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Riley Purgatory Bluff Creek Watershed District Permit Application Review

Permit No: 2023-077

Application Received complete: March 18, 2024

Considered at Board of Managers Meeting: May 8, 2024; June 5, 2024

Applicant: Brandl Anderson Homes; Matt Olsons

Consultant: James R. Hill Inc.; John Bender, PE

Project: Enclave at Manor Road Residential Development – The applicant proposes the demolition of an existing single-family home and the construction of a 17-lot single-family residential development.

Location: 6591 West 168th, Eden Prairie

Reviewer: Scott Sobiech, PE, Barr Engineering

Potential Board Variance Action

Manager _____ moved and Manager _____ seconded adoption of the following resolution based on the permit report that follows, the presentation of the matter at the May 8 and June 5, 2024, meetings of the managers and the managers' findings, as well as the factual findings in the permit report that follows:

Resolved that the variance request for Permit 2023-077 from compliance with Rule J, subsection 3.1a, is approved based on the facts and analysis provided by the RPBCWD engineer below and placed in the record at the May 8 and June 5, 2024, meetings of the managers, and the managers' findings in the record of the May 8, and subject to the following conditions: 1. [CONDITION(S)],

Proposed Board Action

Manager _____ moved and Manager _____ seconded adoption of the following resolutions based on the permit report that follows and the presentation of the matter at the May 8 and June 5, 2024, meetings of the managers:

Resolved that the application for Permit 2023-077 is approved, subject to the conditions and stipulations set forth in the Recommendations section of the attached report;

Resolved that on determination by the RPBCWD administrator that the conditions of approval have been met, the RPBCWD president or administrator is authorized and directed to sign and deliver Permit 2023-077 to the applicant on behalf of RPBCWD.

Upon vote, the resolutions were adopted, _____ [VOTE TALLY].

Applicable Rule Conformance Summary

Rule	Issue	Conforms to RPBCWD Rules?		Comments
C	Erosion Control Plan	See Comment		See rule-specific permit condition C1 related to name of individual responsible for on-site erosion control.
J	Stormwater Management	Rate	No	Applicant is requesting a variance from rate control at one location following Rule K.
		Volume	yes	
		Water Quality	Yes	
		Low Floor Elev.	Yes	See rule-specific permit condition J1 related to additional soil boring to verify low floor compliance.
		Maintenance	See comment	See rule-specific permit condition J2 related to recordation of stormwater facility maintenance declaration.
		Chloride Management	Yes	
		Wetland Protection	Yes	
K	Variations and Exceptions	See Comment		Variance from rate control at all discharge locations in subsection 3.1a of the Stormwater Management rule requested.
L	Permit Fee Deposit	See Comment		\$5000 received January 26, 2024. The applicant must replenish the permit fee deposit to the original amount due before the permit will be issued. As of May 30, 2024 the amount due is \$10,955
M	Financial Assurances	See Comment		The financial assurance is calculated at \$110,968.

Project Description

The proposed Enclave at Manor Road redevelopment project is the redevelopment of a single-family residential property into a 17-lot single-family residential development with associated sewer and utilities, street, construction of a wet forebay, biofiltration basin, backyard swales, and preservation of natural areas to provide rate control, volume abstraction, and water quality. The applicant also proposes to replace the existing 18-inch storm sewer pipe in the eastern boulevard of 168th Street with a 21-inch pipe.

After discussion about the rate control variance request as presented in the permit report for the May 8 meeting, the RPBCWD Board of Managers voted to deny the variance request. The managers also extended the permit-review period by 60 days to July 11, 2024, to allow additional time for design revisions, coordination, and review. The applicant has been working with its engineer, City of Eden Prairie staff, and the RPBCWD engineer since the permit was discussed at the May 8, 2024, board meeting.

The applicant performed additional analysis to investigate alternatives to address/clarify the following concerns raised by the managers.

- Impacts to flow entering Purgatory Creek
- Loss of trees and natural vegetation
- Increased downstream flood risk.

On May 21, 2024, RPBCWD received a revised submittal indicating that the applicant proposes to preserve an additional 11,800 square feet (0.27 acres) of natural vegetation and trees, resulting in a total preservation area of 1.32 acres (about 20.5% of the parcel). The applicant continues to request a variance from rate control. The majority of revisions presented in this updated permit report are focused under the Rule K, variance analysis section.

The project site information is summarized below:

Project Site Information	Area (acres)
Total Site Area	6.5
Existing Site Impervious	0.51
Proposed Site Impervious Area	1.96
Change in Site Impervious Area	1.45 (>100% increase)
Regulated Impervious Surface	1.96
Total Disturbed Area	5.34

Exhibits:

1. Permit Application received December 18, 2023 (The applicant was notified on December 20, 2023 and again on February 16, 2024 that the submittal was incomplete; information completing the application was received on March 13, 2024)
2. Stormwater Management Plan dated January 24, 2024 (revised March 7, 2024, April 19, 2024, and May 20, 2024)
3. Project Plan Set dated January 24, 2024 (revised March 7, 2024, March 18, 2024, and May 21, 2024)
4. HydroCAD models received February 7, 2024 (revised March 13, 2024, April 19, 2024, and May 21, 2024)
5. Existing and proposed conditions P8 models received February 7, 2024 (revised March 13, 2024, April 19, 2024, and May 21, 2024)
6. MIDS model received April 22, 2024 (revised May 21, 2024)
7. PCSWMM models for existing and proposed conditions received March 13, 2024 (revised April 19, 2024 and May 21, 2024)
8. Geotechnical Exploration Report by Haugo GeoTechnical Services dated January 24, 2024
9. Variance Request Narrative dated March 7, 2024 (revised April 19, 2024 and May 21, 2024)
10. Infiltration testing results dated November 3, 2023
11. Engineer’s opinion of probable cost received March 18, 2024 (revised April 19, 2024)
12. Response to comments received April 22, 2024.

Rule Specific Permit Conditions

Rule C: Erosion and Sediment Control

Because the project will alter 5.34 acres of land-surface area, the project must conform to the requirements in the RPBCWD Erosion and Sediment Control rule (Rule C, Subsection 2.1).

The erosion control plan prepared by James R. Hill Inc. includes installation of silt fence perimeter control, rock construction entrance, inlet protection, concrete washout, erosion control blanket, weekly inspection, placement of a minimum of 6 inches of topsoil with at least 5% organic content, decompaction of areas compacted during construction, and retention of native topsoil onsite. To conform to the RPBCWD Rule C requirements the following revisions are needed:

- C1. The Applicant must provide the name and contact information of the individual responsible for erosion control at the site. RPBCWD must be notified if the responsible individual changes during the permit term.

Rule J: Stormwater Management

Because the project will alter 5.34 acres of land-surface area and increase the site imperviousness by more than 50%, the redevelopment must meet the criteria of RPBCWD's Stormwater Management rule (Rule J, Subsection 2.3) for the entire site. The applicant proposes construction of a biofiltration basin with forebay, backyard swales, and preservation of natural areas to provide volume control, water quality, and rate control.

Rate Control

In order to meet the rate control criteria listed in Subsection 3.1.a, the 2-, 10-, and 100-year post development peak runoff rates must be equal to or less than the existing discharge rates at all locations where stormwater leaves the site. The Applicant used a HydroCAD hydrologic model to simulate runoff rates for pre- and post-development conditions for the 2-, 10-, and 100-year frequency storm events using a nested rainfall distribution, and a 100-year frequency, 10-day snowmelt event. The existing and proposed 2-, 10-, and 100-year frequency discharges from the site are summarized in the table below. Because the proposed project increases the discharge to the storm sewer in West 168th Street to provide an outlet for the proposed stormwater facility, the applicant requested a variance from compliance with the rate control criteria at this location (see Rule K variance analysis). Except for the increase discharge leaving the site at this location (the northwest corner of the site), the proposed project is in conformance with RPBCWD Rule J, Subsection 3.1.a.

Modeled Discharge Location	2-Year Discharge (cfs)		10-Year Discharge (cfs)		100-Year Discharge (cfs)		10-Day Snowmelt (cfs)	
	Ex	Prop	Ex	Prop	Ex	Prop	Ex	Prop
North	9.1	2.3	18.4	5.0	37.7	10.7	0.9	0.2
East	1.0	0.2	2.3	0.5	5.0	1.0	0.1	<0.1
South	2.1	0.1	4.5	0.3	9.7	0.6	0.2	<0.1

West	0.2	<0.1	0.3	0.1	0.7	0.1	<0.1	<0.1
168th	0	1.1	0	2.2	0	3.5	0	0.9

Volume Abstraction

Subsection 3.1.b of Rule J requires the abstraction onsite of 1.1 inches of runoff from all impervious surface of the parcel. An abstraction volume of 7,826 cubic feet is required from the 1.96 acres of regulated impervious area. The Plans indicate pretreatment for runoff entering the stormwater facility is provided by grass overland flow and sump manholes, thus the proposed project conforms with RPBCWD Rule J, Subsection 3.1b.1.

Based on the eight soil borings in the Geotechnical Exploration and Review Report conducted by Haugo GeoTechnical Services, the site contain 2 to 7 feet of topsoil overlying predominantly clayey glacial till deposits. Groundwater was not encountered at any boring location, the deepest of which extended to elevation 909.6 feet and collected within the footprint of the proposed stormwater facility. The bottom of the biofiltration basin is at elevation 926.0 feet, 16.4 feet above the bottom of the boring, groundwater is at least 3 feet below the bottom of the subsurface stormwater management facility, complying with Rule J, Subsection 3.1.b.ii..

Double ring infiltrometer test collect by Haugo GeoTechnical Services revealed an infiltration rate of 0.0 in/hr beneath the proposed stormwater management facility. Because the test yielded no infiltration, the infiltration capacity of the underlying soils on this site is limited. The communal open space for irrigation is limited to the stormwater BMPs which negate reuse. Because the engineer concurs that the soil information and infiltration testing support that the abstraction standard in subsection 3.1b of Rule J cannot practicably be met, the site is considered restricted and stormwater runoff volume must be managed in accordance with subsection 3.3 of Rule J.

For restricted sites, subsection 3.3 of Rule J requires rate control in accordance with subsection 3.1.a and that abstraction and water quality protection be provided in accordance with the following sequence:

- (a) Abstraction of 0.55 inches of runoff from site impervious surface determined in accordance with paragraphs 2.3, 3.1 or 3.2, as applicable, and treatment of all runoff to the standard in paragraph 3.1c; or
- (b) Abstraction of runoff onsite to the maximum extent practicable and treatment of all runoff to the standard in paragraph 3.1c; or
- (c) Off-site abstraction and treatment in the watershed to the standards in paragraph 3.1b and 3.1c.

Based on the measured infiltration testing results, the applicant is providing a 6-inch sand storage layer below the biofiltration basin underdrain to promote infiltration and relying on vegetation in the basin to provide abstraction to the maximum extent practicable to conform to Rule J, subsection 3.3b. The designed abstraction performance for the project site is summarized in the table below.

Volume Abstraction Summary

Required Abstraction Depth (inches)	Required Abstraction Volume (cubic feet)	Provided Abstraction Depth (inches)	Provided Abstraction Volume (cubic feet)
0.55	3,913	0.02	140

Water Quality Management

Subsection 3.1.c of Rule J requires the Applicant to provide volume abstraction in accordance with 3.1b or least 60 percent annual removal efficiency for total phosphorus (TP), and at least 90 percent annual removal efficiency for total suspended solids (TSS) from site runoff, and no net increase in TSS or TP loading leaving the site from existing conditions. The Applicant is proposing a wet forebay, biofiltration basin, backyard swales, and preservation of natural areas to treat runoff from the regulated impervious area. The applicant is also a proposing preservation of 1.32 acres of natural area. P8 was used to evaluate the removal efficiencies of the stormwater management features. The results of this modeling are summarized in tables below showing the annual TSS and TP removal requirements are achieved and that there is no net increase in TSS and TP leaving the site. The engineer concurs with the modeling and finds that the proposed project is in conformance with Rule J, Subsection 3.1.c.

Pollutant of Interest	Regulated Site Loading (lbs/yr)	Required Load Removal (lbs/yr)	Provided Load Reduction (lbs/yr)
Total Suspended Solids (TSS)	1,744	1,590 (90%)	1,612 (92.4%)
Total Phosphorus (TP)	5.73	3.44 (60%)	3.52 (61.4%)

Pollutant of Interest	Existing Site Loading (lbs/yr)	Proposed Site Load after Treatment (lbs/yr)	Change (lbs/yr)
Total Suspended Solids (TSS)	676	131	-545
Total Phosphorus (TP)	2.3	2.18	-0.12

Low floor Elevation

All new buildings must be constructed such that the lowest floor is at least two feet above the 100-year high water elevation or one foot above the emergency overflow of a stormwater-management facility according to Rule J, Subsection 3.6a. In addition, a stormwater-management facility must be constructed at an elevation that ensures that no adjacent habitable building will be brought into noncompliance with this requirement according to Rule J, Subsection 3.6b.

As summarized in the following table, the low floor elevations of the proposed structures in Block 1 are more than two feet above the 100-year flood elevation of the proposed biofiltration basin or 1 foot above the adjacent emergency overflow for the backyard low points, thus the lots in Block 1 one are in conformance with Rule J, Subsection 3.6. Because the proposed preservation of an additional 0.27 acres of natural areas results in less runoff being directed to the stormwater facility, the flood elevation in the biofiltration basin is reduce about 0.2 feet.

Structure	Low Floor Elevation of Building (ft)	Stormwater Facility	100-year Event Flood Elevation of Facility (ft)	Freeboard to 100-year HWL (ft)	Emergency Overflow Elevation (ft)	Freeboard to Emergency Overflow (ft)
Blk 1, L1	936.5	Biofiltration Basin	933.61	2.89	--	--
Blk 1, L2	936.3	CBMH-301	--	--	934.2	2.1
Blk 1, L3	937.1	CBMH-301	--	--	934.2	2.9
Blk 1, L4	937.9	CBMH-302	--	--	935.3	2.6
Blk 1, L5	938.7	CBMH-302	--	--	935.3	3.4
Blk 1, L6	939.5	CBMH-303	--	--	936.5	3.0
Blk 1, L7	939.5	CBMH-303	--	--	936.5	3.0
Blk 1, L8	939.4	CBMH-303	--	--	936.5	2.9
Blk 2, L1	936.1	CB-110	939.5	-3.4	941.0	-4.9
Blk 2, L2	935.9	CB-110	939.5	-3.6	941.0	-5.1
Blk 2, L3	936.7	CB-112	939.5	-2.8	941.5	-4.8
Blk 2, L4	936.7	CB-112	939.5	-2.8	941.5	-4.8
Blk 2, L5	936.7	CB-112	939.5	-2.8	941.5	-4.8
Blk 2, L6	938.3	CB-112	939.5	-1.2	941.5	-3.2
Blk 2, L7	939.3	CB-112	939.5	-0.2	941.5	-2.2
Blk 2, L8	940.1	CB-113	939.5	0.6	946.3	-6.2
Blk 2, L9	941.2	CB-113	946.3	-5.1	946.3	-5.1

Because the proposed low floor elevations of lots in Block 2 and the low floors of existing structures are less than 2 feet above the 100-year high-water elevation, an alternative low floor analysis was conducted as outlined in Rule J, Appendix J.1 – Low-Floor Elevation Assessment. Groundwater was not discovered in any of the soil borings collected at the site, thus the groundwater elevations were presumed to be at the elevation of the bottom of the boring nearest the structure. The results of the low-floor analysis using *Appendix J1 Plot 2: Minimum Depth to Water Table for No Further Evaluation* are summarized in the following table. The results demonstrate the provided separation is greater than the minimum required, thus meeting the habitable structure requirements in Rule J, Subsection 3.6.

Structure	Lowest Floor Elevation of Building (feet)	Stormwater Facility	Distance from Building to Adj. Facility (ft)	Representative Soil Boring	Estimated Water Table Elevation ¹ (ft)	Minimum Allowable Depth to Water Table (ft)	Provided Depth from Low Floor Elevation to Water Table (ft)
Blk 2, L1	936.1	CB-110	10	SB-7	919.7	16	16.4
Blk 2, L2	935.9	CB-110	10	SB-7	919.7	16	16.2
Blk 2, L3	936.7	CB-112	55	SB-7	919.7	6.5	17
Blk 2, L4	936.7	CB-112	45	SB-6	920.1	7.2	16.6
Blk 2, L5	936.7	CB-112	35	SB-6	920.1	9.2	16.6
Blk 2, L6	938.3	CB-112	32	SB-6	920.1	10	18.2
Blk 2, L7	939.3	CB-112	45	SB-5	923	7.2	16.3
Blk 2, L8	940.1	CB-113	12	SB-5	923	15.8	17.1
Blk 2, L9	941.2	CB-113	10	SB-5	923	16	18.2

Structure	Lowest Floor Elevation of Building (feet)	Stormwater Facility	Distance from Building to Adj. Facility (ft)	Representative Soil Boring	Estimated Water Table Elevation ¹ (ft)	Minimum Allowable Depth to Water Table (ft)	Provided Depth from Low Floor Elevation to Water Table (ft)
6537 W 168th Ave.	924.6	Biofiltration Basin	40	SB-1	909.6 ²	9.0	15
16480 N. Manor Rd.	915.5	CBMH-301	177	SB-1	909.6 ²	0.5	5.9
16500 N. Manor Rd.	911.0	CBMH-301	161	SB-1	909.6 ²	1.0	1.4
16520 N. Manor Rd.	911.7	CBMH-301	150	SB-1	909.6 ²	1.0	2.1
16540 N. Manor Rd.	912.2	CBMH-302	139	SB-1	909.6 ²	1.0	2.6
6601 W. 168th Ave.	934.5	CB-110	23	SB-7	919.7 ²	12.0	14.8
16720 Honeysuckle La.	934.0	CB-110	74	SB-7	919.7 ²	5.0	14.3
16716 Honeysuckle La.	937.0	CB-112	32	SB-6	920.1 ²	10.5	16.9
16712 Honeysuckle La.	937.5	CB-112	94	SB-6	920.1 ²	3.0	17.4
16680 Honeysuckle La.	937.0	CB-112	73	SB-5	923.0 ²	5.0	14.0

¹ Presumed to be at the elevation of the bottom of the boring nearest the structure.

² Soil boring are the closest available information but are not adjacent to the existing structures.

Because the borings are not located at the proposed structures perimeter closest location to the stormwater management facility, additional subsurface investigation is needed to verify adequate separation between the proposed low floor and groundwater.

Maintenance

Subsection 3.7 of Rule J requires the submission of a maintenance plan. All stormwater management structures and facilities must be designed for maintenance access and properly maintained in perpetuity to assure that they continue to function as designed.

- J1. Permit applicant must provide a maintenance and inspection declaration. A maintenance declaration template is available on the permits page of the RPBCWD website. (<http://www.rpbcwd.org/permits/>). The declaration must include the all stormwater management facilities as well as the preserved natural areas and vegetated swales included as functional elements of the stormwater-management plan. A draft declaration must be provided for District review and approval prior to recording.

Wetland Protection

Because the proposed activities discharge to a downstream stormwater management facility Rule J, subsection 3.10 does not impose requirements on the project.

Chloride Management

Subsection 3.8 of Rule J requires the submission of chloride management plan that designates the individual authorized to implement the chloride management plan and the MPCA-certified salt applicator engaged in implementing the plan. Under subsection 3.8, the RPBCWD chloride-management plan requirement applies to the streets and common areas of the project site, but not the individual single-family homes. Because the streets within the proposed residential development will be within public right of way that will be maintained by the city of Eden Prairie and the City has provided its chloride management plan and its designated state-certified chloride applicator is Eden Prairie's Streets Division Manager Larry Doig, the proposed development conforms with Rule J, subsection 3.8.

Rule K: Variances and Exceptions

The applicant requested variances from the Rule J, Subsection 3.1a for rate control at the NW discharge location.

The attached variance request letter submitted on behalf of the applicant cites several facts related to the development in support of the request. Rule K requires the Board of Managers to find that because of unique conditions inherent to the subject property the application of rule provisions will impose a practical difficulty on the Applicant. Assessment of practical difficulty is conducted against the following criteria:

1. how substantial the variation is from the rule provision;
2. the effect of the variance on government services;
3. whether the variance will substantially change the character of or cause material adverse effect to water resources, flood levels, drainage or the general welfare in the District, or be a substantial detriment to neighboring properties;
4. whether the practical difficulty can be alleviated by a technically and economically feasible method other than a variance. Economic hardship alone may not serve as grounds for issuing a variance if any reasonable use of the property exists under the terms of the District rules;
5. how the practical difficulty occurred, including whether the landowner, the landowner's agent or representative, or a contractor, created the need for the variance; and
6. in light of all of the above factors, whether allowing the variance will serve the interests of justice.

It is the applicant's obligation to address these criteria to support a variance request (see attached variance memo). Following is the RPBCWD engineer's assessment of information received relevant to the applicant's variance requests.

The variance request is from the requirements of subsection 3.1a of the stormwater management rule (Rule J) which states rate for rate control must be provided at all locations discharge leaves the site. For purposes of the Board of Managers' consideration, the following factors were analyzed based on Rule K.

- Related to variance criterion 1 – As presented in the above rate control section, most of the runoff from the site discharges overland to the north to the neighboring properties, ultimately flowing into the storm sewer in North Maner Road under existing conditions. Rather than continuing to

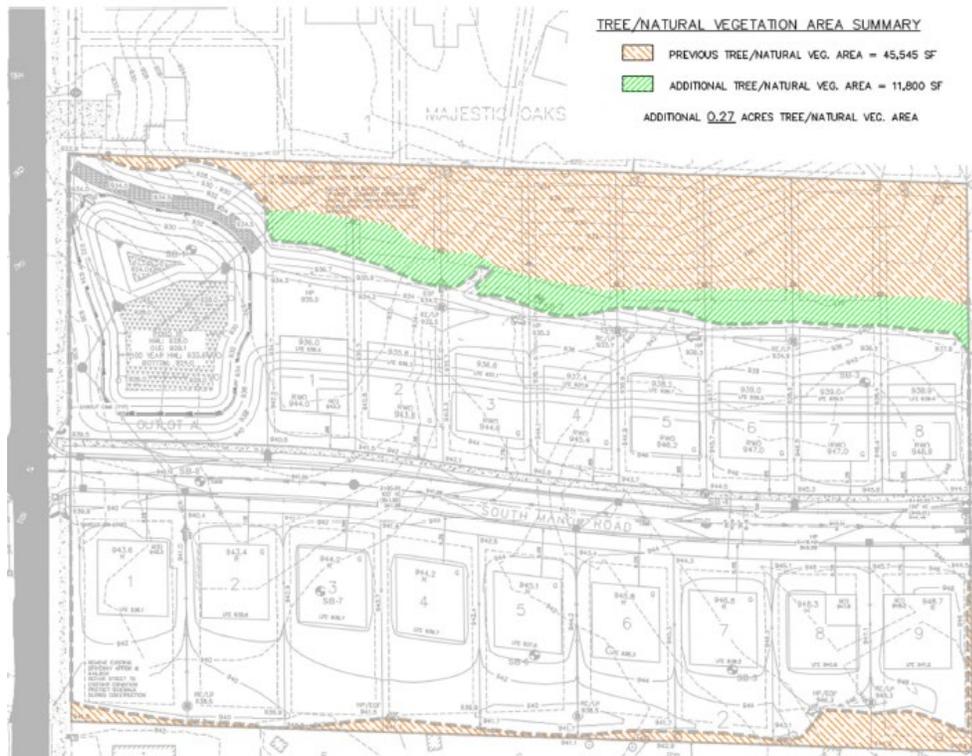
discharge to the neighboring properties, the applicant is proposing to discharge treated site runoff to an existing storm sewer in the boulevard along 168th Avenue which conveys flows to the storm sewer in North Maner Road. The change in stormwater routing and the discharge location would result in between 0.9 cfs to 3.5 cfs of additional flow into the existing storm sewer. Because stormwater currently does not discharge to the NW, the deviations from RPBCWD standards are substantial.

- Regarding variance criteria 2 and 3 –The additional flow into the existing 18-inch storm sewer would exacerbate a known flooding problem to the west of 168th Avenue. The applicant is proposing to increase the diameter of existing storm sewer along 168th Avenue from 18 inches to 21 inches to accommodate the additional flow. The following information provided by the applicant summarizes the off-site flood risk impacts at several locations.

- Flow rates entering Purgatory Creek are reduced.

Storm Event	Existing Flow (cfs)	Proposed Flow (cfs)
2-year	30.3	30.2
10-year	56.5	56.1
100-year	1091.0	1051.6

- The revised design preserves an additional 0.27 acres of natural area with trees from the initial proposed design. This results in a total preservation area of 1.32 acres or roughly 20.5% of the parcel.



- The aggregate flow leaving the site is reduced.

