

BIORETENTION AREA CONSTRUCTION SPECIFICATIONS

GENERAL NOTES

- PRIOR TO CONSTRUCTION, ANY DISCREPANCIES IN THE PLANS AND NOTES SHALL BE BROUGHT TO THE DESIGN ENGINEER'S ATTENTION IMMEDIATELY.
- THE FINAL CERTIFICATION FOR THIS FACILITY WILL INCLUDE A CERTIFICATION BY THE ON-SITE GEOTECHNICAL ENGINEER THAT THE PROJECT WAS CONSTRUCTED PER THE APPROVED PLANS. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE WITH THE ON-SITE GEOTECHNICAL ENGINEER FOR OBSERVATION AND TESTING SUCH THAT THE ON-SITE GEOTECHNICAL ENGINEER CAN CERTIFY THE CONSTRUCTION OF THE DAM EMBANKMENT. THIS CERTIFICATION MUST ADDRESS THE TESTING FOR MATERIALS AND COMPACTION OF THE DAM EMBANKMENT.
- ALL CONSTRUCTION ACTIVITY RELATED TO THE PROPOSED STORMWATER CONTROL MEASURE SHALL BE PER THE DETAILS AND SPECIFICATIONS SHOWN IN THESE DRAWINGS, SOILS, COMPACTION, AND OTHER MISCELLANEOUS DETAILS AND SPECIFICATIONS MAY BE MODIFIED PER THE RECOMMENDATIONS OF THE ON-SITE GEOTECHNICAL ENGINEER. HOWEVER, PRIOR TO IMPLEMENTATION, THE DESIGN ENGINEER SHALL BE NOTIFIED OF ANY DEVIATION FROM THESE DESIGN DRAWINGS, INCLUDING SHOP DRAWINGS FOR ANY PROPOSED MODIFICATION.
- DURING THE INITIAL STAGES OF CONSTRUCTION, THE STORMWATER CONTROL MEASURE MAY BE USED AS A SEDIMENT BASIN FOR EROSION CONTROL PURPOSES. IF SO, THE CONTRACTOR SHALL FOLLOW THE GENERAL CONSTRUCTION SEQUENCE BELOW:
 - THE CONTRACTOR SHALL CONSTRUCT THE ENTIRE FACILITY (PERMANENT OUTLET STRUCTURE, DAM, KEY TRENCH, ETC.) WITH THE EXCEPTION OF THE INTERIOR FINE GRADING AND THE BIORETENTION MEDIA FOR THE FACILITY. THE INTERIOR FINE GRADING AND BIORETENTION MEDIA WILL BE CONSTRUCTED ONCE THE EROSION CONTROL PHASE IS COMPLETE.
 - THE TEMPORARY DRAW DOWN RISER (OR SKIMMER) SHALL BE CONNECTED TO THE 4" UNDERDRAIN OUTLET ORIFICE.
 - ONCE THE UPSTREAM DRAINAGE AREA IS STABILIZED AND THE EROSION CONTROL INSPECTOR APPROVES THE REMOVAL OF THE SEDIMENT BASIN, THE CONTRACTOR SHALL REMOVE THE TEMPORARY DRAW DOWN RISER (OR SKIMMER) AND CLEAN OUT THE BASIN. ALL SEDIMENT, TRASH, ETC. SHALL BE DISPOSED OF PROPERLY (I.E. PLACED IN A LANDFILL) AND NOT STOCKPILED IN AN AREA WHERE WATER QUALITY COULD BE ADVERSELY AFFECTED.
 - ONCE THE BASIN IS CLEANED OUT, AND ALL EROSION CONTROL DEVICES REMOVED, THE CONTRACTOR SHALL CONSTRUCT THE INTERIOR GRADING SHOWN ON THIS SHEET.
 - ONCE THE GRADING IS COMPLETE, THE CONTRACTOR SHALL REQUEST AN ON-SITE INSPECTION AND AN AS-BUILT SURVEY PRIOR TO INSTALLATION OF THE STORMWATER CONTROL MEASURE PLANTS. IF THE CONTRACTOR PLANTS THE PROPOSED VEGETATION PRIOR TO AN AS-BUILT SURVEY (AND SUBSEQUENT APPROVAL), ANY CHANGES TO THE GRADING / RE-PLANTING OF PLANTS WILL BE AT THE CONTRACTOR'S EXPENSE.
 - ONCE THE ENGINEER HAS APPROVED THE AS-BUILT GRADING, THE CONTRACTOR SHALL PLANT THE PROPOSED STORMWATER CONTROL MEASURE PLANTS SHOWN ON THE LANDSCAPE PLAN FOR THE FACILITY. AFTER COMPLETION OF THE PLANTING, THE LANDSCAPE CONTRACTOR SHALL PROVIDE A LETTER TO THE ENGINEER CERTIFYING THAT THE PLANTS HAVE BEEN INSTALLED PER THE APPROVED STORMWATER CONTROL MEASURE PLANTING PLAN. THE CONTRACTOR SHALL PROVIDE A ONE-YEAR WARRANTY FOR ALL PLANTS INSTALLED.
- ALL OSHA REQUIREMENTS FOR EXCAVATIONS (SHORING, DEPTH, ETC.) ARE THE RESPONSIBILITY OF THE CONTRACTOR. IF REQUIRED, THE CONTRACTOR SHALL PROVIDE AN EXCAVATION PLAN TO BE SEALED BY A P.E. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO DETERMINE IF AN EXCAVATION PLAN IS REQUIRED. THE JOHN R. MCADAMS COMPANY ASSUMES NO RESPONSIBILITY FOR ANY EXCAVATION DESIGN RELATED TO SAFETY OR OSHA REQUIREMENTS.
- IT IS ANTICIPATED THAT DEWATERING WILL BE NECESSARY IN THE EXCAVATION AREAS (E.G. - EMBANKMENT SUB GRADE, INTERIOR PORTIONS OF THE STORMWATER CONTROL MEASURE, KEY TRENCH, ETC.). THEREFORE, THE CONTRACTOR SHALL FURNISH, INSTALL, OPERATE, AND MAINTAIN ANY PUMPING EQUIPMENT, ETC. NEEDED FOR REMOVAL OF WATER FROM VARIOUS PARTS OF THE STORMWATER CONTROL MEASURE SITE. DURING PLACEMENT OF FILL WITHIN THESE AREAS, THE CONTRACTOR SHALL KEEP THE WATER LEVEL BELOW THE BOTTOM OF THE EXCAVATION / CONSTRUCTION AREAS. THE MANNER IN WHICH THE WATER IS REMOVED SHALL BE SUCH THAT THE EXCAVATION BOTTOM AND SIDE SLOPES ARE STABLE, WITH NO SEDIMENT DISCHARGED FROM THE SITE (I.E. PUMPED WATER MAY NEED TO BE DIRECTED TO AN APPROVED EROSION CONTROL DEVICE SUCH AS A DIRT BAG (ACT ENVIRONMENTAL), OR ENGINEER APPROVED EQUIVALENT, PRIOR TO DISCHARGE).
- PRIOR TO CONSTRUCTION, THE ONSITE GEOTECHNICAL ENGINEER SHALL VERIFY THE FILTRATION AND PERMEABILITY ASPECTS OF THE PROPOSED BIORETENTION MATERIALS. SPECIAL ATTENTION SHALL BE PAID TO PREVENT MIGRATION OF FINER SOIL PARTICLES THROUGH UNDERLYING GRAVEL LAYERS.
- PRIOR TO PLACING THE BIORETENTION AREA BACKFILL MATERIAL, THE CONTRACTOR SHALL REQUEST AN ON-SITE MEETING WITH THE DESIGN ENGINEER AND THE EROSION CONTROL INSPECTOR TO ENSURE THE UPSTREAM DRAINAGE AREA IS COMPLETELY STABILIZED (I.E. GOOD VEGETATIVE COVER). IF THE CONTRACTOR DECIDES TO PLACE THE BACKFILL FOR THE BIORETENTION AREA PRIOR TO APPROVAL FROM THE DESIGN ENGINEER AND THE EROSION CONTROL INSPECTOR, THEN THE CONTRACTOR SHALL EXCAVATE / REPLACE, AS NECESSARY, ANY BACKFILL MATERIAL NEEDED FOR THE SYSTEM TO FUNCTION PROPERLY AT HIS / HER EXPENSE SHOULD THE BIORETENTION AREA NOT FUNCTION PROPERLY (I.E. WILL NOT DRAIN DUE TO SEDIMENT DEPOSITION) DUE TO AN UNSTABILIZED UPSTREAM DRAINAGE AREA.
- THE GRADES SHOWN ON THIS PLAN ARE FINISHED GRADES. IF THE EXISTING SOIL LAYER AFTER CONSTRUCTION / COMPACTION IS NOT DETERMINED SUITABLE BY A LANDSCAPE PROFESSIONAL FOR THE BIORETENTION AREA PLANTINGS, THEN THE CONTRACTOR SHALL AMEND THE PLANTING AREA OF THE BIORETENTION AREA AS DIRECTED BY A LANDSCAPE PROFESSIONAL.
- PRIOR TO TOPSOIL INSTALLATION, THE CONTRACTOR SHALL SCARIFY THE TOP 2" - 3" OF THE BERM SECTION TO PROMOTE BONDING OF THE TOPSOIL. WITH THE TOPSOIL DEPTH SHALL RANGE FROM 3" - 4" ON THE DAM EMBANKMENT. PLEASE NOTE THE TOPSOIL SHALL BE AMENDED, AS DIRECTED BY A LANDSCAPE PROFESSIONAL, PRIOR TO INSTALLATION ON THE EMBANKMENT.
- ONCE CONSTRUCTION OF THE BIORETENTION INTERIOR IS COMPLETE, THE CONTRACTOR SHALL REQUEST AN ON-SITE INSPECTION AND AN AS-BUILT SURVEY PRIOR TO INSTALLATION OF ANY LANDSCAPING / PLANTS. IF THE CONTRACTOR PLANTS THE PROPOSED LANDSCAPING PRIOR TO AN AS-BUILT SURVEY (AND SUBSEQUENT APPROVAL), ANY CHANGES TO THE GRADING / RE-PLANTING OF PLANTS WILL BE AT THE CONTRACTOR'S EXPENSE.
- THE CONTRACTOR SHALL REFER TO THE LANDSCAPE PLAN ON SHEET C9.XX FOR THE PERMANENT PLANTING PLAN / SCHEDULE FOR THE INTERIOR OF THE BIORETENTION AREA. THE PERMANENT VEGETATION FOR THE PROPOSED DAM EMBANKMENT SHALL BE TALL FESCUE. PLEASE NOTE THAT NO TREES / SHRUBS OR WOODY VEGETATION OF ANY TYPE MAY BE PLANTED ON THE PROPOSED DAM EMBANKMENT (FILL AREAS). THE INTERIOR SLOPES OF THE BIORETENTION AREA ARE TO BE PROVIDED WITH A TALL FESCUE SOO STRIP AROUND THE ENTIRE PERIMETER OF THE CELL ABOVE THE MEDIA.
- ANY EXPOSED EDGE/SIDE OF THE BIORETENTION CELL SHALL BE SODDED AS SOON AS POSSIBLE AFTER CONSTRUCTION IS COMPLETE. PLEASE REFER TO THE LANDSCAPE PLAN FOR ADDITIONAL INFORMATION.

