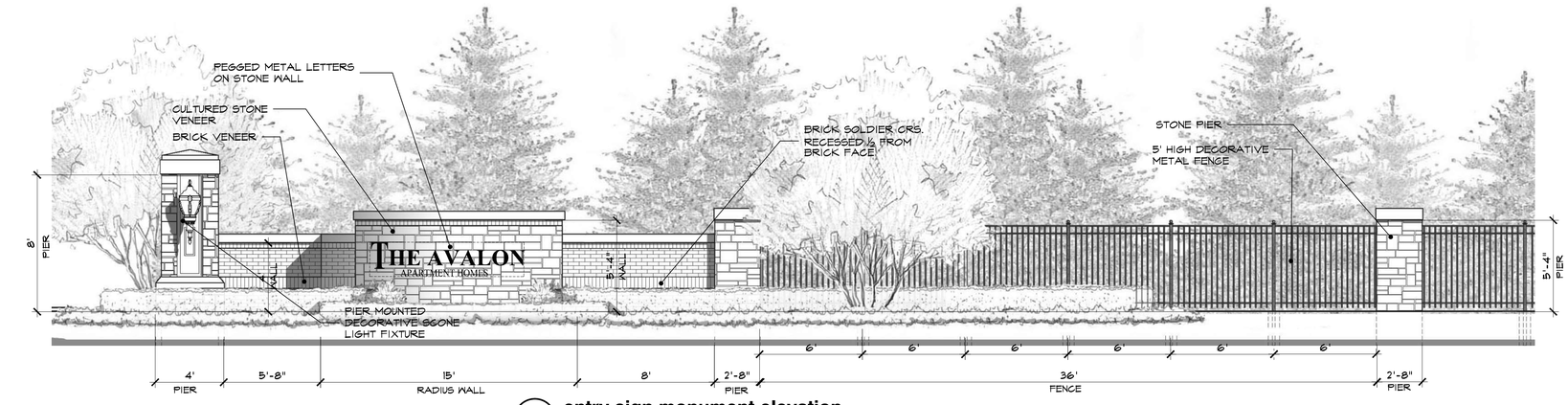
12A entry sign monument site plan
SCALE: 1" =20' - 0"



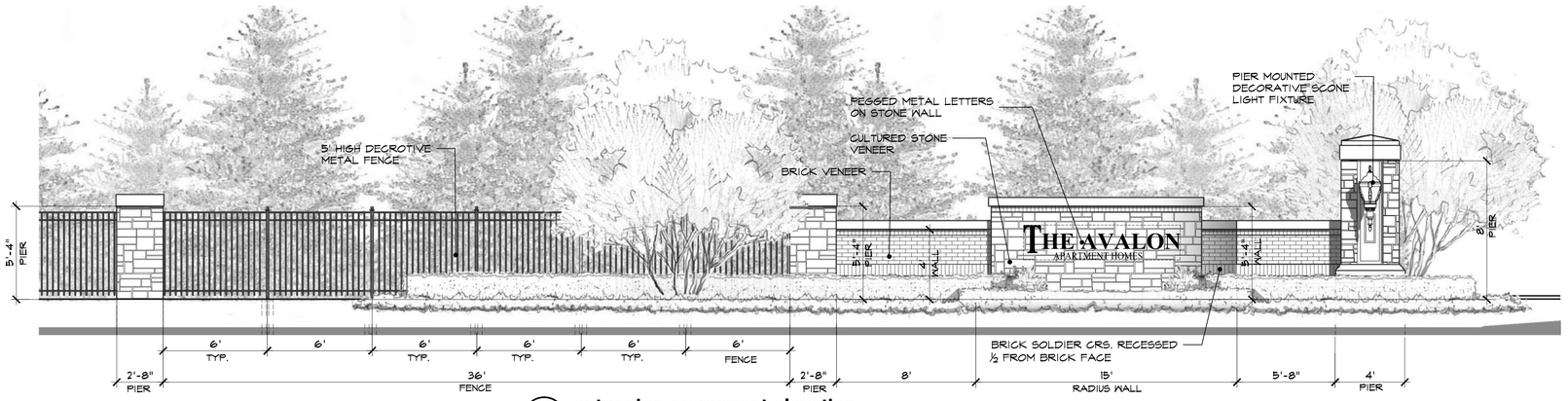
12B blvd. entry sign monument elevation
SCALE: 1/4" =1' - 0"



12C entry sign monument site plan
SCALE: 1" =20' - 0"



12D entry sign monument elevation
SCALE: 1/4" =1' - 0"



12E entry sign monument elevation
SCALE: 1/4" =1' - 0"

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fax. (248) 557-5416

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client:

WHITE LAKE HILL, LLC
31550 Northwestern Hwy
Farmington Hills, Michigan

project:

AVALON
A PLANNED MIXED USE RESIDENTIAL COMMUNITY

project location:

White Lake Twp. Michigan
Highland Road & Hill Road

sheet title:

ENTRANCE SIGN MONUMENT

job no./issue/revision date:

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LP22.056.08	TWP. REV.	8-25-2022
LP23.104.10	SITE UPDATE	10-2-2023
LS24.030.04	REVIEW	4-8-2024
LS24.030.05	SPA	5-20-2024
LS25.047.04	SPA	4-15-2025
LS25.047.09	TWP COMMENTS, SITE PLAN UPDATES	9-23-2025

drawn by:
JP, JM, LA

checked by:
FP

date:
4-15-2025

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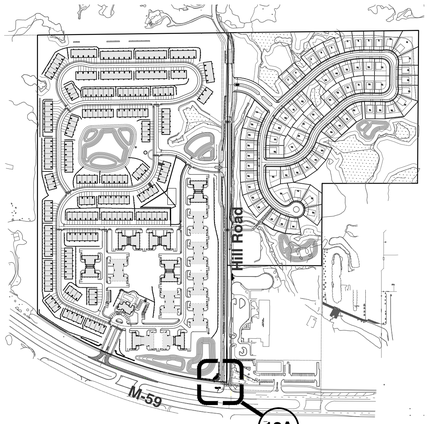
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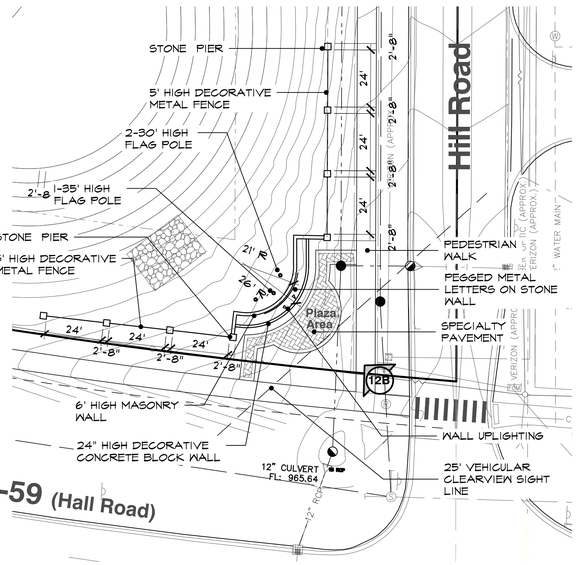
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project no:
LS25.047.04

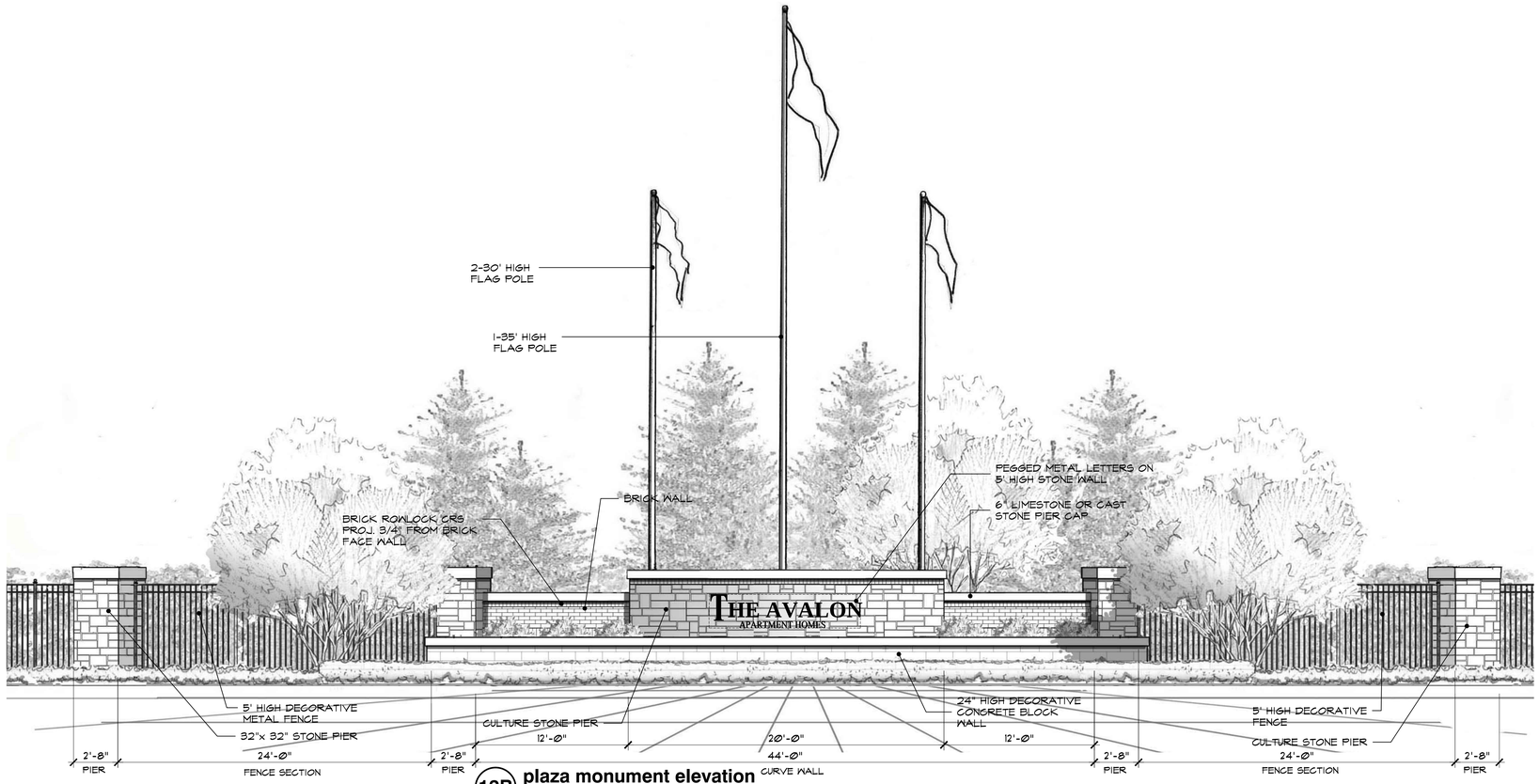
sheet no:
LS-12 of 16



key reference location map
NO SCALE



13A plaza monument site plan
SCALE: 1" =30' - 0"



12B plaza monument elevation
SCALE: 1/4" =1' - 0"

FPA
FELINO A. PASCUAL and ASSOCIATES
Community Land Planner and registered Landscape Architect
24333 Orchard Lake Rd, Suite G
Farmington Hills, MI 48336
ph. (248) 557-5588
fax. (248) 557-5416

seal:

STATE OF MICHIGAN
FELINO A. PASCUAL
LANDSCAPE ARCHITECT
No. 1033
REGISTERED LANDSCAPE ARCHITECT

client:

WHITE LAKE HILL, LLC
31550 Northwestern Hwy
Farmington Hills, Michigan

project:

AVALON
A PLANNED MIXED USE RESIDENTIAL COMMUNITY

project location:

White Lake Twp. Michigan
Highland Road & Hill Road

sheet title:

GATEWAY ENTRANCE SIGN MONUMENT

job no./issue/revision date:

LP22.056.07	REVIEW	7-27-2022
LP22.056.08	REVIEW	8-18-2022
LP22.056.08	TWP. REV.	8-25-2022
LP23.104.10	SITE UPDATE	10-2-2023
LS24.030.04	REVIEW	4-8-2024
LS24.030.05	SPA	5-20-2024
LS25.047.04	SPA	4-15-2025
LS25.047.09	TWP COMMENTS / SITE PLAN UPDATES	9-23-2025

drawn by:
JP, JM, LA

checked by:
FP

date:
4-15-2025

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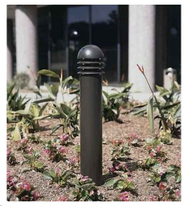
project no:
LS25.047.04

sheet no:
LS-13 of 16



A decorative pole and light

DECORATIVE BLVD. ISLAND SITE FIXTURE LIGHTS AND ALUMINUM POLE.



B bollard light

BY LITHONIA LIGHTS OR EQUAL MODEL. DSXB LED (D-SERIES LED BOLLARD 8"DIA.X42" HST.) OR EQUAL



C trash receptacle

MANUFACTURED BY BY ANOVA, INC.
WWW.ANOVAFURNISHINGS.COM
DESCRIPTION: 32 GAL
FINISH: TEXTURE PEWTER

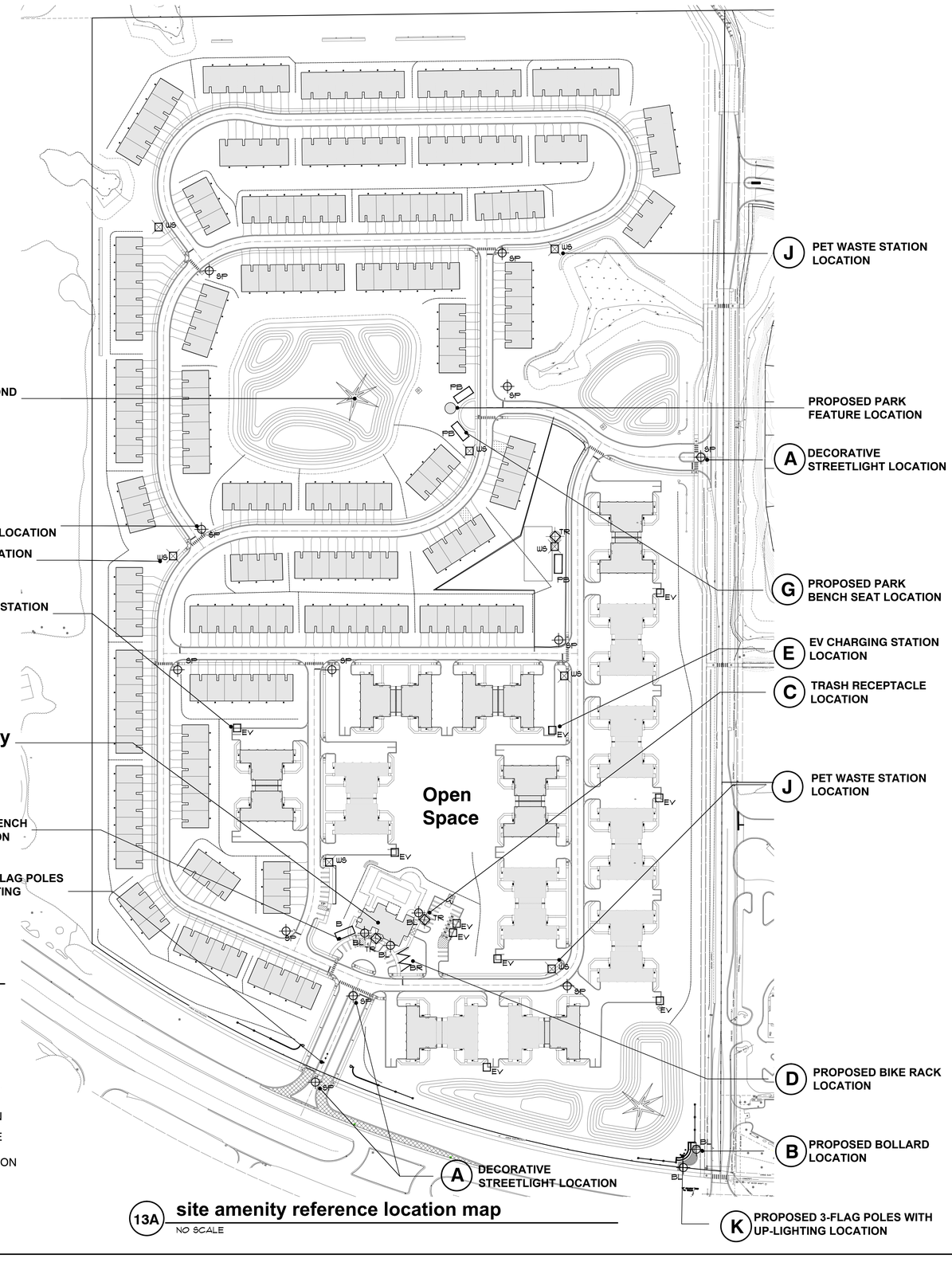


D bicycle rack

BIKE RACK BY DUMOR, INC. MODEL NO. 130-20 (5-2 SURFACE PLATE MOUNT) 2 3/8" O.D. BLACK POWER-COATED LOOP OR EQUAL



E EV charging station



site amenity key

- BR — BIKE RACK
- FB — PARK BENCH SEAT
- B — BENCH SEAT
- BL — BOLLARD LIGHT
- SP — STREET POLE LIGHT
- WS — PET WASTE STATION
- TR — TRASH RECEPTACLE
- EV — EV CHANGING STATION

