

**1 BIO-RETENTION DETAIL**  
C8.6 SCALE : NTS

AREA	OVERFLOW STRUCTURE NUMBER	TOP Elev (A)	CPV Ponding Elev (B)	WQV Ponding Elev (C)	Depth of Soil (C)	Mulch Elev (D)	Soil Elev (E)	Sand Elev (F)	Pea Gravel Elev (G)	Clean Gravel Elev (H)	Bottom Elev (I)	4" PVC Perched Pipe Elev (J)	Perched 4" PVC Elev (K)	15-Year, 20-Min Q	15-Year, 20-Min HW Elev	100-Year, 20-Min Q	100-Year, 20-Min Min HW Elev (K)	Min. Berm Elevation
A	2	625.90	n/a	623.50	2.50	622.75	622.50	620.00	619.50	619.00	618.50	619.17	619.83	5.17	626.23	7.15	626.07	627.10
B	7	626.65	n/a	626.63	2.50	625.75	625.50	623.00	622.50	622.00	621.50	622.17	622.83	1.88	626.82	2.91	626.89	628.00

100 YR LFB HW Elev = FROM LFB STORM REPORT

TABLE 3: PLANTING, WATER AND MULCH REQUIREMENTS

WATER AVAILABILITY	REQUIRED PLANTING PERIOD	MINIMUM CONTAINER SIZE	WATER REQUIREMENT FIRST 3 WEEKS*	WATER REQUIREMENT AFTER 3 WEEKS*	MAXIMUM MULCH DEPTH****
NO ABILITY TO WATER AFTER INITIAL PLANTING	LATE FEB. - APRIL ONLY	2.25" X 3.75" OR LARGER (PLUG)	WATER EACH PLUG IMMEDIATELY AFTER PLANTING**	1" (60 MIN) EVERY 4 DAYS UNTIL PLANTS ESTABLISHED***	1.5" FOR PLUGS 2.5" FOR QUARTS
MANUAL WATERING WITH STANDARD SPRINKLER	LATE FEB. - EARLY JUNE SEPT. - OCTOBER	4.5" X 5" (QUART) OR LARGER IN SUMMER & FALL	1" (60 MIN) EVERY 4 DAYS IN SPRING AND FALL	1" (60 MIN) EVERY 7 DAYS UNTIL PLANTS ESTABLISHED***	1.5" FOR PLUGS 2.5" FOR QUARTS
AUTOMATIC IRRIGATION (SET TO WATER MORE)	LATE FEB. - EARLY OCT.	2.25" X 3.75" (PLUG) OR LARGER IN SPRING	1" (60 MIN) EVERY 4 DAYS IN SPRING AND FALL	1" (60 MIN) EVERY 7 DAYS UNTIL PLANTS ESTABLISHED***	1.5" FOR PLUGS 2.5" FOR QUARTS
FREQUENTLY THAN NORMAL DURING FIRST TWO MONTHS AFTER PLANTING)		4.5" X 5" (QUART) OR LARGER IN SUMMER & FALL	1" (60 MIN) EVERY 3 DAYS IN SUMMER		

\*THIS WATER AMOUNT INCLUDES NATURAL RAINFALL. IF YOU GET A 1/8 INCH OF NATURAL RAIN THEN YOU WILL NEED TO ADD A 1/8 INCH OF WATER TO MEET THE 1 INCH REQUIREMENT.

\*\*REQUIRES TRANSPORT OF WATER TO THE PLANTING SITE IN LARGE CONTAINERS AND POURING ENOUGH WATER ONTO EACH PLANT (AFTER PLANTING) TO MOISTEN THE ENTIRE PLANTING PIT.

\*\*\*PLANTS ARE ESTABLISHED WHEN ROOTS HAVE GROWN OUT OF THE CONTAINER SOIL AND INTO THE NATIVE SOIL BY 3-5 INCHES. THIS NORMALLY TAKES 3-4 MONTHS FOR MOST PERENNIALS AND GRASSES AND UP TO 6-7 MONTHS FOR TREES AND SHRUBS.

