

## Riley Purgatory Bluff Creek Watershed District Permit Application Review

**Permit No:** 2023-003

**Considered at Board of Managers Meeting:** November 1, 2023

**Received complete:** September 14, 2023

**Applicant:** City of Chanhausen

**Representative:** WSB, Bill Alms

**Project:** Galpin Boulevard Reconstruction - The applicant proposes to reconstruct Galpin Boulevard (CR 117) from Highway 5 in the south to the City border with Shorewood to the north. The applicant also proposes to replace the Bluff Creek crossing under Galpin Boulevard. The applicant proposes to provide water quality treatment, volume abstraction and rate control for runoff prior to discharging offsite using five existing stormwater facilities, enhancing two additional existing stormwater facilities, constructing three new biofiltration basins, and constructing a wet pond.

**Location:** Galpin Boulevard (CR 117) from Highway 5 in the south to the City border with Shorewood to the north

**Reviewer:** Scott Sobiech, P.E., Barr Engineering Co.

### 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 October 4, 2023, meeting of the managers and the managers' findings:

Resolved that the variance request for Permit 2023-003 from compliance with Rule D, subsection 3.2 is approved, based on the facts and analysis provided by the RPBCWD engineer below and placed in the record at the November 1, 2023 meeting of the managers, and the managers' findings in the record of the November 1 meeting, and subject to the following conditions: 1. [CONDITION(S)],

### Potential Board Exception 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 November 1, 2023, meeting of the managers and the managers' findings, as well as the factual findings in the permit report that follows:

Resolved that the exception request from compliance with Rule J, subsection 3.1a, for Permit 2023-003 is approved based on the facts and analysis provided by the RPBCWD engineer below and placed in the record at the November 1, 2023 meeting of the managers, and the managers' findings in the record of the November 1 meeting, 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 November 1, 2023 meeting of the managers:

Resolved that the application for Permit 2023-003 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 of the permit have been affirmatively resolved, the RPBCWD president or administrator is authorized and directed to sign and deliver to the applicant, Permit 2023-003 on behalf of RPBCWD.

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

**Applicable Rule Conformance Summary**

Rule	Issue	Conforms to Rule?	Comments
B	Floodplain Management and Drainage Alterations	Yes	
C	Erosion Control Plan	See comment.	See rule-specific permit condition C1 related to providing name and contact information for the individual responsible for erosion control.
D	Wetland and Creek Buffers	No	See rule-specific permit condition D1 related to maintenance agreement execution and variance request for imperviousness within buffer minimum width.
G	Waterbody Crossings and Structures	See comment	See rule-specific permit condition G1 related maintenance agreement execution.
J	Stormwater Management	Rate	No Applicant is requesting an exception from rate control at one location to address a known flooding issue following Rule K.
		Volume	See Comment See stipulation #6 related in infiltration testing during construction.
		Water Quality	Yes
		Low Floor Elev.	Yes
		Maintenance	See Comment See Rule Specific Permit Condition J1 related to maintenance agreement execution
		Chloride Management	See Comment See stipulation #7 related in providing a chloride management plan prior to close-out.
	Wetland Protection	Yes	
K	Variances and Exceptions	See comment.	See variance request related to impervious surface within buffer minimum and exception related to rate control.



**Table 1 Water resource impacted by project**

Water Resource	Projected resource impacts
Wetland 1	An onsite Wetland Conservation Act protected, medium value wetland that is disturbed by the proposed land-disturbing activities.
Wetland 2	An onsite Wetland Conservation Act protected, medium value wetland that is downgradient from proposed land-disturbing activities.
Wetland 3	An onsite Wetland Conservation Act protected, medium value wetland that is disturbed by the proposed land-disturbing activities.
Wetland 4	An onsite Wetland Conservation Act protected, medium value wetland that is disturbed by the proposed land-disturbing activities.
Wetland 5	An onsite Wetland Conservation Act protected, medium value wetland that is disturbed by the proposed land-disturbing activities.
Wetland 6	An onsite wetland determined by the LGU to be an incidental wetland, thus a protected wetland subject to RPBCWD wetland buffer requirements.
Bluff Creek	The applicant proposes to replace the existing 42-inch culvert conveying Bluff Creek flows under Galpin Boulevard with a 6-foot wide, 4-foot high box culvert.

**Table 2 Relevant Project Information**

	RPBCWD Area
Total Site Area (acres)	25.89
Existing Site Impervious (acres)	12.09
Post Construction Site Impervious (acres)	12.74
New (Increase) in Site Impervious Area (acres)	0.65
Disturbed impervious surface (acres)	12.09
Exempt Rehabilitated Impervious Surface (acres)	2.7
Regulated Impervious Surface (acres)	10.04
Total Disturbed Area (acres)	25.89

The following materials were reviewed in support of the permit request:

1. Permit application dated January 18, 2023 (Notified applicant on October 18, 2021 that submittal was incomplete, materials completing the application received September 14, 2023)
2. Galpin Permit Narrative dated January 18, 2023(revised May 19, 2023, June 28, 2023, and September 14, 2023)
3. Galpin Stormwater Memo dated January 18, 2023 (revised May 19, 2023, June 28, 2023, August 15, 2023, and September 14, 2023)
4. Construction Drawings dated January 18, 2023 (revised May 3, 2023 [268 sheets], July 31, 2023 [315 sheets], August 14, 2023 [317 sheet], 37 sheets updated in September 14, 2023 Stormwater Memo, and addendums 1-4 received October 9, 2023)
5. Galpin Drainage Overview Maps received January 18, 2023 (revised June 5, 2023)
6. Geotechnical Evaluation Report dated June 8, 2023
7. Addendum 1 to Geotechnical Evaluation – Additional Infiltration Evaluation dated August 18, 2023
8. Level 2 Wetland Delineation Report with MnRAM site assessment reports dated August 23, 2022 (updated MnRAM for Wetland 5 received September 14, 2023)

9. MnRAM Site Assessment Reports received December 30, 2021 (attached to the Project Permit Application Report)
10. Minnesota Wetland Conservation Act Notice of Decision dated November 3, 2022
11. Electronic HydroCAD models for existing and proposed conditions received January 18, 2023 (revised May 23, 2023, July 31, 2023, August 15, 2023, September 14, 2023, and October 9, 2023)
12. Electronic P8 modeling received January 18, 2023 (revised May 23, 2023, July 31, 2023, August 15, 2023, September 14, 2023, and October 6, 2023)
13. Pollutant Loading Spreadsheet received July 31, 2023 (revised August 15, 2023, September 14, 2023, and October 9, 2023)
14. Variance request dated June 28, 2023 (revised September 14, 2023 and October 6, 2023)
15. Response to Comments from WSB dated May 19, 2023
16. Response to Comments from WSB dated June 26, 2023
17. Response to Comments from WSB dated September 14, 2023
18. Response to Comments from WSB dated October 6, 2023
19. Response to Comments from WSB dated October 9, 2023

**Rule Specific Permit Conditions**

**Rule B: Floodplain Management and Drainage Alterations**

Because the project will involve the alteration of surface flows and fill in the floodplain below the 100-year flood elevation of Wetlands 3 and 4, Bluff Creek, and existing stormwater management facilities LUP2.7 and LU P5.8 the project must conform to the requirements set forth by the RPBCWD Floodplain Management and Drainage Alterations rule (Rule B, Subsection 2.1).

Because the applicant does not propose new or reconstructed structures with low floors, the low floor elevation requirements set forth by Rule B, Subsection 3.1 do not impose requirements on the project.

The summary of the changes to the floodplain storage capacity is provided in Table 3. The project plans show that compensatory flood storage will be created at or below the same elevation of areas where fill will be placed below the 100-year flood elevations. In addition, the plans indicate the proposed outfalls to the creek and basins will daylight below the existing ground surface and the riprap will be embedded below the existing ground surface resulting in a proposed ground surface lower existing grades, thus demonstrating no net fill. The plans provide for a net increase in flood storage for each waterbody, thus conforming with Rule B, Subsection 3.2.

**Table 3 Fill and Cut computation below existing 100-year flood elevations.**

Waterbody	100-Year Elevation	Proposed Fill (CY)	Proposed Cut (CY)	Increase in Storage (CY)
LU P2.7	995.92	45	68	23
LU P5.8	999.18	183	214	31
Wetland 3	973.3	345	367	22

Waterbody	100-Year Elevation	Proposed Fill (CY)	Proposed Cut (CY)	Increase in Storage (CY)
Wetland 4A	974.1	154	163	9
Wetland 4B	977.07	173	173	1
Bluff Creek	956.13	1	1	1

<sup>1</sup>The plans indicate the proposed outfall to the creek will require the contractor to remove soil to daylight the outfall and the riprap will be embedded below the existing ground surface resulting in a proposed ground surface lower than existing grades, thus demonstrating no net fill.

The applicant provided pre- and post-project water quality modeling to demonstrate the project is not reasonably likely to have an adverse impact to water quality. The modeling results show the total suspended solids and total phosphorus load leaving the site after the street reconstruction will be less than the existing load leaving the site (see Rule J Water Quality analysis). The water quality modeling also shows the proposed project will meet the water quality treatment criteria for areas tributary to the onsite wetlands (see Rule J Wetland Protection analysis). In addition, consistent with the rate-control requirement in Rule J, the proposed peak discharge rates leaving the site are less than existing for the 2, 10, and 100-year event as presented in the Rule J Rate Control Analysis and requested exception analysis. Because implementation of the project will provide a reduction in pollutant loading, the proposed alterations are not likely to cause adverse impacts to water quality. The proposed land-disturbing activity conforms to Rule B, Subsection 3.3.

Rule B, subsection 3.4 precludes creation of impervious surface within 50 feet of a watercourse unless such impervious is associated with a creek crossing regulated under Rule G or a trail 10 feet wide or less. All impervious planned for the Galpin Road project qualifies for this exception from the 3.4 restriction. An erosion prevention and sediment control plan has been provided, per subsection 3.5, along with the plans that include notes for controlling aquatic invasive species entering and leaving the site, per subsection 3.6.

The proposed project conforms to the floodplain management and drainage alteration requirements of Rule B.

**Rule C: Erosion Prevention and Sediment Control**

Because the project will involve 25.89 acres of land-disturbing activity, the project must conform to the requirements set forth by the RPBCWD Erosion Prevention and Sediment Control rule (Rule C, Subsection 2.1a).

The erosion control plans prepared by WSB include installation of silt fence, sediment control logs, stabilized construction entrances, inspection, staging areas, riprap at flared ends, placement of a minimum of 6 inches of topsoil with a minimum 5% organic matter, decompaction of areas compacted during construction, and retention of native topsoil onsite to the greatest extent possible. To conform to RPBCWD Rule C requirements, the following revisions are needed:

- C1. The Applicant must provide the name, address and phone number of the individual who will remain liable to the District for performance under this rule and maintenance of erosion and sediment-

control measures from the time the permitted activities commence until vegetative cover is established.

**Rule D: Wetland and Creek Buffers**

Because the proposed work triggers RPBCWD Rules B, G, and J and there are wetlands downgradient from the work for the proposed project as well as WCA wetlands that will be disturbed and Bluff Creek, a public watercourse, will be disturbed by the proposed project, Rule D, Subsection 2.1a requires the applicant to establish buffer areas. Subsection 3.1b requires buffer on the edges of Wetland 4 and Wetland 2 downgradient from the land-disturbing activities. The City of Chanhassen is the LGU administering WCA requirements and in that capacity approved the partial filling of Wetland 1, 3, and 4 and grading a portion of Wetland 5. Because the activities constitute a disturbance of Wetland 1, 3, 4, and 5, wetland buffer must be provided around the entire (remaining) wetland on the property owned by the applicant (Rule D, subsection 3.1a). Rule D, Subsection 3.1c requires buffer along on streambank downgradient from the land-disturbing activity regulated by the District and 50 feet from each of the upstream and downstream extent of the disturbance.

The MnRAM analyses submitted indicate that the five protected wetlands are medium value wetlands. Rule D, Subsection 3.2.b.iii requires wetland buffer with an average of 40 feet from the delineated edge of the wetland, minimum 20 feet for medium value wetlands. Because Subsection 3.2f only requires buffer on property owned by the applicant and the city only has property rights to install buffer within the linear project right of way (ROW) and plans for the project provide for establishment and maintenance of buffer vegetation within the ROW area, the project conforms to the requirements. The buffer widths are summarized in Table 4 and shown on the applicant’s Exhibit K attached to this report for reference. The applicant has requested a variance from subsection 3.3d because a portion of the proposed roadway reconstruction and trials (i.e., impervious surface) is within the buffer area (see Rule K variance analysis).

**Table 4 Waterbody buffer summary**

Wetland ID	RPBCWD Wetland Value	Required Minimum Width (ft)	Required Average Width (ft)	Provided Minimum Width (ft)	Provided Average Width (ft)
Wetland 1	Medium	20	40	0 <sup>2</sup>	27 <sup>2</sup>
Wetland 2	Medium	20	40	15 <sup>2</sup>	7 <sup>2</sup>
Wetland 3	Medium	20	40	0 <sup>2</sup>	34 <sup>2</sup>
Wetland 4	Medium	20	40	2 <sup>2</sup>	25 <sup>2</sup>
Wetland 5	Medium	20	40	6 <sup>2</sup>	36 <sup>2</sup>
Bluff Creek	NA	30	50	31	50

<sup>1</sup> Average and minimum required buffer width under Rule D, Subsection 3.2.b.

<sup>2</sup> The wetland buffer areas are constrained to the ROW and the proximity of the wetland boundary to the edge of the road, the applicant is only required to buffer to the edge of the ROW and thus the buffers are less than required average.

The plans require revegetating disturbed areas within the proposed buffer with native vegetation, thus conforming with Rule D, Subsection 3.3. A note is included on the plan sheet indicating the project will be constructed so as to minimize the potential transfer of aquatic invasive species (e.g., zebra mussels, Eurasian watermilfoil, etc.) to the maximum extent possible conforming to Rule D, Subsection 3.6.

The following revisions are needed to conform to the RPBCWD Rule D:

- D1. Buffer areas and maintenance requirements must be documented in an agreement approved by RPBCWD. As a public entity, the city of Chanhassen may comply with this requirement by entering into a maintenance agreement with the RPBCWD (Rule D, Subsection 3.5). The maintenance agreement must also include an exhibit clearly showing the buffer area and monument locations. the draft agreement must be submitted for review and approval by RPBCWD.

### **Rule G: Waterbody Crossings and Structures**

Because the project proposes to replace the culvert under Galpin Road, a waterbody crossings in contact with the bed and bank of Bluff Creek, a public watercourse, the proposed project must meet the criteria of RPBCWD's Waterbody Crossings and Structures Rule (Rule G, Subsection 3). The applicant also proposes one outfall in contact with the bank of Bluff Creek, three outfalls in contact with Wetland 3 and one outfall in contact with Wetland 5. The proposed crossing and outfall to Bluff Creek falls within the scope of Minnesota Department of Natural Resources General Permit #2015-1192. (Rule F: Stormwater and Streambank Stabilization is not triggered because the riprap being installed in bank of the creek is to prevent erosion more so than stabilize the bank.) Only the criteria in Rule G, subsections 3.1, 3.2, 3.3, and 3.7 impose requirements on the work.

#### *Creek Crossing Replacement*

The applicant proposes to replace the existing 42-inch culvert conveying Bluff Creek flows under Galpin Boulevard with a 6-foot wide, 4-foot high box culvert with a 1-foot restriction sidewall to reduce the controlling flow width to 5 feet. This work will provide a public benefit by allowing the creek to cross in a properly bedded and stabilized box culvert with a much lower risk of failure. Additionally, the public water will see reduced bank erosion at the upstream and downstream ends of the culvert (Rule G, Subsection 3.1a).

Rule G, Subsection 3.2.a requires that the construction of a waterbody crossing in contact with the bed or bank of a waterbody retain adequate hydraulic capacity and assure no net increase in the flood stage of the pertinent waterbody. The proposed crossing was modeled in PCSWMM. The analysis of the proposed crossing in PCSWMM shows that the proposed 100-year frequency flood elevation upstream of the crossing (956.2 M.S.L.) will match the existing elevation 956.2 M.S.L. and the downstream flood elevation will also match the existing flood elevation of 947.5 M.S.L., thus confirming the project will not increase the flood stage of the existing water body conforming to Rule G, Subsection 3.2a. Because the existing crossing does not provide navigational capacity, the requirement set forth by Rule G, subsection 3.2.b does not impose a requirement on the project. Because the waterbody crossing improvement has been designed with a

natural bottom and reduces flow velocities, the project will provide wildlife passage, and is not reasonably likely to change flow gradient, increase scour, or affect water quality. As part of the design process, the applicant dismissed the do nothing alternative because it continues the risk of settlement or failure of the structure over time and does not address the observed downstream scour. Another alternative explored was a 15'x7' box culvert, again this was not determined to be the minimal impact design as it would increase flood stages downstream, with the potential to overtop Coulter Boulevard.

The project plans include a note requiring no activity affecting the bed/banks of a protected water be conducted between March 15 and June 15 (Rule G, Subsection 3.7a) and indicate the banks will be immediately stabilized after completion of permitted work and revegetated as soon as growing conditions allow (Rule G, Subsection 3.7b). A note is included on the plan sheet indicating the project will be constructed so as to minimize the potential transfer of aquatic invasive species (e.g., zebra mussels, Eurasian watermilfoil, etc.) to the maximum extent possible (Rule G, Subsection 3.7c).

Rule G, Subsection 3.7d requires compliance with the applicable criteria in subsection 3.3 of Rule F. The proposed riprap placement extends the minimum distance needed to provide a stilling pool and, thus representing the minimal encroachment to prevent erosion (Rule F, subsection 3.3a). Based on MNDOT's standard riprap drawing included in the plan set, the project proposes the use stone riprap having an average size of 9 inches, with a geotextile and transition layer of granular bedding sized consistent with the erosion intensity at the waterbody crossing locations. The purpose of the riprap is to dissipate flow energy and minimize the potential for erosion consistent with Subsection 3.3b.vi., thus conforming to Rule F, Subsection 3.3b.

### Outfalls

The applicant also proposes one outfall in contact with the bank of Bluff Creek, three outfalls in contact with Wetland 3 and one outfall in contact with Wetland 5. The proposed outfall to Bluff Creek provides a public benefit by efficiently discharging treated stormwater flows at the normal water level of the creek as opposed to the alternative of discharging above the bank of the creek which would result in increased bank erosion and sediment transport (Rule G, Subsections 3.1a). The outfalls to Wetlands 3 and 5 demonstrate a specific need to dissipate flow energy prior to treated runoff entering the waterbodies (Rule G, Subsections 3.1b).

Criteria 3.3 is met because, as shown on Plan Sheet 34R, the proposed flared end sections will include a riprap apron and stilling basin to reduce risk of bank erosion (criteria 3.3a). Because there are upgradient stormwater features which will reduce peak flows and reduce pollutants, the project conforms with criteria 3.3b and 3.3c.

The applicant considered the following alternatives to the proposed outfalls:

- Overflow berms from the facilities which would result in greater velocities, less predictable flow paths, and increased potential for erosion.

The RPBCWD engineer concurs in the applicant's determination that the outfall placement at the bank of Bluff Creek and the edge of the wetlands would minimize impacts on the resource, minimize floodplain fill, and dissipate the flow energy leaving the outlets with riprap, thus the proposed design represents the minimal impact solution (Rule G, Subsection 3.5a).

The plans show the outfalls with riprap will be placed at the existing bank, thus minimizing the encroachment (Rule G, Subsection 3.5b). The Rule B analysis provided above demonstrates the land-disturbing activities comply with the District's floodplain rule as required by Rule G, Subsection 3.5c. Because implementation of the plans will provide a reduction in pollutant loading and show that discharge rates are slightly reduced (see Rule J analysis), the proposed alterations are not likely to cause adverse impacts and project conforms to Rule G, Subsection 3.5d.

Rule G, Subsection 3.7d requires compliance with the applicable criteria in Subsections 3.3 of Rule F. Drawings confirm the proposed outfalls are placed at a location to minimize the horizontal encroachment (Rule F, Subsection 3.3a.iii). The project proposes the use of riprap stabilization at the outfall sized to withstand the anticipated erosive force. The standard riprap detail included with the drawings indicate that a granular transitional layer and a geotextile fabric will be placed, thus conforming to Rule F, Subsection 3.3b (iii). The riprap design reflects energy dissipation and stabilization necessary to minimize erosion at the watercourse and is not placed for cosmetic purposes per Rule F, Subsection 3.3b (vi).

To conform to the RPBCWD Rule G the following revisions are needed:

- G1. An agreement providing for ongoing maintenance of the culvert and outfalls must be executed by the city after review and approval by RPBCWD and prior to release of the permit to undertake the proposed land-disturbing activities.

#### **Rule J: Stormwater Management**

Because the project will alter more than 25.89 acres of surface area, conformance with RPBCWD's Stormwater Management Rule (Rule J) is required.

The project entails construction and reconstruction that altogether amounts to 12.74 acres of linear impervious surface; therefore, stormwater management for this linear project must be provided in accordance with the criteria of Subsection 3.2 (Rule J, Subsection 2.4). The 12.74 acres of impervious surface includes 2.7 acres of paved trail, which is exempt from RPBCWD's stormwater management rule (Rule J, Subsection 2.2d). Therefore, the requirements of Rule J apply to 10.04 acres of proposed new and reconstructed impervious surface within the site.

#### **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 HydroCAD 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 Table 5. Because the proposed project increases the discharge to Bluff Creek upstream of Galpin Boulevard to mitigate a known flooding concern in the Fawn Hill development, the applicant requested an exception from the rate control criteria at this location (see Rule K exception analysis). Except for the increased discharge leaving the site upstream of Galpin Boulevard, the proposed project is in conformance with RPBCWD Rule J, Subsection 3.1.a.

**Table 5. Rate control summary**

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
MN Highway 5	3.9	0	6.2	0	11.5	0	0.3	0
West 78 <sup>th</sup>	6.5	4.2	7.3	6.5	9.1	7.8	1.8	1.2
Bluff Creek Downstream	1.1	0	2.0	0	4.2	0	0.1	0
Bluff Creek Upstream	1.0	0.3	1.8	2.8	3.6	30.5	0.1	1.3
Fawn Hill System	16.9	9.9	43.3	34.7	102.4	87.1	7.0	5.9
Longacres Pond	5.7	5.5	8.4	8.2	12.0	11.9	2.1	2.1
Wetland 1	2.1	1.8	4.1	3.8	6.7	6.4	0.5	0.5
Wetland 2	0.8	0.8	2.1	2.1	5.6	5.6	2.2	2.2
Lake Ann Wetland	9.0	6.8	16.5	7.8	24.5	10.1	7.2	6.3
Wetland 4	21.7	17.9	44.0	37.9	101.1	89.4	3.5	3.1
Wetland 5	5.4	4.0	8.5	4.9	14.5	6.5	2.1	1.6
Lake Lucy Wetland	15.2	13.9	25.1	22.9	50.2	45.6	4.2	3.6
Melody Hills	0.6	0.6	1.1	1.0	2.1	2.0	<0.1	<0.1
East Wetland	18.6	14.3	33.9	32.0	71.8	66.7	3.2	3.2

**Volume Abstraction**

Subsection 3.2c of Rule J requires the abstraction onsite of the larger of 0.55 inches of runoff from the new and fully reconstructed linear impervious surfaces or 1.1 inches from the net increase in linear impervious area. In this case 0.55 inches of runoff from the new and fully reconstructed impervious surfaces is the larger volume. An abstraction volume of 20,045 cubic feet is required from the 10.04 acres of new and reconstructed linear impervious surface on the site. The applicant is proposing three biofiltration basins, two of which will include an elevated draintile to promote infiltration.

Soil information from 24 borings collected by Braun Intertec indicates the soils on the site vary with depth and location. The surface soil is predominately sandy lean clay under varying depth of fill and some areas of organic soils under fill. The subsurface investigation information summarized in the table below supports a determination that groundwater is at least 3 feet below the bottom of the proposed infiltration stormwater facilities (Rule J, Subsection 3.1.b.2.a).

Proposed BMP	Nearest Subsurface Investigation	Boring is within footprint?	Groundwater Elevation (feet)	BMP Bottom Elevation (feet)	Separation (feet)
Biofiltration Basin A	ST-5	Yes	948.9	953	4.1
Biofiltration Basin B	ST-9	Yes	No groundwater observed at boring bottom (approx. el 974.5 ft)	980.25	5.75
Biofiltration Basin C	ST-24	Yes	961.3	971.75	10.43

Because the engineer concurs that the soil boring information showing low permeable soils (i.e., clay), high groundwater, limited area in the linear corridor, and site topography support that the abstraction standard in subsection 3.2 of Rule J cannot practicably be met for runoff from all regulated impervious surface, the site is considered a restricted site 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 paragraph 3.2, 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. Because soils identified in the borings, high groundwater, and limited space within the linear corridor, the abstraction standard in Subsection 3.3a of Rule J cannot practicably be achieved.