13A site amenity reference location map

NO SCALE



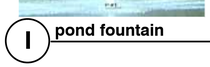
K flag pole with uplighting

BY ZERO WASTE USA
12316 WORLD TRADE DRIVE #102
SAN DIEGO, CA. 92128
PH. 800-784-2563
WWW.ZEROWASTEUSA.COM

MODEL NO. UBOO6-BLACK
DESCRIPTION: SENTRY DOG WASTE STATION (13"H X 13"W)



J pet waste station



I pond fountain



H dog walk



G park bench seating

6' WIDE PARK BENCH SEAT BY DUMOR, INC.
MODEL NO. 34-60D (S-1)
SUPPORT: S-1 EMBEDMENT
FINISH: BLACK POWER-COATED

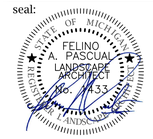


F decorative bench seating

MANUFACTURED BY BY ANOVA, INC.
WWW.ANOVAFURNISHINGS.COM
MODEL NO. LEXC6
DESCRIPTION: 6' WIDE CONTOUR BENCH
FINISH: TEXTURE PEWTER

FPA
FELINO A. PASCUAL and ASSOCIATES
Community Land Planner and registered Landscape Architect
24333 Orchard Lake Rd, Suite G
Farmington Hills, MI 48336
ph. (248) 557-5588
fax. (248) 557-5416

seal:



client:

WHITE LAKE HILL, LLC
31550 Northwestern Hwy
Farmington Hills, Michigan

project:

AVALON
A PLANNED MIXED USE RESIDENTIAL COMMUNITY

project location:

White Lake Twp. Michigan
Highland Road & Hill Road

sheet title:

SITE AMENITY PLAN

job no./issue/revision date:

LP22.056.07	REVIEW	7-27-2022
LP22.056.08	REVIEW	8-18-2022
LP22.056.08	TWP. REV.	8-25-2022
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LS24.030.05	SPA	5-20-2024
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LS25.047.09	TWP COMMENTS SITE PLAN UPDATES	9-23-2025

drawn by: **JP, JM, LA**
checked by: **FP**
date: **4-15-2025**
notice:

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project no: **LS25.047.04**

sheet no: **LS-14 of 16**

detention basin seed mix

A WETLAND SEED MIX FOR SATURATED SOILS IN A DETENTION POND OR FOR SEEDING A SATURATED BASIN, THIS MIX WILL TOLERATE HIGHLY FLUCTUATING WATER LEVELS AND POOR WATER QUALITY ASSOCIATED WITH URBAN STORMWATER WETLANDS AND PONDS. FOR DETENTION BASINS THAT EXPERIENCE LONG, DRY PERIODS, USE THE ECONOMY PRAIRIE SEED MIX IN THE UPPER THIRD TO HALF OF THE BASIN AREA IN COMBINATION WITH THIS MIX. THIS SEED MIX INCLUDES AT LEAST 10 OF 12 NATIVE PERMANENT GRASS AND SEDGE SPECIES AND 13 OF 17 NATIVE FORB SPECIES. APPLY AT 36.22 PLS POUNDS PER ACRE.

BOTANICAL NAME	COMMON NAME	PLS OZ/ACRE
PERMANENT GRASSES/SEDGES		
BOLBOSCHOENUS FLUVIATILIS	RIVER BULRUSH	1.00
CAREX CRISTATELLA	CRESTED OVAL SEDGE	0.50
CAREX LURIDA	BOTTLEBRUSH SEDGE	3.00
CAREX VULPINOIDEA	BROWN FOX SEDGE	2.00
ELYMUS VIRGINICUS	VIRGINIA WILD RYE	24.00
GLYCERIA STRIATA	FOWL MANNA GRASS	1.00
JUNCUS EFFUSUS	COMMON RUSH	1.00
LEERSIA ORYZOIDES	RICE CUT GRASS	1.00
PANICUM VIRGATUM	SWITCH GRASS	2.00
SCHOENOPLECTUS TABERNAEMONTANI	GREAT BULRUSH	3.00
SCIRPUS ATROVIRENS	DARK GREEN RUSH	2.00
SCIRPUS CYPERINUS	WOOL GRASS	1.00
	TOTAL	41.50
TEMPORARY COVER		
AVENA SATIVA	COMMON OAT	512.00
	TOTAL	512.00
FORBS		
ALISMA SUBCORDATUM	COMMON WATER PLANTAIN	2.50
ASCLEPIAS INCARNATA	SWAMP MILKWEED	2.00
BIDENS SPP. BIDENS	SPECIES	2.00
EUPATORIUM PERFOLIATUM	COMMON BONESET	1.00
HELENIUM AUTUMNALE	SNEEZEWEED	2.00
IRIS VIRGINICA V. SHREVEI	BLUE FLAG	4.00
LYCOPUS AMERICANUS	COMMON WATER HOREHOUND	0.50
MIMULUS RINGENS	MONKEY FLOWER	1.00
PENTHORUM SEDOIDES	DITCH STONECROP	0.50
PERSICARIA SPP.	PINKWEED SPECIES	2.00
RUDBECKIA SUBTOMENTOSA	SWEET BLACK-EYED SUSAN	1.00
RUDBECKIA TRILOBA	BROWN-EYED SUSAN	1.50
SAGITTARIA LATIFOLIA	COMMON ARROWHEAD	1.00
SENNA HEBECARPA	WILD SENNA	2.00
SYMPHYOTRICHUM LANCEOLATUM	PANICLED ASTER	0.50
SYMPHYOTRICHUM NOVAE-ANGLIAE	NEW ENGLAND ASTER	0.50
THALICTRUM DASYCARPUM	PURPLE MEADOW RUE	2.00
	TOTAL	26.00

economy prairie seed mix

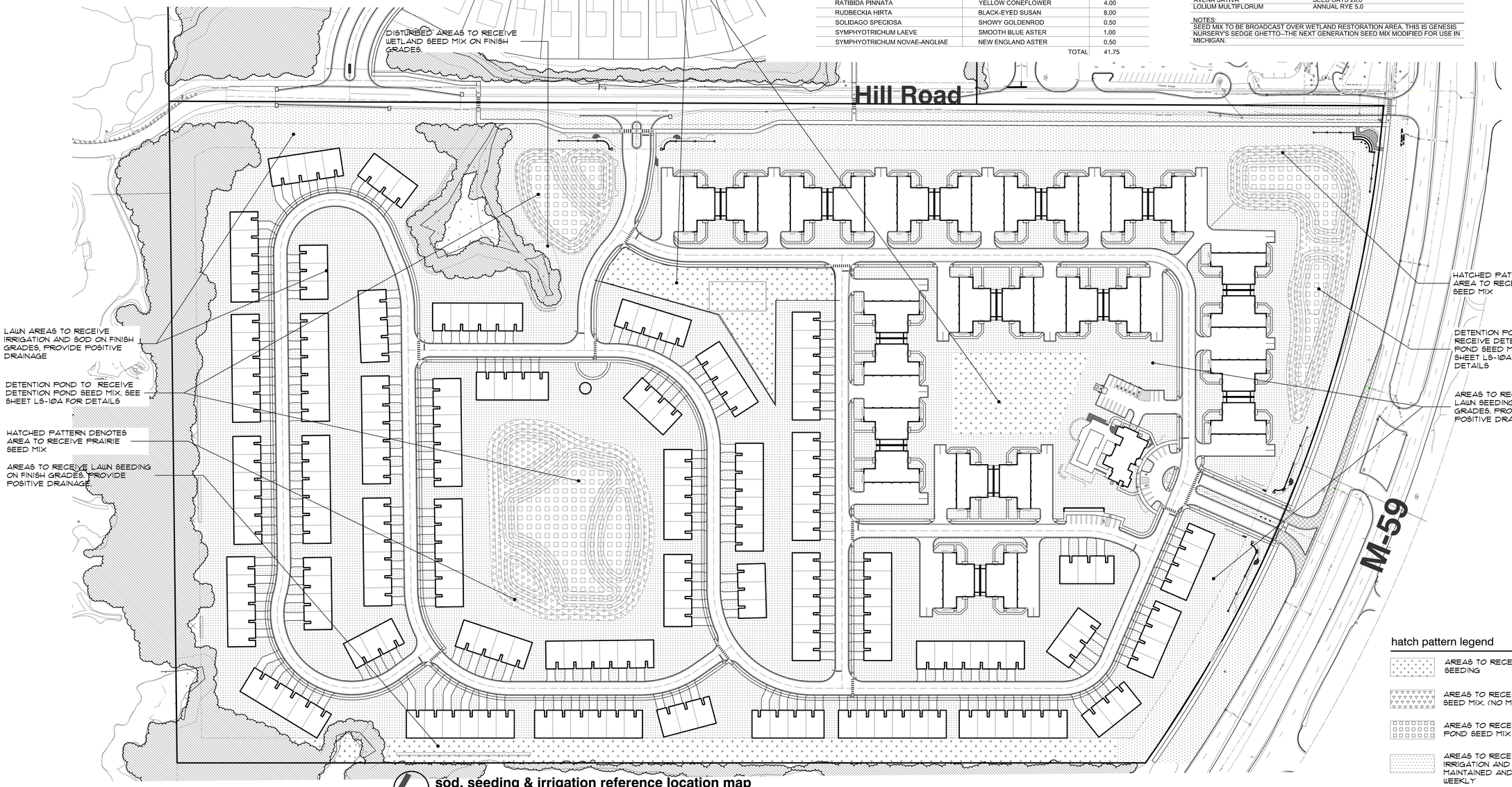
THIS PRAIRIE SEED MIX OFFERS AN ECONOMICAL WAY TO ESTABLISH A PRAIRIE. IN ADDITION TO NATIVE PRAIRIE GRASSES, FLOWERING SPECIES PROVIDE COLOR THROUGHOUT THE GROWING SEASON AND FOOD SOURCES FOR BIRDS AND BUTTERFLIES. ADDING SEED OR PLANT PLUGS AT A LATER DATE IS A WONDERFUL WAY TO INCREASE A PRAIRIE'S RICHNESS AND DIVERSITY. THIS SEED MIX INCLUDES AT LEAST 6 OF 7 NATIVE PERMANENT GRASS AND SEDGE SPECIES AND 10 OF 13 NATIVE FORB SPECIES. APPLY AT 40.95 PLS POUNDS PER ACRE.

BOTANICAL NAME	COMMON NAME	PLS OZ/ACRE
PERMANENT GRASSES/SEDGES		
ANDROPOGON GERARDII	BIG BLUESTEM	12.00
BOUTELOUA CURTIPENDULA	SIDE-OATS GRAMA	16.00
CAREX SPP.	PRAIRIE SEDGE SPECIES	3.00
ELYMUS CANADENSIS	CANADA WILD RYE	24.00
PANICUM VIRGATUM	SWITCH GRASS	2.50
SCHIZACHYRIUM SCOPARIUM	LITTLE BLUESTEM	32.00
SORGHASTRUM NUTANS	INDIAN GRASS	12.00
	TOTAL	101.50
TEMPORARY COVER		
AVENA SATIVA	COMMON OAT 512.00	
FORBS		
ASCLEPIAS SYRIACA	COMMON MILKWEED	1.00
ASCLEPIAS TUBEROSA	BUTTERFLY WEED	1.00
CHAMAECRISTA FASCICULATA	PARTRIDGE PEA	10.00
COREOPSIS LANCEOLATA	SAND COREOPSIS	6.00
ECHINACEA PURPUREA	BROAD-LEAVED PURPLE CONEFLOWER	8.00
HELIOPSIS HELIANTHOIDES	FALSE SUNFLOWER	0.25
MONARDA FISTULOSA	WILD BERGAMOT	0.50
PENSTEMON DIGITALIS	FOXGLOVE BEARD TONGUE	1.00
RATIBIDA PINNATA	YELLOW CONEFLOWER	4.00
RUDBECKIA HIRTA	BLACK-EYED SUSAN	8.00
SOLIDAGO SPECIOSA	SHOWY GOLDENROD	0.50
SYMPHYOTRICHUM LAEVE	SMOOTH BLUE ASTER	1.00
SYMPHYOTRICHUM NOVAE-ANGLIAE	NEW ENGLAND ASTER	0.50
	TOTAL	41.75

wetland seed mix:

SPECIES	COMMON NAME	RATE (LBS./AC.)
ALISMA SUBCORDATUM	COMMON WATER PLANTAIN	0.375
ASCLEPIAS INCARNATA	SWAMP MILKWEED	0.062
ASTER NOVA-ANGLIAE	NEW ENGLAND ASTER	0.062
ASTER SIMPLEX	PANICLED ASTER	0.031
BIDENS CERNUA	NODDING BUR MARIGOLD	0.312
BIDENS FRONDOSA	COMMON BEGGAR'S TICK	0.125
BOLTONIA LATISQUAMA	FALSE ASTER	0.188
CAREX BEBBII	BEBB'S SEDGE	0.125
CAREX COMOSA	BOTTLEBRUSH GRASS	0.125
CAREX LUPULINA C	COMMON HOP SEDGE	0.062
CAREX STIPATA	AWL-FRUITED SEDGE	0.125
CAREX SCOPARIA	POINTED BROOM SEDGE	0.125
CAREX VULPINOIDEA	FOX SEDGE	0.500
ELEOCHARIS SPECIES	SPIKE RUSH SPECIES	0.062
ELYMUS VIRGINICUS	VIRGINIA WILD RYE	1.500
EUPATORIUM MACULATUM	SPOTTED JOE PYE WEED	0.125
GLYCERIA STRIATA	FOWL MANNA GRASS	0.125
HELENIUM AUTUMNALE	SNEEZEWEED	0.250
IRIS VIRGINICA	SOUTHERN BLUE FLAG	0.188
JUNCUS SPECIES	RUSH SPECIES	0.062
LEERSIA ORYZOIDES	RICE CUT GRASS	0.188
LUDWIGIA POLYCARPA	FALSE LOOSESTRIFE	0.001
MIMULUS RINGENS	MONKEYFLOWER	0.031
ONOCLEA SENSIBILIS	SENSITIVE FERN	0.031
PENTHORUM SEDOIDES	DITCH STONECROP	0.001
POLYGONUM HYDROPIPEROIDES	MILD WATER PEPPER	0.750
RUDBECKIA LACINIATA	GREEN CONEFLOWER	0.125
SAGITTARIA LATIFOLIA	DUCK POTATO	0.062
SCIRPUS ATROVIRENS	DARK GREEN RUSH	1.250
SCIRPUS FLUVIATILIS	RIVER BULRUSH	0.125
SCIRPUS PENDULUS	RED BULRUSH	0.031
SCIRPUS VALIDUS	SOFT STEM BULRUSH	0.031
SPARGANIUM EURYCARPUM	COMMON BUR-REED	0.062
VERONONIA FASCICULATA	COMMON IRONWEED	0.062
VERBENA HASTATA	BLUE VERVAIN	0.125
	TOTAL	7.404
COVER CROP		
AVENA SATIVA	SEED OATS 20.0	
LOLIUM MULTIFLORUM	ANNUAL RYE 5.0	

NOTES:
SEED MIX TO BE BROADCAST OVER WETLAND RESTORATION AREA. THIS IS GENESIS NURSERY'S SEDGE GHETTO--THE NEXT GENERATION SEED MIX MODIFIED FOR USE IN MICHIGAN.



sod, seeding & irrigation reference location map
SCALE; 1"=100'-0"

FPA
FELINO A. PASCUAL and ASSOCIATES
Community Land Planner and registered Landscape Architect
24333 Orchard Lake Rd, Suite G
Farmington Hills, MI 48336
ph. (248) 557-5588
fax. (248) 557-5416

seal:
STATE OF MICHIGAN
FELINO A. PASCUAL
LANDSCAPE ARCHITECT
No. 4333
REGISTERED LANDSCAPE ARCHITECT

client:
WHITE LAKE HILL, LLC
31550 Northwestern Hwy
Farmington Hills, Michigan

project:
AVALON
A PLANNED MIXED USE RESIDENTIAL COMMUNITY

project location:
White Lake Twp. Michigan
Highland Road & Hill Road

sheet title:
SOD & SEEDING REFERENCE PLAN

job no./issue/revision date:

LP22.056.07	REVIEW	7-27-2022
LP22.056.08	REVIEW	8-18-2022
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drawn by:
JP, JM, LA
checked by:
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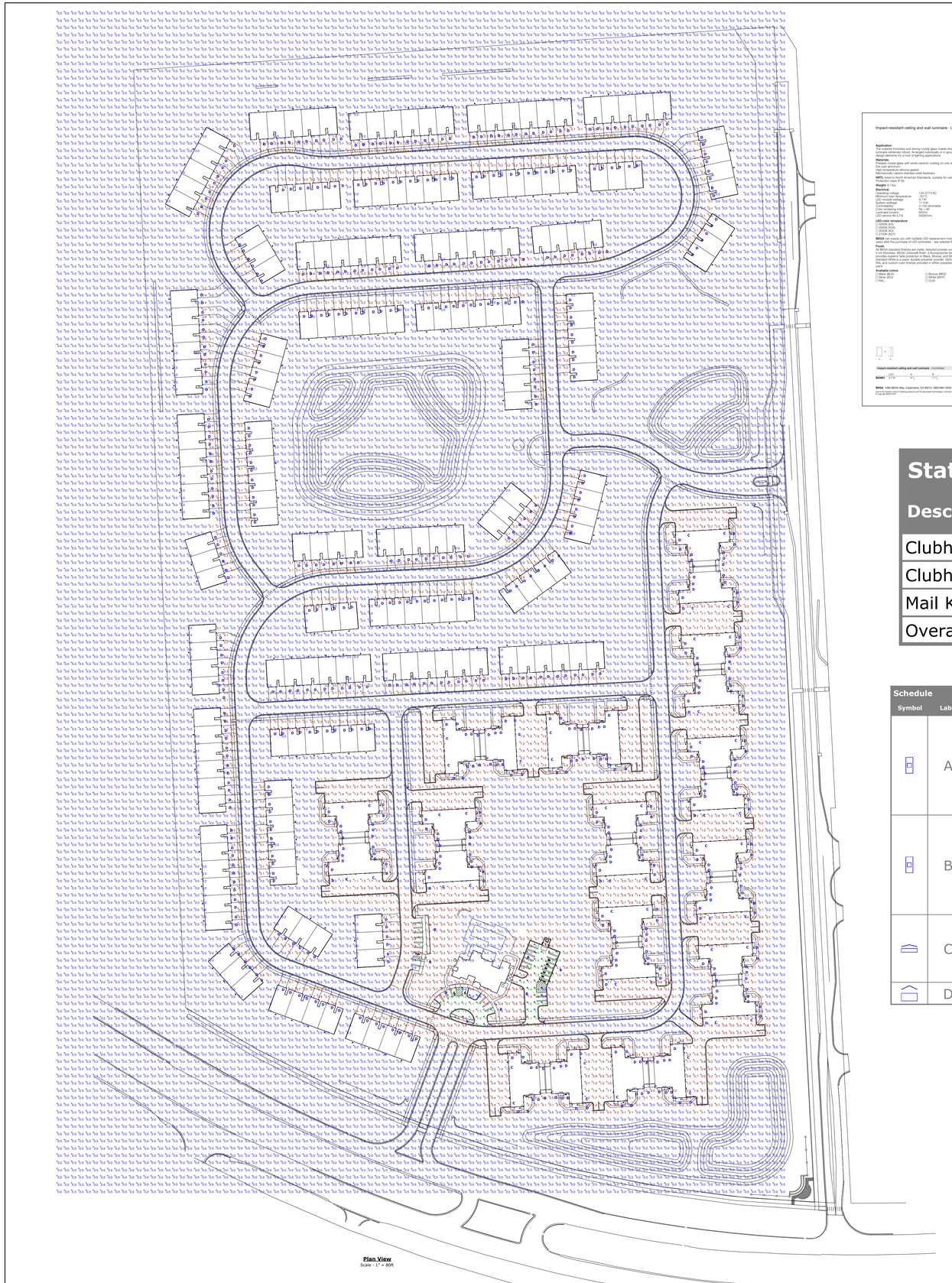
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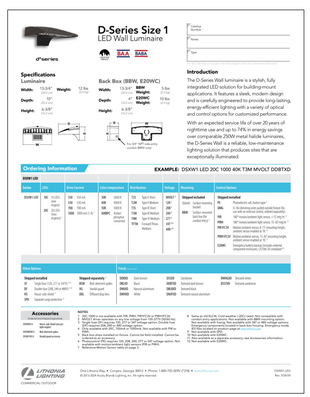
sheet no:
LS-15 of 16



Plan View
Scale - 1" = 80ft







Statistics

Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
Clubhouse Parking	+	1.2 fc	1.6 fc	0.8 fc	2.0:1	1.5:1
Clubhouse Parking	+	1.3 fc	1.9 fc	0.8 fc	2.4:1	1.6:1
Mail Kiosk Parking	+	1.2 fc	1.5 fc	0.9 fc	1.7:1	1.3:1
Overall	+	0.1 fc	3.2 fc	0.0 fc	N/A	N/A

Schedule

Symbol	Label	QTY	Manufacturer	Catalog	Description	Lamp Output	LLF	Input Power	Mounting Height
	A	1	Holophane	PUCL3 P40 30K xxxx FC5 CLGL	Taft LED Post-Top Full Cutoff Lantern 70W 3000 series CCT Type 5 distribution zero uplight Clear tempered glass lens No HSS, 3000K	8552	0.9	69.03	20'
	B	8	Holophane	PUCL3 P30 30K xxxx FC4 CLGL	Taft LED Post-Top Full Cutoff Lantern 60W 3000 series CCT Type 4 distribution zero uplight Clear tempered glass lens No HSS, 3000K	6134	0.9	58.5	20'
	C	52	Lithonia Lighting	DSXW1 LED 20C 530 30K TFTM MVOLT	DSXW1 LED WITH (2) 10 LED LIGHT ENGINES, TYPE TFTM OPTIC, 3000K, @ 530mA.	4066	0.9	34.9	13'
	D	679	BEGA		24 601 K3 3000K	603	0.9	12	6'

General Note
1. SEE SCHEDULE FOR LUMINAIRE MOUNTING HEIGHT.
2. SEE LUMINAIRE SCHEDULE FOR LIGHT LOSS FACTOR.
3. CALCULATIONS ARE SHOWN IN FOOTCANDLES AT: 0' - 0"

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 2019. FOR SPECIFIC INFORMATION CONTACT GBA CONTROLS GROUP AT ASG@GASSERBUSH.COM OR 734-266-6705.

Alternates Note
THE USE OF FIXTURE ALTERNATES MUST BE RESUBMITTED TO THE CITY FOR APPROVAL.

Drawing Note
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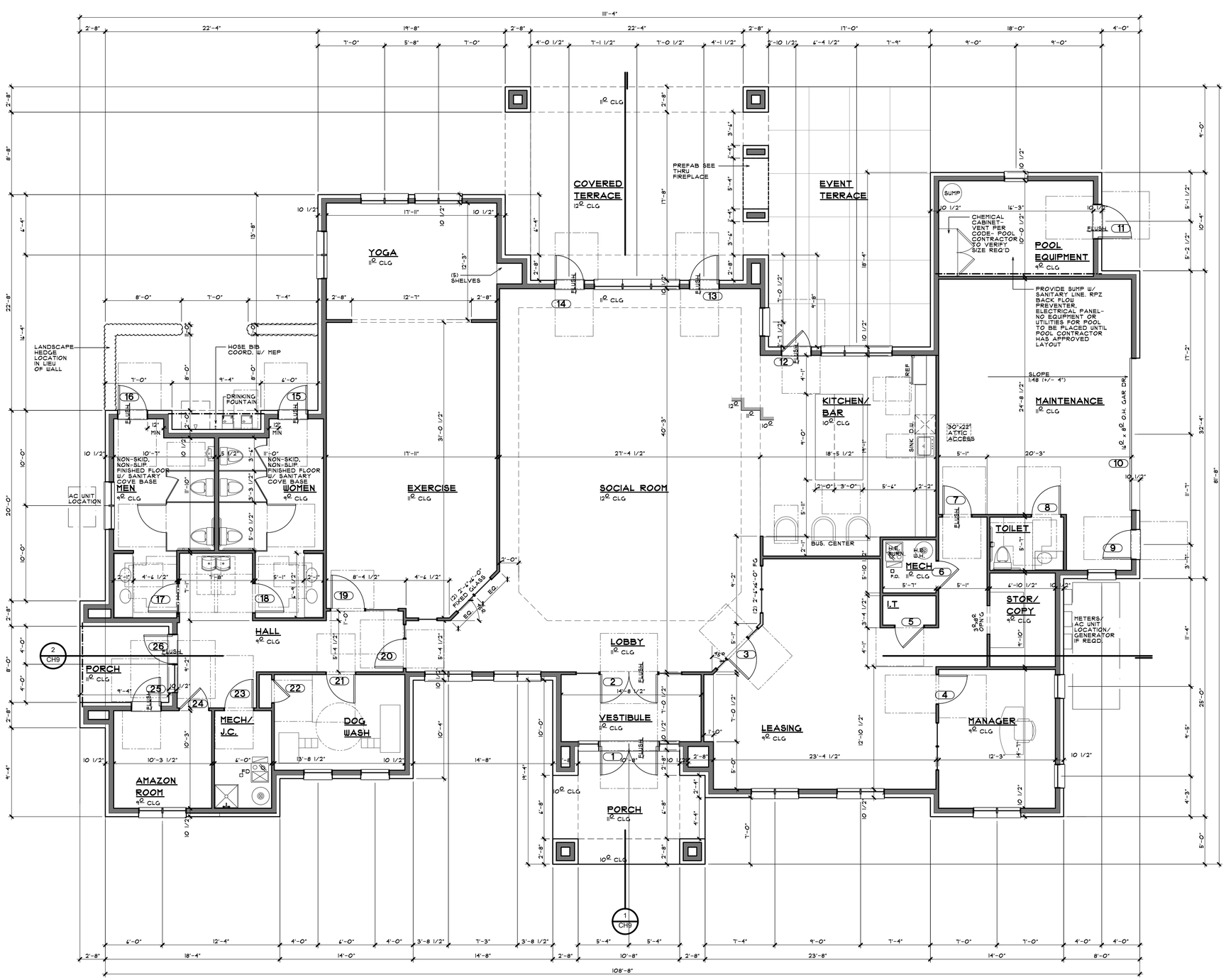
Ordering Note
FOR INQUIRIES CONTACT GASSER BUSH AT QUOTES@GASSERBUSH.COM OR 734-266-6705.

Mounting Height Note
MOUNTING HEIGHT IS MEASURED FROM GRADE TO FACE OF FIXTURE. POLE HEIGHT SHOULD BE CALCULATED AS THE MOUNTING HEIGHT LESS BASE HEIGHT.

WHITE LAKE AVALON APARTMENTS
WHITE LAKE, MICHIGAN
GASSER BUSH ASSOCIATES
WWW.GASSERBUSH.COM

Designer KS
Date 09/22/2025
Scale Not to Scale
Drawing No. #24-31163_V2

NOTE: STRUCTURE SHOWN FOR REFERENCE ONLY. REFER TO STRUCTURAL DRAWINGS BY OTHERS FOR ADDITIONAL INFORMATION.



FIRST FLOOR PLAN

SCALE: 3/16" = 1'-0"

SQUARE FOOTAGE	
IST FLOOR	4495 SQ. FT.
MAINT. AREA	540 SQ. FT
TOTAL	5035 SQ. FT.
TOTAL EXTERIOR	5428 SQ. FT.

1 FLOOR PLAN

SCALE: 3/16" = 1'-0"

ALL INTERIOR PARTITION DIMENSIONS ARE 3 1/2" UNLESS NOTED OTHERWISE.

BEFORE CONSTRUCTION OBTAIN WINDOW & DOOR ROUGH OPENING SIZES FROM WINDOW/DOOR SUPPLIER.

TRUSS DESIGNER/FABRICATOR SEE SHEET #2 FOR ADDITIONAL NOTES & INFORMATION

SEE SHEET #T-1 THRU L-1 FOR ADDITIONAL NOTES REGARDING DRAWINGS & CONSTRUCTION.

DO NOT SCALE THESE DRAWINGS. USE CALCULATED DIMENSIONS. IF VARIATIONS OCCUR CONTACT ARCHITECT FOR CLARIFICATION.

NOTE TO BUILDING OFFICIAL: THIS DRAWING IS NOT VALID UNLESS THE SIGNATURE AND SEAL ARE IN BLUE INK.

Alexander V. Boggerts + Associates, P.C. ▪ Architecture ▪ Planning ▪ Interior Design
2445 Franklin Road
Bloomfield Hills, MI 48302
248▪334▪5000

SHEET TITLE: FIRST FLOOR PLAN

PRELIMINARY

CLIENT/PROJECT: SHAPIRO DEVELOPMENT
COMMUNITY BUILDING
GENOA TOWNSHIP, MICHIGAN

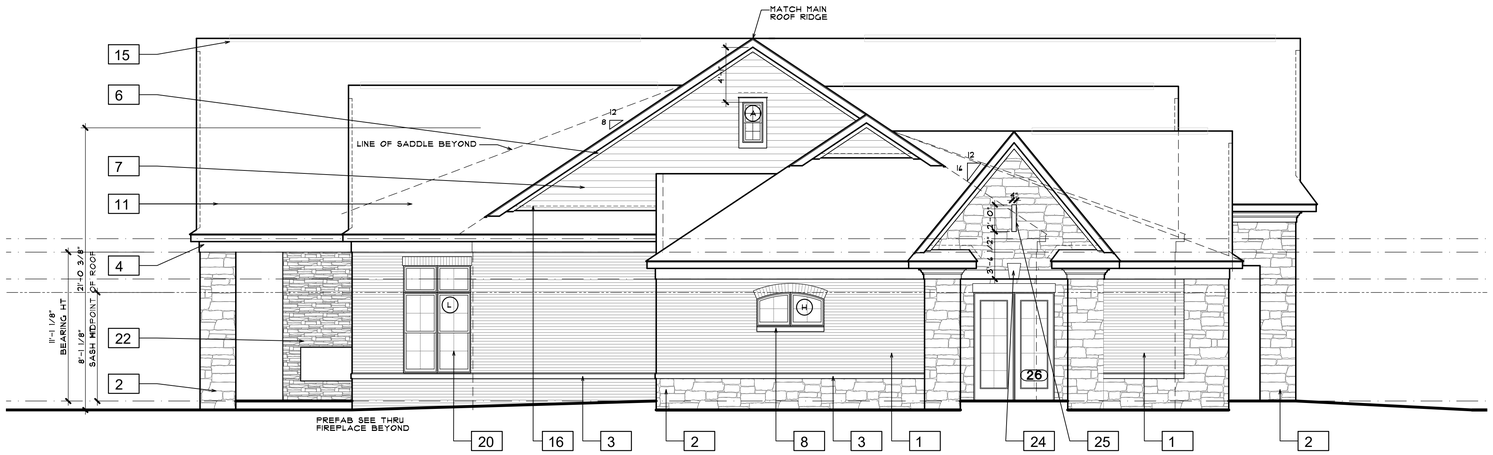
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■ PRELIMINARY/SPA 06-11-2024
☐ BIDS
☐ PERMITS
☐ CONSTRUCTION

REVISIONS

DRAWN BY: MAS
CAD FILENAME: 02 2763PLAN.DWG
CHECKED BY:
JOB NUMBER: 2763
DATE:
SHEET NUMBER: CH-4

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2 CH6 LEFT SIDE ELEVATION

SCALE: 3/16" = 1'-0"

EXTERIOR MATERIAL LEGEND (GENOVA)	
KEY NAME	MATERIAL
1	Brick (Field)
2	Stone
3	Stone Band
4	Trim (Fascia & Frieze)
5	Trim (1x6)
6	Trim (1x6 Rake & 1x4 Trim)
7	Horizontal Vinyl Siding
8	Brick Window sills
9	Brick Soldier course
10	Stone header
11	Roofing: Asphalt
12	Soffit
13	Entry Doors (Full Lite)
14	Service door
15	Roof Vent
16	Metal Flashing
17	Caulking
18	Gutters and Downspouts @ Main Roof
19	Fixed glass
20	Single Hung Window
21	Decorative Gable Vent
22	Stone @ Exterior Fireplace
23	Garage Door
24	Stone Key
25	Stone Accent

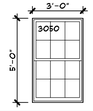
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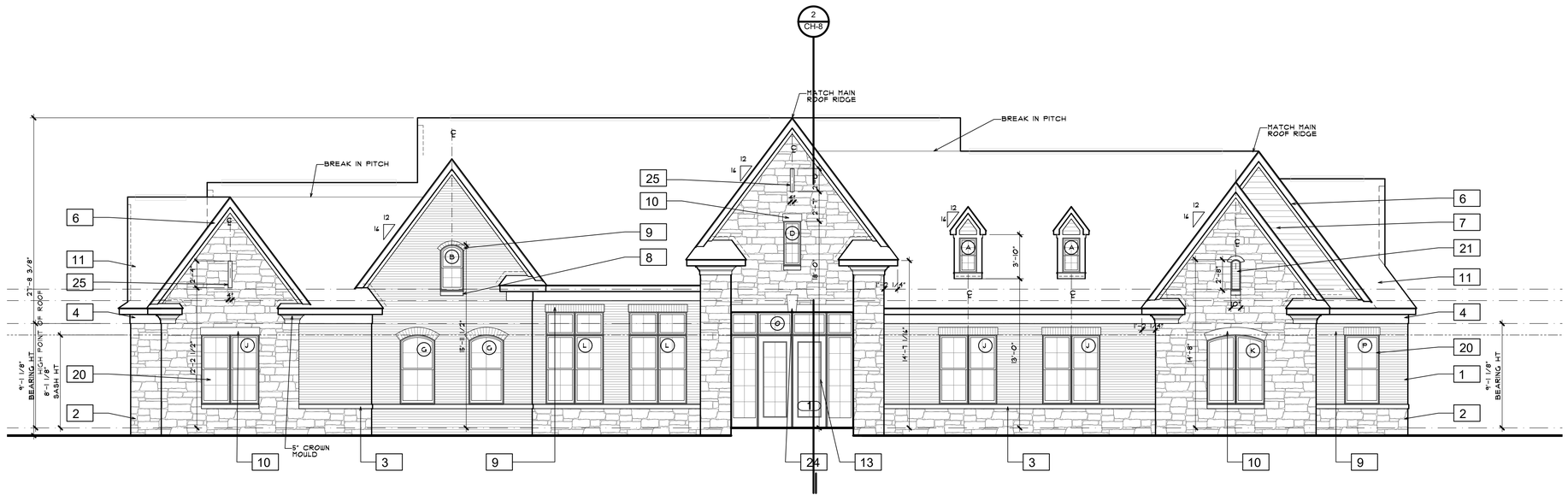
PROVIDE GUTTERS AND DOWNSPOUTS FOR DRAINAGE OF ROOF WATER. ROOF WATER, DOWNSPOUTS ARE TO BE LOCATED SO THAT THE DISCHARGE WILL NOT SPILL ON OR FLOW ACROSS ANY PORCHES, WALKS OR DRIVES.