MATERIAL	SPECIFICATION	SIZE	NOTES
PLANTINGS	SEE LANDSCAPE PLAN	N/A	PLANTINGS ARE SITE-SPECIFIC
PLANTING SOIL [2.5' TO 4.5' DEEP]	SAND MIN OF 60% CLAY MAX OF 10%	N/A	USDA SOIL TYPES LOAMY SAND, SANDY LOAM OR LOAM
GRAVEL MULCH	MERAMEC PEA GRAVEL	1/4" TO 3/8"	
GEOTEXTILE	MSD TYPE 4	N/A	FOR USE ON SIDES ONLY
SAND [6" DEEP]	CLEAN ASTM-C-33 FINE AGGREGATE	0.02" TO 0.04"	SAND SUBSTITUTIONS SUCH AS DIABASE AND GRAYSTONE #10 ARE NOT ACCEPTABLE. NO CALCIUM CARBONATED OR DOLOMITIC SAND SUBSTITUTIONS ARE ACCEPTABLE. NO "ROCK DUST" CAN BE USED FOR SAND
GRAVEL LAYER [6" DEEP]	ASTM C-33 NO. 8	3/8" #	
UNDERDRAIN GRAVEL [6" DEEP]	ASTM C-33 NO. 6 OR 67	0.75" #	
UNDERDRAIN PIPING	4" RIGID SCHEDULE 40 PVC OR SDR35	3/8" PERF. # 12" ON CENTER, 2 HOLES PER ROW AT 5 & 7 O'CLOCK FACING; DOWN; MINIMUM OF 2" OF GRAVEL UNDER PIPES	

Basin ID	Design Filter Surface Area (ft <sup>2</sup> )	As-Built Filter Surface Area (ft <sup>2</sup> )	Design Filter Surface Elev (ft)	As-Built Filter Surface Elev (ft)	Design Overflow Sill Elev (ft)*	As-Built Overflow Sill Elev (ft)*	Required WQ Volume (ft <sup>3</sup> )	As-Built WQ Volume (ft <sup>3</sup> )	Required Forebay Volume (ft <sup>3</sup> )	As-Built Forebay Volume (ft <sup>3</sup> )
A	1123		622.75		625.90		3,701		N/A	
B	592		625.75		626.65		1,353		N/A	

\* Overflow Sill Elevation = Maximum Water Quality Storage Elevation  
As-built portion of table to be certified by a Professional Engineer or Professional Land Surveyor licensed in Missouri

**PLANTING SOIL**

The planting soil should be a sandy loam or loamy sand (should contain a minimum of 60 percent sand, by volume). The clay content for these soils should be less than 10 percent by volume. A permeability of at least 1.0 feet per day (0.5 inches per hour) is required (a conservative value of 0.5 feet per day is used for design). The design rate may be increased to 2 feet/day if field observation, post-construction infiltration testing, or other equivalent testing (as determined by the District) is provided to confirm the design rate is achieved.) The soil should be free of stones, stumps, roots, or other woody material over 1 inch in diameter. For best results, brush or seeds from noxious weeds, such as Johnson grass, mugwort, nutsedge and Canadian thistle should not be present in the soils. Placement of the planting soil should be in lifts of 12 to 18 inches, loosely compacted (rubber wheeled heavy equipment and mechanical tamping devices are not recommended for compaction). The specific characteristics are presented in the following table.

Table 1: Planting Soil Characteristics. Source: Maryland Stormwater Manual

Parameter	Value
pH range	5.2 to 8.00
Organic matter	1.5 to 5.0%
Magnesium	35 lbs. per acre, minimum
Phosphorus (P205)	75 lbs. per acre, minimum
Potassium (K2O)	85 lbs. per acre, minimum
Soluble salts	≤ 500 ppm

The mulch layer plays an important role in the performance of the bioretention system. It helps maintain soil moisture and avoids surface sealing that reduces permeability. Mulch helps prevent erosion and provides a microenvironment suitable for soil biota at the mulch/soil interface. It also serves as a pretreatment layer, trapping the finer sediments that remain suspended after the primary pretreatment. The mulch layer should be free of other materials, such as weed seeds, soil, roots, etc. The mulch should be applied to a maximum depth of three inches. Grass clippings should not be used as a mulch. Pea gravel or other similar natural gravel may be used.

**SAND SPECIFICATIONS**

Washed ASTM C33 Fine Aggregate Concrete Sand is utilized for stormwater management applications. In addition to the ASTM C33 specifications, sand must meet ALL of the following conditions.