Storm Event	Existing Flow (cfs)	Proposed Flow (cfs)
2-year	12.2	2.7
10-year	25.1	7.0
100-year	52.0	14.9

- With the exception of the 100-year elevation at location 6, the proposed project would maintain or reduce the flood risk in the downstream depressions. The following table summarizes the impact on off-site flood level for the 2-, 10-, and 100-year events. The proposed-conditions modeling indicates there would be a 0.3-foot reduction in the



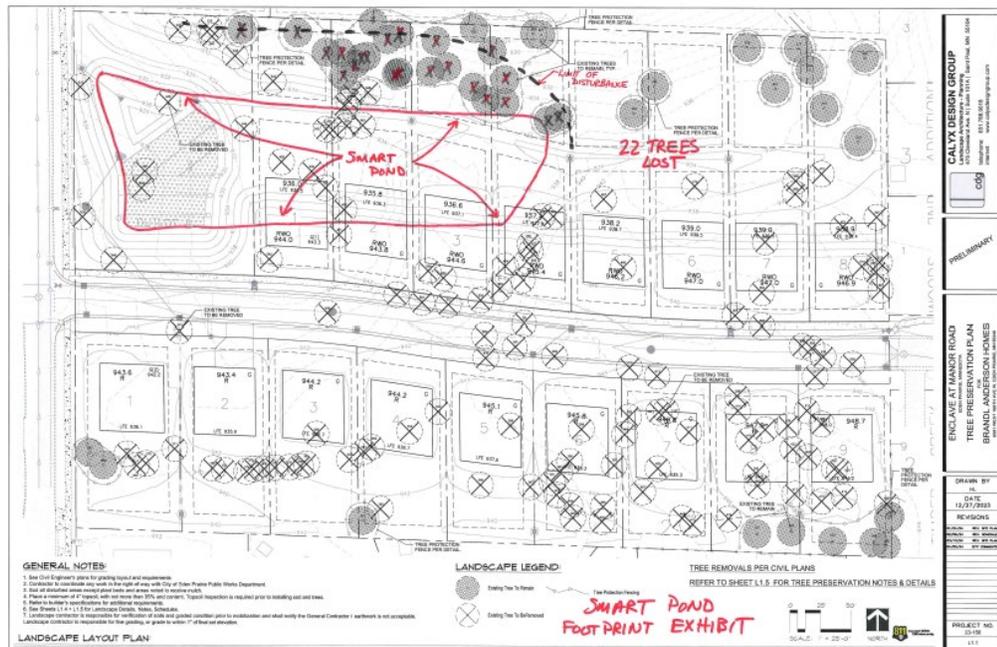
100-year flood elevation in area 9 (shown in photo above). This would provide some flood risk reduction to the adjacent homes relative to existing conditions.

Location	Description	Existing 2-Yr HWL	Proposed 2-Yr HWL (21"N-S)	Existing 10-Yr HWL	Proposed 10-Yr HWL (21"N-S)	Existing 100-Yr HWL	Proposed 100-Yr HWL (21"N-S)
1	Rear Yard Low Point – Lot 7, Block 1 Coachlight Manor	929.7	929.7 (0.0)	930.1	930.1 (0.0)	931.9	931.8 (-0.10)
6	Pond in Block 2, Lot 1 Majestic Oaks	911.7	910.6 (-1.1)	913.7	913.7 (0.0)	913.9	914.0 (+0.10)
9	Northern Low Point	905.3	904.9 (-0.4)	907.8	907.1 (-0.6)	910.6	910.3 (-0.3)

- The applicant considered the following alternatives to alleviate the practical difficulty (variance criterion 4) or reduce the magnitude of the variance from compliance.

- Discharging sheet flow to the adjacent properties to the north to align with current drainage paths would eliminate the need for a variance. A long rock trench outlet or long concrete weir wall concept configurations were considered but dismissed for the following reasons:
 - They would result in increased land disturbance and limit the preservation of existing trees and vegetation.
 - Would require between 20-27 additional trees be removed to construct the facilities.
 - Construction to ensure uniform discharge over the entire length of the weir presents logistical challenges. Any settlement or deviation in the crest elevation would result in channelized flow onto adjacent properties.
 - The stormwater facility will collect public drainage and be transferred to the City of Eden Prairie for ongoing management. Extensive effort would be needed to access and maintain flow-spreading facility.
- The applicant dismissed the idea of constructing a new storm sewer discharge directly north toward the storm sewer in North Manor because the applicant did not obtain property rights to install the storm sewer through the private properties. In addition, modeling indicates this option would not reduce the impacts at location 6.
- To respond to the managers questions at the May 8, 2024 meeting, the applicant considered the following onsite runoff-retention/abstraction strategies to reduce the magnitude of the variance request. As a surrogate for sizing and modeling each alternative, the applicant used the PCSWMM model to estimate the impact on the 100-year runoff and flood elevations of abstracting an amount of runoff equivalent to 1.1 inches from the regulated impervious surface (i.e., the full abstraction required by Rule J, subsection 3.1b). Because the 100-year event represents 7.41 inches of rainfall, the modeling confirmed that abstracting 1.1 inches from the impervious surface has negligible impacts on the off-site 100-year flood elevations.
 - Natural area preservation is incorporated into the site design. As described above the applicant adjusted the plans to provide an addition 0.27 acres of natural area and tree preservation.
 - Stormwater harvest and reuse were dismissed due to concerns with sufficient water retention to meet the entire demand for all lots, public roadway runoff and associated pollutants impact private lawns, equitable use by individual resident irrigation systems.
 - Rain gardens on each lot was dismissed because the soils on the site are not conducive to infiltration, thus requiring and underdrain which would limit the abstraction volume achieved by the gardens.
 - Tree trenches were not a viable option because the city of Eden Prairie does not allow trees within public right-of-way.

- o Redesign of the stormwater facility to provide live storage to hold the runoff from the entire 100-year event and release water via an electronically actuate valve or pump station only when downstream storm sewer has capacity (referred to the “Smarty Pond” alternative in the applicants variance memo.) The applicant’s narrative suggests this alternative has the potential to alleviate the modeled increase in downstream flood elevation at location 6. The applicant dismissed the alternative because of concern the system would not achieve the necessary pollutant removals, result in 22 more trees being removed to facilitate grading, rely on electrical controls and power (ie, concerns about power failure), logistical challenges/concerns express by the city related to the complex and intensive maintenance requirements (The stormwater facility will collect public drainage and be transferred to the City of Eden Prairie for ongoing management).



- Regarding variance criterion 5, the applicant has created the circumstances leading to the variance by connecting the storm sewer for the proposed development into the existing off-site storm sewer rather than discharging runoff overland to adjacent properties.

The engineer makes no determination as to whether there is an adequate technical basis for the managers to rely on to grant the requested variance. If the Managers grant the requested variance the RPBCWD engineer recommends the managers discuss a further condition with legal counsel, such as the following:

- K1. The applicant must provide written indemnification of the RPBCWD, signed by a representative with authority to bind the applicant, from all claims and causes of action arising from the proposed noncompliance with the RPBCWD low-floor criteria.

Rule L: Permit Fee Deposit:

The RPBCWD permit fee schedule adopted in February 2020 requires permit applicants to deposit \$3,000 to be held in escrow and applied to cover the \$10 permit-processing fee and reimburse RPBCWD for permit

review and inspection-related costs and when a permit application is approved, the deposit must be replenished to the applicable deposit amount by the applicant before the permit will be issued to cover actual costs incurred to monitor compliance with permit conditions and the RPBCWD Rules. A permit fee deposit of \$3,000 and a \$2,000 variance fee were received on January 16, 2024. The applicant must replenish the permit fee deposit to the original amount due before the permit will be issued. Subsequently, if the costs of review, administration, inspections and closeout-related or other regulatory activities exceed the fee deposit amount, the applicant will be required to replenish the deposit to the original amount or such lesser amount as the RPBCWD administrator deems sufficient within 30 days of receiving notice that such deposit is due. The administrator will close out the relevant application or permit and revoke prior approvals, if any, if the permit-fee deposit is not timely replenished.

L1. The applicant must replenish the permit fee deposit to the original amount due before the permit will be issued. As of May 30, 2024 the amount due is \$10,955.

Rule M: Financial Assurance:

	Unit	Unit Cost	# of Units	Total
Rule C: Erosion Control				
Silt Fence	LF	\$2.50	1,920	\$4,800
Inlet Protection	EA	\$100	15	\$1,500
Rock Entrance	EA	\$250	1	\$250
Restoration of disturbance	Ac	\$2,500	5.61	\$14,025
Rule J: Stormwater Management Infiltration basin: 125% of engineer’s opinion of cost (1.25*\$64,244)	EA	125% OPC	1	\$80,305
Contingency (10%)		10%		\$10,088
Total Financial Assurance				\$110,968

Applicable General Requirements:

1. The RPBCWD Administrator and Engineer shall be notified at least three days prior to commencement of work.
2. Construction must be consistent with the plans, specifications, and models that were submitted by the applicant that were the basis of permit approval. The date(s) of the approved plans, specifications, and modeling are listed on the permit. The grant of the permit does not in any way relieve the permittee, its engineer, or other professional consultants of responsibility for the permitted work.
3. The grant of the permit does not relieve the permittee of any responsibility to obtain approval of any other regulatory body with authority.
4. The issuance of this permit does not convey any rights to either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state, or local laws or regulations.

5. In all cases where the doing by the permittee of anything authorized by this permit involves the taking, using or damaging of any property, rights or interests of any other person or persons, or of any publicly owned lands or improvements or interests, the permittee, before proceeding therewith, must acquire all necessary property rights and interest.
6. RPBCWD's determination to issue this permit was made in reliance on the information provided by the applicant. Any substantive change in the work affecting the nature and extent of applicability of RPBCWD regulatory requirements or substantive changes in the methods or means of compliance with RPBCWD regulatory requirements must be the subject of an application for a permit modification to the RPBCWD.
7. If the conditions herein are met and the permit is issued by RPBCWD, the applicant, by accepting the permit, grants access to the site of the work at all reasonable times during and after construction to authorized representatives of the RPBCWD for inspection of the work.

Findings

1. The proposed project includes the information necessary, plan sheets and erosion control plan for review.
2. The Applicant has requested a variance from compliance with the Rule J criteria related control at all point discharge leave the site.
3. The proposed project will conform to Rules C if the Rule Specific Permit Conditions listed above are met.

Recommendation:

Approval of the permit contingent upon:

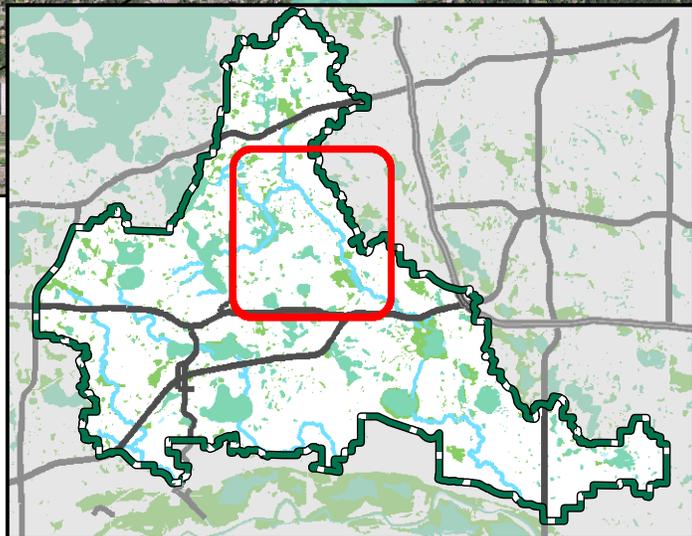
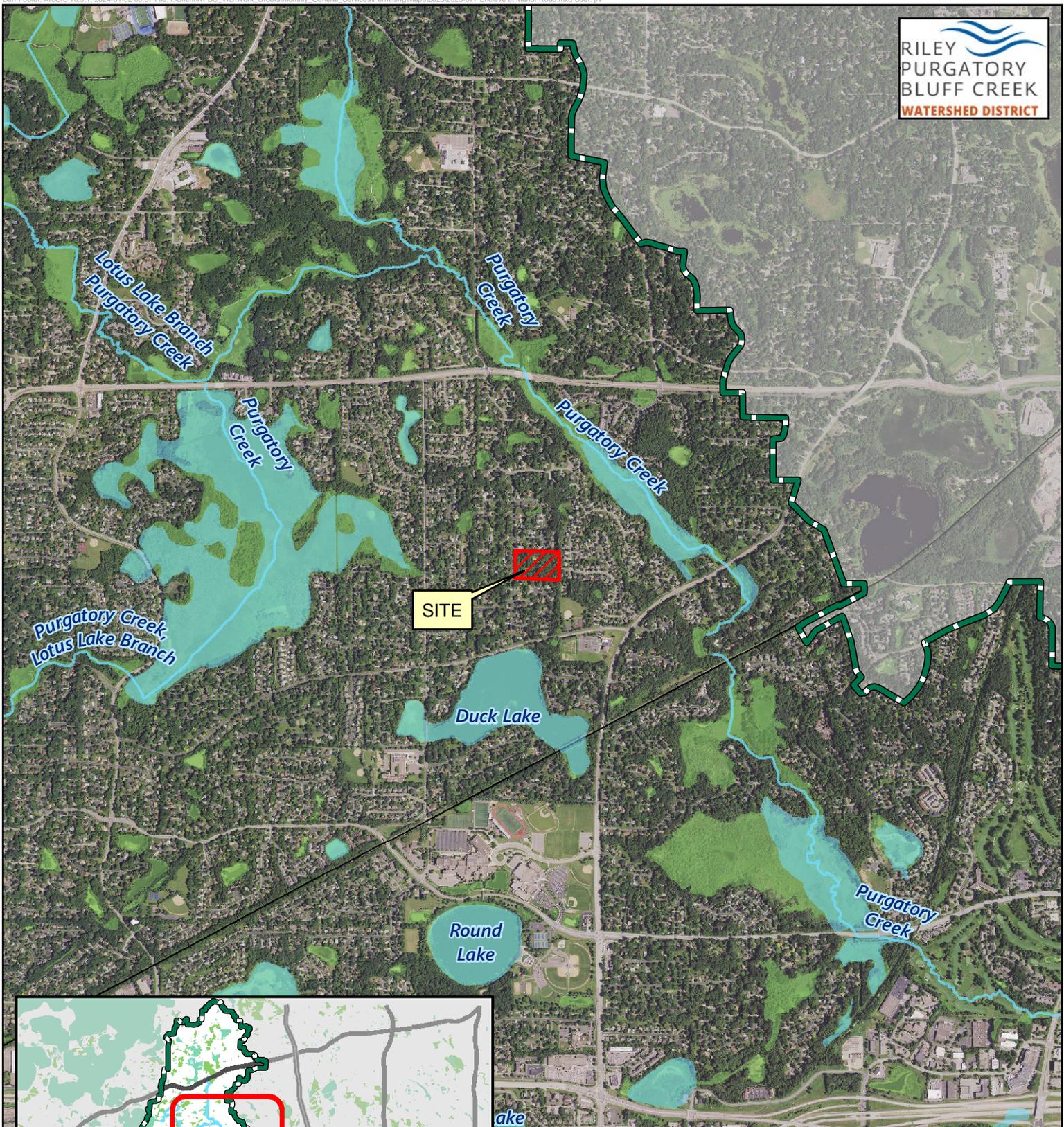
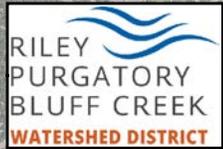
1. Financial Assurance in the amount of \$110,968.
2. Permit applicant must provide the name and contact information of the general contractor responsible for the site. RPBCWD must be notified if the responsible party changes during the permit term.
3. Receipt in recordation a maintenance declaration for the operation and maintenance all stormwater management facilities. The declaration must include the all stormwater management facilities as well as the preserved natural areas and vegetated swales. Drafts of all documents to be recorded must be reviewed and approved by the District prior to recordation.
4. The applicant must replenish the permit fee deposit to the original amount due before the permit will be issued. The amount needed to replenish the permit fee deposit is \$10,955 as of May 30, 2024.

By accepting the permit, when issued, the applicant agrees to the following stipulations:

1. Continued compliance with General Requirements.
2. Per Rule J Subsection 4.5, upon completion of the site work, the permittee must submit as-built drawings demonstrating that at the time of final stabilization the stormwater management facilities

conforms to design specifications and functions as intended and approved by the District. As-built/record drawings must be signed by a professional engineer licensed in Minnesota and include, but not limited to:

- a) the surveyed bottom elevations, water levels, and general topography of all facilities;
 - b) the size, type, and surveyed invert elevations of all stormwater facility inlets and outlets;
 - c) the surveyed elevations of all emergency overflows including stormwater facility, street, and other;
 - d) other important features to show that the project was constructed as approved by the Managers and protects the public health, welfare, and safety.
3. Providing the following additional close-out materials:
 - a) Documentation that constructed infiltration facility performs as designed. This may include infiltration testing, flood testing, or other with prior approval from RPBCWD
 - b) Documentation that disturbed pervious areas remaining pervious have been decompacted per Rule C.2c criteria
 4. The work on the Enclave at Manor Road subdivision under the terms of permit 2023-077, if issued, must have an impervious surface area and configuration materially consistent with the approved plans. Design that differs materially from the approved plans (e.g., in terms of total impervious area) will need to be the subject of a request for a permit modification or new permit, which will be subject to review for compliance with all applicable regulatory requirements.
 5. The applicant must submit additional soil investigation information supporting documentation demonstrating there is adequate freeboard or separation to groundwater to achieve the low floor criteria for Block 2, Lots 1, 2, 4, 6, 8, and 9. If the technical information demonstrates the structure would not comply with the low floor requirement in subsection 3.6a, design modifications to achieve compliance with RPBCWD requirements will need to be submitted in the form of an application for a permit modification or new permit.



Feet



Permit Location Map

ENCLAVE AT MANOR ROAD

Permit 2023-077

Riley Purgatory Bluff Creek
Watershed District

**ENCLAVE AT MANOR ROAD
EDEN PRAIRIE, MN**

for
BRANDL ANDERSON

VARIANCE REQUEST ADDENDUM

May 20, 2024

Prepared by:
John Bender, P.E.
License No. 43358



**James R. Hill, Inc.
2999 W. County Road 42, Ste. 100
Burnsville, MN 55306
Ph: 952-890-6044
ENCLAVE AT MANOR ROAD
EDEN PRAIRIE, MN**

INTRODUCTION

On April 19, 2024 on behalf of Brandl Anderson, James R. Hill submitted to Riley Purgatory Bluff Creek Watershed District (RPBCWD) an updated request for variance from their rate control rules for the proposed Enclave at Manor Road development in Eden Prairie, MN. On May 8th, 2024 the RPBCWD Board of Managers heard the variance request and voted against it in a 3-2 decision. The concerns listed by the Managers included:

- Impacts to flow entering Purgatory Creek
- Loss of trees and natural vegetation
- Increased downstream flood risk

Additionally, Managers suggested considering alternative stormwater management options to eliminate or reduce the severity of the variance, including stormwater reuse, tree trenches and small rain gardens.

The purpose of this addendum to the variance narrative is to address the Managers' concerns and recommendations and provide supporting information.

As demonstrated by the stormwater management plan and variance request, the proposed development will meet the water quality and volume abstraction requirements for a restricted site. The overall runoff rates for each critical storm event are reduced in the proposed condition. However, to avoid creating a nuisance condition for the neighbors, the discharge from the proposed stormwater basin will route to public storm sewer along 168th Ave. instead of directly onto neighboring properties to the north. The public storm sewer routes to the same downstream location as site runoff to the north, thus the overall existing drainage pattern is maintained in the proposed condition.

REDUCTION OF PEAK FLOW IN PURGATORY CREEK

The Board of Managers raised concerns about the rate of water entering Purgatory Creek resulting from the proposed variance. RPBCWD has recently implemented restoration of portions of Purgatory Creek and protecting it is of prime importance to the Board. To address this concern, the proposed development was added to the RPBCWD PCSWMM model and compared to the existing condition model. As shown in the **Table 1**, the flow rates of Purgatory Creek in the proposed condition downstream of the site will be less than existing for all critical rain events.

TABLE 1 – Purgatory Creek Flow Rates

Storm Event	Existing (cfs)	Proposed (cfs)
2 Year	30.3	30.2
10 Year	56.5	56.1
100 Year	1091.0	1051.6

PRESERVATION OF TREES AND NATURAL VEGETATION

The Board of Managers raised concern about the loss of natural vegetation and trees resulting from the proposed development. While the proposed development is consistent with the proposed zoning for the site and tree mitigation consistent with the City's tree ordinance will be provided, Brandl Anderson

agrees with the Managers’ desire to preserve natural vegetation. Lot density reduction is not feasible due to Metropolitan Council density requirements for land development served by their sanitary sewer system. Therefore, modifications to the utility, grading and site design were made to reduce the cultivated lawn space and **save an additional 11,800 square feet of natural vegetation and trees**, bringing the total preserved space to over 1.3 acres as shown in the **Figure 1** below. This results in reduced rates of runoff to the 168th Ave. storm sewer compared to the previous design and significantly reduced runoff from the site as a whole compared to the existing condition, see **Tables 2 & 3**, respectively. Additionally, the water quality is improved as shown in **Table 4**.

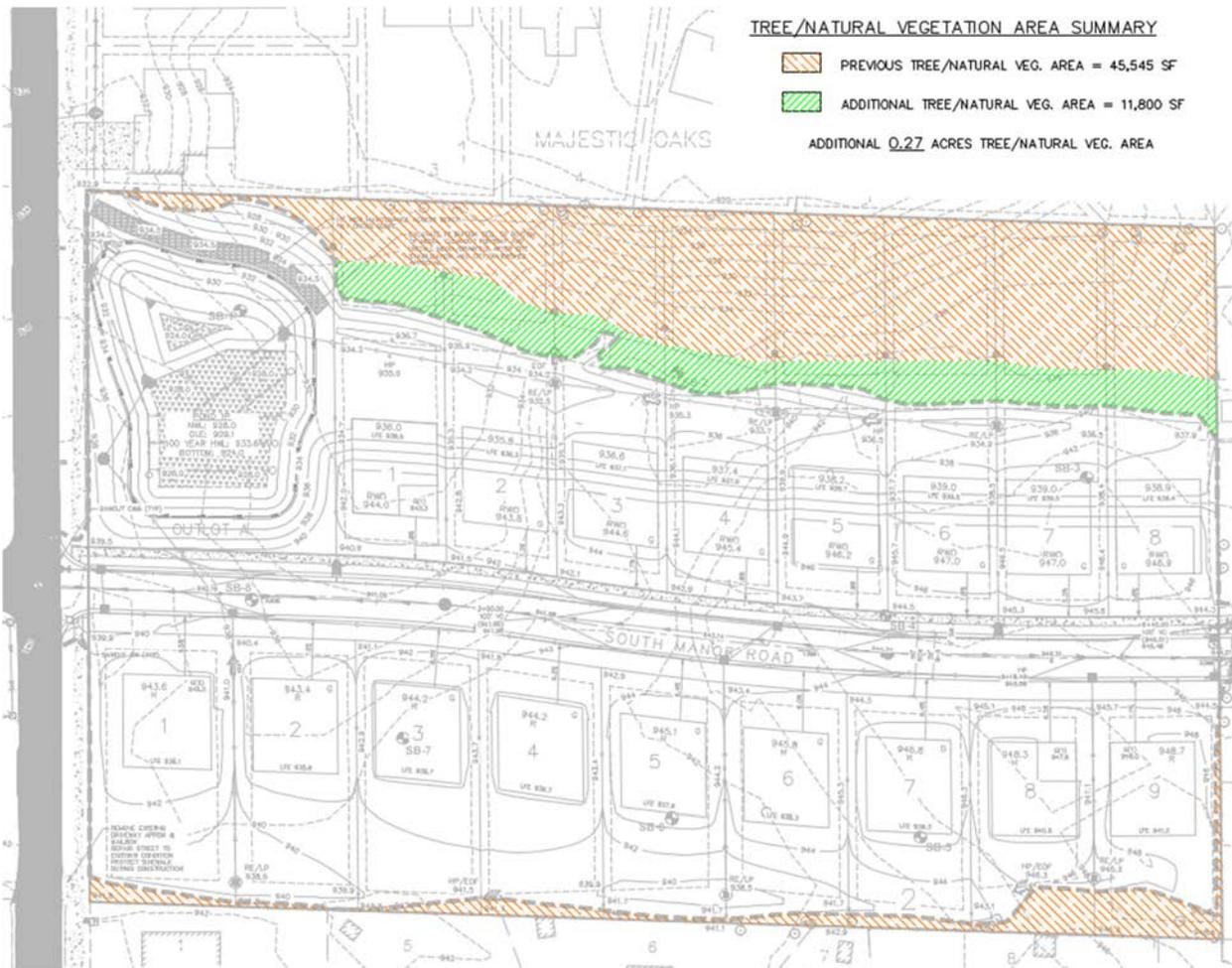


Figure 1

TABLE 2 – Reduced Rates to 168th Ave. Storm Sewer

Storm Event	Previous Design (cfs)	Updated Design with Additional Tree Preservation (cfs)
2 Year	1.16	1.14
10 Year	2.21	2.19
100 Year	3.55	3.50

TABLE 3 – Reduced Discharge Rates from the Site as a Whole

Storm Event	Existing Rates (cfs)	Updated Design with Additional Tree Preservation (cfs)
2 Year	12.18	2.69
10 Year	25.06	6.96
100 Year	52.01	14.86

TABLE 4 – Improved Water Quality

Pollutant	Allowed Per RPBCWD	Previous Design (cfs)	Updated Design with Additional Tree Preservation (cfs)
Annual TSS Discharge (lbs/yr)	646.3 (Existing)	143.6	131.5
Annual TP Discharge (lbs/yr)	2.2 (Existing)	2.2	2.2
Percent TSS Removal	90%	91.7%	92.5%
Percent TP Removal	60%	61.1%	61.9%

DOWNSTREAM FLOOD RISK

The site is restricted, meaning infiltration is not feasible. Rather, a biofiltration basin will provide water quality enhancements and minimal volume reduction via evapotranspiration. As a result, the high water levels (HWL) of offsite low areas will be affected by the proposed development. **Figure 2** shows the three regional low areas that are affected with the existing high water level inundation areas shown. All HWLs will remain the same or reduce for all critical events in the proposed condition with the exception of Low Area 6, which increases 0.1' during the 100-year event. This modified HWL will be contained within the existing public drainage and utility easement at Low Area 6. The existing and proposed HWLs are presented in **Table 5**.

