RILEY PURGATORY BLUFF CREEK WATERSHED DISTRICT

18681 Lake Drive East
Chanhassen, MN 55317
952-607-6512
www.rpbcwd.org

Riley Purgatory Bluff Creek Watershed District Permit Application Review

Permit No: 2021-089

Considered at Board of Managers Meeting: March 2, 2022

Received complete: February 16, 2022

Applicant: Nor-Son Inc, Andy Anderson

Representative: Nor-Son Inc, Mark Strelnieks

Project: Nor-Son Office Development - The applicant proposes the redevelopment of an existing parking lot into a new office building with associated parking, utilities, and landscaping. The project includes an infiltration basin and underground stormwater infiltration system to provide volume control, water quality, and rate control.

Location: 7544 Market Place Drive, Eden Prairie, Minnesota 55344

Reviewer: Scott Sobiech, PE; Barr Engineering Co.

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 March 2, 2022 meeting of the managers:

Resolved that the application for Permit 2021-082 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 Permit 2021-082 to the applicant on behalf of RPBCWD.

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

Applicable Rule Conformance Summary

Rule	Issue		Conforms to RBPCWD Rules?	Comments
C	**Erosion Control Plan**		See comment.	See rule-specific permit condition C1 related to name of individual responsible for on-site erosion control.
J	**Stormwater Management**	Rate	Yes	
		Volume	See Comment	See stipulation 5 related to verifying the abstraction capacity of the stormwater facility using a measured infiltration rate and rule-specific permit condition J1 related to design revision to route all site impervious area to an abstraction BMP.
		Water Quality	Yes	
		Low Floor Elev.	Yes	
		Maintenance	See Comment	See rule-specific permit condition J2 related to recordation of stormwater facility maintenance declaration.
		Chloride Management	See Comment	See stipulation 4 related to providing a chloride management plan prior to project close-out.
		Wetland Protection	Yes	
L	**Permit Fee Deposit**		Yes	$3,000 deposit fee received January 10, 2022.
M	**Financial Assurance**		See Comment	The financial assurance is calculated at $232,233.

Background

The applicant proposes the redevelopment of an existing parking lot into a new office building with associated parking, utilities, and landscaping. The project includes an infiltration basin and underground stormwater infiltration system to provide volume control, water quality, and rate control. The project site information is summarized in Table 1.

While there are no on-site or adjacent Wetland Conservation Act (WCA) protected wetlands for which wetland buffers would be required, the treated runoff leaving the site from the infiltration basin is conveyed via storm sewer directly to an off-site wetland.

Table 1. Project site information

Site Information	Project Area
Total Site Area (acres)	1.67
Existing Site Impervious Area (acres)	1.15
Disturbed Impervious Area (acres)	0.83 (72.2%)
Post Construction Site Impervious (acres)	0.96
Change in Site Impervious Area (acres)	-0.19
Total Disturbed Area (acres)	1.52

Exhibits:

1. Permit application received on December 21, 2021 with associated permit fee received on January 10, 2022. (Incomplete notice was sent on January 6, 2022; materials submitted to complete application on February 16, 2022)
2. Stormwater Management Report dated December 9, 2021 (revised February 8, 2022)
3. Project Plan Set (10 sheets) dated December 21, 2021 (revised February 8, 2022)
4. Review Comments dated January 6, 2022
5. Review Comments Applicant Response email sent February 8, 2022
6. Existing and Proposed HydroCAD Models received January 6, 2022 (resubmitted February 16, 2022)
7. P8 excel files received January 6, 2022 (resubmitted February 16, 2022)
8. Estimate of Probable Cost dated February 8, 2022
9. Geotechnical Evaluation Report dated May 25, 2021 completed by Braun Intertec

Rule Specific Permit Conditions

Rule C: Erosion Prevention and Sediment Control

Because the project will involve 1.52 acres of land-disturbing activities, the project must conform to the erosion prevention and sediment control requirements established in Rule C.

The erosion control plan prepared by Westwood Professional Services, Inc. includes installation of perimeter control (silt fence or sediment control logs), a stabilized rock construction entrance, inlet protection, erosion control blanket, daily inspection, staging areas, placement of a minimum of 6 inches of topsoil (at 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 and contact information of the individual responsible for erosion control at the site. RPBCWD must be notified if the responsible individual changes during the permit term.

Rule J: Stormwater Management

Because the project will involve 1.52 acres of land-disturbing activity, the project must meet the criteria of RPBCWD's Stormwater Management rule (Rule J, Subsection 2.1). The criteria listed in Subsection 3.1 will apply to the entire site because the project is redevelopment that will disturb more than 50% of the existing impervious surface on the parcel (Rule J, Subsection 2.3).

The applicant is proposing construction of an infiltration basin and an underground infiltration system to provide the rate control, volume abstraction and water quality management. Pretreatment for runoff entering the infiltration basin and underground infiltration system is being provided by catchbasin/manholes with sumps.

Rate Control

In order to meet the rate control criteria listed in Subsection 3.1.a, the 2-, 10-, and 100-year post development peak runoff rates must be equal to or less than the existing discharge rates at all locations where stormwater leaves the site. The applicant used a HydroCAD hydrologic model to simulate runoff rates for pre- and post-development conditions for the 2-, 10-, and 100-year frequency storm events using a nested rainfall distribution, and a 100-year frequency, 10-day snowmelt event. The existing and proposed 2-, 10-, and 100-year frequency discharges from the site are summarized in Table 2 below. The proposed project is in conformance with RPBCWD Rule J, Subsection 3.1.a.

Table 2. Existing and Proposed Peak Runoff Rates

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
West	3.9	1.4	6.3	3.4	9.4	5.2	0.2	0.2
North	0.9	0.6	1.5	1.1	2.8	1.9	<0.1	<0.1
Northeast	0.6	0.3	0.9	0.8	1.6	1.4	<0.1	<0.1

Volume Abstraction

Subsection 3.1.b of Rule J requires the abstraction onsite of 1.1 inches of runoff from the regulated impervious surface of the site. An abstraction volume of 2,915 cubic feet is required from the 0.96 acres (41,818 square feet) of regulated impervious area. The proposed infiltration basin provides 3,402 cubic feet of abstraction volume, while the underground infiltration system provides 342 cubic feet of abstraction volume. Pretreatment for runoff entering the infiltration basin and underground infiltration system is being provided by catchbasin/manholes with sumps to conform to Rule J, Subsection 3.1.b.1.

Two soil borings (ST-8 and ST-5) were performed by Braun Intertec under or adjacent the proposed infiltration pond and underground filtration system, respectively. Soil boing ST-8 is directly underneath the proposed infiltration pond, while soil boring ST-5 is adjacent to the proposed underground infiltration system. Both soil boring show silty sand soils with no groundwater present for 11 feet below the surface. The subsurface investigation information summarized Table 3 shows that groundwater is at least 3 feet below the bottom of the proposed infiltration basin and underground infiltration system (Rule J, Subsection 3.1.b.2.a).

Table 3. Groundwater Separation Analysis

Proposed BMP	Nearest Subsurface Investigation	Boring is within footprint?	Groundwater Elevation (feet)	BMP Bottom Elevation (feet)	Separation (feet)
Infiltration Basin	ST-8	Yes	No groundwater observed at boring bottom (approx. el 882)	886	4.0
Underground Infiltration System	ST-5	No	No groundwater observed at boring bottom (approx. el 880)	884.5	4.5

The engineer concurs with the applicant's design infiltration rates of 0.45 inches per hour for silty sand based on the guidelines provided in the Mn Stormwater Manual. Based on the design infiltration rate, the engineer concurs that the basins will draw down within 48 hours (Rule J, subsection 3.1b.3). Because of the existing asphalt pavement at the locations of proposed infiltration basin and underground infiltration system, infiltration testing was not performed at that BMP locations. 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. 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 3.1b 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).

The table below summarizes the volume abstraction for the site based on the design infiltration capacity of the underground infiltration system.

Table 4. Volume Abstraction Summary

Required Abstraction Depth (inches)	Required Abstraction Volume (cubic feet)	Provided Abstraction Depth (inches)	Provided Abstraction Volume (cubic feet)
1.1	3,745	1.1	3,745

While the stormwater management facilities provide adequate retention capacity to meet the requirement, the impervious area in proposed watershed DA5 (3,191 square feet or about 8% of the total site impervious surface) is not tributary to an abstraction BMP. To conform to RPBCWD Rule J, subsection 3.1b requirements, the following revision is needed:

J1. Applicant must capture and route runoff from watershed DA5 to an abstraction BMP to demonstrate that 1.1" of runoff is being captured from all impervious areas (per rule J, subsection 2.3 and 3.1bi).