CONSTRUCTION PREPARATION

- PRIOR TO PLACEMENT OF THE NEW FILL, THE AREAS ON WHICH FILL IS TO BE PLACED SHALL BE CLEARED AND STRIPPED OF TOPSOIL, TREES, ROOTS, VEGETATION, AND OTHER OBJECTIONABLE MATERIAL. THE AREAS ON WHICH FILL IS TO BE PLACED SHALL BE SCARIFIED.
- FOUNDATION AREAS MAY REQUIRE UNDERCUTTING OF COMPRESSIBLE AND/OR UNSUITABLE SOILS IN ADDITION TO THAT INDICATED ON THE PLANS. ALL SUCH UNDERCUTTING SHALL BE PERFORMED AT THE DISCRETION OF THE GEOTECHNICAL ENGINEER AND SHALL BE MONITORED AND DOCUMENTED. IN NO CASE SHALL THERE BE AN ATTEMPT TO STABILIZE ANY PORTIONS OF THE FOUNDATION SOILS WITH CRUSHED STONE.
- TREATMENT OF SEEPAGE AREAS, SUBGRADE PREPARATION, FOUNDATION DEWATERING AND ROCK FORMATION PREPARATION (I.E., TREATMENT WITH SLUSH GROUTING, DENTAL CONCRETE, ETC.) MAY BE REQUIRED AT THE DISCRETION OF THE GEOTECHNICAL ENGINEER. ALL SUCH ACTIVITIES SHALL BE CLOSELY MONITORED AND DOCUMENTED BY THE GEOTECHNICAL ENGINEER.

BIORETENTION PLANTING SOIL MIX SPECIFICATIONS

- THE PLANTING SOIL SHALL BE A UNIFORM MIX, FREE OF STONES, STUMPS, ROOTS OR OTHER SIMILAR OBJECTS LARGER THAN ONE-HALF INCH IN DIAMETER. NO OTHER MATERIALS OR SUBSTANCES SHALL BE MIXED OR DUMPED WITHIN THE BIORETENTION AREA THAT MAY BE HARMFUL TO PLANT GROWTH, OR PROVE A HINDRANCE TO THE PLANTING OR MAINTENANCE OPERATIONS. THE PLANTING SOIL SHALL BE FREE OF BERMUDA GRASS, JOHNSON GRASS, QUACK GRASS, MUGWORT, NUTSEDGE, POISON IVY, CANADA THISTLE, OR OTHER NOXIOUS WEEDS.
- THE MEDIA SHALL BE A HOMOGENOUS SOIL MIX ENGINEERED MEDIA BLEND WITH APPROXIMATE VOLUMES OF:
 - 75% TO 85% MEDIUM TO COARSE WASHED SAND (ASTM C33, AASHTO M6/M80, ASTM C330, AASHTO M195, OR APPROVED EQUIVALENT)
 - 8% TO 15% FINES (SILT AND CLAY, PASSING #200 SIEVE)
 - 5% TO 10% ORGANIC MATTER
- THE P-INDEX OF THE MEDIA SHALL NOT EXCEED 30.
- THE FOLLOWING TEST FREQUENCIES SHALL APPLY TO THE ABOVE SOIL CONSTITUENTS: ALL BIORETENTION AREAS SHALL HAVE A MINIMUM OF ONE TEST PER 200 CUBIC YARDS. EACH TEST SHALL CONSIST OF BOTH THE STANDARD SOIL TEST FOR MIX COMPOSITION AND PHOSPHORUS. A TEXTURAL ANALYSIS IS REQUIRED FROM THE SITE STOCKPILED BIORETENTION SOIL.

NOTE:

 - SINCE DIFFERENT LABS CALIBRATE THEIR TESTING EQUIPMENT DIFFERENTLY, ALL TESTING RESULTS SHALL COME FROM THE SAME TESTING FACILITY.
- AFTER INSTALLATION OF THE MEDIA, AN INFILTRATION TEST SHALL BE PERFORMED. THE MINIMUM INFILTRATION RATE OF THE INSTALLED MEDIA IS 1.0 IN/HR.
- THE MEDIA SHALL NOT BE MECHANICALLY COMPACTED. IT IS RECOMMENDED TO EITHER WATER OR WALK ON THE MEDIA AS IT IS PLACED.
- TRIPLE SHREDED HARDWOOD MULCH SHALL BE USED FOR THE BIORETENTION AREA. MULCH SHALL BE UNIFORMLY PLACED TWO TO FOUR INCHES DEEP.

TESTING OF THE EMBANKMENT

- TESTING OF THE NEW FILL MATERIALS SHALL BE PERFORMED TO VERIFY THAT THE RECOMMENDED LEVEL OF COMPACTION IS ACHIEVED DURING CONSTRUCTION. THEREFORE, ONE DENSITY TEST SHALL BE PERFORMED FOR EVERY 2,500 SQUARE FEET OF AREA FOR EVERY LIFT OF FILL. THE CONTRACTOR SHALL PROVIDE THE ENGINEER WITH REPORTS TO VERIFY THAT THE DAM EMBANKMENT MEETS THE SPECIFIED COMPACTION REQUIREMENTS. COMPACTION REPORTS WILL BE NEEDED DURING THE AS-BUILT CERTIFICATION PROCESS FOR THIS STORMWATER FACILITY. THEREFORE, IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE COMPACTION TESTS ARE PROPERLY PERFORMED DURING CONSTRUCTION.
- TESTING WILL BE REQUIRED ALONG THE Ø O-RING OUTLET BARRELS AT A FREQUENCY OF ONE TEST PER 25 LF OF PIPE PER VERTICAL FOOT OF FILL.
- TESTING OF THE DEGREE (%) OF COMPACTION OF THE PLACED FILL IN THE DAM SHALL BE PERFORMED AS A PART OF THE PERMITTEE'S NORMAL QUALITY CONTROL PROGRAM FOR THE CONSTRUCTION OF THE DAM. TESTS SHALL BE CONDUCTED CONCURRENT WITH THE INSTALLATION OF COMPACTED FILL AND THE CONTRACTOR SHALL COORDINATE THE CONSTRUCTION OF THE DAM SO THAT TESTING CAN BE COMPLETED. SHOULD THE RESULTS OF THE TESTS INDICATE THAT THE SPECIFIED DEGREE OF COMPACTION HAS NOT BEEN OBTAINED, THE PORTIONS OF THE DAM REPRESENTED BY SUCH TESTS SHALL BE REWORKED OR REBUILT. ALL PORTIONS OF THE DAM SHALL ACHIEVE THE SPECIFIED MINIMUM DEGREE OF COMPACTION.