The applicant’s geotechnical engineer performed calculations of infiltration rate based upon the Kozeny-Carman Equation using grain size analysis tests. The results indicate much faster infiltration (0.7 and 1.4 inches per hour) than recommended by the MN Stormwater Manual for the soils present at the stormwater facility locations. The engineer concurs with the applicant’s design infiltration rates of between 0.06 inches per hour based on the calculations provided by the geotechnical engineer and the guidelines provided in the Mn Stormwater Manual. Based on the presumed design infiltration rate, the engineer concurs that the proposed infiltration systems will draw down within 48 hours (Rule J, subsection 3.1b.3). Per Rule J, Subsection 3.1.b.2.c measured infiltration capacity of the soils at the bottom of the infiltration systems must be provided, and the RPBCWD engineer supports the applicant’s geotechnical engineer’s proposed in-situ infiltration testing plan. The applicant must submit documentation verifying the infiltration capacity of

the soils and that the volume control capacity is calculated using the measured infiltration rate. If infiltration capacity is less than needed to conform with the volume abstraction requirement in subsection 3.3a or there is inadequate separation to groundwater or redoximorphic soils, design modifications will need to be submitted (in the form of an application for a permit modification or new permit).

The Engineer concurs that because there are low permeable soils (i.e., clay), high groundwater, topography constraints, and limited right of way, the applicant is providing abstraction of runoff from the regulated impervious surface to the maximum extent practicable (see Table 6) on the project site and the proposed activity conforms to Rule J, Subsection 3.3b.

**Table 6. Volume abstraction summary**

Required Abstraction Depth (inches)	Required Abstraction Volume (cubic feet)	Provided Abstraction Depth (cubic feet)	Provided Abstraction Volume (cubic feet)
0.55	20,055	0.06	2,265

**Water Quality Management**

Subsection 3.1.c of Rule J requires the Applicant to provide for at least 60 percent annual removal efficiency for total phosphorus (TP), and at least 90 percent annual removal efficiency for total suspended solids (TSS), as well as no net increase in pollutant loading from existing conditions. The applicant demonstrated and the engineer concurs that the site is restricted. Rule J, subsection 3.1c(ii) (made applicable by 3.2c) requires water-quality treatment of at least 60 percent annual removal efficiency for total phosphorus, at least 90 percent annual removal efficiency for total suspended solids and no net increase in TP or TSS from the site from existing conditions.

P8 models were developed to estimate the TP and TSS loading from the watersheds and the removal capacity of the proposed BMPs. The results of this modeling are summarized in Table 7 and Table 8 below. The results show the proposed project will remove sufficient TSS and TP to achieve an overall pollutant reduction in accordance with the required annual removals (Rule J, Subsection 3.2c).

**Table 7. Annual TSS and TP removal summary**

Resource	Pollutant of Interest	Regulated Site Loading (lbs/yr)	Required Load Removal (lbs/yr) <sup>1</sup>	Provided Load Reduction (lbs/yr) <sup>2</sup>
Bluff Creek	Total Suspended Solids (TSS)	3,417	3,076 (90%)	3,887 (>100%)
	Total Phosphorus (TP)	11.05	6.63 (60%)	8.29 (75%)
BC P1.5B, offsite wetland	Total Suspended Solids (TSS)	239	215 (90%)	288 (>100%)
	Total Phosphorus (TP)	0.77	0.46 (60%)	0.57 (74%)
Wetland 1 <sup>3</sup>	Total Suspended Solids (TSS)	0 <sup>3</sup>	0 (90%)	0
	Total Phosphorus (TP)	0 <sup>3</sup>	0 (60%)	0
Wetland 2	Total Suspended Solids (TSS)	860	774 (90%)	1,157 (>100%)
	Total Phosphorus (TP)	2.78	1.67 (60%)	2.63 (95%)
Wetland 3/4 <sup>4</sup>	Total Suspended Solids (TSS)	2,199	1,980 (90%)	2,264 (>100%)
	Total Phosphorus (TP)	7.11	4.27 (60%)	4.74 (67%)

Resource	Pollutant of Interest	Regulated Site Loading (lbs/yr)	Required Load Removal (lbs/yr) <sup>1</sup>	Provided Load Reduction (lbs/yr) <sup>2</sup>
Wetland 5	Total Suspended Solids (TSS)	770	693 (90%)	704 (91%)
	Total Phosphorus (TP)	2.48	1.49 (60%)	1.51 (61%)
BMP D, offsite wetland	Total Suspended Solids (TSS)	823	740 (90%)	2,143 (>100%)
	Total Phosphorus (TP)	2.65	1.59 (60%)	3.90 (>100%)
LU P1.4, offsite wetland	Total Suspended Solids (TSS)	112	100 (90%)	123 (>100%)
	Total Phosphorus (TP)	0.36	0.22 (60%)	0.27 (75%)
Entire Site	Total Suspended Solids (TSS)	8,420	7,578 (90%)	10,566 (>100%)
	Total Phosphorus (TP)	27.2	16.32 (60%)	21.91 (80.6%)

<sup>1</sup>Required load reduction is calculated based on the criteria in Rule J, Subsection 3.1c and the new and reconstructed impervious area site loading

<sup>2</sup> Provided removal is greater than the regulated load because of the treatment on exempt impervious trails and offsite runoff.

<sup>3</sup> Because the only site area tributary to Wetland 1 under proposed conditions is native buffer areas, which are self-mitigating, the regulated loading to Wetland 1 under proposed conditions is zero (0).

<sup>4</sup> The technical evaluation panel (TEP) and RPBCWD wetland scientist determined Wetland 3 and Wetland 4 to be part of the same wetland complex because the wetlands are connected through equalization culverts.

**Table 8. Summary of net change in TSS and TP leaving the site**

Resource	Pollutant of Interest	Existing Loading (lbs/yr)	Proposed Load after Treatment (lbs/yr)	Change (lbs/yr)
Bluff Creek	Total Suspended Solids (TSS)	3523	594	-2929
	Total Phosphorus (TP)	18.59	7.91	-10.68
BC P1.5B, offsite wetland	Total Suspended Solids (TSS)	384	375	-9
	Total Phosphorus (TP)	3.78	3.7	-0.08
Wetland 1	Total Suspended Solids (TSS)	583	399	-184
	Total Phosphorus (TP)	1.93	1.34	-0.59
Wetland 2	Total Suspended Solids (TSS)	897	26	-871
	Total Phosphorus (TP)	5.24	1.22	-4.02
Wetland 3/4	Total Suspended Solids (TSS)	3847	3334	-513
	Total Phosphorus (TP)	16.65	16.57	-0.08
Wetland 5	Total Suspended Solids (TSS)	1128	285	-843
	Total Phosphorus (TP)	9.13	4.06	-5.07
BMP D, offsite wetland	Total Suspended Solids (TSS)	3326	968	-2358
	Total Phosphorus (TP)	10.82	6.33	-4.49
LU P1.4, offsite wetland	Total Suspended Solids (TSS)	170	169	-1
	Total Phosphorus (TP)	2.87	2.86	-0.01
Entire Site	Total Suspended Solids (TSS)	13275	5751	-7524
	Total Phosphorus (TP)	67.08	42.65	-24.43

### **Low floor Elevation**

No structure may be constructed or reconstructed such that its lowest floor elevation is less than 2 feet above the 100-year event flood elevation 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 a standard in this subsection 3.6b. Because the project does not propose to construct or reconstruct structures that have low-floor elevations, subsection 3.6a does not impose requirements on the project. However, the project will construct stormwater management facilities in proximity to existing habitable structures. The RPBCWD Engineer concurs with the attached low

floor analysis provided by the applicant, which utilized Appendix J1, that demonstrates the proposed project is in conformance with Rule J, Subsection 3.6b.

**Table 9. Low Floor Evaluation of Existing Structures**

Stormwater Facility	Low Floor Elevation of Building (feet)	100-year Event Flood Elevation of Adjacent Stormwater Facility (feet)	Freeboard (feet)
LU 2-18-1	984.0	976.72	7.28
LU P1.9	996.0	993.13	2.87
Biofiltration Basin B	992.0	986.47	5.53
Pond D	1026.0	1019.91	6.09

***Maintenance***

Subsection 3.7 of Rule J requires the submission of 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 draft maintenance and inspection plan for review and approval by RPBCWD. As a public entity, the city of Chanhassen may comply with this requirement by entering into a maintenance agreement with the RPBCWD.

***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. To close out the permit, Permit applicant must provide a chloride management plan that designates the individual authorized to implement the chloride management plan.

***Wetland Protection***

Because the proposed activities discharge to on-site protected Wetland 2-5, the proposed activities must conform to RPBCWD wetland protection criteria (Rule J, subsection 3.10). Wetlands 2, 3, 4, and 5 are medium value. Table 10 summarizes the allowable change in bounce and inundation duration from Table J1 of RPBCWD Rule J. The information summarized in Table 11 summarizes the applicant’s analysis for wetland protection and the potential impacts on the wetlands.

**Table 10: Summary of allowable impacts on onsite wetland from Rule J, Table J1**

Wetland Value/ Waterbody	Permitted Bounce for, 10-Year Event	Inundation Period for 1- and 2-Year Event	Inundation Period for 10-Year Event	Runout Control Elevation
Medium	Existing +/- 1.0 feet	Existing+2 days	Existing +14 days	0 to 1.0 ft above existing runout

**Table 11: Impacts of Project on Wetlands**

Wetland	RPBCWD Wetland Value	Change in Bounce for, 10-Year Event (feet)	1-year Increase in Inundation Period (days)	2-year Increase in Inundation Period (days)	10-year Increase in Inundation Period (days)	Runout Control Elevation <sup>1</sup>
Wetland 1	Medium	-0.18	No change	No change	No change	No change
Wetland 2	Medium	-0.01	No change	No change	No change	No change
Wetland 3	Medium	0.79	0.1	0.1	0.2	No change
Wetland 4 (south)	Medium	0.23	No change	0.1	0.2	No change
Wetland 4 (north)	Medium	0	No change	No change	No change	No change
Wetland 5	Medium	-0.18	0.1	0.2	0.3	No change

The analysis shows the bounce for the 10-year event will be within the allowable change for each wetland. In addition, the engineer concurs with the applicant’s modeling and analysis showing that the proposed street reconstruction will not increase the inundation periods for the wetland, thus conforming with Rule J, Subsection 3.10.a.

The applicant provided P8 modeling as summarized in Table 7 demonstrate the runoff from the disturbed areas tributary to the wetlands will be treated in conformance with Rule J, Subsection 3.10b.

**Rule K: Variances and Exceptions**

Variance Request

The applicant requested a variance from the Rule D, Subsection 3.3d requirement to allow reconstructed impervious surface for the roads and trails within the buffer width of 40 feet for Wetland 1, 2, 3, 4, and 5, medium value wetlands.

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 and associated buffer maps). Following is the RPBCWD engineer’s assessment of information received relevant to the applicant’s request for a variance

- Related to variance criterion 1 – The buffer widths along the wetlands vary between 0 and 36 feet because of the reconstructed roadway and proposed trail locations within the existing right-of-way. Subsection 3.3d prohibits impervious surface from within the buffer. Table 12 show the amount of impervious surface proposed within the 40-foot average buffer area. As a result of the new and reconstructed impervious roadway and trails within the buffer, the shortfall from the required minimum widths to be between 25% to 100%.

**Table 12 Impervious surface within buffer**

Wetland ID	Impervious Surface in Buffer (sf)	Minimum Buffer Width Shortfall
Wetland 1	6,095	100%
Wetland 2	5,010	25%
Wetland 3 <sup>1</sup>	26,960	100%
Wetland 4 <sup>1</sup>	19,130	90%
Wetland 5	2,896	70%

<sup>1</sup> The 40-foot average buffer overlaps between Wetlands 3 and 4, double counting some area. The technical evaluation panel (TEP) and RPBCWD wetland scientist determined Wetland 3 and Wetland 4 to be part of the same wetland complex because the wetlands are connected through equalization culverts.

- Regarding variance criteria 2 and 3 – Under existing conditions, runoff flows directly into the wetlands with minimal treatment provided by the vegetated side slopes of the roadway. The information submitted demonstrates the project design will capture and redirect roadway and trail runoff away from wetlands to stormwater facilities. As a result, the project will not change the character of the water resources, flood levels, or drainage, even though the criterion in 3.3d is not met. The applicant asserts the location of the roadways within the right of way is needed to maintain the existing transportation services to existing and future homes. The applicant asserts that the impervious trails are needed to provide safe pedestrian routes and minimize the need for pedestrian to cross the roadway.
- Technical measures considered to alleviate the practical difficulty (variance criterion 4) include realigning the roadway within the existing right-of-way, narrowing the roadway, bridge construction, and removal of the roadway.
  - The applicant dismissed the alternative the roadway realignment and removal because of the lack of space due to the presence of wetland on both sides of the roadway in some locations.
  - The applicant dismissed the bridge alternative was dismissed due to a higher degree of impact on wetlands during construction and the increased cost.

- Boardwalk in select areas were dismissed due to the need for specialty snow removal equipment and maintenance burden.
- The applicant is proposing to narrow the roadway from 12-foot lanes to 11-foot lanes.
- In most locations the applicant is proposing to tilt the proposed trail toward the roadway to capture the runoff and direct it to a stormwater facility for treatment prior to discharging to the wetland.
- Regarding variance criterion 5, the applicant has created the circumstances leading to the variances to reconstruct existing roadways and add impervious trails on both side of the roadway. This roadway was originally constructed decades ago, before the Wetland Conservation Act.

The engineer finds there is adequate technical basis for the managers to rely on to grant the requested variance to allow the roadways and trails to be reconstructed within the minimum buffer widths to provide safe transportation and pedestrian routes.

Exception Request

The project results in a net increase in discharge to Bluff Creek upstream of Galpin Boulevard for the 10- and 100-year rainfall event (see Table 5). Because the proposed project increases the discharge to Bluff Creek upstream of Galpin Boulevard to mitigate a known flooding concern in the Fawn Hill development, the applicant requested that RPBCWD grant an exception to the criterion (Rule J, subsection 3.1a), as the project provides better natural resource protection and enhancement (Rule K, Section 2). The engineer finds that:

- While the discharge from the site entering Bluff Creek upstream of Galpin Boulevard increases for the 10-year, 100-year and 10-day snowmelt events, the HydroCAD modeling provided by the applicant demonstrates that the modeled flows in Bluff Creek will be reduced relative to existing conditions because of directing the site runoff through the proposed biofiltration basin A (see below summary). The reduction of flows in Bluff Creek have the added benefit of reducing the erosion potential in the creek from the headwaters wetland to the west and areas downstream.

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
Discharge to Bluff Creek Upstream of Galpin Blvd	1.0	0.3	1.8	2.8	3.6	30.5	0.1	1.3
Flow in Bluff Creek	17.4	10.1	45.0	35.0	106.7	87.5	7.1	7.1

- The proposed design will route runoff away from a floodprone area with observed high groundwater and wet surface conditions, thus helping mitigate existing flooding.
- Redirecting flows to the proposed biofiltration basin A also reduces pollutants entering the off-site wetland complex to the west of the Fawn Hill development (i.e., the Bluff Creek headwaters wetland), thus improving the protection of this off-site wetland.

Because the proposed flow routing provides for better natural resource protection than maintenance of existing discharge locations, the RPBCWD engineer finds that there is ample factual and analytical basis for a determination by the managers that an exception is warranted from compliance with Rule J, subsection 3.1a.

**Applicable General Requirements:**

1. The RPBCWD Administrator and Engineer shall be notified at least three days prior to commencement of work.
2. Construction shall be consistent with the plans and specifications approved by the District as a part of the permitting process. The date of the approved plans and specifications is listed on the permit.
3. 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.
4. The grant of the permit does not relieve the permittee of any responsibility to obtain approval of any other regulatory body with authority.
5. 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.
6. 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.
7. 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.
8. 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 proposed project conforms with Rule B.

3. The Applicant has requested a variance from compliance with the Rule D criteria related to reconstructed and new impervious surface within the minimum buffer width for Wetland 1, 2, 3, 4, and 5.
4. The Applicant has requested an exception from compliance with the Rule J criteria related to rate control at all discharge locations to address known flooding concerns.
5. If the variance from Rule D and exception from Rule J are approved, the proposed project will conform to Rules C, D, G and J if the Rule Specific Permit Conditions listed above are met.
6. Under Minnesota Department of Natural Resources General Permit 2015-1192 (attached to this report), approval of work under RPBCWD Rule G constitutes approval under applicable DNR work in waters rules. Compliance with conditions on approval and payment of applicable fees, if any, are necessary to benefit from general permit approval and the responsibility of the applicants.

**Recommendation:**

If the managers grant the variance and exception (with such conditions as the managers may impose), the engineer recommends approval of the permit, contingent upon:

1. The applicant providing the name and contact information of the general contractor responsible for the site.
2. Stormwater management facilities, buffer areas and waterbody crossing structure maintenance requirements must be documented in an agreement with RPBCWD. A draft of the agreement and associated exhibits must be provided for RPBCWD review and approval prior to execution.

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

1. Continued compliance with General Requirements.
2. Under Minnesota Department of Natural Resources General Permit 2015-1192 (attached to this report), approval of work under RPBCWD rule G constitutes approval under applicable DNR work in waters rules. Compliance with conditions on approval and payment of applicable fees, if any, are necessary to benefit from general permit approval and the responsibility of the applicants. Further, any modification of the project plans material to compliance with RPBCWD rules or this permit – whether undertaken to comply with requirements imposed or actions undertaken by DNR – must be submitted to RPBCWD in the form a request for a permit modification.
3. Per Rule C, Subsection 3.3 the permit holder will be responsible for the inspection, maintenance and effectiveness of all erosion prevention and sediment control facilities, features and techniques. The permittee must inspect all erosion prevention and sediment control facilities and soil stabilization measures to ensure integrity and effectiveness until final site stabilization.
4. Per Rule J Subsection 5.6, 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 conform 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.
5. Providing the following additional close-out materials:
    - a) Documentation that constructed stormwater facilities perform 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 Subsection 3.2c criteria
  6. Per Rule J, Subsection 3.1.b.ii measured infiltration capacity of the soils at the bottom of the infiltration BMPs must be provided. The applicant must submit documentation verifying the infiltration capacity of the soils and that the volume control capacity is calculated using the measured infiltration rate. In addition, subsurface soil investigation is needed to verify adequate separation to groundwater (Rule J subsection 3.1.b.2). If infiltration capacity is less than needed to conform with the volume abstraction requirement in subsection 3.3b or there is inadequate separation to groundwater, 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).
  7. To close out the permit, the permit applicant must provide a 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 at the site.

# Memorandum

To: Riley Purgatory Bluff Creek Watershed District (RPBCWD)  
City of Chanhassen

From: Bill Alms, WSB Engineering  
Henry Meeker, WSB Engineering  
George Bender, City of Chanhassen  
Joe Seidl, City of Chanhassen

Date: October 6, 2023

Re: Galpin Boulevard Wetland Buffers  
City of Chanhassen, MN  
City Project No. PW176  
WSB Project No. 020055-000

As part of the Galpin Boulevard Improvement Project, the City of Chanhassen is requesting a variance for RPBCWD's Rule D.3.2 controlling wetland buffer widths. A variance is also requested for Rule D.3.3d to allow reconstructed impervious surface within the minimum buffer width of 20 feet for Wetlands 1, 2, 3, 4, and 5. Existing project constraints and proposed work do not allow for these rules' requirements to be met. The below table summarizes the proposed buffer conditions throughout the project.

Wetland (Value)	Avg. Required Buffer (ft)	Provided Buffer Area (sf)	Length of Wetland Boundary (ft)	Avg. Buffer Width (ft)	Min. Required Buffer Width (ft)	Min. Provided Buffer Width (ft)
1 (medium)	40	3,993	148	27	20	0 (trail)
2 (medium)	40	5,408	730	7	20	15
3 (medium)	40	47,404	1,400	34	20	0 (retaining wall)
4 (medium)	40	16,026	652	25	20	2 (retaining wall)
5 (medium)	40	4,007	110	36	20	6

RPBCWD Rule K governs variances and exceptions to watershed rules. The following sections address the factors of this variance process.

## How substantial the variation is from the rule provision

As delineated and described in the MnRAM assessment, all wetlands requiring variance through the corridor are of medium value. Watershed buffer rules require an average buffer width of 40 feet and a minimum buffer width of 20 feet for these medium value wetlands. The average buffer widths possible within road right of way vary from 7 to 36 feet (18 to 90%). Minimum buffer width varies from 0 to 15 feet (0 to 75%).

Average buffer widths are generally below the required amount due to the narrow nature of the corridor through wetland complexes and the lack of right of way near the wetlands. To maximize property space for developments and residents, much of the potential buffer area falls under private property rather than City control for buffer maintenance. Minimum buffer widths are low due to the existing road proximity to the wetlands and the need to slightly alter the road geometry in areas to modernize the corridor and enhance safety along it.

### **The effect of the variance on government services**

The requested variance is required for any work that would be taking place on Galpin Blvd. With the roadway's existing proximity to wetlands, there is no feasible way to fully achieve required buffer dimensions. Rehabilitation and reconstruction of the road is required to alleviate problems arising from its poor and deteriorating quality. Recent housing developments along the road have further put a burden on the roadway that was originally designed in a primarily agricultural setting.

Modern roadway design and improved driving conditions are needed to serve the neighborhoods off Galpin Blvd, both for resident access and for emergency services. This area of the City has seen significant residential development in the past five years, with 179 new residential properties being created along the corridor since 2017. These new homes, plus the hundreds of other existing homes off the road, have put new strain on the road and necessitate improvements.

The corridor also provides a high degree of pedestrian access opportunities. Multi use trails are proposed to allow nearby residents to safely travel the corridor and reach various City parks and other amenities. Additionally, utility and stormwater improvements will be made with this project, greatly improving government services. This variance is required to allow these improvements to be made.

### **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**

This requested buffer width variance will not materially impact the hydrology of the wetlands in question, no major drainage pattern changes will result from the reduced buffers. In meeting the requirements of Rule J, this project is demonstrably improving flows to water resources via rate control and water quality improvements. The trail section will drain towards the roadway and storm sewer system in this area rather than surface flowing directly into wetlands or wetland buffers. BMPs employed along the corridor, including sumps, SAFL baffles, wet ponds, and filtration basins, will serve to remove pollutants from road runoff prior to reaching any natural resources in question.

Existing conditions in the corridor are significantly worse than proposed. The current rural drainage of the roadway means pollutants sheet flow either directly to wetlands or are gathered in swales and storm sewer to flow into the wetlands. While the buffer widths may be out of compliance, the net effect of the project on District water resources will be positive.

### **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**

The roadway corridor is very limited in ways it can be shifted and as such, is proposed to generally remain in the same footprint. If it's even possible to shift the road one way or another to provide full buffer widths, the road footprint would either extend into another wetland, impact another element of the City stormwater infrastructure, or require removal of existing homes. Especially between Wetlands 3 and 4, the road is pushed to the very edge of the wetland, often with wetland edges being set by existing retaining walls. Moving the road alignment into Wetland 3 to provide buffer for Wetland 4 would cause further impacts to natural resources, which runs counter to requirements of Rule D.

Alternative designs are limited throughout the corridor without becoming prohibitively expensive. For instance, Wetlands 3 and 4 are delineated as 70-90 feet apart, meaning without a variance for buffer width, nearly all of or all of the roadway would be needed for buffer space to keep the 40' average width. This is not possible without construction of a bridge in the area, which would prohibitively add to the project complexity and cost if it's even feasible, not to mention the much higher degree of impacts arising as a result of constructing a bridge. Significant alterations needed for wetland buffers would also place the corridor out of compliance with roadway design standards. As project funding is contingent on

meeting these standards, changes to vertical sight line curves and roundabout design would likely prevent the project from occurring.

The design of the roadway did include some geometric revisions that reduced the width of some of the roadway. The existing roadway includes 12' lanes with gravel shoulders, but also includes numerous turn lanes at key intersections. The roadway width was reduced to 11' lanes and 4' shoulders, which includes the 1.5' of gutter. With the ADT projected over 10,000 and the anticipated speed to be 40 mph, the project is meeting the minimum lane width of 11' and requires the additional shoulder for snow maintenance. Additionally, without the given shoulder width, spread and run design requirements become an overwhelming burden on the storm sewer design.

Another portion of the variance arises from the footprint of the pedestrian paths and roundabouts. These are necessary components of the project to provide sufficient vehicle and pedestrian safety, key items for the reconstruction supported by numerous public comments. This is further exacerbated by the large number of new housing developments and the nearby parks and schools. Many use Galpin for recreational activities and we expect that to grow in the upcoming years. Removal of trail sections would serve to further segment the pedestrian access through the corridor, requiring more crossings of Galpin Blvd and therefore increasing risk of injury or death through accidents. The purpose of having the trail on both sides is to limit the locations that pedestrians need to cross, and instead aiming towards having them cross at one of the controlled intersection locations, such as the roundabouts. Additionally, trail footprints at intersections are designed to be compliant with ADA requirements. Boardwalks in select areas for buffer would require specialty snow removal in the winter and fall out of ADA compliance faster than a typical paved trail, placing an undue maintenance burden on the City public works that are already stretched thin.