Water Quality Management

Subsection 3.1.c of Rule J requires the Applicant to provide volume abstraction in accordance with 3.1b or least 60 percent annual removal efficiency for total phosphorus (TP), and at least 90 percent annual removal efficiency for total suspended solids (TSS) from site runoff, and no net increase in TSS or TP loading leaving the site from existing conditions. Because the infiltration basin and underground infiltration system proposed by the applicant provides the volume abstraction required by 3.1b and the engineer concurs with the modeling, the engineer finds that the proposed project is in conformance with Rule J, Subsection 3.1.c.

Low floor Elevation

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

Table 5. Low Floor Summary

Building Riparian to Stormwater Facility	Low Floor Elevation of Building (feet)	100-year High Water Level (feet)	Freeboard to 100-year High Water Level (feet)
Proposed Office Building	899.0	890.1	8.9

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. While the applicant provided a draft post construction operation and maintenance plan for review, the following revisions are needed:

J2. Permit applicant must provide a maintenance and inspection declaration. A maintenance declaration template is available on the permits page of the RPBCWD website. (http://www.rpbcwd.org/permits/). A draft declaration must be provided for District review prior to recording.

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 Minnesota Pollution Control Agency-certified salt applicator engaged in implementing the plan. To close out the permit and release the $5,000 in financial assurance held for the purpose of chloride management, 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.

Wetland Protection

In accordance with Rule J, subsection 3.10a, there is no proposed activity subject to Rule J that will alter the site in a manner that increases the bounce in water level, duration of inundation, or change the runout elevation in the subwatershed, for the wetland receiving runoff from the land disturbing activities. Because the applicant's HydroCAD model results demonstrate, and the engineer concurs, that the proposed flow rate and volumes flowing towards the off-site wetland are less than the under existing conditions, the bounce and inundation will not increase, thus the project meets the Bounce and Inundation criterion.

Rule J, Subsection 3.10b requires that treatment of runoff to high and exceptional value wetlands archive 90 percent total suspended solids removal and 75 percent total phosphorus removal. Because the value of the off-site wetland is unknown, the applicant assumed the wetland is exceptional value. MIDS modeling results show the proposed underground infiltration system provides 93% TSS and 88% TP removals, thus the engineer finds that the proposed project is in conformance with Rule J, Subsection 3.10b.

Rule L: Permit Fee

The RPBCWD permit fee schedule requires permit applicants to submit a permit-fee deposit of $3,000 to be held in escrow and applied to reimburse RPBCWD for the permit-application processing fee and permit review and inspection-related costs. A permit fee deposit of $3,000 was received by Nor-Son on January 10, 2022. The applicant must replenish the permit fee deposit to the original amount due before the permit will be issued. Subsequently, if the costs of review, administration, inspections and closeout-related or other regulatory activities exceed the fee deposit amount, the applicant will be required to replenish the deposit to the original amount or such lesser amount as the RPBCWD administrator deems sufficient within 30 days of receiving notice that such deposit is due. The administrator will close out the relevant application or permit and revoke prior approvals, if any, if the permit-fee deposit is not timely replenished.

L1. The applicant must replenish the permit fee deposit to the original amount due before the permit will be issued.

Rule M: Financial Assurance

	Unit	Unit Cost	# of Units	Total
Rules C: Silt fence:	LF	$2.50	300	$750
Inlet protection	EA	$100	6	$600
Rock Entrance	EA	$250	1	$250
Restoration	Ac	$2,500	1.52	$3,800
Rules J: Stormwater Management Underground infiltration system: 125% of engineer's opinion of cost ($160,577)	EA	125% OPC	1	$200,721
Chloride Management	LS	$5,000	1	$5,000
Contingency (10%)		10%		$21,112
Total Financial Assurance				**$232,233**

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 will conform to Rules C and J if the Rule Specific Permit Conditions listed above are met.

Recommendation:

Approval of the permit contingent upon:

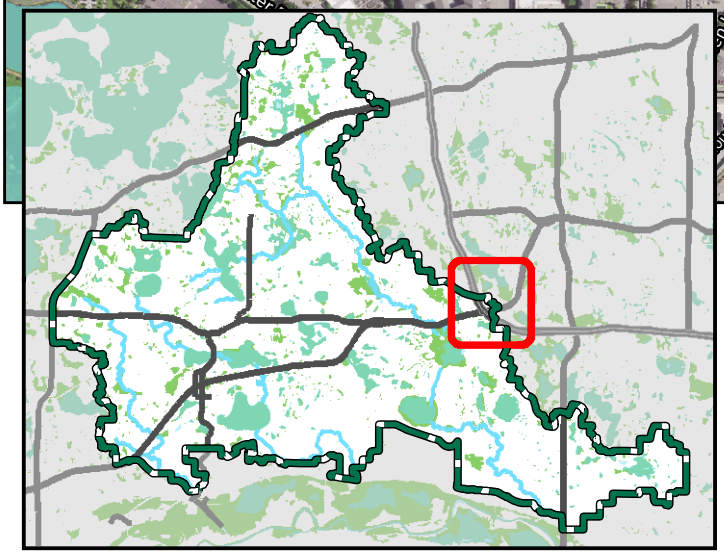
1. Financial Assurance in the amount of $232,233.

2. Receipt of an stormwater management report that has been certified by an engineer registered in Minnesota (per Rule J, subsection 5.4).
3. The Applicant providing the name and contact information of the individual responsible for erosion control at the site. RPBCWD must be notified if the responsible individual changes during the permit term.
4. Receipt of updated plans showing runoff from watershed DA5 routed to an abstraction BMP to fully demonstrate that 1.1" of runoff is being captured from all impervious areas (per rule J, subsection 2.3 and 3.1bi).
5. Receipt in recordation a maintenance declaration for the stormwater management facilities. A draft must be approved by the District prior to recordation.
6. The applicant must replenish the permit fee deposit to the original amount due before the permit will be issued.

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

1. Continued compliance with General Requirements.
2. 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.
3. Providing the following additional close-out materials:
    a) Documentation that constructed infiltration 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
4. To close out the permit and release the $5,000 in financial assurance held for the purpose of the chloride management, the permit applicant must provide a signed 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.
5. Per Rule J, Subsection 3.1.b.ii measured infiltration capacity of the soils at the bottom of the infiltration system 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 3.1b 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).