BIORETENTION AREA MATERIAL SPECIFICATIONS

- THE MULCH SHALL CONSIST OF DOUBLE OR TRIPLE SHREDED HARDWOOD. MULCH SHALL BE WELL-AGED AND UNIFORM IN COLOR. WELL-AGED MULCH IS DEFINED AS MULCH THAT HAS BEEN STOCKPILED OR STORED FOR AT LEAST 12 MONTHS. MULCH SHOULD BE FREE OF WEED SEEDS, SOIL, ROOTS, OR ANY OTHER OBSTACLES. MULCH SHOULD BE UNIFORM IN COLOR AND BARK. THE MULCH DEPTH SHALL BE 2-4 INCHES UNIFORMLY PLACED. GRASS CLIPPINGS ARE UNSUITABLE FOR MULCH AND SHOULD BE AVOIDED FOR USE WITHIN THE BIORETENTION AREA.
- THE GRAVEL LAYER SHALL CONSIST OF NCDOT WASHED #57 STONE OR ENGINEER APPROVED EQUIVALENT
- THE WASHED SAND SHALL MEET REQUIREMENTS OF WASHED ASTM-C-33 FINE AGGREGATE CONCRETE SAND. IN ADDITION TO THE ASTM-C-33 SPECIFICATION, THE WASHED SAND MUST MEET THE FOLLOWING CONDITIONS:
 - SAND MUST MEET GRADATION REQUIREMENTS FOR ASTM-C-33 FINE AGGREGATE CONCRETE SAND. AASHTO M-6/M-80, ASTM C330, AASHTO M195 GRADATION IS ALSO ACCEPTABLE.
 - SAND MUST BE SILICA BASED. NO LIMESTONE BASED PRODUCTS MAY BE USED. IF THE MATERIAL IS WHITE OR GRAY IN COLOR, IT IS PROBABLY 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.
- THE CHOKING STONE LAYER SHALL BE WASHED #8 OR WASHED #89 STONE LAYER MEETING THE REQUIREMENTS OF ASTM-C-33.
- THE UNDERDRAIN PIPING FOR THE BIORETENTION AREAS SHALL BE 4" Ø ADS N-12 PIPE. THE PIPE AND FITTINGS SHALL BE TYPE 'S' AND SHALL MEET THE REQUIREMENTS OF AASHTO M-252. THE 6" Ø PERFORATED PIPE SHALL CONTAIN CIRCULAR PERFORATIONS MEETING AASHTO CLASS II. THE PERFORATIONS SHALL BE ¾" DIAMETER AT 6" ON CENTER MEETING PERFORATION PATTERN 'E' (6 AT 60°).

BIORETENTION AREA BACKFILLING SEQUENCE

- UNDERCUT BIORETENTION AREA TO NECESSARY DEPTH (SEE BIORETENTION AREA CROSS SECTION ON SHEET C9.01).
- PLACE 4" Ø SCHEDULE 40 OR SDR 35 SMOOTH WALL PVC UNDERDRAIN PIPES AND GEOTEXTILE LAYER. GEOTEXTILE SHALL BE SPECIFIED BY THE ON-SITE GEOTECHNICAL ENGINEER. THE ENDS OF THE UNDERDRAIN PIPES NOT TERMINATING IN AN OBSERVATION WELL SHALL BE CAPPED. THE COLLECTOR PIPES SHALL BE CONSTRUCTED AT A MINIMUM SLOPE OF 0.5%.
- PLACE 2" OF CHOKING STONE AND 4" OF WASHED SAND PER THE CROSS-SECTION ON SHEET C9.01.
- PLACE LAYER OF PLANTING SOIL (PER PLANTING SOIL SPECIFICATION) TO ELEVATION XXX.XX". PLACEMENT OF THE SOIL IN THE BIORETENTION AREA SHOULD BE IN LIFTS OF 18" OR LESS AND LIGHTLY COMPACTED.
- PLACE 3" LAYER OF MULCH (PER MULCH SPECIFICATIONS) TO GRADE.
- BIORETENTION SURFACE AREA SHALL BE AS STATED IN SHEET C9.00. THIS REQUIRED SURFACE AREA EXCLUDES THE SURFACE AREA OCCUPIED BY THE INLET RIPRAP VELOCITY DISSIPATOR.

COMPACTION OF THE BIORETENTION AREA

- CONTRACTOR SHALL MINIMIZE THE COMPACTION OF BOTH THE BASE OF THE BIORETENTION AREA AND THE REQUIRED BACKFILL. WHEN POSSIBLE, CONTRACTOR SHALL USE EXCAVATION HOES TO REMOVE THE ORIGINAL SOIL. IF THE BIORETENTION AREA IS EXCAVATED USING A LOADER, THE CONTRACTOR SHALL USE WIDE TRACK OR MARSH TRACK EQUIPMENT, OR LIGHT EQUIPMENT WITH TURF TYPE TIRES. COMPACTION AT THE BASE OF THE BIORETENTION AREA CAN BE ALLEVIATED BY USING A PRIMARY TILLING OPERATION SUCH AS A CHISEL PLOW, RIPPER, OR SUBSOILER. THESE TILLING OPERATIONS ARE TO REFRACATURE THE SOIL PROFILE THROUGH THE 12 INCH COMPACTION ZONE. SUBSTITUTE METHODS MUST BE APPROVED BY THE ENGINEER. ROTOTILLERS DO NOT TILL DEEP ENOUGH TO REDUCE THE EFFECTS OF COMPACTION FROM HEAVY EQUIPMENT.
- ROTOTILL 2 TO 3 INCHES OF SAND INTO THE BASE OF THE BIORETENTION FACILITY BEFORE BACKFILLING THE REQUIRED GRAVEL LAYER. PUMP ANY PONDED WATER BEFORE PREPARING (ROTOTILLING) BASE.
- WHEN BACKFILLING THE BIORETENTION AREA, PLACE SOIL IN LIFTS OF 12 INCHES TO 18 INCHES. DO NOT USE HEAVY EQUIPMENT WITHIN THE BIORETENTION AREA. HEAVY EQUIPMENT CAN BE USED AROUND THE PERIMETER TO SUPPLY SOILS AND SAND. GRADE BIORETENTION MATERIALS WITH LIGHT EQUIPMENT SUCH AS A COMPACT LOADER OR A DOZER/LOADER WITH MARSH TRACKS.