TYP. WINDOW DESIGNATION

GENERAL REFERENCE FOR ROUGH OPENING SIZES ONLY.

CONSULT WITH WINDOW MANUFACTURER FOR EXACT WINDOW SIZES & REQUIREMENTS.





1 CH6 FRONT ELEVATION

SCALE: 3/16" = 1'-0"

PROVIDE NON-COMB. ROOF SHTG. FROM EDGE OF RATED CONST. AND EXTEND MIN. 4'-0" BEYOND (BOTH SIDES OF COMMON WALL)

ALL INTERIOR PARTITION DIMENSIONS ARE 3 1/2" UNLESS NOTED OTHERWISE.

BEFORE CONSTRUCTION OBTAIN WINDOW & DOOR ROUGH OPENING SIZES FROM WINDOW/DOOR SUPPLIER.

TRUSS DESIGNER/FABRICATOR SEE SHEET #2 FOR ADDITIONAL NOTES & INFORMATION

SEE SHEET #T-1 THRU L-1 FOR ADDITIONAL NOTES REGARDING DRAWINGS & CONSTRUCTION.

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Bloomfield Hills, MI 48302
248•334•5000

SHEET TITLE: BUILDING ELEVATIONS

PRELIMINARY

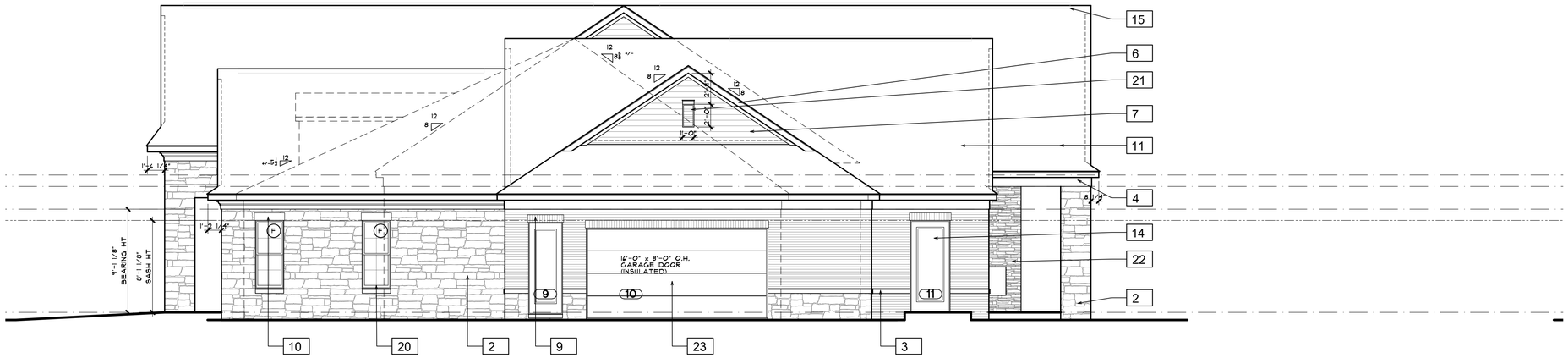
CLIENT/PROJECT: SHAPIRO DEVELOPMENT
COMMUNITY BUILDING
GENOA TOWNSHIP, MICHIGAN

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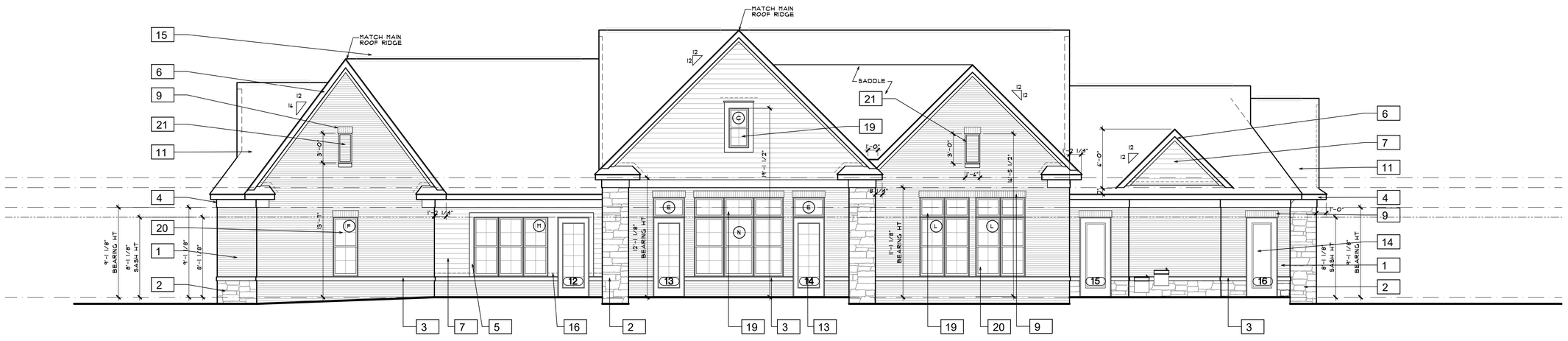
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2 CH7 RIGHT SIDE ELEVATION

SCALE: 1/4" = 1'-0"



1 CH7 REAR ELEVATION

SCALE: 1/4" = 1'-0"

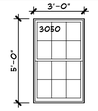
DRAINAGE

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SHEET TITLE: BUILDING ELEVATIONS

PRELIMINARY

CLIENT/PROJECT: SHAPIRO DEVELOPMENT
COMMUNITY BUILDING
GENOA TOWNSHIP, MICHIGAN

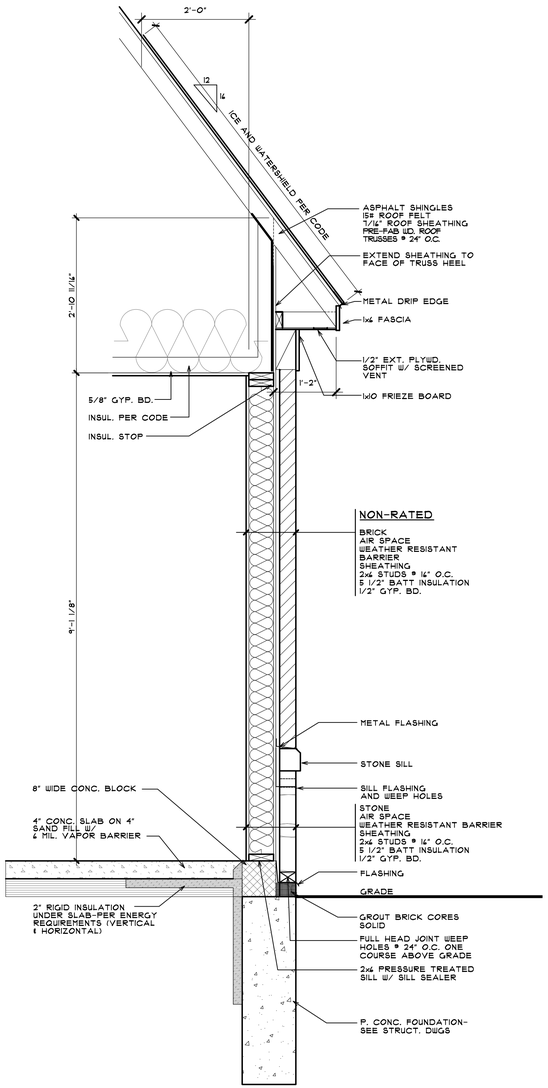
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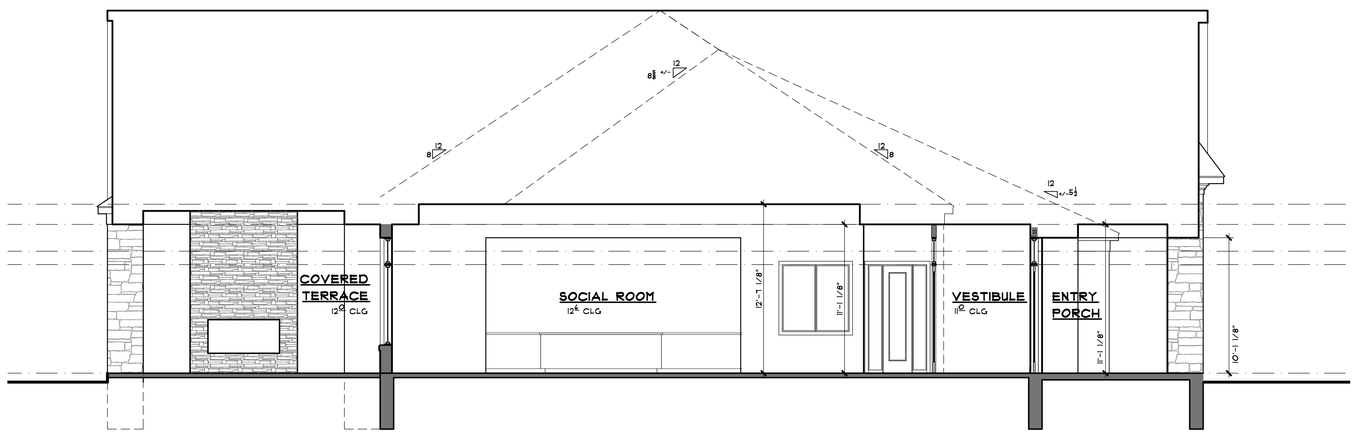
3 C8 WALL SECTION

SCALE: 3/4" = 1'-0"



2 CH-8 BUILDING SECTION

SCALE: 3/16" = 1'-0"



1 CH-8 BUILDING SECTION

SCALE: 3/16" = 1'-0"

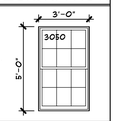
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SHEET TITLE: BUILDING SECTIONS

PRELIMINARY

CLIENT/PROJECT:
SHAPIRO DEVELOPMENT
COMMUNITY BUILDING
GENOA TOWNSHIP, MICHIGAN

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SHEET NUMBER: CH-8

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PROVIDE BLOCKING FOR FUTURE GRAB BARS AS PER OPTION "B" SECTION 1004.11.3.2 SEE DETAILS ON SHEET #10 FOR REQUIRED LOCATIONS

2 HOUR FIRE WALL

2 HOUR FIRE WALL TO EXTEND TO END OF WALL

MATCH LINE

8'-0" DROPPED CEILING HT. IN SHADED AREA

3/8" PLYWOOD OR ½" DRYWALL DRAFTSTOP IN TRUSS SPACE

LINE OF DECK ABOVE

12" x 12" DROP SOFFIT VERIFY HT.

NOTE: PATIO SLAB TO BE FLUSH WITH INTERIOR FLOOR ON ACCESSIBLE UNITS ONLY & 4" BELOW FLOOR ON ALL OTHER UNITS

Bath

Bedroom #1

Closet

Porch
CONC. SLAB

ESGRESS (2) 3'-4" x 6'-0"

Dining Room

Living Room
Unit A

Kitchen

RANGE w/ HOOD FAN

D.W.

6' X 3' ISLAND

Foyer A

Foyer B

CLOSET

Porch
CONC. SLAB SLOPE ¼"

8"x8" BOXED WOOD COLUMN AROUND TR'D 4x4 POST – TYP.

Bedroom #2

Bath

Closet

LINEN

Laundry
4'-0" OPEN'G

F.D.

W.H.

Vest A

Vest B

Closet

Water Meter Room

Foyer C

Porch

Garage A
SLOPE FLOOR 4" TO DOOR

Garage B
SLOPE FLOOR 4" TO DOOR

Garage C
SLOPE FLOOR 4" TO DOOR

LOAD BEARING WALL

(2) 1 3/4"x14" LVL

(3)2x6

L6 x 4 x 5/16

(2) 1½" x 11 7/8" LVLs

2x10 P.T. JOISTS @ 16" o/c

14" DEEP FLOOR TRUSS @ 19.2" o/c

1 HR. FIRE RATED

2x8 RAFTERS & 2x6 CLG JST @ 16"o/c

4x4 TR'D POST

6x6 TR'D POST

VERIFY DOOR & METER ROOM SIDE PER UTILITY LOCATION ON SITE

OPEN ABOVE

22" DEEP TRUSSES @ 19.2" o/c

22" DEEP TRUSS GIRDER

22" DEEP FLOOR TRUSS @ 19.2" o/c

GIRDER TRUSS

2x10 P.T. @ 16" o/c

(3) 2x6 BR'G & (2) 2x6 F.H. @ EACH END

(2) TIE DOWN HOLDOWNS

(1) STRAP TIE HOLDOWN

(3) 1 3/4"x18" LVL

SIMPSON #STHD-14 STRAP TIE HOLDOWN – (1) ADJACENT TO EACH END OF GARAGE DOORS. 14" EMBEDMENT IN CONCRETE FOOTING, FILL BLOCK SOLID w./ CONCRETE (TYPICAL)

NOTE:
THE DOORS SEPERATING THE GARAGES & THE APARTMENTS SHALL HAVE A 20 MINUTE FIRE RATING IN COMPLIANCE WITH SECTION 716.5.3. DOORS SHALL HAVE A DOOR CLOSER AND A SELF CLOSING LATCH DEVICE AS PER SECTION 406.3.4 2012 MICHIGAN BUILDING CODE.

WALL TYPE KEY
- NO FIRE RATING
- 1 HOUR FIRE RATED PARTITION
- 2 HOUR FIRE RATED WALL
- LOAD BEARING

2x10 STUDS @ 16" o/c

2x4 STUDS @ 16" o/c

3/8" PLYWOOD OR ½" DRYWALL DRAFTSTOP IN TRUSS SPACE ABOVE WALL

20 MIN FIRE DOOR

RAISED CONCRETE 4" CURB

16'-0"x7'-0" OVERHEAD DOOR

LINE OF SECOND FLOOR ABOVE

LINE OF DECK ABOVE

65'-8"

56'-0"

112'-0" FULL BUILDING

147'-0 1/2" FULL BUILDING

75'-6 1/4" HALF BUILDING

56'-0" HALF BUILDING

First Floor Plan

Scale: 1/4" = 1'-0"

Type "B" Units

ALL UNITS EXCEPT FOR:
BUILDINGS #3, #4 & #9 – SEE SHEET #10
BUILDING #10 – SEE SHEET #11

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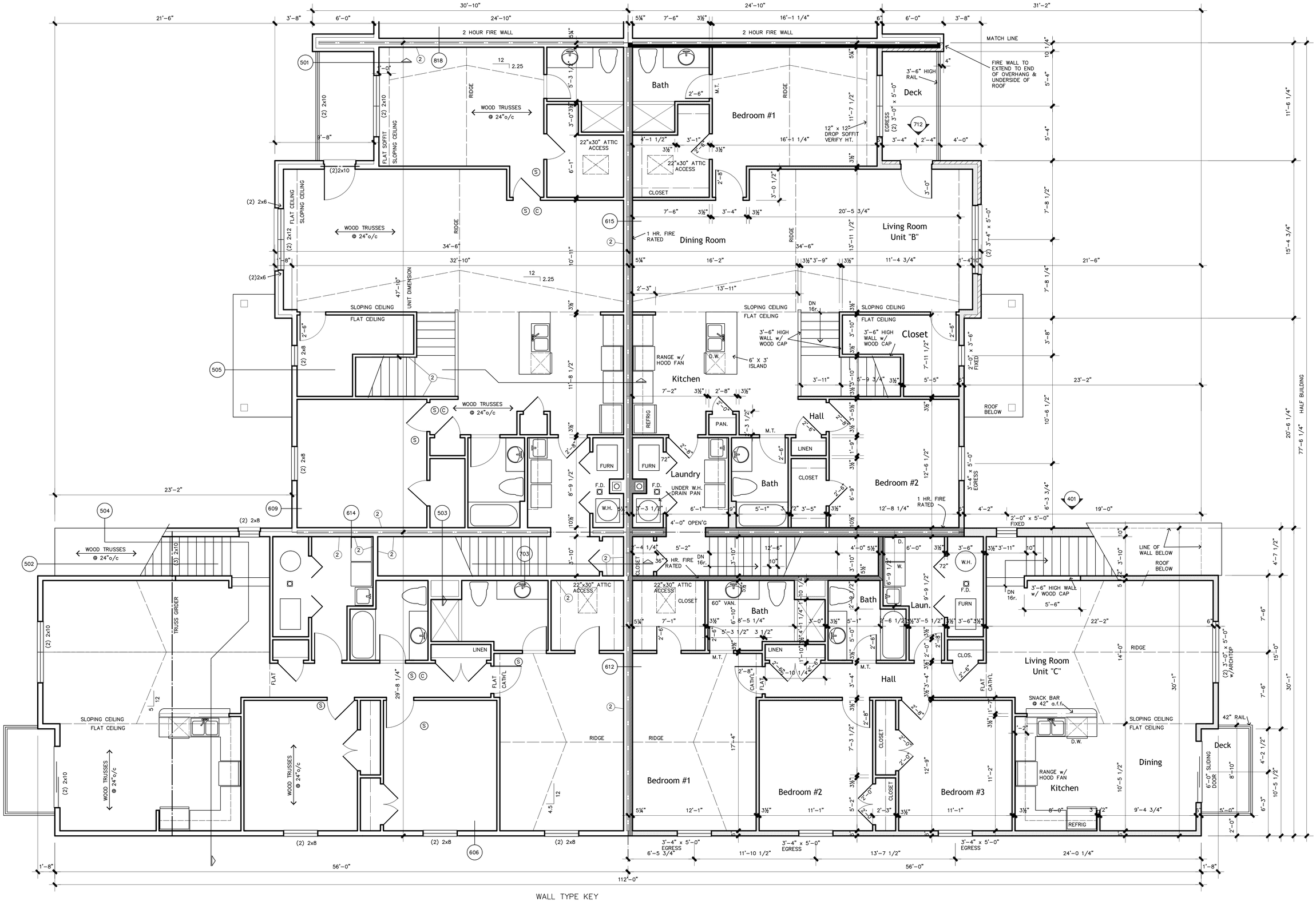
MJC
12 - Plex Condominiums

burmann
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1441 S. Clarkston • Milford, MI 48381-2455
Office 586-752-5910
greatarchitects@charter.net 586-201-1602 Cell
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Sheet Contents:

First Floor Plan

Job:	18173
Drawn by:	REB
Date:	27JUN18
Sheet Number:	2



WALL TYPE KEY

- NO FIRE RATING
- 1 HOUR FIRE RATED PARTITION
- 2 HOUR FIRE RATED WALL
- LOAD BEARING

Second Floor Plan

Scale: 1/4" = 1'-0"

ALL UNITS "B" & "C" ARE NOT ACCESSIBLE UNITS.