N

Feet

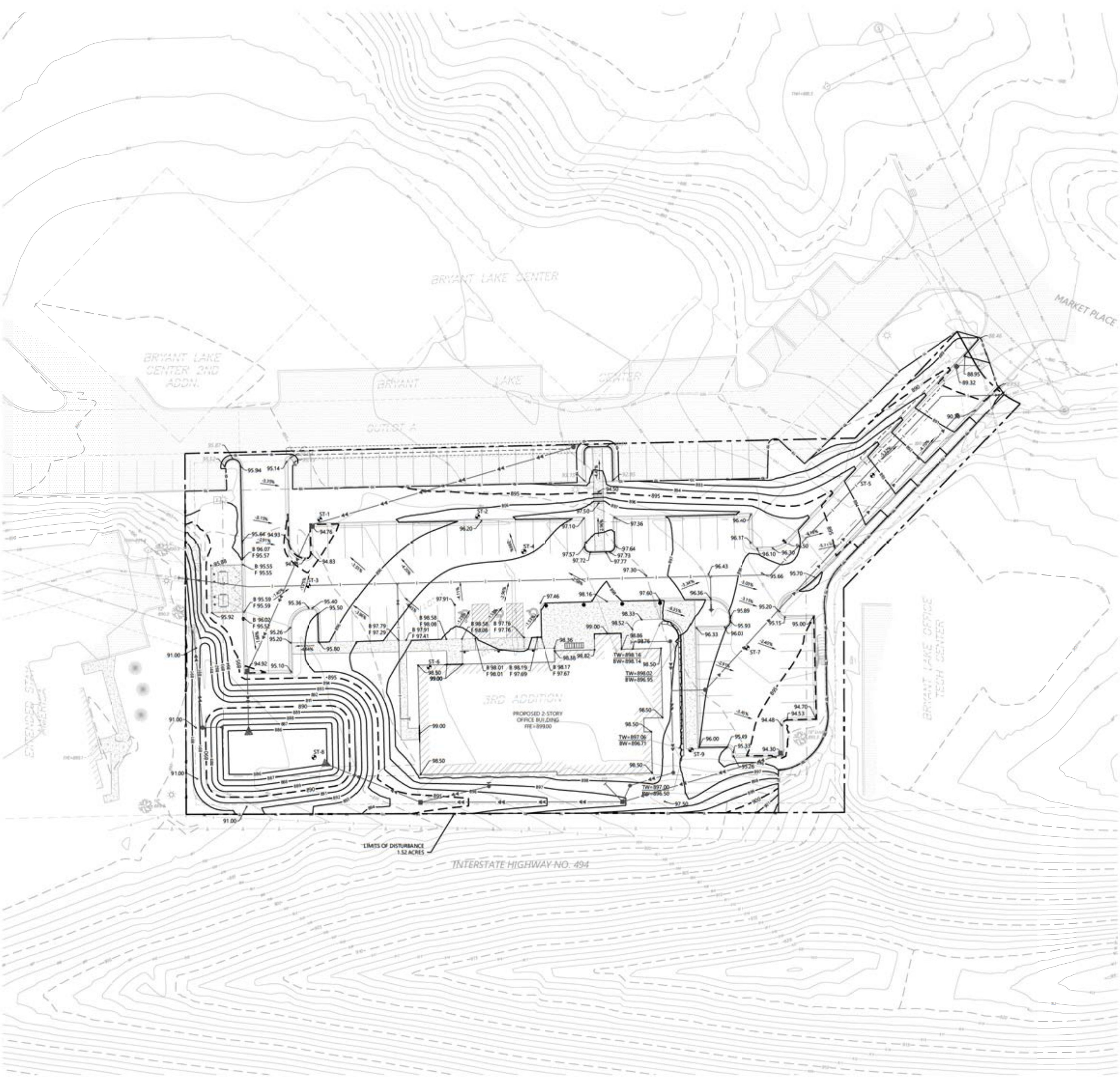
0 1,000

Permit Location Map

NOR-SON OFFICE DEVELOPMENT

Permit 2021-089

Riley Purgatory Bluff Creek Watershed District



Call 48 Hours before digging:
811 or call811.com
Common Ground Alliance

GRADING LEGEND

EXISTING	PROPOSED	
		PROPERTY LINE
		INDEX CONTOUR
		INTERVAL CONTOUR
		CURB AND GUTTER
		POND NORMAL WATER LEVEL
		STORM SEWER
		FLARED END SECTION (WITH RIPRAP)
		WATER MAIN
		SANITARY SEWER
		RETAINING WALL
		DRAIN TILE
		RIDGE LINE
		GRADING LIMITS
	× 900.00	SPOT ELEVATION
	0.00%	FLOW DIRECTION
	TW=XXX.XX / BW=XXX.XX	TOP AND BOTTOM OF RETAINING WALL
	E.O.F.	EMERGENCY OVERFLOW
SB-19	SB-19	SOIL BORING LOCATION

GRADING NOTES

1. LOCATIONS AND ELEVATIONS OF EXISTING TOPOGRAPHY AND UTILITIES AS SHOWN ON THIS PLAN ARE APPROXIMATE. CONTRACTOR SHALL FIELD VERIFY SITE CONDITIONS AND UTILITY LOCATIONS PRIOR TO EXCAVATION/CONSTRUCTION. THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY IF ANY DISCREPANCIES ARE FOUND.
2. CONTRACTORS SHALL REFER TO ARCHITECTURAL PLANS FOR EXACT LOCATIONS AND DIMENSIONS OF VESTIBULE, SLOPED PAVEMENT, EXIT PORCHES, RAMPS, TRUCK DOCKS, PRECISE BUILDING DIMENSIONS, EXACT BUILDING UTILITY ENTRANCE LOCATIONS, AND EXACT LOCATIONS AND NUMBER OF DOWNSPOUTS.
3. ALL EXCAVATION SHALL BE IN ACCORDANCE WITH THE CURRENT EDITION OF "STANDARD SPECIFICATIONS FOR TRENCH EXCAVATION AND BACKFILL/SURFACE RESTORATION" AS PREPARED BY THE CITY ENGINEERS ASSOCIATION OF MINNESOTA.
4. ALL DISTURBED UNPAVED AREAS ARE TO RECEIVE SIX INCHES OF TOPSOIL AND SOD OR SEED. THESE AREAS SHALL BE WATERED UNTIL A HEALTHY STAND OF GRASS IS OBTAINED. SEE LANDSCAPE PLAN FOR PLANTING AND TURF ESTABLISHMENT.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AND MAINTAINING TRAFFIC CONTROL DEVICES SUCH AS BARRICADES, WARNING SIGNS, DIRECTIONAL SIGNS, FLAGMEN AND LIGHTS TO CONTROL THE MOVEMENT OF TRAFFIC WHERE NECESSARY. PLACEMENT OF THESE DEVICES SHALL BE APPROVED BY THE ENGINEER PRIOR TO PLACEMENT. TRAFFIC CONTROL DEVICES SHALL CONFORM TO APPROPRIATE MNDOT STANDARDS.
6. ALL SLOPES SHALL BE GRADED TO 3:1 OR FLATTER, UNLESS OTHERWISE INDICATED ON THIS SHEET.
7. CONTRACTOR SHALL UNIFORMLY GRADE AREAS WITHIN LIMITS OF GRADING AND PROVIDE A SMOOTH FINISHED SURFACE WITH UNIFORM SLOPES BETWEEN POINTS WHERE ELEVATIONS ARE SHOWN OR BETWEEN SUCH POINTS AND EXISTING GRADES.
8. **SPOT ELEVATIONS SHOWN INDICATE FINISHED PAVEMENT ELEVATIONS & GUTTER FLOW LINE UNLESS OTHERWISE NOTED. PROPOSED CONTOURS ARE TO FINISHED SURFACE GRADE.**
9. SEE SOILS REPORT FOR PAVEMENT THICKNESSES AND HOLD DOWNS.
10. CONTRACTOR SHALL DISPOSE OF ANY EXCESS SOIL MATERIAL THAT EXISTS AFTER THE SITE GRADING AND UTILITY CONSTRUCTION IS COMPLETED. THE CONTRACTOR SHALL DISPOSE OF ALL EXCESS SOIL MATERIAL IN A MANNER ACCEPTABLE TO THE OWNER AND THE REGULATING AGENCIES.
11. CONTRACTOR SHALL PROVIDE A STRUCTURAL RETAINING WALL DESIGN CERTIFIED BY A LICENSED PROFESSIONAL ENGINEER.
12. ALL CONSTRUCTION SHALL CONFORM TO LOCAL, STATE AND FEDERAL RULES INCLUDING THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT REQUIREMENTS.
13. PRIOR TO PLACEMENT OF ANY STRUCTURE OR PAVEMENT, A PROOF ROLL, AT MINIMUM, WILL BE REQUIRED ON THE SUBGRADE. PROOF ROLLING SHALL BE ACCOMPLISHED BY MAKING MINIMUM OF 2 COMPLETE PASSES WITH FULLY-LOADED TANDEM-AXLE DUMP TRUCK, OR APPROVED EQUAL, IN EACH OF 2 PERPENDICULAR DIRECTIONS WHILE UNDER SUPERVISION AND DIRECTION OF THE INDEPENDENT TESTING LABORATORY. AREAS OF FAILURE SHALL BE EXCAVATED AND RE-COMPACTED AS SPECIFIED HEREIN.
14. EMBANKMENT MATERIAL PLACED BENEATH BUILDINGS AND STREET OR PARKING AREAS SHALL BE COMPACTED IN ACCORDANCE WITH THE SPECIFIED DENSITY METHOD AS OUTLINED IN MNDOT 2105.3F1 AND THE REQUIREMENTS OF THE GEOTECHNICAL ENGINEER.
15. EMBANKMENT MATERIAL NOT PLACED IN THE BUILDING PAD, STREETS OR PARKING AREA, SHALL BE COMPACTED IN ACCORDANCE WITH REQUIREMENTS OF THE ORDINARY COMPACTION METHOD AS OUTLINED IN MNDOT 2105.3F2.
16. ALL SOILS AND MATERIALS TESTING SHALL BE COMPLETED BY AN INDEPENDENT GEOTECHNICAL ENGINEER. EXCAVATION FOR THE PURPOSE OF REMOVING UNSTABLE OR UNSUITABLE SOILS SHALL BE COMPLETED AS REQUIRED BY THE GEOTECHNICAL ENGINEER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL REQUIRED SOILS TESTS AND INSPECTIONS WITH THE GEOTECHNICAL ENGINEER.

INFILTRATION BASIN NOTES

1. BASIN EXCAVATION AND PIPE INSTALLATION MAY TAKE PLACE BEFORE CURB INSTALLATION. ALL OTHER BASIN CONSTRUCTION MUST WAIT UNTIL FINAL SITE LANDSCAPING. REMOVE SEDIMENT FROM EXCAVATED BASIN PRIOR TO PLACEMENT OF FILTER MEDIA. PLACE SAND BAGS OR SIMILAR ITEM IN CURB CUTS TO PRE-FILTER STORM WATER UNTIL PLANTS ARE ESTABLISHED IN BASINS. MAINTAIN INLET PROTECTION ON DOWN STREAM INLETS UNTIL BASINS ARE ON-LINE.
2. BASIN EXCAVATION SHALL BE WITH TOOTHED-BUCKETS TO SCARIFY THE BOTTOM.
3. PLACE SILT FENCE AROUND BASINS AS SHOWN IMMEDIATELY AFTER BASIN CONSTRUCTION.
4. BASINS MUST BE TESTED FOR INFILTRATION RATE AFTER TOTAL SITE STABILIZATION. A DUAL RING INFILTROMETER SHALL BE USED FOR TESTING. MINIMUM INFILTRATION RATE IS 1-INCH PER HOUR. IF BASIN DOES NOT MEET INFILTRATION RATE, CONTRACTOR MUST TAKE CORRECTIVE ACTION UNTIL MINIMUM INFILTRATION RATE IS MET. CORRECTIVE ACTION MAY INCLUDE REMOVING PLUG IN DRAIN TILE. ALL TESTING AND CORRECTIVE ACTION SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR, AND SHALL BE INCIDENTAL TO THE CONTRACT, WITH NO DIRECT COMPENSATION MADE.
5. THE POND SHALL BE SEEDED WITH MNDOT 33-261 SEED MIX.