BERM SOIL AND COMPACTION SPECIFICATIONS

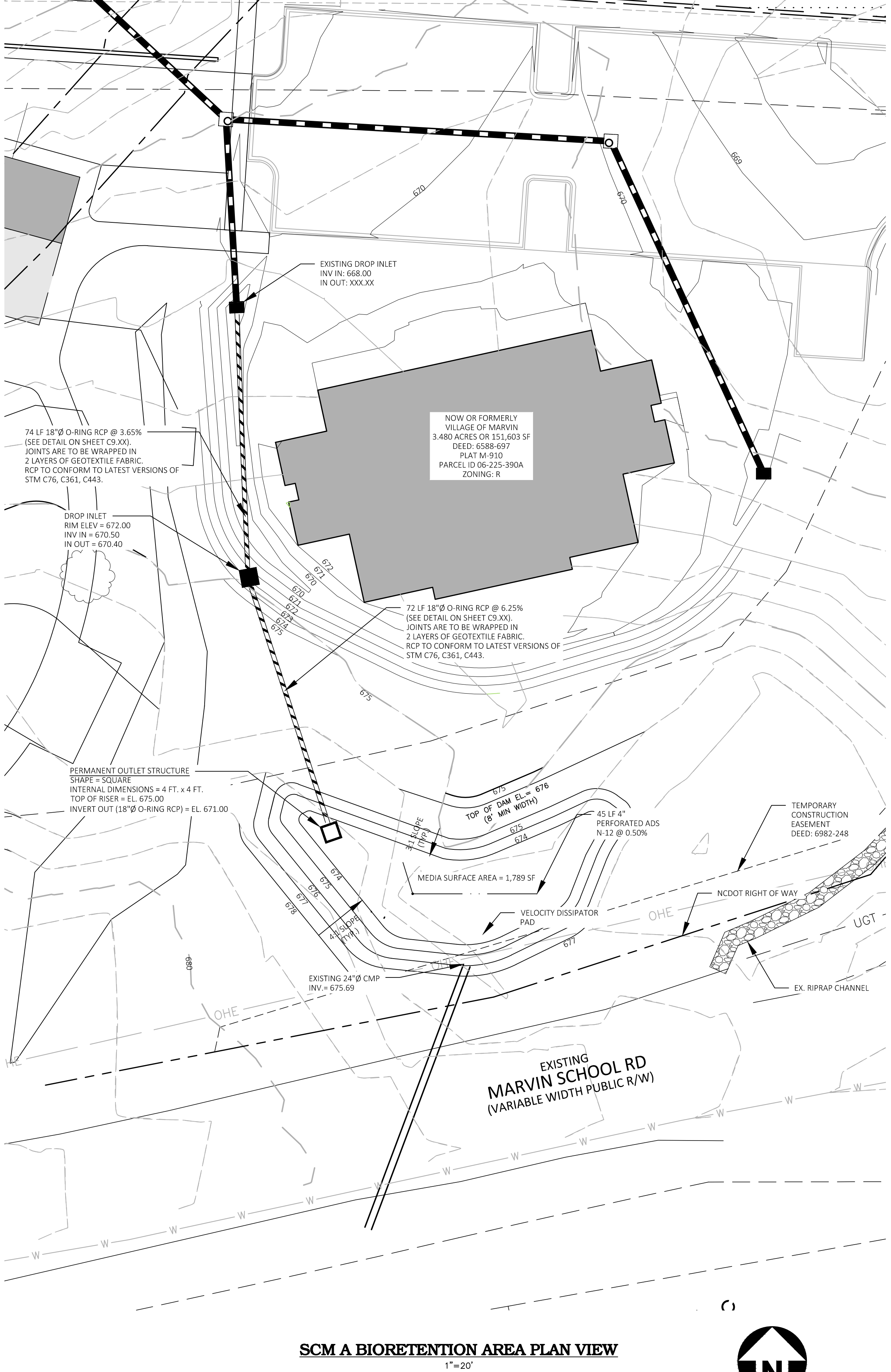
- PRIOR TO CONSTRUCTION, THE ON-SITE GEOTECHNICAL ENGINEER SHALL IDENTIFY BORROW / FILL AREAS AND VERIFY THEIR SUITABILITY FOR USE WITHIN THE DAM EMBANKMENT. ALSO, THE ON-SITE GEOTECHNICAL ENGINEER SHALL PERFORM STANDARD PROCTORS ON THE PROPOSED BORROW MATERIAL TO ENSURE THAT OPTIMUM MOISTURE CONTENT AND COMPACTION CAN BE ACHIEVED / CONTROLLED DURING CONSTRUCTION.
- ALL FILL MATERIALS TO BE USED FOR THE DAM EMBANKMENT SHALL BE TAKEN FROM BORROW AREAS APPROVED BY THE ON-SITE GEOTECHNICAL ENGINEER. THE FILL MATERIAL SHALL BE FREE FROM ROOTS, STUMPS, WOOD, STONES GREATER THAN 6", AND FROZEN OR OTHER OBJECTIONABLE MATERIAL. THE FOLLOWING SOIL TYPES ARE SUITABLE FOR USE AS FILL WITHIN THE DAM EMBANKMENT AND KEY TRENCH: ML AND CL. ALL FILL MATERIALS SHALL BE APPROVED BY THE ONSITE GEOTECHNICAL ENGINEER FOR THE INTENDED USE.
- FILL PLACEMENT FOR THE EMBANKMENT SHALL NOT EXCEED A MAXIMUM 8" LIFT (UNCOMPACTED). EACH LIFT SHALL BE CONTINUOUS FOR THE ENTIRE LENGTH OF EMBANKMENT. BEFORE PLACEMENT OF FILL FOR THE BERM SECTION, ALL UNSUITABLE MATERIAL SHALL BE REMOVED AND THE SURFACE PROPERLY PREPARED FOR FILL PLACEMENT. FILL MATERIAL ADJACENT TO ALL SPILLWAY AND DRAINAGE STRUCTURES SHALL BE PLACED IN 4-INCH (UNCOMPACTED) LIFTS AND HAND-COMPACTED TO THE SAME COMPACTION AND MOISTURE REQUIREMENTS AS THE ENTIRE EMBANKMENT.
- ALL FILL SOILS USED IN THE EMBANKMENT CONSTRUCTION SHALL BE COMPACTED TO AT LEAST 95% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY (ASTM D-698). THE FILL SOILS SHALL BE COMPACTED AT A MOISTURE CONTENT WITHIN -1 TO +3 PERCENT OF ITS OPTIMUM MOISTURE CONTENT. COMPACTION TESTS SHALL BE PERFORMED BY THE ON-SITE GEOTECHNICAL ENGINEER DURING CONSTRUCTION TO VERIFY THAT THE PROPER COMPACTION LEVEL HAS BEEN REACHED. THE FILL SHOULD BE COMPACTED USING A SHEEPSFOOT TYPE COMPACTOR. IN ORDER TO PREVENT DAMAGE TO THE PIPE, NO COMPACTION EQUIPMENT SHALL CROSS ANY PIPE UNTIL MINIMUM COVER IS ESTABLISHED ALONG THE PIPE.
- THE DESIGN ENGINEER SHALL BE PROVIDED WITH REPORTS AND CERTIFICATION, BY THE ON-SITE GEOTECHNICAL ENGINEER, THAT THE GEOTECHNICAL ASPECTS OF THE FACILITY HAVE BEEN CONSTRUCTED PER PLAN. THIS CERTIFICATION MUST ADDRESS THE TESTING FOR MATERIALS AND COMPACTION OF THE EMBANKMENT AND SPILLWAY. THESE REPORTS AND CERTIFICATION WILL BE NEEDED DURING THE AS-BUILT CERTIFICATION PROCESS FOR THIS STORMWATER CONTROL MEASURE. THEREFORE, IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE TESTING AND OBSERVATION WITH THE ON-SITE GEOTECHNICAL ENGINEER.
- TESTING OF THE NEW FILL MATERIALS SHALL BE PERFORMED TO VERIFY THAT THE RECOMMENDED LEVEL OF COMPACTION IS ACHIEVED DURING CONSTRUCTION. THEREFORE, ONE DENSITY TEST SHALL BE PERFORMED FOR EVERY 2,500 SQUARE FEET OF AREA FOR EVERY LIFT OF FILL OR AS RECOMMENDED BY THE ON-SITE GEOTECHNICAL ENGINEER.
- TESTING WILL BE REQUIRED ALONG THE RCP OUTLET BARREL AT A FREQUENCY OF ONE TEST PER 25 LF OF PIPE PER VERTICAL FOOT OF FILL OR AS DIRECTED BY THE ON-SITE GEOTECHNICAL ENGINEER.

OUTLET STRUCTURE MATERIAL SPECIFICATIONS

- THE RCP OUTLET BARREL SHALL BE CLASS III RCP, MODIFIED BELL AND SPIGOT, MEETING THE REQUIREMENTS OF ASTM C76-LATEST. THE PIPES SHALL HAVE CONFINED O-RING RUBBER GASKET JOINTS MEETING ASTM C-443-LATEST. THE PIPE JOINTS SHALL BE TYPE R-4
- THE STRUCTURAL DESIGN FOR THE 4' X 4' (INTERNAL DIMENSIONS) RISER BOX WITH EXTENDED BASE SHALL BE BY OTHERS. PRIOR TO ORDERING THE STRUCTURES, THE CONTRACTOR SHALL PROVIDE, TO THE DESIGN ENGINEER FOR REVIEW, SHOP DRAWINGS AND SUPPORTING STRUCTURAL CALCULATIONS SEALED BY A P.E. REGISTERED IN NORTH CAROLINA DEMONSTRATING THE PERTINENT VERTICAL LOADS ARE SUPPORTED BY THE CONCRETE RISER STRUCTURE.
- THE RISER BOX OUTLET STRUCTURE SHALL BE PROVIDED WITH STEPS 16" ON CENTER. STEPS SHALL BE PROVIDED ON THE INNER WALL OF THE RISER BOX. STEPS SHALL BE IN ACCORDANCE WITH NCDOT STD. 840.66. PLEASE REFER TO SHEET C9.03 FOR LOCATION OF THE RISER STEPS. NOTE THE STEPS SHALL LINE UP WITH THE ACCESS HATCH OF THE TRASH RACK.
- THE CONCRETE ANTI-FLOTATION BLOCK SHALL BE CAST-IN-PLACE. STEEL REINFORCEMENT AND CONNECTION TO THE RISER SHALL BE PROVIDED IN ACCORDANCE WITH THE DETAIL ON SHEET C9.03. THE CONTRACTOR SHALL ENSURE THE WEIGHT OF THE ENTIRE RISER STRUCTURE IS GREATER THAN OR EQUAL TO XX,XXX LBS. IN LIEU OF CAST-IN-PLACE, THE CONTRACTOR MAY OPT FOR A PRECAST ANTI-FLOTATION BLOCK. SHOP DRAWINGS FOR THE PRECAST BLOCK SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW. THE PRECAST ANTI-FLOTATION BLOCK SHALL HAVE A SHIPPING WEIGHT OF XX,XXX LBS.
- THE RISER BOX JOINTS SHALL BE SEALED USING BUTYL RUBBER SEALANT CONFORMING TO ASTM-C990-LATEST. IF NECESSARY, THE CONTRACTOR SHALL INCORPORATE A WATERSTOP INTO THE RISER BOX JOINT TO ENSURE A WATERTIGHT CONNECTION. THE CONTRACTOR SHALL PARGE JOINTS ON BOTH THE INSIDE AND OUTSIDE WITH NON-SHRINK GROUT. JOINT STRAPS SHALL BE PROVIDED PER THE DETAIL ON C9.03.
- PRIOR TO ORDERING, THE CONTRACTOR SHALL SUBMIT TRASH RACK SHOP DRAWINGS TO THE ENGINEER FOR REVIEW. CONTRACTOR SHALL ENSURE THAT AN ACCESS HATCH IS PROVIDED WITHIN THE TRASH RACK (SEE DETAIL FOR LOCATION) THAT WILL ALLOW FOR FUTURE MAINTENANCE ACCESS. CONTRACTOR SHALL ALSO PROVIDE A CHAIN AND LOCK FOR SECURING THE ACCESS HATCH. NOTE THE ACCESS HATCH SHALL LINE UP WITH THE ACCESS STEPS AFTER INSTALLATION.
- ALL POURED CONCRETE SHALL MEET THE FOLLOWING SPECIFICATIONS UNLESS OTHERWISE NOTED:
 - MINIMUM 3000 PSI (28 DAY)
 - SUMP = 3" - 5"
 - EN-TRAINED AIR = 5% - 7%PLEASE NOTE NO CONCRETE SHALL BE POURED WHEN THE AMBIENT AIR TEMPERATURES ARE EXPECTED TO BE ABOVE 85°F OR BELOW 40°F. CAST-IN-PLACE CONCRETE SHALL BE "WET CURED" AFTER FINISHING FOR A MINIMUM OF 48 HOURS.
- ON-SITE GEOTECHNICAL ENGINEER TO ENSURE AND CERTIFY ALL POURED CONCRETE MEETS THE ABOVE SPECIFICATIONS.
- GEOTEXTILE FABRIC FOR THE RCP OUTLET BARREL JOINTS SHALL BE MIRAFI 180N OR ENGINEER APPROVED EQUAL (NON-WOVEN FABRIC).