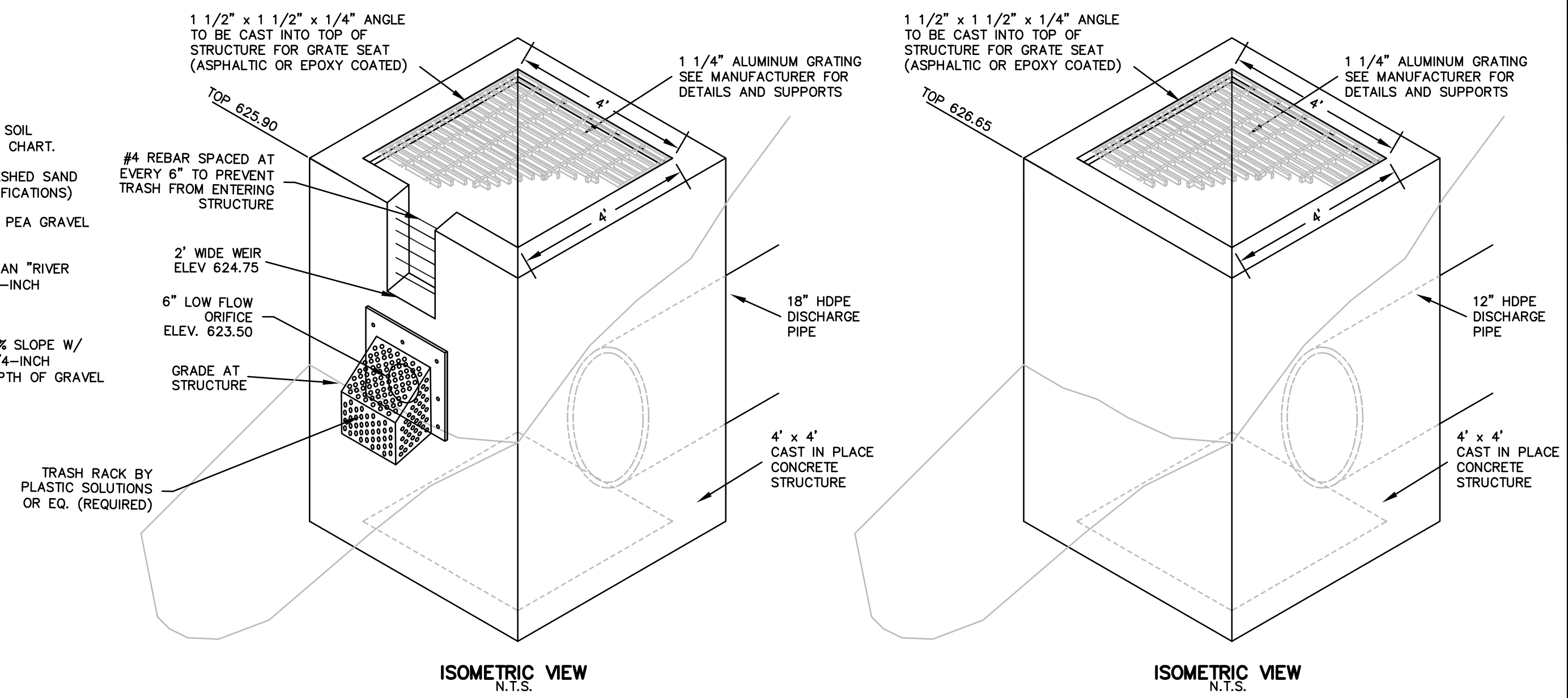
- Sand must meet gradation requirements for ASTM C-33 Fine Aggregate Concrete Sand.
- Sand must be silica based...no limestone based products may be used. If the material is white or gray in color, it is not acceptable.
- Sand must be clean. Natural, unwashed sand deposits may not be used. Likewise, sand that has become contaminated by improper storage or installation practices will be rejected.
- Manufactured sand or stone dust is not acceptable under any circumstance.

**BIO-RETENTION**  
THE RAIN GARDEN IS DESIGNED TO HOLD STORM WATER RUNOFF SO IT CAN FILTER POLLUTANTS. THERE ARE SPECIAL PLANTS IN THE BEDS WHICH ACTUALLY ASSIST IN THE PROCESS OF ABSORBING THE POLLUTANTS. THE PLANTS ARE ALSO USED TO FEED AND ATTRACT BIRDS AND BUTTERFLIES.