0' 20' 40' 60'

PERMIT SET

NOR-SON CONSTRUCTION

Westwood

Westwood Professional Services, Inc.

NOR-SON EDEN PRIARIE OFFICE

7544 MARKET PLACE DR. EDEN PRAIRIE, MN. 55344

PERMIT SET

PRINTED: 2/8/2022 2:17:27 PM

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

LICENSE NO. 26908 DATE: 02/08/22

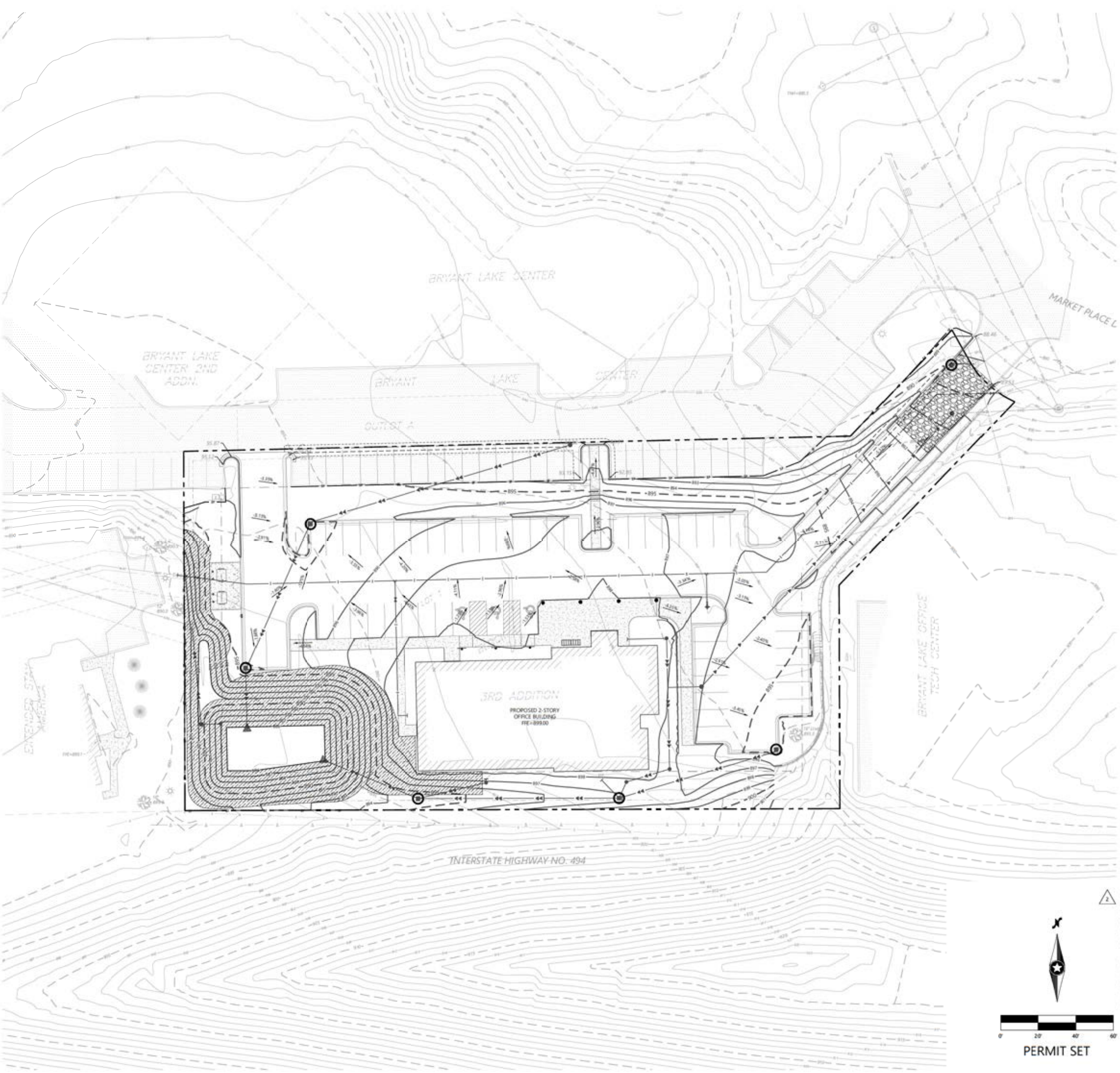
PROJECT NUMBER: 0032747.00
ISSUED: 12/21/21

#	REVISION	DATE
A	BID ADDENDUM 01	01/07/22
B	BID ADDENDUM 02	01/12/22
1	FIELD BULLETIN 01	01/28/22
2	WATERSHED COMMENTS	02/08/22

GRADING & DRAINAGE PLAN

C3

PROJECT NUMBER: 0032747.00



EROSION CONTROL LEGEND

Call 48 Hours before digging:
811 or call811.com
Common Ground Alliance

EXISTING	PROPOSED	
		PROPERTY LINE
		INDEX CONTOUR
		INTERVAL CONTOUR
		CURB AND GUTTER
		POND NORMAL WATER LEVEL
		SILT FENCE
		HEAVY DUTY SILT FENCE
		REDUNDANT SILT CONTROL
		STORM SEWER
		FLARED END SECTION (WITH RIPRAP)
		WATER MAIN
		SANITARY SEWER
		RETAINING WALL
		DRAIN TILE
		GRADING LIMITS
		ROCK CONSTRUCTION ENTRANCE
		EROSION CONTROL BLANKET
		TURF REINFORCEMENT MAT
	E.O.F.	EMERGENCY OVERFLOW
SB-19	SB-19	SOIL BORING LOCATION
		INLET PROTECTION