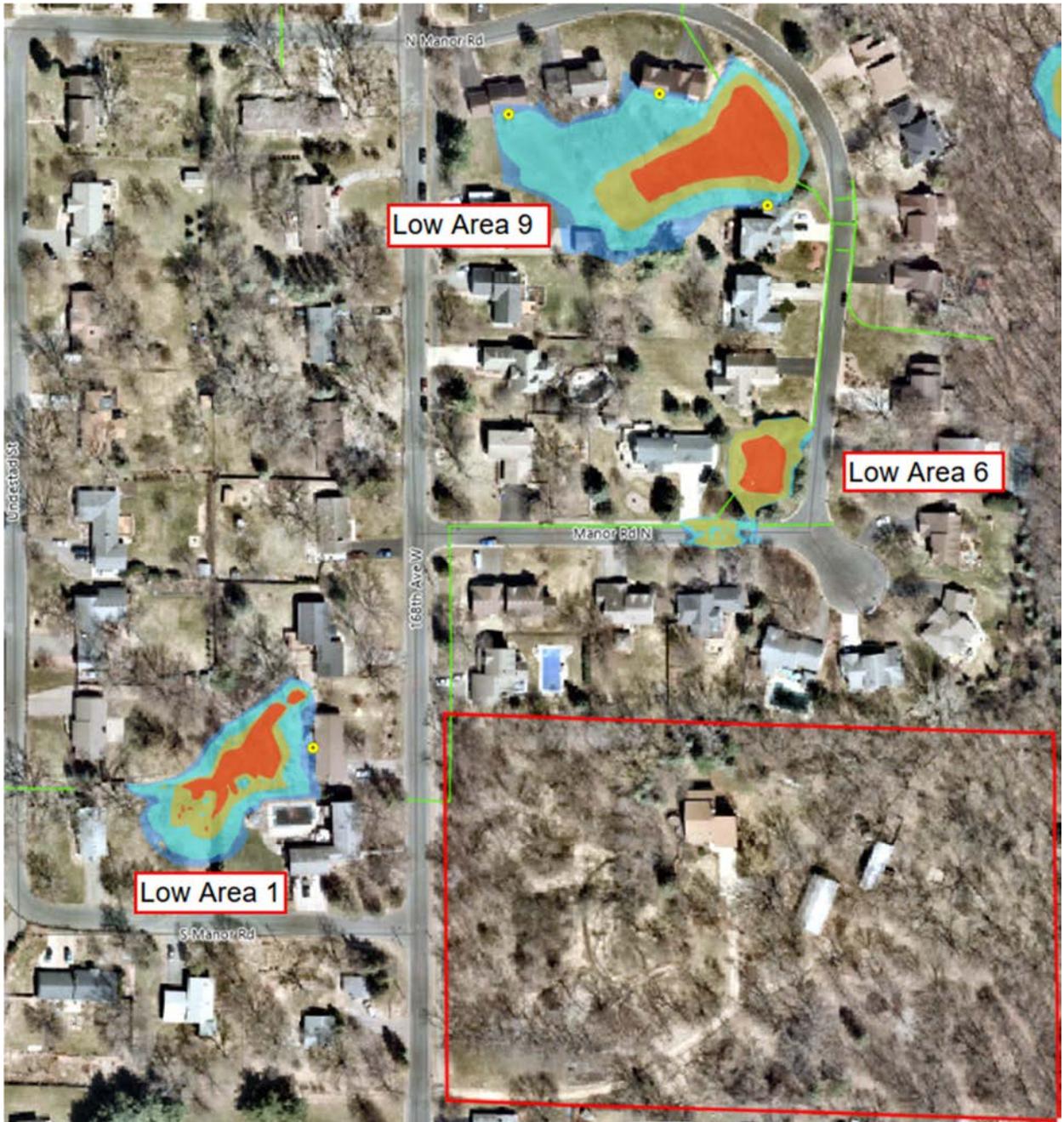


Figure 2 – Source: RPBCWD

TABLE 5 – Regional Low Area HWLs

Area 1	Existing	Proposed
2 Year HWL	929.7	929.7
10 Year HWL	930.1	930.1
100 Year HWL	931.9	931.8

Area 6	Existing	Proposed
2 Year HWL	911.7	910.6
10 Year HWL	913.7	913.7
100 Year HWL	913.9	914.0

Area 9	Existing	Proposed
2 Year HWL	905.3	904.9
10 Year HWL	907.8	907.1
100 Year HWL	910.6	910.3

The Managers expressed concern over the 0.1’ increase in HWL that will occur on average once every 100 years. Multiple options for reducing the increase in HWL were studied and are listed below. Because the City of Eden Prairie will own and operate the stormwater facilities, Patrick Sejkora, the Water Resources Engineer for the City provided the City’s opinion of the best management practices (BMP) considered in a letter dated May 20, 2024 that is presented in the appendix. The City does not believe the BMPs listed below are viable or impactful systems.

1. Stormwater reuse for irrigation – Reuse was studied using both the Carver County Reuse Calculator and the Ramsey Washington Metro Watershed District Reuse Calculator. Both confirmed that the lack of drainage area available for the site means the reservoir would not have an adequate supply of water to feed the irrigation system. Therefore, municipal water would be needed to augment system. The City’s concerns as presented in Mr. Sejkora’s letter are quoted here:

- *Any contamination coming from the right-of-way (salt, automotive fluids, pet waste, etc.), which the City has little to no control over, would be collected in the reuse system then be discharged directly onto residential lawns for irrigation. This could spread pollutants onto private property and present a health risk.*
- *The system would be difficult and expensive to maintain, especially since irrigation backup using public potable water would have to be provided for dry spells.*
- *The system would be impossible to equitably maintain and operate as different residents may water at different rates based on personal preference. Thus, some residents may exploit the “free” water from reuse leaving other residents to utilize City water, thus creating an unequitable situation between neighbors that could lead to conflict.*

It should also be noted that water reuse as a stormwater management technique provides little to no reduction in the 100-year runoff volume or runoff rate and thus would not reduce the

proposed HWL in Low Area 6. Additionally, the outlet of the reuse reservoir would route to the 168th Ave. storm sewer. Thus, the variance would still be required.

2. Rain Gardens – A series of small rain gardens distributed across the private lots was considered as a volume reduction technique. Per Mr. Sejkora’s letter, rain garden BMPs would not be an effective option:

Public curbside rain gardens or private ones in the yards of the homes would have to include an underdrain system due to the non-infiltrating soils onsite. This would severely limit their benefit in terms of abstraction or rate control to the point their maintenance and upkeep considerations outweigh the benefit they provide. The only runoff reduction benefit of the rain gardens would be solely from evapotranspiration, which is likely negligible.

Similar to water reuse, the rain gardens would provide little to no reduction in the 100-year runoff volume or runoff rate and thus would not reduce the proposed HWL in Low Area 6. Additionally, the outlet of the system would route to the 168th Ave. storm sewer. Thus, the variance would still be required.

3. Tree Trenches – Tree trenches were considered early in the design process. The City does not allow boulevard trees and thus tree trenches are not feasible for this site. Per Mr. Sejkora:

The City as a practice does not plant new trees within the right-of-way to allow for the installation of public and private utilities. Thus, tree trenches are not a viable option for the extension of South Manor Road.

As with the other techniques considered, tree trenches provide little to no reduction in the 100-year runoff volume or runoff rate and thus would not reduce the proposed HWL in Low Area 6. Additionally, the outlet of the system would route to the 168th Ave. storm sewer. Thus, the variance would still be required.

4. Smart Pond – After the Board decision on 5/8/24, James R. Hill conferred with RPBCWD Staff to brainstorm ideas to address the concerns raised by the Managers. One of the ideas put forward by Staff was a “smart pond”. This technique would involve a stormwater pond that is sized for live storage approximately equal to the 100-year runoff volume from the site. The outlet control structure would have an actuated valve that would remain closed throughout a rain event. The system would include a water sensor in the downstream storm sewer system. When that sensor reads that the downstream pipes are no longer flowing, the actuator would open the valve, allowing the stored runoff volume to drain downstream after the peak flow has passed through the system. If properly calibrated, it is feasible that such a system could reduce the 0.1’ increase in HWL in Low Area 6. Unfortunately, this system could not accommodate an underdrain. Without filtration, the basin would not meet the water quality requirement. The large storage volume required would result in more land disturbance, significantly reducing the preserved vegetation and trees which would further degrade water quality. Also, the complexity of the system could be prone to failure, as it would require power to actuate the valve and would depend on reliable communication with the downstream sensors. Should the system fail, the next rain event would discharge over the emergency overflow, which would

provide no rate control, resulting in significantly increased flooding potential downstream. The City's concerns with this BMP are quoted here:

- *Such a system would function best if routed directly to a larger water body with more storage like a lake or creek system as the City's current stormwater lift station on Preserve Boulevard does. By routing the water to a large public water body, the increased stages from the release of water is attenuated with minimal impacts to private property. However, in this case, the water would be routed to several small ponds within private property in residential neighborhoods. The smart pond system would have to be calibrated to ensure that releases from the basin could be routed through these ponds in such a way that it wouldn't adversely impact the private property around the homes in each of these ponds, which will be unfeasibly costly and difficult to do.*
- *Such a system would be expensive, complex, and intensive to maintain. It (would) likely require instrumentation and power at several downstream ponds that would need to be kept working at all times in order for the system to function properly.*

VARIANCE AVOIDANCE

Options for avoiding the need of the variance were considered. The variance is necessary because the proposed stormwater basin outlet routes to storm sewer in 168th Ave. Therefore, alternative outlet routing options were considered and are described below. It should be noted that all options considered will increase the HWL of Low Area 6 approximately 0.1' in the 100-year event.

- 1) Long Weir Wall Outlet - This BMP would involve a long stormwater basin along the north boundary of the site. Please refer to the exhibit in the appendix. The basin would be sized to provide the required rate control and the outlet would be a long weir wall extending most of the east-west width of the site. The discharge from this BMP would be designed to sheet flow to the north, mimicking the existing flow to the properties to the north. Unfortunately, a weir wall outlet does not accommodate an underdrain filtration system. Thus, the water quality requirement would not be met by this option. Also, nearly all the preserved vegetation and trees would be destroyed to construct the BMP, further reducing water quality. There is also concern of the potential for concentrated flow occurring due to minor imperfections in the weir wall. The City has several concerns with this BMP:

- *Uniform grading and vegetation establishment of an earthen berm several hundred feet in length does not seem feasible.*
- *Any inevitable minor settlement, cracking, or sloughing of the berm would result in concentrated flow, which would result in erosion or drainage problems for the downstream private properties.*
- *The basin would have to extend along the entirety of the north side of the parcel, resulting in additional tree loss.*
- *Maintenance of such a weir would not be feasible for City staff due to the challenging access and the constant need to keep a uniform berm elevation along several hundred feet.*
- *The City is not aware of any BMPs similar to this within the City or elsewhere that are designed to have a primary overflow of a weir directly onto private property.*

2) Long Rock Trench Outlet – This BMP would involve a long trench filled with riprap extending most of the east-west width of the site. Please refer to the exhibit in the appendix. The BMP would be downstream of a stormwater basin that would provide rate control, water treatment and volume abstraction. A perforated outlet pipe from the stormwater basin would run down the bottom of the rock trench. Water would distribute throughout the rock trench, filling it and overflowing to the north. The discharge from this BMP would be sheet flow, mimicking the existing flow to the properties to the north. As with the long weir wall, concentrated flow and erosion is a concern. Settling of the soil is inevitable, which could result in unequitable flow to an individual property to the north, creating erosion and safety issues. The City has several concerns with this BMP:

- *Uniform grading of a rock trench several hundred feet in length does not seem feasible, and any minor variations in elevation along the trench would result in concentrated flows on private property.*
- *The rock trench would be frozen during the winter. Thus, the basin would effectively have a plugged outlet during all subfreezing conditions. This would create significant issues if there is rain or freeze/thaw during winter, including damage to the basin or surrounding property (extended detention that could kill vegetation or damage the basin, water rising to the point of the emergency overflow, etc).*
- *The rock trench would be extremely difficult if not impossible to maintain. It would have to be kept free of weeds and vegetation, requiring extensive maintenance and use of herbicides. Any sedimentation within the trench would be nearly impossible to remove without full removal and replacement of the perforated pipe and rock.*
- *As with the long weir wall outlet BMP, the trench and its associated maintenance access would have to extend along the entirety of the north side of the parcel, resulting in additional tree loss.*
- *The aesthetics of the trench are problematic.*
- *The City is not aware of such a system within the City or elsewhere. It is unknown how the trench would respond to large magnitude storms with significant flow rates leaving the site.*

CONCLUSION

In response to the Board of Managers' concerns, Brandl Anderson and James R. Hill revised the plan to preserve over 1.3 acres of natural vegetation and trees. This further improves rate control, water quality and volume control. The rate discharging to Purgatory Creek will reduce in the proposed condition for all critical rain events and flooding potential is reduced in two off-site areas – Low Areas 1 & 9 – that have been identified by the City as flood prone. We appreciate the careful consideration RPBCWD has shown our development and the improved product that resulted for all stake holders.

APPENDIX

- City of Eden Prairie 5/20/24 Letter
- Long Weir Wall Outlet Exhibit
- Long Rock Trench Outlet Exhibit



OFC 952 949 8300
FAX 952 949 8390
TDD 952 949 8399

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Eden Prairie, MN
55344-4485

edenprairie.org

May 20, 2024

John Bender
James R. Hill, Inc.
2999 County Road 42 W, Suite 100
Burnsville, MN 55306

RE: The Enclave at Manor Road Stormwater Management

Dear Mr. Bender:

The City of Eden Prairie has reviewed several alternatives to the stormwater management for the proposed Enclave at Manor Road development that could mitigate the variance with the Riley Purgatory Bluff Creek Watershed District. Each of these best management practice (BMP) alternatives are listed below along with concerns the City has regarding the feasibility of their construction, functionality, and maintenance. Ultimately, the City does not believe the BMPs summarized below are viable or impactful systems that the City would own and maintain.

Smart Pond

The Smart Pond BMP is a wet pond with a mechanism within the outlet could allow for the system to retain and release water based on anticipated magnitude of storm events in a highly controlled manner. Thus, using forecasting, it could release water to an elevation below the normal water level prior to a rain event to allow for more retention for the event.

The City has several concerns with a smart pond for the proposed development:

- Such a system would function best if routed directly to a larger water body with more storage like a lake or creek system as the City's current stormwater lift station on Preserve Boulevard does. By routing the water to a large public water body, the increased stages from the release of water is attenuated with minimal impacts to private property. However, in this case, the water would be routed to several small ponds within private property in residential neighborhoods. The smart pond system would have to be calibrated to ensure that releases from the basin could be routed through these ponds in such a way that it wouldn't adversely impact the private property around the homes in each of these ponds, which will be unfeasibly costly and difficult to do.
- Such a system would be expensive, complex, and intensive to maintain. It likely require instrumentation and power at several downstream ponds that would need to be kept working at all times in order for the system to function properly.

Long Weir Well Outlet

This BMP would utilize a long linear basin on the north side of the Development that would not have a piped outlet connected to City storm sewer. Rather, a long weir with a uniform elevation would allow any overflows to sheet flow through the properties to the north and into the storm system along North Manor Road.

The City's concerns with this approach are:

- Uniform grading and vegetation establishment of an earthen berm several hundred feet in length does not seem feasible.
- Any inevitable minor settlement, cracking, or sloughing of the berm would result in concentrated flow, which would result in erosion or drainage problems for the downstream private properties.
- The basin would have to extend along the entirety of the north side of the parcel, resulting in additional tree loss.
- Maintenance of such a weir would not be feasible for City staff due to the challenging access and the constant need to keep a uniform berm elevation along several hundred feet.
- The City is not aware of any BMPs similar to this within the City or elsewhere that are designed to have a primary overflow of a weir directly onto private property.

Long Rock Trench Outlet

This BMP itself would function similarly to previously proposed filtration basin. However, instead of the outlet pipe connecting directly into City storm sewer, it would be directed to a perforated pipe running within a rock trench along the entirety of the north side of the development. Head from the basin would then force water from the basin up through the perforated pipe and rock to sheet flow to the properties to the north.

The City's concerns with this approach are:

- Uniform grading of a rock trench several hundred feet in length does not seem feasible, and any minor variations in elevation along the trench would result in concentrated flows on private property.
- The rock trench would be frozen during the winter. Thus, the basin would effectively have a plugged outlet during all subfreezing conditions. This would create significant issues if there is rain or freeze/thaw during winter, including damage to the basin or surrounding property (extended detention that could kill vegetation or damage the basin, water rising to the point of the emergency overflow, etc).
- The rock trench would be extremely difficult if not impossible to maintain. It would have to be kept free of weeds and vegetation, requiring extensive maintenance and use of herbicides. Any sedimentation within the trench would be nearly impossible to remove without full removal and replacement of the perforated pipe and rock.
- As with the long weir wall outlet BMP, the trench and its associated maintenance access would have to extend along the entirety of the north side of the parcel, resulting in additional tree loss.
- The aesthetics of the trench are problematic.
- The City is not aware of such a system within the City or elsewhere. It is unknown how the trench would respond to large magnitude storms with significant flow rates leaving the site.

Stormwater Reuse

This BMP would utilize runoff collected from the Site and stored in a reservoir for irrigation of the private homes within the development. Since much of the runoff would come from the right-of-way and there is no home owners association planned for the development, the reservoir would be maintained by the City.

The City has several concerns with this BMP:

- Any contamination coming from the right-of-way (salt, automotive fluids, pet waste, etc.), which the City has little to no control over, would be collected in the reuse system then be discharged directly onto residential lawns for irrigation. This could spread pollutants onto private property and present a health risk.
- The system would be difficult and expensive to maintain, especially since irrigation backup using public potable water would have to be provided for dry spells.
- The system would be impossible to equitably maintain and operate as different residents may water at different rates based on personal preference. Thus, some residents may exploit the “free” water from reuse leaving other residents to utilize City water, thus creating an inequitable situation between neighbors that could lead to conflict.

Rain gardens

Public curbside rain gardens or private ones in the yards of the homes would have to include an underdrain system due to the non-infiltrating soils onsite. This would severely limit their benefit in terms of abstraction or rate control to the point their maintenance and upkeep considerations outweigh the benefit they provide. The only runoff reduction benefit of the rain gardens would be solely from evapotranspiration, which is likely negligible.

Tree Trenches

The City as a practice does not plant new trees within the right-of-way to allow for the installation of public and private utilities. Thus, tree trenches are not a viable option for the extension of South Manor Road.

Regards,



Patrick Sejkora, PE (MN # 53713)
Water Resources Engineer

F:\Civil_3D\Projects\24123\PRE-PLAT PLANS\24123G.dwg - 5/08/2024 09:09AM

168TH AVENUE WEST

WOODS 2ND

TIMBER CREEK

COUNTRY VISTA

MAJESTIC OAKS

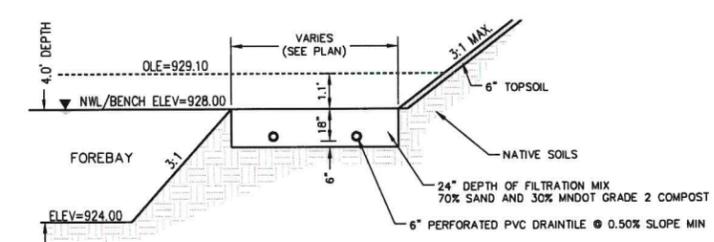
SOUTH MANOR ROAD

TOP OF WEIR WALL 928.0
SID LF 7/2

RATE CONTROL
BASIN

LONG WEIR WALL OUTLET
EXHIBIT

POND 1P FOREBAY W/ FILTRATION BENCH

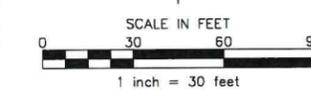


LEGEND

- EXISTING WATERMAIN
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING CURB & GUTTER
- EXISTING RETAINING WALL
- EXISTING FENCE
- EXISTING RAILROAD
- EXISTING CONTOUR
- EXISTING WETLAND EDGE
- EXISTING SOIL BORING LOCATION
- EXISTING TREELINE/TREES
- EXISTING ASPHALT
- EXISTING CONCRETE
- EXISTING GRAVEL
- EXISTING WETLAND
- PROPOSED WATERMAIN
- PROPOSED SANITARY SEWER
- PROPOSED SANITARY SERVICE
- PROPOSED WATER SERVICE
- PROPOSED STORM SEWER
- PROPOSED DRAIN TILE
- PROPOSED PERFORATED DRAIN TILE
- PROPOSED CURB & GUTTER
- PROPOSED RETAINING WALL
- PROPOSED CONTOUR
- PROPOSED GRADING LIMITS
- PROPOSED EMERGENCY OVERFLOW
- PROPOSED CONCRETE
- PROPOSED ASPHALT SURFACE
- PROPOSED SEDIMENT BASIN
- PROPOSED FILTRATION BASIN
- PROPOSED MAINTENANCE ACCESS
- NATURAL AREA MONUMENT POST

ESTIMATED EARTHWORK QUANTITIES

ORIGINAL TO FINISH:
 CUT = 7,990 CUBIC YARDS
 FILL = 18,100 CUBIC YARDS

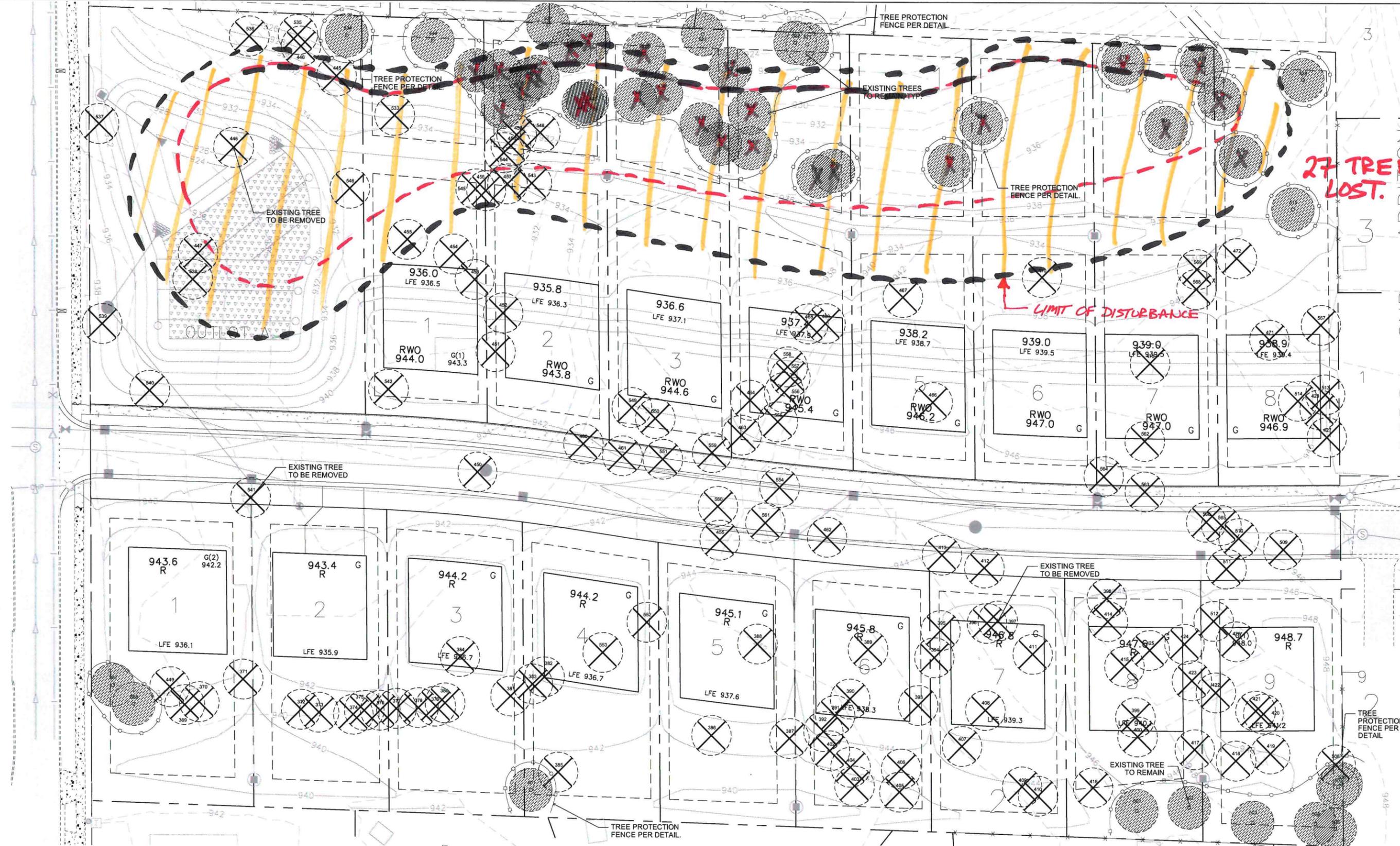


James R. Hill, Inc.
 PLANNERS / ENGINEERS / SURVEYORS
 2999 W. Cty. Rd. 42, Suite 100, Burnsville, MN 55306
 PHONE: (952)890-6044 FAX: (952)890-6244

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am an Engineer under the laws of the State of Minnesota.
 JOHN H. BENDER
 Date: 01/24/24 Reg. No. XXXXX

ENCLAVE AT MANOR ROAD
 EDEN PRAIRIE, MINNESOTA
PRELIMINARY GRADING & DRAINAGE PLAN
 FOR
BRANDL ANDERSON
 221 RIVER RIDGE CIRCLE SOUTH - SUITE 100, BURNSVILLE, MN 55337

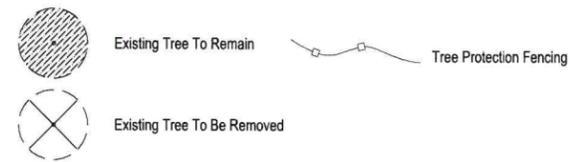
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REVISIONS	
2024-03-13 CITY COMMENTS	
2024-03-18 WATERSHED COMMENTS	
2024-04-03 CITY COMMENTS	
2024-04-19 WATERSHED COMMENTS	
2024-05-08 LOT & BLOCK 2 GRADE	
CAD FILE	24123G
PROJECT NO.	24123
	C4.0



GENERAL NOTES:

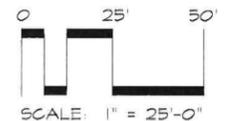
1. See Civil Engineer's plans for grading layout and requirements
2. Contractor to coordinate any work in the right-of-way with City of Eden Prairie Public Works Department.
3. Sod all disturbed areas except plant beds and areas noted to receive mulch.
4. Place a minimum of 4" topsoil, with not more than 35% and content. Topsoil inspection is required prior to installing sod and trees.
5. Refer to builder's specifications for additional requirements.
6. See Sheets L1.4 + L1.5 for Landscape Details, Notes, Schedules.
7. Landscape contractor is responsible for verification of soils and graded condition prior to mobilization and shall notify the General Contractor if earthwork is not acceptable. Landscape contractor is responsible for fine grading, or grade to within 1" of final set elevation.

