



PERMIT REPORT

To: Board of Managers

From: Elizabeth Showalter, Permitting Technician

Date: July 23, 2018

Re: Permit 18-248: Airborne Construction (PID: 24-117-22-12-0096 and 24-117-22-12-0096, Hopkins)

Recommendation:

Approval of MCWD permit application on the following conditions:

1. Identification of the contractor responsible for implementing the erosion control plan;
2. Submission for MCWD approval of draft declaration for the maintenance of stormwater management facilities and wetland buffers, and noting applicability of MCWD permitting requirements for future construction on individual lots, then recordation;
3. Submission of financial assurance for Erosion Control (\$1,500), Wetland Protection (\$5,000), and Stormwater Management (\$1,600);
4. Submission of plan for avoidance of neighboring utilities for approval by the District Engineer;
5. Reimbursement of MCWD costs.

Background:

Airborne Construction has applied for a Minnehaha Creek Watershed District permit under the Erosion Control, Stormwater Management, and Wetland Protection rules for a four lot subdivision. The permit is before the Board of Managers at the request of members of the public. The site is located off of Highway 7 in Hopkins, near the Eisenhower Community Center. The 1.3 acre site is triangular with approximately fifteen percent slopes, with slopes in some areas in excess of 30 percent. A paved road is present on the site providing access to a city well house on an adjacent parcel. A large open water wetland is located primarily on the Eisenhower Community Center site, with a portion of the wetland on the site of the proposed development. The applicant is proposing four single family home lots and the construction of a private road. The applicant will construct the road and utilities and will sell the lots for grading and home construction by others. The applicant has submitted a plan for erosion control and stormwater management based on the anticipated home sizes, based on the building envelopes. Permits for single family home construction will be required, and when submitted staff will review for compliance with the subdivision plan, as required by the common scheme of development framework of the Stormwater Management Rule.

District Rule Analysis:

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Erosion Control Rule

The District’s Erosion Control Rule is applied when a project proposes 5,000 square feet of disturbance or 50 cubic yards of fill, excavation, or stockpiling on-site. The Applicant is proposing 0.7 acres of disturbance, therefore the rule is triggered. The Applicant has submitted an erosion control plan which provides best management practices to achieve erosion and sediment control including a rock construction entrance, silt fence and inlet protection where necessary. A vegetative stabilization plan including the incorporation of six-inches of topsoil into underlying soils prior to final stabilization has also been provided. The Project’s concrete washout will be contained on a truck. The project as proposed will meet the Erosion Control Rule.

Stormwater Management Rule

The Stormwater Management Rule is triggered by the creation of new or replacement of existing impervious surface. The proposed project will create 14,303 square feet of additional impervious area which triggers the Stormwater Management Rule. Since the project proposes greater than 40% site disturbance and a greater than 50% increase in impervious area, the applicant is required to treat the entire site’s impervious surface for phosphorus, rate, and volume.

Size of Site (ac)	Site Drains To	Existing Impervious (ac)	Proposed Impervious (ac)	Disturbance Area (ac)
1.3 acres	Nine Mile Creek	0.1	0.5	0.7

The applicant has proposed to meet the District’s Stormwater Management Rule by providing a filtration basin to treat the runoff from the front of the homes and the private road, and rock filtration trenches in the rear yards to treat the rear roofs of the homes.

The volume control requirement of the rule, requires the abstraction of the first inch of runoff from the entire site’s impervious surface. The applicant is required to provide 1,477 cubic feet of abstraction. As shown in the table below, the applicant has provided 2,229 cubic feet of abstraction through preservation of existing trees, planting new trees, a filtration basin, and filtration trenches.

Stormwater Practice	Area or Volume Provided	Multiplier	Abstraction Provided
Tree Preservation	12,708 SF canopy	Interception percentage	48
Tree Planting	7,778 SF canopy	Interception percentage x 1/2	14
Filtration Trenches	1,920 CF storage	50%	960
Filtration Basin	2,414 CF storage	50%	1,207
Total			2,229

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The rate control section of the rule requires applicants to demonstrate that runoff rates will be maintained or reduced at all downgradient property boundaries. The southwestern property boundary is the only downgradient property boundary. The existing and proposed runoff rates are shown in the table below, and demonstrate that runoff rates will be reduced for all storm events.

Storm Event	Existing	Proposed
1-year	2.0	0.9
10-year	5.0	4.1
100-year	10.4	10.1

The impacts to downstream waterbodies section of the rule regulates new point source discharges and impacts to the bounce, inundation, and runout control elevations of waterbodies. The project proposes a new point source (the outlet of the filtration basin), and the pretreatment is provided as required by the rule. The project does not propose a change in the runout control elevation of any waterbody. The proposed development will not change the bounce of the onsite wetland at the 1, 10, and 100-year storm events. If the bounce is maintained, the inundation period will also be maintained. Therefore, the project is in conformance with the downstream waterbody requirements of the rule.

The neighboring building has a stormwater line with cleanouts near the property line, within the area that may be disturbed by construction. Submittal of a plan for avoidance of the cleanouts is a listed as a recommended condition of approval.

The maintenance requirement will be satisfied through the recordation of a maintenance declaration, listed as a condition of approval.

The high water elevation section of the rule, requires that at least two vertical feet of separation be provided between the low opening of structures and the 100 year high water elevation of all BMPs. Demonstration of compliance with this section will be required when the single family homes are proposed.

The project as proposed, based on submitted conceptual imperviousness, upon fulfillment of the recommended conditions will meet the requirements of the Stormwater Management Rule. If impervious surface proposed for the home site construction proposes additional impervious surface, addition stormwater management may be required.

Wetland Protection

The buffer provision of the Wetland Protection Rule is triggered whenever the Stormwater Management Rule is triggered, and buffers must be provided down gradient of disturbance or around the entirety of a wetland that will be disturbed. The applicant proposes no wetland disturbance (draining, filling or excavation), therefore buffer is required on that portion of the wetland that is on the applicant’s site that is downgradient from proposed disturbance. Wetland

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buffer widths are determined based on the management class of the wetland as evaluated by the District's Functional Assessment of Wetlands (FAW) or by the current version of the Minnesota Routine Assessment Method (MnRAM). The wetland on the property was classified as a Preserve, the highest functional value, in the FAW. The applicant submitted a MnRAM assessment demonstrating a Manage 2 management class. The FAW was conducted 2003 through a primarily desktop review of aerial imagery, topographic and soils mapping, and other similar resources. Due to the age of the assessment and the lack of field review of most wetlands, applicants are often able to submit MnRAM assessments that more accurately reflect the functional value of wetlands with a lower management class. Staff and the wetland specialists at Wenck reviewed the submitted MnRAM and determined that it accurately portrayed the wetland, and that a Manage 2 classification is appropriate. The Manage 2 classification corresponds to a 30-foot buffer width. Under subsection 6(c), buffer width may vary based on demonstrated site constraints provided that a minimum width of 50% of the applied buffer width is maintained at all points, the buffer provides wetland and habitat protection equivalent to a buffer of uniform width, and areas of buffer beyond 200 feet from the wetland are excluded from the calculation of total buffer area. A buffer with a uniform 30-foot width would be 7,710 square feet. The applicant has provided 8,169 square feet of buffer.

The applicant proposes some disturbance within the buffer area for outlets from the stormwater facilities. The applicant has submitted a buffer vegetation, maintenance, and monitoring plan in accordance with the requirements of the rule. The applicant has submitted a monumentation plan including placement of wetland buffer signs at each property line and as needed to delineate the contour of the wetland with a maximum spacing of 100 feet. The submittal of a draft maintenance declaration for staff review and recordation of the declaration is listed in the recommended conditions of approval.

The project as proposed, upon fulfillment of the recommended conditions will meet the requirements of the Wetland Protection Rule.

Summary:

Airborne Construction has applied for a Minnehaha Creek Watershed District permit under the Erosion Control, Stormwater Management, and Wetland Protection rules for a four lot subdivision. The proposed project meets the applicable requirements under the applicable rules. Staff recommends approval of the permit with the conditions listed.

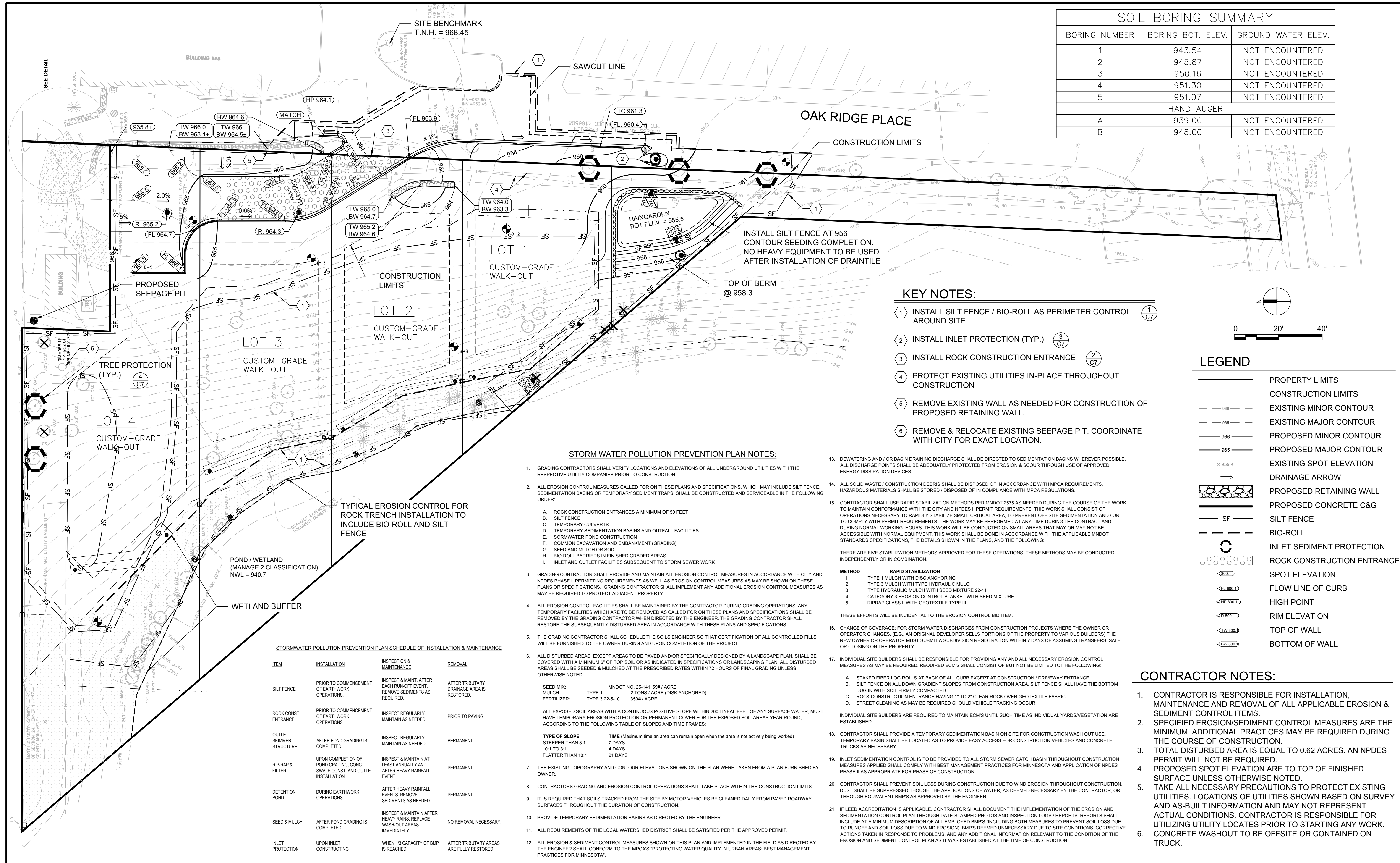
Attachments:

1. Application Form
2. Site Plans
3. Buffer Maintenance Plan

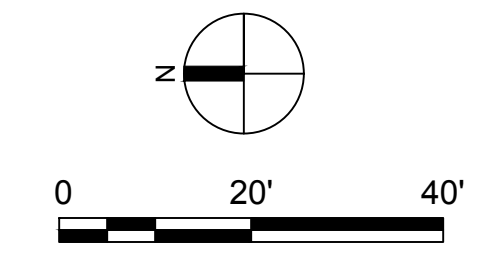
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SOIL BORING SUMMARY		
BORING NUMBER	BORING BOT. ELEV.	GROUND WATER ELEV.
1	943.54	NOT ENCOUNTERED
2	945.87	NOT ENCOUNTERED
3	950.16	NOT ENCOUNTERED
4	951.30	NOT ENCOUNTERED
5	951.07	NOT ENCOUNTERED
HAND AUGER		
A	939.00	NOT ENCOUNTERED
B	948.00	NOT ENCOUNTERED



- KEY NOTES:**
- INSTALL SILT FENCE / BIO-ROLL AS PERIMETER CONTROL AROUND SITE
 - INSTALL INLET PROTECTION (TYP.)
 - INSTALL ROCK CONSTRUCTION ENTRANCE
 - PROTECT EXISTING UTILITIES IN-PLACE THROUGHOUT CONSTRUCTION
 - REMOVE EXISTING WALL AS NEEDED FOR CONSTRUCTION OF PROPOSED RETAINING WALL.
 - REMOVE & RELOCATE EXISTING SEEPAGE PIT. COORDINATE WITH CITY FOR EXACT LOCATION.



LEGEND

	PROPERTY LIMITS
	CONSTRUCTION LIMITS
	EXISTING MINOR CONTOUR
	EXISTING MAJOR CONTOUR
	PROPOSED MINOR CONTOUR
	PROPOSED MAJOR CONTOUR
	EXISTING SPOT ELEVATION
	DRAINAGE ARROW
	PROPOSED RETAINING WALL
	PROPOSED CONCRETE C&G
	SILT FENCE
	BIO-ROLL
	INLET SEDIMENT PROTECTION
	ROCK CONSTRUCTION ENTRANCE
	SPOT ELEVATION
	FLOW LINE OF CURB
	HIGH POINT
	RIM ELEVATION
	TOP OF WALL
	BOTTOM OF WALL

STORM WATER POLLUTION PREVENTION PLAN NOTES:

- GRADING CONTRACTORS SHALL VERIFY LOCATIONS AND ELEVATIONS OF ALL UNDERGROUND UTILITIES WITH THE RESPECTIVE UTILITY COMPANIES PRIOR TO CONSTRUCTION.
- ALL EROSION CONTROL MEASURES CALLED FOR ON THESE PLANS AND SPECIFICATIONS, WHICH MAY INCLUDE SILT FENCE, SEDIMENTATION BASINS OR TEMPORARY SEDIMENT TRAPS, SHALL BE CONSTRUCTED AND SERVICEABLE IN THE FOLLOWING ORDER:
 - ROCK CONSTRUCTION ENTRANCES A MINIMUM OF 50 FEET
 - SILT FENCE
 - TEMPORARY CULVERTS
 - TEMPORARY SEDIMENTATION BASINS AND OUTFALL FACILITIES
 - SORMWATER POND CONSTRUCTION
 - COMMON EXCAVATION AND EMBANKMENT (GRADING)
 - SEED AND MULCH OR SOD
 - BIO-ROLL BARRIERS IN FINISHED GRADED AREAS
 - INLET AND OUTLET FACILITIES SUBSEQUENT TO STORM SEWER WORK
- GRADING CONTRACTOR SHALL PROVIDE AND MAINTAIN ALL EROSION CONTROL MEASURES IN ACCORDANCE WITH CITY AND NPDES PHASE II PERMITTING REQUIREMENTS AS WELL AS EROSION CONTROL MEASURES AS MAY BE SHOWN ON THESE PLANS OR SPECIFICATIONS. GRADING CONTRACTOR SHALL IMPLEMENT ANY ADDITIONAL EROSION CONTROL MEASURES AS MAY BE REQUIRED TO PROTECT ADJACENT PROPERTY.
- ALL EROSION CONTROL FACILITIES SHALL BE MAINTAINED BY THE CONTRACTOR DURING GRADING OPERATIONS. ANY TEMPORARY FACILITIES WHICH ARE TO BE REMOVED AS CALLED FOR ON THESE PLANS AND SPECIFICATIONS SHALL BE REMOVED BY THE GRADING CONTRACTOR WHEN DIRECTED BY THE ENGINEER. THE GRADING CONTRACTOR SHALL RESTORE THE SUBSEQUENTLY DISTURBED AREA IN ACCORDANCE WITH THESE PLANS AND SPECIFICATIONS.
- THE GRADING CONTRACTOR SHALL SCHEDULE THE SOILS ENGINEER SO THAT CERTIFICATION OF ALL CONTROLLED FILLS WILL BE FURNISHED TO THE OWNER DURING AND UPON COMPLETION OF THE PROJECT.
- ALL DISTURBED AREAS, EXCEPT AREAS TO BE PAVED AND/OR SPECIFICALLY DESIGNED BY A LANDSCAPE PLAN, SHALL BE COVERED WITH A MINIMUM 6" OF TOP SOIL OR AS INDICATED IN SPECIFICATIONS OR LANDSCAPING PLAN. ALL DISTURBED AREAS SHALL BE SEEDED & MULCHED AT THE PRESCRIBED RATES WITHIN 72 HOURS OF FINAL GRADING UNLESS OTHERWISE NOTED.

SEED MIX:	MNDOT NO. 25-141 59# / ACRE
MULCH:	TYPE 1 2 TONS / ACRE (DISK ANCHORED)
FERTILIZER:	TYPE 3 22-5-10 350# / ACRE

ALL EXPOSED SOIL AREAS WITH A CONTINUOUS POSITIVE SLOPE WITHIN 200 LINEAL FEET OF ANY SURFACE WATER, MUST HAVE TEMPORARY EROSION PROTECTION OR PERMANENT COVER FOR THE EXPOSED SOIL AREAS YEAR ROUND, ACCORDING TO THE FOLLOWING TABLE OF SLOPES AND TIME FRAMES:

TYPE OF SLOPE	TIME (Maximum time an area can remain open when the area is not actively being worked)
STEEPER THAN 3:1	7 DAYS
10:1 TO 3:1	4 DAYS
FLATTER THAN 10:1	21 DAYS
- THE EXISTING TOPOGRAPHY AND CONTOUR ELEVATIONS SHOWN ON THE PLAN WERE TAKEN FROM A PLAN FURNISHED BY THE OWNER.
- CONTRACTORS GRADING AND EROSION CONTROL OPERATIONS SHALL TAKE PLACE WITHIN THE CONSTRUCTION LIMITS.
- IT IS REQUIRED THAT SOILS TRACKED FROM THE SITE BY MOTOR VEHICLES BE CLEANED DAILY FROM PAVED ROADWAY SURFACES THROUGHOUT THE DURATION OF CONSTRUCTION.
- PROVIDE TEMPORARY SEDIMENTATION BASINS AS DIRECTED BY THE ENGINEER.
- ALL REQUIREMENTS OF THE LOCAL WATERSHED DISTRICT SHALL BE SATISFIED PER THE APPROVED PERMIT.
- ALL EROSION & SEDIMENT CONTROL MEASURES SHOWN ON THIS PLAN AND IMPLEMENTED IN THE FIELD AS DIRECTED BY THE ENGINEER SHALL CONFORM TO THE MPCA'S "PROTECTING WATER QUALITY IN URBAN AREAS: BEST MANAGEMENT PRACTICES FOR MINNESOTA".
- DEWATERING AND / OR BASIN DRAINING DISCHARGE SHALL BE DIRECTED TO SEDIMENTATION BASINS WHEREVER POSSIBLE. ALL DISCHARGE POINTS SHALL BE ADEQUATELY PROTECTED FROM EROSION & SCOUR THROUGH USE OF APPROVED ENERGY DISSIPATION DEVICES.
- ALL SOLID WASTE / CONSTRUCTION DEBRIS SHALL BE DISPOSED OF IN ACCORDANCE WITH MPCA REQUIREMENTS. HAZARDOUS MATERIALS SHALL BE STORED / DISPOSED OF IN COMPLIANCE WITH MPCA REGULATIONS.
- CONTRACTOR SHALL USE RAPID STABILIZATION METHODS PER MNDOT 2575 AS NEEDED DURING THE COURSE OF THE WORK TO MAINTAIN CONFORMANCE WITH THE CITY AND NPDES II PERMIT REQUIREMENTS. THIS WORK SHALL CONSIST OF OPERATIONS NECESSARY TO RAPIDLY STABILIZE SMALL CRITICAL AREA. TO PREVENT OFF SITE SEDIMENTATION AND / OR TO COMPLY WITH PERMIT REQUIREMENTS. THE WORK MAY BE PERFORMED AT ANY TIME DURING THE CONTRACT AND DURING NORMAL WORKING HOURS. THIS WORK WILL BE CONDUCTED ON SMALL AREAS THAT MAY OR MAY NOT BE ACCESSIBLE WITH NORMAL EQUIPMENT. THIS WORK SHALL BE DONE IN ACCORDANCE WITH THE APPLICABLE MNDOT STANDARDS SPECIFICATIONS. THE DETAILS SHOWN IN THE PLANS, AND THE FOLLOWING:

METHOD	RAPID STABILIZATION
1	TYPE 1 MULCH WITH DISC ANCHORING
2	TYPE 3 MULCH WITH TYPE HYDRAULIC MULCH
3	TYPE HYDRAULIC MULCH WITH SEED MIXTURE 22-11
4	CATEGORY 3 EROSION CONTROL BLANKET WITH SEED MIXTURE
5	RIPRAP CLASS II WITH GEOTEXTILE TYPE III

THESE EFFORTS WILL BE INCIDENTAL TO THE EROSION CONTROL BID ITEM.
- CHANGE OF COVERAGE: FOR STORM WATER DISCHARGES FROM CONSTRUCTION PROJECTS WHERE THE OWNER OR OPERATOR CHANGES, (E.G., AN ORIGINAL DEVELOPER SELLS PORTIONS OF THE PROPERTY TO VARIOUS BUILDERS) THE NEW OWNER OR OPERATOR MUST SUBMIT A SUBDIVISION REGISTRATION WITHIN 7 DAYS OF ASSUMING TRANSFERS, SALE OR CLOSING ON THE PROPERTY.
- INDIVIDUAL SITE BUILDERS SHALL BE RESPONSIBLE FOR PROVIDING ANY AND ALL NECESSARY EROSION CONTROL MEASURES AS MAY BE REQUIRED. REQUIRED ECM'S SHALL CONSIST OF BUT NOT BE LIMITED TOT THE FOLLOWING:
 - STAKED FIBER LOG ROLLS AT BACK OF ALL CURB EXCEPT AT CONSTRUCTION / DRIVEWAY ENTRANCE.
 - SILT FENCE ON ALL DOWN GRADIENT SLOPES FROM CONSTRUCTION AREA. SILT FENCE SHALL HAVE THE BOTTOM DUG IN WITH SOIL FIRMLY COMPACTED.
 - ROCK CONSTRUCTION ENTRANCE HAVING 1" TO 2" CLEAR ROCK OVER GEOTEXTILE FABRIC.
 - STREET CLEANING AS MAY BE REQUIRED SHOULD VEHICLE TRACKING OCCUR.

INDIVIDUAL SITE BUILDERS ARE REQUIRED TO MAINTAIN ECM'S UNTIL SUCH TIME AS INDIVIDUAL YARDS/VEGETATION ARE ESTABLISHED.
- CONTRACTOR SHALL PROVIDE A TEMPORARY SEDIMENTATION BASIN ON SITE FOR CONSTRUCTION WASH OUT USE. TEMPORARY BASIN SHALL BE LOCATED AS TO PROVIDE EASY ACCESS FOR CONSTRUCTION VEHICLES AND CONCRETE TRUCKS AS NECESSARY.
- INLET SEDIMENTATION CONTROL IS TO BE PROVIDED TO ALL STORM SEWER CATCH BASIN THROUGHOUT CONSTRUCTION. MEASURES APPLIED SHALL COMPLY WITH BEST MANAGEMENT PRACTICES FOR MINNESOTA AND APPLICATION OF NPDES PHASE II AS APPROPRIATE FOR PHASE OF CONSTRUCTION.
- CONTRACTOR SHALL PREVENT SOIL LOSS DURING CONSTRUCTION DUE TO WIND EROSION THROUGHOUT CONSTRUCTION. DUST SHALL BE SUPPRESSED THROUGH THE APPLICATIONS OF WATER, AS DEEMED NECESSARY BY THE CONTRACTOR, OR THROUGH EQUIVALENT BMP'S AS APPROVED BY THE ENGINEER.
- IF LEED ACCREDITATION IS APPLICABLE, CONTRACTOR SHALL DOCUMENT THE IMPLEMENTATION OF THE EROSION AND SEDIMENTATION CONTROL PLAN THROUGH DATE-STAMPED PHOTOS AND INSPECTION LOGS / REPORTS. REPORTS SHALL INCLUDE AT A MINIMUM DESCRIPTION OF ALL EMPLOYED BMP'S (INCLUDING BOTH MEASURES TO PREVENT SOIL LOSS DUE TO RUNOFF AND SOIL LOSS DUE TO WIND EROSION), BMP'S DEEMED UNNECESSARY DUE TO SITE CONDITIONS, CORRECTIVE ACTIONS TAKEN IN RESPONSE TO PROBLEMS, AND ANY ADDITIONAL INFORMATION RELEVANT TO THE CONDITION OF THE EROSION AND SEDIMENT CONTROL PLAN AS IT WAS ESTABLISHED AT THE TIME OF CONSTRUCTION.

STORMWATER POLLUTION PREVENTION PLAN SCHEDULE OF INSTALLATION & MAINTENANCE

ITEM	INSTALLATION	INSPECTION & MAINTENANCE	REMOVAL
SILT FENCE	PRIOR TO COMMENCEMENT OF EARTHWORK OPERATIONS.	INSPECT & MAINT. AFTER EACH RUN-OFF EVENT. REMOVE SEDIMENTS AS REQUIRED.	AFTER TRIBUTARY DRAINAGE AREA IS RESTORED.
ROCK CONST. ENTRANCE	PRIOR TO COMMENCEMENT OF EARTHWORK OPERATIONS.	INSPECT REGULARLY. MAINTAIN AS NEEDED.	PRIOR TO PAVING.
OUTLET SKIMMER STRUCTURE	AFTER POND GRADING IS COMPLETED.	INSPECT REGULARLY. MAINTAIN AS NEEDED.	PERMANENT.
RIP-RAP & FILTER	UPON COMPLETION OF POND GRADING, CONC. SWALE CONST. AND OUTLET INSTALLATION.	INSPECT & MAINTAIN AT LEAST ANNUALLY AND AFTER HEAVY RAINFALL EVENT.	PERMANENT.
DETENTION POND	DURING EARTHWORK OPERATIONS.	AFTER HEAVY RAINFALL EVENTS. REMOVE SEDIMENTS AS NEEDED.	PERMANENT.
SEED & MULCH	AFTER POND GRADING IS COMPLETED.	INSPECT & MAINTAIN AFTER HEAVY RAINS. REPLACE WASH-OUT AREAS IMMEDIATELY.	NO REMOVAL NECESSARY.
INLET PROTECTION	UPON INLET CONSTRUCTING	WHEN 1/3 CAPACITY OF BMP IS REACHED	AFTER TRIBUTARY AREAS ARE FULLY RESTORED

NO.	DATE	DESCRIPTION OF REVISIONS
7	7/17/18	CITY PUD APPROVAL
6	7/6/18	REVISED PER CITY AND MCWD COMMENTS
5	6/21/18	REVISED PER MCWD COMMENTS
4	6/14/18	UPDATED LOT AREA
3	6/11/18	REMOVED AMENITIES - REVISED LOT 1 AND OUTLOT A

DESIGNED:	TJG	I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA. PRINT NAME: TROY J. GAMBLE, PE SIGNATURE: NOT FOR CONSTRUCTION DATE JULY 17, 2018 LICENSE # 23137
DRAWN:	BJF	
CHECKED BY:	TJG	
NO.	DATE	