GENERAL EROSION CONTROL NOTES

1. THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AS SHOWN ON THESE PLANS ARE BASED ON RECORDS OF THE VARIOUS UTILITY COMPANIES AND LIMITED MEASUREMENTS TAKEN IN THE FIELD. THE INFORMATION SHALL NOT BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR SHALL VERIFY EXISTING CONDITIONS PRIOR TO CONSTRUCTION AND NOTIFY THE OWNER OR ENGINEER OF DISCREPANCIES.
2. ALL SILT FENCE AND OTHER EROSION CONTROL FEATURES SHALL BE IN-PLACE PRIOR TO ANY EXCAVATION/CONSTRUCTION AND SHALL BE MAINTAINED UNTIL VIABLE TURF OR GROUND COVER HAS BEEN ESTABLISHED. EXISTING SILT FENCE ON-SITE SHALL BE MAINTAINED AND OR REMOVED AND SHALL BE CONSIDERED INCIDENTAL TO THE GRADING CONTRACT. IT IS OF EXTREME IMPORTANCE TO BE AWARE OF CURRENT FIELD CONDITIONS WITH RESPECT TO EROSION CONTROL. TEMPORARY PONDING, DIKES, HAYBALES, ETC., REQUIRED BY THE CITY SHALL BE INCIDENTAL TO THE GRADING CONTRACT.
3. EROSION AND SILTATION CONTROL (ESC): THE CONTRACTOR SHALL ASSUME COMPLETE RESPONSIBILITY FOR CONTROLLING ALL SILTATION AND EROSION OF THE PROJECT AREA. THE CONTRACTOR SHALL USE WHATEVER MEANS NECESSARY TO CONTROL THE EROSION AND SILTATION INCLUDING BUT NOT LIMITED TO: CATCH BASIN INSERTS, CONSTRUCTION ENTRANCES, EROSION CONTROL BLANKET, AND SILT FENCE. ESC SHALL COMMENCE WITH GRADING AND CONTINUE THROUGHOUT THE PROJECT UNTIL ACCEPTANCE OF THE WORK BY THE OWNER. THE CONTRACTOR'S RESPONSIBILITY INCLUDES ALL IMPLEMENTATION AS REQUIRED TO PREVENT EROSION AND THE DEPOSITING OF SILT. THE OWNER MAY DIRECT THE CONTRACTOR'S METHODS AS DEEMED FIT TO PROTECT PROPERTY AND IMPROVEMENTS. ANY DEPOSITION OF SILT OR MUD ON NEW OR EXISTING PAVEMENT OR IN EXISTING STORM SEWERS OR SWALES SHALL BE REMOVED AFTER EACH RAIN EVENT. AFFECTED AREAS SHALL BE CLEANED TO THE SATISFACTION OF THE OWNER, ALL AT THE EXPENSE OF THE CONTRACTOR. ALL TEMPORARY EROSION CONTROL SHALL BE REMOVED BY THE CONTRACTOR AFTER THE TURF IS ESTABLISHED.
4. ALL STREETS DISTURBED DURING WORKING HOURS MUST BE CLEANED AT THE END OF EACH WORKING DAY. A CONSTRUCTION ENTRANCE TO THE SITE MUST BE PROVIDED ACCORDING TO DETAILS TO REDUCE TRACKING OF DIRT ONTO PUBLIC STREETS.
5. PROPOSED PONDS SHALL BE EXCAVATED FIRST AND USED AS TEMPORARY PONDING DURING CONSTRUCTION.
6. WHEN INSTALLING END-OF-LINE FLARED END SECTIONS, BRING THE SILT FENCE UP & OVER THE FLARED END SECTIONS & COVER DISTURBED AREAS WITH RIP RAP. THE UPSTREAM FLARED END SECTIONS SHALL HAVE WOOD FIBER BLANKET INSTALLED ON THE DISTURBED SOILS.
7. ALL UNPAVED AREAS ALTERED DUE TO CONSTRUCTION ACTIVITIES MUST BE RESTORED WITH SEED AND MULCH, SOD, EROSION CONTROL BLANKET OR BE HARD SURFACE WITHIN 2 WEEKS OF COMPLETION OF CONSTRUCTION.
8. THE SITE MUST BE STABILIZED PER THE REQUIREMENTS OF THE MPCA, NPDES, MNDOT, AND CITY.
   - A. TEMPORARY (GREATER THAN 1-YEAR) SEED SHALL BE MNDOT SEED MIX 22-111 AT 30.5-POUNDS PER ACRE.
   - B. TEMPORARY (LESS THAN 1-YEAR) SEED SHALL BE MNDOT SEED MIX 21-112 (FALL) OR 21-111 (SPRING/SUMMER) AT 100-POUNDS PER ACRE.
   - C. INFILTRATION/FILTRATION BASIN SHALL BE MNDOT SEED MIX 34-262 AT 14.5-POUNDS PER ACRE.
   - D. POND SLOPES SHALL BE MNDOT SEED MIX 33-261 AT 35-POUNDS PER ACRE.
   - E. GENERAL SEEDING SHALL BE MNDOT SEED MIX 25-151 AT 70-POUNDS PER ACRE.
   - F. MULCH SHALL BE MNDOT TYPE 1 APPLIED AT 2-TONS PER ACRE.
9. FOR AREAS WITH SLOPE OF 3:1 OR GREATER, RESTORATION WITH SOD OR EROSION CONTROL BLANKET IS REQUIRED.
10. ALL TEMPORARY STOCKPILES MUST HAVE SILT FENCE INSTALLED AROUND THEM TO TRAP SEDIMENT.
11. ALL PERMANENT PONDS USED AS TEMPORARY SEDIMENT BASINS DURING CONSTRUCTION SHALL BE DREDGED AFTER THE SITE HAS BEEN STABILIZED TO RESTORE THE POND TO THE PROPOSED BOTTOM ELEVATION.
12. ALL CONSTRUCTION SHALL CONFORM TO LOCAL AND STATE RULES INCLUDING THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT REQUIREMENTS.
13. THE SITE MUST BE KEPT IN A WELL-DRAINED CONDITION AT ALL TIMES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR TEMPORARY DITCHES, PIPING OR OTHER MEANS REQUIRED TO INSURE PROPER DRAINAGE DURING CONSTRUCTION. LOW POINTS IN ROADWAYS OR BUILDING PADS MUST BE PROVIDED WITH A POSITIVE OUTFLOW.
14. PUBLIC STREETS USED FOR HAULING SHALL BE KEPT FREE OF SOIL AND DEBRIS. STREET SWEEPING SHALL BE CONCURRENT WITH SITE WORK.
15. CONSTRUCTION SHOULD INCLUDE MINIMIZATION OF THE DISTURBANCE INTENSITY AND DURATION, INCLUDING PHASING OF DISTURBANCE TO MINIMIZE QUANTITY OF DISTURBED AREA AT ANY ONE TIME.
16. SOIL SURFACES COMPACTED DURING CONSTRUCTION AND REMAINING PERVIOUS UPON COMPLETION OF CONSTRUCTION MUST BE DECOMPACTED TO ACHIEVE:
   - A. A SOIL COMPACTION TESTING PRESSURE OF LESS THAN 1,400 KILOPASCALS OR 200 POUNDS PER SQUARE INCH IN THE UPPER 12 INCHES OF SOIL OR
   - B. A BULK DENSITY OF LESS THAN 1.4 GRAMS PER CUBIC CENTIMETER OR 87 POUNDS PER CUBIC FOOT IN THE UPPER 12 INCHES OF SOIL.

   IN ADDITION, UTILITIES, TREE ROOTS AND OTHER EXISTING VEGETATION MUST BE PROTECTED UNTIL FINAL REVEGETATION OR OTHER STABILIZATION OF THE SITE.
17. PROTECTION OF NATURAL TOPOGRAPHY AND SOILS CONDITIONS, INCLUDING RETENTION ONSITE OF NATIVE TOPSOIL TO THE GREATEST EXTENT POSSIBLE (PER RULE C, SUBSECTION 3.1A).
18. STAKING OFF AND MARKING OF PROPOSED INFILTRATION FACILITIES TO PREVENT SOIL COMPACTION BY HEAVY EQUIPMENT, STOCKPILING OF MATERIALS, AND TRAFFIC. IF INFILTRATION FACILITIES ARE IN PLACE DURING CONSTRUCTION ACTIVITIES, BEST PRACTICES MUST BE DEPLOYED TO PREVENT SEDIMENT AND OTHER MATERIAL FROM ENTERING THE PRACTICE. INFILTRATION FACILITIES MUST NOT BE EXCAVATED TO WITHIN 3 FEET FINAL GRADE UNTIL THE CONTRIBUTING DRAINAGE AREA HAS BEEN CONSTRUCTED AND FULLY STABILIZED. ANY ACCUMULATED SEDIMENT IN AN INFILTRATION FACILITY MUST BE REMOVED IN MANNER THAT PREVENTS COMPACTION OF THE FACILITY BOTTOM. (PER RULE C, SUBSECTION 3.1H).
19. ALL TEMPORARY EROSION PREVENTION AND SEDIMENT CONTROL BMPS MUST BE REMOVED UPON FINAL STABILIZATION. (PER RULE C, SUBSECTION 3.2B).
20. PROPER MANAGEMENT OF ALL CONSTRUCTION SITE WASTE, SUCH AS DISCARDED BUILDING MATERIALS, CONCRETE TRUCK WASHOUT, CHEMICALS, LITTER AND SANITARY WASTE AT THE CONSTRUCTION SITE.

PROJECT NUMBER: 0032747.00

NOR-SON CONSTRUCTION

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NOR-SON EDEN PRIARIE OFFICE

7544 MARKET PLACE DR. EDEN PRAIRIE, MN. 55344

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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

LICENSE NO. 26908 DATE: 02/08/22

PROJECT NUMBER: 0032747.00
ISSUED: 12/21/21

#	REVISION	DATE
A	BID ADDENDUM 01	01/07/22
B	BID ADDENDUM 02	01/12/22
1	FIELD BULLETIN 01	01/28/22
2	WATERSHED COMMENTS	02/08/22