LANDSCAPE LEGEND:



TREE REMOVALS PER CIVIL PLANS

REFER TO SHEET L1.5 FOR TREE PRESERVATION NOTES & DETAILS



LANDSCAPE LAYOUT PLAN:

CALYX DESIGN GROUP
 Landscape Architecture - Planning
 475 Cleveland Ave. N | Suite 101A | Saint Paul, MN 55104
 telephone: 651.788.9018
 internet: www.calyxdesigngroup.com

PRELIMINARY

ENCLAVE AT MANOR ROAD
 EDEN PRAIRIE, MINNESOTA
 TREE PRESERVATION PLAN
 FOR
 BRANDL ANDERSON HOMES
 6591 WEST 188TH AVE W, EDEN PRAIRIE, MN 55346

DRAWN BY
HL

DATE
12/27/2023

REVISIONS

REV.	DATE	DESCRIPTION
01/24/24	REV. SITE PLAN	
02/06/24	REV. SCHEDULE	
03/13/24	REV. SITE PLAN	
04/02/24	CITY COMMENTS	

PROJECT NO.
23-156

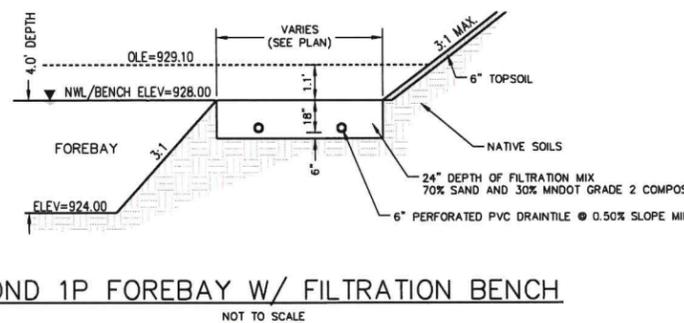
L1.1

F:\Civil_3D_Projects\24123\PRE-PLAT PLANS\24123G.dwg - 5/08/2024 09:09AM

168TH AVENUE WEST

MAJESTIC OAKS

POND 1P FOREBAY W/ FILTRATION BENCH



LEGEND

- EXISTING WATERMAIN
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING CURB & GUTTER
- EXISTING RETAINING WALL
- EXISTING FENCE
- EXISTING RAILROAD
- EXISTING CONTOUR
- EXISTING WETLAND EDGE
- EXISTING SOIL BORING LOCATION
- EXISTING TREELINE/TREES
- EXISTING ASPHALT
- EXISTING CONCRETE
- EXISTING GRAVEL
- EXISTING WETLAND
- PROPOSED WATERMAIN
- PROPOSED SANITARY SEWER
- PROPOSED SANITARY SERVICE
- PROPOSED WATER SERVICE
- PROPOSED STORM SEWER
- PROPOSED DRAIN TILE
- PROPOSED PERFORATED DRAIN TILE
- PROPOSED CURB & GUTTER
- PROPOSED RETAINING WALL
- PROPOSED CONTOUR
- PROPOSED GRADING LIMITS
- PROPOSED EMERGENCY OVERFLOW
- PROPOSED CONCRETE
- PROPOSED ASPHALT SURFACE
- PROPOSED SEDIMENT BASIN
- PROPOSED FILTRATION BASIN
- PROPOSED MAINTENANCE ACCESS
- NATURAL AREA MONUMENT POST

ESTIMATED EARTHWORK QUANTITIES

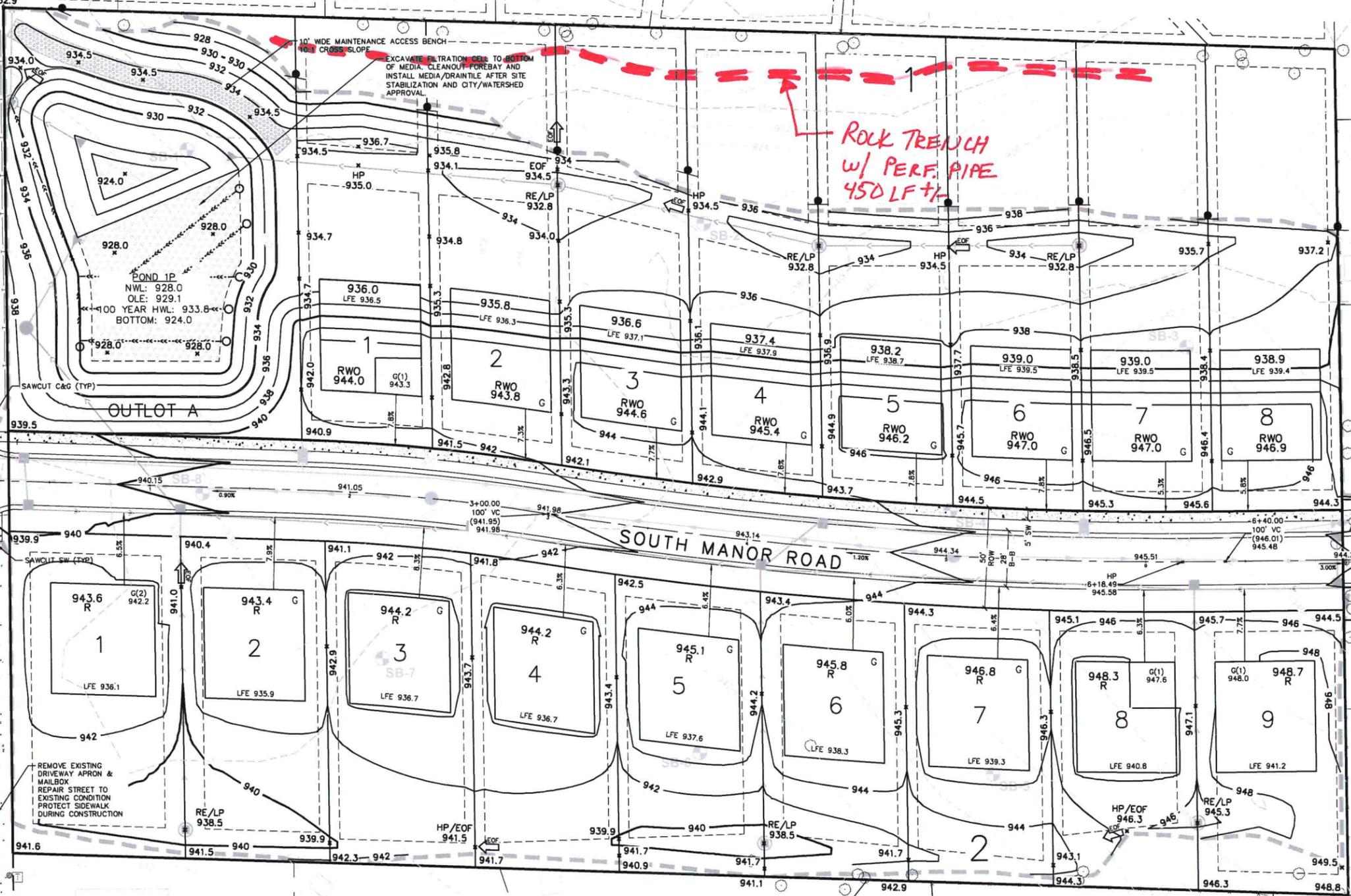
ORIGINAL TO FINISH:
 CUT = 7,990 CUBIC YARDS
 FILL = 18,100 CUBIC YARDS

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ENCLAVE AT MANOR ROAD
 EDEN PRairie, MINNESOTA
PRELIMINARY GRADING & DRAINAGE PLAN
 FOR
BRANDL ANDERSON
 221 RIVER RIDGE CIRCLE SOUTH - SUITE 100, BURNSVILLE, MN 55337

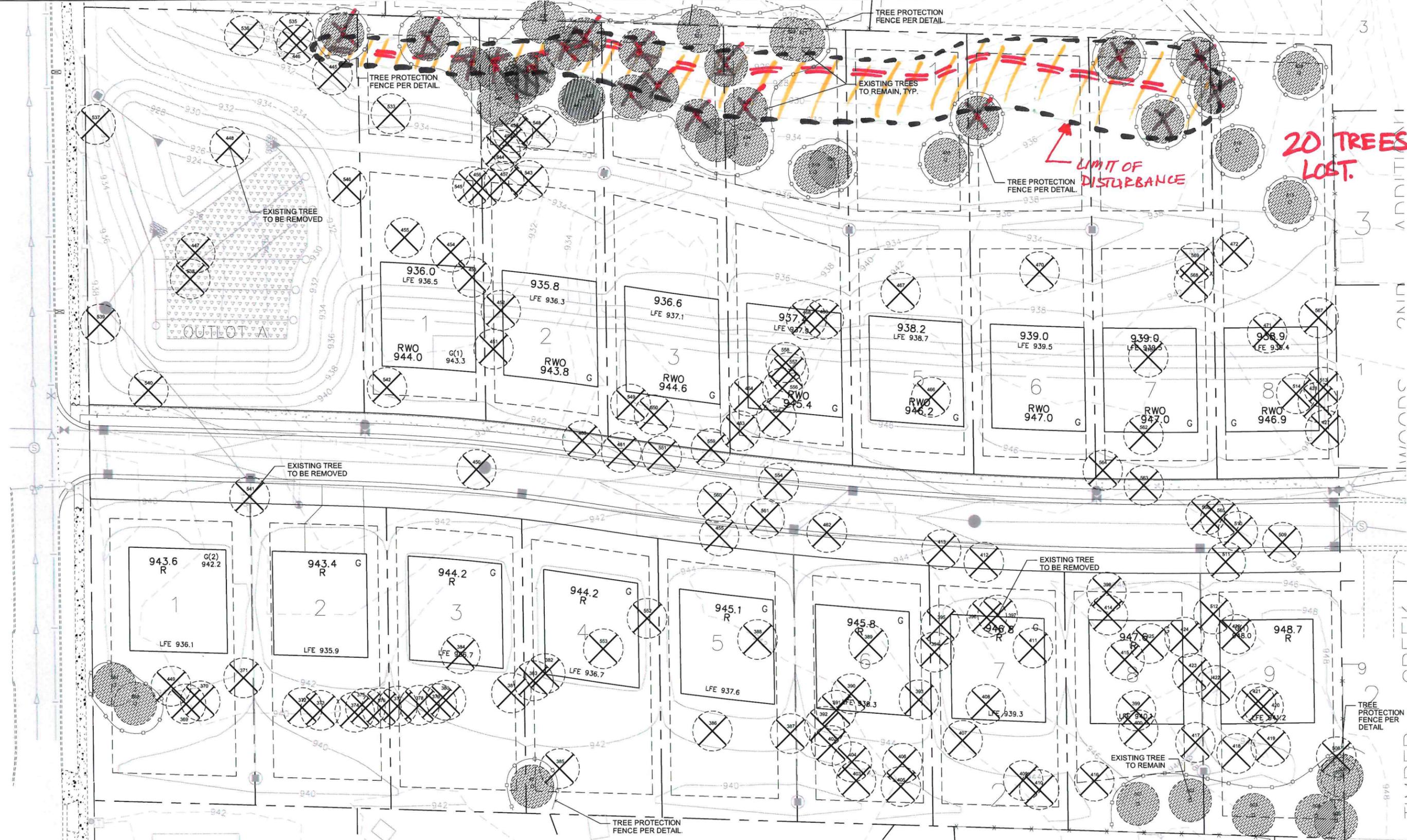
DRAWN BY
 EPF
 DATE
 01/24/24
 REVISIONS
 2024-03-13 QTY COMMENTS
 2024-03-18 WATERSHED COMMENTS
 2024-04-03 QTY COMMENTS
 2024-04-19 WATERSHED COMMENTS
 2024-05-08 LOT 8, BLOCK 2 GRADE
 CAD FILE
 24123G
 PROJECT NO.
 24123
 C4.0



LONG ROCK TRENCH OUTLET EXHIBIT



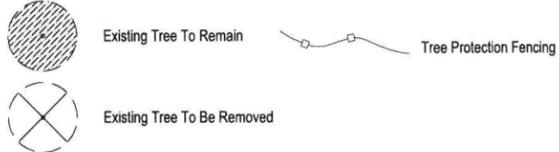
Know what's below. Call before you dig.



GENERAL NOTES:

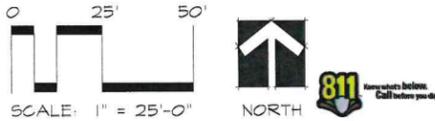
1. See Civil Engineer's plans for grading layout and requirements
2. Contractor to coordinate any work in the right-of-way with City of Eden Prairie Public Works Department.
3. Sod all disturbed areas except plant beds and areas noted to receive mulch.
4. Place a minimum of 4" topsoil, with not more than 35% and content. Topsoil inspection is required prior to installing sod and trees.
5. Refer to builder's specifications for additional requirements.
6. See Sheets L1.4 + L1.5 for Landscape Details, Notes, Schedules.
7. Landscape contractor is responsible for verification of soils and graded condition prior to mobilization and shall notify the General Contractor if earthwork is not acceptable. Landscape contractor is responsible for fine grading, or grade to within 1" of final set elevation.

LANDSCAPE LEGEND:



TREE REMOVALS PER CIVIL PLANS

REFER TO SHEET L1.5 FOR TREE PRESERVATION NOTES & DETAILS



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PRELIMINARY

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 EDEN PRAIRIE, MINNESOTA
TREE PRESERVATION PLAN
 FOR
BRANDL ANDERSON HOMES
 6591 WEST 168TH AVE W, EDEN PRAIRIE, MN 55346

DRAWN BY
HL

DATE
12/27/2023

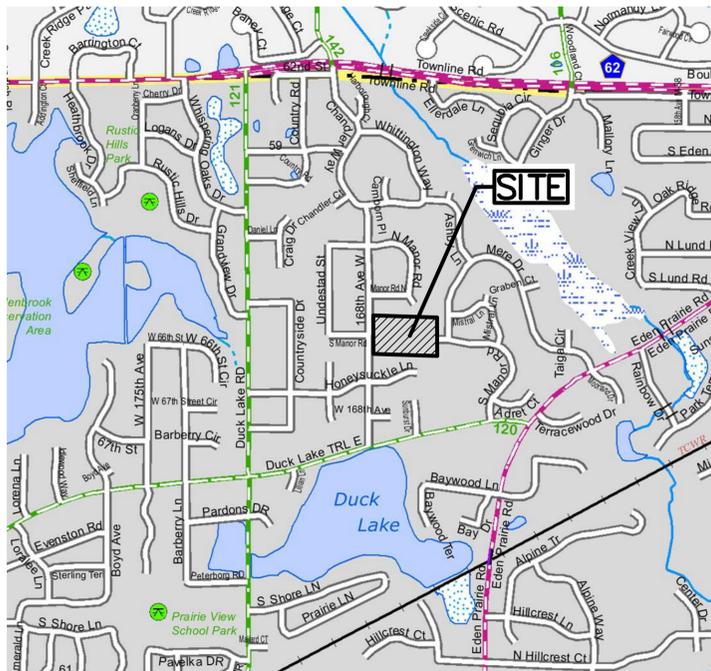
REVISIONS

REV.	DATE	DESCRIPTION
01/24/24	REV.	SITE PLAN
02/06/24	REV.	SCHEDULE
03/13/24	REV.	SITE PLAN
04/02/24	REV.	QTY COMMENTS

PROJECT NO.
23-156

L1.1

PROJECT COORDINATES
 N 44° 53' 03"
 W 93° 29' 19"



LOCATION MAP

1" = 1000'

SITE DATA

LOTS	17 LOTS
TOTAL SITE AREA	6.43 AC.
LOT AREA	4.96 AC.
OUTLOT AREA	0.70 AC.
RIGHT OF WAY AREA	0.77 AC.
GROSS DENSITY	2.64 LOTS/AC

EXISTING ZONING IS RURAL
 PROPOSED ZONING IS R1-9.5 (PUD)

MINIMUM LOT WIDTH PROVIDED	65 FEET
MINIMUM LOT DEPTH PROVIDED	136 FEET
MINIMUM LOT AREA PROVIDED	9,921 S.F.
AVERAGE LOT AREA	12,707 S.F.

MINIMUM BUILDING SETBACKS

FRONT	25 FEET
SIDE YARD (INTERIOR)	5 FEET MINIMUM
SIDE YARD (STREET)	15 FEET TOTAL OF BOTH SIDES
REAR	20 FEET

PROJECT CONTACTS

PROJECT ENGINEER:	JOHN BENDER, P.E. - JAMES R. HILL, INC.	952-890-6044 (O)
DEVELOPER:	MATT OLSON - BRANDL ANDERSON	952-898-0230 (O)
CITY ENGINEER:	CARTER SCHULZE - EDEN PRAIRIE	952-949-8339 (O)
NPDES OFFICER:	JOSH NORMAN - MPCA	951-757-2389 (O)
GENERAL CONTRACTOR REPRESENTATIVE:	TBD	

ENCLAVE AT MANOR ROAD

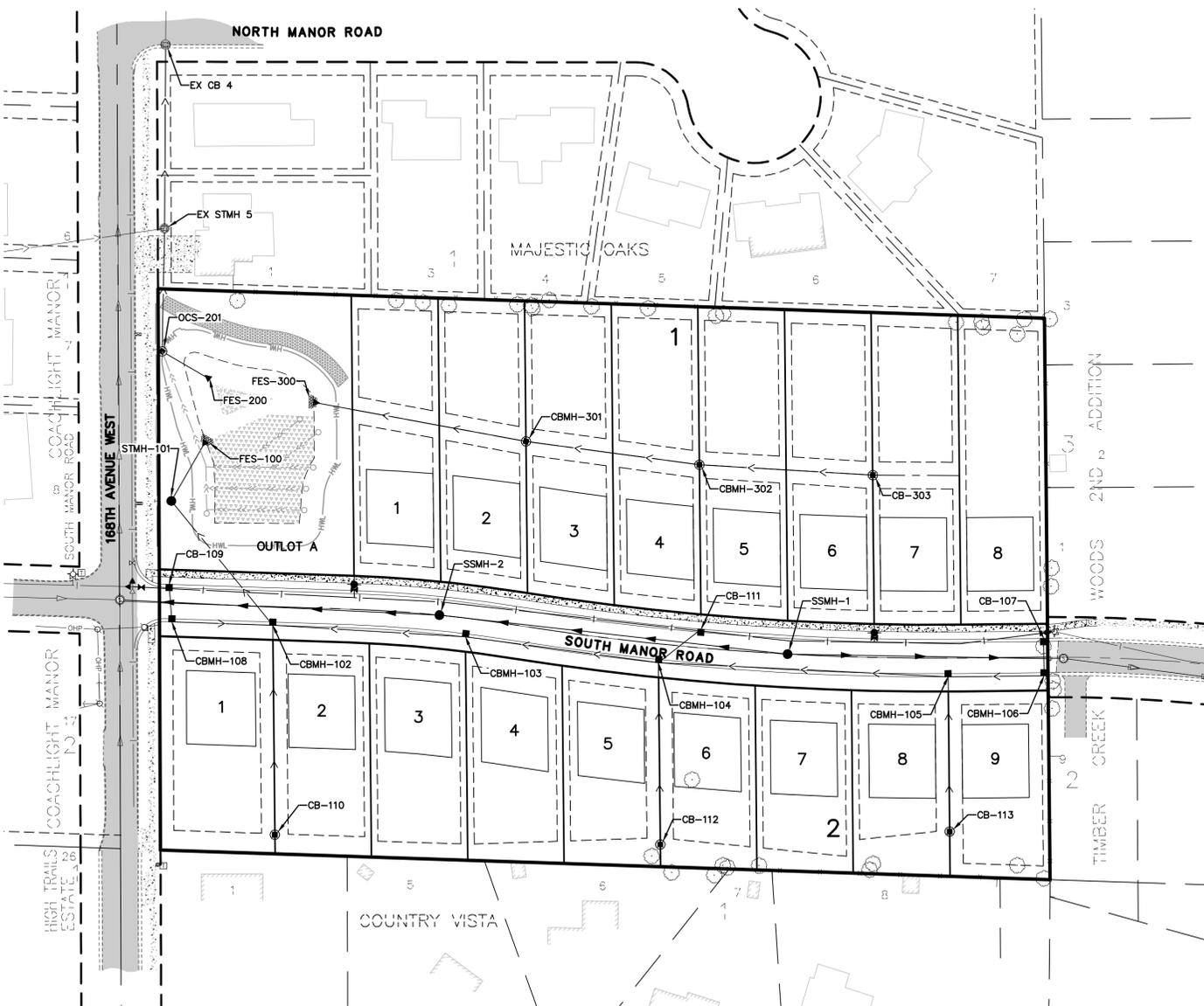
EDEN PRAIRIE, MINNESOTA

PRELIMINARY PLAT

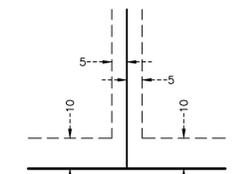
FOR

BRANDL ANDERSON

221 RIVER RIDGE CIRCLE SOUTH - SUITE 100, BURNSVILLE, MN 55337
 PHONE: (952) 898-0230



DRAINAGE AND UTILITY EASEMENTS ARE SHOWN THUS:



DRAINAGE AND UTILITY EASEMENTS BEING 5 FEET IN WIDTH, UNLESS OTHERWISE INDICATED, ADJOINING LOT LINES, AND BEING 10 FEET IN WIDTH, UNLESS OTHERWISE INDICATED, ADJOINING RIGHT OF WAY LINES, AS SHOWN ON THIS PLAT.