ANDERSON ENGINEERING
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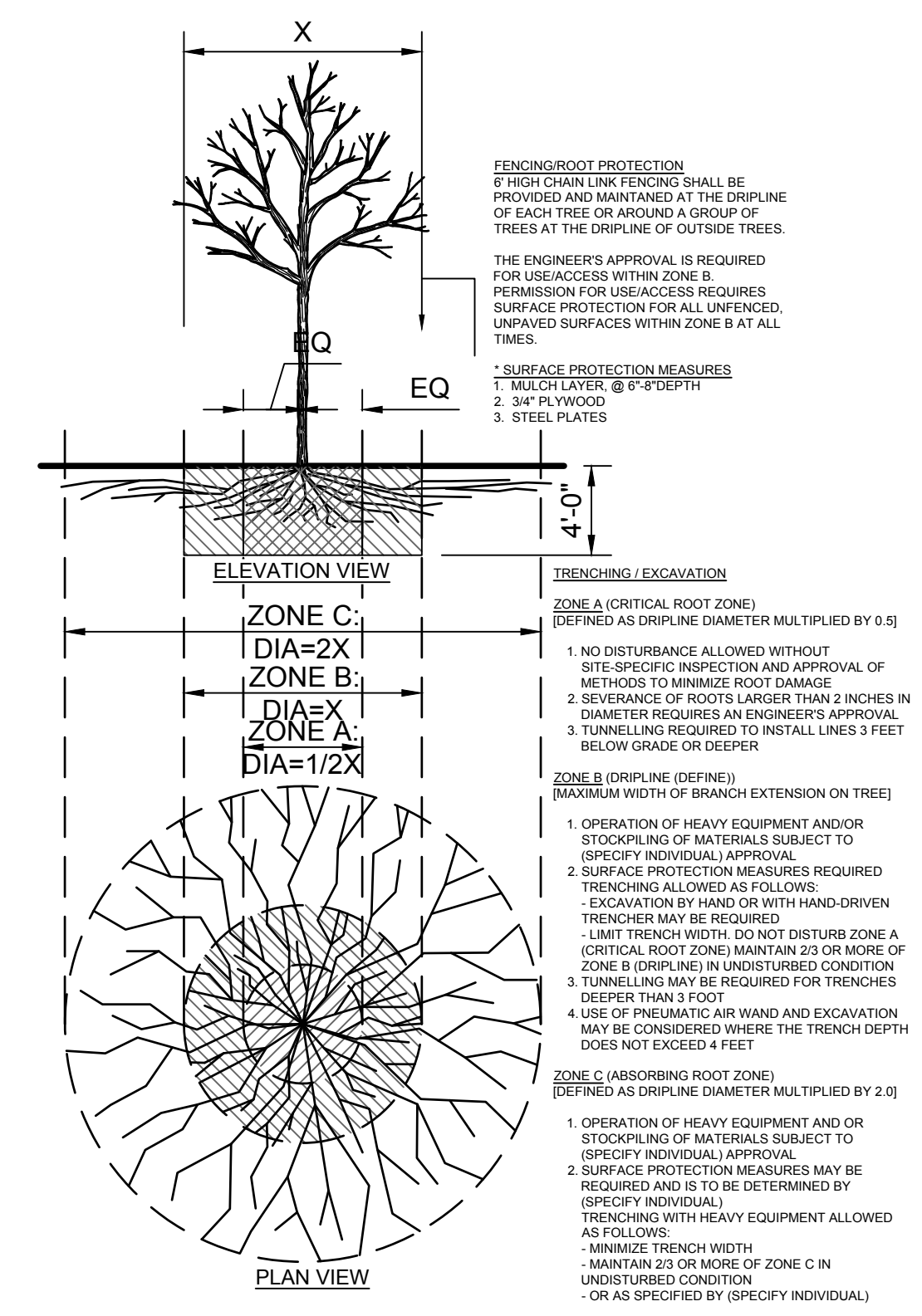
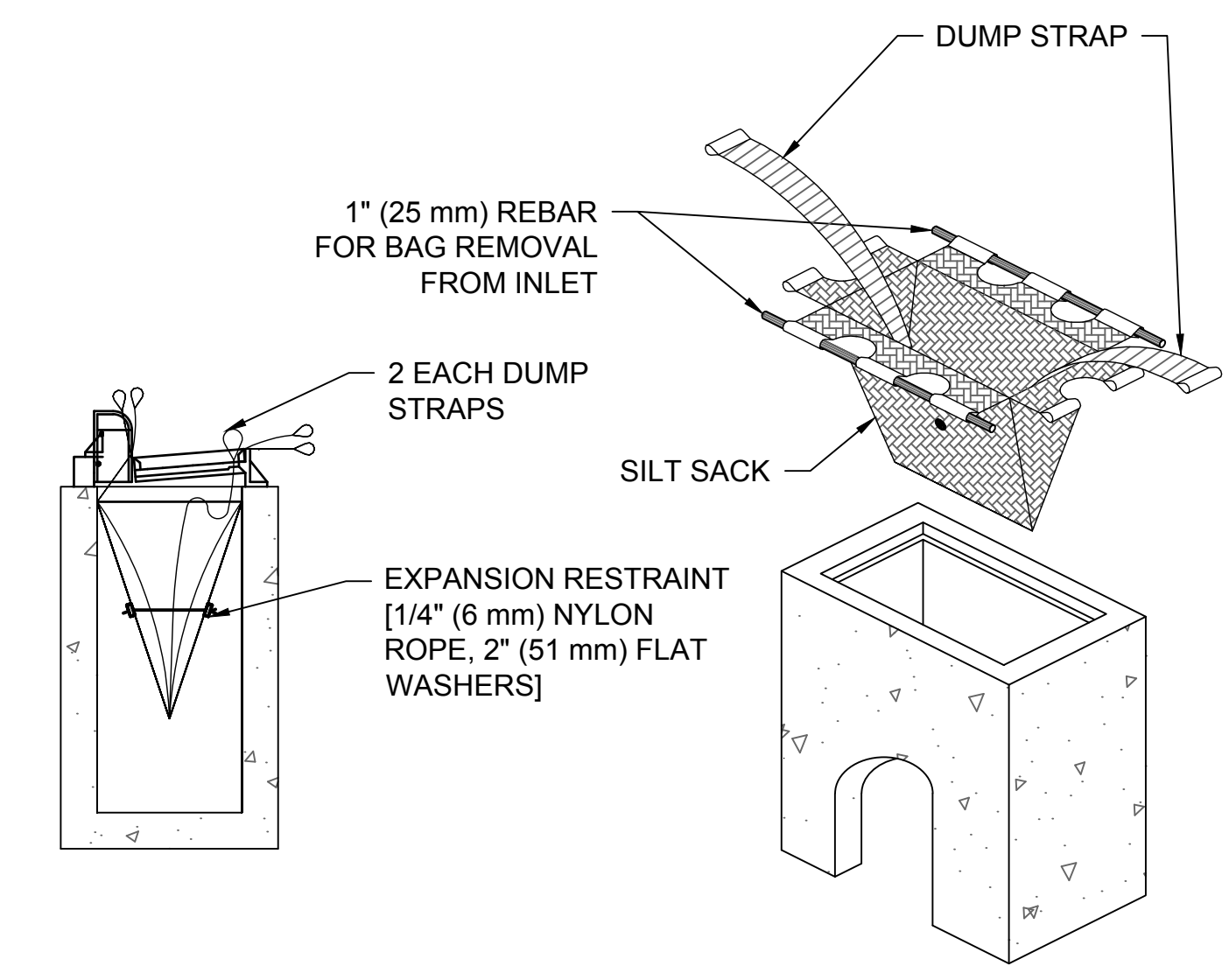
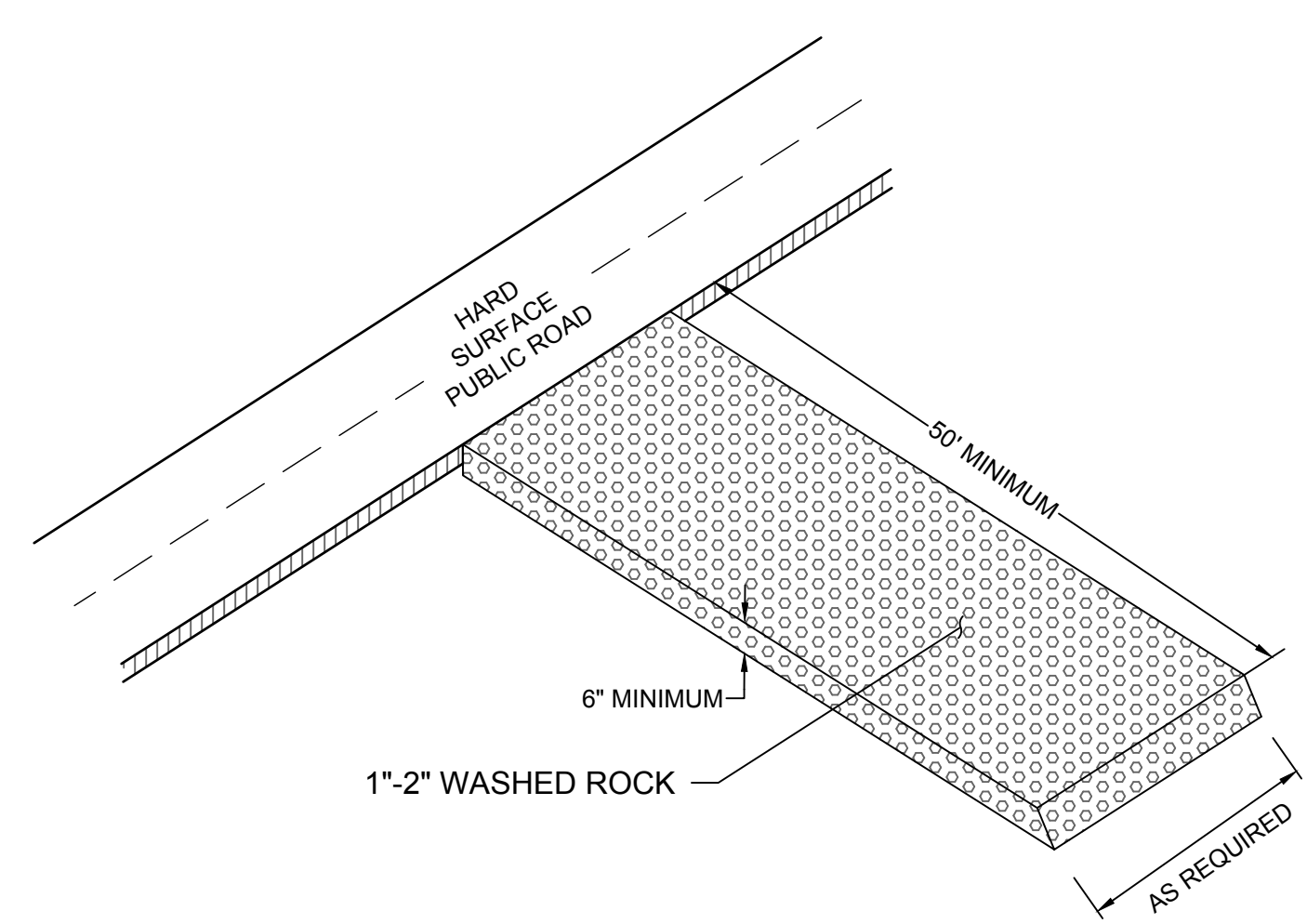
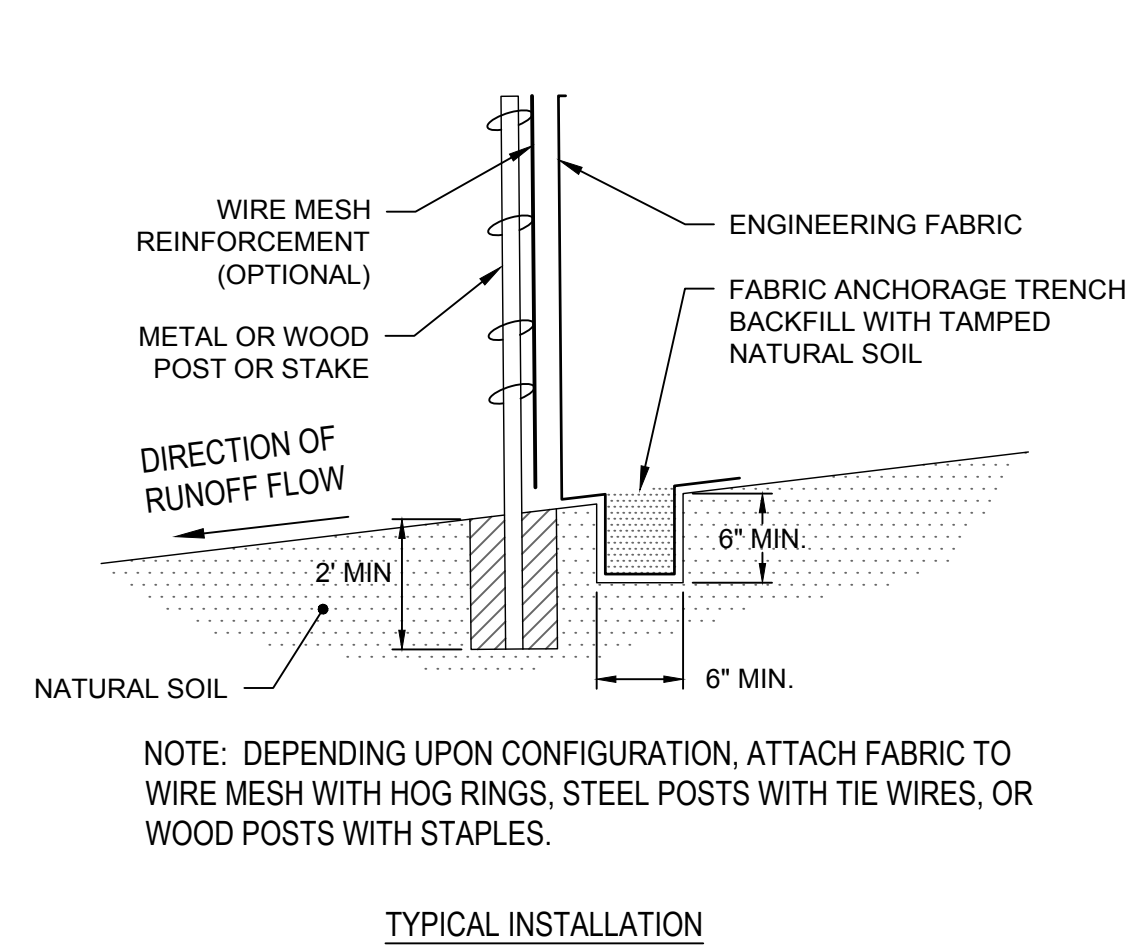
Anderson Engineering of Minnesota, LLC
 13605 1st Avenue North
 Suite 100
 Plymouth, MN 55441
 763-412-4000 (o) 763-412-4090 (f)
 www.ae-mn.com