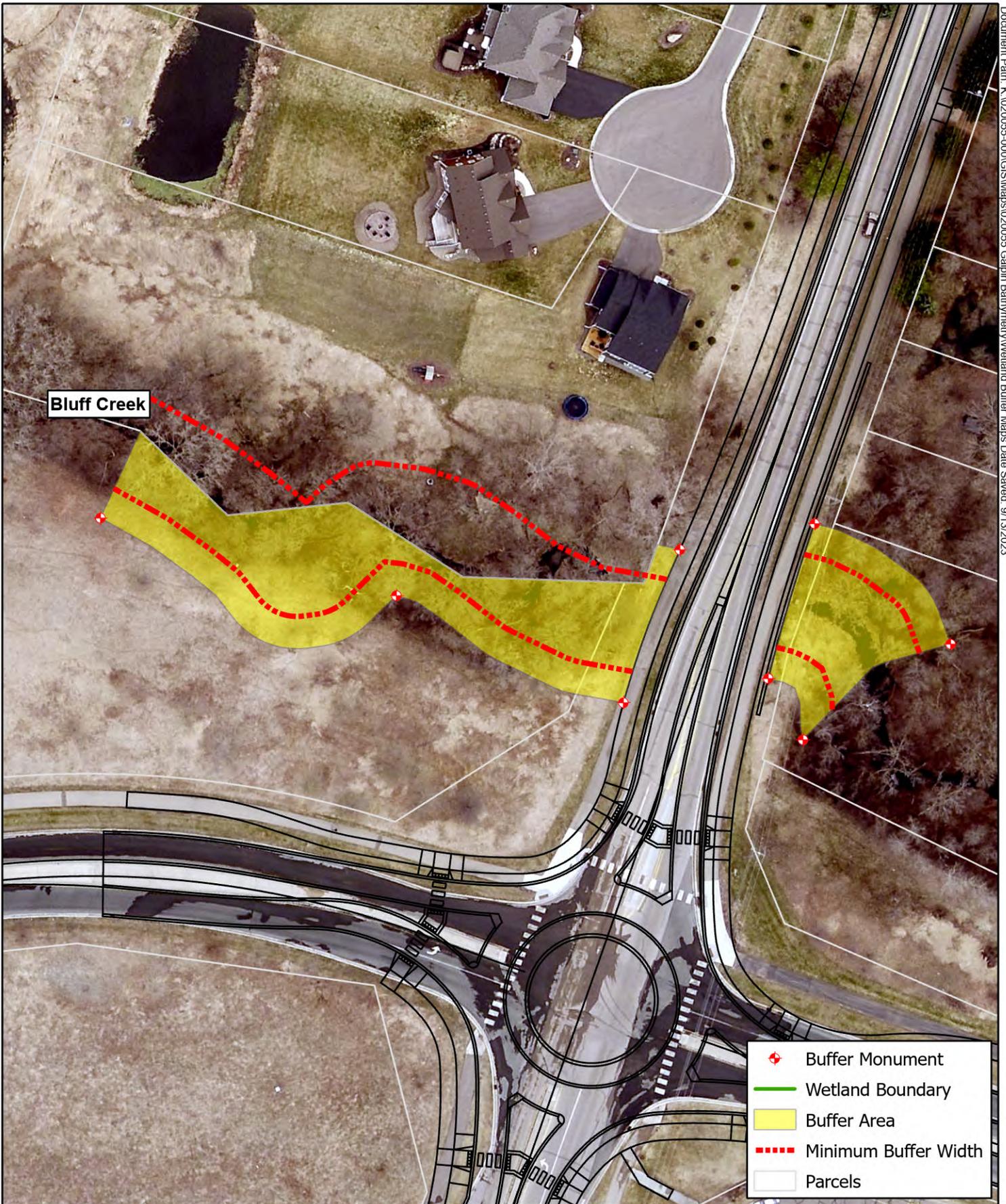
**How the practical difficulty occurred, including whether the landowner, the landowner's agent or representative, or a contractor, created the need for the variance**

Development along this alignment was completed prior to 1956, based on historical aerial imagery. Impacts to wetlands and buffer concerns were not a priority or consideration in creation of the corridor at that time.

**In light of all of the above factors, whether allowing the variance will serve the interests of justice**

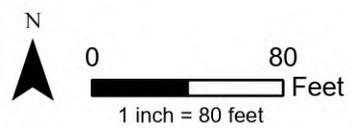
This project seeks to improve and modernize a road that has seen a large uptick in usage since its conception. The improvements to safety that come with roundabout design, improved sight distances, and proper emergency vehicle access all provide justice for residents in the area and citizens of Chanhassen more generally. The predicted 2043 average daily traffic is over 10,000 vehicles, meaning improvements outlined here requiring the variance will support the lives and business of thousands of future residents.

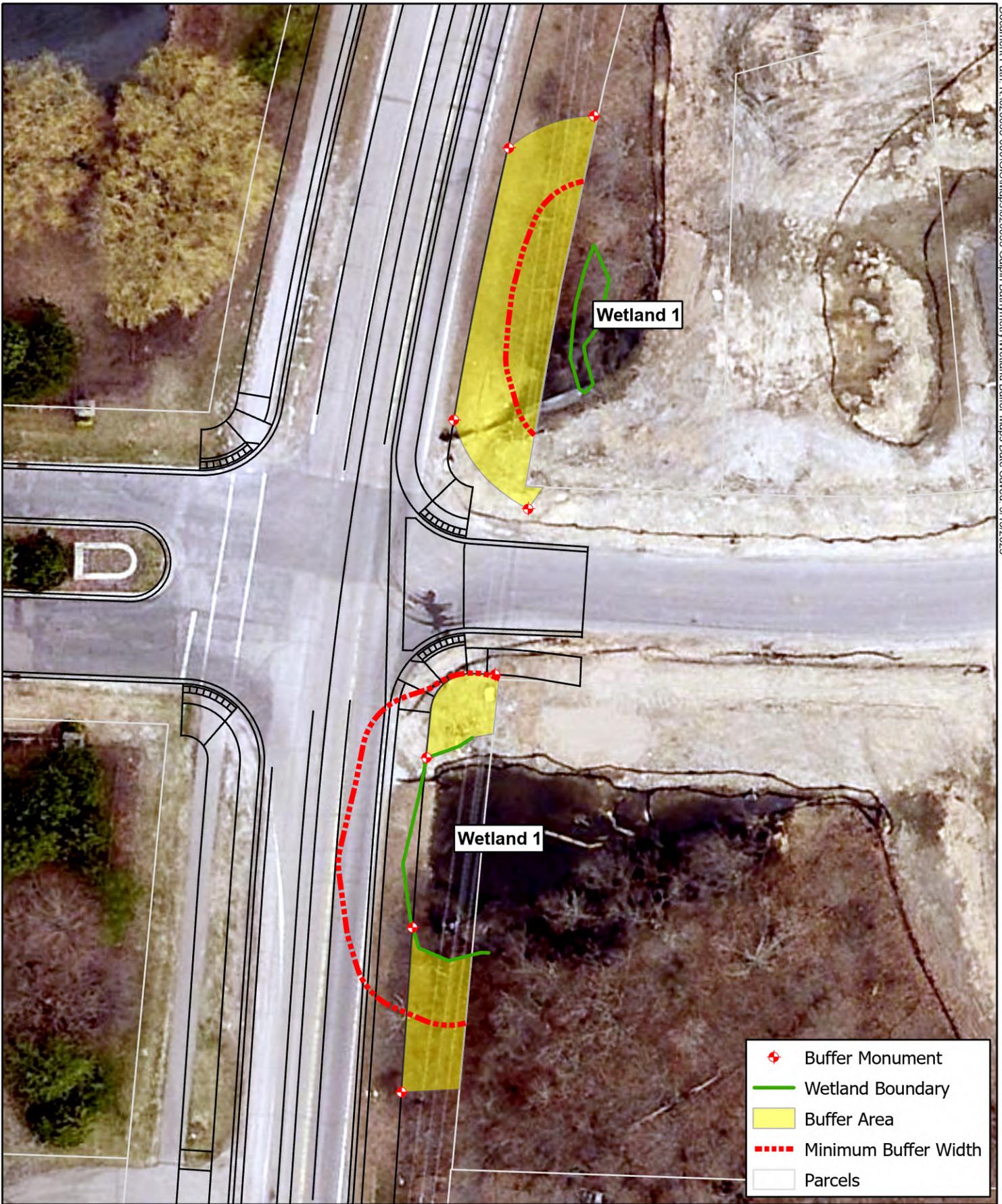
The interest of justice is also served with the proposed pedestrian improvements. Proper access for residents with disabilities is key to achieving equitable living standards in the City. Improved pedestrian options encourage alternatives to vehicle use and further connect residents to the natural world around them. The proposed utility improvements with the project will serve not only residents near the corridor, but residents throughout the City who rely on the proper functioning of these utilities. Without this variance, much of these quality of life improvements are not possible.



### Buffer Map 1

Galpin Boulevard Improvements  
City of Chanhasseen





### Buffer Map 2

Galpin Boulevard Improvements  
City of Chanhasen



0 40  
Feet  
1 inch = 40 feet





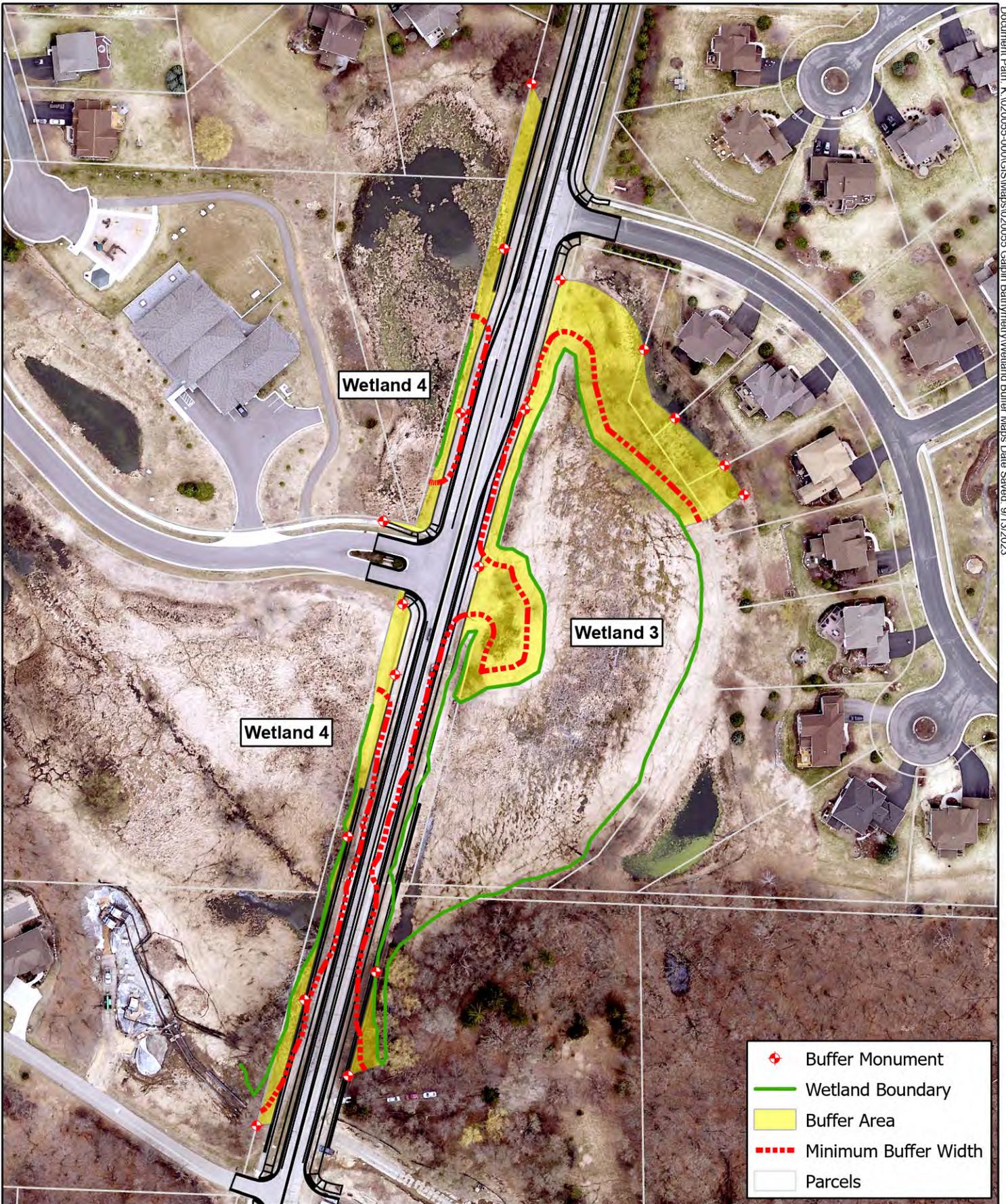
### Buffer Map 3

Galpin Boulevard Improvements  
City of Chanhasen



0 40  
Feet  
1 inch = 40 feet





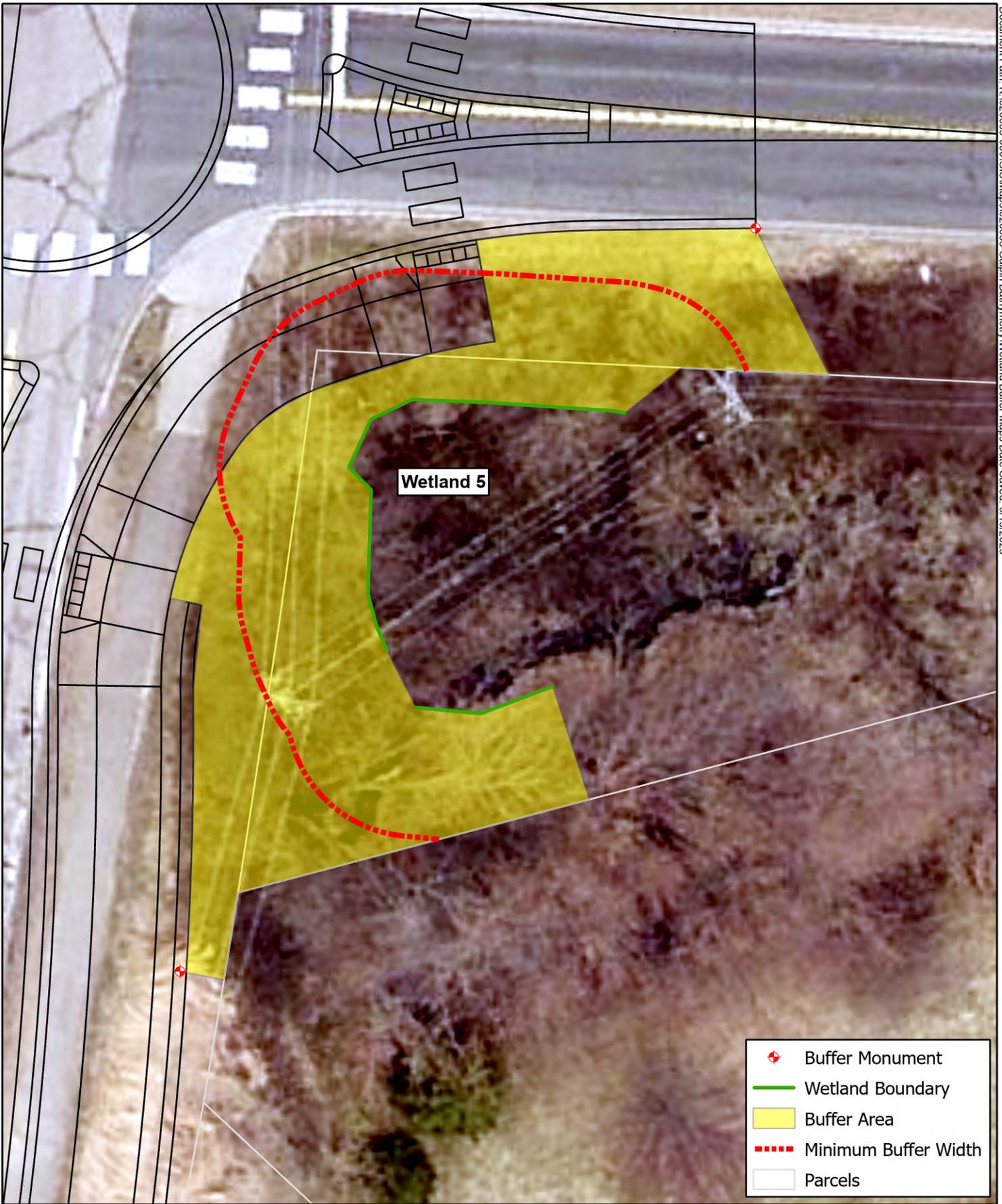
### Buffer Map 4

Galpin Boulevard Improvements  
City of Chanhasen



0 150  
Feet  
1 inch = 150 feet





### Buffer Map 5

Galpin Boulevard Improvements  
City of Chanhasen



0 20 Feet  
1 inch = 20 feet



# CITY OF CHANHASSEN

CONSTRUCTION PLAN FOR ROUNDABOUTS, GRADING, BITUMINOUS PAVING, STORM SEWER, RETAINING WALLS, LIGHTING, WALK AND ADA IMPROVEMENTS

LOCATED ON GALPIN BLVD FROM HIGHWAY 5 TO 640' NORTH OF PHEASANT DR (CHANHASSEN NORTH CITY LIMIT WITH SHOREWOOD)

**GALPIN BLVD**  
SAP 194-115-004

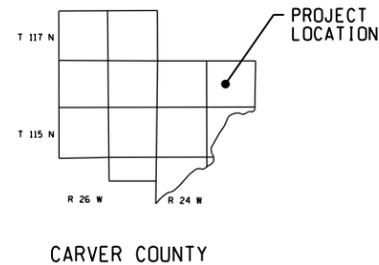
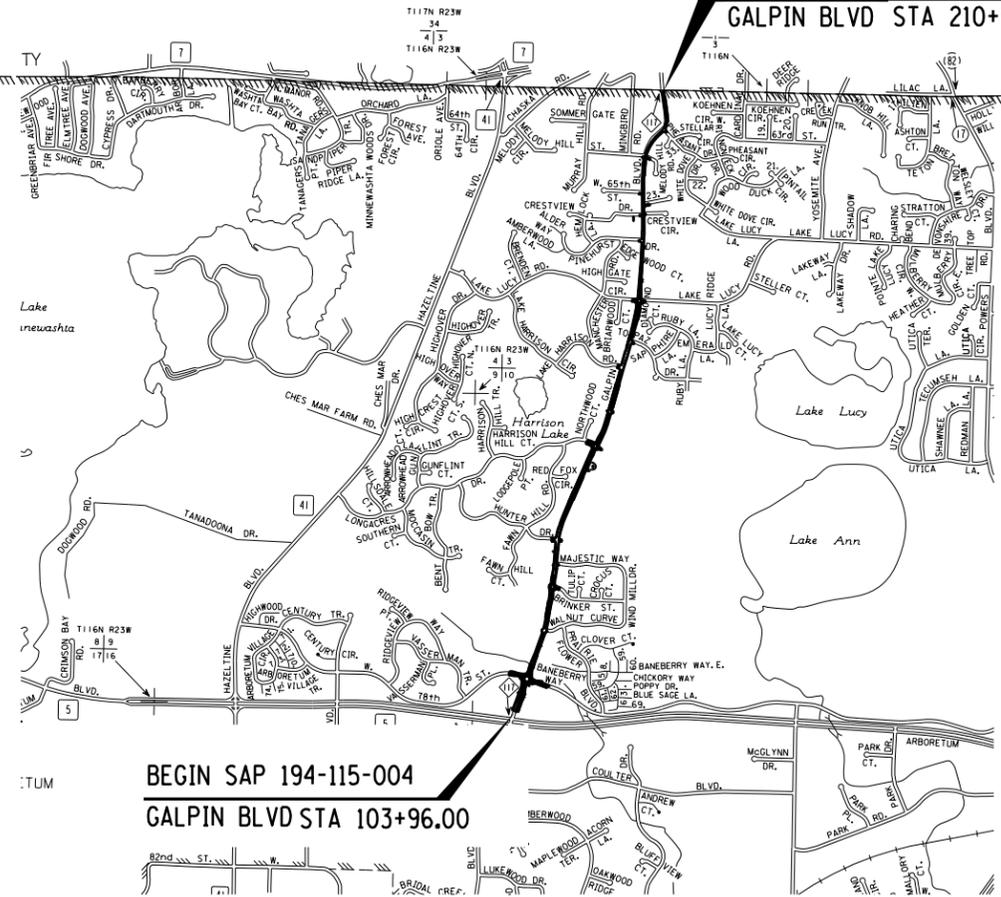
GROSS LENGTH 10684.57 ft 2.024 miles  
BRIDGES-LENGTH \_\_\_\_\_ ft \_\_\_\_\_ miles  
EXCEPTIONS-LENGTH \_\_\_\_\_ ft \_\_\_\_\_ miles  
NET LENGTH 10684.57 ft 2.024 miles

NOTE: LENGTH AND DESCRIPTION BASED ON GALPIN NB ALIGNMENT.

END SAP 194-115-004

GALPIN BLVD STA 210+80.57

CITY OF SHOREWOOD  
HENNEPIN COUNTY  
CITY OF CHANHASSEN  
CARVER COUNTY



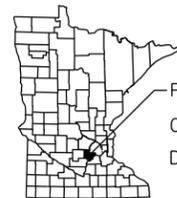
### DESIGN DESIGNATION

GALPIN BLVD  
SAP 194-115-004

R VALUE = 12  
ADT (Current Year) 2023 = 4,480  
ADT (Future Year) 2043 = 4,928  
D (DIRECTIONAL DISTR.) = 50/50  
ESALS 1,045,000  
DESIGN SPEED 40 MPH / 30 MPH (1)  
BASED ON STOPPING SIGHT DISTANCE  
HEIGHT OF EYE 3.5 HEIGHT OF OBJECT 2.0  
DESIGN SPEED NOT ACHIEVED AT: ROUNDABOUTS  
FUNCTIONAL CLASSIFICATION: MAJOR COLLECTOR  
NO. OF TRAFFIC LANES 2 - 11'  
NO. OF PARKING LANES N/A  
SHOULDER WIDTH 4'  
TON DESIGN 10

(1) 40 MPH: TH 5 TO LAKE LUCY RD  
30 MPH: LAKE LUCY ROAD TO CITY LIMIT

BEGIN SAP 194-115-004  
GALPIN BLVD STA 103+96.00



PROJECT LOCATION  
COUNTY: CARVER  
DISTRICT: METRO

### GOVERNING SPECIFICATIONS

THE 2020 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION" AND THE "SUPPLEMENTAL SPECIFICATIONS" DATED SEPTEMBER 2022 SHALL GOVERN. THE WORK SHALL BE DONE IN ACCORDANCE WITH THE 2023 EDITION OF THE CITY OF CHANHASSEN "STANDARD SPECIFICATIONS AND DETAIL PLATES".

### INDEX

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	GENERAL LAYOUT
3 - 6	ESTIMATED QUANTITIES
7 - 15	QUANTITY TABULATIONS
16 - 18	EARTHWORK SUMMARY & TABULATIONS
19	SOIL & CONSTRUCTION NOTES
20 - 28	TYPICAL SECTIONS
29 - 35A	MISCELLANEOUS DETAILS
36 - 51	STANDARD PLANS
52 - 61	CONSTRUCTION STAGING & TRAFFIC CONTROL
62 - 72	ALIGNMENT PLAN & TABULATION
73 - 78	INPLACE TOPOGRAPHY & UTILITIES PLAN
79 - 84	MISCELLANEOUS REMOVAL PLAN
85 - 90	SIGN REMOVAL PLAN
91 - 107	CONSTRUCTION PLAN & PROFILE
108 - 141	RETAINING WALL PLAN
142 - 163	QUADRANT DETAILS
164 - 167	CONCRETE PAVING PLAN
168 - 184	PEDESTRIAN RAMP DETAILS
185 - 194	DRIVEWAY DETAILS
195 - 204	DRAINAGE PLAN & PROFILE
205 - 209	DRAINAGE PROFILES
210 - 215	DRAINAGE TABULATIONS
216 - 219	BOX CULVERT PLAN
220 - 231	POND GRADING PLAN
232 - 241	SANITARY SEWER & WATERMAIN PLAN
242 - 244	SWPPP
245 - 251	TURF ESTABLISHMENT & EROSION CONTROL
252 - 264	SIGNING PLAN
265 - 273	PAVEMENT MARKING PLAN
274 - 279	LIGHTING PLAN
S1.0 - S4.0	TRAFFIC CONTROL SIGNAL PLAN
L1.0 - L2.0	LANDSCAPING PLAN
X1 - X36	CROSS SECTIONS

THIS PLAN CONTAINS 324 SHEETS

ALL APPLICABLE FEDERAL, STATE, AND LOCAL LAWS AND ORDINANCES WILL BE COMPLIED WITHIN THE CONSTRUCTION OF THIS PROJECT.



SIGNATURE: *Andrew Plovman* TYPED OR PRINTED NAME: ANDREW PLOVMAN, PE  
DESIGN ENGINEER: I HEREBY CERTIFY THAT THIS PLAN 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.