INDEX

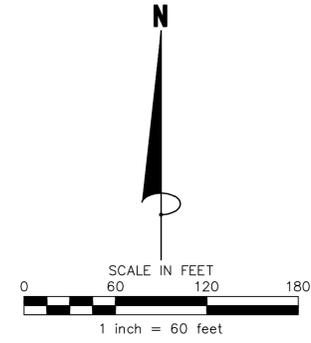
TITLE SHEET	C1.0
EXISTING CONDITIONS	C1.1
EXISTING DRAINAGE MAP	C1.2
PROPOSED DRAINAGE MAP	C1.3
DEMOLITION PLAN	C1.4
PRELIMINARY PLAT	C2.0
EROSION & SEDIMENT CONTROL PLAN	C3.0
EROSION & SEDIMENT CONTROL NOTES/DETAILS	C3.1-C3.2
GRADING & DRAINAGE PLAN	C4.0
UTILITY PLAN	C5.0-C5.4
CONSTRUCTION DETAILS	C6.0

LEGEND

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[Symbol]	EXISTING STORM SEWER
[Symbol]	EXISTING UNDERGROUND GAS
[Symbol]	EXISTING UNDERGROUND ELECTRIC
[Symbol]	EXISTING UNDERGROUND TELEPHONE
[Symbol]	EXISTING UNDERGROUND FIBER OPTIC
[Symbol]	EXISTING OVERHEAD POWER LINE
[Symbol]	EXISTING LIGHT POLE
[Symbol]	EXISTING TRANSFORMER
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[Symbol]	EXISTING TV PEDESTAL
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[Symbol]	EXISTING FENCE
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[Symbol]	EXISTING TREELINE/TREES
[Symbol]	EXISTING ASPHALT
[Symbol]	EXISTING CONCRETE
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[Symbol]	PROPOSED WATER SERVICE
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[Symbol]	PROPOSED SEED & MULCH MIX
[Symbol]	NATIVE PONDS & WET AREAS MnDOT 33-261



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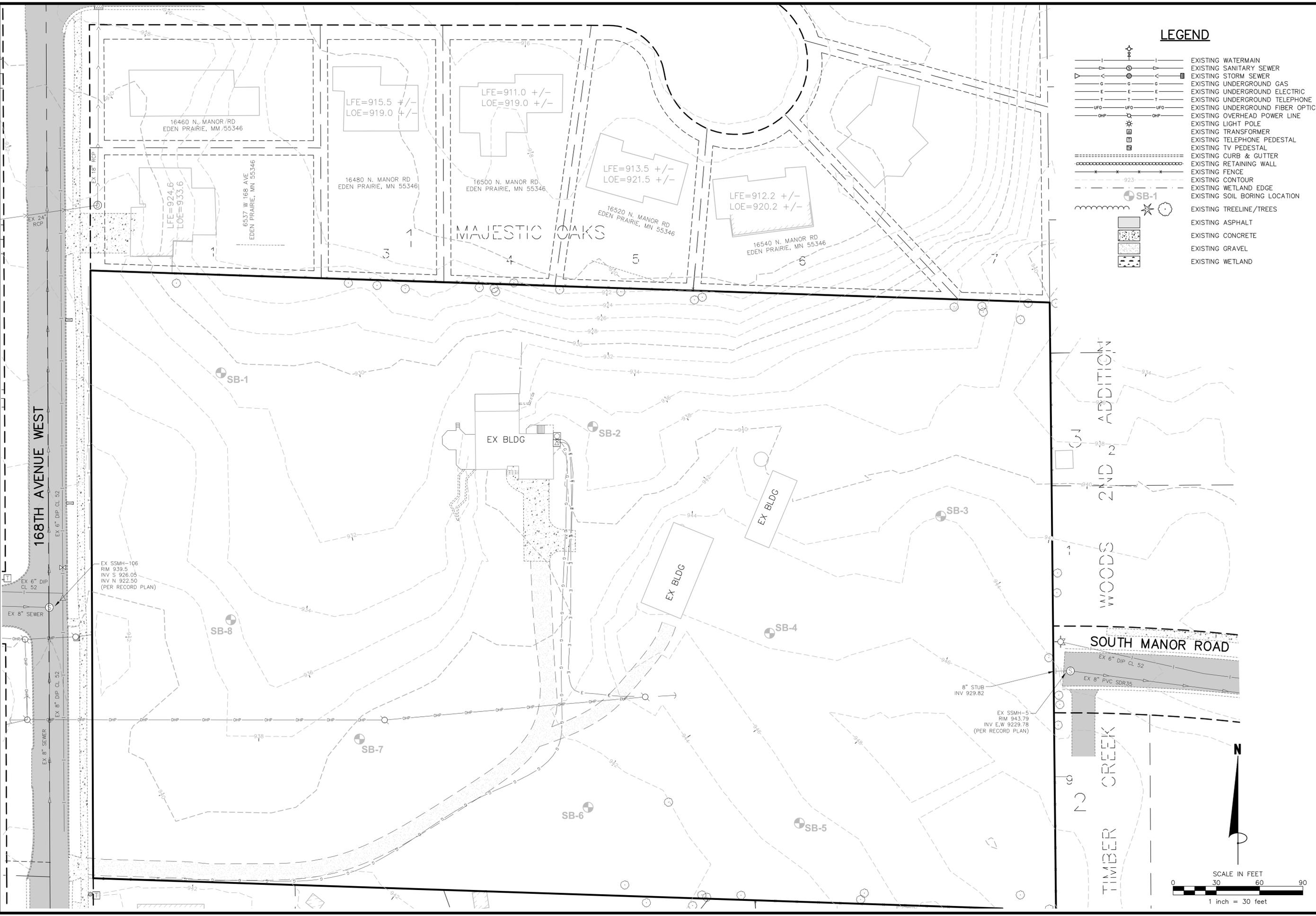
James R. Hill, Inc.
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 JOHN H. BENDER
 Date: 01/24/24 Reg. No. XXXXX

ENCLAVE AT MANOR ROAD
 EDEN PRAIRIE, MINNESOTA
TITLE SHEET
 FOR
BRANDL ANDERSON
 221 RIVER RIDGE CIRCLE SOUTH - SUITE 100, BURNSVILLE, MN 55337

DRAWN BY	EPF
DATE	01/24/24
REVISIONS	
2024-03-13 CITY COMMENTS	
2024-03-18 WATERSHED COMMENTS	
2024-04-03 CITY COMMENTS	
2024-04-19 WATERSHED COMMENTS	
2024-05-06 LOT 8, BLOCK 2 GRADE	
2024-05-20 WATERSHED COMMENTS	
CAD FILE	24123TS
PROJECT NO.	24123
	C1.0

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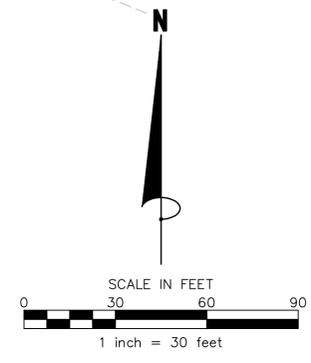
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	EXISTING STORM SEWER
	EXISTING UNDERGROUND GAS
	EXISTING UNDERGROUND ELECTRIC
	EXISTING UNDERGROUND TELEPHONE
	EXISTING UNDERGROUND FIBER OPTIC
	EXISTING OVERHEAD POWER LINE
	EXISTING LIGHT POLE
	EXISTING TRANSFORMER
	EXISTING TELEPHONE PEDESTAL
	EXISTING TV PEDESTAL
	EXISTING CURB & GUTTER
	EXISTING RETAINING WALL
	EXISTING FENCE
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	EXISTING SOIL BORING LOCATION
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	EXISTING ASPHALT
	EXISTING CONCRETE
	EXISTING GRAVEL
	EXISTING WETLAND

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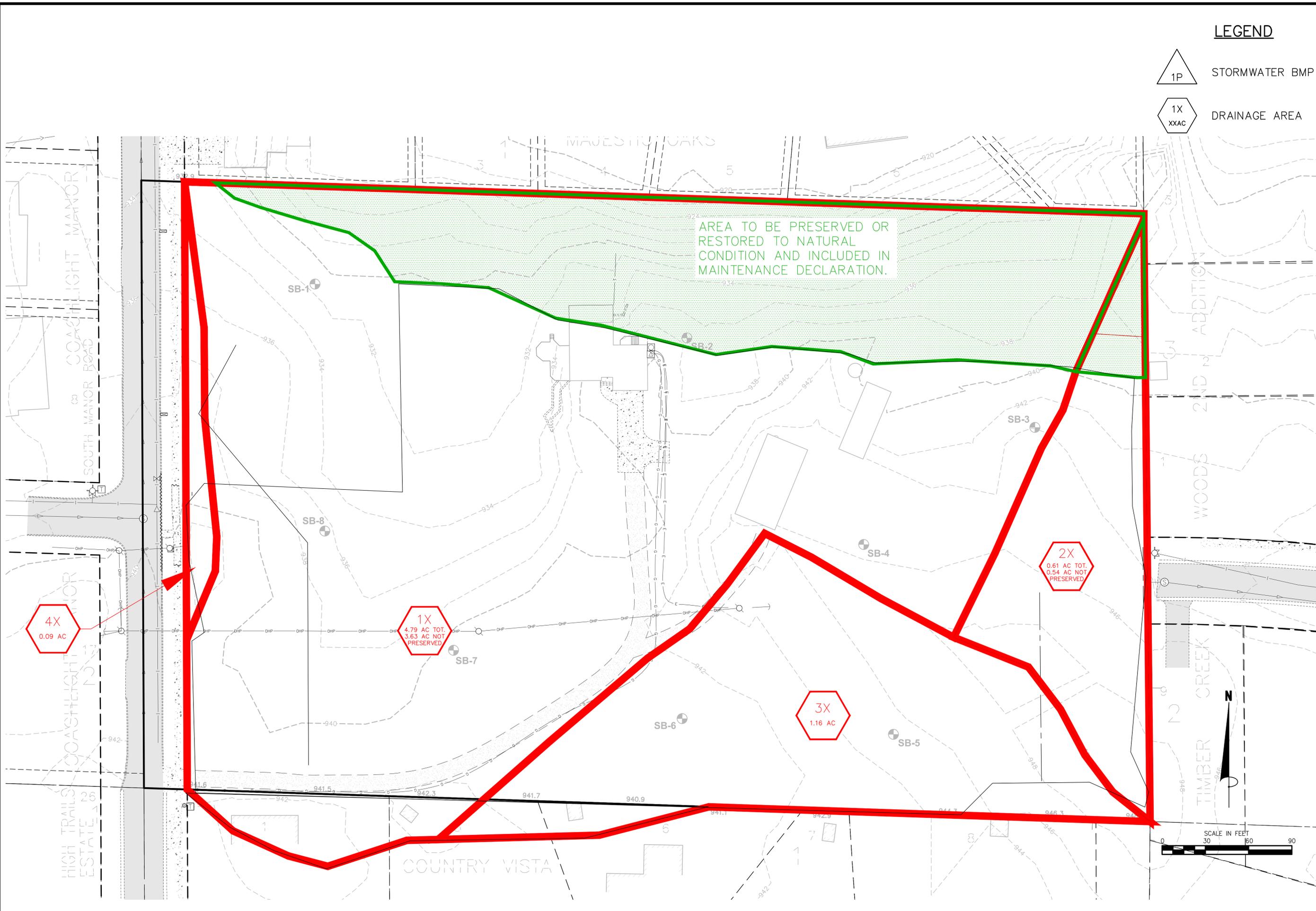
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ENCLAVE AT MANOR ROAD
 EDEN PRAIRIE, MINNESOTA
EXISTING CONDITIONS
 FOR
BRANDL ANDERSON
 221 RIVER RIDGE CIRCLE SOUTH - SUITE 100, BURNSVILLE, MN 55337

DRAWN BY EPF
DATE 01/24/24
REVISIONS
2024-03-13 CITY COMMENTS
2024-03-18 WATERSHED COMMENTS
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2024-04-19 WATERSHED COMMENTS
2024-05-06 LOT & BLOCK 2 GRADE
2024-05-20 WATERSHED COMMENTS
CAD FILE 24123-EXC
PROJECT NO. 24123
C1.1



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LEGEND

-  1P STORMWATER BMP
-  1X
XXAC DRAINAGE AREA

James R. Hill, Inc.
 PLANNERS / ENGINEERS / SURVEYORS
 2500 W. Cty. Rd. 42, SUITE 120, BURNSVILLE, MN 55337
 PHONE: (952)890-6044 FAX: (952)890-6244



ENCLAVE AT MANOR ROAD
 EDEN PRAIRIE, MINNESOTA
EXISTING DRAINAGE MAP
 FOR
BRANDL ANDERSON

DRAWN BY	JHB
DATE	5/20/2024
REVISIONS	
CAD FILE	DRN
PROJECT NO.	24123
C1.2	

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168TH AVENUE WEST

MAJESTIC OAKS

WOODS

SOUTH MANOR ROAD

TIMBER CREEK
2ND ADDITION

LEGEND

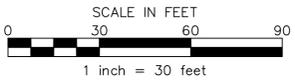
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- EXISTING STORM SEWER
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- EXISTING UNDERGROUND ELECTRIC
- EXISTING UNDERGROUND TELEPHONE
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- EXISTING CURB & GUTTER
- EXISTING RETAINING WALL
- EXISTING FENCE
- EXISTING CONTOUR
- SB-1 EXISTING SOIL BORING LOCATION
- EXISTING TREELINE/TREES
- EXISTING ASPHALT
- EXISTING CONCRETE
- EXISTING GRAVEL
- PROPOSED UTILITY REMOVALS
- PROPOSED STRUCTURE REMOVALS
- PROPOSED SAWCUT

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 Date: 01/24/24 Reg. No. XXXXX

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DEMOLITION PLAN
 FOR
BRANDL ANDERSON
 221 RIVER RIDGE CIRCLE SOUTH - SUITE 100, BURNSVILLE, MN 55337

DRAWN BY VUN
DATE 01/24/24
REVISIONS
2024-03-13 CITY COMMENTS
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2024-04-19 WATERSHED COMMENTS
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2024-05-20 WATERSHED COMMENTS
CAD FILE 24123-DEMO
PROJECT NO. 24123
C1.4



REPLACE DRIVEWAY & RESTORE GREENSPACE TO EXISTING CONDITION AFTER INSTALLATION OF PROPOSED STORM PIPE & REPLACEMENT OF EX STORM PIPE

SAW CUT AND REMOVE EXISTING CONCRETE CURB AND DISPOSE OFFSITE
 SAW CUT AND REMOVE EXISTING CONCRETE SIDEWALK AND DISPOSE OFFSITE

EXISTING OVER HEAD POWER TO BE REMOVED BY OTHERS

REMOVE EXISTING DRIVEWAY APRON AND MAIL BOX. REPAIR STREET TO EXISTING CONDITION PROTECT SIDEWALK DURING CONSTRUCTION

EXISTING BUILDING TO BE REMOVED AND DISPOSE OFFSITE

EXISTING CONCRETE TO BE REMOVED AND DISPOSE OFFSITE

EXISTING OVER HEAD POWER TO BE REMOVED BY OTHERS

EXISTING GRAVEL TO BE REMOVED

EXISTING TELEPHONE LINE TO BE REMOVED

EXISTING TELEPHONE LINE TO BE REMOVED

EXISTING ELECTRIC LINE TO BE REMOVED BY OTHERS

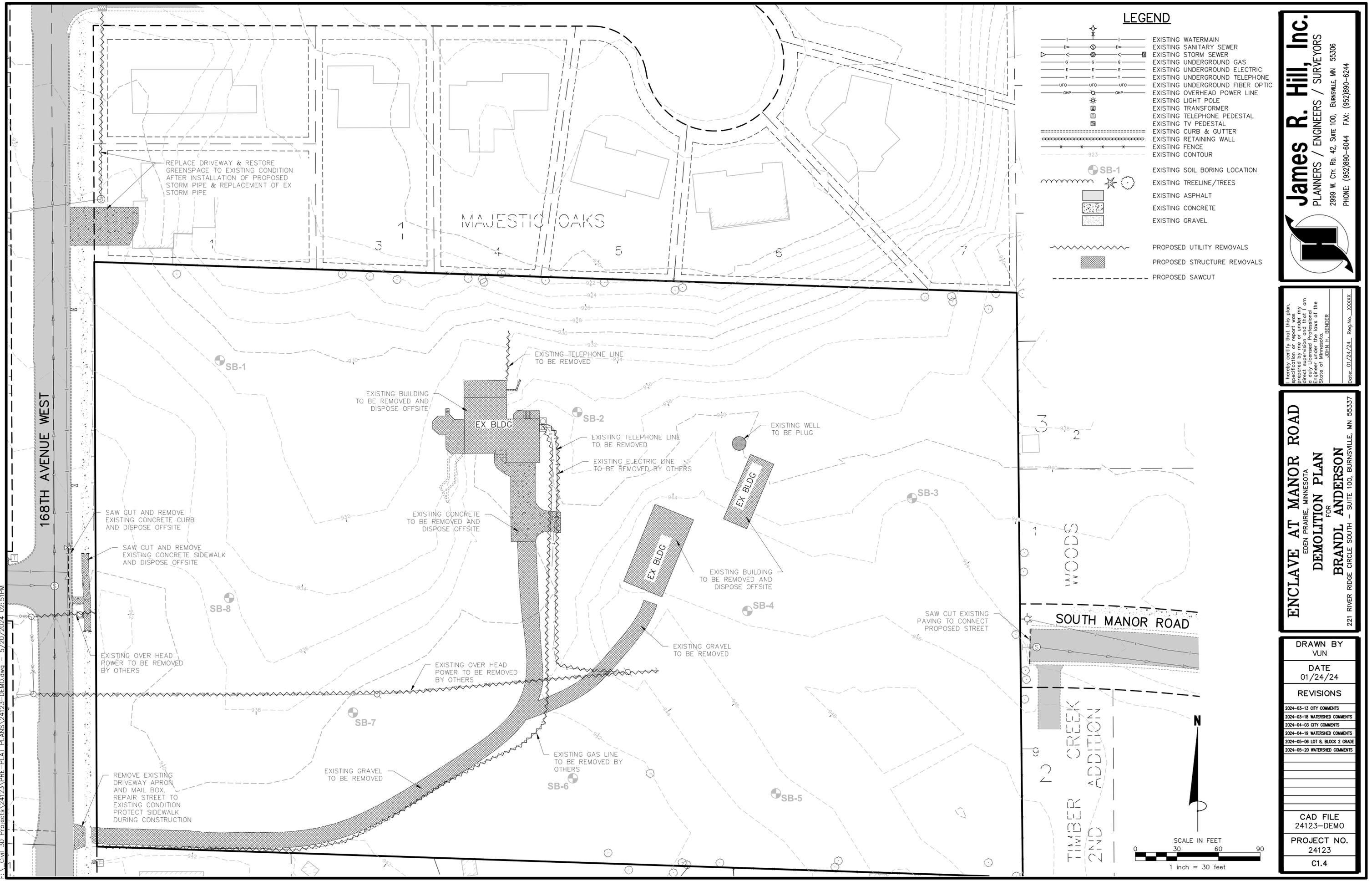
EXISTING WELL TO BE PLUG

EXISTING BUILDING TO BE REMOVED AND DISPOSE OFFSITE

EXISTING GRAVEL TO BE REMOVED

EXISTING GAS LINE TO BE REMOVED BY OTHERS

SAW CUT EXISTING PAVING TO CONNECT PROPOSED STREET



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SITE DATA

LOTS	17 LOTS	MINIMUM LOT WIDTH PROVIDED	65 FEET
TOTAL SITE AREA	6.43 AC.	MINIMUM LOT DEPTH PROVIDED	136 FEET
LOT AREA	4.96 AC.	MINIMUM LOT AREA PROVIDED	9,921 S.F.
OUTLOT AREA	0.70 AC.	AVERAGE LOT AREA	12,707 S.F.
RIGHT OF WAY AREA	0.77 AC.		
GROSS DENSITY	2.64 LOTS/AC		
EXISTING ZONING IS RURAL		MINIMUM BUILDING SETBACKS	
PROPOSED ZONING IS R1-9.5 (PUD)		FRONT	25 FEET
		SIDE YARD (INTERIOR)	5 FEET MINIMUM
			15 FEET TOTAL OF BOTH SIDES
		SIDE YARD (STREET)	20 FEET
		REAR	20 FEET

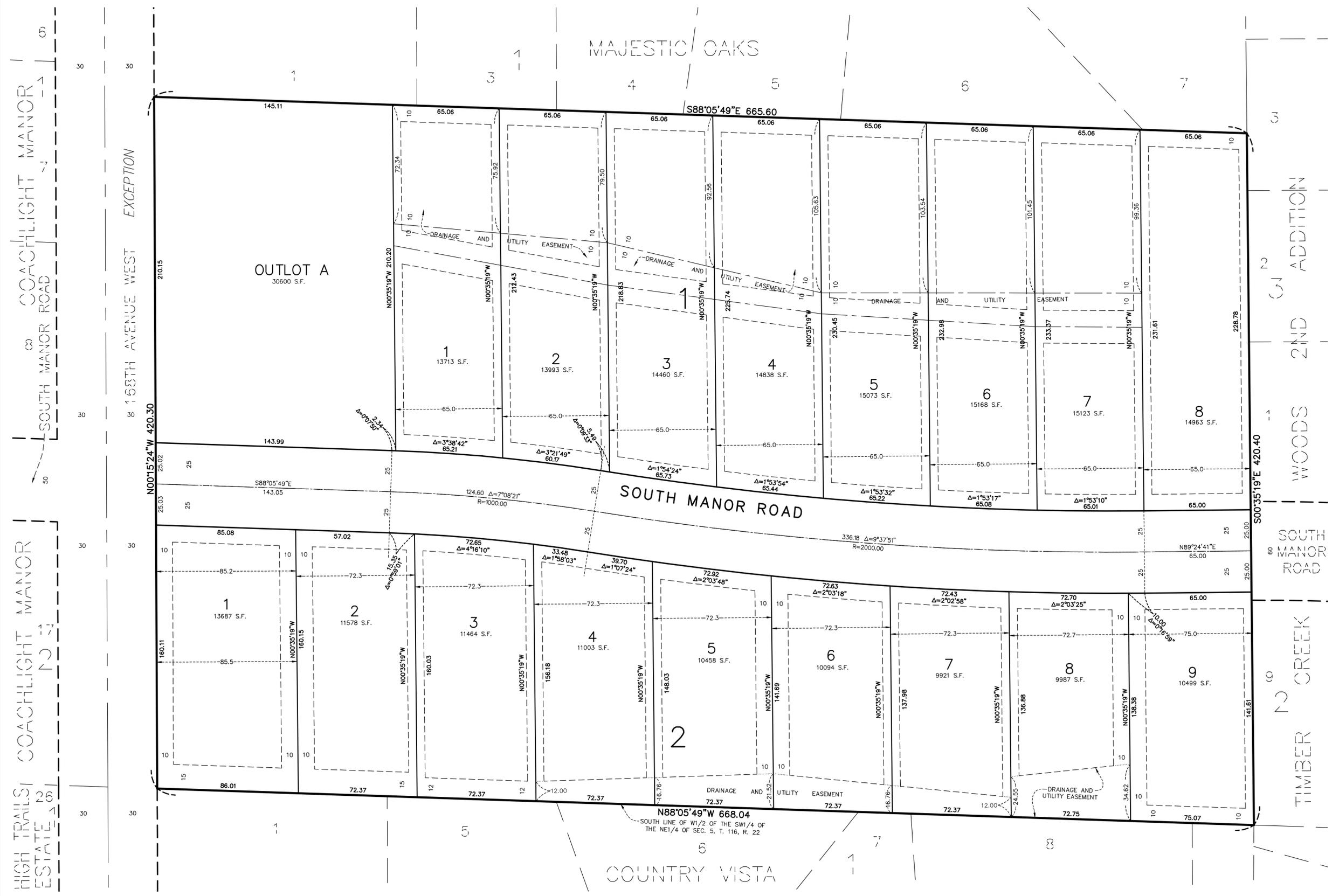
PROPERTY DESCRIPTION

The South 420.00 feet of the West 1/2 of the Southwest Quarter of the Northeast Quarter of Section 5, Township 116, Range 22, Hennepin County, Minnesota, except the West 30.00 feet thereof.

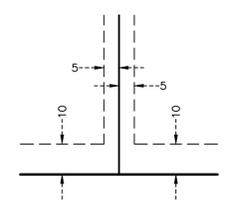
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 2999 WEST C.R. 42, SUITE 100, BURNSVILLE, MN 55306
 PHONE: 952.890.6044
 mhampston@jrhinc.com
 www.jrhinc.com

ENCLAVE AT MANOR ROAD
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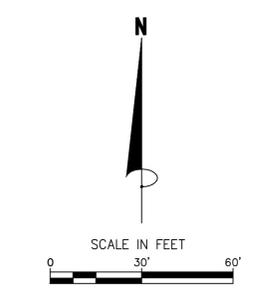
DRAWN BY	PLM
DATE	12/22/2023
REVISIONS	
A 1/15/24: Zoning and setback notes	
B 1/18/24: Layout	
C 3/12/24: Layout	
CAD FILE	24123pp.dwg
PROJECT NO.	24123-00
C2.0	



DRAINAGE AND UTILITY EASEMENTS ARE SHOWN THUS:

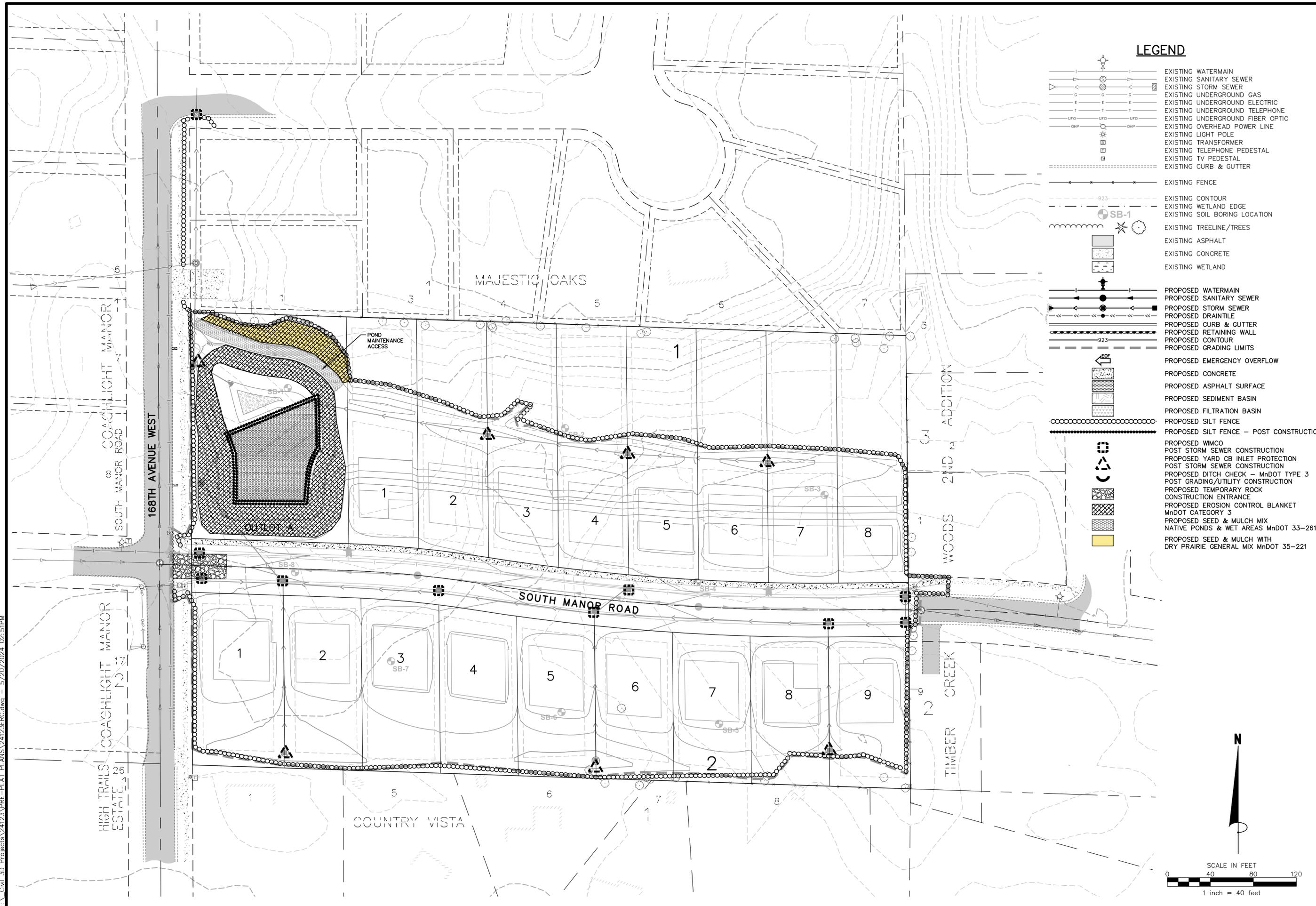


DRAINAGE AND UTILITY EASEMENTS BEING 5 FEET IN WIDTH, UNLESS OTHERWISE INDICATED, ADJOINING LOT LINES, AND BEING 10 FEET IN WIDTH, UNLESS OTHERWISE INDICATED, ADJOINING RIGHT OF WAY LINES, AS SHOWN ON THIS PLAT.