SANCTUARY AT OAK RIDGE
HOPKINS, MN

GRADING, DRAINAGE, & EROSION CONTROL PLAN

COMM. NO.	DATE:
14916	6/11/18
DRAWING NO.	
C5	

Jul 16, 2018 - 1:29pm
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1 EROSION CONTROL FENCE
 SCALE: NTS

2 CONSTRUCTION ROCK ENTRANCE
 SCALE: NTS

3 INLET PROTECTION SEDIMENT FILTER SACK
 SCALE: NTS

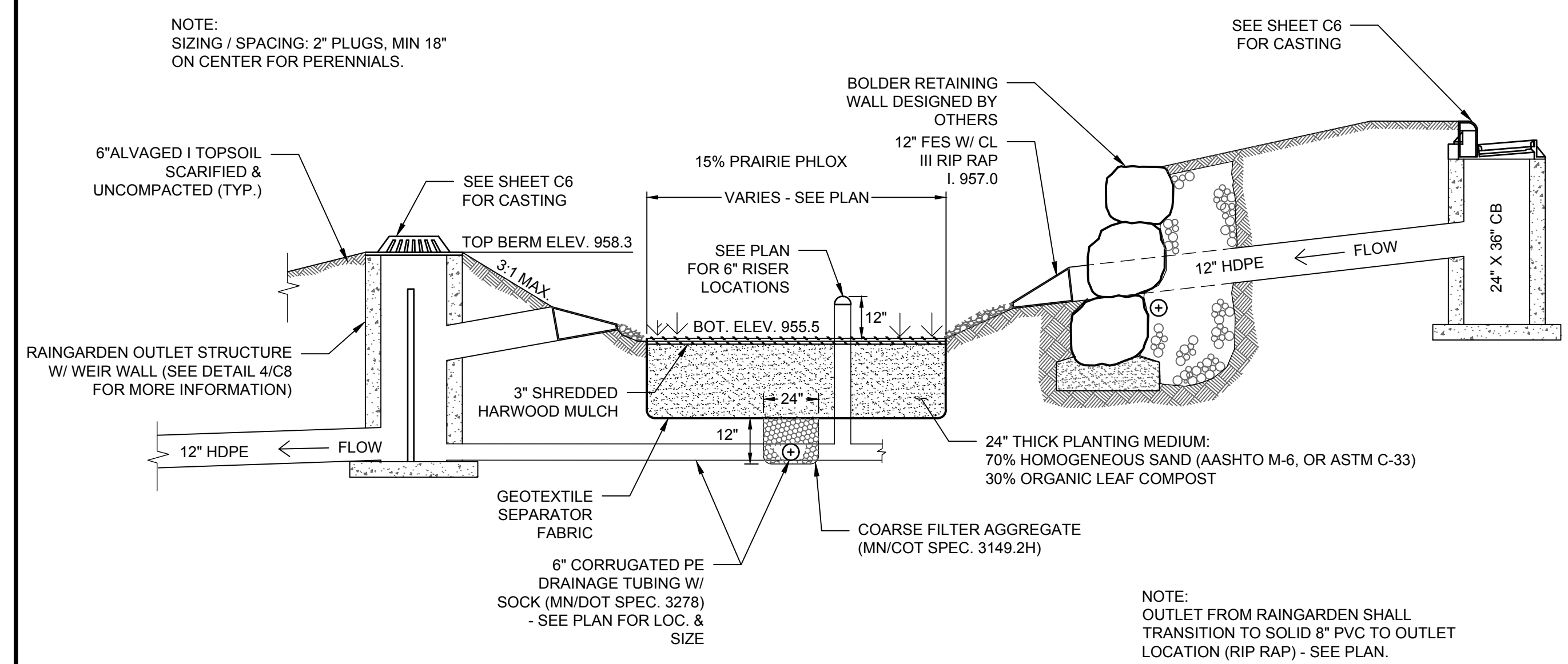
4 TREE PROTECTION DETAIL
 SCALE: NTS

RAINGARDEN PERENNIALS:

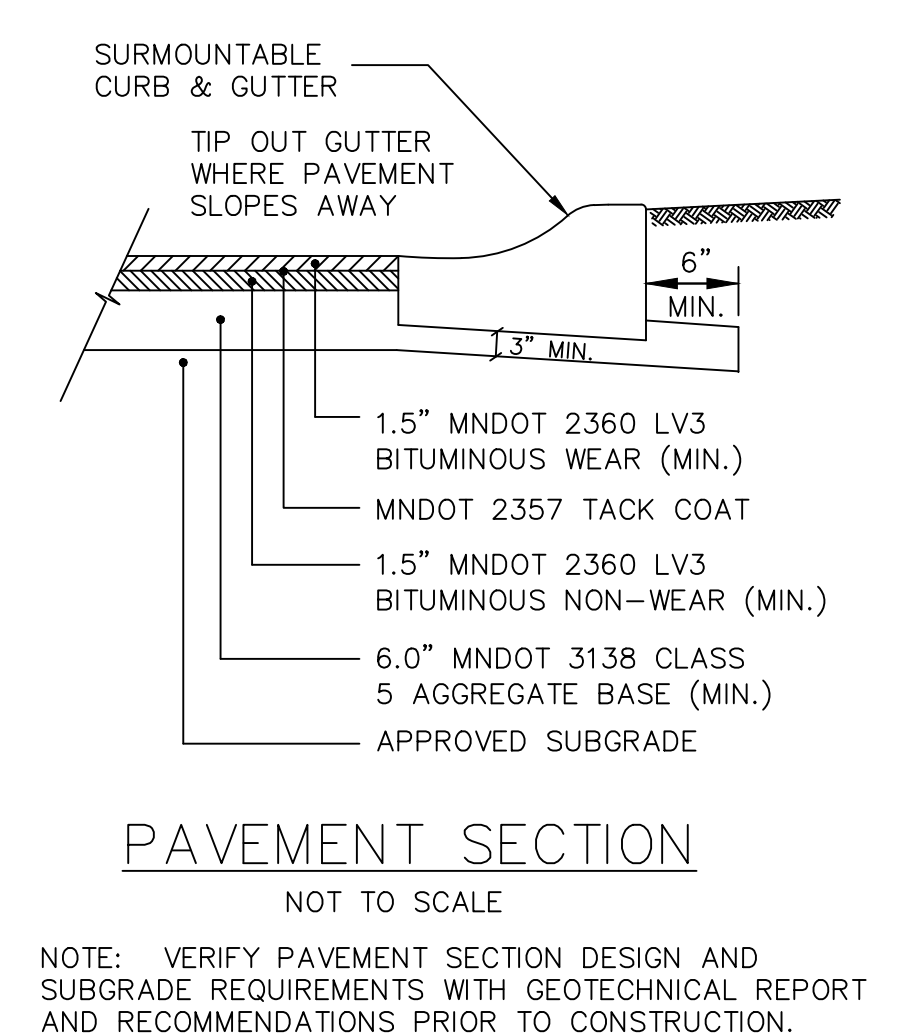
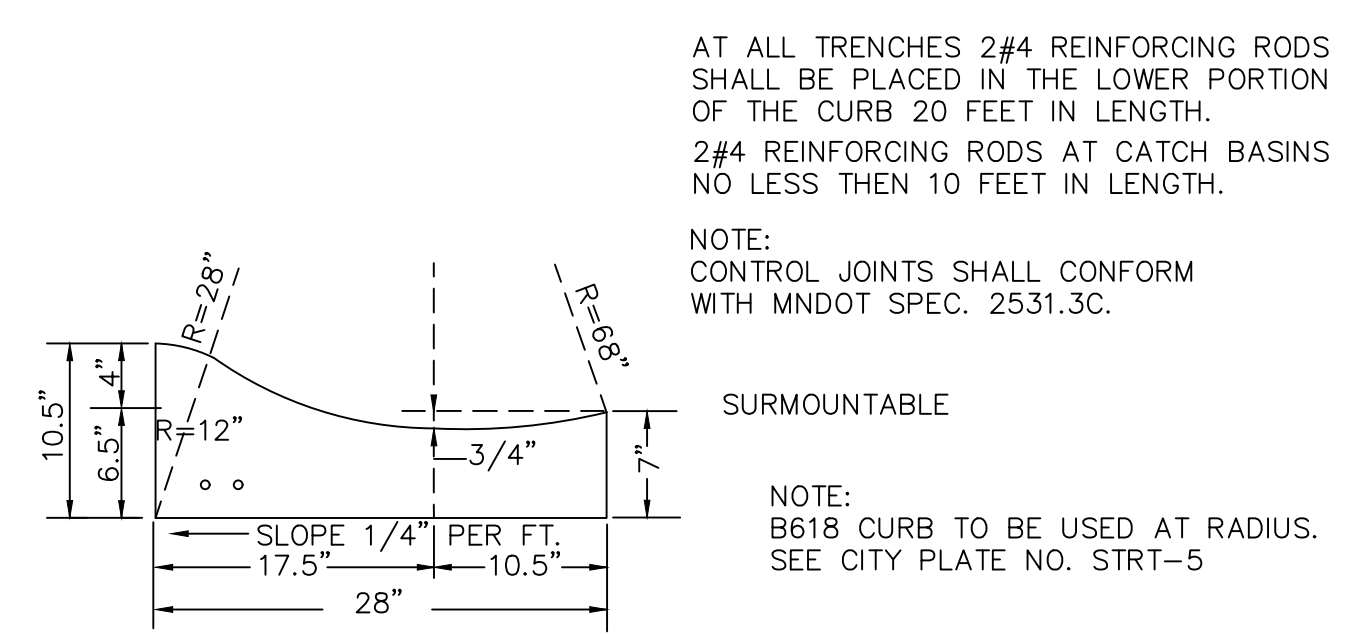
PLANT QUANTITY SHALL COVER ENTIRE RAINGARDEN AREA AND INCLUDE THE FOLLOWING VARIETIES:

50% PRAIRIE DROPSEED
 20% BLUE FLAG IRIS
 15% YELLOW CONEFLOWER

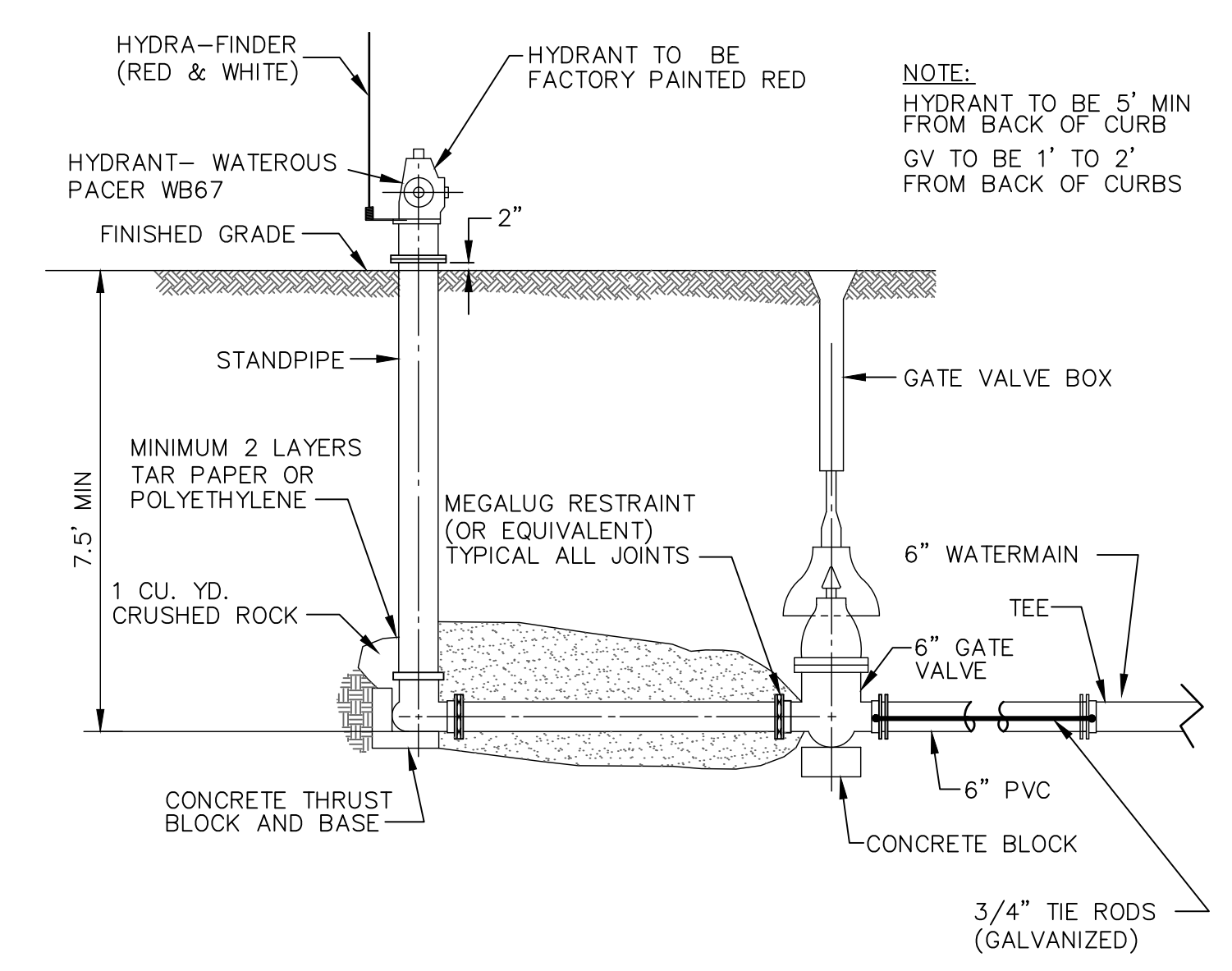
NOTE:
 SIZING / SPACING: 2" PLUGS, MIN 18" ON CENTER FOR PERENNIALS.



5 FILTRATION BASIN SECTION DETAIL
 SCALE: NTS



6 ASPHALT PAVEMENT SECTION & CONC. G&G
 SCALE: NTS



7 HYDRANT AND GATE VALVE INSTALLATION
 SCALE: NTS

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DESIGNED:	TJ
DRAWN:	EH
CHECKED BY:	TJ

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 PRINT NAME: TROY J. GAMBLE, PE
 SIGNATURE: *NOT FOR CONSTRUCTION*
 DATE: JULY 17, 2018 LICENSE # 23137

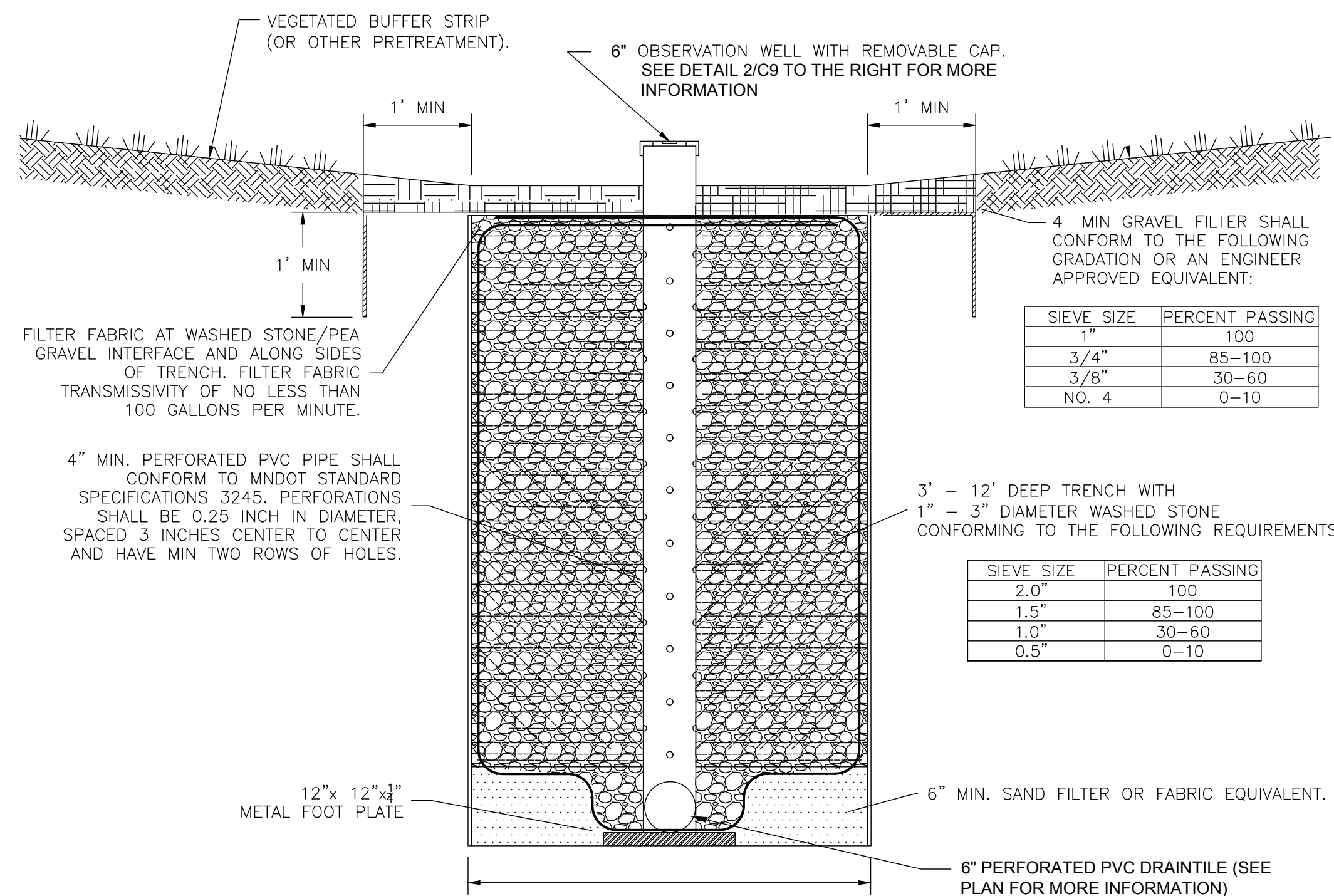
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**SANCTUARY AT OAK RIDGE
 HOPKINS, MN**