EROSION CONTROL PLAN

C4

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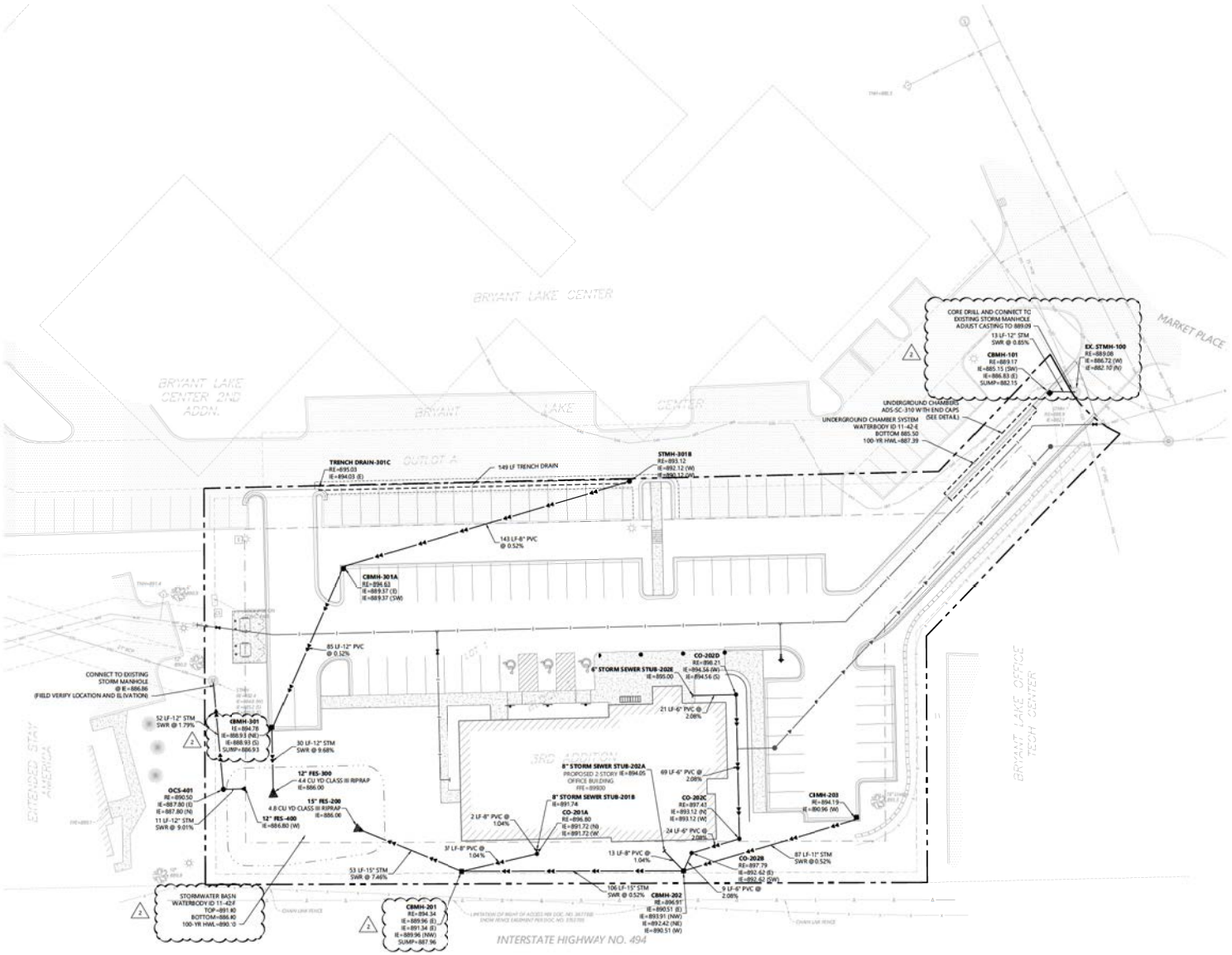

STORM SEWER LEGEND

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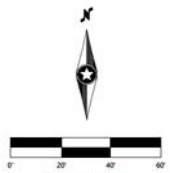
EXISTING	PROPOSED	
		PROPERTY LINE
		EASEMENT LINE
		CURB AND GUTTER
		SANITARY SEWER
		SANITARY SEWER FORCE MAIN
		STORM SEWER
		WATER MAIN
		HYDRANT
		GAS
		UNDERGROUND ELECTRIC
		OVERHEAD ELECTRIC
		UNDERGROUND TELEPHONE
		OVERHEAD TELEPHONE
		TELEPHONE FIBER OPTIC
		CABLE TELEVISION
		DRAIN TILE
		GATE VALVE
		FLARED END SECTION (WITH RIPRAP)
		LIGHT POLE

GENERAL STORM SEWER NOTES

1. THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AS SHOWN ON THESE PLANS ARE BASED ON RECORDS OF THE VARIOUS UTILITY COMPANIES AND LIMITED MEASUREMENTS TAKEN IN THE FIELD. THE INFORMATION SHALL NOT BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR SHALL VERIFY EXISTING CONDITIONS PRIOR TO CONSTRUCTION AND NOTIFY THE OWNER OR ENGINEER OF DISCREPANCIES.
2. ALL STORM SEWER MATERIAL AND INSTALLATIONS SHALL BE PER CITY REQUIREMENTS, MINNESOTA PLUMBING CODE, AND IN ACCORDANCE WITH THE CURRENT EDITION OF "STANDARD SPECIFICATIONS FOR WATER MAIN AND SERVICE LINE INSTALLATION AND SANITARY SEWER AND STORM SEWER INSTALLATION" AS PREPARED BY THE CITY ENGINEERS ASSOCIATION OF MINNESOTA.
3. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL OBTAIN THE NECESSARY FEDERAL, STATE AND LOCAL PERMITS FOR THE PROPOSED WORK OR VERIFY WITH THE OWNER OR ENGINEER THAT PERMITS HAVE BEEN OBTAINED. PERMIT FEES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR UNLESS OTHERWISE ARRANGED WITH THE OWNER.
4. CONTRACTOR SHALL REFER TO ARCHITECTURAL PLANS FOR EXACT LOCATION AND DIMENSIONS OF DOORWAYS, RAMPS, TRUCK DOORS, PRECISE BUILDING DIMENSIONS AND EXACT BUILDING UTILITY CONNECTION LOCATIONS.
5. ALL PRIVATE UTILITIES SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE SPECIFICATIONS OF THE APPROPRIATE UTILITY COMPANY. THE CONTRACTOR SHALL COORDINATE THE SERVICE LINE CONSTRUCTION WITH THE UTILITY COMPANIES.
6. CONTRACTOR SHALL OBTAIN ALL NECESSARY CITY PERMITS FOR UTILITY CONNECTIONS, AND UTILITIES SHALL BE INSPECTED AND APPROVED BY THE CITY. THE CITY SHALL BE NOTIFIED 48-HOURS PRIOR TO COMMENCING WITH THE UTILITY CONSTRUCTION OR ANY REQUIRED TESTING. CONTRACTOR SHALL NOT OPERATE, INTERFERE WITH, CONNECT ANY PIPE OR HOSE TO, OR TAP ANY WATER MAIN BELONGING TO THE CITY UNLESS DULY AUTHORIZED TO DO SO BY THE CITY. ANY ADVERSE CONSEQUENCES OF SCHEDULED OR UNSCHEDULED DISRUPTIONS OF SERVICE TO THE PUBLIC ARE TO BE THE RESPONSIBILITY OF THE CONTRACTOR.
7. A MINIMUM VERTICAL SEPARATION OF 18 INCHES S REQUIRED AT ALL WATER LINE CROSSINGS WITH STORM SEWER. THE WATER LINE SHALL NOT HAVE JOINTS OR CONNECTION WITHIN 10-FEET OF THE CROSSING. INSULATE CROSSINGS WITH STORM SEWER.
8. UTILITY SERVICES TYPICALLY TERMINATE 5' OUTSIDE BUILDING WALL UNLESS OTHERWISE SHOWN OR NOTED.
9. STORM SEWER PIPE:
   A. RCP AND HDPE PIPE MAY BE INSTALLED WITH APPROVAL OF LOCAL GOVERNING AGENCY.
   B. REINFORCED CONCRETE PIPE SHALL BE CLASS I FOR PIPE DIAMETERS 18" AND SMALLER, CLASS 3 FOR PIPE DIAMETERS 21" AND LARGER UNLESS OTHERWISE NOTED, PER ASTM C76 WITH R-4 GASKETS.
   C. HDPE STORM PIPE 4- TO 10-INCHES IN DIAMETER SHALL MEET REQUIREMENTS OF AASHTO M252. HDPE STORM PIPE 12- TO 60-INCHES IN DIAMETER SHALL MEET REQUIREMENTS OF ASTM F306. FITTINGS SHALL BE PER ASTM D3212 AND INSTALLED PER ASTM D2321.
   D. PVC STORM SEWER PIPE AND FITTINGS SHALL BE SCHEDULE 40 PIPE PER ASTM D2665 AND INSTALLED PER ASTM D2321.
   E. CORRUGATED METAL PIPE (CMP) FOR SIZES 18 TO 120-INCH AND MUST MEET ASTM A760 OR ASTM A 796 AND BE INSTALLED PER ASTM A798. CMP MAY NOT BE INSTALLED WITHIN 10-FEET OF A WATERMAIN, WATER SERVICE, OR A BUILDING.
   F. ALL STORM SEWER JOINTS AND STRUCTURE CONNECTIONS SHALL BE GASTIGHT OR WATERTIGHT AS REQUIRED BY MINNESOTA PLUMBING CODE, PART 707.3. STORM SEWER LOCATED WITHIN 10-FEET OF A BUILDING AND/OR WATER LINE SHALL BE TESTED PER MINNESOTA PLUMBING CODE, PART 712.
10. ALL NONCONDUCTIVE PIPE SHALL BE INSTALLED WITH A LOCATE (TRACER) WIRE PER MINNESOTA PLUMBING CODE, PART 604.9.
11. AFTER CONSTRUCTION IS COMPLETED, THE CONTRACTOR SHALL PROVIDE THE OWNER WITH AN AS-BUILT RECORD OF UTILITY CONSTRUCTION. THE AS-BUILT SHALL INCLUDE LOCATION AND LENGTH DEVIATIONS OR CHANGES TO THE PLAN. CONTRACTOR TO VERIFY WITH OWNER OR ENGINEER WHETHER A PLAN WITH POST-CONSTRUCTION ELEVATIONS IS REQUIRED.
12. ALL CATCH BASIN CASTINGS IN CURB SHALL BE SUMPED 0.15 FEET AND MANHOLE CASTINGS IN PAVED AREAS SHALL BE SUMPED 0.05 FEET. RIM ELEVATIONS ON PLAN REFLECT THE SUMPED ELEVATIONS.