DATE: 9/11/2023 LICENSE NUMBER 44200

APPROVED: CITY OF CHANHASSEN ENGINEER DATE: \_\_\_\_\_  
APPROVED: CARVER COUNTY ENGINEER DATE: \_\_\_\_\_  
DISTRICT STATE AID ENGINEER: REVIEWED FOR COMPLIANCE WITH STATE-AID RULES/POLICY DATE: \_\_\_\_\_  
APPROVED FOR STATE AID FUNDINGS: STATE AID ENGINEER DATE: \_\_\_\_\_

PLAN REVISIONS		
DATE	SHEET NO.	APPROVER

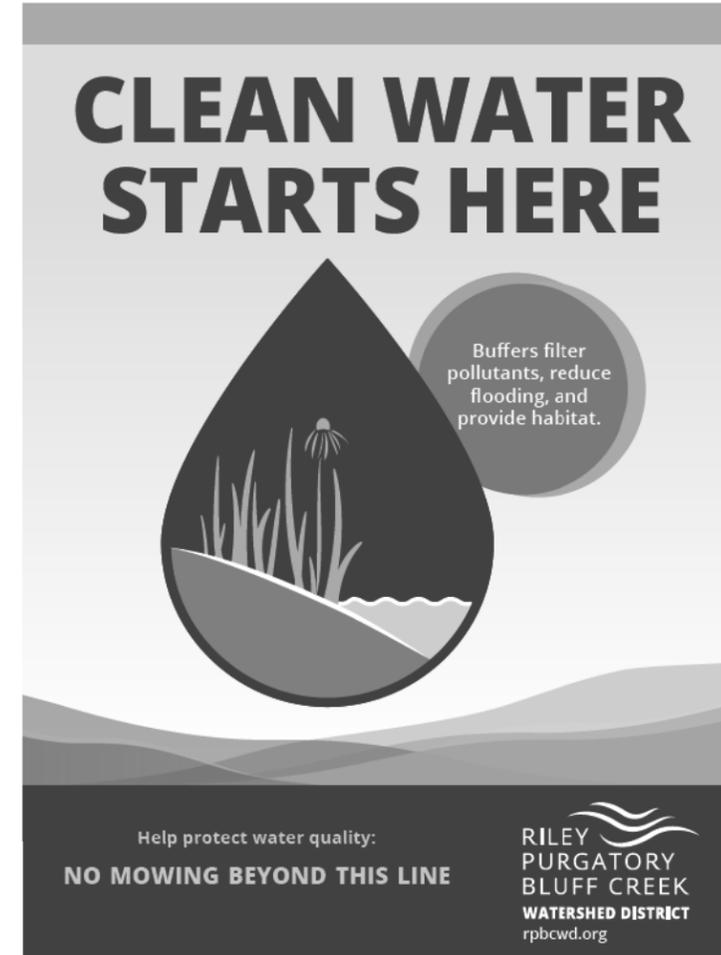
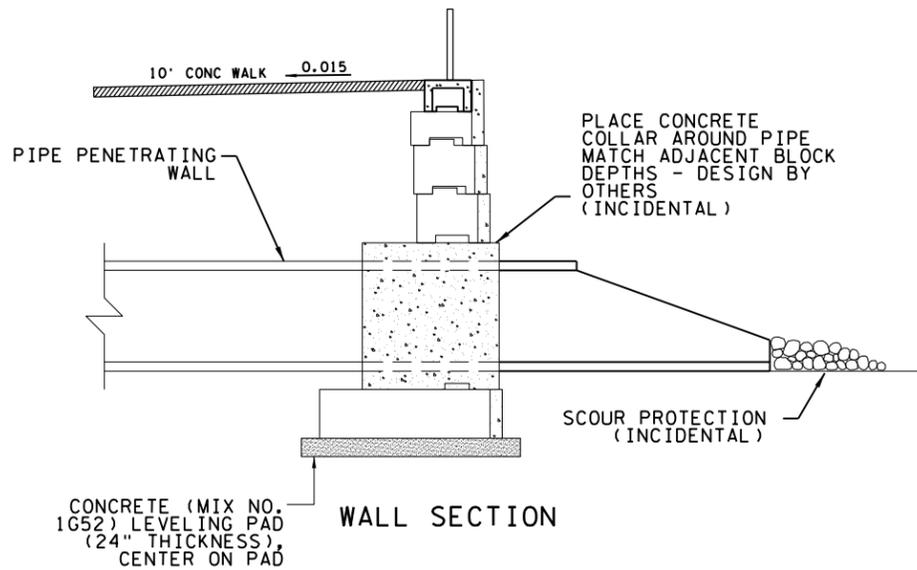
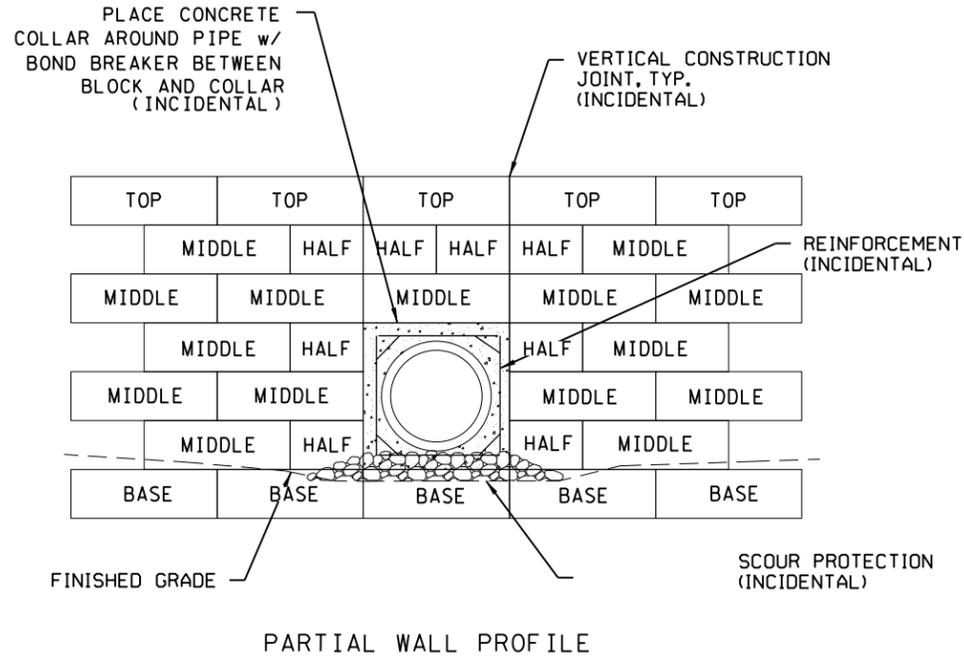
NOTE: THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS QUALITY LEVEL D. THIS QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF C/ASCE 38-02 ENTITLED STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA.

SAP 194-115-004

SHEET NO. 1R OF 286 SHEETS

**PIPE INSTALLED PERPENDICULAR THROUGH WALL**

APPLIES TO WALLS: 7, 9, AND 12



**BUFFER SIGN DETAIL**

MOUNT TO GREEN STEEL U-CHANNEL SIGN POSTS  
SEE TURF ESTABLISHMENT & EROSION CONTROL PLANS FOR SIGN LOCATIONS

PLOTTED/REVISED: 9/11/2023

PATH & FILENAME: Projects\Minnesota\020055-000\Cad\Plan\20055-000\_def03.dgn

NO.	DATE	BY	CHK	REVISIONS

Design By:	MLS	I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.  PRINT NAME: <u>ANDREW J. PLOWMAN, PE</u>  DATE: <u>9/11/2023</u> LICENSE # <u>44200</u>
Plan By:	CWK	
Checked By:	AJP	
Approved By:	AJP	



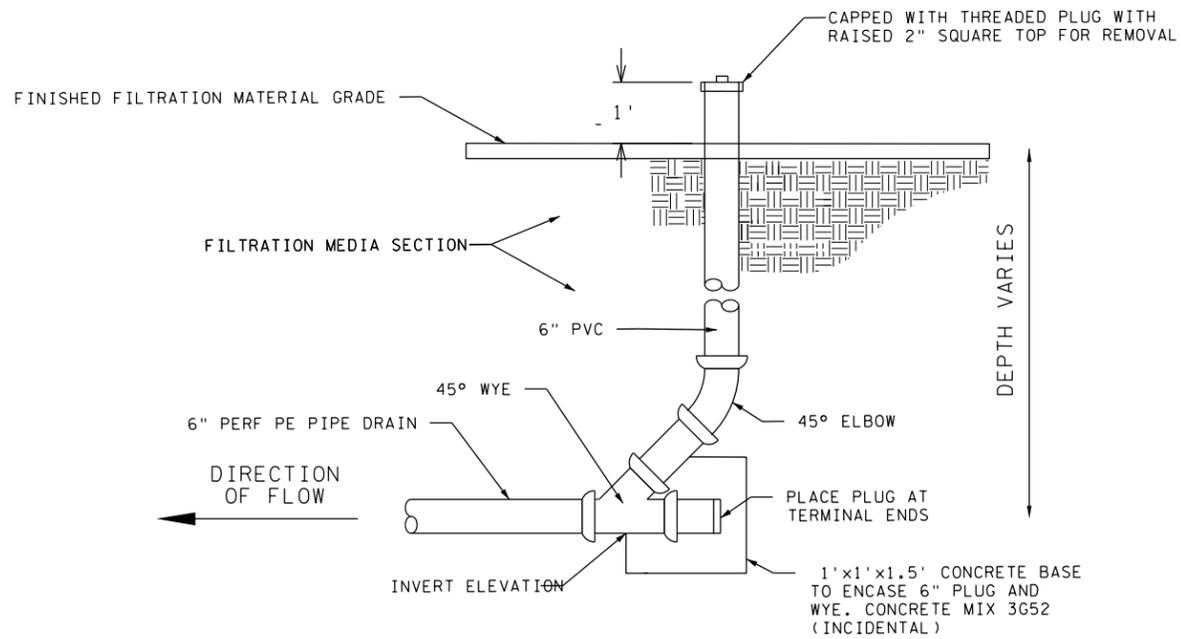
**Galpin Blvd Improvements**  
City of Chanhasen, Minnesota

CARVER COUNTY, MINNESOTA  
**MISCELLANEOUS DETAILS**  
SAP 194-115-004

SHEET **32R** OF **286** SHEETS

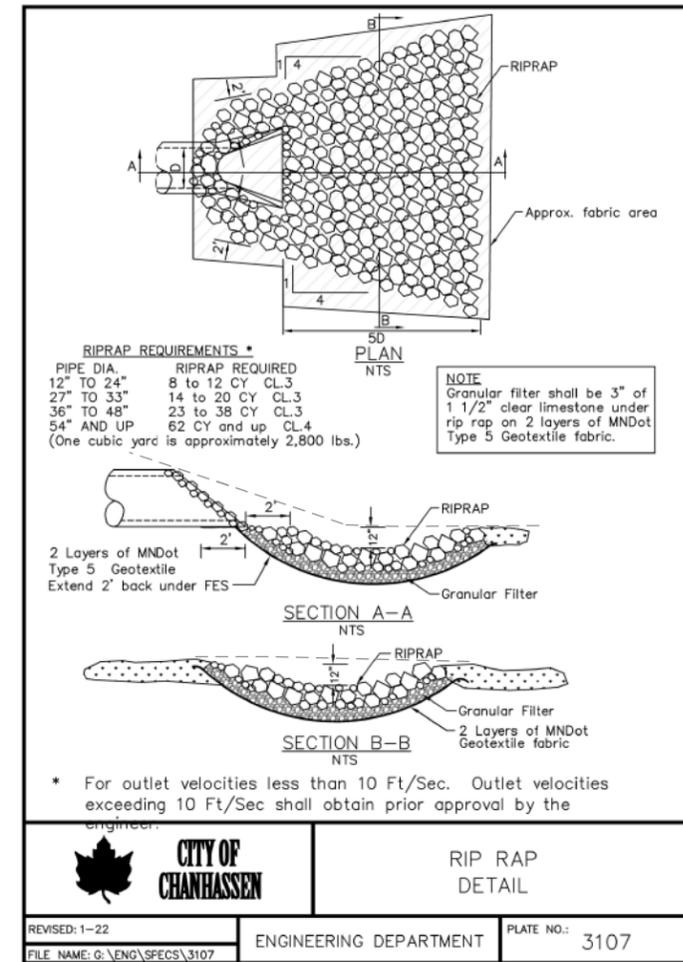
PLOTTED/REVISED: 9/26/2023

PATH & FILENAME: Projects\Minnesota\020055-000\Cad\Plan\20055-000\_dtd01.dgn



NOTES:  
 - BENDS AND RISER TO BE SAME SIZE AS DRAINTILE.  
 - CLEAN OUTS SHALL BE PLACED ON PIPE DRAIN AS SHOWN ON THE PLAN.  
 - ALL NECESSARY FITTING, ELBOWS, PLUGS AND WYES ARE INCIDENTAL.

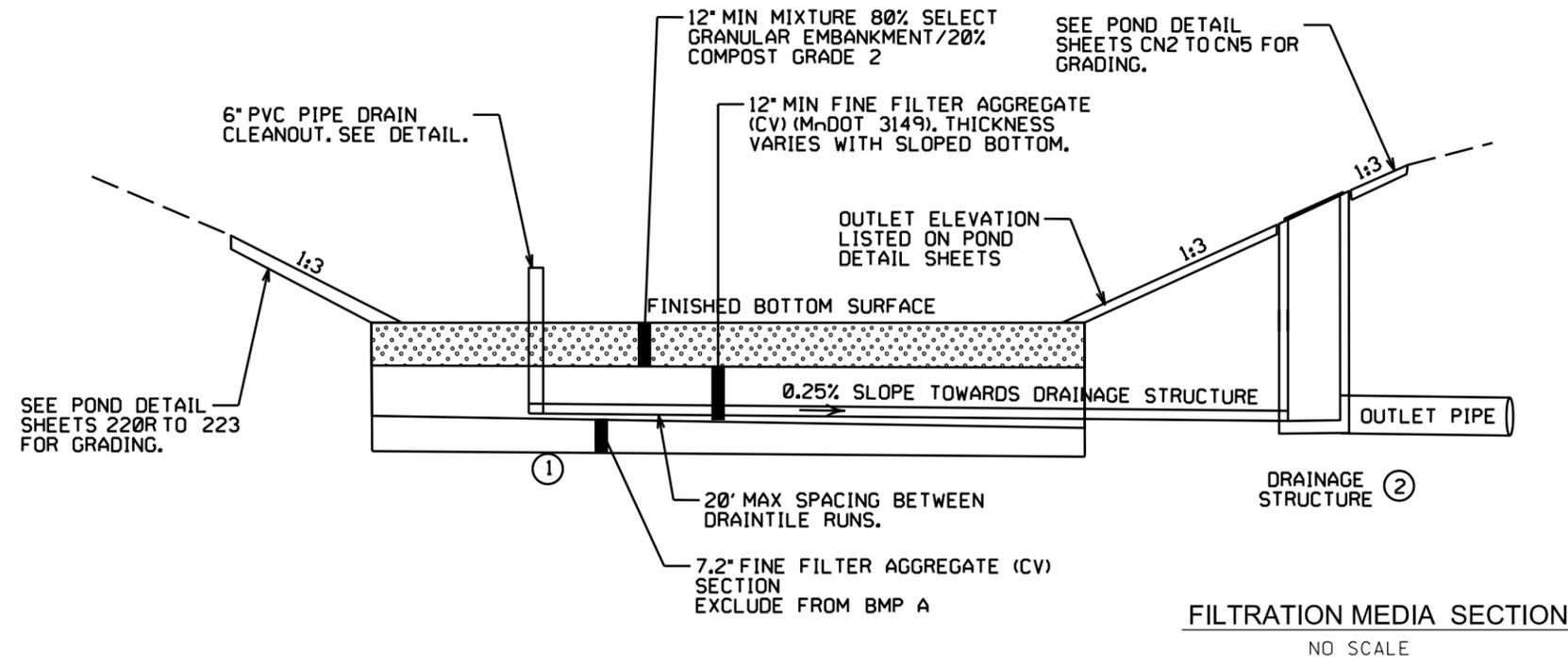
**6" PVC PIPE DRAIN CLEANOUT**  
NO SCALE



	RIP RAP DETAIL	
	REVISED: 1-22 FILE NAME: G:\ENG\SPCS\3107	ENGINEERING DEPARTMENT PLATE NO.: 3107

**KEY NOTES:**

- 6" PERFORATED PE PIPE DRAIN WITH A MINIMUM SLOPE OF 0.25%. DRAINS SHALL INCLUDE SLITS FOR PERFORATIONS (DO NOT USE HOLES FOR PERFORATIONS). DO NOT USE GEOTEXTILE SOCKS AROUND DRAINS.
  - SEE DETAILS ON SHEET 35R FOR DRAINAGE STRUCTURE DESIGN SPEC 2, 3, 4 & 5.
  - FOR FLOW LINE ELEVATIONS, SEE DRAINAGE TABULATIONS AND PROFILES SHEETS. FOR INFILTRATION BASINS, CAP ENDS OF ALL DRAIN TILE OUTLETS (SEE DRAINAGE DETAILS).
  - IF THE SEPARATION DISTANCE BETWEEN EXCAVATED BASIN BOTTOM AND SEASONAL HIGH GROUNDWATER IS LESS THAN 3', BORROW SPECIAL, THE COMMON BORROW SPECIAL (CV) SHALL CONSIST OF SOILS COMPOSED OF AT LEAST 30% CLAY PARTICLES AS DEFINED IN THE MNDOT GEOTECHNICAL AND PAVEMENT DESIGN MANUALS. COMPACTION SHALL BE MEASURED BY THE SPECIFIED DENSITY METHOD (100% COMPACTION).
- OR
- IF CONTAMINATED SOILS AND/OR MATERIALS ARE PRESENT, THEN USE A PLASTIC LINER. CONTRACTOR IS TO PROVIDE A LINER MEETING THE REQUIREMENTS OF AN MPCA LEVEL 2 LINER.



**FILTRATION MEDIA SECTION**  
NO SCALE

NO.	DATE	BY	CHK	REVISIONS

Design By: ZH  
 Plan By: ZH  
 Checked By: WCA  
 Approved By: WCA

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

PRINT NAME: William C. Aims, PE  
 DATE: 9/26/2023 LICENSE #: 54301



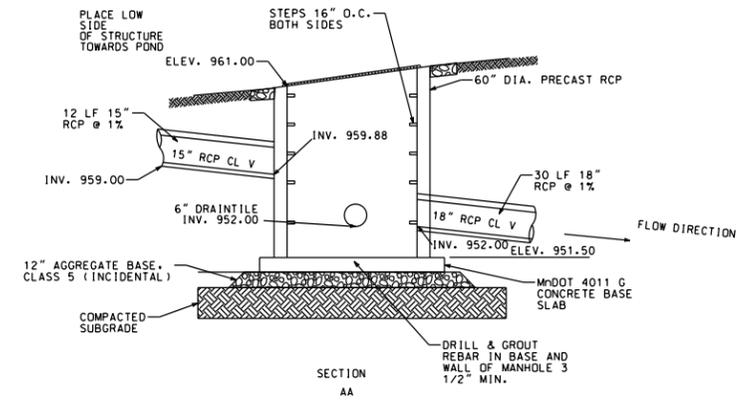
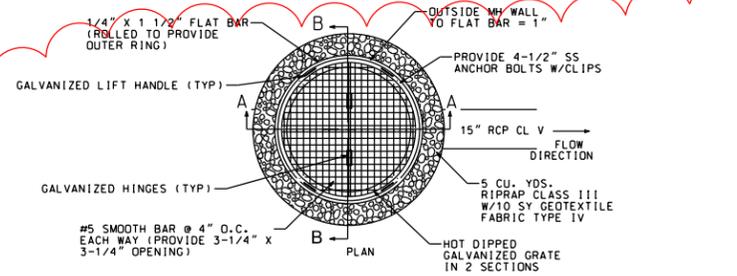
**Galpin Blvd Improvements**  
City of Chanhassen, Minnesota

CARVER COUNTY, MINNESOTA  
 DRAINAGE  
**MISCELLANEOUS DETAILS**  
 SAP 194-115-004

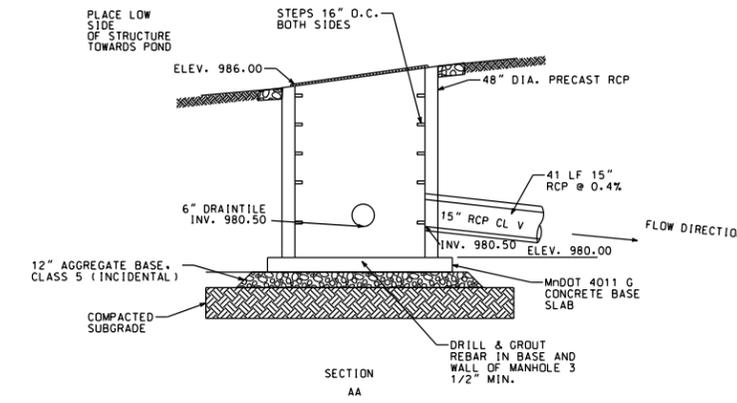
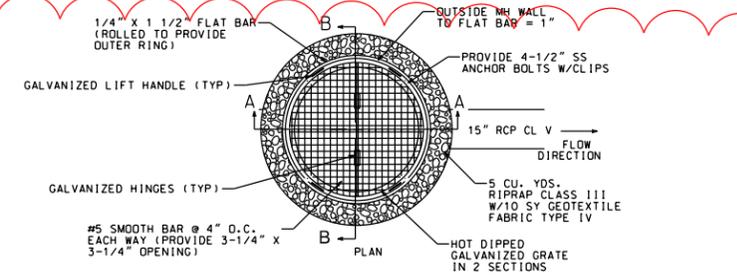
SHEET  
**34R**  
 OF  
**286**  
 SHEETS

PLOTTED/REVISED: 9/11/2023

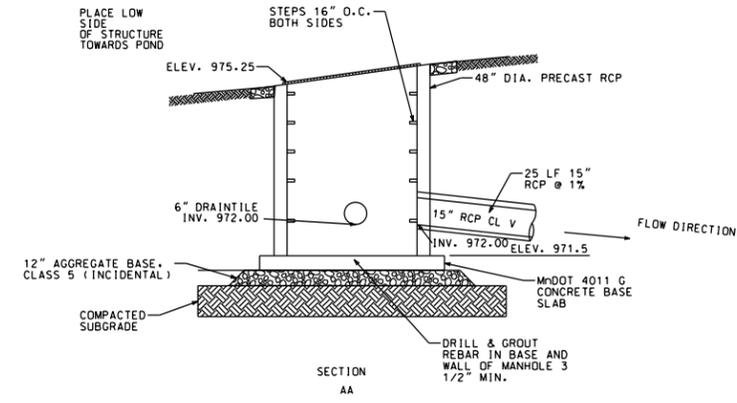
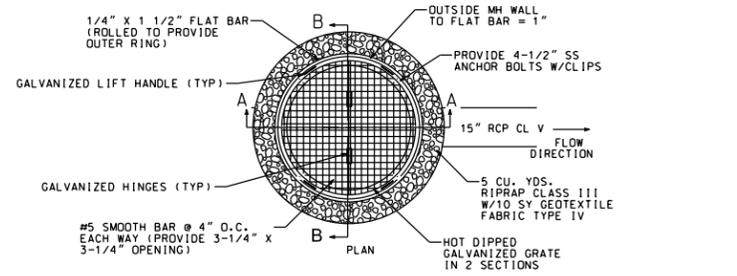
PATH & FILENAME: Projects\Minnesota\020055-000\Cad\Plan\20055-000\_dtd01.dgn



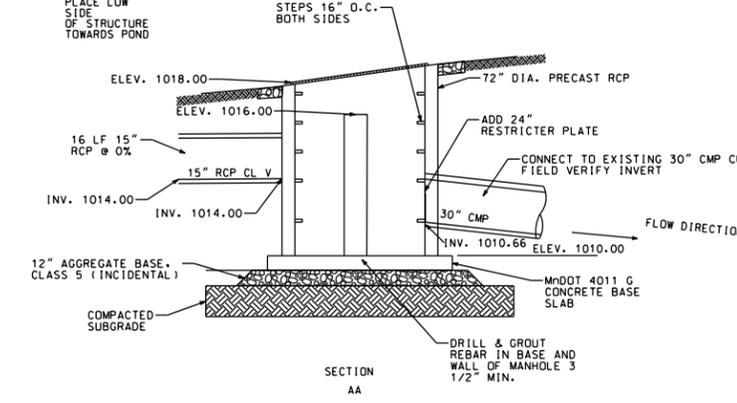
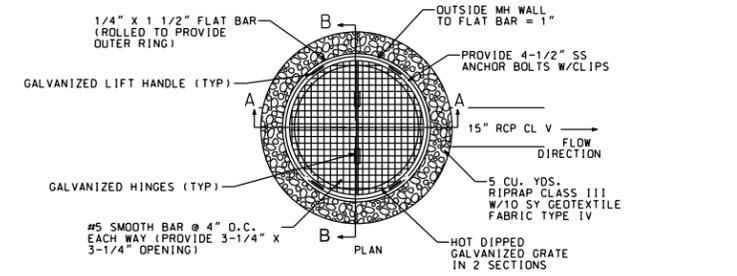
DESIGN SPECIAL 2 - 5033  
OUTLET CONTROL STRUCTURE (N.T.S.)