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burmann

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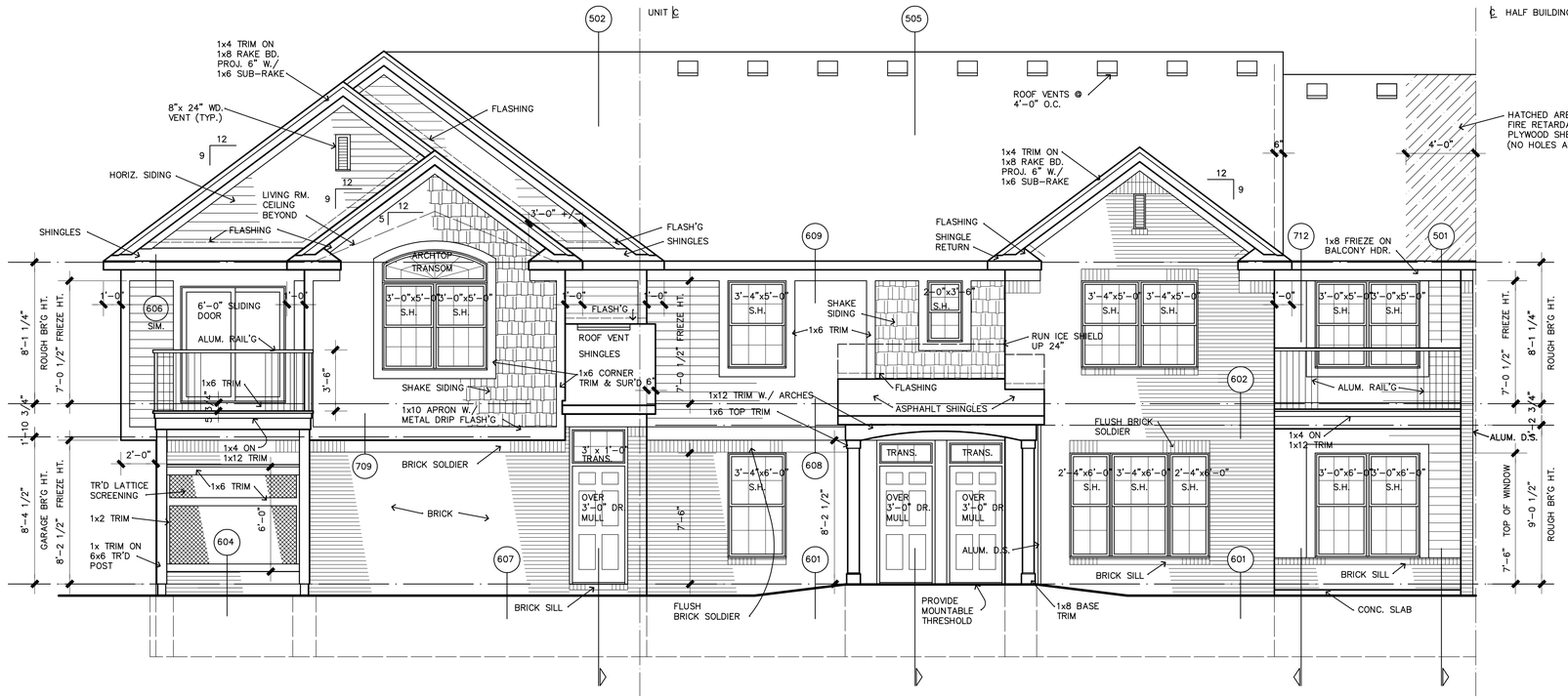
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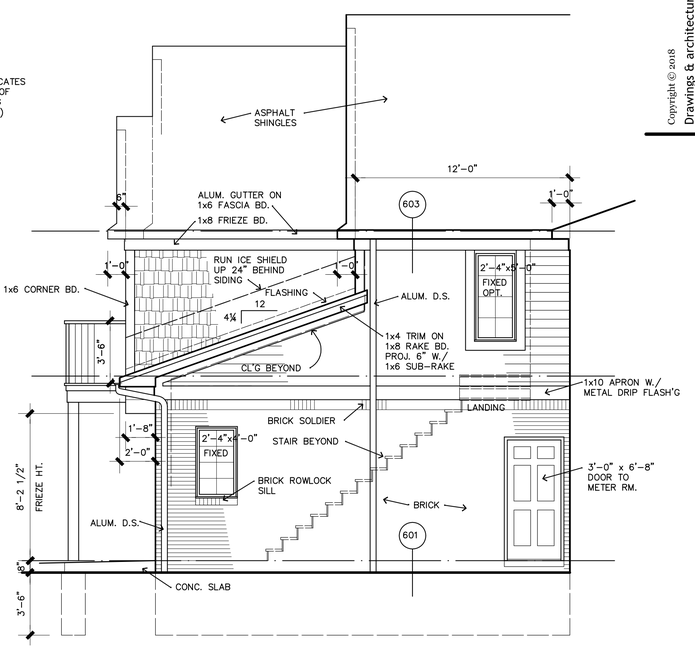
Second Floor

Job:	18173
Drawn by:	REB
Date:	17JUL18
Sheet Number:	3-A



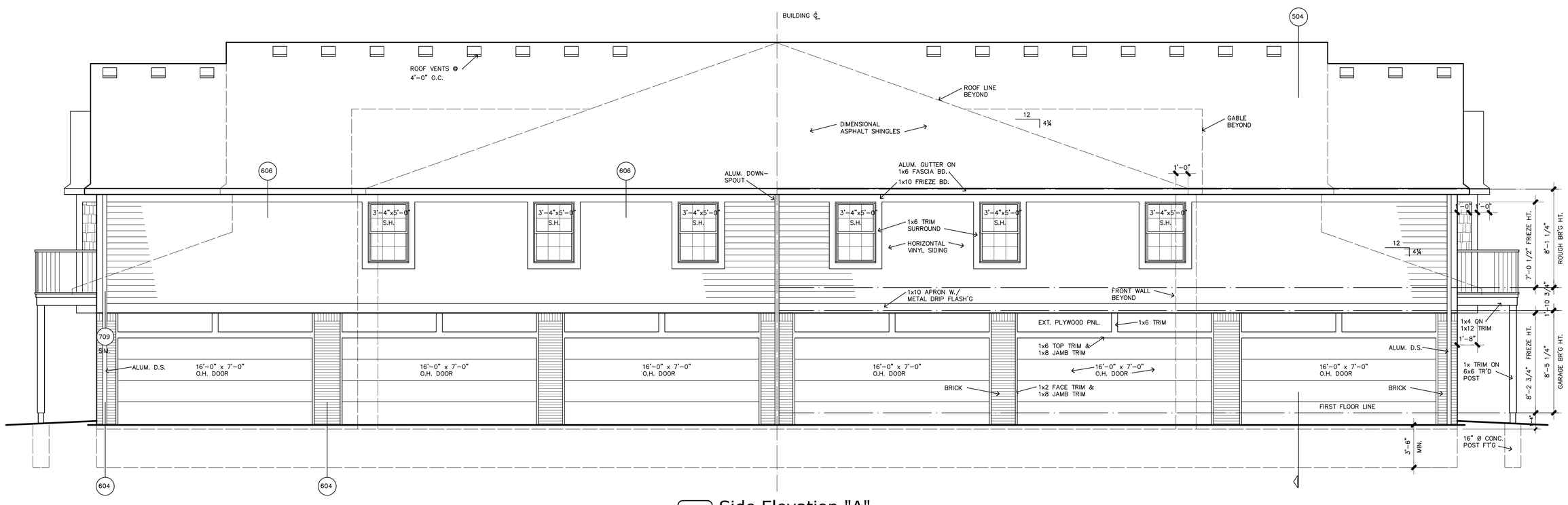
Front/Rear Elevation "A"

Scale: 1/4" = 1'-0"



Partial Elevation "A"

Scale: 1/4" = 1'-0"



Side Elevation "A"

Scale: 1/4" = 1'-0"

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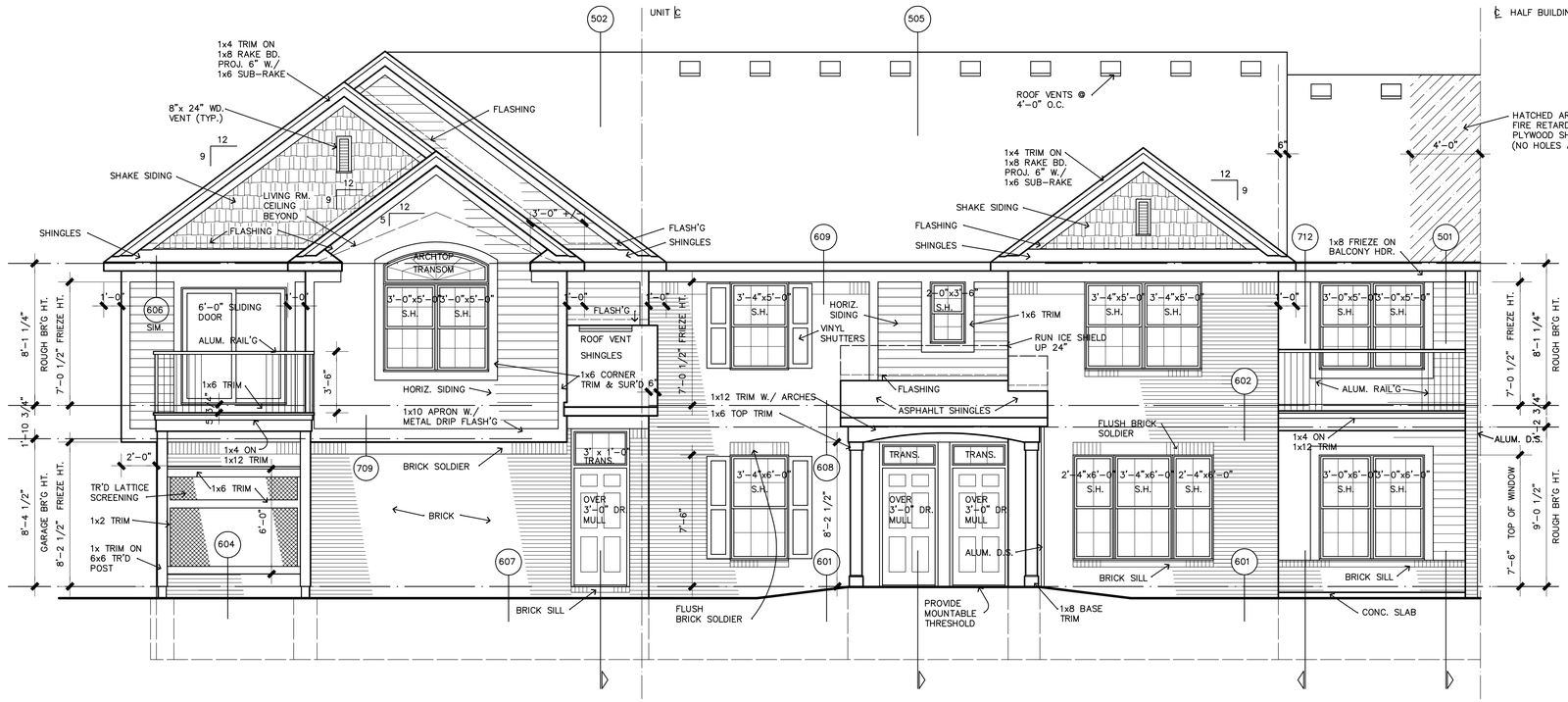
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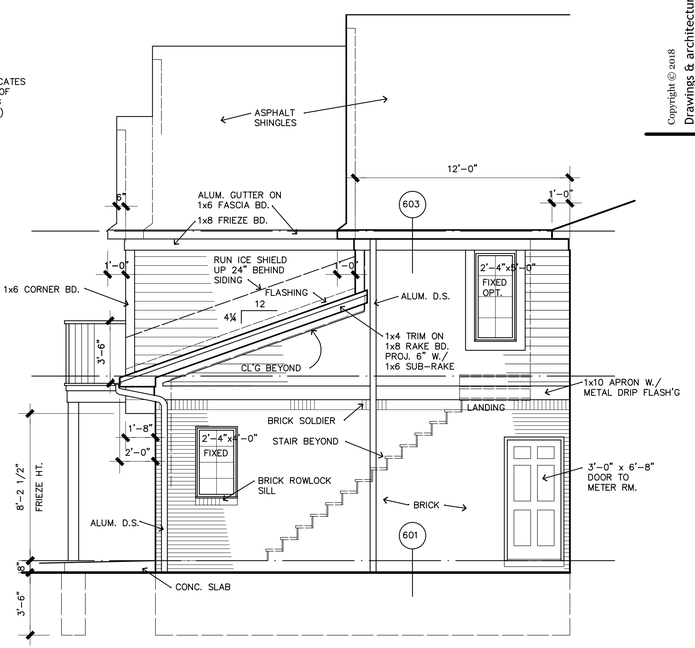
Elevations

Job:	18173
Drawn by:	MAK
Date:	17JUL18
Sheet Number:	4-A



Front/Rear Elevation "B"

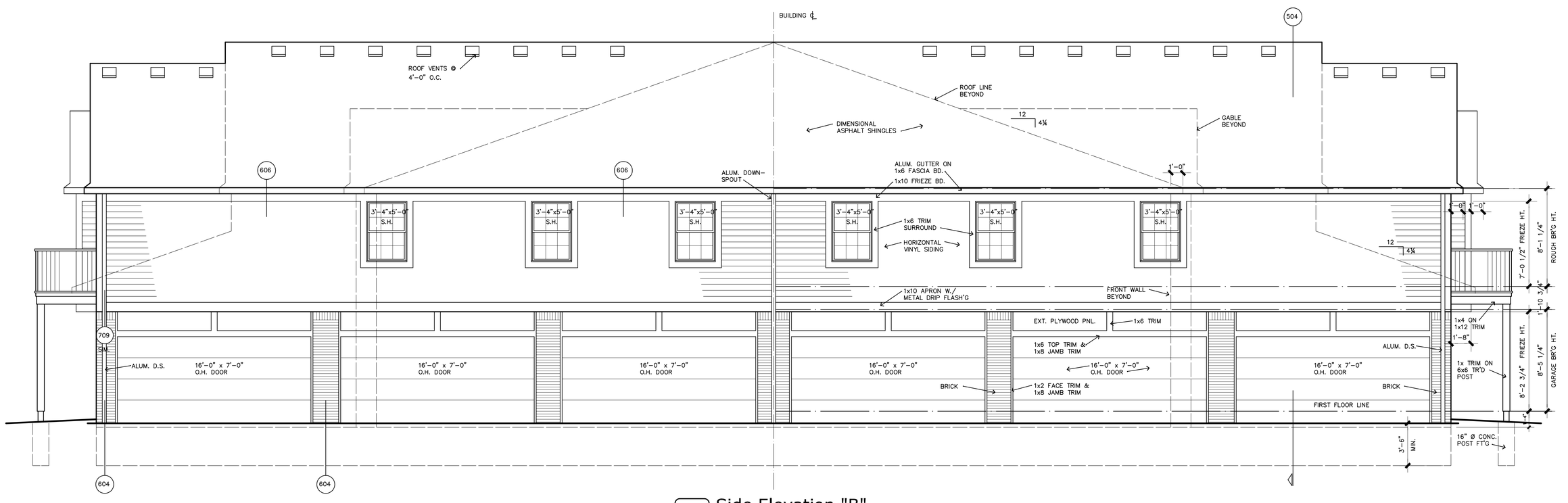
Scale: 1/4" = 1'-0"



401

Partial Elevation "B"

Scale: 1/4" = 1'-0"



Side Elevation "B"

Scale: 1/4" = 1'-0"