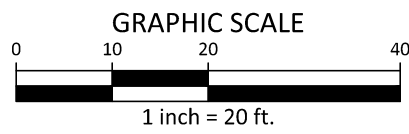
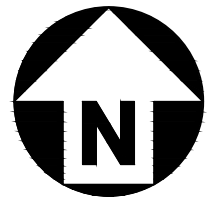
STATEMENT OF RESPONSIBILITY

ALL REQUIRED MAINTENANCE AND INSPECTIONS OF THIS FACILITY SHALL BE THE RESPONSIBILITY OF THE PROPERTY OWNER, PER THE EXECUTED OPERATION AND MAINTENANCE AGREEMENT FOR THIS FACILITY.



SCM A BIORETENTION AREA PLAN VIEW

1"=20'



PRELIMINARY DRAWING - NOT RELEASED FOR CONSTRUCTION



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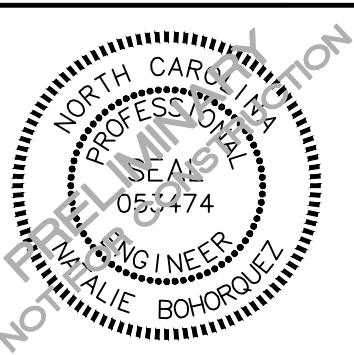
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Village of Marvin
Enriched by Nature

VILLAGE OF MARVIN
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10006 MARVIN SCHOOL RD
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REVISIONS

NO.	DATE	REVISION DESCRIPTION
1	XX.XX.XXXX	REVISION DESCRIPTION
2	XX.XX.XXXX	REVISION DESCRIPTION

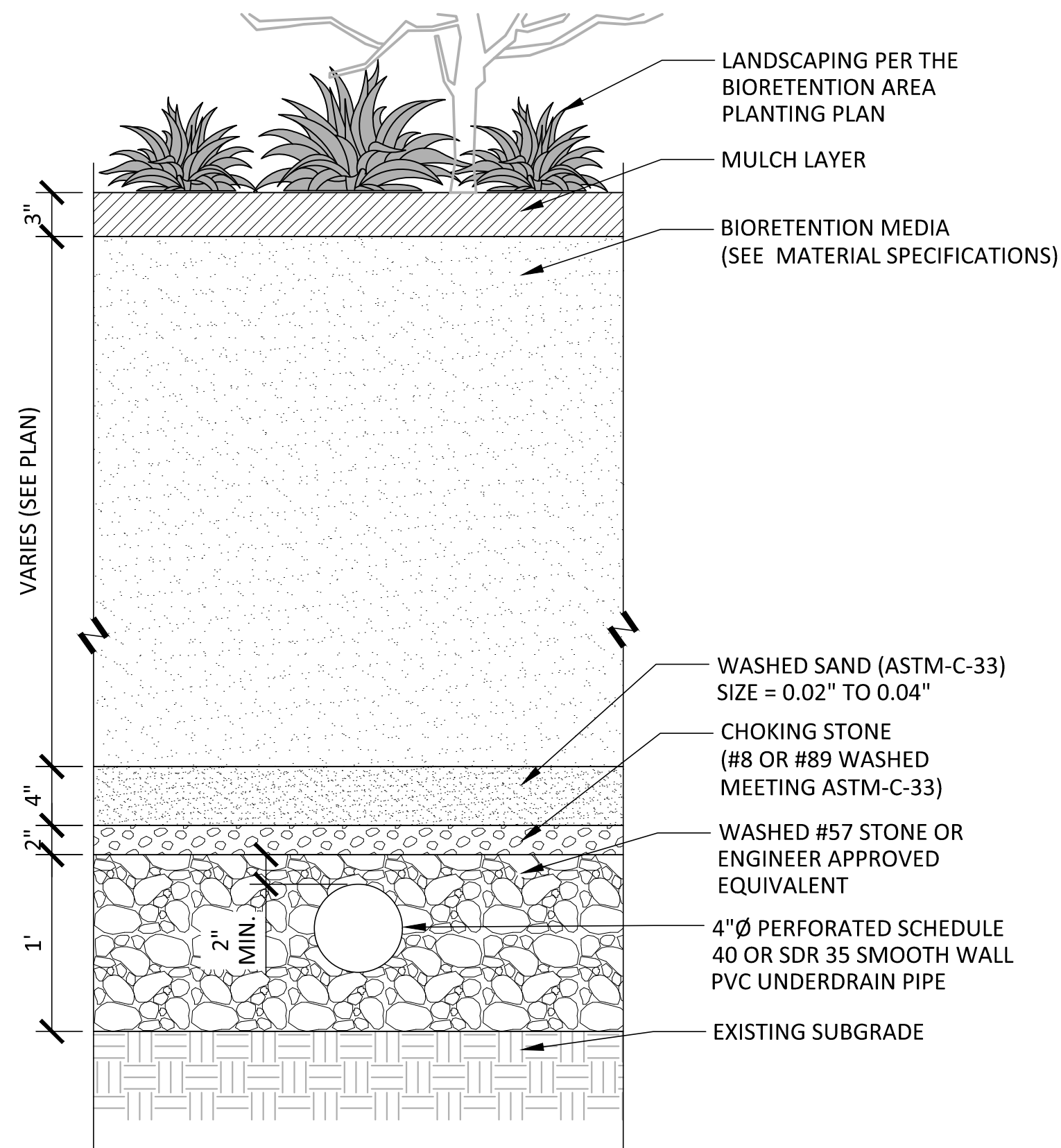
PLAN INFORMATION

PROJECT NO.	VOM-23001
FILENAME	VOM23001 - BIO
CHECKED BY	NB
DRAWN BY	EKB
SCALE	1"=20'
DATE	07.19.2023

SHEET

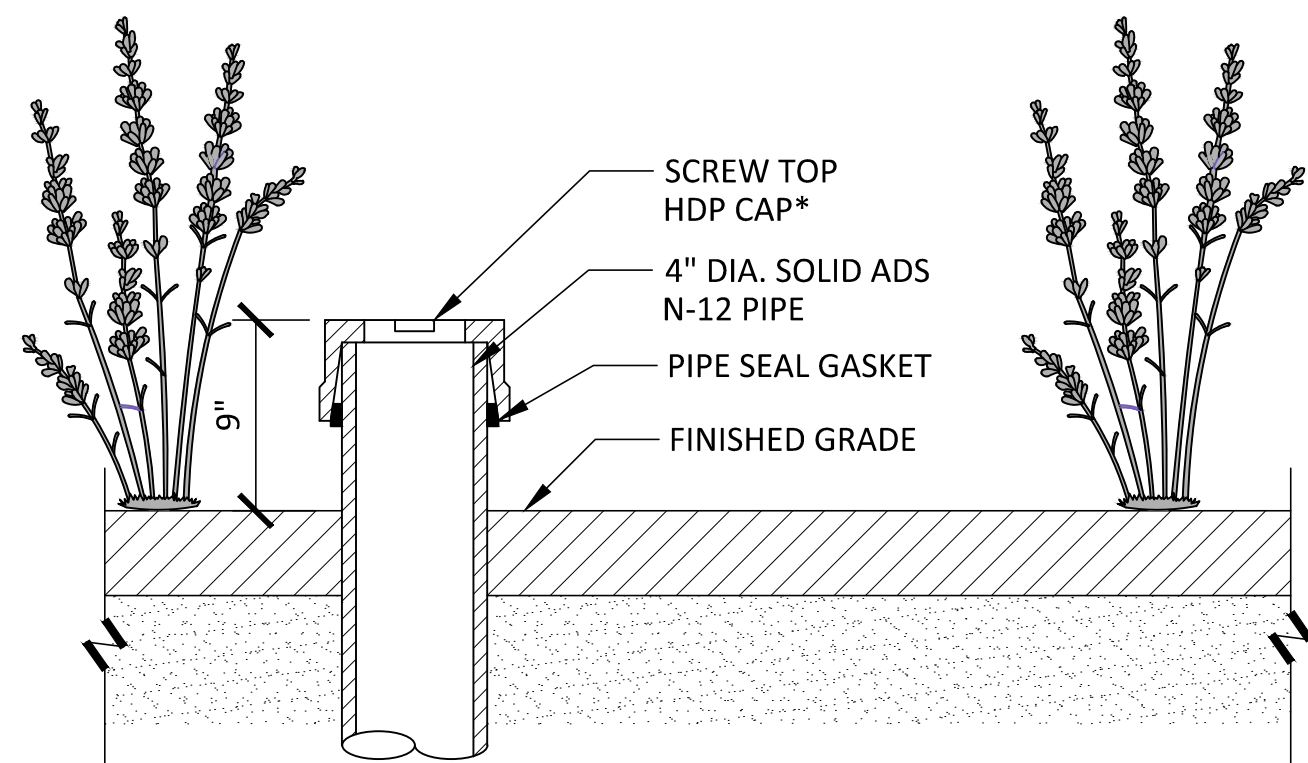
SCM A PLAN VIEW

C9.00



01 BIORETENTION SECTION - WOODY PLANTS

SCALE: 1" = 1'-0"