DESIGN SPECIAL 3 - 5034  
OUTLET CONTROL STRUCTURE (N.T.S.)



DESIGN SPECIAL 4 - 5035  
OUTLET CONTROL STRUCTURE (N.T.S.)



DESIGN SPECIAL 5 - 5036  
OUTLET CONTROL STRUCTURE (N.T.S.)

NO.	DATE	BY	CHK	REVISIONS
1	09/11/2023	ZH	BA	DETAILS MODIFIED

Design By: ZH  
 Plan By: ZH  
 Checked By: WCA  
 Approved By: WCA

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

PRINT NAME: William C. Aims, PE  
 DATE: 9/11/2023 LICENSE #: 54301



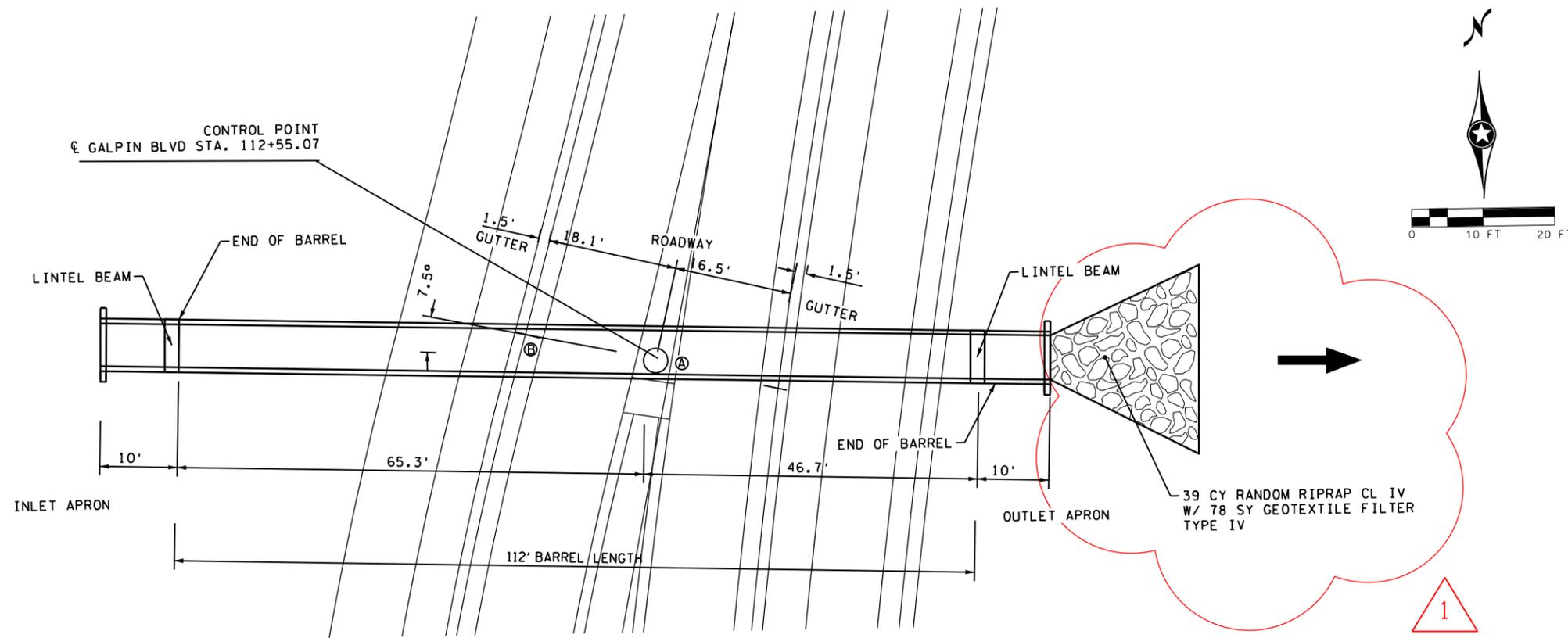
**Galpin Blvd Improvements**  
 City of Chanhassen, Minnesota

CARVER COUNTY, MINNESOTA  
 DRAINAGE  
**MISCELLANEOUS DETAILS**  
 SAP 194-115-004

SHEET  
**35R**  
 OF  
**286**  
 SHEETS

PLOTTED/REVISED: 9/15/2023

PATH & FILENAME: Projects\Minnesota\020055-000\Cad\Plan\020055-000\_box\_culvert01.dgn



**DESIGN DATA**

DESIGNED IN ACCORDANCE WITH 2014 AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.

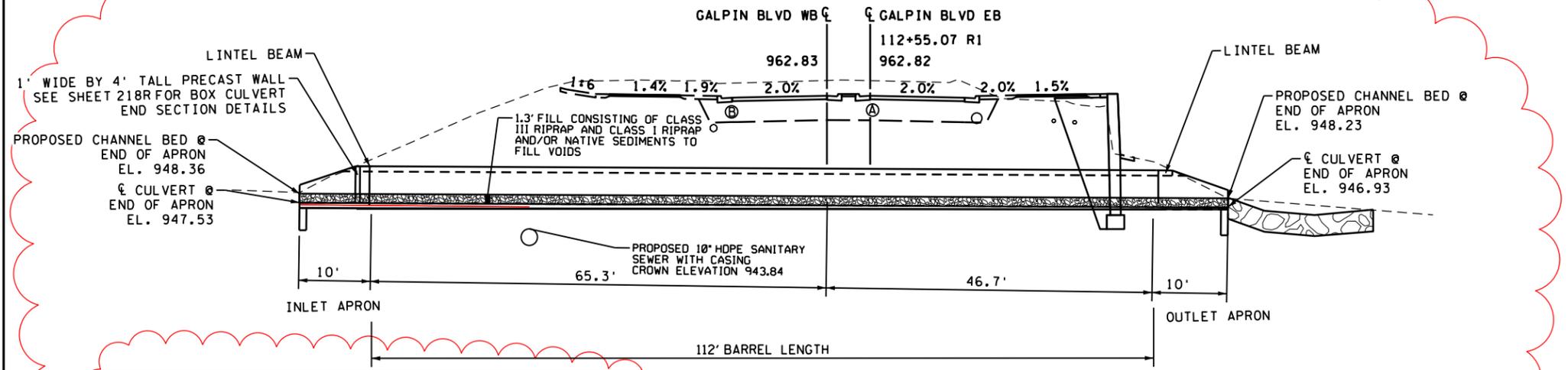
HL-93 LIVE LOAD  
 BARREL INSIDE WIDTH = 6'  
 BARREL INSIDE HEIGHT = 4'  
 BARREL LENGTH = 112'  
 EST. MAX. FILL DEPTH (A) = 10.4'  
 EST. MIN. FILL DEPTH (B) = 9.9'  
 SKEW ANGLE = 7.5° LT AHEAD

DESIGN SPEED = 40 MPH  
 CURRENT ADT (YEAR) = 2023 8,880  
 PROJECTED ADT (YEAR) = 2043 10,380

**LIST OF SHEETS**

NO.	DESCRIPTION
216R	GENERAL PLAN AND ELEVATION
217R	PRECAST CONCRETE BARREL DETAILS
218R	PRECAST CONCRETE END SECTION TYPE III - SINGLE OR DOUBLE BARREL
219R	EMBANKMENT PROTECTION FOR BOX CULVERTS

**GENERAL PLAN**



**SCHEDULE OF QUANTITIES FOR ENTIRE CULVERT GALPIN BOULEVARD**

ITEM	UNIT	QUANTITY	M
GEOTEXTILE FILTER TYPE IV	SQ. YD.	78	
RANDOM RIPRAP CLASS III	CU. YD.	13	
RANDOM RIPRAP CLASS IV	CU. YD.	39	
COARSE FILTER AGGREGATE (CV)	CU. YD.	244	
SELECT GRANULAR EMBANKMENT (CV)	CU. YD.	1752	
6' X 4' PRECAST CONCRETE BOX CULVERT	LIN. FT.	112	
6' X 4' PRECAST CONCRETE BOX CULVERT END SECTION	EACH	2	
STRUCTURE EXCAVATION	LS	1	

**SIDE ELEVATION**

GENERAL NOTES:  
 1. SEE SHEET 35A FOR BOX CULVERT BEDDING DETAIL

SAP 194-115-004  
 LOCATION: GALPIN BLVD. EB STA 112+55.07  
 MAIN 6 x 4 MNDOT STD. PRECAST CONCRETE BOX CULVERT

GENERAL PLAN AND ELEVATION

CITY OF CHANHASSEN CARVER COUNTY

NO.	DATE	BY	CHK	REVISIONS
1	09/11/2023	ZH	BA	BOX CULVERT CHANGED TO 6'-4". BED MATERIAL ADDED WITHIN CULVERT, CULVERT SLOPE ADJUSTED, QUANTITIES ADJUSTED
2	09/15/2023	ZH	BA	QUANTITIES UPDATED

Design By: ZH  
 Plan By: ZH  
 Checked By: WCA  
 Approved By: WCA

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

PRINT NAME: William C. Aims, PE  
 DATE: 9/15/2023 LICENSE #: 54301



**Galpin Blvd Improvements**  
 City of Chanhassen, Minnesota

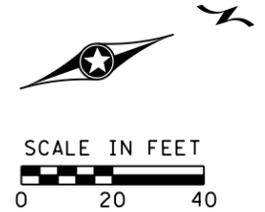
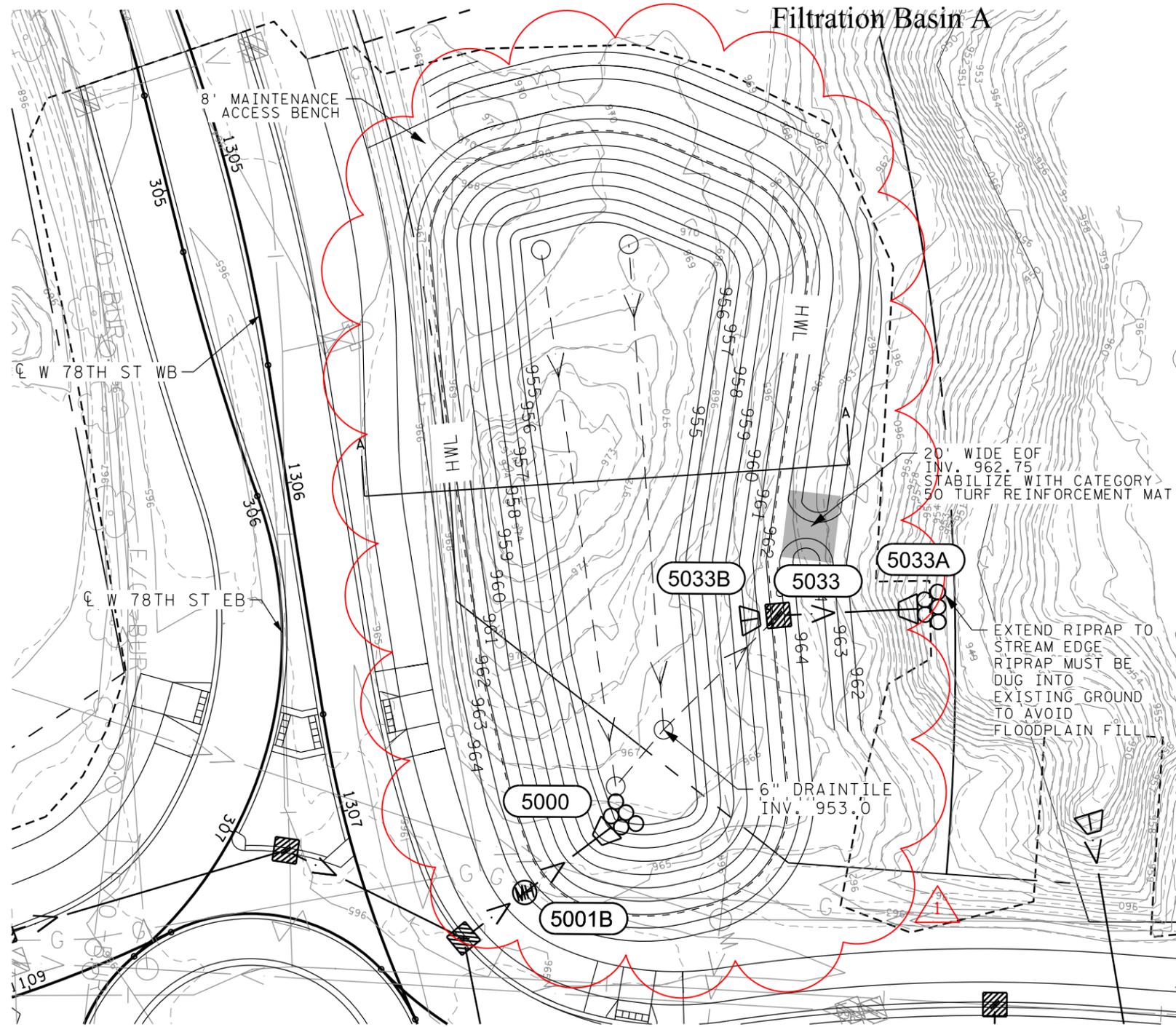
CARVER COUNTY, MINNESOTA

BOX CULVERT PLAN  
 SAP 194-115-004

SHEET 216R OF 286 SHEETS

PLOTTED/REVISED: 9/11/2023

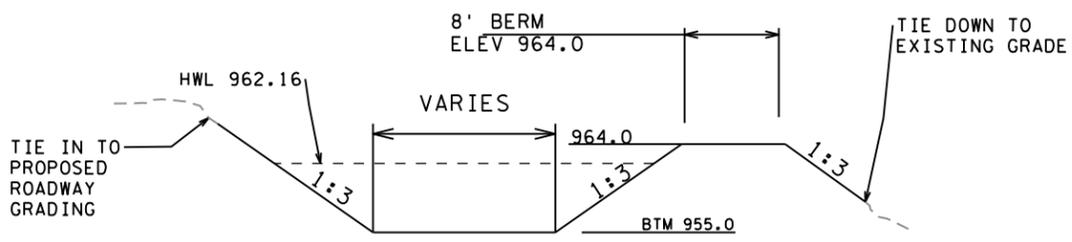
PATH & FILENAME: Projects\Minnesota\020055-000\Cad\Plan\20055-000\_dp\_pond01.dgn



**LEGEND**

- × GUIDE POST TYPE B
- RIPRAP CLASS III
- CATCH BASIN
- MANHOLE
- DROP INLET
- APRON
- DRAIN TILE CLEANOUT
- POND CLEANOUT AREA
- SURFACE FLOW DIRECTION
- STORM SEWER PIPE
- 6" PERF PE PIPE DRAIN
- INPLACE STORM SEWER
- CONSTRUCTION LIMITS
- EX RIGHT OF WAY
- RIGHT OF WAY
- TEMPORARY EASEMENT
- PERMANENT EASEMENT
- DRAINAGE/ UTIL

- NOTES:**
- 1) ALL STORM SEWER AND CULVERTS SHALL BE CLEANED AT THE END OF CONSTRUCTION AND PRIOR TO FINAL ACCEPTANCE.
  - 2) THE CONTRACTOR SHALL MAINTAIN DRAINAGE FROM THE SITE AT ALL TIMES DURING THE PROJECT.
  - 3) PERFORM CONTINUOUS INSPECTIONS OF EROSION CONTROL PRACTICES, ESPECIALLY AFTER EACH RAINFALL EVENT.
  - 4) CONTOURS ARE TO FINISHED GRADE.
  - 5) EXCAVATION OF THE BMP REQUIRES A TOOTHED BUCKET TO AVOID COMPACTING OR SMEARING SOILS.
  - 6) GRADING OF THE BMP REQUIRES USE OF LOW-IMPACT EARTH-MOVING EQUIPMENT TO PREVENT COMPACTION OF THE UNDERLYING SOILS. SMALL TRACKED DOZERS AND BOBCATS WITH RUNNER TRACKS ARE RECOMMENDED.
  - 7) IN THE EVENT THAT SEDIMENT IS INTRODUCED INTO THE BMP DURING OR IMMEDIATELY FOLLOWING EXCAVATION, THIS MATERIAL SHALL BE REMOVED FROM THE PRACTICE PRIOR TO CONTINUING CONSTRUCTION.
  - 8) INFILTRATION AREA SHALL BE STAKED OFF DURING CONSTRUCTION TO RESTRICT HEAVY EQUIPMENT TRAFFIC FROM COMPACTING NATIVE SOILS.
  - 9) SEE FILTRATION BASIN DETAILS ON SHEET 34R.



**SECTION A-A (TYP)**  
NOT TO SCALE

NO.	DATE	BY	CHK	REVISIONS
1	09/11/2023	ZH	BA	BASIN LOWERED BY 1FT, BASIN INLET ADJUSTED, PRETREATMENT STRUCTURE ADDED

Design By: ZH  
 Plan By: ZH  
 Checked By: WCA  
 Approved By: WCA

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

PRINT NAME: William C. Aims, PE  
 DATE: 9/11/2023 LICENSE #: 54301



**Galpin Blvd Improvements**  
 City of Chanhassen, Minnesota

**CARVER COUNTY, MINNESOTA**  
 Filtration Basin A  
**POND GRADING PLAN**  
 SAP 194-115-004

SHEET  
**220R**  
 OF  
**286**  
 SHEETS

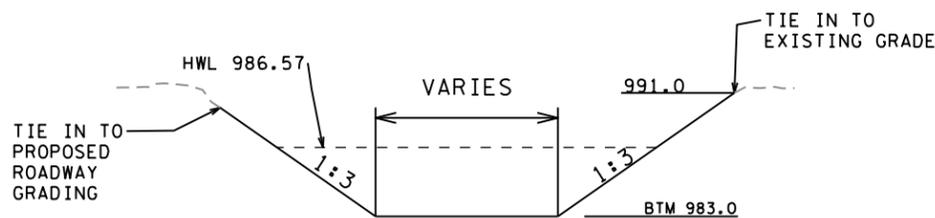
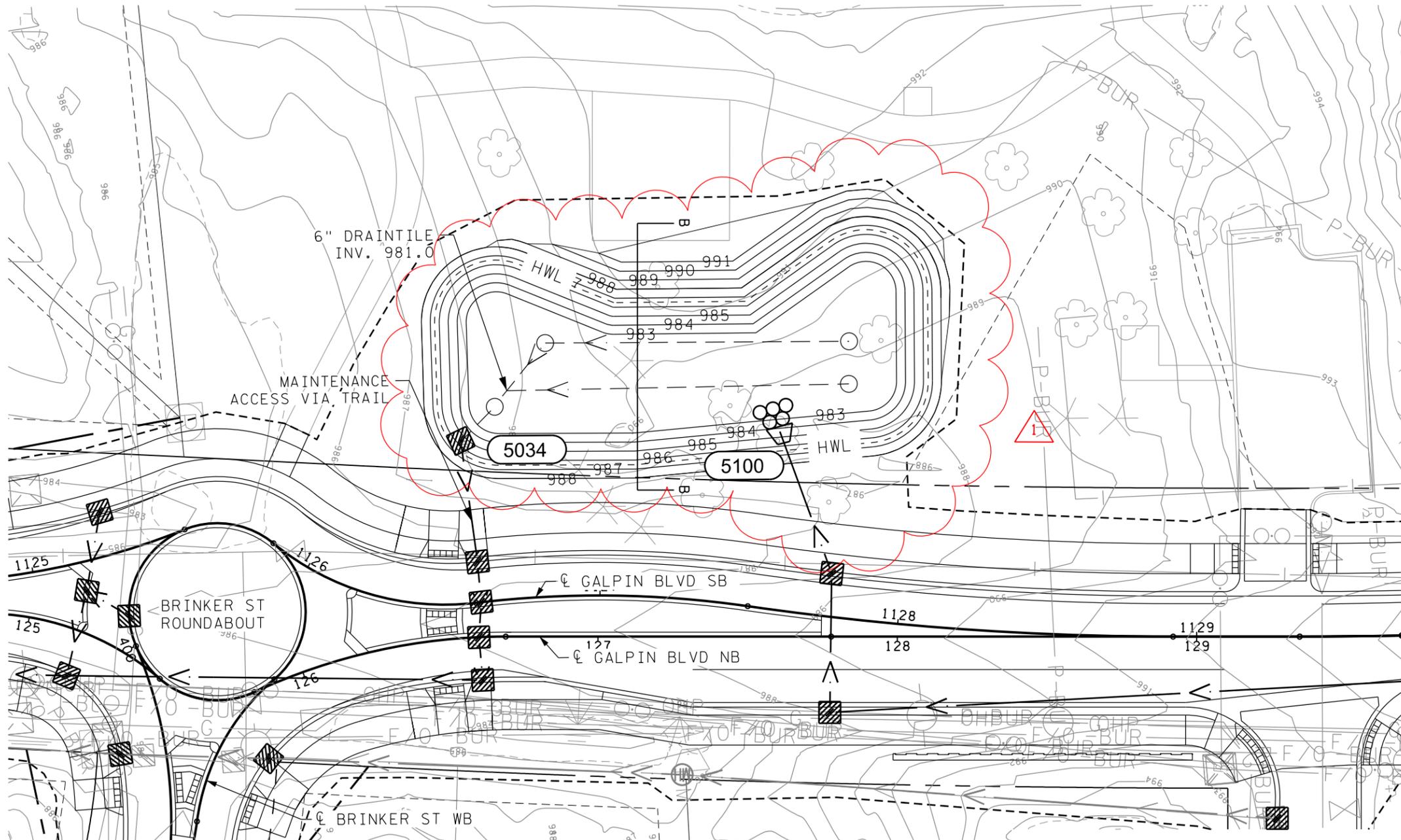
# Filtration Basin B



## LEGEND

- GUIDE POST TYPE B
- RIPRAP CLASS III
- CATCH BASIN
- MANHOLE
- DROP INLET
- APRON
- DRAIN TILE CLEANOUT
- POND CLEANOUT AREA
- SURFACE FLOW DIRECTION
- STORM SEWER PIPE
- 6" PERF PE PIPE DRAIN
- INPLACE STORM SEWER
- CONSTRUCTION LIMITS
- EX RIGHT OF WAY
- RIGHT OF WAY
- TEMPORARY EASEMENT
- PERMANENT EASEMENT DRAINAGE/ UTIL

- NOTES:
- 1) ALL STORM SEWER AND CULVERTS SHALL BE CLEANED AT THE END OF CONSTRUCTION AND PRIOR TO FINAL ACCEPTANCE.
  - 2) THE CONTRACTOR SHALL MAINTAIN DRAINAGE FROM THE SITE AT ALL TIMES DURING THE PROJECT.
  - 3) PERFORM CONTINUOUS INSPECTIONS OF EROSION CONTROL PRACTICES, ESPECIALLY AFTER EACH RAINFALL EVENT.
  - 4) CONTOURS ARE TO FINISHED GRADE.
  - 5) EXCAVATION OF THE BMP REQUIRES A TOOTHED BUCKET TO AVOID COMPACTING OR SMEARING SOILS.
  - 6) GRADING OF THE BMP REQUIRES USE OF LOW-IMPACT EARTH-MOVING EQUIPMENT TO PREVENT COMPACTION OF THE UNDERLYING SOILS. SMALL TRACKED DOZERS AND BOBCATS WITH RUNNER TRACKS ARE RECOMMENDED.
  - 7) IN THE EVENT THAT SEDIMENT IS INTRODUCED INTO THE BMP DURING OR IMMEDIATELY FOLLOWING EXCAVATION, THIS MATERIAL SHALL BE REMOVED FROM THE PRACTICE PRIOR TO CONTINUING CONSTRUCTION.
  - 8) INFILTRATION AREA SHALL BE STAKED OFF DURING CONSTRUCTION TO RESTRICT HEAVY EQUIPMENT TRAFFIC FROM COMPACTION NATIVE SOILS.
  - 9) SEE FILTRATION BASIN DETAILS ON SHEET 34R.