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M J C

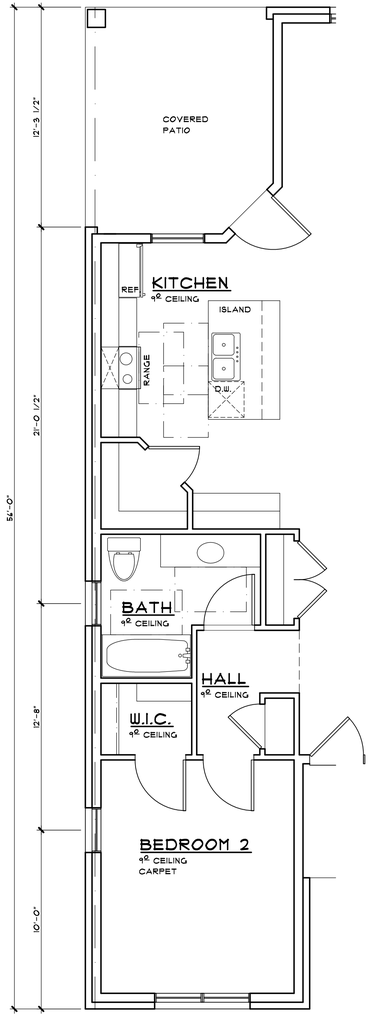
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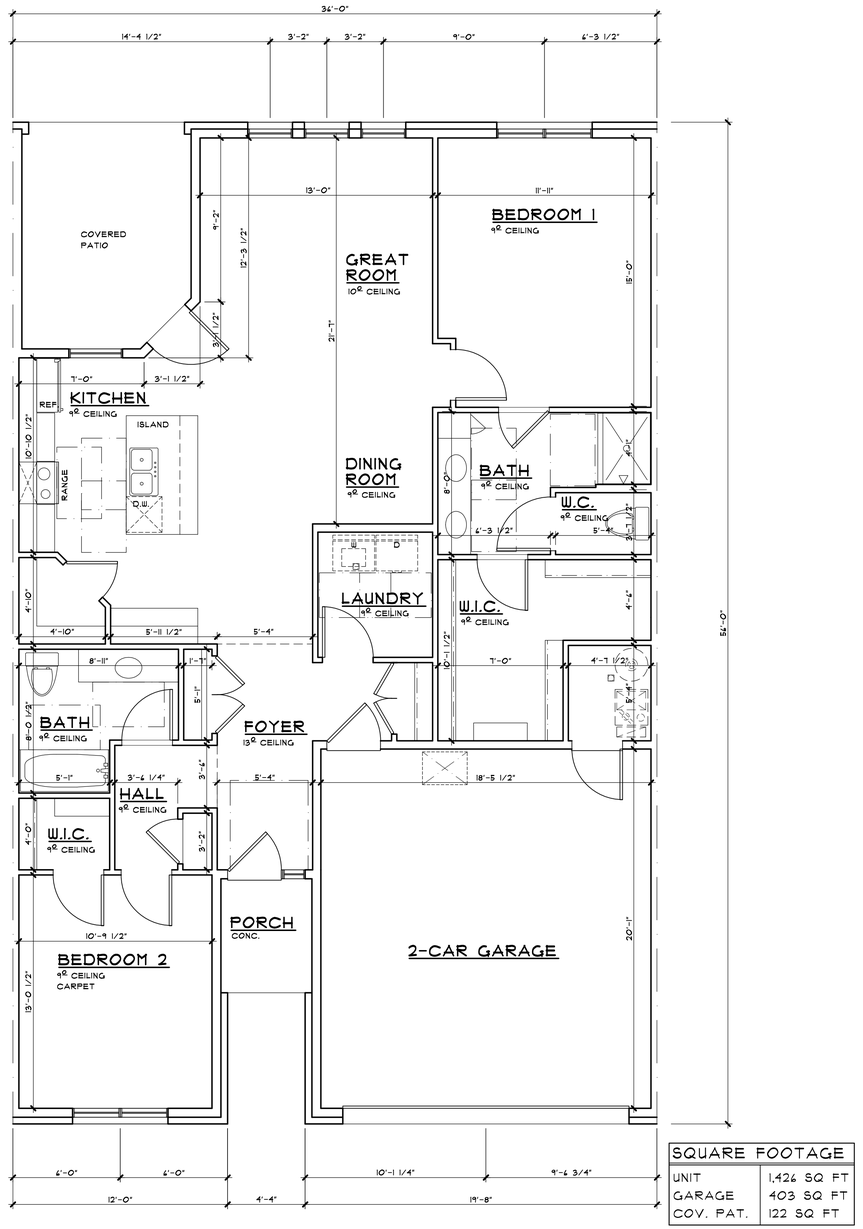
Elevations

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Sheet Number:	4-B



UNIT FLOOR PLAN - LEFT SIDE END

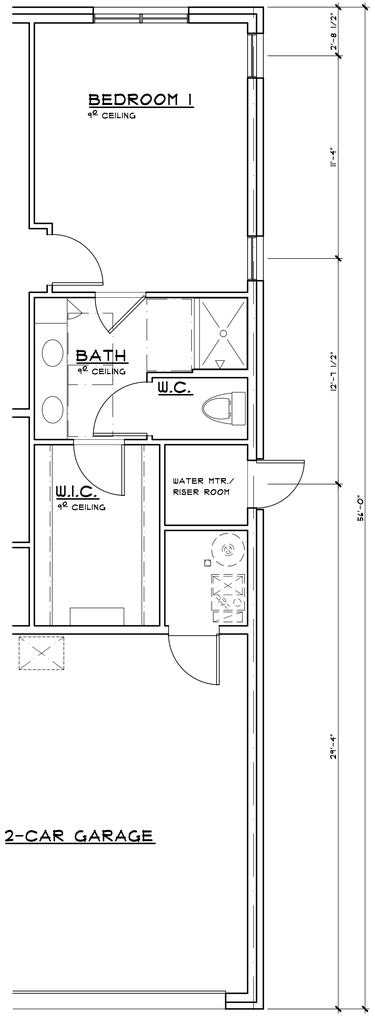
SCALE: 1/4" = 1'-0"



SQUARE FOOTAGE	
UNIT	1,426 SQ FT
GARAGE	403 SQ FT
COV. PAT.	122 SQ FT

UNIT FLOOR PLAN

SCALE: 1/4" = 1'-0"



UNIT FLOOR PLAN - RIGHT SIDE END

SCALE: 1/4" = 1'-0"

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ALEXANDER V. BOGAERTS II
ARCHITECT
No. 1301068995
LICENSED ARCHITECT

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Bloomfield Hills, MI 48302
248▪334▪5000

SHEET TITLE: UNIT FLOOR PLAN

CLIENT/PROJECT: WHITE LAKE HILL, LLC
AVALON - RANCHES
WHITE LAKE TOWNSHIP, MICHIGAN

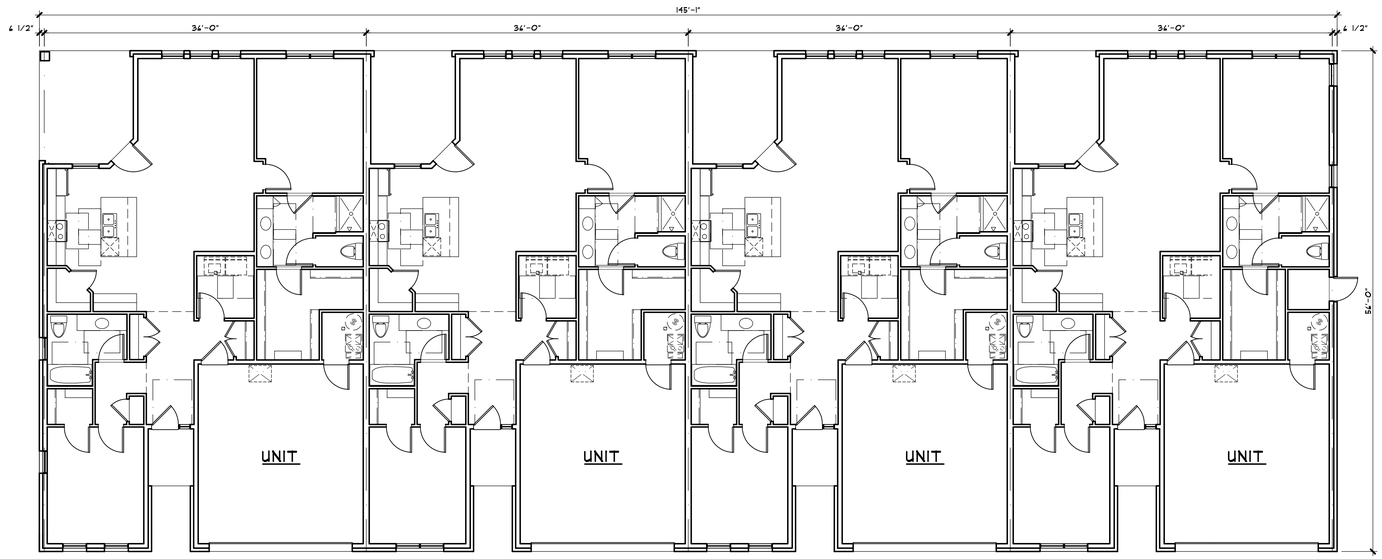
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2022-03-29
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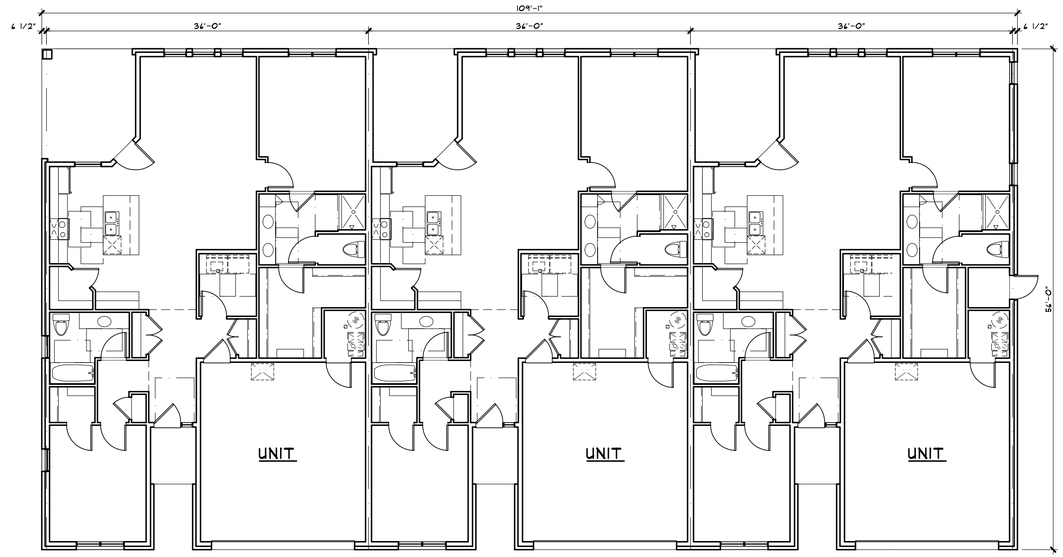
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DATE: 2022-03-29
SHEET NUMBER: A100

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4 UNIT BUILDING FLOOR PLAN

SCALE: 1/8" = 1'-0"



3 UNIT BUILDING FLOOR PLAN

SCALE: 1/8" = 1'-0"

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SHEET TITLE: BUILDING FLOOR PLANS

CLIENT/PROJECT: WHITE LAKE HILL, LLC
AVALON - RANCHES
WHITE LAKE TOWNSHIP, MICHIGAN

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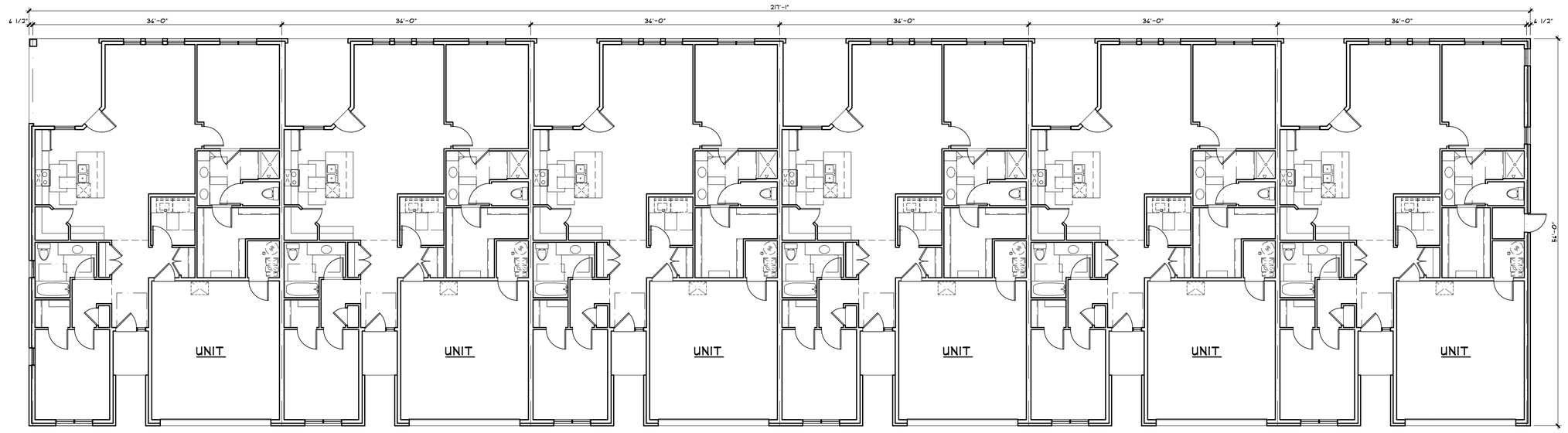
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DATE 2022-03-29
SHEET NUMBER A101

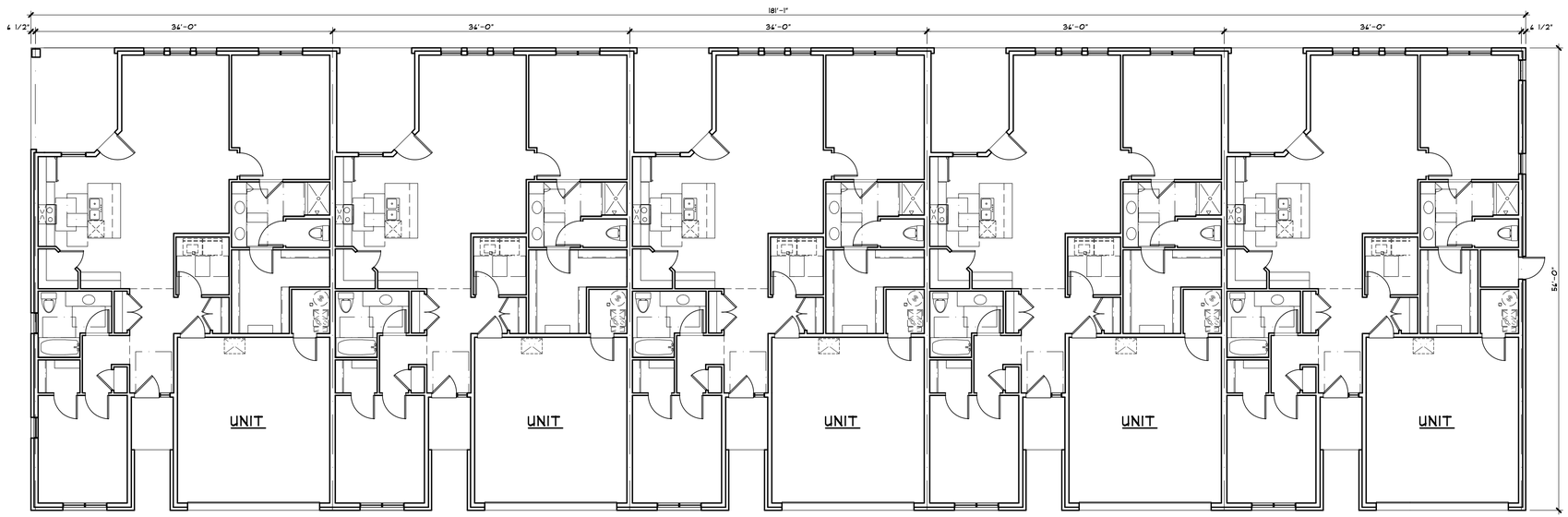
STATE OF MICHIGAN
ALEXANDER V. BOGAERTS II
ARCHITECT
No. 1301068995
LICENSED ARCHITECT

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6 UNIT BUILDING FLOOR PLAN

SCALE: 1/8" = 1'-0"



5 UNIT BUILDING FLOOR PLAN

SCALE: 1/8" = 1'-0"

Alexander V. Bogaerts + Associates, P.C. ▪ Architecture ▪ Planning ▪ Interior Design
2445 Franklin Road
Bloomfield Hills, MI 48302
248▪334▪5000

SHEET TITLE: BUILDING FLOOR PLANS

CLIENT/PROJECT: WHITE LAKE HILL, LLC
AVALON - RANCHES
WHITE LAKE TOWNSHIP, MICHIGAN

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- □ PERMITS
- □ CONSTRUCTION