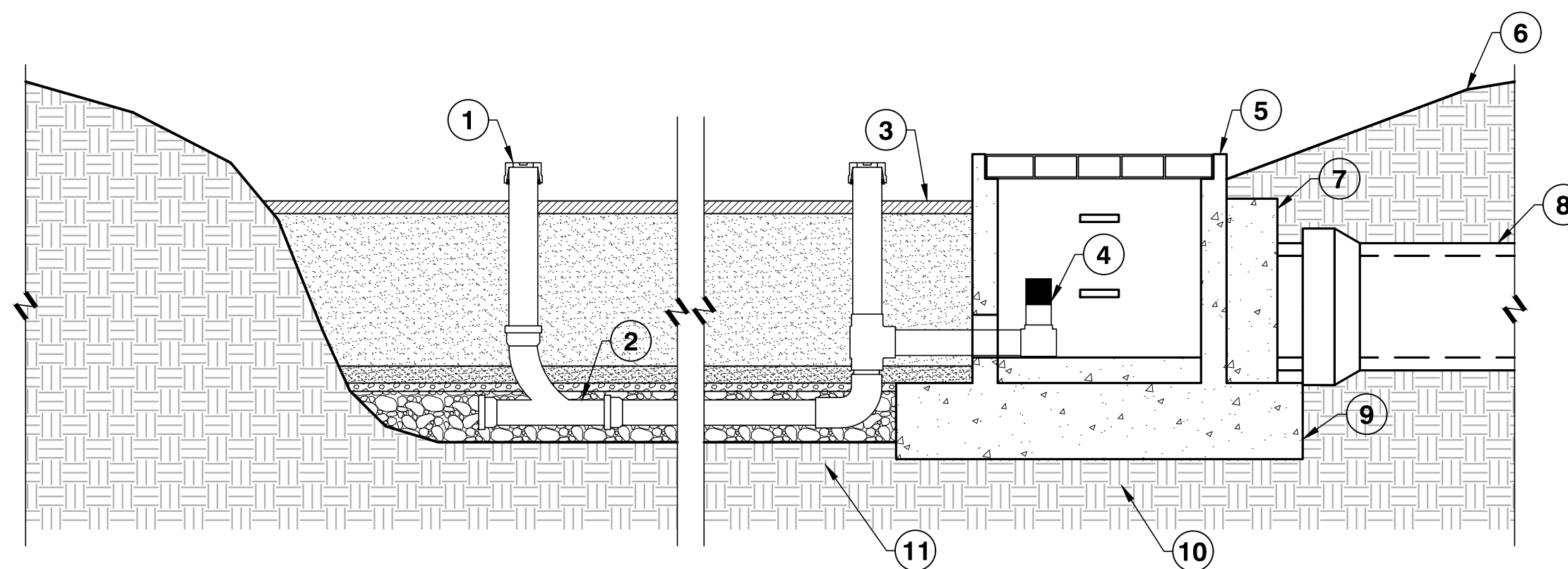
* DETAIL NOT PROVIDED FOR SCREW TOP PVC (OR HDPE) WELL CAPS, SCHEMATIC FOR DISPLAY PURPOSES ONLY

NOTES:

- CLEANOUTS TO BE EXTENDED 9" ABOVE FINISHED GRADE UNLESS OTHERWISE NOTED ON PLANS (SEE PLANS FOR PONDING DEPTH)
- FOR AN UNDERGROUND OBSERVATION WELL/CLEANOUT, PROVIDE A TUBE MADE OF NON-CORROSIVE MATERIAL, SCHEDULE 40 OR EQUAL, AT LEAST 3 FEET LONG, WITH AN INSIDE DIAMETER OF AT LEAST 4 INCHES.
- THE TUBE SHALL HAVE A FACTORY ATTACHED CAST IRON OR HIGH IMPACT PLASTIC COLLAR WITH RIBS TO PREVENT ROTATION WHEN REMOVING SCREW TOP LID. THE SCREW TOP LID SHALL BE CAST IRON OR HIGH IMPACT PLASTIC THAT WILL WITHSTAND ULTRAVIOLET RAYS

03 OBSERVATION WELL / CLEANOUT DETAIL

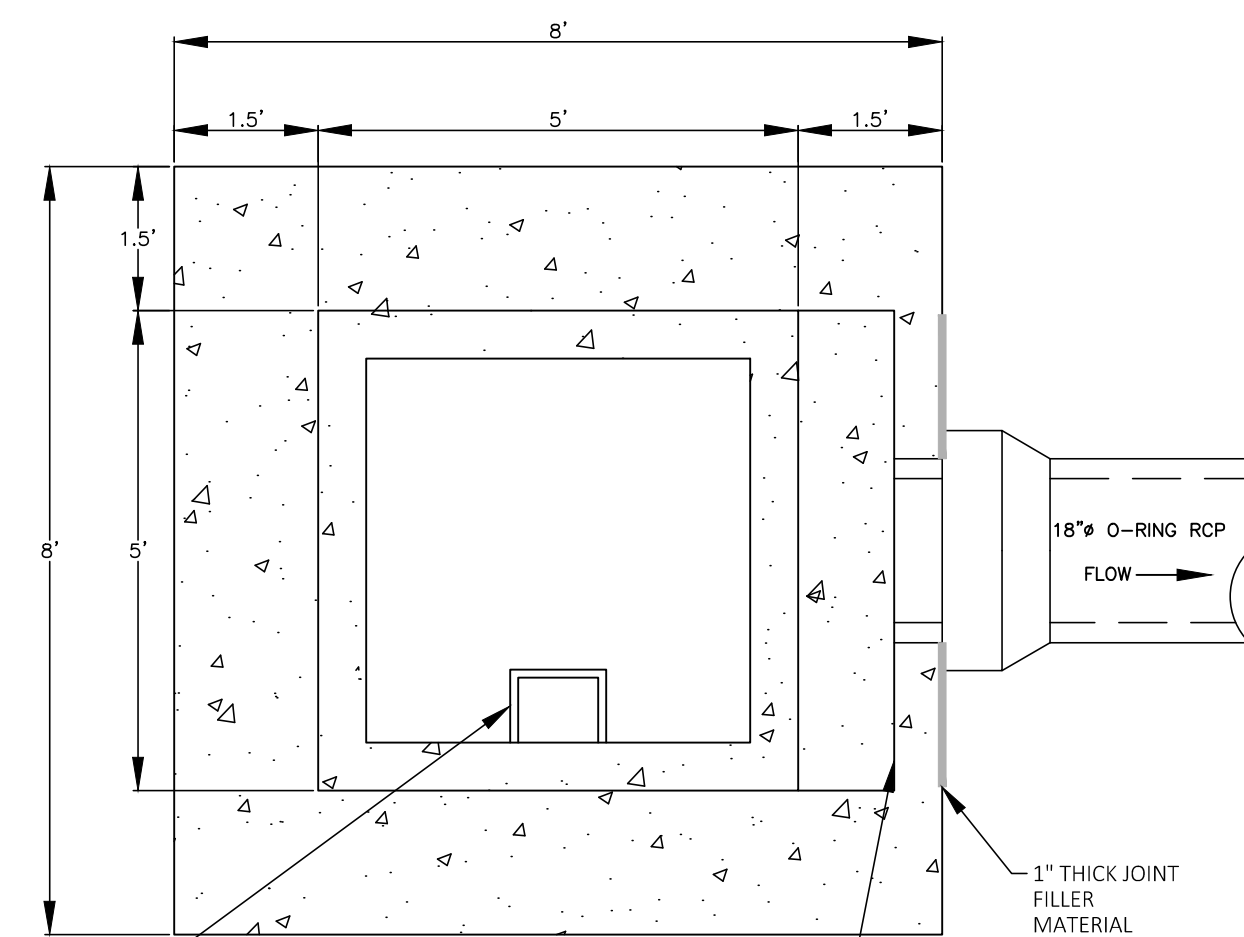
SCALE: 1" = 1'-0"