PLOTTED/REVISED: 9/11/2023

PATH & FILENAME: Projects\Minnesota\020055-000\Cad\Plan\20055-000\_dp\_pand02.dgn

NO.	DATE	BY	CHK	REVISIONS
1	09/11/2023	ZH	BA	BASIN LOWERED BY 1FT, BASIN INLET ADJUSTED

Design By: ZH  
 Plan By: ZH  
 Checked By: WCA  
 Approved By: WCA

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

PRINT NAME: ANDREW J. PLOWMAN, PE  
 DATE: 9/11/2023 LICENSE #: 44200



**Galpin Blvd Improvements**  
 City of Chanhassen, Minnesota

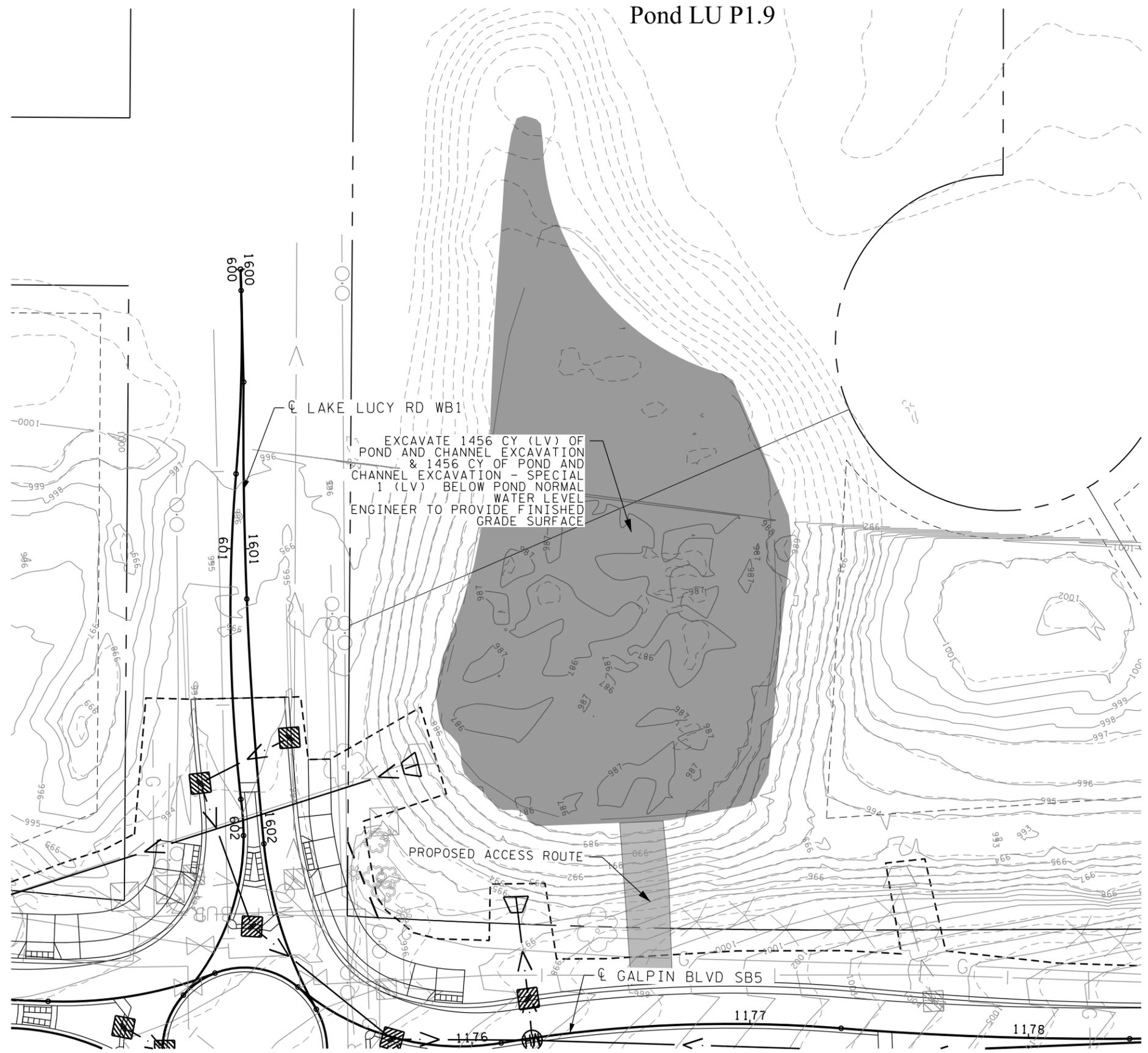
CARVER COUNTY, MINNESOTA  
 Filtration Basin B  
**POND GRADING PLAN**  
 SAP 194-115-004

SHEET  
**221R**  
 OF  
**286**  
 SHEETS

PLOTTED/REVISED: 9/11/2023

PATH & FILENAME: Projects\Minnesota\020055-000\Cad\Plan\20055-000\_dp\_pond05.dgn

### Pond LU P1.9



#### LEGEND

- × GUIDE POST TYPE B
- ⊗ RIPRAP CLASS III
- ▨ CATCH BASIN
- ⊙ MANHOLE
- ⊠ DROP INLET
- △ APRON
- DRAIN TILE CLEANOUT
- POND CLEANOUT AREA
- ➔ SURFACE FLOW DIRECTION
- - - - STORM SEWER PIPE
- - - - 6" PERF PE PIPE DRAIN
- - - - INPLACE STORM SEWER
- - - - CONSTRUCTION LIMITS
- - - - EX RIGHT OF WAY
- - - - RIGHT OF WAY
- - - - TEMPORARY EASEMENT
- - - - PERMANENT EASEMENT DRAINAGE/ UTIL

- NOTES:**
- 1) ALL STORM SEWER AND CULVERTS SHALL BE CLEANED AT THE END OF CONSTRUCTION AND PRIOR TO FINAL ACCEPTANCE.
  - 2) THE CONTRACTOR SHALL MAINTAIN DRAINAGE FROM THE SITE AT ALL TIMES DURING THE PROJECT.
  - 3) PERFORM CONTINUOUS INSPECTIONS OF EROSION CONTROL PRACTICES, ESPECIALLY AFTER EACH RAINFALL EVENT.
  - 4) CONTOURS ARE TO FINISHED GRADE.
  - 5) EXCAVATION OF THE BMP REQUIRES A TOOTHED BUCKET TO AVOID COMPACTING OR SMEARING SOILS.
  - 6) GRADING OF THE BMP REQUIRES USE OF LOW-IMPACT EARTH-MOVING EQUIPMENT TO PREVENT COMPACTION OF THE UNDERLYING SOILS. SMALL TRACKED DOZERS AND BOBCATS WITH RUNNER TRACKS ARE RECOMMENDED.
  - 7) IN THE EVENT THAT SEDIMENT IS INTRODUCED INTO THE BMP DURING OR IMMEDIATELY FOLLOWING EXCAVATION, THIS MATERIAL SHALL BE REMOVED FROM THE PRACTICE PRIOR TO CONTINUING CONSTRUCTION.
  - 8) INFILTRATION AREA SHALL BE STAKED OFF DURING CONSTRUCTION TO RESTRICT

NO.	DATE	BY	CHK	REVISIONS

Design By: ZH  
 Plan By: ZH  
 Checked By: WCA  
 Approved By: WCA

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

PRINT NAME: **ANDREW J. PLOWMAN, PE**  
 DATE: 9/11/2023 LICENSE #: 44200

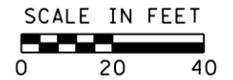


**Galpin Blvd Improvements**  
 City of Chanhassen, Minnesota

CARVER COUNTY, MINNESOTA  
 POND BC P1.6 EXPANSION  
**POND GRADING PLAN**  
 SAP 194-115-004

SHEET  
**224A**  
 OF  
**286**  
 SHEETS

# Pond LU P2-18-1



## LEGEND

- × GUIDE POST TYPE B
- RIPRAP CLASS III
- ▨ CATCH BASIN
- ⊙ MANHOLE
- ⊞ DROP INLET
- △ APRON
- DRAIN TILE CLEANOUT
- POND CLEANOUT AREA
- ➔ SURFACE FLOW DIRECTION
- - - STORM SEWER PIPE
- - - 6" PERF PE PIPE DRAIN
- - - INPLACE STORM SEWER
- - - CONSTRUCTION LIMITS
- - - EX RIGHT OF WAY
- - - RIGHT OF WAY
- - - TEMPORARY EASEMENT
- - - PERMANENT EASEMENT
- - - DRAINAGE/ UTIL

## NOTES:

- 1) ALL STORM SEWER AND CULVERTS SHALL BE CLEANED AT THE END OF CONSTRUCTION AND PRIOR TO FINAL ACCEPTANCE.
- 2) THE CONTRACTOR SHALL MAINTAIN DRAINAGE FROM THE SITE AT ALL TIMES DURING THE PROJECT.
- 3) PERFORM CONTINUOUS INSPECTIONS OF EROSION CONTROL PRACTICES, ESPECIALLY AFTER EACH RAINFALL EVENT.
- 4) CONTOURS ARE TO FINISHED GRADE.
- 5) EXCAVATION OF THE BMP REQUIRES A TOOTHED BUCKET TO AVOID COMPACTING OR SMEARING SOILS.
- 6) GRADING OF THE BMP REQUIRES USE OF LOW-IMPACT EARTH-MOVING EQUIPMENT TO PREVENT COMPACTON OF THE UNDERLYING SOILS. SMALL TRACKED DOZERS AND BOBCATS WITH RUNNER TRACKS ARE RECOMMENDED.
- 7) IN THE EVENT THAT SEDIMENT IS INTRODUCED INTO THE BMP DURING OR IMMEDIATELY FOLLOWING EXCAVATION, THIS MATERIAL SHALL BE REMOVED FROM THE PRACTICE PRIOR TO CONTINUING CONSTRUCTION.
- 8) INFILTRATION AREA SHALL BE STAKED OFF DURING CONSTRUCTION TO RESTRICT

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 DATE: 9/11/2023 LICENSE #: 44200

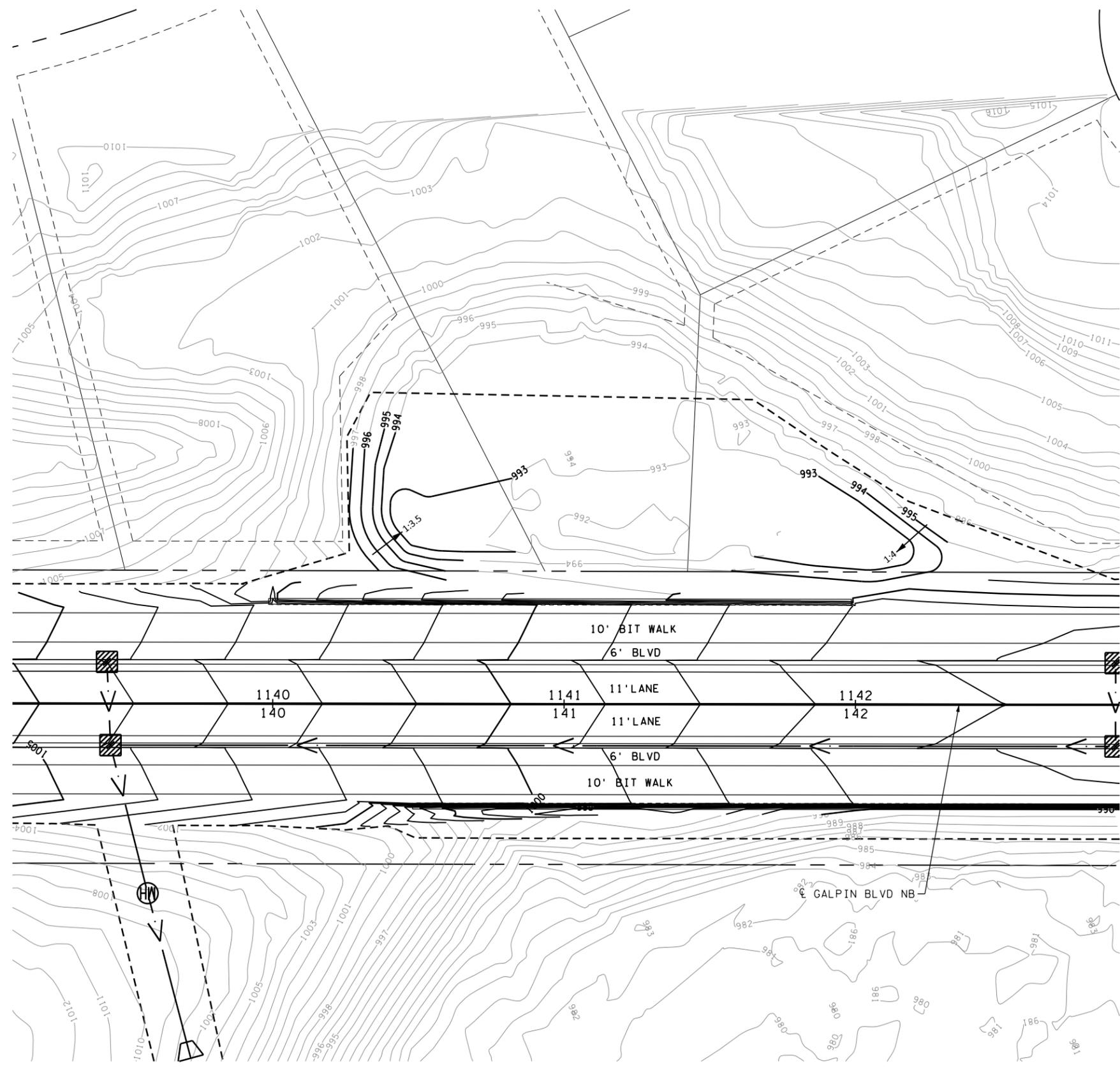
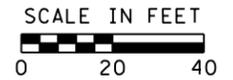


**Galpin Blvd Improvements**  
 City of Chanhassen, Minnesota

CARVER COUNTY, MINNESOTA  
 POND LU P2-18-1 EXPANSION  
**POND GRADING PLAN**  
 SAP 194-115-004

SHEET  
**224B**  
 OF  
**286**  
 SHEETS

LU P2.7



**LEGEND**

- CATCH BASIN
- MANHOLE
- DROP INLET
- APRON
- STORM SEWER PIPE
- CONSTRUCTION LIMITS
- EX RIGHT OF WAY
- RIGHT OF WAY
- TEMPORARY EASEMENT
- PERMANENT EASEMENT
- DRAINAGE/ UTIL

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Plan By:	ZH	
Checked By:	WCA	
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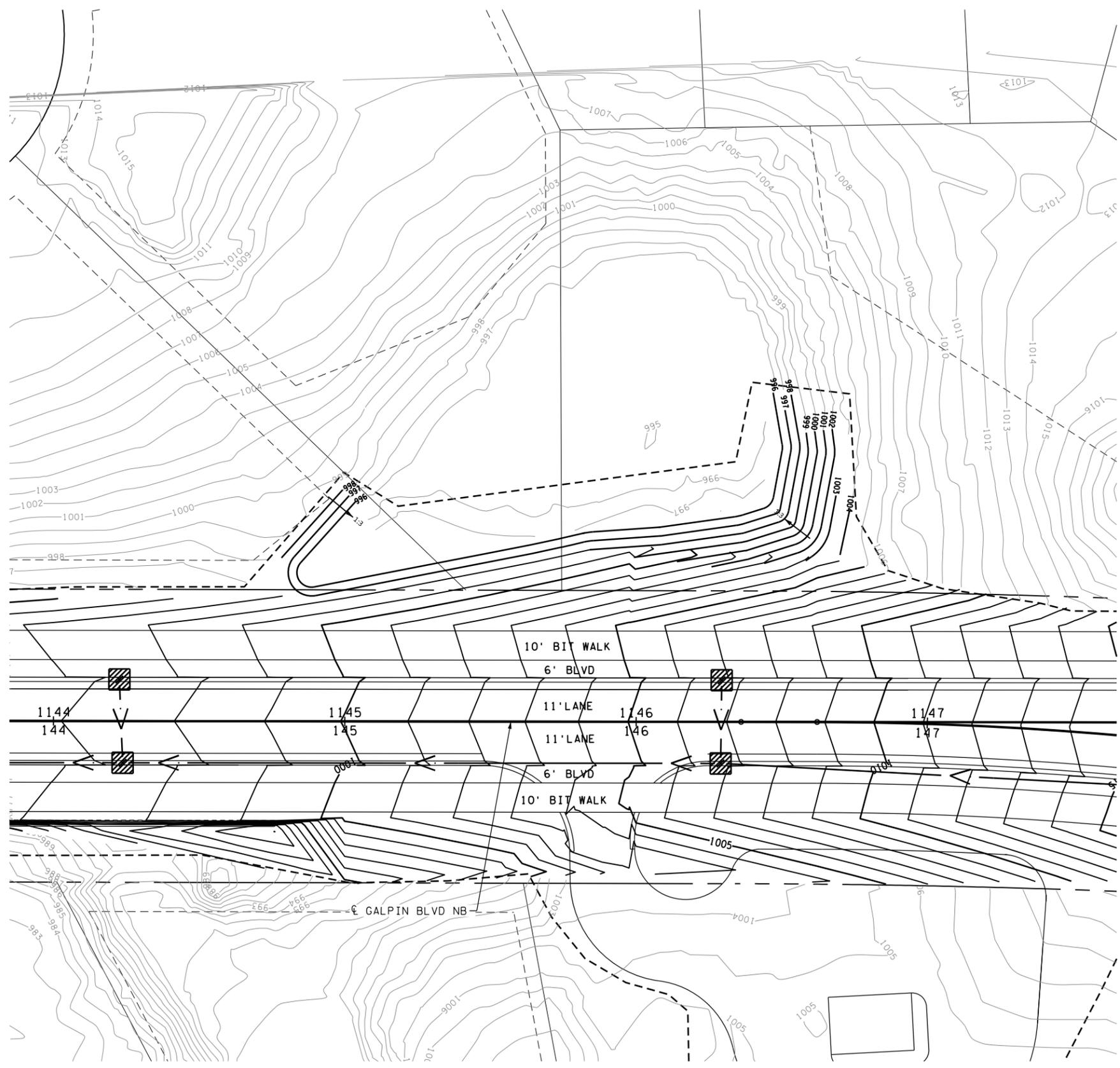


**Galpin Blvd Improvements**  
City of Chanhassen, Minnesota

CARVER COUNTY, MINNESOTA  
Mitigation Area - LU P2.7  
**POND GRADING PLAN**  
SAP 194-115-004

SHEET  
**225R**  
OF  
**286**  
SHEETS

LU P5.8



**LEGEND**

- CATCH BASIN
- MANHOLE
- DROP INLET
- APRON
- STORM SEWER PIPE
- CONSTRUCTION LIMITS
- EX RIGHT OF WAY
- RIGHT OF WAY
- TEMPORARY EASEMENT
- PERMANENT EASEMENT
- DRAINAGE/ UTIL

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Plan By:	ZH	
Checked By:	WCA	
Approved By:	WCA	



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City of Chanhassen, Minnesota

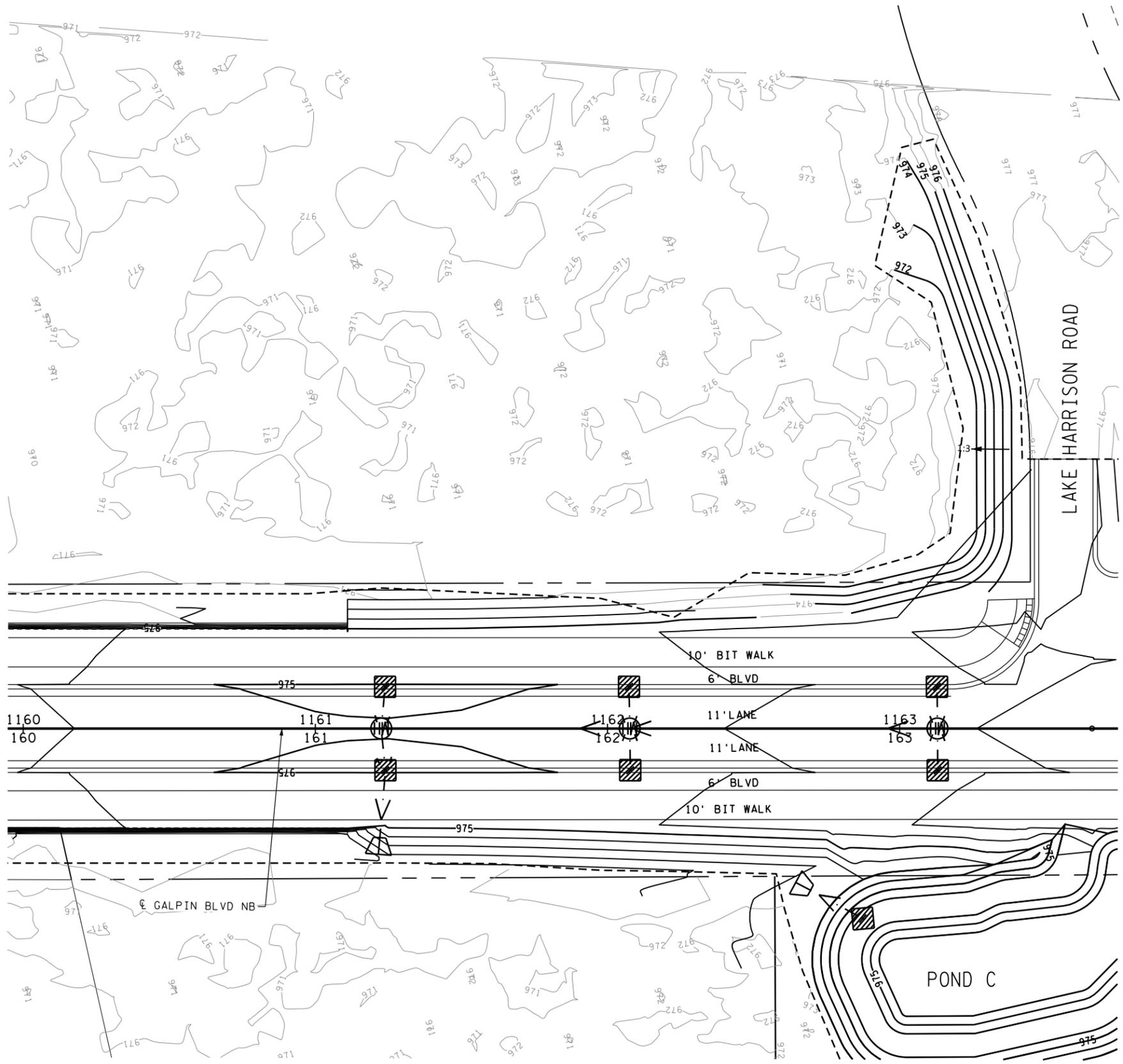
CARVER COUNTY, MINNESOTA  
Mitigation Area - LU P5.8  
**POND GRADING PLAN**  
SAP 194-115-004

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**226R**  
OF  
**286**  
SHEETS

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# Wetland 4A



LEGEND	
	CATCH BASIN
	MANHOLE
	DROP INLET
	APRON
	STORM SEWER PIPE
	CONSTRUCTION LIMITS
	EX RIGHT OF WAY
	RIGHT OF WAY
	TEMPORARY EASEMENT
	PERMANENT EASEMENT
	DRAINAGE/ UTIL

NO.	DATE	BY	CHK	REVISIONS

Design By: ZH  
 Plan By: ZH  
 Checked By: WCA  
 Approved By: WCA

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PRINT NAME: **ANDREW J. PLOWMAN, PE**  
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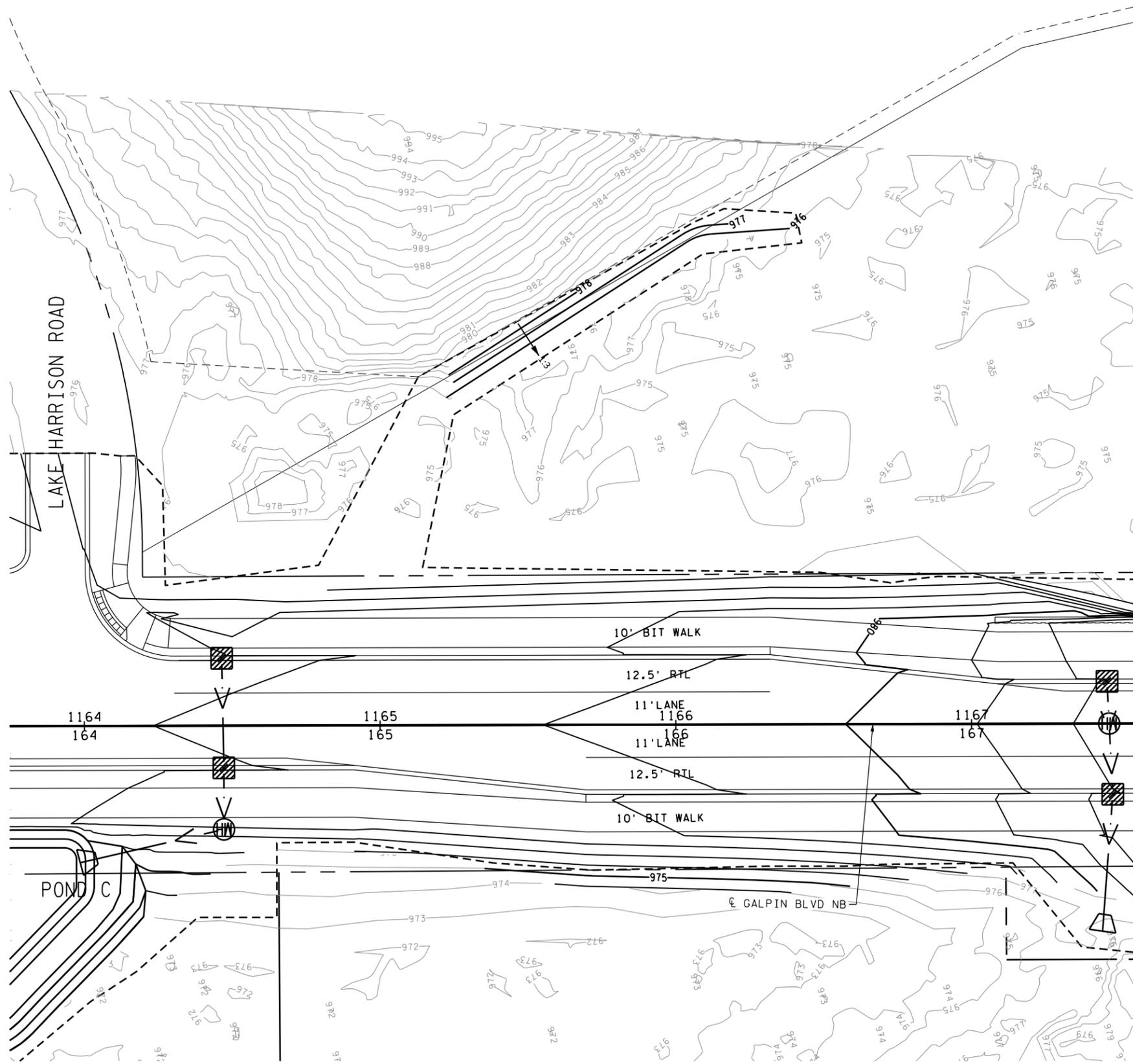
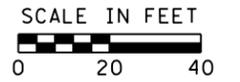