REVISIONS
2022-03-29
SITE PLAN APPROVAL

STATE OF MICHIGAN
ALEXANDER V. BOGAERTS II
ARCHITECT
No. 1301068995
LICENSED ARCHITECT

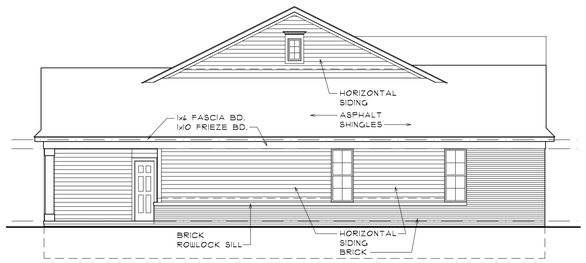
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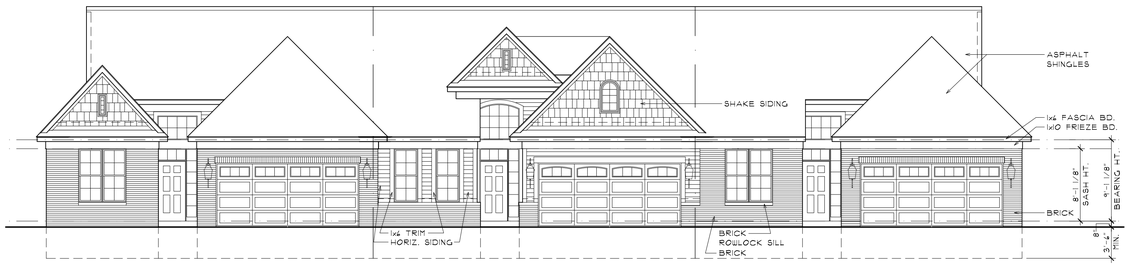
3 UNIT REAR ELEVATION 'A' and 'C' ('B' SIMILAR)

SCALE: 1/8" = 1'-0"



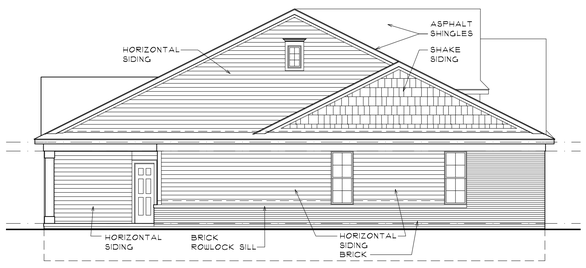
LEFT SIDE ELEVATION 'A' and 'C'

SCALE: 1/8" = 1'-0"



3 UNIT FRONT ELEVATION 'A'

SCALE: 1/8" = 1'-0"



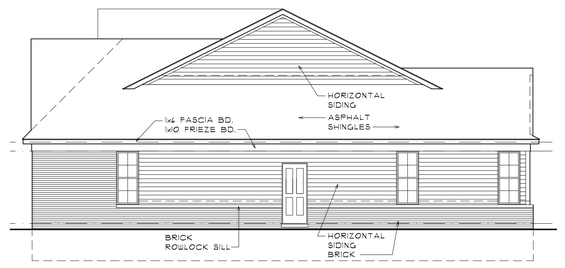
LEFT SIDE ELEVATION 'B'

SCALE: 1/8" = 1'-0"



3 UNIT FRONT ELEVATION 'B'

SCALE: 1/8" = 1'-0"



RIGHT SIDE ELEVATION 'B' ('A' and 'C' SIMILAR)

SCALE: 1/8" = 1'-0"

NOTE:
SEE BUILDING RENDERINGS FOR ALL BUILDING MATERIAL COLORS. 3 DIFFERENT COLOR SCHEMES PROPOSED FOR A, B, AND C. 3RD SCHEME C SIMILAR TO 4 AND 6 UNIT RENDERINGS.
ELEVATIONS RENDERED:
4 UNIT FRONT ELEVATION 'B'
6 UNIT FRONT ELEVATION 'A'



3 UNIT FRONT ELEVATION 'C'

SCALE: 1/8" = 1'-0"

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SHEET TITLE: BUILDING ELEVATIONS

CLIENT/PROJECT
WHITE LAKE HILL, LLC
AVALON - RANCHES
WHITE LAKE TOWNSHIP, MICHIGAN

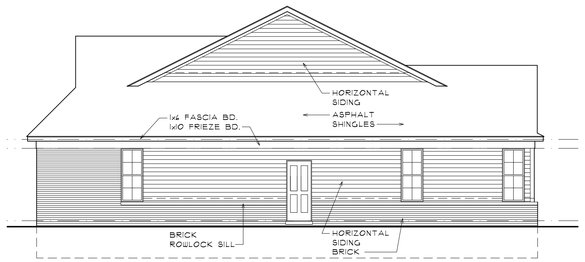
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REVISIONS
2022-03-29
SITE PLAN APPROVAL

STATE OF MICHIGAN
ALEXANDER V. BOGAERTS II
ARCHITECT
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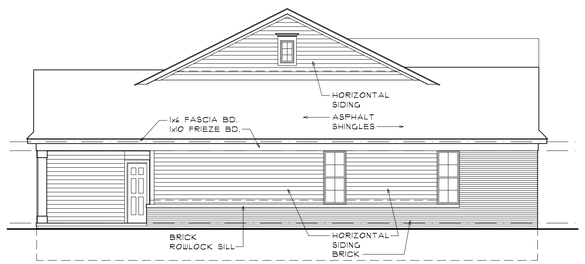
RIGHT SIDE ELEVATION 'B' ('A' and 'C' SIMILAR)

SCALE: 1/8" = 1'-0"



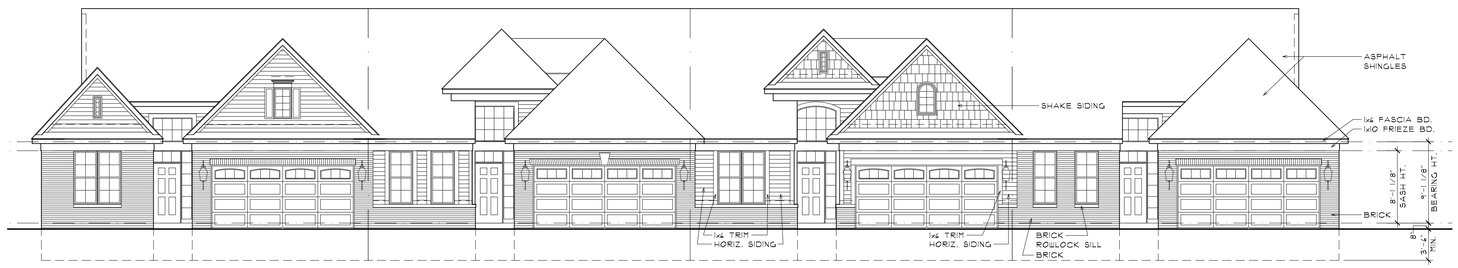
REAR ELEVATION 'A' and 'C' ('B' SIMILAR)

SCALE: 1/8" = 1'-0"



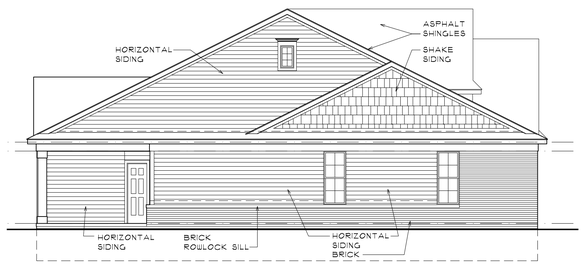
LEFT SIDE ELEVATION 'A' and 'C'

SCALE: 1/8" = 1'-0"



4 UNIT FRONT ELEVATION 'A'

SCALE: 1/8" = 1'-0"



LEFT SIDE ELEVATION 'B'

SCALE: 1/8" = 1'-0"



4 UNIT FRONT ELEVATION 'B'

SCALE: 1/8" = 1'-0"

NOTE:
SEE BUILDING RENDERINGS FOR ALL BUILDING MATERIAL COLORS. 3 DIFFERENT COLOR SCHEMES PROPOSED FOR A, B, AND C. 3RD SCHEME C SIMILAR TO 4 AND 6 UNIT RENDERINGS.
ELEVATIONS RENDERED:
4 UNIT FRONT ELEVATION 'B'
6 UNIT FRONT ELEVATION 'A'



4 UNIT FRONT ELEVATION 'C'

SCALE: 1/8" = 1'-0"

STATE OF MICHIGAN
ALEXANDER V. BOGAERTS II
ARCHITECT
No. 1301068995
LICENSED ARCHITECT

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2445 Franklin Road
Bloomfield Hills, MI 48302
248▪334▪5000

SHEET TITLE
BUILDING ELEVATIONS

CLIENT/PROJECT
WHITE LAKE HILL, LLC
AVALON - RANCHES
WHITE LAKE TOWNSHIP, MICHIGAN

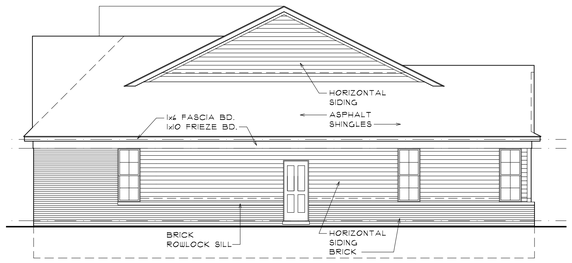
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REVISIONS
2022-03-29
SITE PLAN APPROVAL

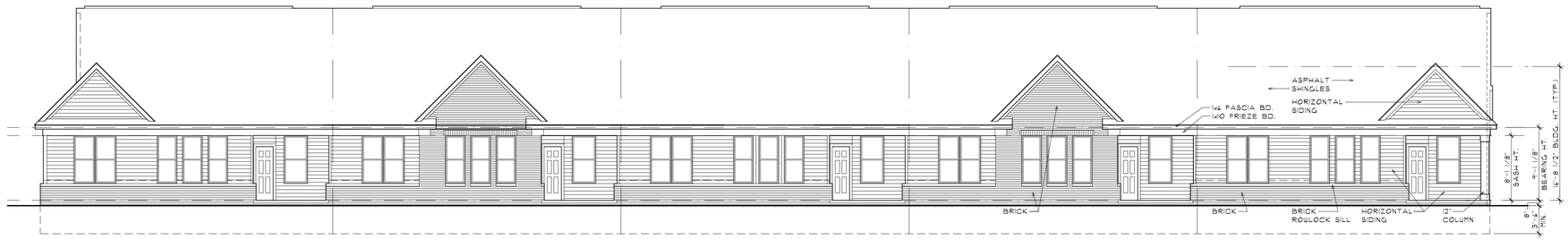
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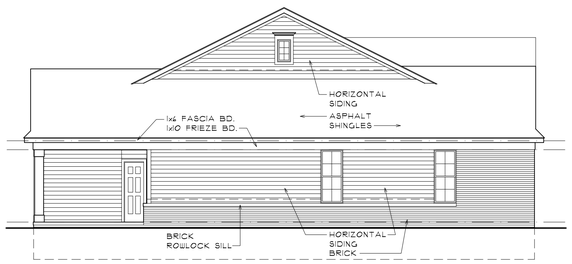
RIGHT SIDE ELEVATION 'B' ('A' and 'C' SIMILAR)

SCALE: 1/8" = 1'-0"



REAR ELEVATION 'A' and 'C' ('B' SIMILAR)

SCALE: 1/8" = 1'-0"



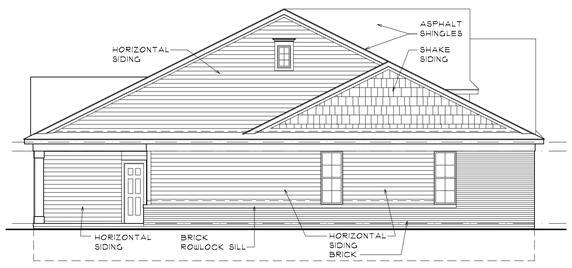
LEFT SIDE ELEVATION 'A' and 'C'

SCALE: 1/8" = 1'-0"



5 UNIT FRONT ELEVATION 'A'

SCALE: 1/8" = 1'-0"



LEFT SIDE ELEVATION 'B'

SCALE: 1/8" = 1'-0"



5 UNIT FRONT ELEVATION 'B'

SCALE: 1/8" = 1'-0"

NOTE:
SEE BUILDING RENDERINGS FOR ALL BUILDING MATERIAL COLORS. 3 DIFFERENT COLOR SCHEMES PROPOSED FOR A, B, AND C. 3RD SCHEME C SIMILAR TO 4 AND 6 UNIT RENDERINGS.
ELEVATIONS RENDERED:
4 UNIT FRONT ELEVATION 'B'
6 UNIT FRONT ELEVATION 'A'



5 UNIT FRONT ELEVATION 'C'

SCALE: 1/8" = 1'-0"

STATE OF MICHIGAN
ALEXANDER V. BOGAERTS II
ARCHITECT
No. 1301068995
LICENSED ARCHITECT

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2445 Franklin Road
Bloomfield Hills, MI 48302
248 ▪ 334 ▪ 5000

SHEET TITLE
BUILDING ELEVATIONS

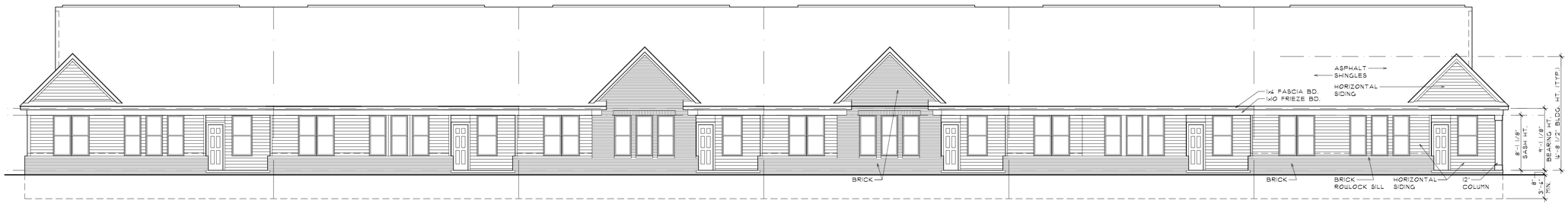
CLIENT/PROJECT
WHITE LAKE HILL, LLC
AVALON - RANCHES
WHITE LAKE TOWNSHIP, MICHIGAN

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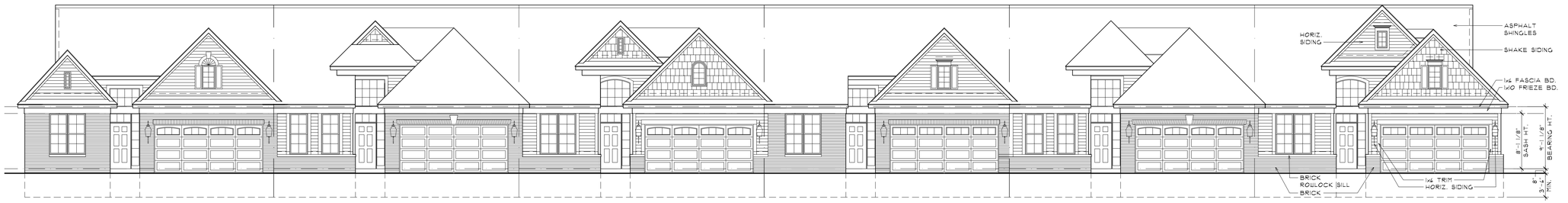
REVISIONS
2022-03-29
SITE PLAN APPROVAL

DRAWN BY
CAD FILENAME
CHECKED BY
JOB NUMBER 2451
DATE 2022-03-29
SHEET NUMBER A105



REAR ELEVATION 'A' and 'C' ('B' SIMILAR)

SCALE: 1/8" = 1'-0"



6 UNIT FRONT ELEVATION 'A'

SCALE: 1/8" = 1'-0"

NOTE:
SEE BUILDING RENDERINGS FOR ALL BUILDING MATERIAL COLORS. 3 DIFFERENT COLOR SCHEMES PROPOSED FOR A, B, AND C. 3RD SCHEME C SIMILAR TO 4 AND 6 UNIT RENDERINGS.
ELEVATIONS RENDERED:
4 UNIT FRONT ELEVATION 'B'
6 UNIT FRONT ELEVATION 'A'

NOTE:
REFER TO SHEET A105 FOR BUILDING SIDE ELEVATIONS



6 UNIT FRONT ELEVATION 'B'

SCALE: 1/8" = 1'-0"



6 UNIT FRONT ELEVATION 'C'

SCALE: 1/8" = 1'-0"

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SHEET TITLE
BUILDING ELEVATIONS

CLIENT/PROJECT
WHITE LAKE HILL, LLC
AVALON - RANCHES
WHITE LAKE TOWNSHIP, MICHIGAN

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REVISIONS
2022-04-01
SITE PLAN APPROVAL

STATE OF MICHIGAN
ALEXANDER V. BOGAERTS II
ARCHITECT
No. 1301068995
LICENSED ARCHITECT

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DATE 2022-03-29
SHEET NUMBER A106

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ABERDEEN

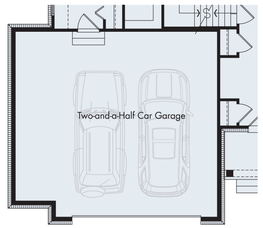
First Level	1,182 sf
Second Level	1,091 sf
Total	**2,273 sf**



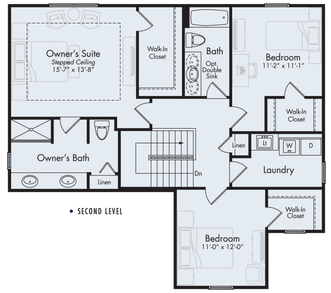
The Aberdeen is designed for entertaining and flexible family living. There's smart space for everything – main-floor study, a mud room with an optional bench, island kitchen with walk-in pantry, large family room with fireplace, and options for a covered porch or harvest room off the dining area. Upstairs, there's a convenient laundry room, private wing with an elegant owner's suite, complete with its own luxurious bath and walk-in closet. There are also options for an oversized 2.5-car or 3-car garage.