COMM. NO.	14916	DATE:	6/11/18
DRAWING NO.	C7		

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 Jul 16, 2018 - 1:30pm
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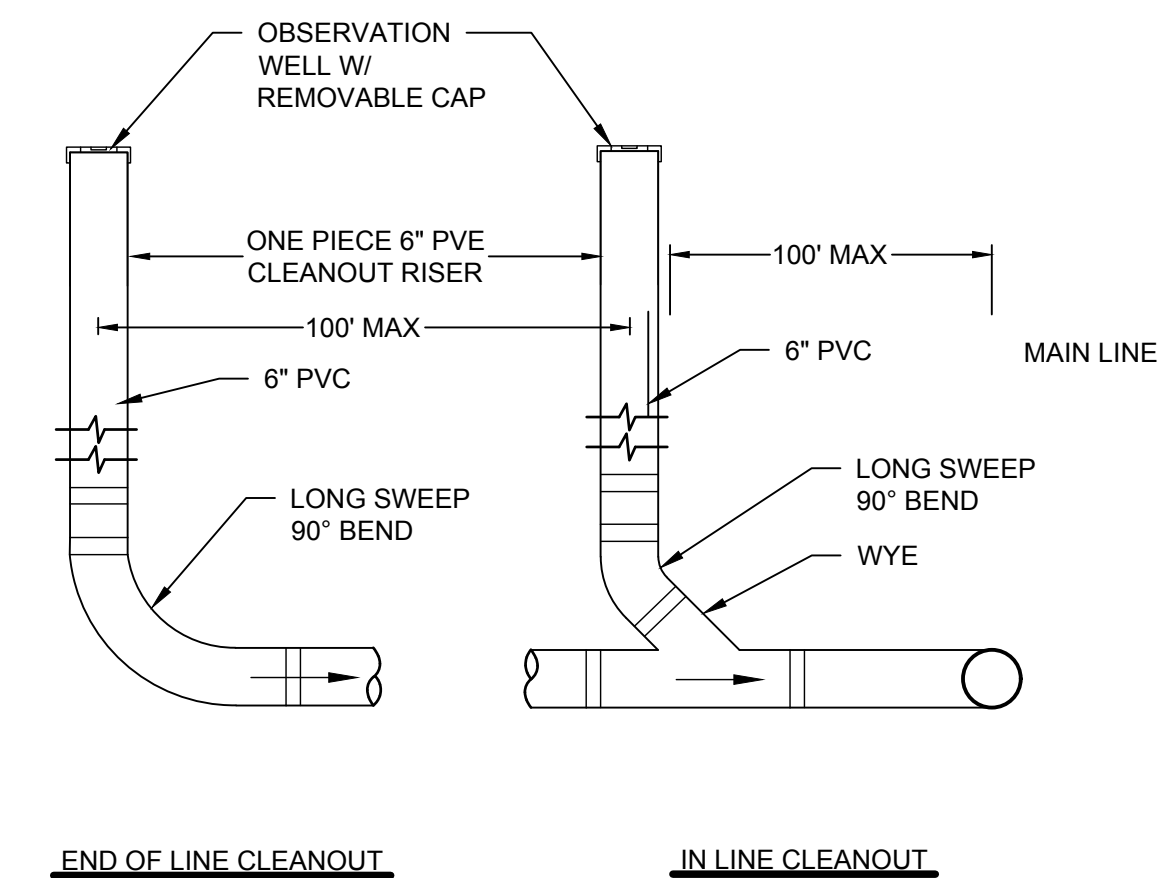


TYPICAL FILTRATION TRENCH CROSS-SECTION
NOT TO SCALE

1 TYPICAL INFILTRATION TRENCH CROSS-SECTION
SCALE: NTS

- CONSTRUCTION REQUIREMENTS:**
- PERFORM CONTINUOUS INSPECTION OF EROSION CONTROL PRACTICES.
 - INSTALL SILT FENCE ALONG THE PERIMETER OF THE SITE TO PREVENT SEDIMENT FROM LEAVING THE SITE DURING THE CONSTRUCTION PROCESS.
 - ALL DOWNGRADIENT PERIMETER SEDIMENT CONTROL BMPs MUST BE IN PLACE BEFORE ANY UP GRADIENT LAND-DISTURBING ACTIVITY BEGINS.
 - REMOVE TOPSOIL FROM THE SITE AND PLACE IN TEMPORARY STOCKPILE LOCATION. TEMPORARILY SEED THE STOCKPILE.
 - INSTALL UNDERGROUND UTILITIES (WATER, SANITARY SEWER, ELECTRIC AND PHONES) TAKING THE LOCATION AND FUNCTION OF STORM WATER BMPs INTO CONSIDERATION.
 - ROUGH GRADE THE SITE. IF THE INFILTRATION TRENCH IS GOING TO BE USED FOR TEMPORARY SEDIMENT CONTROL, GRADE THE INFILTRATION TRENCH TO WITHIN THREE (3) FEET OF FINAL GRADE TO PREVENT FLOODING OF INSTU SOIL.
 - SEED AND MULCH DISTURBED AREAS ON SITE.
 - CONSTRUCT THE ROADS TAKING THE LOCATION AND FUNCTION OF STORM WATER BMPs INTO CONSIDERATION.
 - PERFORM ALL OTHER SITE IMPROVEMENTS TAKING THE LOCATION AND FUNCTION OF THE STORM WATER BMPs INTO CONSIDERATION.
 - FINAL GRADE THE SITE.
 - STABILIZE THE SITE BY IMPLEMENTING THE NATIVE SEEDING AND PLANTING PORTION OF THE LANDSCAPING PLAN.
 - REMOVE THE SILT FENCE AFTER THE SITE IS STABILIZED PER PROJECT ENGINEER APPROVAL.

- GENERAL NOTES:**
- INSTALL ALL TEMPORARY EROSION CONTROL MEASURES (IN ACCORDANCE WITH MNDOT GENERAL CONDITIONS SETS) PRIOR TO SITE DISTURBANCE.
 - INSTALL STORM DRAIN INLET PROTECTION TO PREVENT CLOGGING OF THE STORM SEWER AND SEDIMENT LOADS TO DOWNSTREAM STORM WATER FACILITIES OR WATERBODIES.
 - IF THE STORM WATER BMP IS BEING DESIGNED TO SERVE AS A TEMPORARY SEDIMENT BASIN, GRADE THE BMP TO WITHIN THREE (3) FEET OF FINAL GRADE TO PREVENT CLOGGING OF INSTU SOIL. ONCE CONSTRUCTION IN THE CONTRIBUTING DRAINAGE AREA HAS BEEN COMPLETED AND THE SITE IS STABILIZED, EXCAVATE THE INFILTRATION TRENCH TO FINAL GRADE AND COMPLETE CONSTRUCTION OF THE INFILTRATION TRENCH.
 - GRADING OF THE INFILTRATION TRENCH SHALL BE ACCOMPLISHED USING LOW IMPACT EARTH-MOVING EQUIPMENT TO PREVENT COMPACTION OF THE UNDERLYING SOILS. WIDE TRACKED VEHICLES SUCH AS BACKHOES, SMALL DOZERS AND BOBCATS ARE RECOMMENDED.
 - EXCAVATE THE INFILTRATION TRENCH TO THE SPECIFIED DEPTH (ELEVATION). ALL SUB MATERIAL BELOW THE SPECIFIED ELEVATION SHALL BE LEFT UNDISTURBED, UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
 - GRADE TO THE DEPTH (ELEVATION) SPECIFIED IN THE CONSTRUCTION DOCUMENTS UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
 - IN THE EVENT THAT SEDIMENT IS INTRODUCED INTO THE BMP DURING OR IMMEDIATELY FOLLOWING EXCAVATION, THE SEDIMENT WILL NEED TO BE REMOVED FROM THE INFILTRATION TRENCH PRIOR TO INITIATING THE NEXT STEP IN THE INFILTRATION TRENCH CONSTRUCTION PROCESS.
 - MATERIAL EXCAVATED FROM THE INFILTRATION TRENCH SHALL BE DISPOSED OF ON-SITE AT LOCATIONS (TEMPORARY STOCKPILE AREAS) DESIGNATED BY ENGINEER.
 - CLEAN, WASHED 1 TO 8-INCH GRAVEL SHALL BE PLACED IN THE BOTTOM OF THE INFILTRATION TRENCH TO THE DEPTH SPECIFIED IN THE CONSTRUCTION DOCUMENTS. GRAVEL SHOULD BE PLACED IN LIFTS AND LIGHTLY COMPACTED WITH PLATE COMPACTORS.

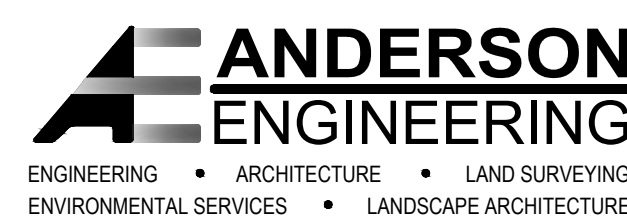


2 TYPICAL FILTRATION CLEANOUT DETAIL
SCALE: NTS

NO.	DATE	DESCRIPTION OF REVISIONS
7	7/17/18	CITY PUD APPROVAL
6	7/6/18	REVISED PER CITY AND MCWD COMMENTS
5	6/21/18	REVISED PER MCWD COMMENTS
4	6/14/18	UPDATED LOT AREA
3	6/11/18	REMOVED AMENITIES - REVISED LOT 1 AND OUTLOT A

DESIGNED: TJG
DRAWN: BJF
CHECKED BY: TJG

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.
PRINT NAME: TROY J. GAMBLE, PE
SIGNATURE: *NOT FOR CONSTRUCTION*
DATE: JULY 17, 2018 LICENSE # 23137



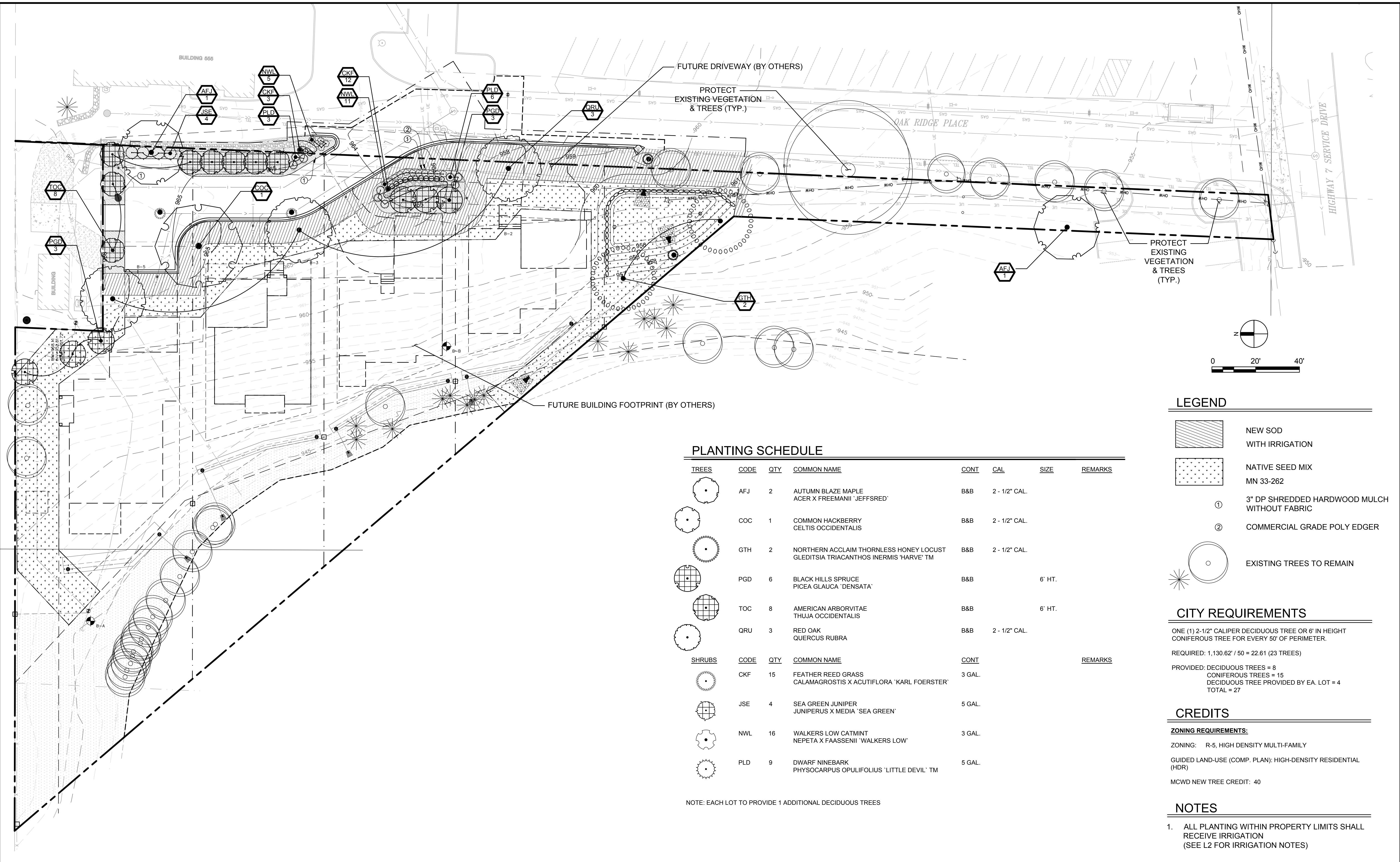
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www.ae-mn.com