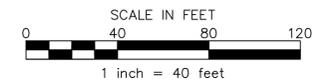
BEARINGS ARE BASED ON THE SOUTH LINE OF THE W1/2 OF THE SW 1/4 OF THE NE1/4 OF SEC. 5, T. 116, R. 22 WHICH IS ASSUMED TO HAVE A BEARING OF N 88°05'49" W

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LEGEND

- EXISTING WATERMAIN
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING UNDERGROUND GAS
- EXISTING UNDERGROUND ELECTRIC
- EXISTING UNDERGROUND TELEPHONE
- EXISTING UNDERGROUND FIBER OPTIC
- EXISTING OVERHEAD POWER LINE
- EXISTING LIGHT POLE
- EXISTING TRANSFORMER
- EXISTING TELEPHONE PEDESTAL
- EXISTING TV PEDESTAL
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- PROPOSED CONCRETE
- PROPOSED ASPHALT SURFACE
- PROPOSED SEDIMENT BASIN
- PROPOSED FILTRATION BASIN
- PROPOSED SILT FENCE
- PROPOSED SILT FENCE - POST CONSTRUCTION
- PROPOSED WMCO
- POST STORM SEWER CONSTRUCTION
- PROPOSED YARD CB INLET PROTECTION
- POST STORM SEWER CONSTRUCTION
- PROPOSED DITCH CHECK - MnDOT TYPE 3
- POST GRADING/UTILITY CONSTRUCTION
- PROPOSED TEMPORARY ROCK CONSTRUCTION ENTRANCE
- PROPOSED EROSION CONTROL BLANKET
- MnDOT CATEGORY 3
- PROPOSED SEED & MULCH MIX
- NATIVE PONDS & WET AREAS MnDOT 33-261
- PROPOSED SEED & MULCH WITH DRY PRAIRIE GENERAL MIX MnDOT 35-221



James R. Hill, Inc.
 PLANNERS / ENGINEERS / SURVEYORS
 2999 W. Cty. Rd. 42, Suite 100, Burnsville, MN 55306
 PHONE: (952)890-6044 FAX: (952)890-6244

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
 JOHN L. BENDER
 Date: 01/24/24 Reg. No. XXXXX

ENCLAVE AT MANOR ROAD
 EDEN PRAIRIE, MINNESOTA
PRELIMINARY EROSION & SEDIMENT CONTROL PLAN
 FOR
BRANDL ANDERSON
 221 RIVER RIDGE CIRCLE SOUTH - SUITE 100, BURNSVILLE, MN 55337

DRAWN BY VUN
DATE 01/24/24
REVISIONS
2024-03-13 CITY COMMENTS
2024-03-18 WATERSHED COMMENTS
2024-04-03 CITY COMMENTS
2024-04-19 WATERSHED COMMENTS
2024-05-06 LOT 8, BLOCK 2 GRADE
2024-05-20 WATERSHED COMMENTS
CAD FILE 24123ERC
PROJECT NO. 24123
C3.0

ENCLAVE AT MANOR RD - EDEN PRAIRIE, MN

TYPE OF PROJECT: SINGLE FAMILY RESIDENTIAL

TYPE OF WORK: Mass Grading, Utility and Street Construction, Paving. Subsequently, Joint Trench and Home construction will occur.

TOTAL PLATTED AREA: 6.43 AC

TOTAL DISTURBED AREA: 5.16 AC

EXISTING IMPERVIOUS AREA: 0.14 AC

PROPOSED (DESIGN) IMPERVIOUS AREA: 1.96 AC

SPECIAL WATERS: The site is within a 1-mile radius of Round Lake. However this site does not drain to it.

CONSTRUCTION PHASING

The project is expected to be constructed in three phases, with mass grading occurring during one construction season. Mass grading is anticipated to be completed within 4 weeks from commencement of work. Utility and street construction is anticipated to be completed within 4 weeks from commencement of work.

POTENTIAL FOR EROSION AND DISCHARGE OF SEDIMENT

As the site will be stripped of topsoil and vegetation for a period of several weeks during construction, the potential for erosion will increase. The overall gradients on the site are relatively low. The street subcut will serve as temporary sediment basins during construction. The project is primarily cut, and therefore perimeter erosion will flow inward towards the project.

The risk of discharge of sediment off of the site is low, due to the grade orientation and design. The highest potential for discharge off the site is from the street entrance.

Contractor will be required to manage completion of 3:1 slopes such that soil exposure is minimized. After excavation and embankments are completed, slopes shall be re-spread with topsoil, the slope grades certified, and erosion blanket installed as per the plan. Contractor shall coordinate these steps to be carried out in a timely manner.

EROSION CONTROL BMPs

The construction plans anticipate the use of, but are not limited to, the following Erosion Control BMPs:

1. Perimeter delineation to minimize disturbed areas
2. Temporary Rock Construction Entrance
3. Temporary straw mulch as needed.
4. Seed and mulch/sod
5. Erosion Control Blanket
6. Minimize active or disturbed work areas
7. Horizontal slope grading
8. Turf Reinforcement Mat

SEDIMENT CONTROL BMPs

The construction plans anticipate the use of, but are not limited to, the following Sediment Control BMPs:

1. Sediment traps constructed in street subcut
2. Rock filter dikes in street subcut
3. Utilize permanent stormwater basin as Temporary Sediment Basin
4. Silt Fence at project perimeter or toe of slopes
5. Inlet protection on existing catch basins
6. Inlet protection on existing culverts
7. Inlet protection after utility construction
8. Linear control along back of new curb and gutter (sod, bioroll, or silt fence)
9. Routine street sweeping adjacent to construction entrance.
10. Ditch checks

Refer to plans for designated locations of BMPs, details and implementation notes.

BASIN AND TRAP DEWATERING BMPs

Should the need arise for basin or trap dewatering, contractor shall utilize a floating skimmer pump intake, such that the water is drawn from the surface of the basin. Pumped effluent shall not be discharged into Surface Waters in a turbid state. Turbid effluent shall be filtered with mechanical devices, chemical filtering, or a combination thereof, to a state of 50 NTUs or less.

RPBC WD NOTES:

- a. Natural topography and soil conditions will be protected, including retention onsite of native topsoil to the greatest extent possible.
- b. Soil surfaces compacted during construction and remaining pervious upon completion of construction will be de-compacted to achieve:
 - a soil compaction testing pressure of less than 1,400 kilopascals or 200 pounds per square inch in the upper 12 inches of soil or
 - a bulk density of less than 1.4 grams per cubic centimeter or 87 pounds per cubic foot in the upper 12 inches of soil.
- c. In addition, utilities, tree roots and other existing vegetation will be protected until final revegetation or other stabilization of the site.
- d. The permittee will inspect all erosion prevention and sediment control facilities and soil stabilization measures to ensure integrity and effectiveness. The permittee will repair, replace or supplement all nonfunctional BMPs with functional BMPs within 48 hours of discovery and prior to the next precipitation event unless adverse conditions preclude access to the relevant area of the site, in which case the repair must be completed as soon as conditions allow. When active land-disturbing activities are not under way, the permittee will perform these responsibilities at least weekly until vegetative cover is established. The permittee will maintain a log of activities under this section for inspection by the District on request.

STABILIZATION BMPs

The construction plans anticipate the use of, but are not limited to, the following Stabilization BMPs:

1. After lot pads are grade certified, permanent seed and mulch can be applied, generally from the front of the building pad extending to the rear of the lot (areas where no further utility construction is anticipated.)
2. After 3:1 slopes on lots are certified, permanent seed and erosion control blanket can be applied.
3. Rip rap at pipe outfalls
4. Permanent seed and erosion control blanket on basin slopes after grade certified.
5. After curbs are backfilled, apply permanent seed and mulch to remaining building pads and boulevard area not already stabilized.
6. Sod placement, as appropriate.

POLLUTION CONTROL BMPs

1. Fueling: A fixed fueling station is not anticipated. Contractor will be required to implement BMPs for onsite re-fueling of equipment.
2. Concrete Washout: A suggested washout area will be specified on the plan. The developer has the ability to adjust location or to provide alternative washout containment.
3. There is not an anticipated need for storing chemicals, paints, solvents or other potentially toxic or hazardous materials on site.

SEED & MULCH SPECIFICATIONS

Seed placed for permanent cover or final stabilization requires 6" minimum topsoil cover. Topsoil must contain at least 5.0% organic content. Exception: Infiltration basins - see basin details for soil type. Multiple site visits will be required to accommodate permanent or temporary stabilization as required during the phases of construction.

(1) General Seed & Mulch

- A. Seed: **MNDOT 25-141** at a rate of 59 lb/acre
- B. Fertilizer: Type 3 slow release 10-10-10 at a rate of 200 lb/acre
- C. Mulch: MNDOT Type 1 at a rate of 2 tons/acre

(2) Temporary Cover Crop (Ponding/Infiltration/Adjacent Slope Areas)

- A. Seed: **MNDOT 21-112** at a rate of 100 lb/acre
- B. Fertilizer: Type 3 slow release 10-10-10 at a rate of 200 lb/acre
- C. Mulch: MNDOT Type 3 at a rate of 2 tons/acre

(3) Hydro-Seeding (Stockpile)

- A. Seed: **MNDOT 22-111 Seed & Type Hydraulic Mulch** at a rate of 10 lb/1000 gal
- B. Fertilizer: Type 3 slow release 10-10-10 at a rate of 50 lb/1000 gal
- C. Mulch: Type Hydraulic Mulch at a rate of 350 lb/1000 gal
- D. Water: 875 gal/1000 gal
- E. Apply at 6000 gal of Slurry per acre

(4) Stormwater Basins (Aquatic Bench up to HWL)

- A. Seed: **MNDOT 33-261** at a rate of 14.5 lb/acre
- B. Fertilizer: Type 3 slow release 10-10-10 at a rate of 200 lb/acre
- C. Mulch: MNDOT Type 3 at a rate of 2 tons/acre

INSPECTION AND MAINTENANCE OF BMPs

Routine Inspection

1. Rock Entrance - Inspect weekly. If rock becomes filled with sediment and tracked material to the extent the purpose ceases to function, remove the contaminated rock and replace with new rock.
2. Silt fence - Inspect weekly, particularly for damaged sections, breaches, down-gradient areas, flow concentration points, scour areas and sections adjacent to sensitive areas. Where capacity is filled to more than 50% of depth, sediment shall be removed to restore capture capacity.
3. Sediment traps and basins - Inspect weekly. Where capacity is filled to more than 50% of depth, sediment shall be removed to restore capture capacity within 72 hours of discovery.
4. Inlet Protection - Inspect weekly or more frequently as needed after multiple rainfalls less than 0.5". Verify intake capacity is not compromised. Where capacity is filled to more than 50% of depth, sediment shall be removed to restore capture capacity.
5. Inspect other site specific BMPs on a weekly basis minimum.

Rain Event Inspection - Mandatory, within 24 hours after a rain event 0.5" or greater. Complete all items associated with Routine Inspection. Furthermore, inspect site for breaches, failures, scours and gullying. Take corrective actions as necessary to restore functionality to the BMPs. If a given situation is discovered to be prone to repetitive failure, advise the Engineer and Contractor for SWPPP and BMP amendments.

ADDITIONAL SWPPP NOTES

1. All Erosion and Sediment Control facilities shall be maintained by the contractor during the construction operations. Any temporary facilities which are to be removed as called for on these plans and specifications shall be removed by the contractor at the time directed by the engineer. The contractor shall then restore the subsequently disturbed areas in accordance with these plans and specifications.
2. Wherever practical and feasible, the contractor shall protect and preserve existing natural trees, grass and other vegetative cover in effort to provide natural buffering and filtering of runoff.
3. Contractor shall be adaptable in adjusting construction schedules in anticipation of weather forecasts of precipitation, in order to minimize risk of erosion and sediment transport.
4. It is the responsibility of the contractor to keep public streets, travel ways, parking lots and trails utilized for ingress to and egress from the construction site free of dirt, sediment and debris, resulting from construction activity. Cost for this shall be considered incidental to the contract.
5. Adequate control of dust shall be maintained by the contractor. Cost for dust control shall be considered incidental to the contract.

ADDITIONAL SWPPP NOTES (continued)

6. Perimeter controls shall not be removed until final stabilization of areas draining toward the control devices.
7. When temperatures do not exceed 40 degrees F. areas that require seed and mulch stabilization shall be dormant seeded. Application rate shall be two times the normal rate. No dormant seeding shall be done on ice or snow greater than 2" in depth.
8. Any areas that were seeded that do not achieve 70% coverage shall be reseeded at the contractor's expense, where coverage limitation is caused by lack of seed germination and growth.

MPCA STORMWATER PERMIT - RESPONSIBILITY

The Contractor will be required to become the Permittee for the project, until final stabilization and transfer of responsibility is completed. Transfer of responsibility shall be completed with the Permit Modification Form.

OWNER: BRANDL ANDERSON - 952-898-0230

PERMITTEE: TBD

OPERATOR(S): TBD

OTHER CONTACTS

ENGINEER:
JOHN BENDER, P.E., - James R. Hill, Inc. - 952-890-6044

TRAINING REQUIREMENTS

JOHN BENDER, P.E.
DESIGN OF CONSTRUCTION SWPPP (CERTIFICATION(2023-2026))
UNIVERSITY OF MINNESOTA
INSTRUCTOR: JOHN CHAPMAN

LGU CONTACT: CARTER SCHULZE - EDEN PRAIRIE - 952-949-8339

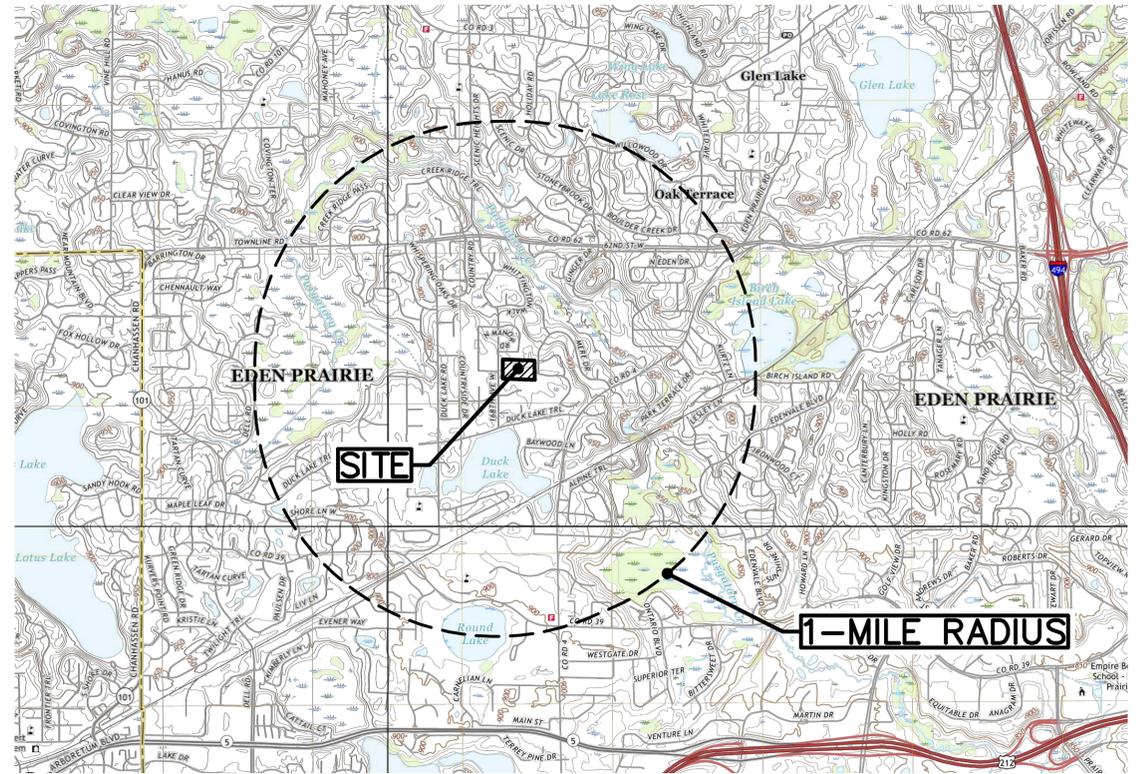
MPCA COMPLIANCE: JOSH NORMAN - MPCA - 651-757-2389

The Contractor shall follow the implementation sequence as described on these plans. Amendments shall be made as site conditions change. Amendments shall be proposed by contractor and reviewed by the engineer.

All BMPs selected and implemented shall be appropriate for the time of year, the current site conditions and for the estimated duration of use.

These plans shall be considered part of the project SWPPP. A copy of the SWPPP shall remain on site throughout active construction.

ESTIMATED EROSION AND SEDIMENT CONTROL QUANTITIES			
CONSTRUCTION ROCK ENTRANCE	EA	LF	1
STANDARD DUTY SILT FENCE	LF	2,554	
MNDOT SEED AND MULCH 33-261 (STORMWATER BASIN)	AC	X	
MNDOT SEED AND MULCH 25-141 (GENERAL MIX) - 1.5X	AC	X	
MNDOT SEED AND MULCH 21-112 (TEMPORARY COVER CROP)	AC	X	
REAR YARD INLET PROTECTION	EA	4	
WMCO OR APPROVED EQUAL INLET PROTECTION	EA	8	



USGS MAP

1" = 2000'



USDA SOIL MAP

1" = 100'

James R. Hill, Inc.
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JOHN H. BENDER
Date: 01/24/24 Reg. No. XXXXX

ENCLAVE AT MANOR ROAD
EDEN PRAIRIE, MINNESOTA
EROSION & SEDIMENT CONTROL DETAILS
FOR
BRANDL ANDERSON
221 RIVER RIDGE CIRCLE SOUTH - SUITE 100, BURNSVILLE, MN 55337

DRAWN BY EPF
DATE 01/24/24
REVISIONS
2024-03-13 CITY COMMENTS
2024-03-18 WATERSHED COMMENTS
2024-04-03 CITY COMMENTS
2024-04-19 WATERSHED COMMENTS
2024-05-06 LOT & BLOCK 2 GRADE
2024-05-20 WATERSHED COMMENTS
CAD FILE 24123ERD
PROJECT NO. 24123
C3.1

Table with 2 columns: Item Number and Description. Items range from 1.1 to 10.3, covering permit coverage, construction activities, erosion control, and water management. Each item includes specific regulatory references and project requirements.

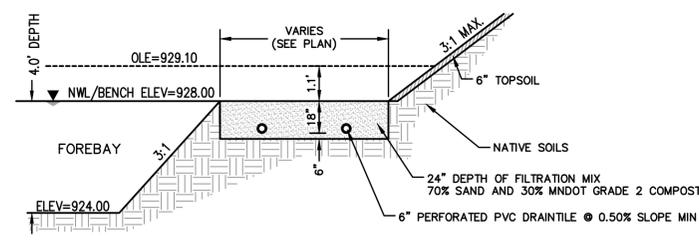
James R. Hill, Inc. PANNERS ENGINEERS / SURVEYORS. 2999 W. Ctr. Rd. 42, Suite 100, Burnsville, MN 55306. Phone: 952/890-6044, Fax: 952/890-6244. Includes a 'DRAW BY EPF' stamp, date '01/24/24', and project number '24123'. A large 'ENCLAVE AT MANOR ROAD' stamp is also present.

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168TH AVENUE WEST

MAJESTIC OAKS

POND 1P FOREBAY W/ FILTRATION BENCH



LEGEND

- EXISTING WATERMAIN
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING CURB & GUTTER
- EXISTING RETAINING WALL
- EXISTING FENCE
- EXISTING RAILROAD
- EXISTING CONTOUR
- EXISTING WETLAND EDGE
- EXISTING SOIL BORING LOCATION
- EXISTING TREELINE/TREES
- EXISTING ASPHALT
- EXISTING CONCRETE
- EXISTING GRAVEL
- EXISTING WETLAND
- PROPOSED WATERMAIN
- PROPOSED SANITARY SEWER
- PROPOSED SANITARY SERVICE
- PROPOSED WATER SERVICE
- PROPOSED STORM SEWER
- PROPOSED DRAIN TILE
- PROPOSED PERFORATED DRAIN TILE
- PROPOSED CURB & GUTTER
- PROPOSED RETAINING WALL
- PROPOSED CONTOUR
- PROPOSED GRADING LIMITS
- PROPOSED EMERGENCY OVERFLOW
- PROPOSED CONCRETE
- PROPOSED ASPHALT SURFACE
- PROPOSED SEDIMENT BASIN
- PROPOSED FILTRATION BASIN
- PROPOSED MAINTENANCE ACCESS
- NATURAL AREA MONUMENT POST

ESTIMATED EARTHWORK QUANTITIES

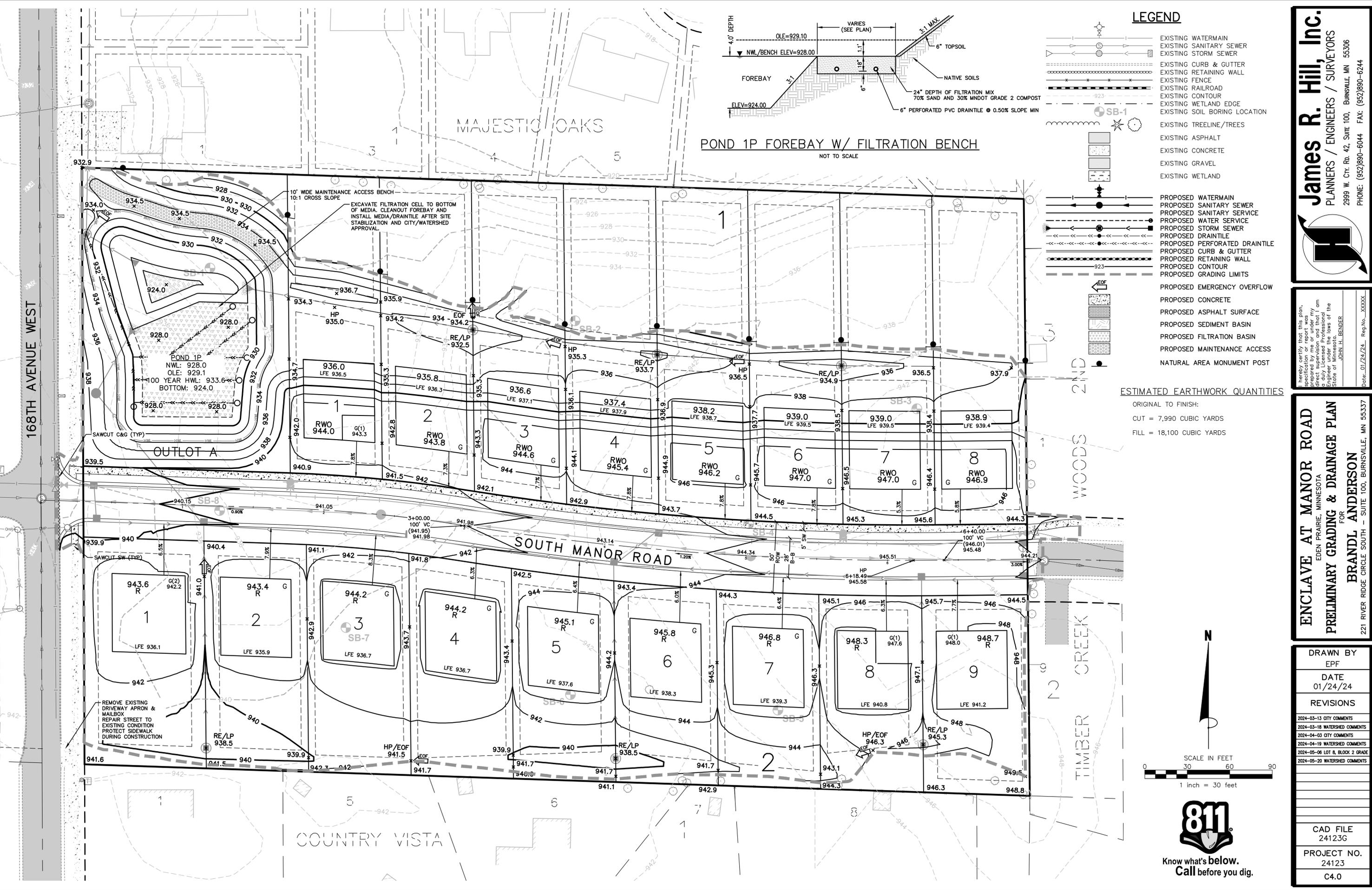
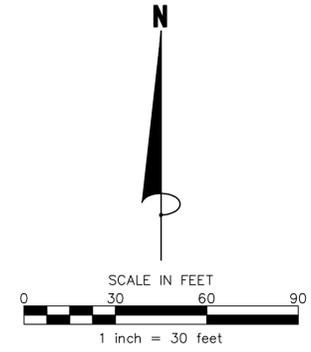
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 FILL = 18,100 CUBIC YARDS