02 BIORETENTION AREA SECTION

SCALE: 3/8" = 1'-0"

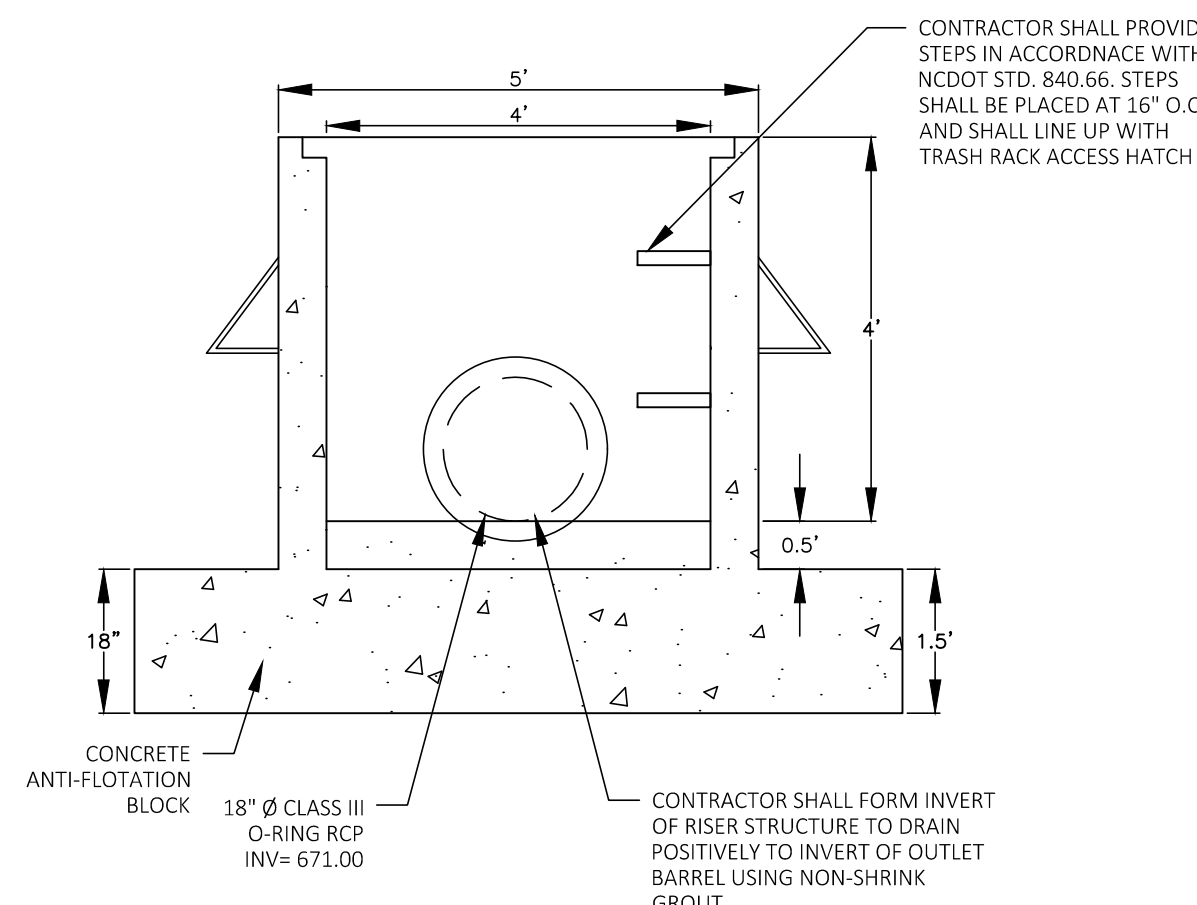
- CLEANOUT/OBSERVATION WELL
- PERFORATED UNDERDRAIN PIPE (SEE BIORETENTION SECTION FOR SIZE)
- TOP OF BIORETENTION MEDIA (SEE SHEET C9.00)
- INVERTED STRUCTURE (SEE OUTLET STRUCTURE DETAILS FOR SIZING, MATERIAL, AND ELEVATION)
- PERMANENT OUTLET STRUCTURE (SEE OUTLET STRUCTURE DETAIL FOR DIMENSIONS AND CONSTRUCTION DETAILS)
- FINAL GRADE (SEE GRADING PLAN FOR ELEVATIONS/SLOPE AND SEE SPECIFICATION FOR EMANKMENT COMPACTION DETAILS)
- CONCRETE COLLAR (SEE OUTLET STRUCTURE DETAILS)
- CONCRETE OUTLET PIPE (SEE PERMANENT OUTLET STRUCTURE DETAIL)
- CONCRETE ANTI-FLOATATION BLOCK (SEE PERMANENT OUTLET STRUCTURE DETAIL)
- COMPACTED SUBGRADE BENEATH OUTLET STRUCTURE (SEE SPECIFICATION FOR REQUIRED COMPACTION)
- BIORETENTION CELL SUBGRADE TO REMAIN UNCOMPACTED DURING CONSTRUCTION. SUBGRADE SURFACE TO BE SCARIFIED PRIOR TO ADDING BIORETENTION MATERIAL.



CONTRACTOR SHALL PROVIDE STEPS IN ACCORDANCE WITH NCDOT STD. 840.66. STEPS SHALL BE PLACED AT 16" O.C. AND SHALL LINE UP WITH TRASH RACK ACCESS HATCH

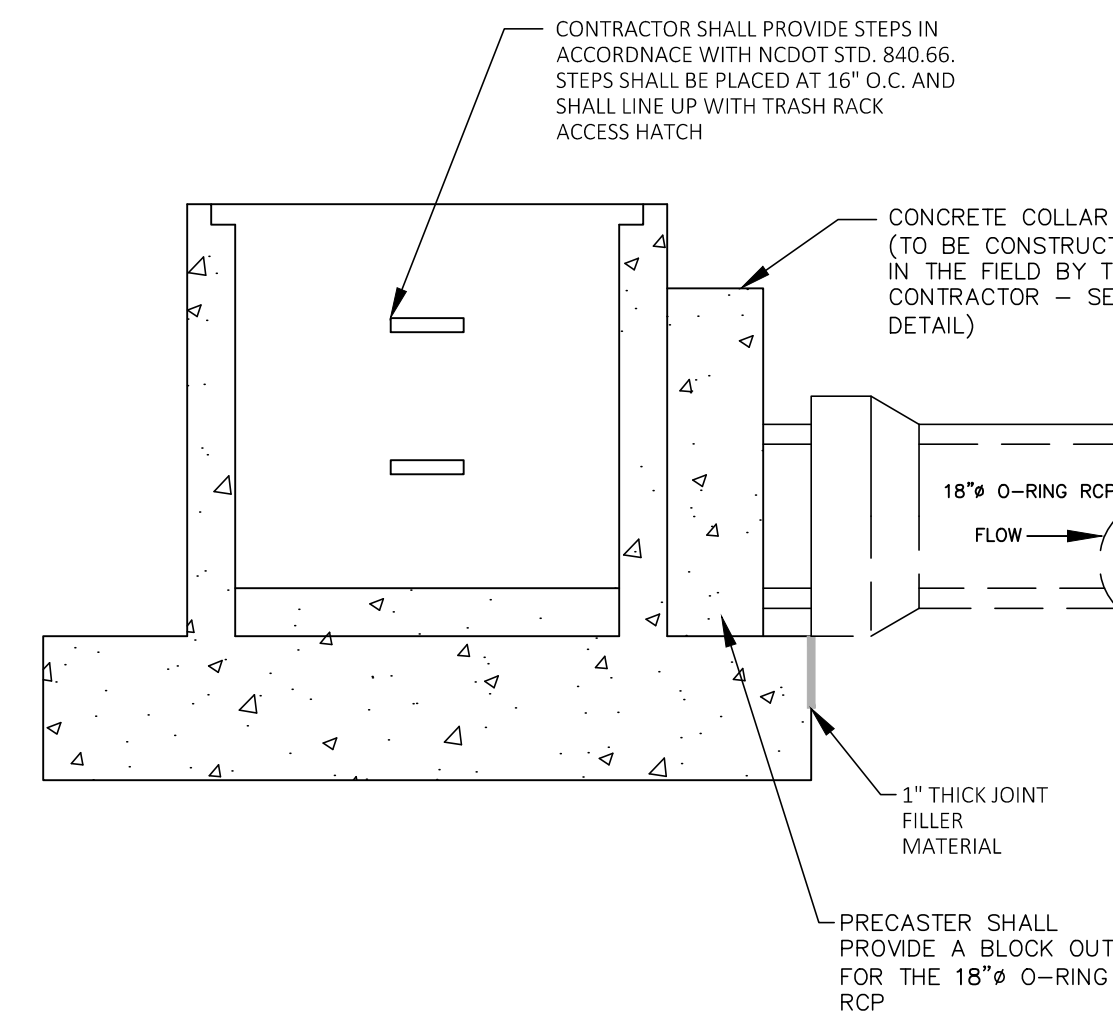
PRECASTER SHALL PROVIDE A BLOCK OUT FOR THE 18" O-RING RCP