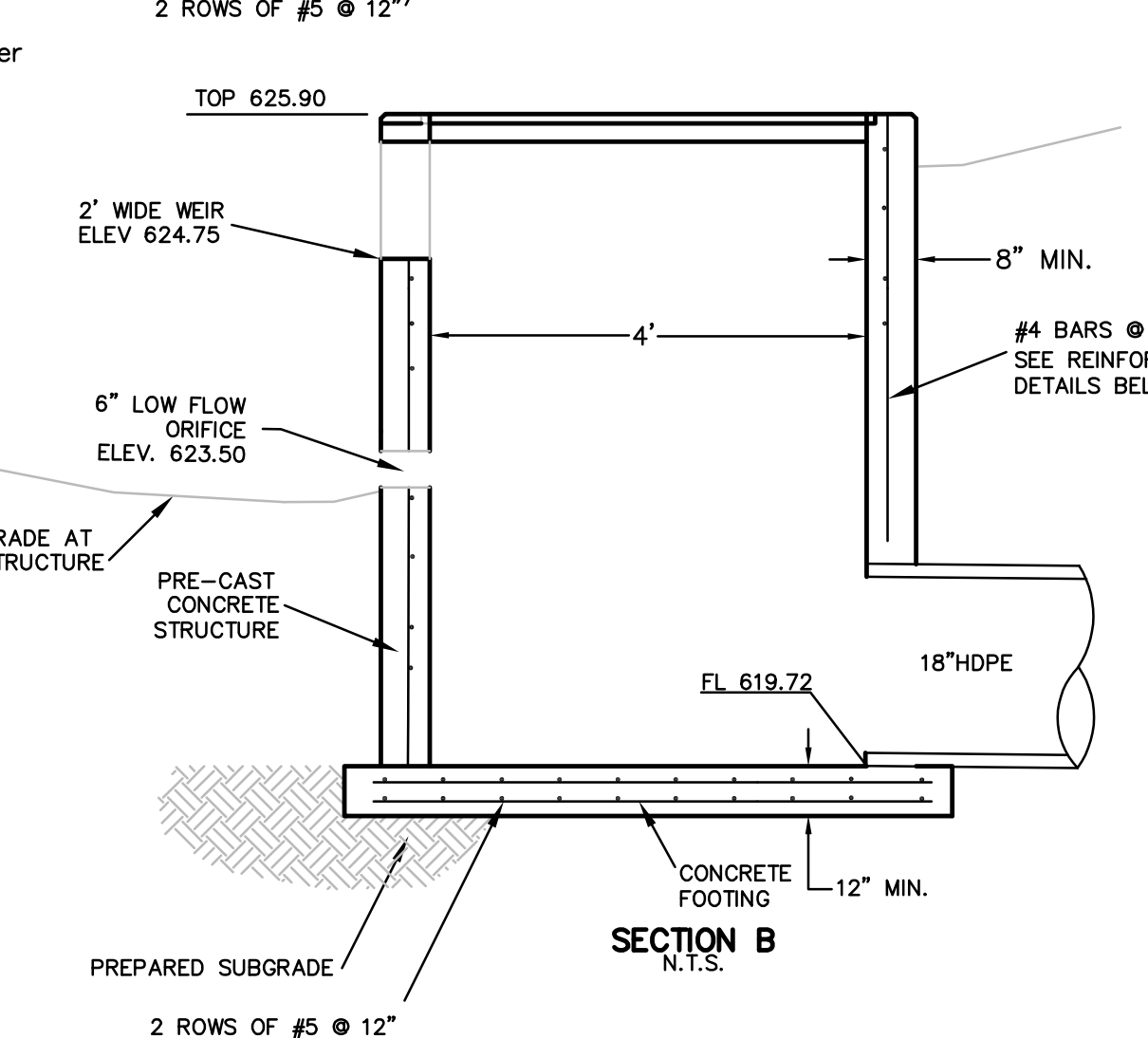
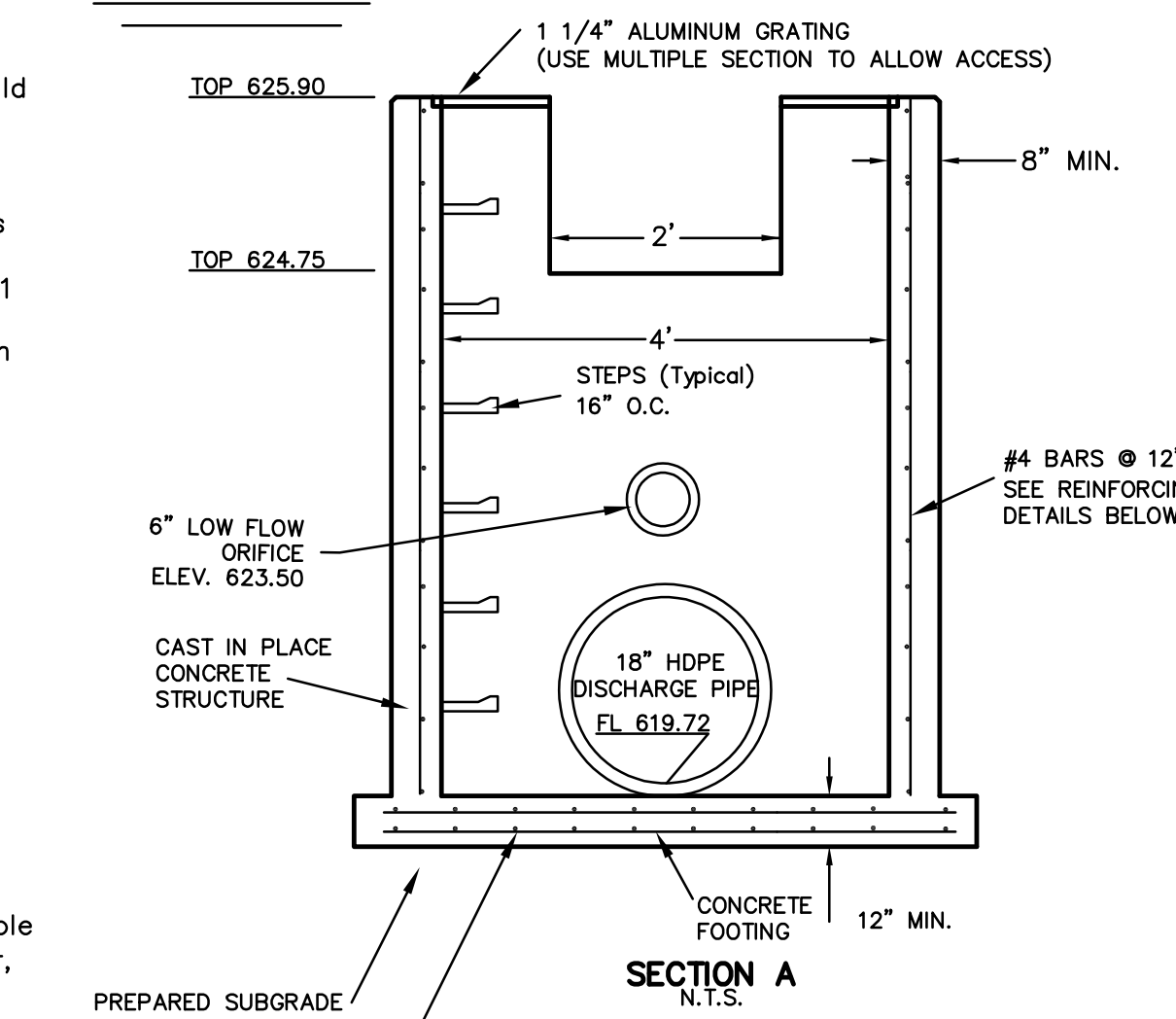
**BIO-RETENTION INFO SIGN**