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 Date: 01/24/24 Reg. No. XXXXX

ENCLAVE AT MANOR ROAD
 EDEN PRAIRIE, MINNESOTA
PRELIMINARY GRADING & DRAINAGE PLAN
 FOR
BRANDL ANDERSON
 221 RIVER RIDGE CIRCLE SOUTH - SUITE 100, BURNSVILLE, MN 55337

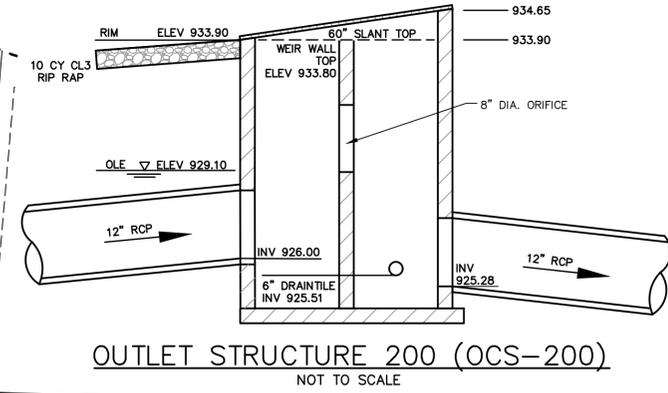
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DATE	01/24/24
REVISIONS	
2024-03-13	CITY COMMENTS
2024-03-18	WATERSHED COMMENTS
2024-04-03	CITY COMMENTS
2024-04-19	WATERSHED COMMENTS
2024-05-06	LOT & BLOCK 2 GRADE
2024-05-20	WATERSHED COMMENTS
CAD FILE	24123G
PROJECT NO.	24123
	C4.0



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168TH AVENUE WEST

MAJESTIC OAKS



LEGEND

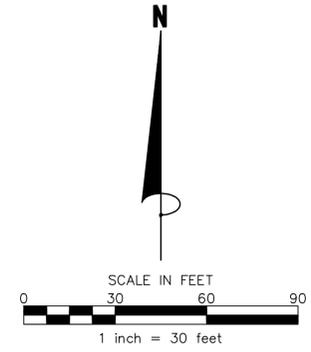
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- PROPOSED CURB & GUTTER

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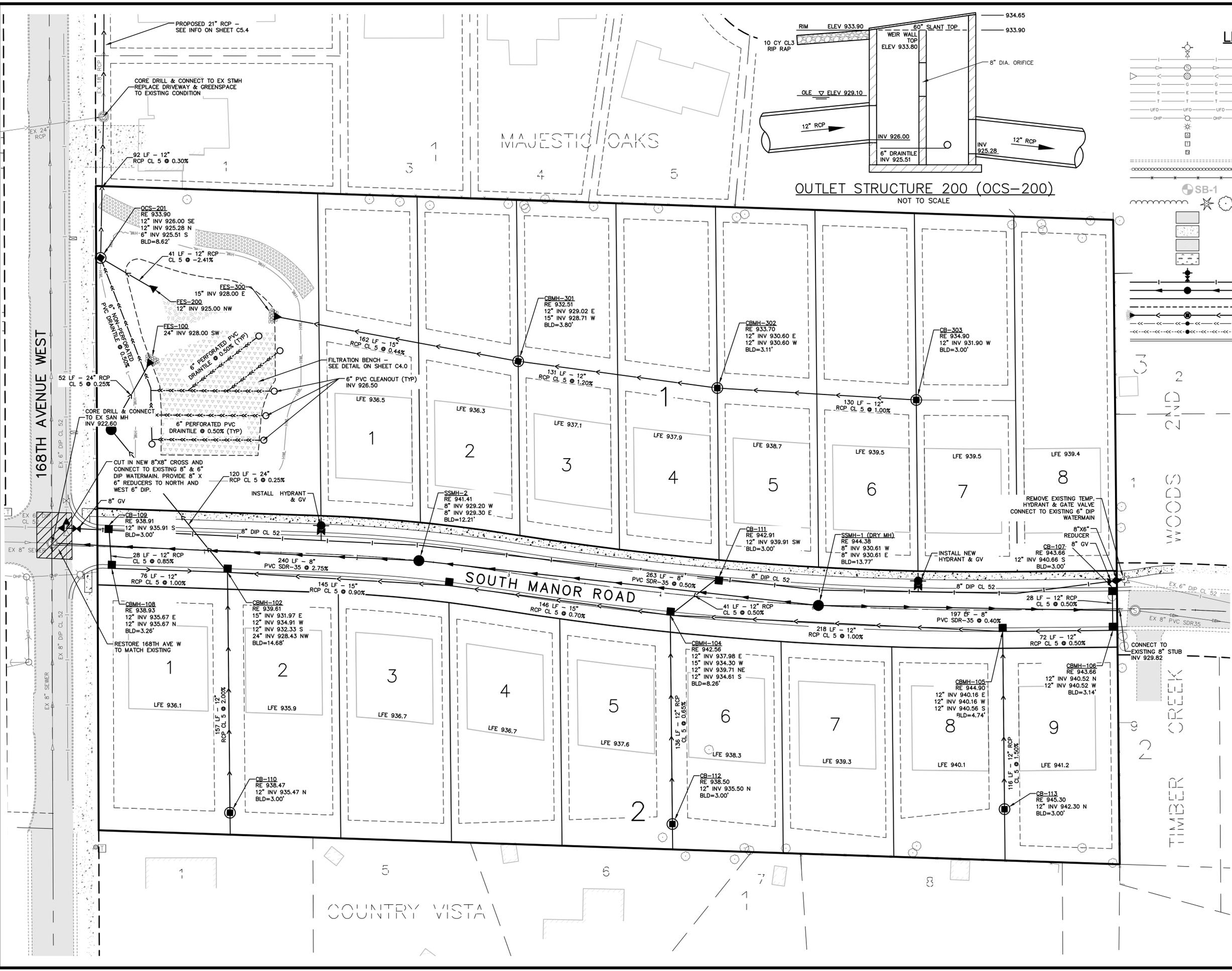
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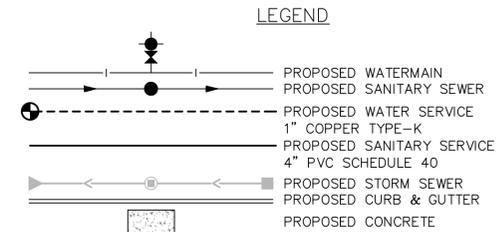
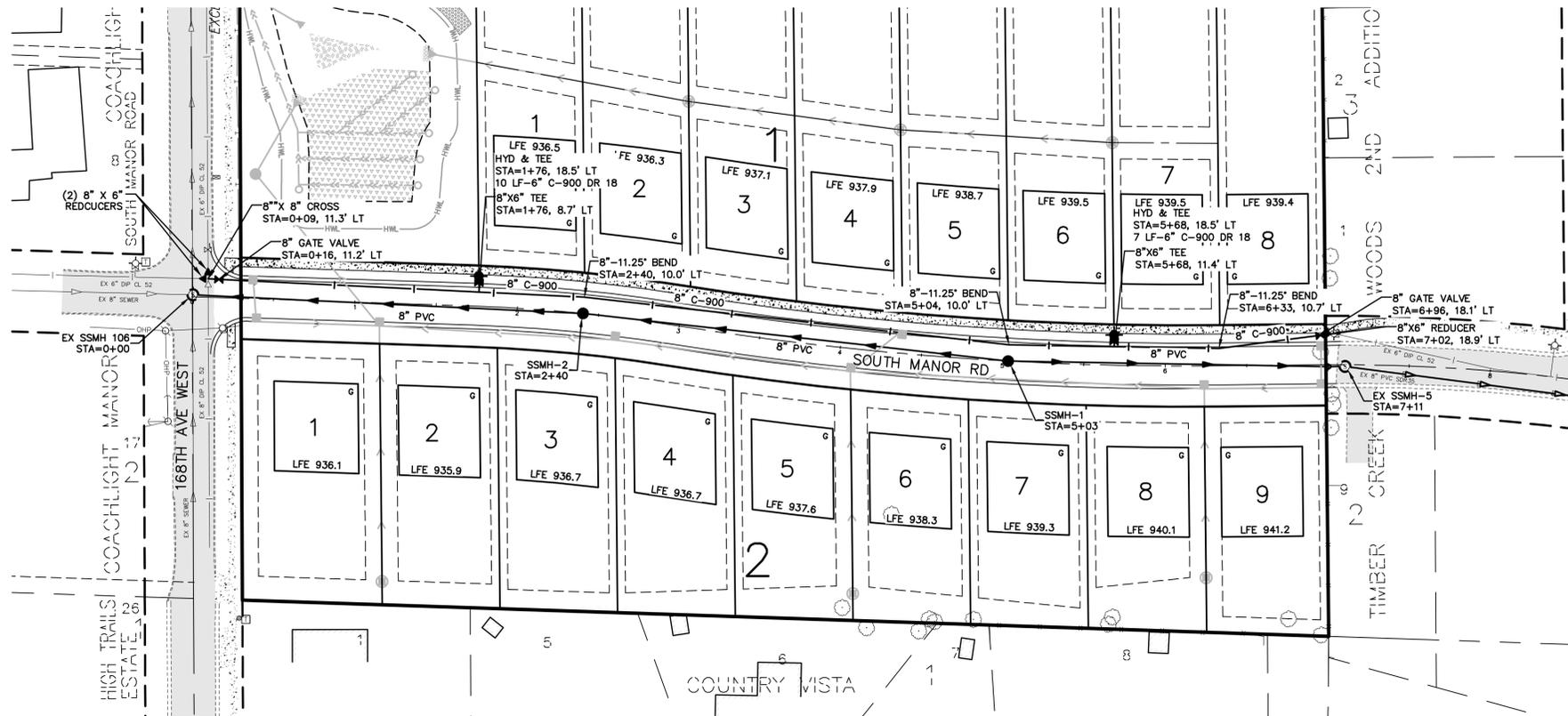
ENCLAVE AT MANOR ROAD
 EDEN PRAIRIE, MINNESOTA
 PRELIMINARY OVERALL UTILITY PLAN
 FOR
BRANDL ANDERSON
 221 RIVER RIDGE CIRCLE SOUTH - SUITE 100, BURNSVILLE, MN 55337

DRAWN BY	EPF
DATE	01/24/24
REVISIONS	
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CAD FILE	24123-U
PROJECT NO.	24123
	C5.0



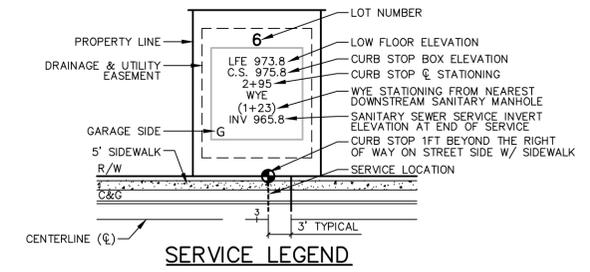
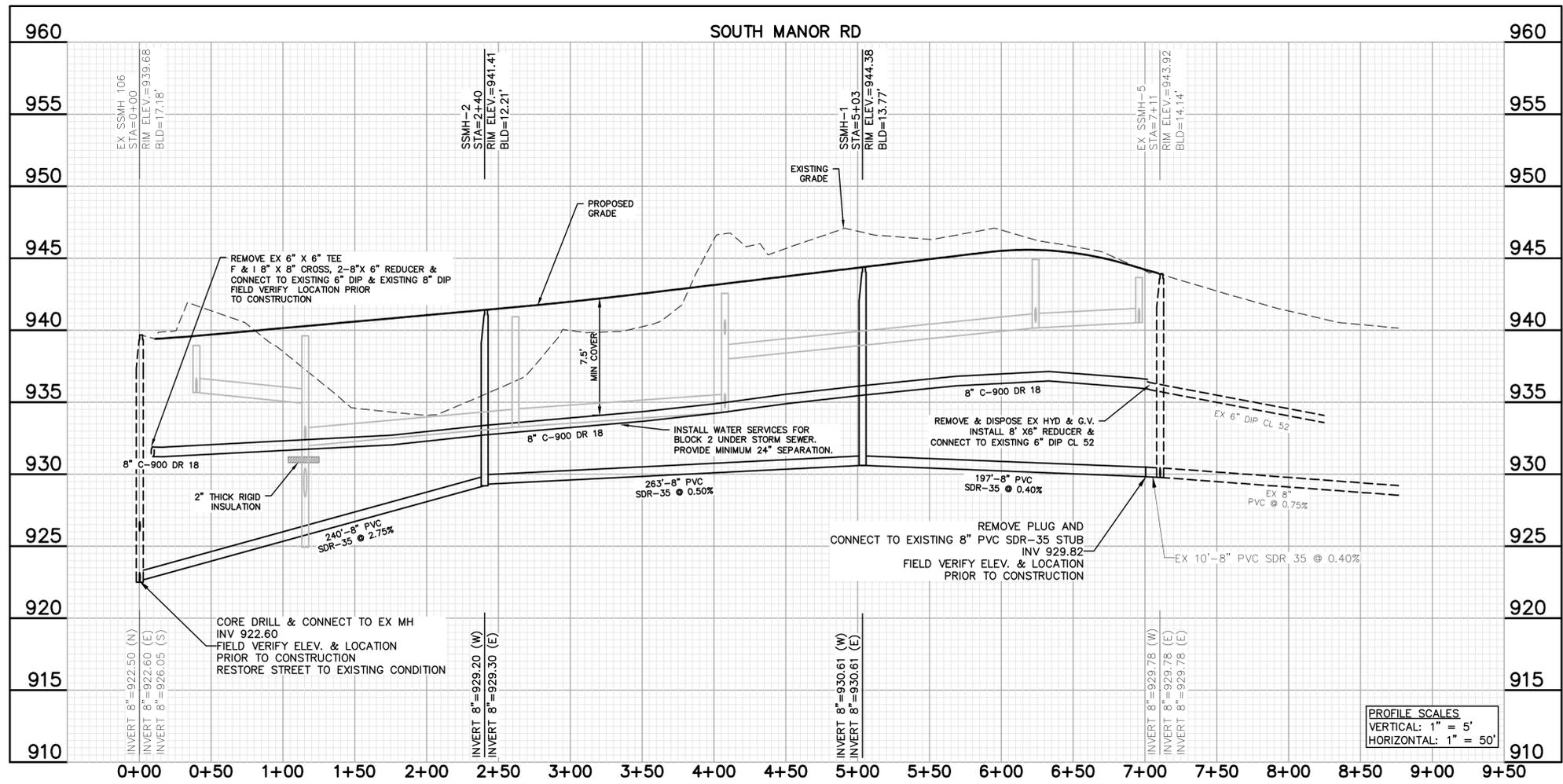
Know what's below.
 Call before you dig.





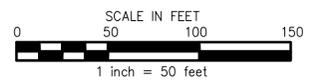
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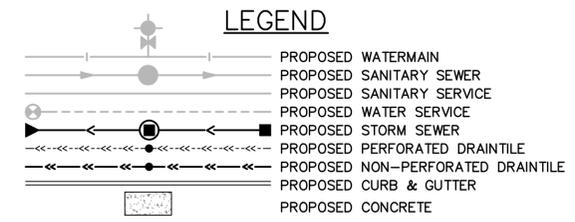
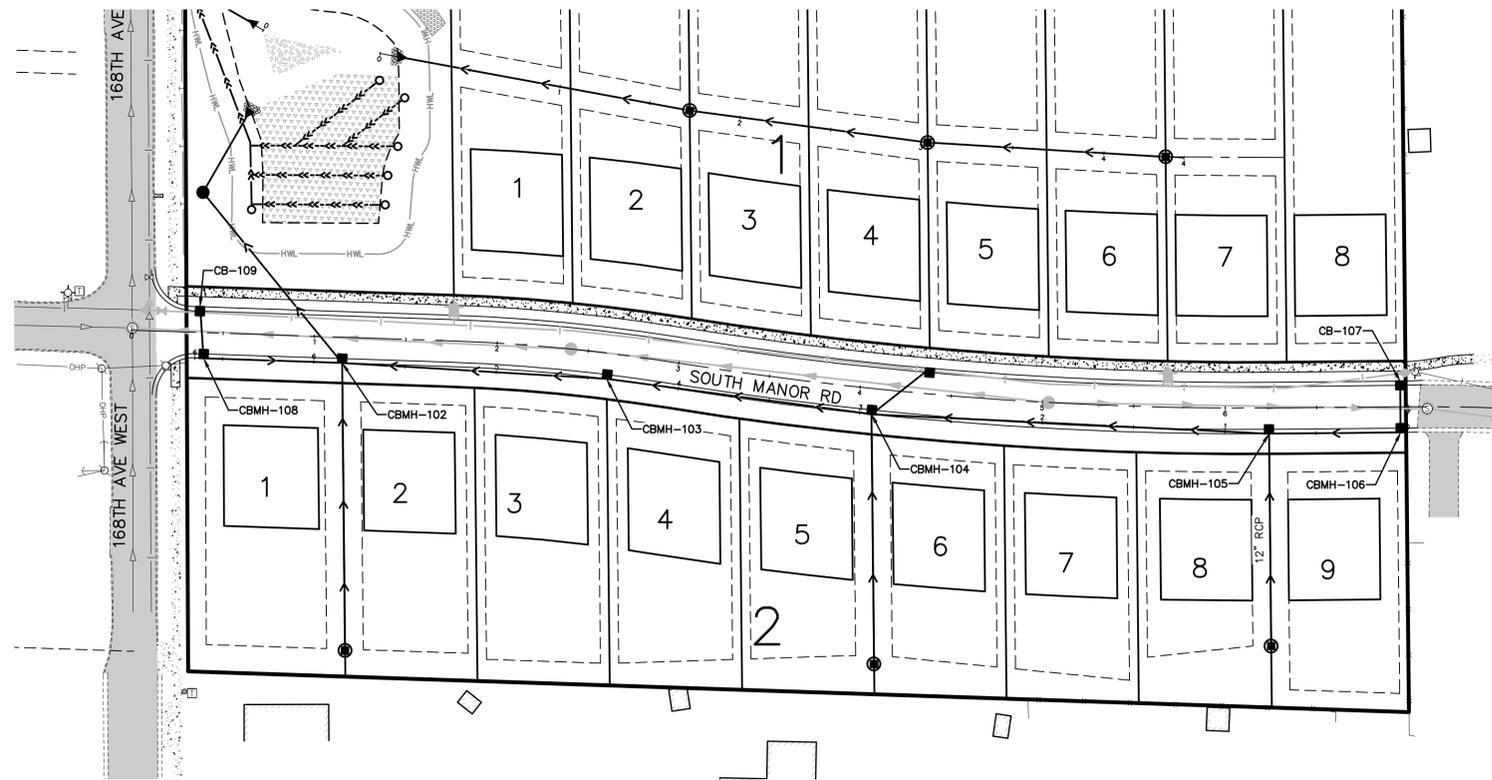


ENCLAVE AT MANOR ROAD
 EDEN PRARIE, MINNESOTA
SANITARY SEWER & WATERMAIN CONSTRUCTION
 SOUTH MANOR RD
BRANDL ANDERSON
 221 RIVER RIDGE CIRCLE SOUTH - SUITE 100, BURNSVILLE, MN 55337

DRAWN BY VUN
DATE 01/24/24
REVISIONS
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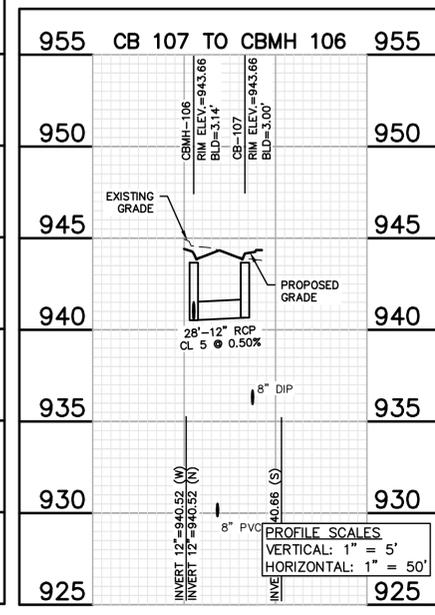
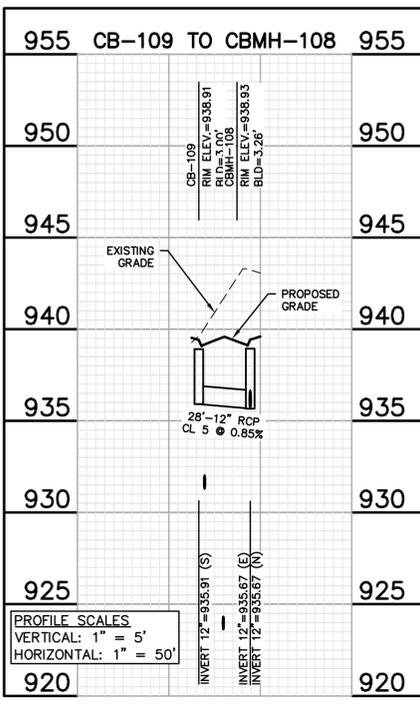
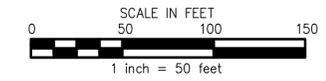
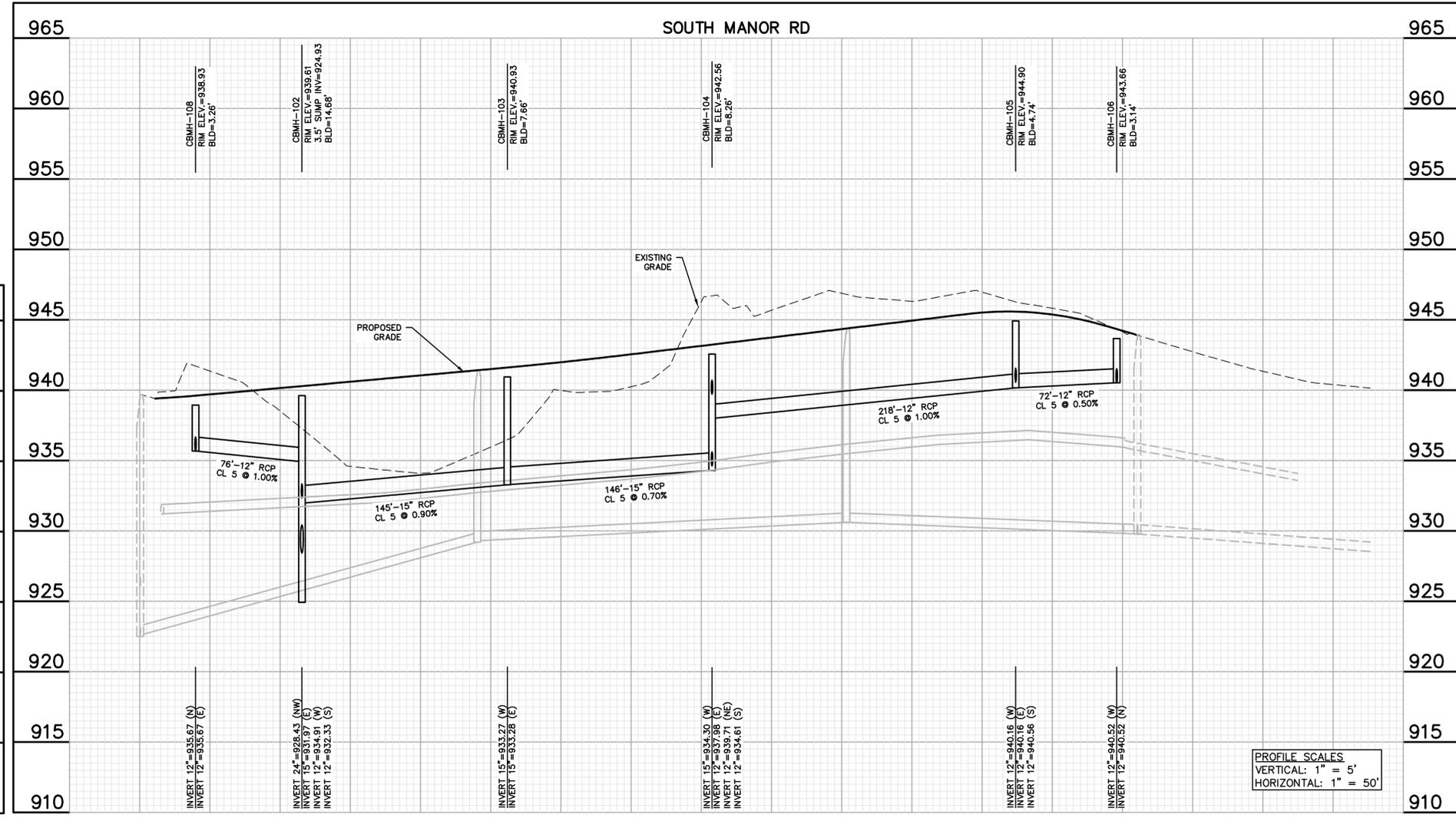
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JOHN L. BENDER
Date: 01/24/24 Reg. No. XXXXX