**Galpin Blvd Improvements**  
 City of Chanhassen, Minnesota

CARVER COUNTY, MINNESOTA  
 Mitigation Area - Wetland 4A  
**POND GRADING PLAN**  
 SAP 194-115-004

SHEET  
**227R**  
 OF  
**286**  
 SHEETS

# Wetland 4B



LEGEND	
	CATCH BASIN
	MANHOLE
	DROP INLET
	APRON
	STORM SEWER PIPE
	CONSTRUCTION LIMITS
	EX RIGHT OF WAY
	RIGHT OF WAY
	TEMPORARY EASEMENT
	PERMANENT EASEMENT
	DRAINAGE/ UTIL

PLOTTED/REVISED: 9/11/2023

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Plan By:	ZH	
Checked By:	WCA	
Approved By:	WCA	

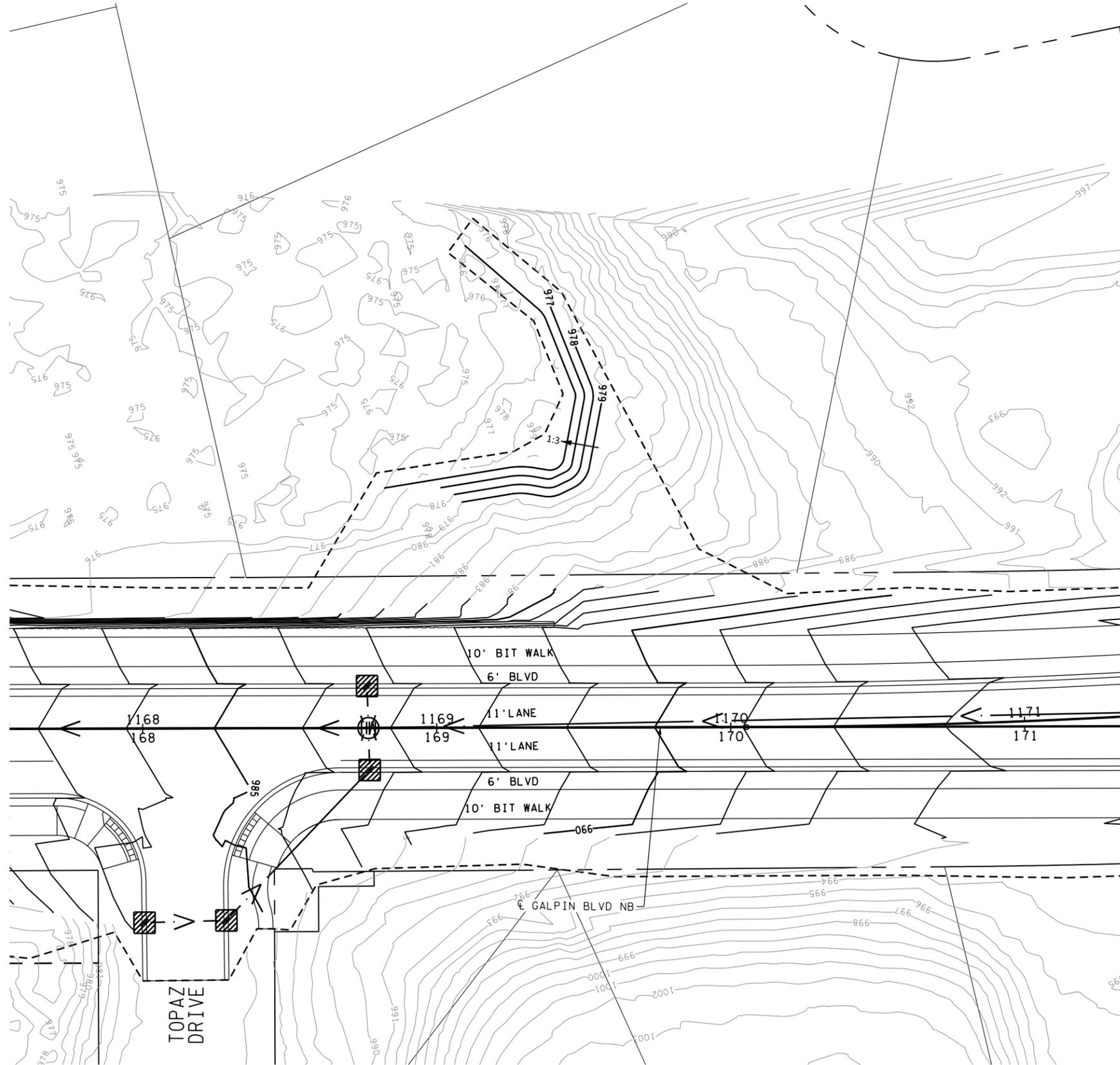
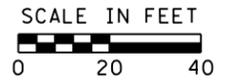


**Galpin Blvd Improvements**  
City of Chanhassen, Minnesota

CARVER COUNTY, MINNESOTA  
Mitigation Area - Wetland 4B  
**POND GRADING PLAN**  
SAP 194-115-004

SHEET  
**228R**  
OF  
**286**  
SHEETS

# Wetland 4B



**LEGEND**

- CATCH BASIN
- MANHOLE
- DROP INLET
- APRON
- STORM SEWER PIPE
- CONSTRUCTION LIMITS
- EX RIGHT OF WAY
- RIGHT OF WAY
- TEMPORARY EASEMENT
- PERMANENT EASEMENT
- DRAINAGE/ UTIL

PLOTTED/REVISED: 9/11/2023

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Design By:	MLS	I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.
Plan By:	CWK	
Checked By:	AJP	
Approved By:	AJP	
DATE	9/11/2023	

PRINT NAME: **ANDREW J. PLOWMAN, PE**

*Andrew J. Plowman*

DATE: 9/11/2023 LICENSE #: 44200

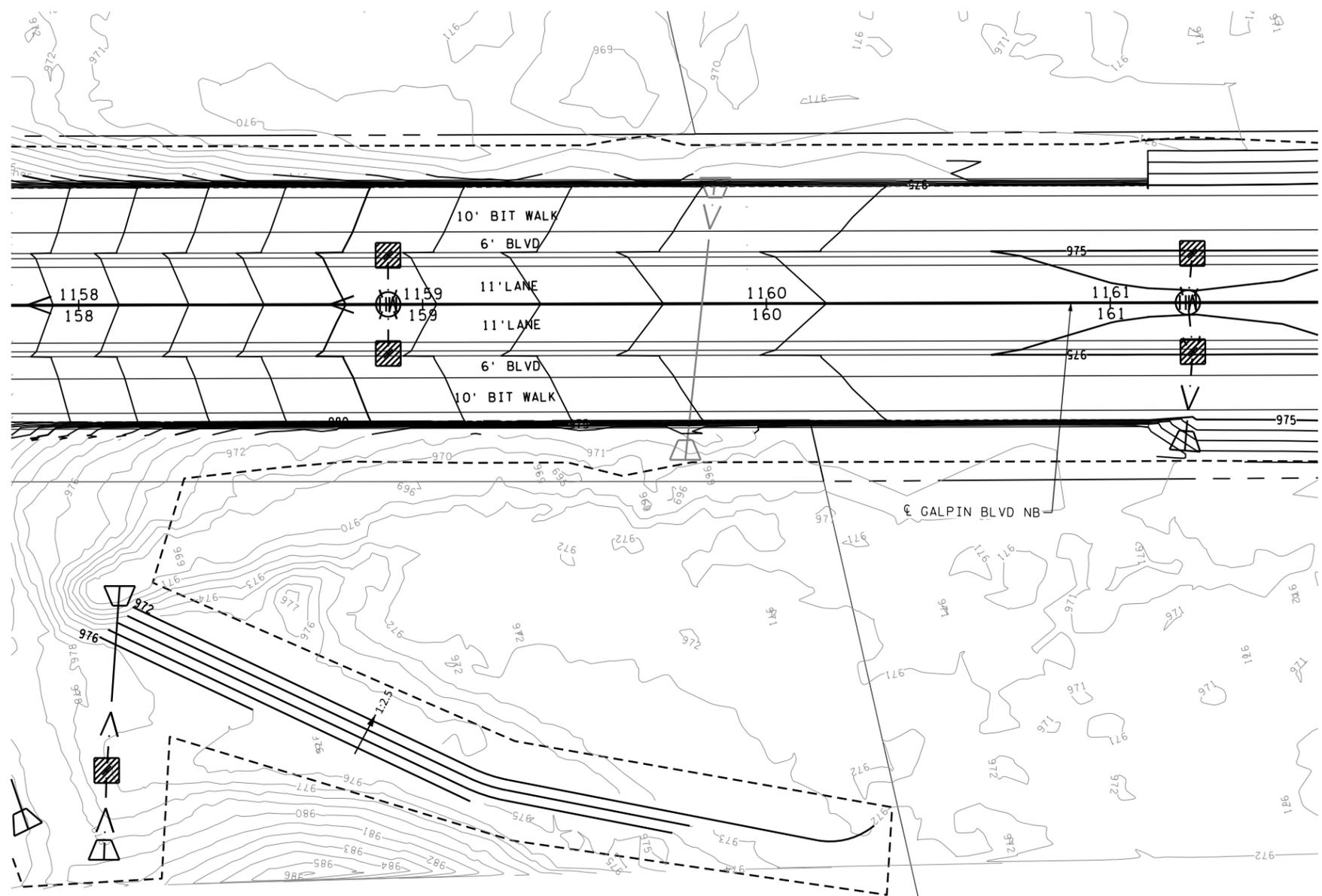
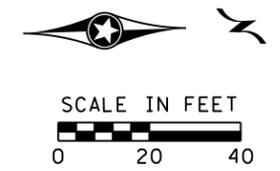


**Galpin Blvd Improvements**  
City of Chanhassen, Minnesota

CARVER COUNTY, MINNESOTA  
Mitigation Area - Wetland 4B  
**POND GRADING PLAN**  
SAP 194-115-004

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**229R**  
OF  
**286**  
SHEETS

# Wetland 3



**LEGEND**

- CATCH BASIN
- MANHOLE
- DROP INLET
- APRON
- STORM SEWER PIPE
- CONSTRUCTION LIMITS
- EX RIGHT OF WAY
- RIGHT OF WAY
- TEMPORARY EASEMENT
- PERMANENT EASEMENT DRAINAGE/ UTIL

PLOTTED/REVISED: 9/11/2023

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Design By: ZH  
 Plan By: ZH  
 Checked By: WCA  
 Approved By: WCA

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**Galpin Blvd Improvements**  
 City of Chanhassen, Minnesota

**CARVER COUNTY, MINNESOTA**  
 Mitigation Area - Wetland 3  
**POND GRADING PLAN**  
 SAP 194-115-004

SHEET  
**230R**  
 OF  
**286**  
 SHEETS

GRADING TAB		U
LOCATION	EXCAVATION CHANNEL & POND	COMMON EMBANKMENT (CV) (1)
	CU YD	CU YD
LU P2.7	69	38
LU P5.8	214	50
WETLAND 4A	163	54
WETLAND 4B	158	83
WETLAND 3	367	130
TOTAL	971	355

NOTES:  
 1. TOPSOIL IS INCLUDED IN COMMON EMBANKMENT (CV).

NO.	DATE	BY	CHK	REVISIONS

Design By: MLS

Plan By: CWK

Checked By: AJP

Approved By: AJP

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**Galpin Blvd Improvements**  
 City of Chanhassen, Minnesota

CARVER COUNTY, MINNESOTA  
 TABULATION  
**POND GRADING PLAN**  
 SAP 194-115-004

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**286**  
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EROSION/SEDIMENT CONTROL NOTES:

SEDIMENT CONTROL PRACTICES:

1. SEDIMENT CONTROL MUST BE IN PLACE AND APPROVED BY THE ENGINEER BEFORE ANY PHASE OF CONSTRUCTION CAN BEGIN.
2. IF A 50' NATURAL BUFFER AROUND A SURFACE WATER IS INFEASIBLE, REDUNDANT PERIMETER CONTROLS MUST BE PROVIDED. REDUNDANT MEASURE TO BE INSTALLED 3-5' FROM THE PRIMARY MEASURE WITH STABILIZED AREAS IN BETWEEN THE TWO BMPS.
3. INLET PROTECTION WILL BE INSTALLED AT ALL CATCH INLETS WITHIN THE PROJECT AREA PER STANDARD DETAILS.
4. TEMPORARY STABILIZATION MEASURES SHALL BE EMPLOYED WITHIN 200' OF THE NWP OF ALL DISCHARGE POINTS WITHIN 24 HOURS. MULCH IS NOT AN APPROVED MEASURE.
5. IN THE EVENT THAT PERMANENT STABILIZATION CANNOT BE IMPLEMENTED WITHIN 7 DAYS AFTER CONSTRUCTION ACTIVITY IN THE DISTURBED AREA HAS CEASED, TEMPORARY STABILIZATION BMPS MUST BE SCHEDULED TO OCCUR WITHIN THAT 7 DAY TIME FRAME (EXCEPT WHERE CALLED OUT BY NOTE BELOW)
6. RAPID STABILIZATION METHOD 4 SHALL BE EMPLOYED WITHIN 200 FEET OF THE NORMAL WETTED PERIMETER OF ALL DISCHARGE POINTS WITHIN 24 HOURS.
7. A SEDIMENT TRAP MUST BE INSTALLED PER THE APPROVED STANDARD DETAILS WITHIN 24 HOURS OF CONNECTING THE UTILITIES.
8. ALL STOCKPILES MUST HAVE DOWN GRADIENT PERIMETER SEDIMENT CONTROL IMPLEMENTED AND MAINTAINED AT ALL TIMES. STOCKPILES TO RECEIVE TEMPORARY STABILIZATION IF UNWORKED FOR 7 DAYS.
9. STOCKPILES MAY NOT BE PLACED WITHIN ANY DRAINAGE OR CURB LINE UNLESS PROPER BYPASS IS INSTALLED PRIOR TO STOCKPILE PLACEMENT.
10. CONTRACTOR TO INSTALL SEDIMENT CONTROL LOGS DOWN GRADIENT FROM ANY EXPOSED AREAS

EROSION PREVENTION PRACTICES:

1. STABILIZATION OF DISTURBED AREAS SHALL BE DONE BY PERMANENT TURF ESTABLISHMENT WHENEVER POSSIBLE.

POLLUTION PREVENTION MANAGEMENT MEASURES:

1. A ROCK CONSTRUCTION ENTRANCE WILL BE PLACED AT ALL ENTRANCES THAT LEAD TO THE PROJECT SITE IN ACCORDANCE WITH THE STORMWATER POLLUTION PREVENTION PLAN AND THE APPROVED STANDARD DETAILS.
2. ALL STREETS IN AND ADJACENT TO THE PROJECT SHALL REMAIN CLEAN AND PASSABLE AT ALL TIMES. ADJACENT STREET AND CURB LINE TO BE SWEEPED FREE OF DEBRIS AT THE END OF EACH WORK DAY, OR AS OFTEN AS NEEDED TO ENSURE PUBLIC SAFETY.
3. SLURRY FROM CONCRETE OPERATIONS MUST BE VACUUMED UP IMMEDIATELY. NO CONCRETE WASHOUT SHALL COME IN CONTACT WITH THE GROUND AND MUST BE PROPERLY DISPOSED OF. ALL HAZARDOUS MATERIALS MUST BE KEPT UNDER COVER AND WITHIN PROPER CONTAINMENT WHEN NOT IN USE.

INFILTRATION BASINS:

1. NO HEAVY EQUIPMENT, STOCKPILES, OR HAZARDOUS MATERIALS SHALL BE STORED ON OR NEAR THE INFILTRATION BASINS.
2. DO NOT FULLY EXCAVATE INFILTRATION BASINS UNTIL ALL UPGRADIENT LAND DISTURBING ACTIVITY HAS BEEN COMPLETED AND THE DRAINAGE AREA HAS BEEN STABILIZED. PROVIDE RIGOROUS EROSION PREVENTION AND SEDIMENT AND SEDIMENT CONTROL BMP'S TO KEEP SEDIMENT AND RUNOFF COMPLETELY AWAY FROM THE INFILTRATION AREAS.

MISCELLANEOUS:

1. ADDITIONAL EROSION AND SEDIMENT CONTROL MAY BE ADDED DURING ANY PHASE OF CONSTRUCTION AS DIRECTED BY THE ENGINEER.
2. IF PROJECT CONSISTS OF MILL & OVERLAY OF SECTIONS, ENSURE MILLINGS ARE NOT A THREAT FROM WASHING OFF THE PROJECT ROW.
3. CONTRACTOR TO PROTECT ALL WETLAND AREAS WITH PERIMETER CONTROL (AND REDUNDANT MEASURES) UNTIL WORK IN THE PERMITTED AREAS IS NEEDED.
4. NATURAL TOPOGRAPHY AND SOIL CONDITIONS MUST BE PROTECTED, INCLUDING RETENTION ONSITE OF NATIVE TOPSOIL TO THE GREATEST EXTENT POSSIBLE.
5. ADDITIONAL MEASURES, SUCH AS HYDRAULIC MULCHING AND OTHER PRACTICES AS SPECIFIED BY THE DISTRICT MUST BE USED ON SLOPES OF 3:1 (H:V) OR STEEPER TO PROVIDE ADEQUATE STABILIZATION.
6. FINAL SITE STABILIZATION MEASURES MUST SPECIFY THAT AT LEAST SIX INCHES OF TOPSOIL (WITH A MIN. OF 5% ORGANIC MATTER) BE SPREAD AND INCORPORATED INTO THE UNDERLYING SOIL DURING FINAL SITE TREATMENT WHEREVER TOPSOIL HAS BEEN REMOVED.
7. SOIL SURFACES COMPACTED DURING CONSTRUCTION AND REMAINING PREVIOUS UPON COMPLETION OF CONSTRUCTION MUST BE DECOMPACTED 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 THE SOIL PROFILES WHILE TAKING CARE TO PROTECT UTILITIES, TREE ROOTS, AND OTHER EXISTING VEGETATION.
8. THE PERMITTEE MUST INSPECT ALL EROSION PREVENTION AND SEDIMENT CONTROL FACILITIES AND SOIL STABILIZATION MEASURES TO ENSURE INTEGRITY AND EFFECTIVENESS. THE PERMITTEE MUST 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 MUST 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.
9. NO ACTIVITY AFFECTING THE BED OR BANKS OF A PROTECTED WATER MAY BE CONDUCTED BETWEEN MARCH 15 AND JUNE 15 ON WATERCOURSES, OR BETWEEN APRIL 1 AND JUNE 30 ON ALL OTHER PUBLIC WATERBODIES, TO MINIMIZE IMPACTS ON FISH SPAWNING AND MIGRATION.
10. THE POTENTIAL TRANSFER OF AQUATIC INVASIVE SPECIES (E.G., ZEBRA MUSSELS, EURASIAN WATERMILFOIL, ETC.) MUST BE MINIMIZED TO THE MAXIMUM EXTENT POSSIBLE.

TURF ESTABLISHMENT AND EROSION CONTROL LEGEND

		<b>PERMANENT:</b> SEED MIXTURE 25-121 (61 LBS/ACRE) FERTILIZER TYPE 3 (SLOW RELEASE: 22-5-10) (350 LBS/ACRE) HYDRAULIC STABILIZED FIBER MATRIX (3000 LB/ACRE)	<b>TEMPORARY:</b> RAPID STABILIZATION METHOD 3 (6 MGAL/AC)
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	<b>PERMANENT:</b> SEED MIXTURE 35-221 (36.5 LBS/ACRE) FERTILIZER TYPE 3 (SLOW RELEASE: 22-5-10) (350 LBS/ACRE) EROSION CONTROL BLANKET CATEGORY 3N	<b>TEMPORARY:</b> RAPID STABILIZATION METHOD 4
---	---	--

	<b>PERMANENT:</b> SEED MIXTURE 33-261 (35 LBS/ACRE) FERTILIZER TYPE 4 (18-1-18) (120 LBS/ACRE) EROSION CONTROL BLANKET CATEGORY 3N	<b>TEMPORARY:</b> RAPID STABILIZATION METHOD 4
---	---	--

 BUFFER SIGN, SEE DETAIL FOR MORE INFORMATION

 SILT FENCE, TYPE MS

 SEDIMENT CONTROL LOG, TYPE WOOD FIBER

 STORM DRAIN INLET PROTECTION

 STABILIZED CONSTRUCTION EXIT

 SURFACE DRAINAGE DIRECTION

 EX RIGHT OF WAY

 RIGHT OF WAY

 TEMPORARY EASEMENT

 PERMANENT DRAINAGE EASEMENT

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Plan By: CWK	
Checked By: AJP	
Approved By: AJP	
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PRINT NAME: **ANDREW J. PLOWMAN, PE**



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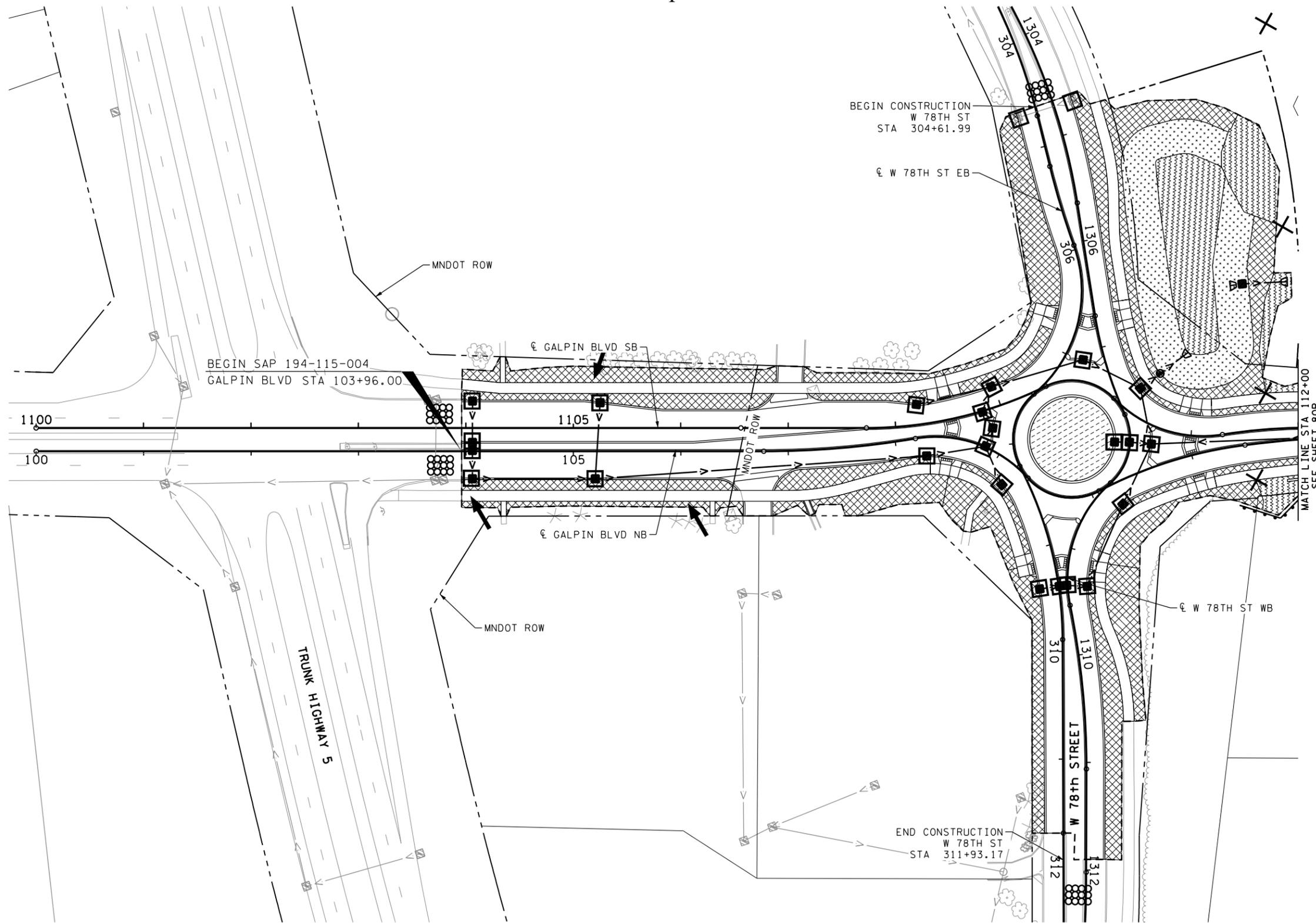
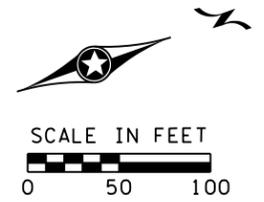
**Galpin Blvd Improvements**  
City of Chanhassen, Minnesota