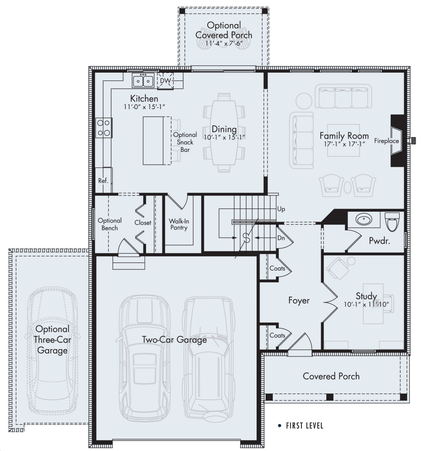
• OPTIONAL DELUXE OWNER'S BATH



• OPTIONAL TWO-AND-A-HALF CAR GARAGE



• SECOND LEVEL



• FIRST LEVEL



• OPTIONAL EXPANDED DINING ROOM



• OPTIONAL HARVEST ROOM

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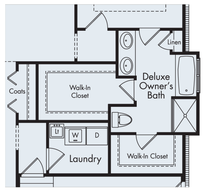
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BERKSHIRE

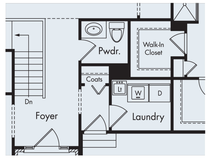
First Level	1,653 sf



We designed the Berkshire to offer modern, single-level living with a casual touch. The kitchen, family room and dining area have all been brought together to create an open flow for relaxed family times and lively entertaining. Whether you were unwinding in the family room or gathering in the spacious island kitchen, you'll love the natural sunlight that comes in from all the windows in the main living area. The owner's suite showcases the stepped ceiling, spacious private bath and twin walk-in closets. Another wing at the front of the home contains two spacious bedrooms with walk-in closets and access to a second full bath.



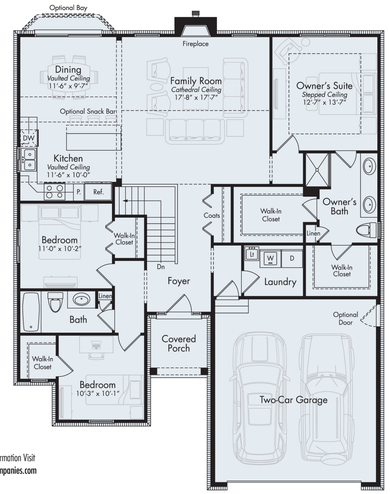
• OPTIONAL DELUXE OWNER'S BATH



• OPTIONAL POWDER ROOM



• OPTIONAL LIBRARY



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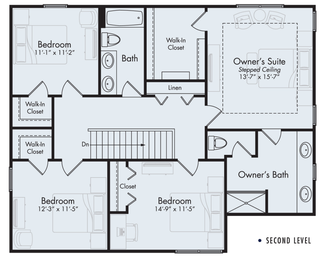
BURBANK

First Level	1,332 sf
Second Level	1,160 sf
Total	**2,492 sf**

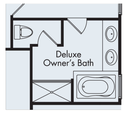


The two-story Burbank is a stunning open concept plan with an L-shaped living area that includes the family room, oversized dining room and enormous island kitchen. The optional lanai vastly increases the living space and brings the outdoors into this spacious home. The main floor also includes a secluded study, guest closet, powder room, mud room, walk-in pantry and laundry room. No convenience was overlooked, including the option of a 2.5- or 3-car garage.

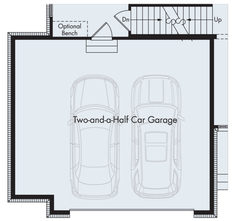
Upstairs, the owner's suite features a stepped ceiling, spacious bath with an optional whirlpool tub and oversized walk-in closet. Three more large bedrooms share a central bath with double sinks.



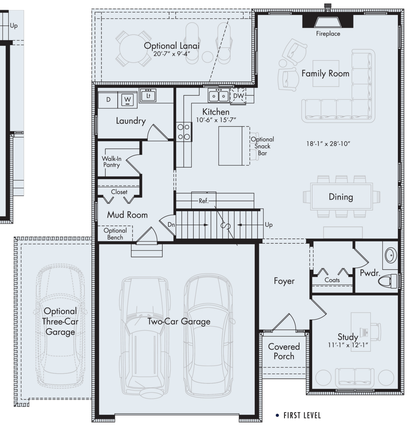
• SECOND LEVEL



• OPTIONAL DELUXE OWNER'S BATH



• OPTIONAL TWO-AND-A-HALF CAR GARAGE



• FIRST LEVEL

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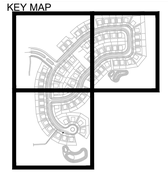
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811 Know what's below. Call before you dig.

CAUTION!!
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KEY MAP



CLIENT
WHITE LAKE HILL, LLC
31550 NORTHWESTERN HWY
FARMINGTON HILLS, MI 48334

PROJECT TITLE
THE AVALON - SINGLE FAMILY
HIGHLAND ROAD
WHITE LAKE TWP., MI

REVISIONS

FINAL SITE PLAN REVIEW	5/8/25
FINAL SITE PLAN REVIEW	9/30/25

ORIGINAL ISSUE DATE:
MAY 8, 2025

DRAWING TITLE
SINGLE FAMILY HOME FLOOR PLANS

PEA JOB NO.	2021-0084
P.M.	JC
DN.	BSH/JEB
DES.	BSH

DRAWING NUMBER:
1 OF 3

S:\PROJECTS\2021\2021-0084 WHITE LAKE MIXED USE\PAT\CONSTRUCTION\1-SHALE FAMILY\FLOOR PLANS-21-0084.dwg

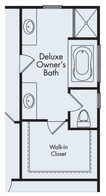
CAMPBELL

First Level	1,217 sf
Second Level	1,402 sf
Total	**2,619 sf**

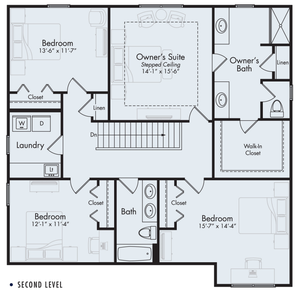


The four-bedroom Campbell is an ideal family home with two spacious levels. The foyer opens to reveal the family room with it's centered fireplace and triple windows. This sunny dining room with its sliding glass doorwall can extend outdoors for an optional covered porch. The U-shaped kitchen is centered on a convenient island with snack bar seating. The main floor also includes a secluded study, powder room, mud room and walk-in pantry.

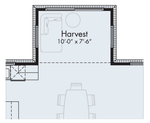
The upper level showcases the owner's suite with stepped ceiling, spacious bath with twin vanities, and large walk-in closet. There is also an option to include a whirlpool tub. There are three more bedrooms on the second floor along with a full bath and oversized laundry room.



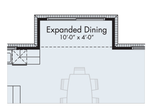
• OPTIONAL DELUXE OWNER'S BATH



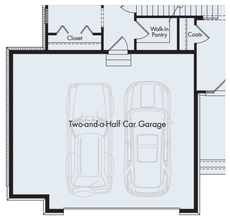
• SECOND LEVEL



• OPTIONAL HARVEST ROOM



• OPTIONAL EXPANDED DINING ROOM



• OPTIONAL TWO-AND-A-HALF CAR GARAGE



• FIRST LEVEL

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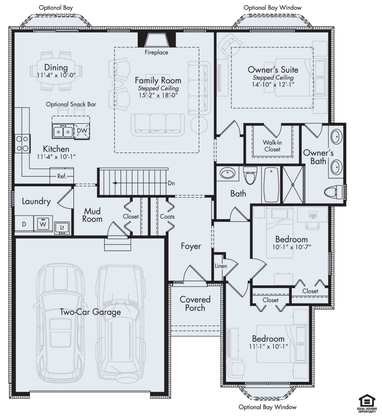
CYPRESS

First Level	1,539 sf



If you're looking for the perfect ranch floor plan with no wasted space, then the Cypress is ideal for you! The open island kitchen, dining area with its optional bay window, and family room with a cozy fireplace, will keep your family together and enhance the connections during special times hosted at your home. The Cypress also keeps privacy in mind with the elegant owner's suite and two additional bedrooms and a full bath nicely separated from the living space. The 2-car garage opens to a large mud room with a closet and adjacent laundry room.

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• FIRST LEVEL

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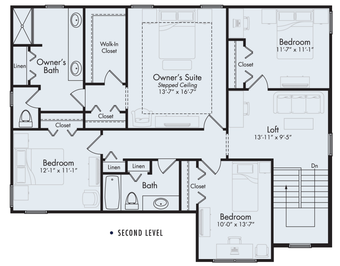
DAVENPORT

First Level	1,411 sf
Second Level	1,293 sf
Total	**2,704 sf**

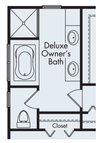


Fall in love with the spacious open flow of the Davenport's main floor living area. The Davenport offers an imaginatively designed two-story home with an inviting central family room with a cozy fireplace and triple windows. The adjoining kitchen is a dream with lots of counter space and a functional island with optional snack bar seating. The dining room is extended beyond the balance of the room with triple windows and a French door. A flex-room is a pleasant surprise off this area with its double doors and double window. The first floor also offers a powder room, mud room, laundry and walk-in pantry.

The second floor showcases four bedrooms including the owner's suite with its stepped ceiling, plenty of closet space and an elegant bath with the option of a spa tub and stall shower. There is an option for a second bedroom suite with a full bath on this level or a large loft as the standard. A covered front porch adds a distinctive touch to the home as well as an optional 2.5-car or 3-car garage.



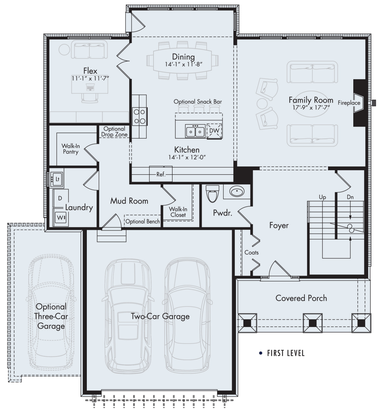
• SECOND LEVEL



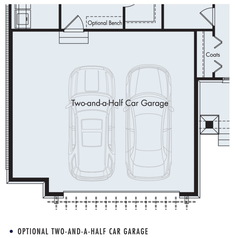
• OPTIONAL DELUXE OWNER'S BATH



• OPTIONAL BEDROOM BATH



• FIRST LEVEL



• OPTIONAL TWO-AND-A-HALF CAR GARAGE

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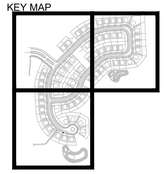
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KEY MAP



CLIENT
WHITE LAKE HILL, LLC
31550 NORTHWESTERN HWY
FARMINGTON HILLS, MI 48334

PROJECT TITLE
THE AVALON - SINGLE FAMILY
HIGHLAND ROAD
WHITE LAKE TWP., MI

REVISIONS

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FINAL SITE PLAN REVIEW	9/30/25

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MAY 8, 2025

DRAWING TITLE
SINGLE FAMILY HOME FLOOR PLANS

PEA JOB NO.	2021-0084
P.M.	JC
DN.	BSH/JEB
DES.	BSH

DRAWING NUMBER:
2 OF 3

S:\PROJECTS\2021\2021-0084 WHITE LAKE MIXED USE\DWG\CONSTRUCTION\1-SINGLE FAMILY\FLOOR PLANS-21-0084.dwg

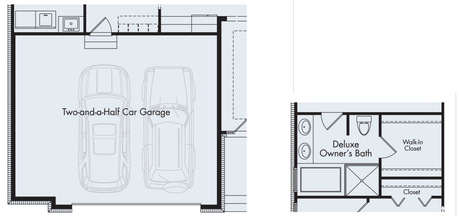
EASTWIND

First Level 1,848 sf



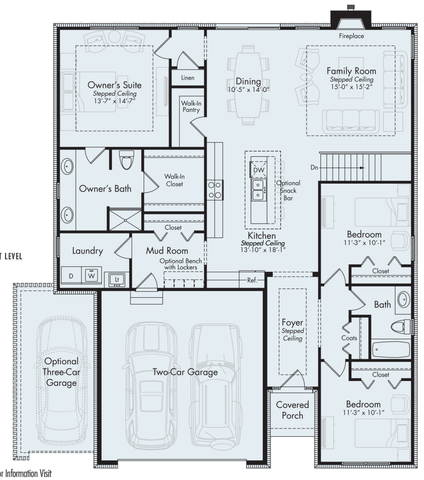
Love the open layouts offered by modern ranch designs, but want more space? The Eastwind is the floor plan for you – with no wasted space. The kitchen, with its oversized island, is the heart of the home with the adjoining dining and family room and a cozy fireplace, abundant windows and stepped ceiling. This creative space will keep your guests well entertained during special occasions.

Two bedrooms are tucked away off the foyer with a central bath to share. An owner's suite offers an extra measure of privacy and elegance with its stepped ceiling, spacious bath and an optional soaking tub and large walk-in closet. The garage offers options for 2.5-cars and 3-cars, opens to a mud room with optional bench and lockers and a central laundry room.



• OPTIONAL TWO-AND-A-HALF CAR GARAGE

• OPTIONAL DELUXE OWNER'S BATH



• FIRST LEVEL



• OPTIONAL FIRST LEVEL LAUNDRY

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EVANSTON IV

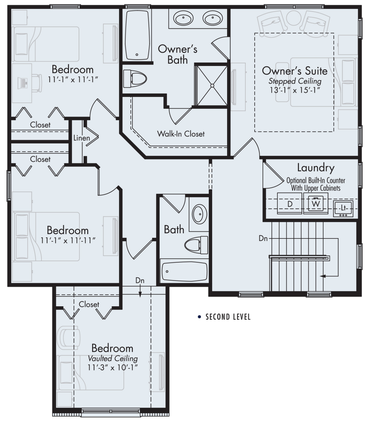
First Level 797 sf
Second Level 1,139 sf
Total 1,936 sf



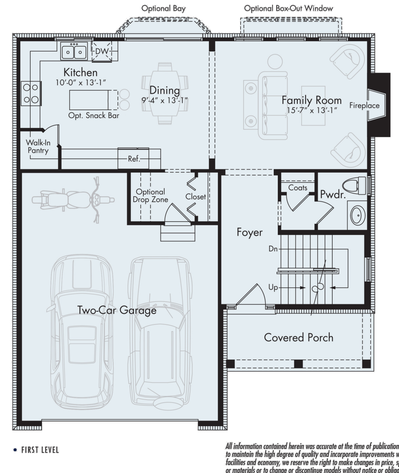
This home is a two-story masterpiece. Featuring a charming front porch with columns, the Evanston IV opens to a large foyer with a guest closet and powder room. The huge U-shaped kitchen, a dining area and family room are bathed in sunlight from lots of windows and sliding glass doorwall with options for a bay and box-out windows to further enhance the open feeling.

Upstairs, the owner's suite boasts a stepped ceiling, elegant bath with separate tub, shower and walk-in closet. There are three more bedrooms on the second floor, along with a central bath and convenient laundry room.

The garage opens to an optional drop zone or second laundry area.



• SECOND LEVEL



• FIRST LEVEL

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WASHINGTON

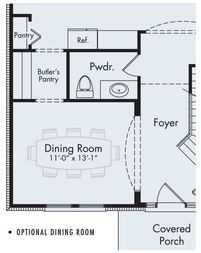
First Level 1,147 sf
Second Level 1,092 sf
Total 2,239 sf



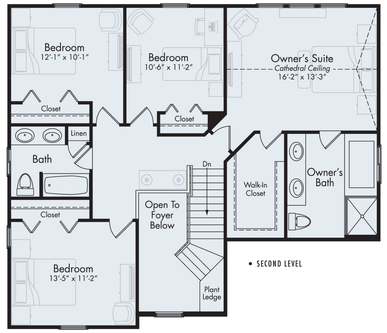
The Washington is a very unique floor plan that lives large thanks to its two-story foyer and very open, flowing first floor living area. The foyer opens to a cozy library or optional formal dining room with butler's pantry. The spacious island kitchen, dining nook and family room keep the family connected and engaged.

The second level owner's suite offers a cathedral ceiling, triple windows and an elegant spa bath with separate tub and shower. Three additional bedrooms share a central bath and space for a study station.

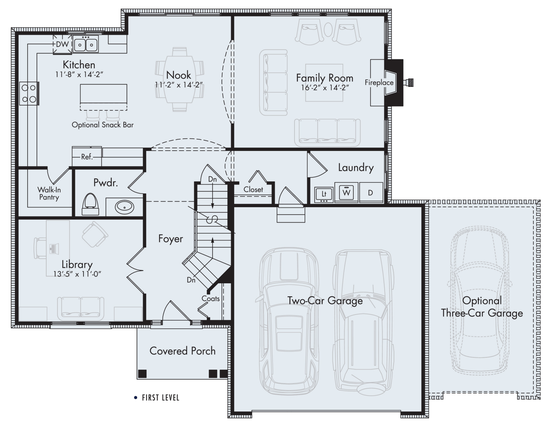
A 2-car or optional 3-car garage leads to a mud room and convenient laundry. You'll love this home from the moment you enter from the covered porch.



• OPTIONAL DINING ROOM



• SECOND LEVEL



• FIRST LEVEL

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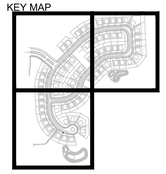
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