STANDARD 18"x12"x.080" ALUMINUM SIGN FACE WITH BLACK 0.625" SERIES 2000 STANDARD ALPHABET ON WHITE BACKGROUND GALVANIZED STEEL POST 9'6" LONG. SET BOTTOM OF SIGN 5' ABOVE GRADE. SET BOTTOM OF POST 3' BELOW GRADE.

**2 BIO-RETENTION SIGN**  
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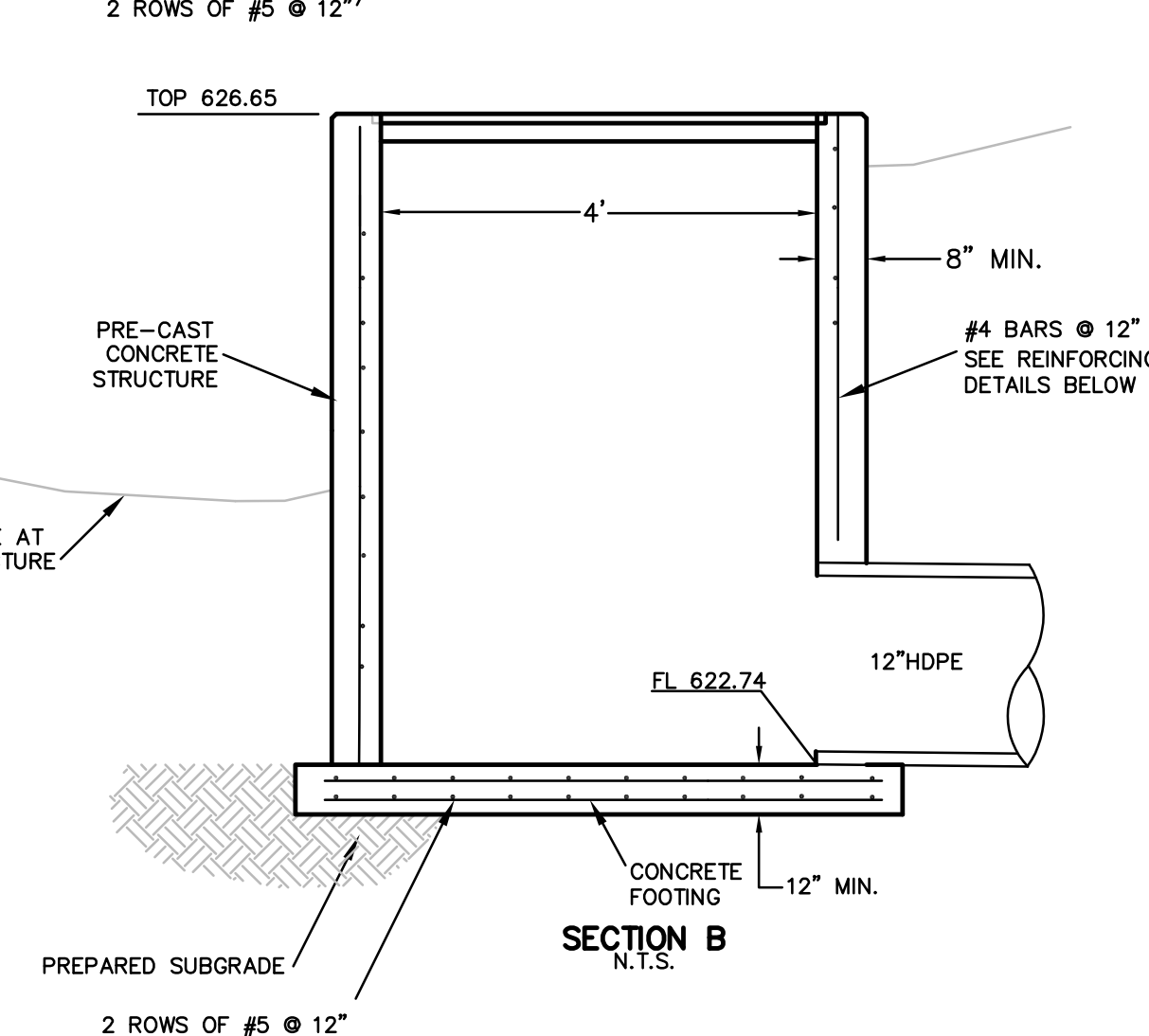
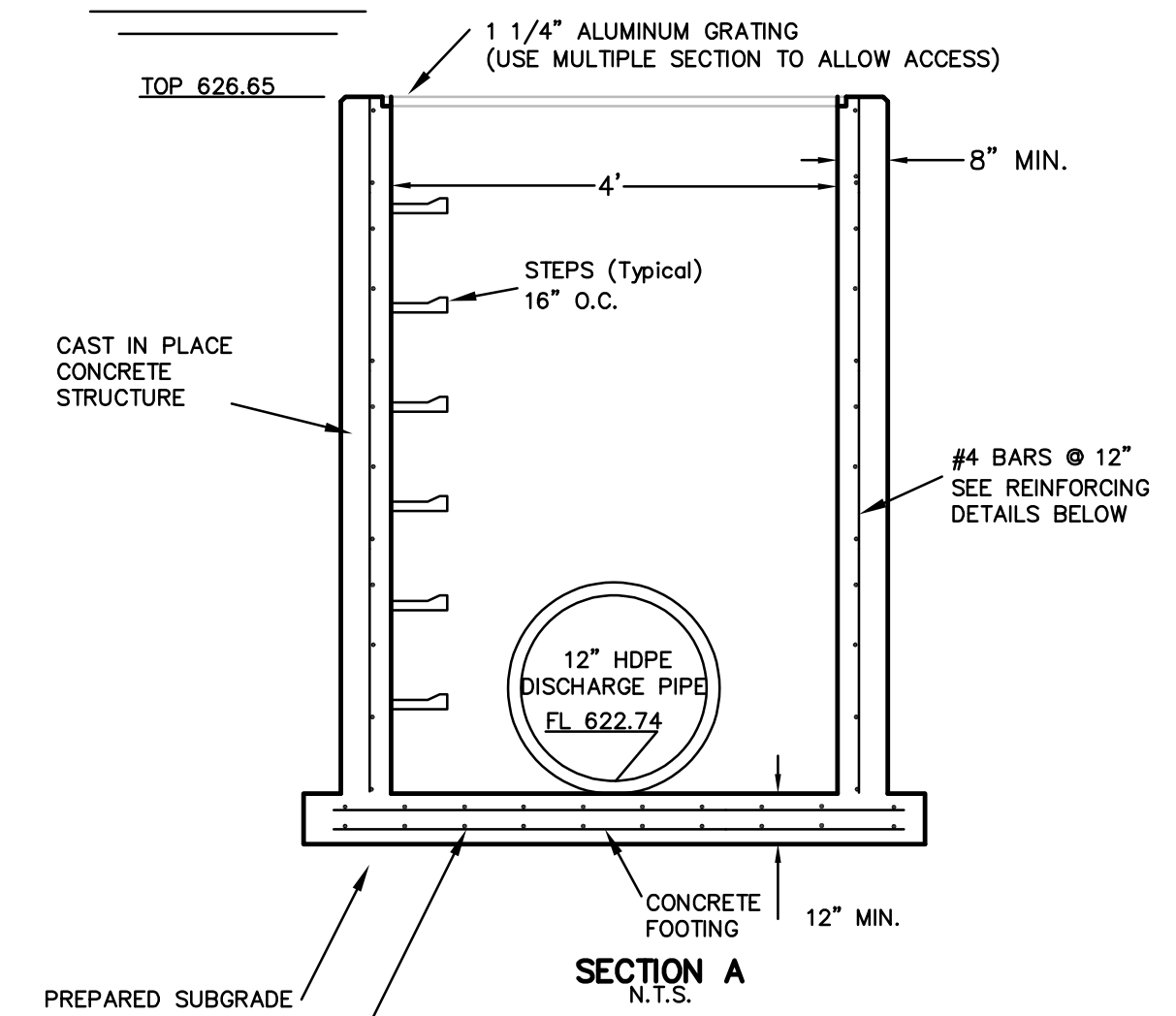