PERMIT SET

PROJECT NUMBER: 0032747.00

NOR-SON CONSTRUCTION

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NOR-SON EDEN PRIARIE OFFICE

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LICENSE NO. 26908 DATE: 02/08/22

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ISSUED: 12/21/21

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B	BID ADDENDUM 02	01/12/22
1	FIELD BULLETIN 01	01/28/22
2	WATERSHED COMMENTS	02/08/22

STORM SEWER PLAN

C6

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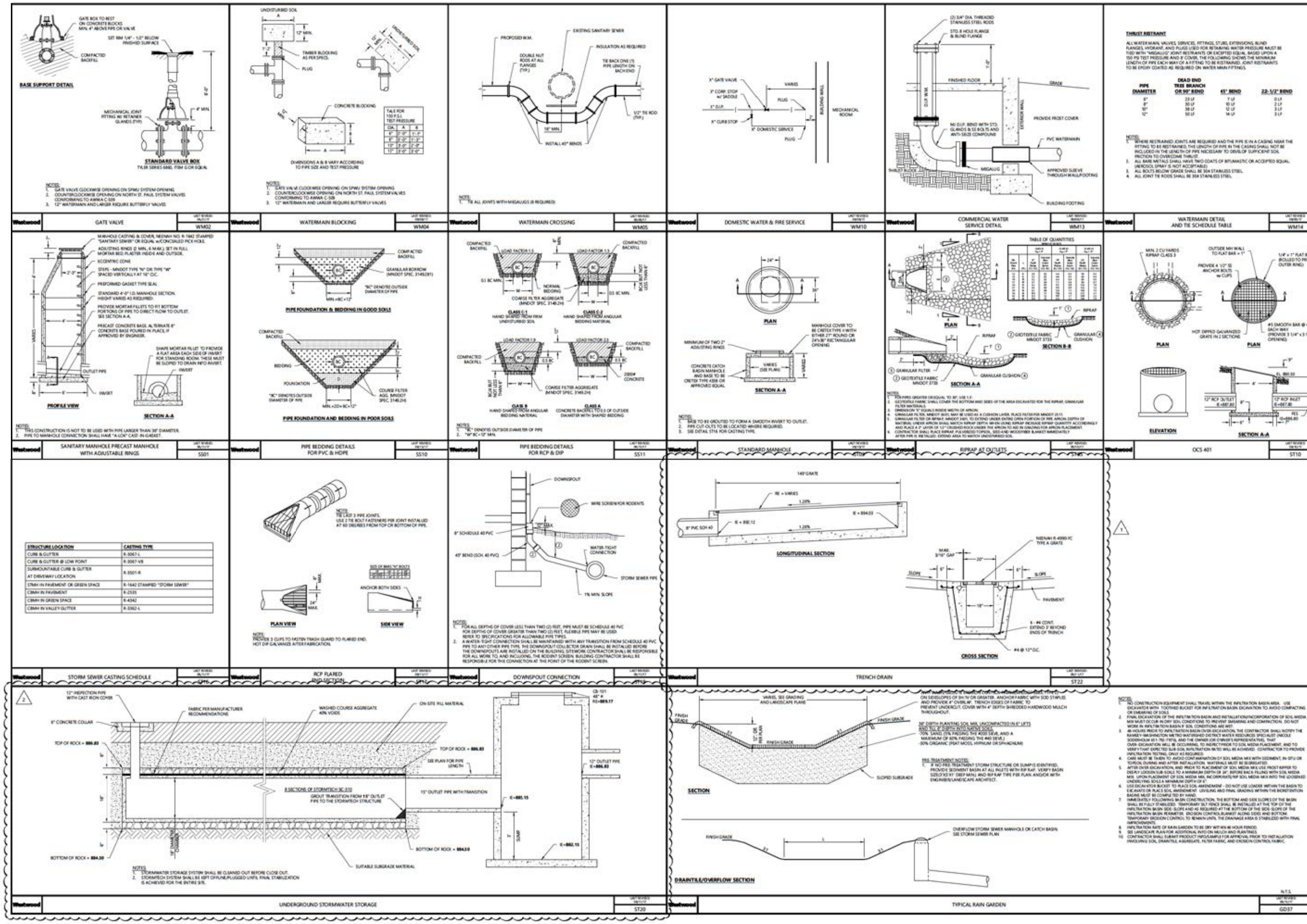

STRUCTURE LOCATION	CASTING TYPE
CURB & GUTTER	R-3067-L
CURB & GUTTER @ LOW POINT	R-3067-VB
SURMOUNTABLE CURB & GUTTER AT DRIVEWAY LOCATION	R-3501-R
STMH IN PAVEMENT OR GREEN SPACE	R-1642 STAMPED "STORM SEWER"
CBMH IN PAVEMENT	R-2535
CBMH IN GREEN SPACE	R-4342
CBMH IN VALLEY GUTTER	R-3362-L

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LICENSE NO. 26908 DATE: 02/08/22

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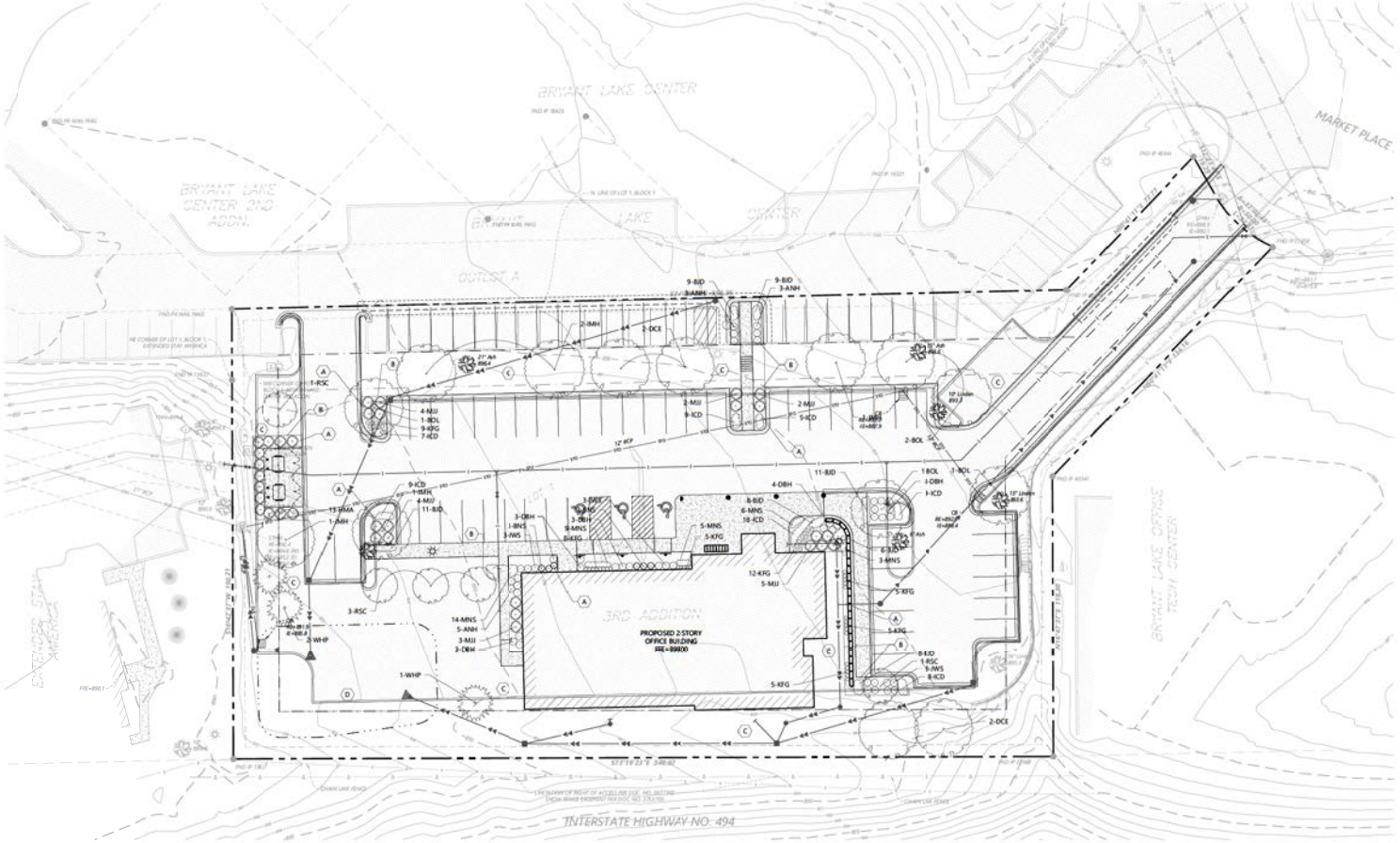
UTILITY DETAILS