PROFILE SCALES
VERTICAL: 1" = 5'
HORIZONTAL: 1" = 50'

PROFILE SCALES
VERTICAL: 1" = 5'
HORIZONTAL: 1" = 50'

ENCLAVE AT MANOR ROAD
EDEN PRAIRIE, MINNESOTA
STORM SEWER CONSTRUCTION
FOR
BRANDL ANDERSON
221 RIVER RIDGE CIRCLE SOUTH - SUITE 100, BURNSVILLE, MN 55337

DRAWN BY
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DATE
01/24/24

REVISIONS

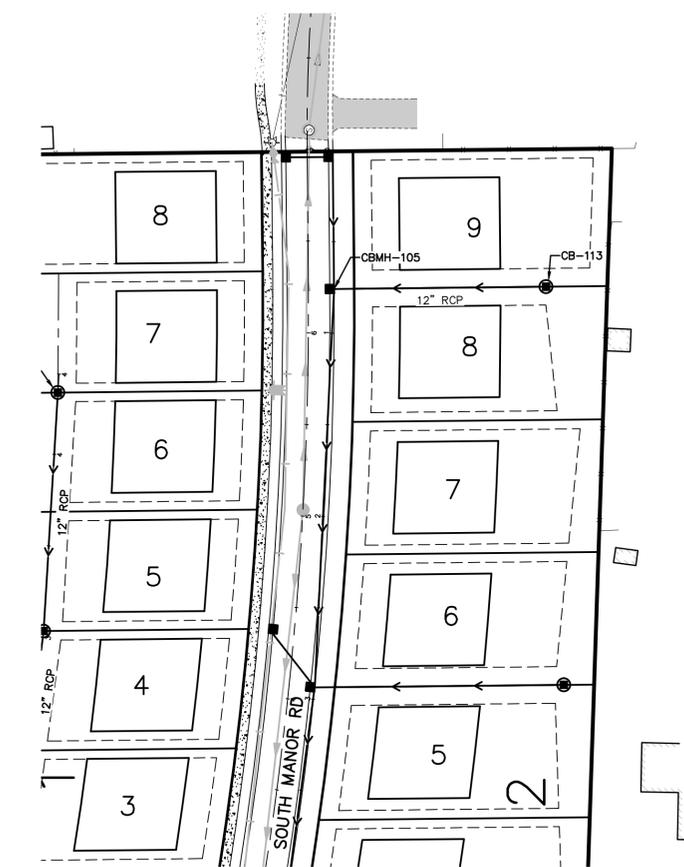
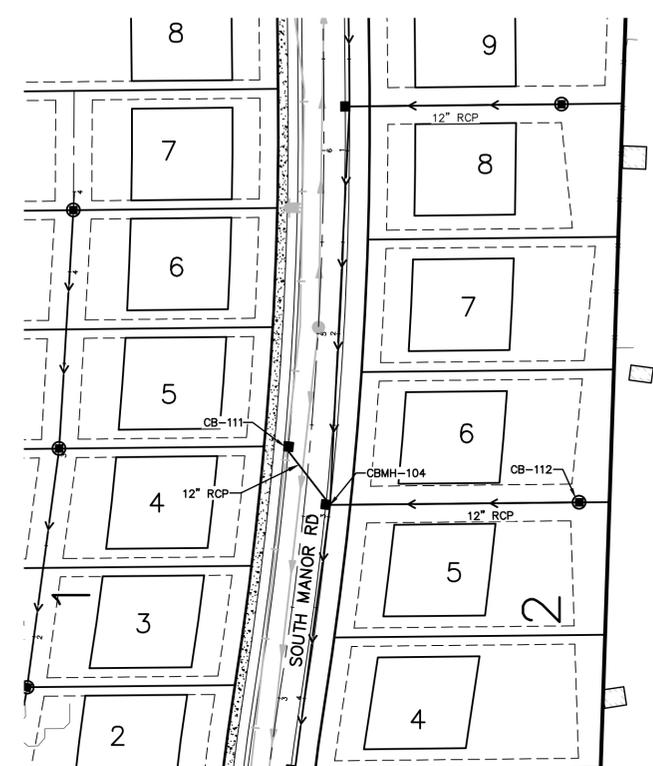
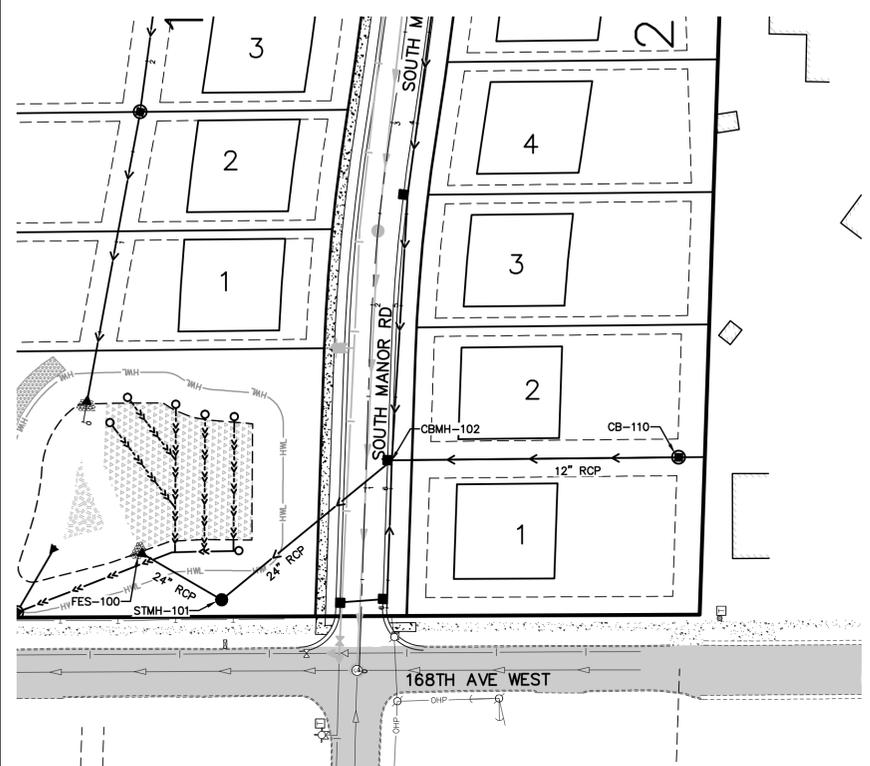
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2024-03-18	WATERSHED COMMENTS
2024-04-03	CITY COMMENTS
2024-04-19	WATERSHED COMMENTS
2024-05-06	LOT & BLOCK 2 GRADE
2024-05-20	WATERSHED COMMENTS

CAD FILE
24123-ST

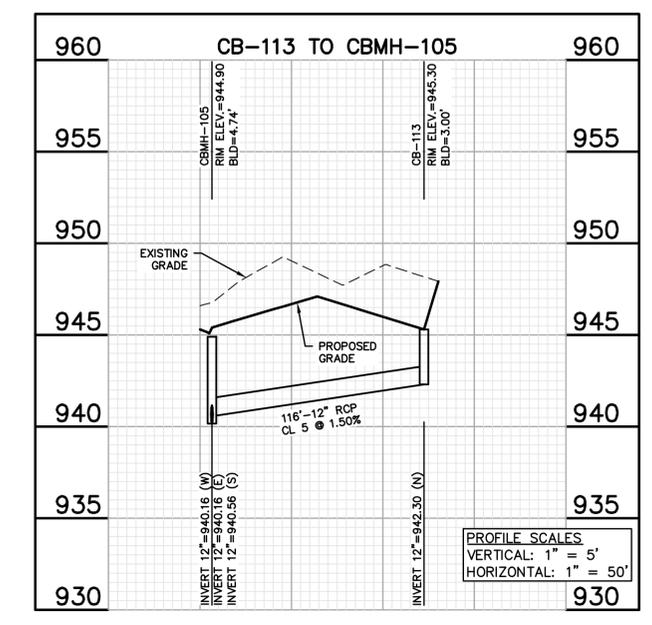
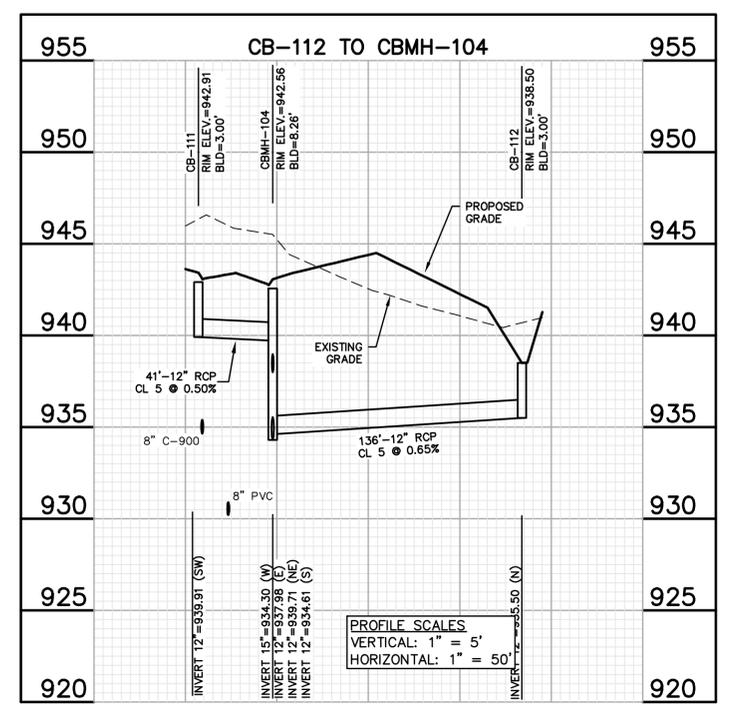
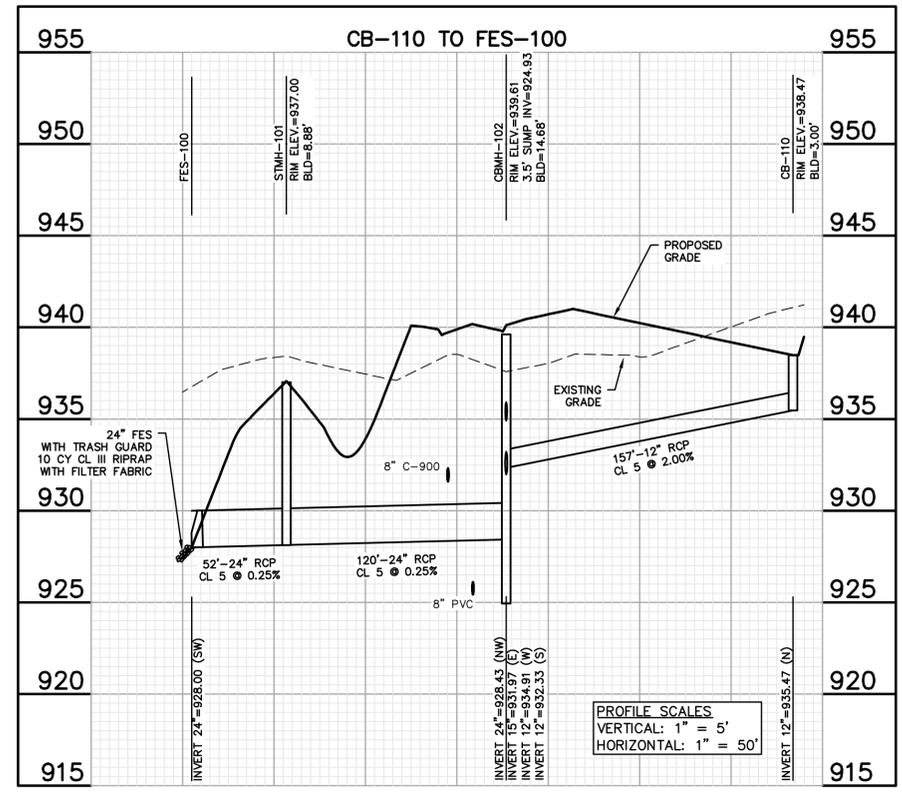
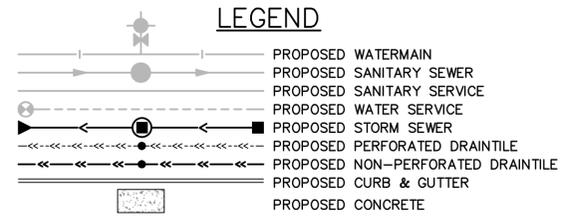
PROJECT NO.
24123

C5.2

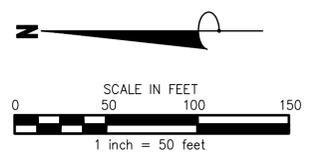
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LEGEND



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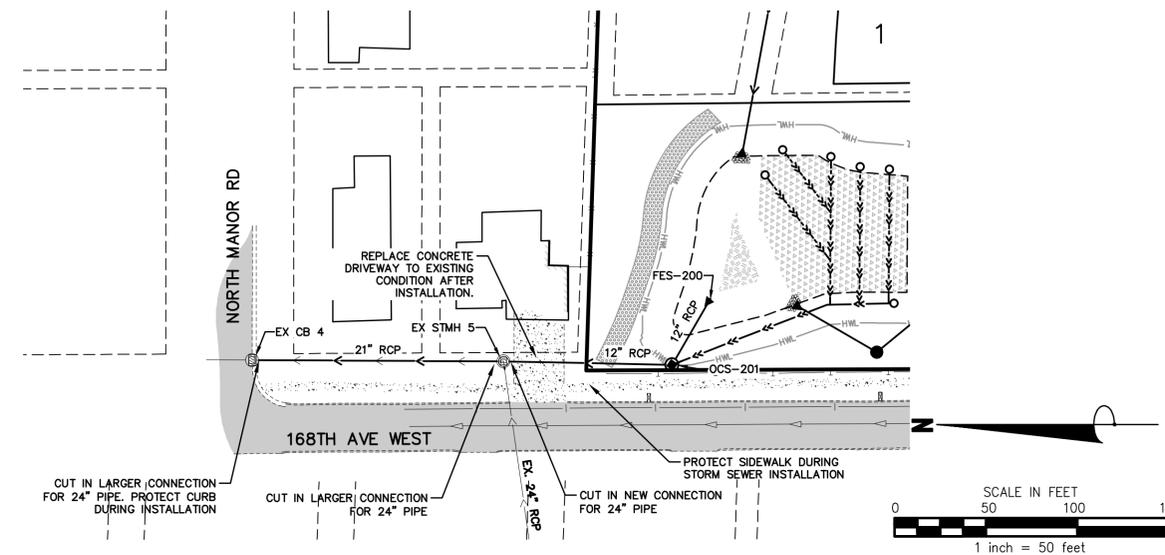
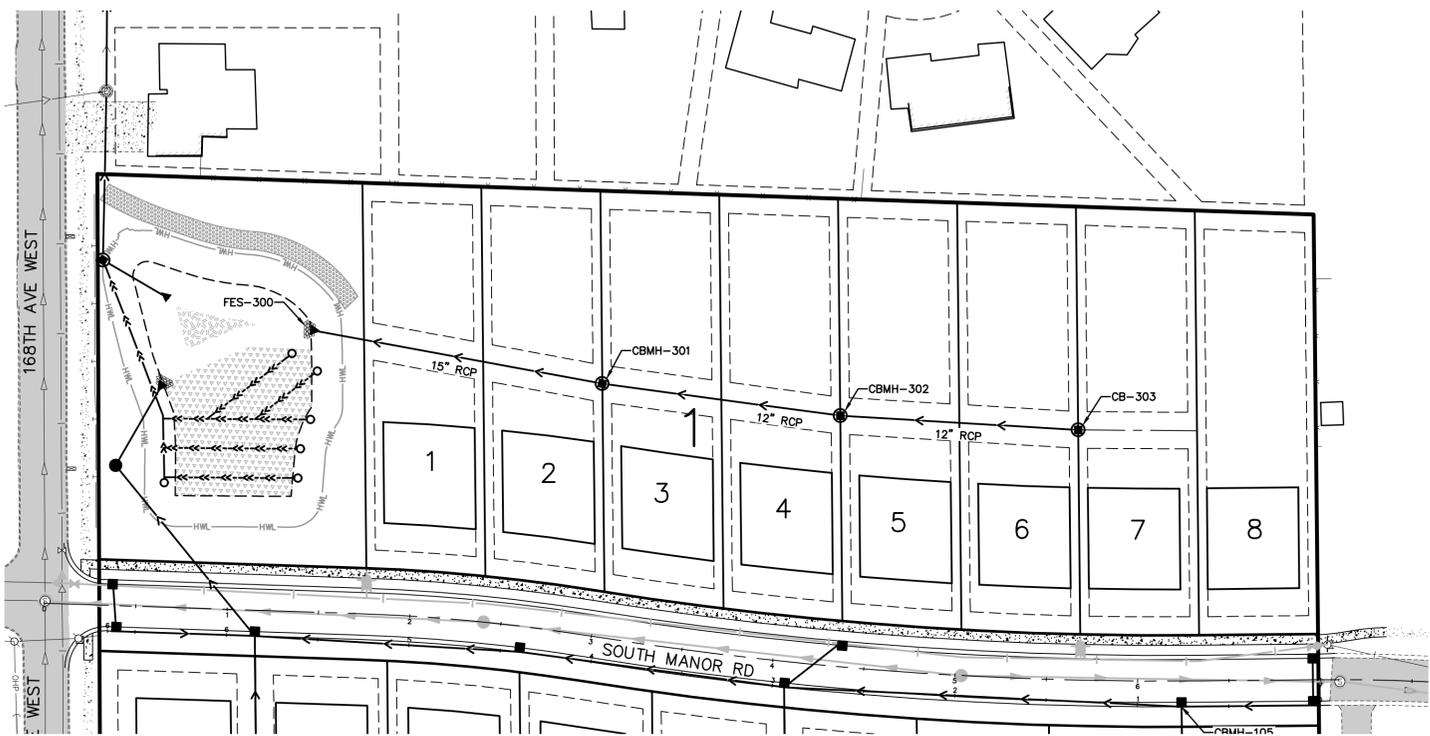
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 FOR
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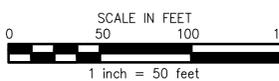
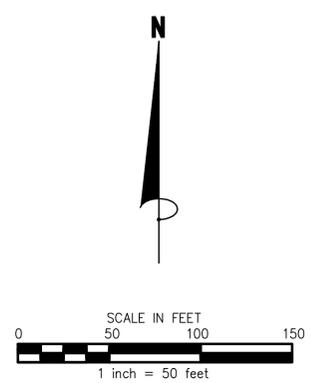
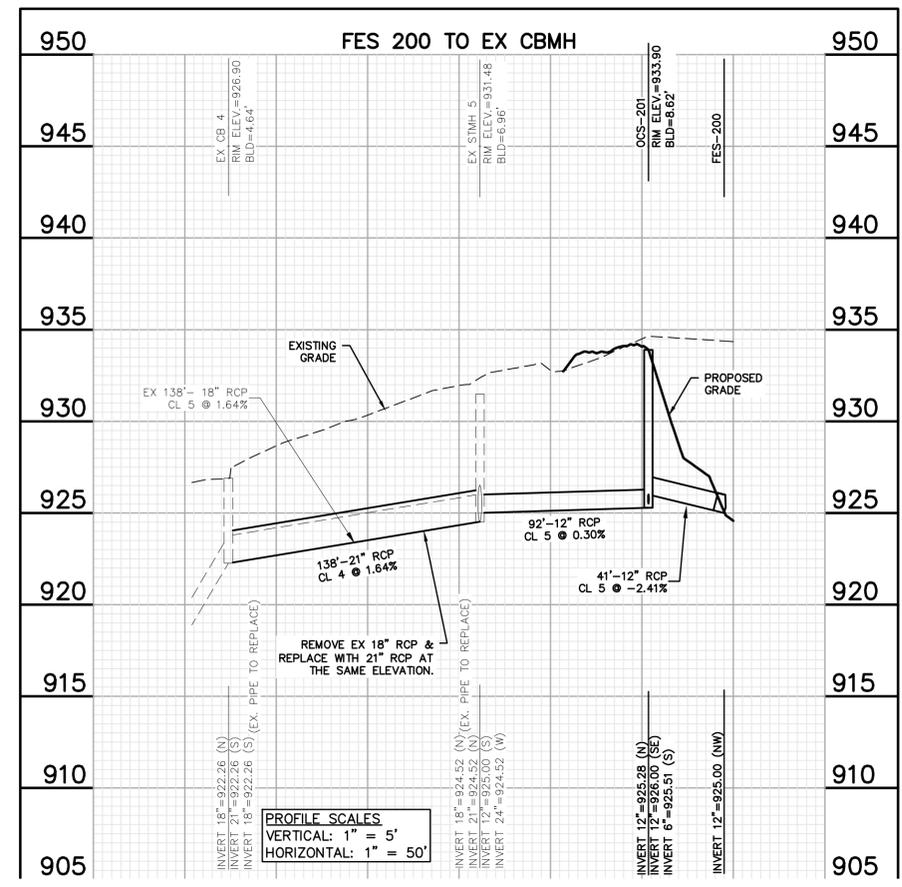
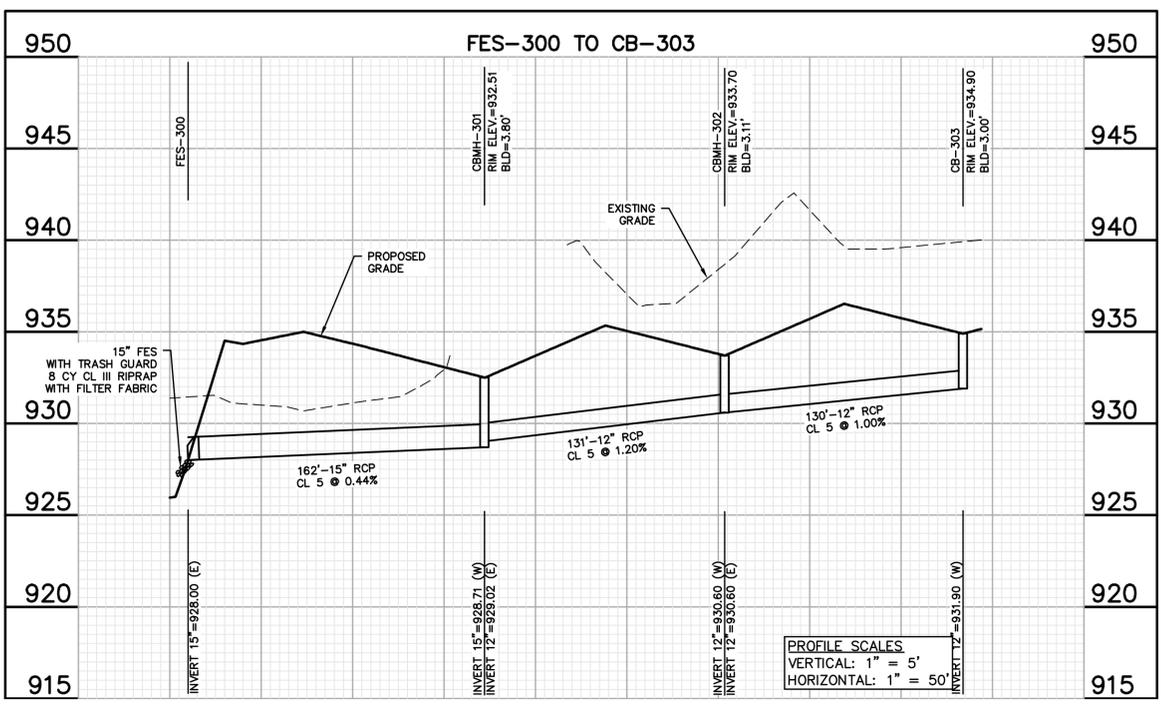
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DATE	01/24/24
REVISIONS	
2024-03-13 CITY COMMENTS	
2024-03-18 WATERSHED COMMENTS	
2024-04-03 CITY COMMENTS	
2024-04-19 WATERSHED COMMENTS	
2024-05-06 LOT & BLOCK 2 GRADE	
2024-05-20 WATERSHED COMMENTS	
CAD FILE	24123-ST
PROJECT NO.	24123
	C5.3

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LEGEND

- PROPOSED WATERMAIN
- PROPOSED SANITARY SEWER
- PROPOSED WATER SERVICE
- PROPOSED STORM SEWER
- PROPOSED PERFORATED DRAINTILE
- PROPOSED NON-PERFORATED DRAINTILE
- PROPOSED CURB & GUTTER
- PROPOSED CONCRETE



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Date	Comments
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CAD FILE
24123-ST

PROJECT NO.
24123

C5.4