100 YR LFB HW ELEV = 626.07



**3 OUTFALL STRUCTURE #2**  
C8.6 SCALE : NTS

100 YR LFB HW ELEV = 626.89

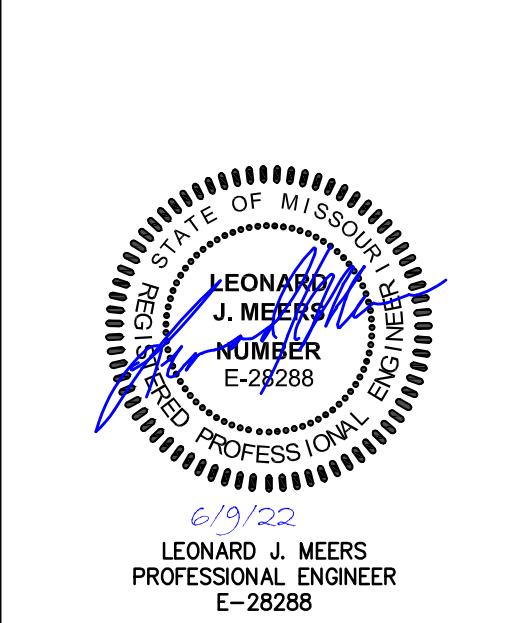


**4 OUTFALL STRUCTURE #7**  
C8.6 SCALE : NTS

NO.	DESCRIPTION	DATE
1	CITY COMMENTS	02-24-2022
2	CITY/UTIL COMMENTS	03-14-2022

**PROJECT TITLE**  
O'FALLON U-HAUL  
1200 S. OUTER ROAD  
O'FALLON, MO 63366

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Approval Date:  
City No.  
Page No.  
**C8.6**

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**BMP DETAILS**