C7

PROJECT NUMBER: 0032747.00



LANDSCAPE LEGEND

- OVERSTORY DECIDUOUS TREE
- CONIFEROUS TREE
- ORNAMENTAL TREE
- SHRUBS
- PERENNIALS
- EDGER

LANDSCAPE KEYNOTES (A)

- A SHREDDED HARDWOOD MULCH (TYP.)
- B EDGER (TYP.)
- C SOD (TYP.)
- D SEED (MNDOT STORMWATER SEED MIX #33-261)

PLANT SCHEDULE

CODE	QTY	COMMON	BOTANICAL NAME	SIZE	ROOT	SPACING
OVERSTORY TREE	**14**					
DCE	4	DISCOVERY ELM	ULMUS DAVIDIANA VAR. JAPONICA 'DISCOVERY'	2.5" CAL.	B&B	AS SHOWN
BOL	5	BOULEVARD LINDEN	TILIA AMERICANA 'BOULEVARD'	2.5" CAL.	B&B	AS SHOWN
IMH	5	IMPERIAL HONEYLOCUST	GLEDITSIA TRIACANTHOS VAR. INERMIS 'IMPCOLE'	3.0" CAL.	B&B	AS SHOWN
CONIFEROUS TREE	**3**					
WHP	3	WHITE PINE	PINUS STROBUS	8' HT.	B&B	FULL FORM
ORNAMENTAL TREE	**5**					
RSC	5	RED SPLENDOR CRAB	MALUS 'RED SPLENDOR'	1.5" CAL.	B&B	AS SHOWN
DECIDUOUS SHRUB	**66**					
JWS	14	JAPANESE WHITE SPIREA	SPIRAEA ALBIFLORA	#5	CONT.	3'-6" O.C.
DBH	21	DWARF BUSH HONEYSUCKLE	DIERVILLA LONICERA	#5	CONT.	3'-6" O.C.
ANH	11	ANNABELLE HYDRANGEA	HYDRANGEA ARBORESCENS 'ANNABELLE'	#5	CONT.	4'-6" O.C.
CONIFEROUS SHRUB	**42**					
BNS	9	BIRD'S NEST SPRUCE	PICEA ABIES 'NIDIFORMIS'	#5	CONT.	5'-0" O.C.
HMA	13	HOLMSTRUP ARBORVITAE	THUJA OCCIDENTALIS 'HOLMSTRUP	#5	CONT.	3'-0" O.C.
MJI	20	MINT JULEP JUNIPER	JUNIPERUS CHINENSIS 'MONLEP'	#5	CONT.	5'-0" O.C.
PERENNIALS	**217**					
ICD	69	ICE CARNIVAL DAYLILY	HEMEROCALLIS 'ICE CARNIVAL'	#1	CONT.	18" O.C.
BJD	62	BAJA DAYLILY	HEMEROCALLIS 'BAJA'	#1	CONT.	18" O.C.
MNS	37	MAY NIGHT SALVIA	SALVIA X NEMOROSA 'MAY NIGHT'	#1	CONT.	18" O.C.
KFG	49	KARL FOERSTER FEATHER REED GRASS	CALAMAGROSTIS X ACUTIFLORA 'KARL FOERSTER'	#1	CONT.	24" O.C.

ABBREVIATIONS: B&B = BALLED AND BURLAPPED CAL. = CALIPER HT. = HEIGHT MIN. =MINIMUM O.C. = ON CENTER SP. = SPREAD QTY. = QUANTITY CONT. = CONTAINER NOTE: QUANTITIES ON PLAN SUPERSEDE LIST QUANTITIES IN THE EVENT OF A DISCREPANCY.

Tree Replacement Calculations

SIGNIFICANT TREE REPLACEMENT:
Significant tree caliper inches are to be replaced at a 1:2ratio.

A = EXISTING CALIPER INCHES:	65 CAL. IN.
B = CALIPER INCHES REMOVED:	49 CAL. IN.
(B/A) = PERCENTAGE OF CALIPER INCHES REMOVED:	75.4%
C = REPLACEMENT RATIO PER ORDINANCE:	(0.5)
TREE REPLACEMENT FORMULA:	(B/A)(C)(B) (.75)(0.5)(49)
TOTAL REPLACEMENT REQUIRED:	18.5 CAL. IN.
TOTAL CALIPER INCHES REPLACED: (Significant + Heritage Trees)	(18.5+0.0)
TOTAL REPLACEMENT REQUIRED:	18.5 CAL. IN.

Landscape Requirement Calculations

TOTAL CALIPER INCHES REQUIRED: DIVIDE TOTAL GROSS SQUARE FOOTAGE OF ALL FLOORS OF A BUILDING BY 320.

Additional Tree Caliper Requirements

A= Total Gross Building Area (SF)
B= Constant 320
C= # new tree cal. inches

A / B = C

15,400 SF / 320 = 48.1 cal. in.

SHRUBS, PERENNIALS OR PLANTING BEDS MAY BE SUBSTITUTED FOR TREES ACCORDING TO THE FOLLOWING LIMIT: NOT MORE THAN 25% OF THE TOTAL TREE CALIPER INCHES REQUIRED SHALL BE REPLACED WITH SHRUBS AND PERENNIALS. REPLACEMENT RATIO: 6 SHRUBS MAY REPLACE 3 CALIPER INCHES OF TREES. OR 2 SHRUBS = 1CAL IN.

Shrub/Perennial Planting Bed Substitutions for Trees:

Total required trees required = 48.1 cal. in.
Max. 25% = 48.1 * .25 = 12 cal. in.

Total number of shrubs on site = xx
xx / 2 = xx cal. in. (more than max allowed for replacement

IN ADDITION TO THE SHRUBS PROPOSED ON SITE THE DESIGN IS ALSO PROPOSING PERENNIALS THAT WILL COVER APPROXIMATELY xxx SF.

PLANTING BEDS AND/OR DECORATIVE PLANTING CONTAINERS MAY REPLACE UP TO TWENTY-FIVE PERCENT (25%) OF THE REQUIRED CALIPER INCHES FOR TREES AT A RATE OF THREE (3) CALIPER INCHES OF TREES PER FIVE HUNDRED (500) SQUARE FEET OF CUMULATIVE PLANTING BEDS AND/OR DECORATIVE PLANTING CONTAINERS.

- Total Perennial Planting Beds 488 S'
- 488 SF/500 SF/3 CAL. IN.) = 0 cal. in.
- Total Shrub/Perennial Planting Beds = 0 cal. in. (12 ca. in. max credit)

Landscape Requirements Per Lot

TREE REPLACEMENT REQUIREMENT	18.5	CAL. IN.
PROPOSED LANDSCAPE REQUIREMENT	48.1	CAL. IN.
TOTAL	66.6	CAL. IN.
PROVIDED	66.9	CAL. IN.

Proposed Caliper In. Calculations

DECIDUOUS TREES (10):

* 5 TREES @ 3.0 CAL. IN. = 15.0 CAL. IN.
* 9 TREES @ 2.5 CAL. IN. = 22.5 CAL. IN.

CONIFEROUS TREES (3):

* 3 TREES @ 3.33 CAL. IN. = 9.9 CAL. IN.
(8' DIVIDED BY CONVERSION OF 2.4 = 3.33)

ORNAMENTAL TREES (4):

* 5 TREES @ 1.5 CAL. IN. = 7.5 CAL. IN.

SHRUBS (88):

* 88 SHRUBS @ 0.5 CAL. IN. = 44.0 CAL. IN.
(24 SHRUBS/2 = 12 CAL. IN. TO BE USED TOWARDS 25% OF LANDSCAPE REQUIREMENTS)

PERENNIALS (217):

* 488 SF OF PERENNIAL BED AREA

PERMIT SET

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LICENSE NO. 44018 DATE: 02/08/22

PROJECT NUMBER: 0032747.00
ISSUED: 12/21/21

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LANDSCAPE PLAN

L100