SANCTUARY AT OAK RIDGE
HOPKINS, MN

DETAILS

COMM. NO. 14916 DATE: 6/11/18
DRAWING NO. C9

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 bfield
 Jul 16, 2018 - 1:30pm
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PLANTING SCHEDULE

TREES	CODE	QTY	COMMON NAME	CONT	CAL	SIZE	REMARKS
	AFJ	2	AUTUMN BLAZE MAPLE ACER X FREEMANII 'JEFFSRED'	B&B	2 - 1/2" CAL.		
	COC	1	COMMON HACKBERRY CELTIS OCCIDENTALIS	B&B	2 - 1/2" CAL.		
	GTH	2	NORTHERN ACCLAIM THORNLESS HONEY LOCUST GLEDITSIA TRIACANTHOS INERMIS 'HARVE' TM	B&B	2 - 1/2" CAL.		
	PGD	6	BLACK HILLS SPRUCE PICEA GLAUCA 'DENSATA'	B&B		6' HT.	
	TOC	8	AMERICAN ARBORVITAE THUJA OCCIDENTALIS	B&B		6' HT.	
	QRU	3	RED OAK QUERCUS RUBRA	B&B	2 - 1/2" CAL.		
SHRUBS	CODE	QTY	COMMON NAME	CONT	REMARKS		
	CKF	15	FEATHER REED GRASS CALAMAGROSTIS X ACUTIFLORA 'KARL FOERSTER'	3 GAL.			
	JSE	4	SEA GREEN JUNIPER JUNIPERUS X MEDIA 'SEA GREEN'	5 GAL.			
	NWL	16	WALKERS LOW CATMINT NEPETA X FAASSENII 'WALKERS LOW'	3 GAL.			
	PLD	9	DWARF NINEBARK PHYSOCARPUS OPULIFOLIUS 'LITTLE DEVIL' TM	5 GAL.			

NOTE: EACH LOT TO PROVIDE 1 ADDITIONAL DECIDUOUS TREES

LEGEND

- NEW SOD WITH IRRIGATION
- NATIVE SEED MIX MN 33-262
- 3" DP SHREDDED HARDWOOD MULCH WITHOUT FABRIC
- COMMERCIAL GRADE POLY EDGER
- EXISTING TREES TO REMAIN

CITY REQUIREMENTS

ONE (1) 2-1/2" CALIPER DECIDUOUS TREE OR 6" IN HEIGHT CONIFEROUS TREE FOR EVERY 50' OF PERIMETER.
 REQUIRED: 1,130.62' / 50 = 22.61 (23 TREES)
 PROVIDED: DECIDUOUS TREES = 8
 CONIFEROUS TREES = 15
 DECIDUOUS TREE PROVIDED BY EA. LOT = 4
 TOTAL = 27

CREDITS

ZONING REQUIREMENTS:
 ZONING: R-5, HIGH DENSITY MULTI-FAMILY
 GUIDED LAND-USE (COMP. PLAN): HIGH-DENSITY RESIDENTIAL (HDR)
 MCWD NEW TREE CREDIT: 40

NOTES

- ALL PLANTING WITHIN PROPERTY LIMITS SHALL RECEIVE IRRIGATION (SEE L2 FOR IRRIGATION NOTES)

NO.	DATE	DESCRIPTION OF REVISIONS
7	7/17/18	CITY PUD APPROVAL
6	7/6/18	REVISED PER CITY AND MCWD COMMENTS
5	6/21/18	REVISED PER MCWD COMMENTS
4	6/14/18	UPDATED LOT AREA
3	6/11/18	REMOVED AMENITIES - REVISED LOT 1 AND OUTLOT A

DESIGNED: JDJ
 DRAWN: JAF
 CHECKED BY: JDJ
 I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL LANDSCAPE ARCHITECT UNDER THE LAWS OF THE STATE OF MINNESOTA.
 PRINT NAME: JOSEPH D. LUCHT, PLA
 SIGNATURE: *NOT FOR CONSTRUCTION*
 DATE: JULY 17, 2018 LICENSE # 52858

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**SANCTUARY AT OAK RIDGE
 HOPKINS, MN**

LANDSCAPE PLAN
 COMM. NO. 14916 DATE: 6/11/18
 DRAWING NO. L1

Disturbed Wetland Buffer Planting Plan

The wetland buffer that shall be established and recorded for the lot split and residential development located northwest of the intersection of State Highway 7 Frontage Road and Oak Ridge Place (PID: 2411722120096) Hopkins, MN will have an average applied buffer width of 25 feet with a minimum width of 12.5 feet. The proposed location of the buffer is depicted on the Site Plan included in Appendix A.

Prior to construction of the lots, a silt fence shall be installed along the edge of the area to be disturbed by construction, as indicated on the Site Plan in Appendix A. The silt fence shall be inspected and maintained until the completion of construction and re-establishment of vegetation, as applicable.

In the spring of 2019, upon completion of construction, the disturbed areas located within the wetland buffer depicted in Appendix A shall be planted with a native wet prairie seed mix according to the specifications listed below. Note that the undisturbed areas within the upland buffer will not require seeding.

1. Decompact the soil in the disturbed buffer areas by incorporating organic matter to a depth of 18 inches, as required by the MCWD. Decompaction shall be accomplished solely by incorporation of organic matter within the drip line or critical root zone of trees or within 10 feet of underground utilities
2. Purchase 11 permanent buffer monuments from MCWD and install along the edge of the buffer where required as depicted on the attached site plan.
3. Purchase a native wet prairie seed mix such as State Mix 33-262 (included in Appendix B) or equivalent mix of native species included in MCWD's *Wetland Buffer Template* document (included in Appendix C)
4. Drill or broadcast specified seed mix at recommended rate
5. After seeding, roll, tamp or loosely rake the seeded areas to ensure proper seed to soil contact and to lightly cover seed with approximately $\frac{1}{8}$ to $\frac{1}{4}$ inch of soil. Seeds should be no deeper than $\frac{1}{4}$ inch.
6. Apply an erosion control blanket or weed free mulch at a rate of 1 ton/acre within the seeded area. Mulch should be $\frac{1}{2}$ to 1 $\frac{1}{2}$ inch deep. Mulch should be crimped into the soil to a depth of 1 to 2 inches immediately after it is applied. After mulch has been spread, apply water with a fine spray.
7. After germination of the broadcast seeding, hand-seed the specified mix into the disturbed areas that did not germinate, and lightly rake the hand spread seed into the soil. Supplement planted area with suitable native potted plants as desired.

Maintenance & Monitoring Plan

The seeded buffer area will require maintenance and monitoring for up to five years to prevent growth of unwanted non-native/invasive species and to promote native species development. The following management techniques will be employed to ensure successful establishment:

Monitoring Approach

The site will be visited twice during the growing season by a biologist, landscape architect or other qualified professional. Site visits will generally be mid-June and early August. Conditions will be documented and issues noted. Issues will be communicated to owner along with recommended corrective actions.

Typical Maintenance

Non-native and Invasive Plant Control

Eradication of non-native and invasive species will be conducted as necessary to minimize competition that could prevent the establishment of native species. Non-native and invasive plants should be removed by hand or controlled with proper herbicides, as approved by MCWD or a restoration specialist.

Other Pests

Insects, vertebrate pests, disease and herbivore predation will be monitored. Generally speaking, there will be a moderate threshold of tolerance before control measures are considered. All applicable federal and state laws and regulations will be closely followed.

Fertilization

Fertilizer will not be applied in the wetland buffer.

Mowing

Mowing is an essential step in the establishment of native vegetation. Mowing at least twice during the first growing season and at least once during the second growing season is necessary for native vegetation establishment. Mowing shall commence when weed species reach 6-10 inches, before the plants form flowering heads (weeds usually reach 12-14 inches). The mowing height shall be set so that the vegetation in the restoration area is left at minimum height of 5 inches after mowing is complete. Mowing height should be raised as native plants establish. Primary goals of mowing are to allow sufficient light to reach native plant seedlings and preventing weed seed production. Care should be taken to not mow desirable species in the planting if possible (the species listed in the seed mix). For example if the weed species are 12 to 14 inches and the native species are 7 to 8 inches high, the mowing height should be set at 9-inches.

Annual Wetland Buffer Inspection Report

An annual Wetland Buffer Inspection Report shall be prepared and submitted to MCWD before November 15th of each year for five years (2019-2023), unless MCWD determines that the buffer is adequately established after year three. The Annual Buffer Inspection Report shall include the following:

- Photos of the buffer area taken during the growing season
- A site plan that depicts the location of the buffer as well as the photo vantage points
- Notes on areas of bare soil or erosion, areas of invasive vegetation, and location and type of any encroachments on the buffer, if applicable
- A list of dominant plant species and estimated percent cover
- A comparison of the species present to the approved planting/seeding plan
- A written narrative that identifies future management strategies