CARVER COUNTY, MINNESOTA

**TURF ESTABLISHMENT & EROSION CONTROL**  
SAP 194-115-004

SHEET  
**245R**  
OF  
**286**  
SHEETS

# Galpin Blvd



PLOTTED/REVISED: 9/11/2023

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 Checked By: **AJP**  
 Approved By: **AJP**

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

PRINT NAME: **ANDREW J. PLOWMAN, PE**  
 DATE: **9/11/2023** LICENSE # **44200**



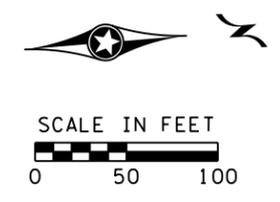
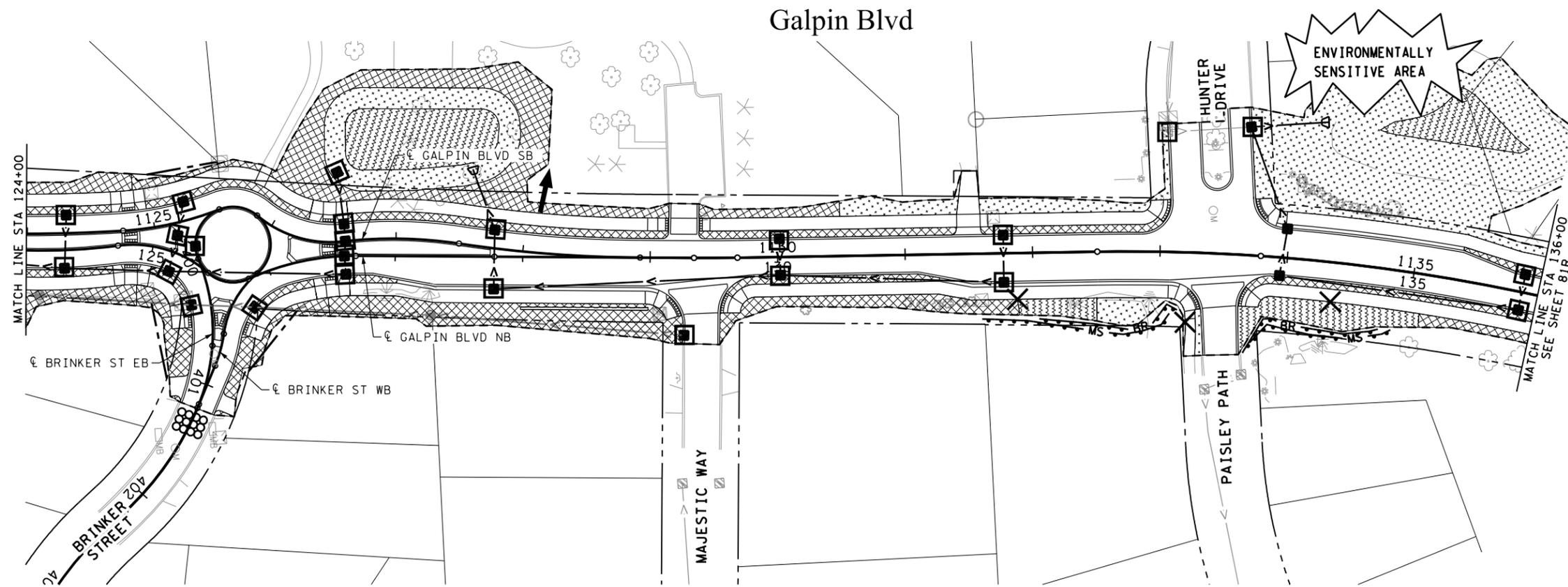
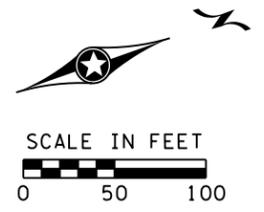
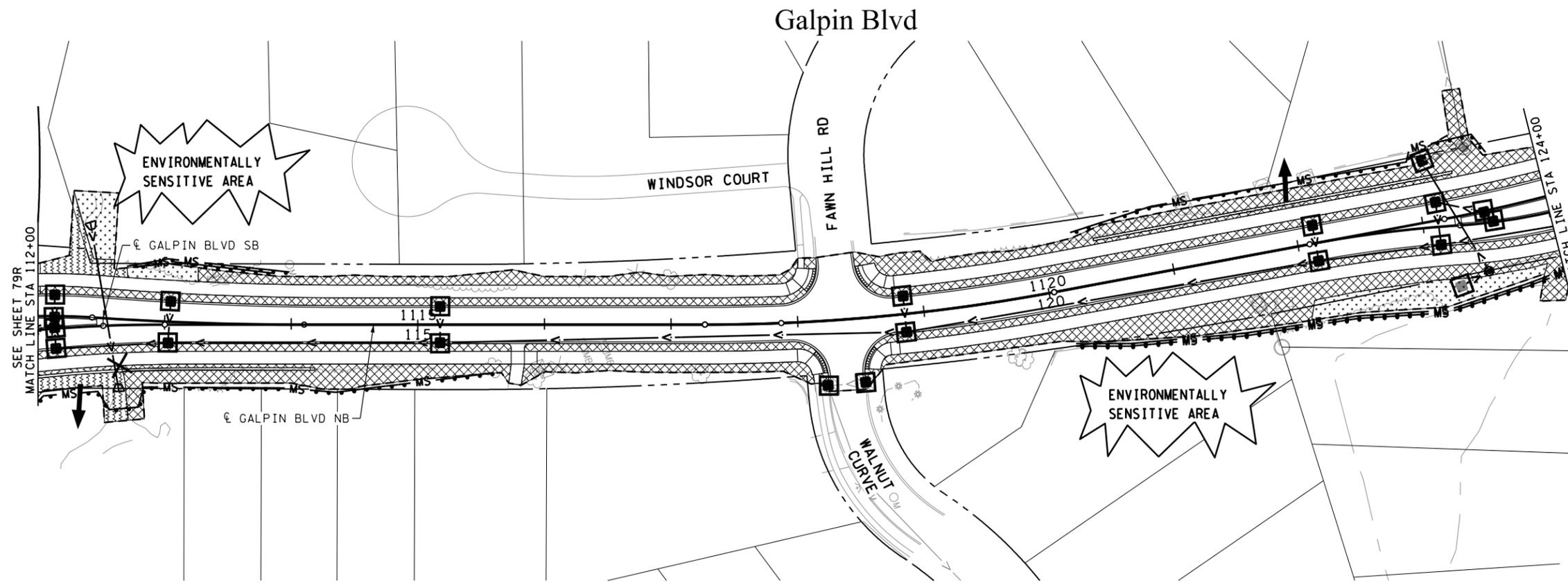
**Galpin Blvd Improvements**  
 City of Chanhassen, Minnesota

CARVER COUNTY, MINNESOTA  
 STA 100+00 TO STA 112+00  
**TURF ESTABLISHMENT & EROSION CONTROL**  
 SAP 194-115-004

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**246R**  
 OF  
**286**  
 SHEETS

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Design By: MLS  
 Plan By: CWK  
 Checked By: AJP  
 Approved By: AJP

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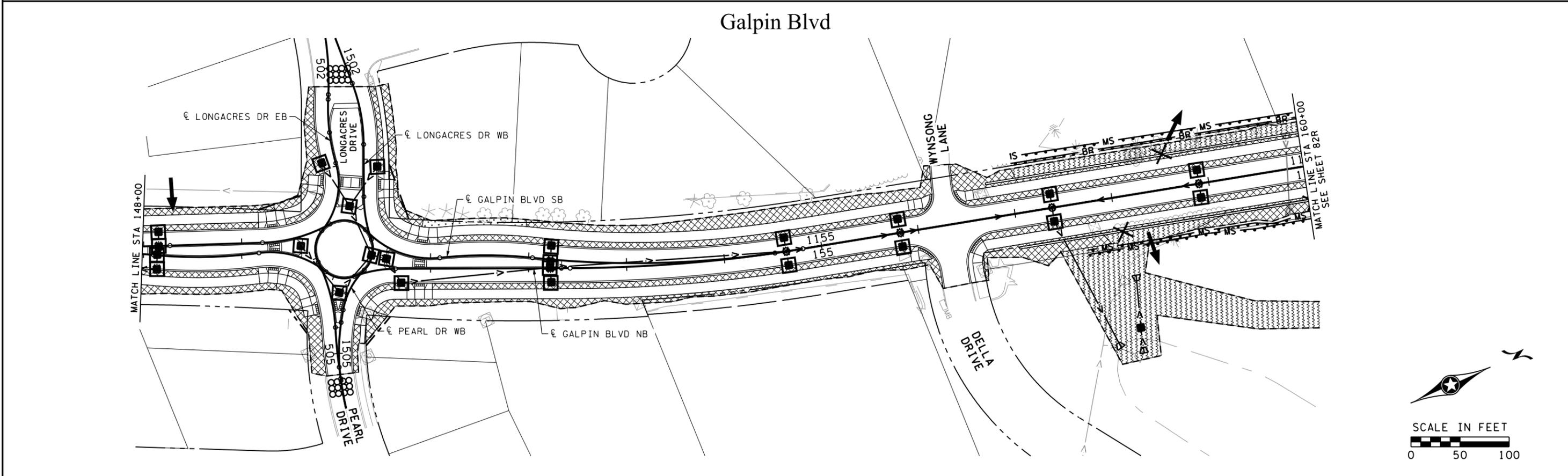
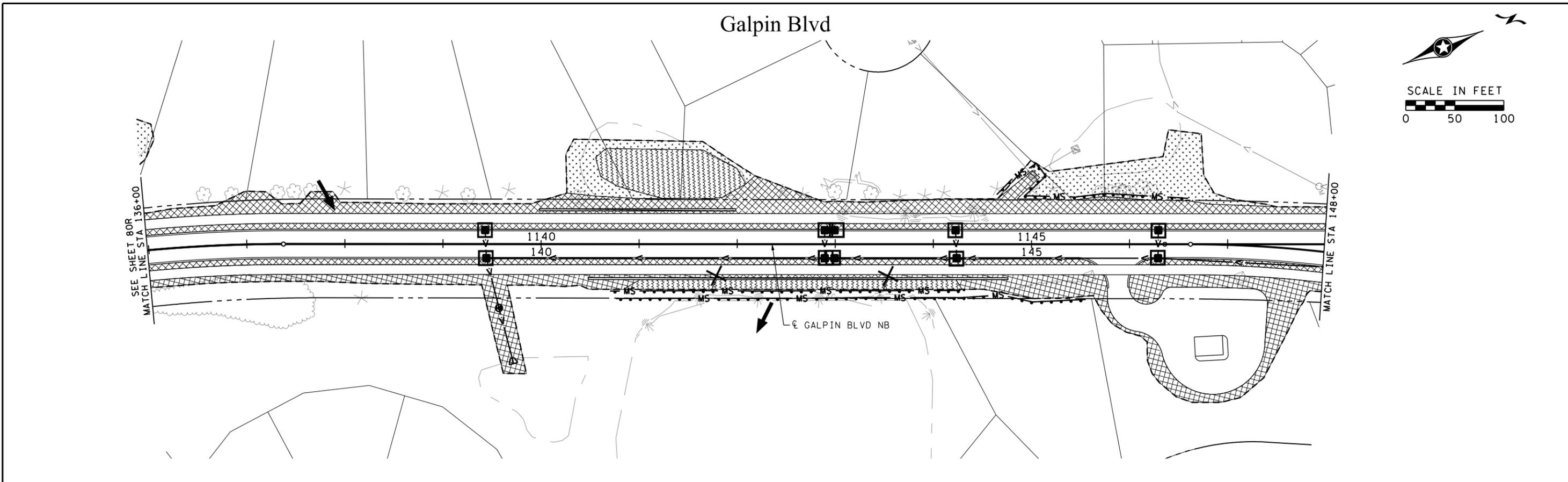
**Galpin Blvd Improvements**  
 City of Chanhassen, Minnesota

CARVER COUNTY, MINNESOTA  
 STA 112+00 TO STA 136+00  
**TURF ESTABLISHMENT & EROSION CONTROL**  
 SAP 194-115-004

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**247R**  
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**286**  
 SHEETS

PLOTTED/REVISED: 9/11/2023

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Design By: MLS  
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 DATE: 9/11/2023 LICENSE #: 44200



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 City of Chanhassen, Minnesota

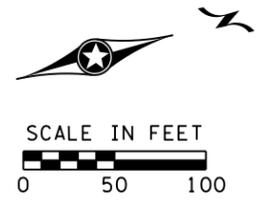
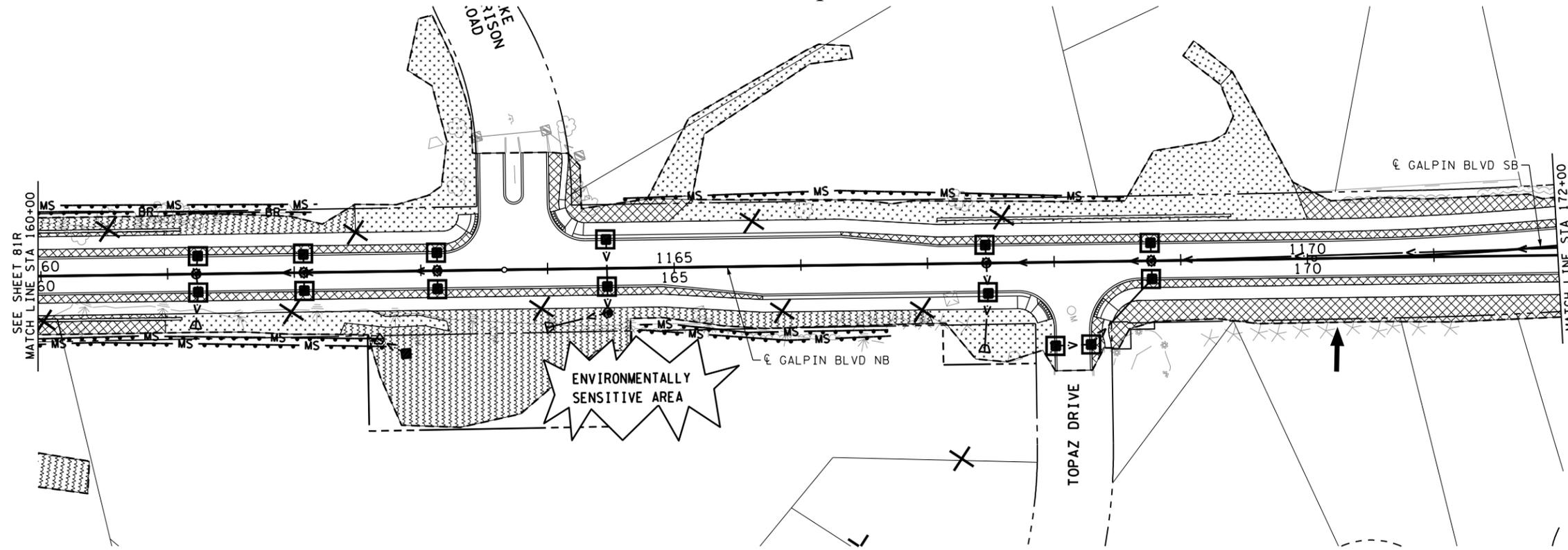
CARVER COUNTY, MINNESOTA  
 STA 136+00 TO STA 160+00  
**TURF ESTABLISHMENT & EROSION CONTROL**  
 SAP 194-115-004

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**248R**  
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**286**  
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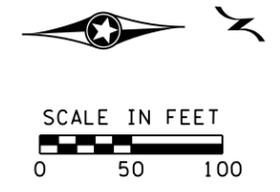
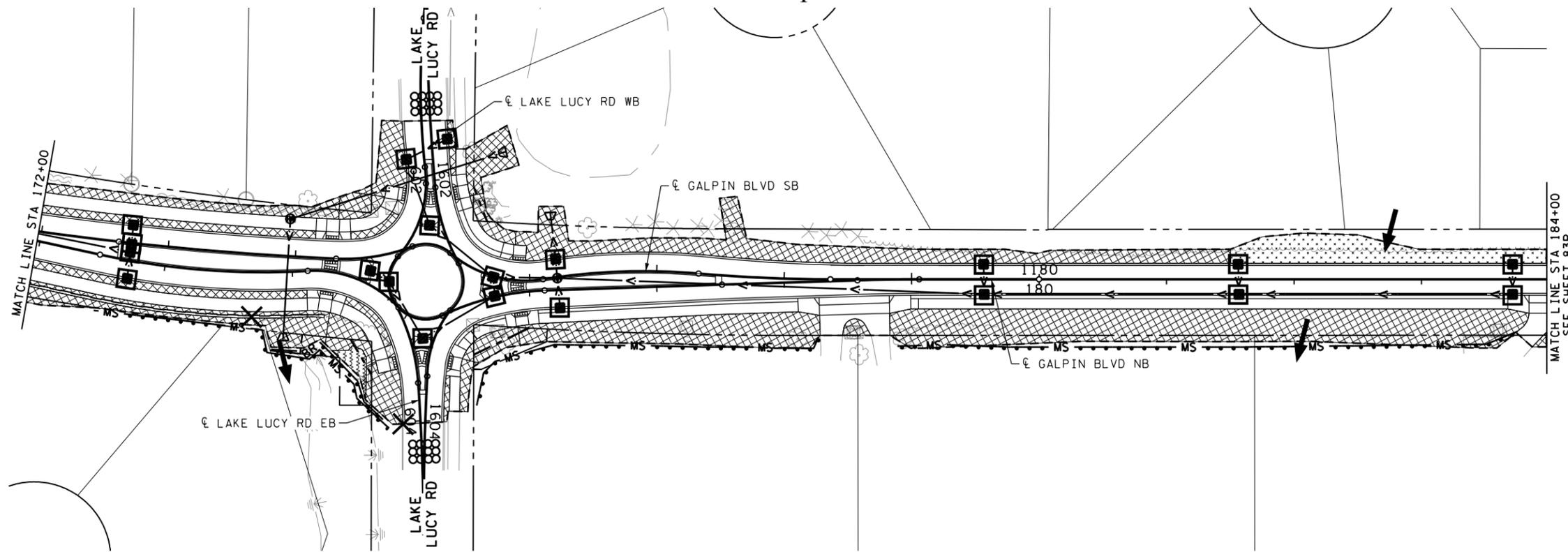
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Plan By:	CWK	
Checked By:	AJP	
Approved By:	AJP	



**Galpin Blvd Improvements**  
City of Chanhassen, Minnesota

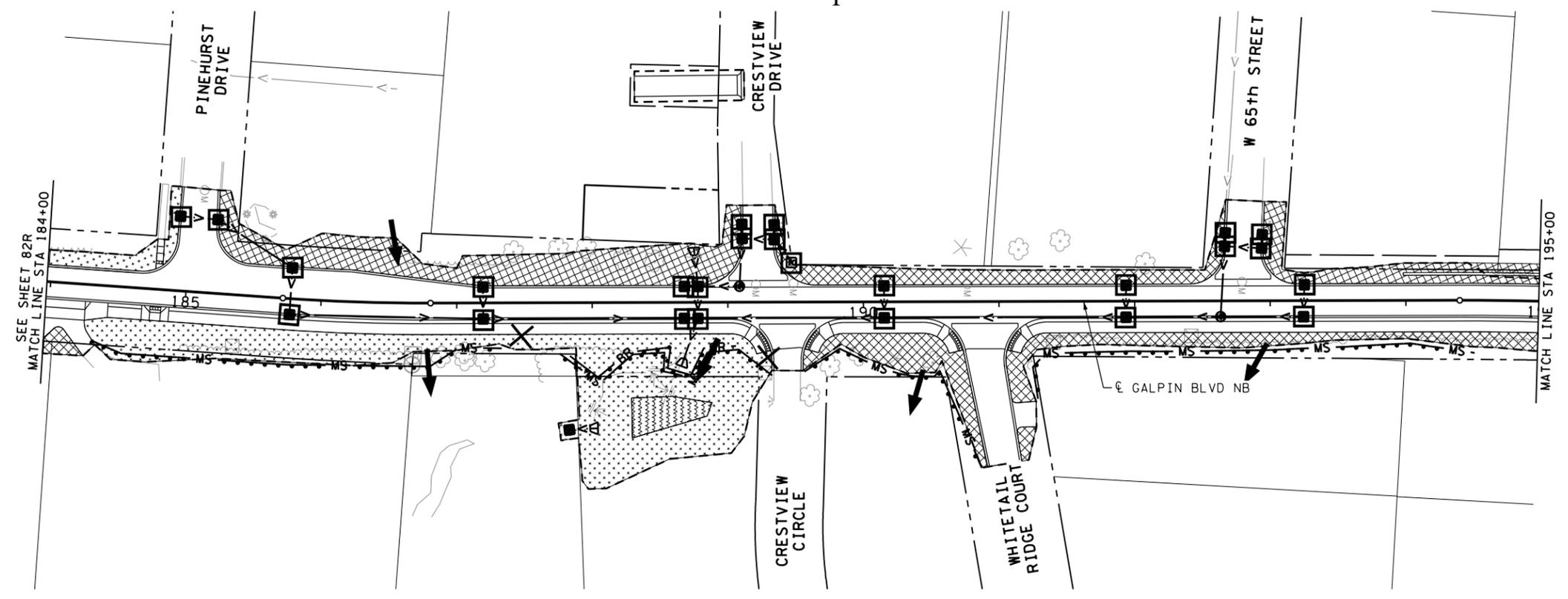
CARVER COUNTY, MINNESOTA  
STA 160+00 TO STA 184+00  
**TURF ESTABLISHMENT & EROSION CONTROL**  
SAP 194-115-004

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OF **286**  
SHEETS

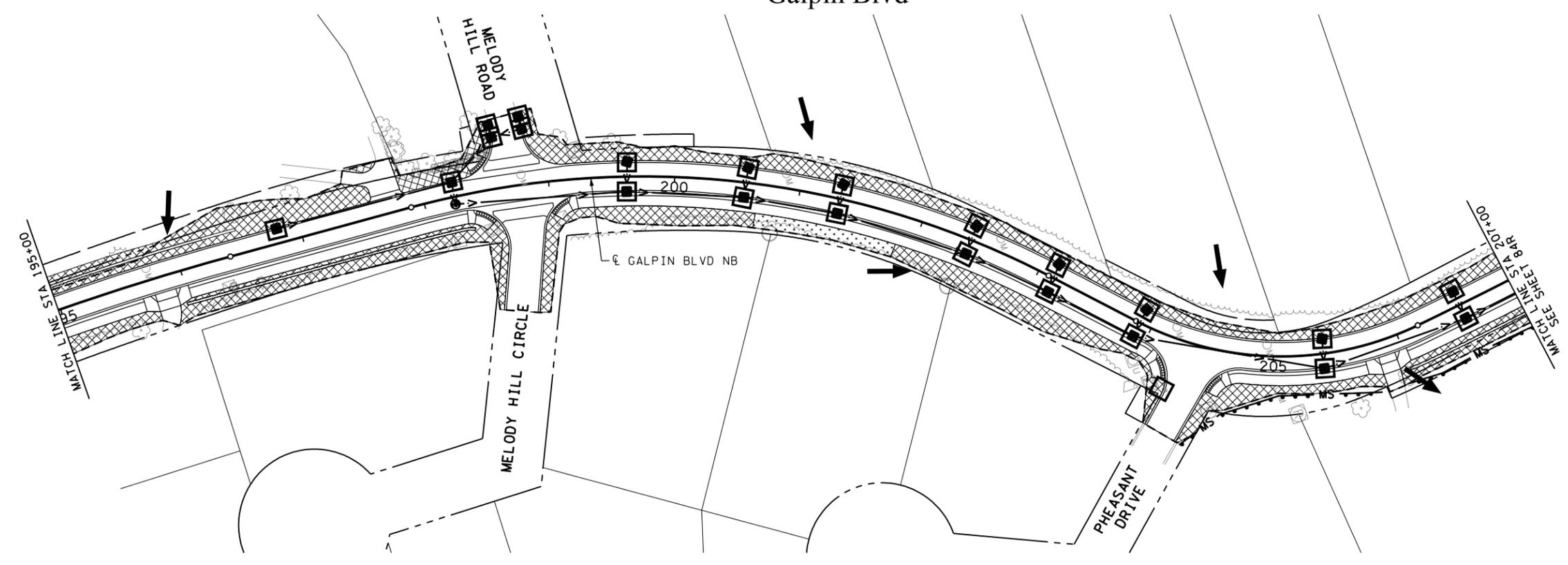
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**Galpin Blvd Improvements**  
 City of Chanhassen, Minnesota

CARVER COUNTY, MINNESOTA  
 STA 184+00 TO STA 207+00  
**TURF ESTABLISHMENT & EROSION CONTROL**  
 SAP 194-115-004

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**250R**  
 OF  
**286**  
 SHEETS