1" THICK JOINT FILLER MATERIAL



04 PERMANENT OUTLET STRUCTURE DETAILS

SCALE: 1" = 2'-0"



CONCRETE COLLAR (TO BE CONSTRUCTED IN THE FIELD BY THE CONTRACTOR - SEE DETAIL)

18" O-RING RCP

1" THICK JOINT FILLER MATERIAL

PRECASTER SHALL PROVIDE A BLOCK OUT FOR THE 18" O-RING RCP



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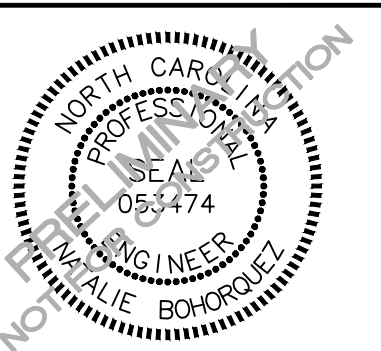
CLIENT

VILLAGE OF MARVIN
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Village of Marvin
Enriched by Nature

VILLAGE OF MARVIN
TOWN HALL
10006 MARVIN SCHOOL RD
MARVIN, NC, 28173



REVISIONS

NO.	DATE	REVISION DESCRIPTION
1	XX.XX.XXXX	REVISION DESCRIPTION
2	XX.XX.XXXX	REVISION DESCRIPTION

PLAN INFORMATION

PROJECT NO.	VOM-23001
FILENAME	VOM23001 - BIO
CHECKED BY	NB
DRAWN BY	EKB
SCALE	NTS
DATE	08.10.2023

SHEET

SCM DETAILS

C9.01

BIORETENTION PLANT PALETTE



CAREX CHEROKEENSIS



ECHINACEA PURPUREA



JUNCUS EFFUSUS



COREOPSIS LANCEOLATA



HELIANTHUS AUTUMNALE



ELYMUS CANADENSIS



COREOPSIS TINCTORIA



VERNONIA NOVEBORACENSIS



SYMPHYOTRICHUM LAEVE



RUDBECKIA HIRTA



CHASMANTHIUM LATIFOLIUM



LOBELIA CARDINALIS



SORGHASTRUM NUTANS



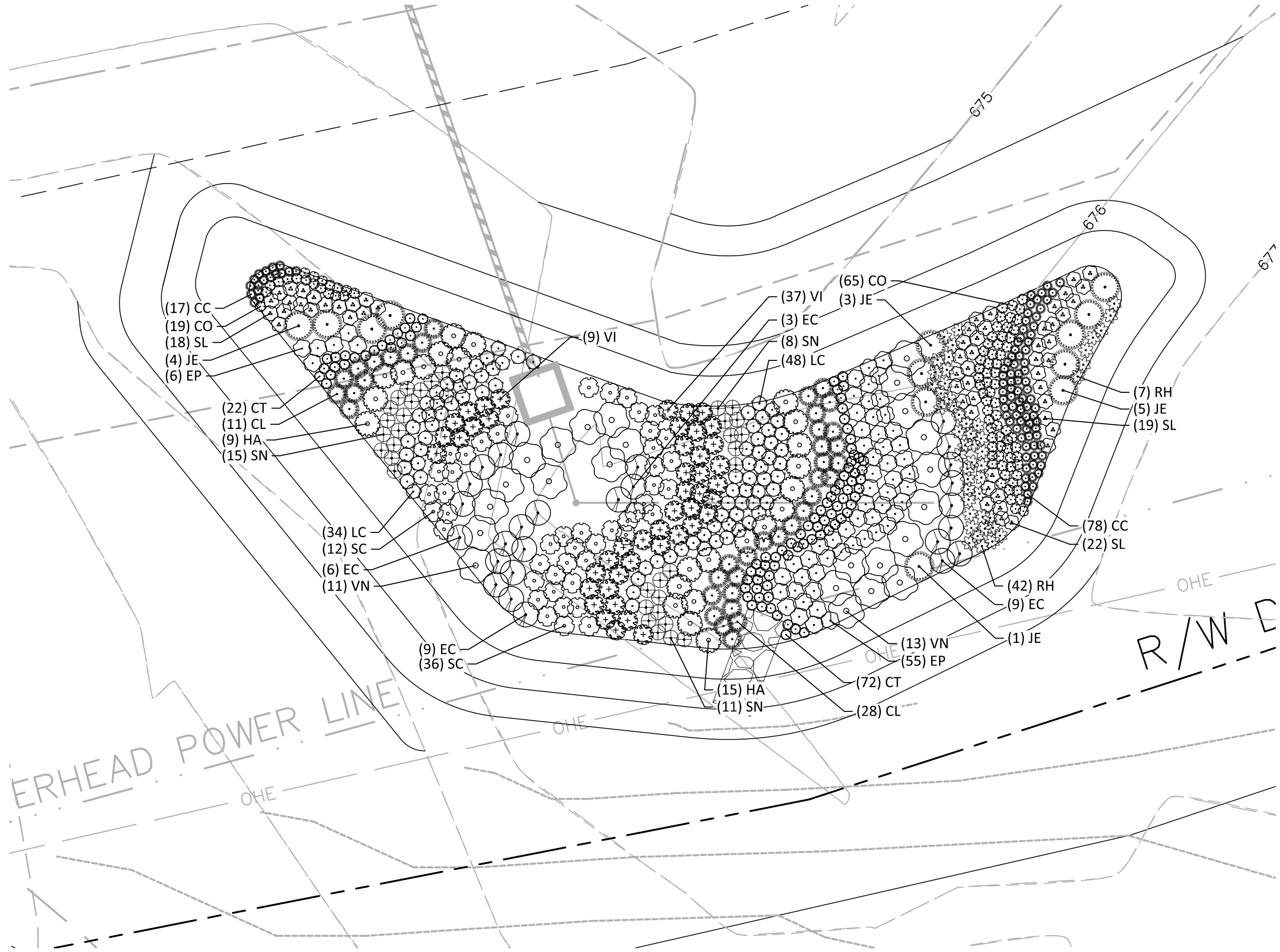
VERBENA HASTATA



SILPHIUM PERFOLIATUM

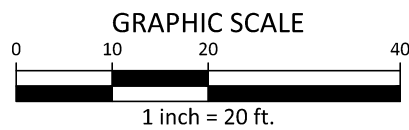
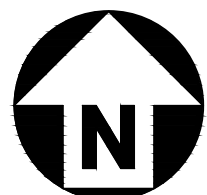
PLANT SCHEDULE

ORNAMENTAL GRASSES	CODE	QTY	COMMON NAME	BOTANICAL NAME
	CC	95	Cherokee Sedge	Carex cherokeensis
	CL	40	Northern Sea Oats	Chasmanthium latifolium
	EC	27	Canada Wild Rye	Elymus canadensis
	JE	13	Soft Rush	Juncus effusus
	SN	34	Indian Grass	Sorghastrum nutans
PERENNIALS	CODE	QTY	COMMON NAME	BOTANICAL NAME
	CO	84	Lanceleaf Tickseed	Coreopsis lanceolata
	CT	100	Plains Coreopsis	Coreopsis tinctoria
	EP	61	Coneflower	Echinacea purpurea
	HA	24	Sneezeweed	Helenium autumnale
	LC	82	Cardinal Flower	Lobelia cardinalis
	RH	49	Black-eyed Susan	Rudbeckia hirta
	SC	48	Cup Plant	Silphium perfoliatum
	SL	59	Smooth Aster	Symphyotrichum laeve
	VI	46	Blue Vervain	Verbascum hastata
	VN	24	Comon Ironweed	Vernonia noveboracensis

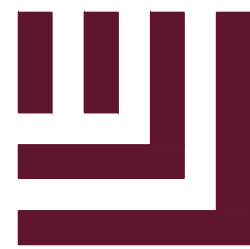


SCM A BIORETENTION AREA PLAN VIEW

1"=20'



PRELIMINARY DRAWING - NOT RELEASED FOR CONSTRUCTION



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PLAN INFORMATION

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FILENAME	VOM23001 - BIO
CHECKED BY	NB
DRAWN BY	HD
SCALE	1"=20'
DATE	07.19.2023

SHEET

SCM PLANTING PLAN + PALETTE

L5.00

BIORETENTION AREA CONSTRUCTION SPECIFICATIONS

GENERAL NOTES

- PRIOR TO CONSTRUCTION, ANY DISCREPANCIES IN THE PLANS AND NOTES SHALL BE BROUGHT TO THE DESIGN ENGINEER'S ATTENTION IMMEDIATELY.
- THE FINAL CERTIFICATION FOR THIS FACILITY WILL INCLUDE A CERTIFICATION BY THE ON-SITE GEOTECHNICAL ENGINEER THAT THE PROJECT WAS CONSTRUCTED PER THE APPROVED PLANS. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE WITH THE ON-SITE GEOTECHNICAL ENGINEER FOR OBSERVATION AND TESTING SUCH THAT THE ON-SITE GEOTECHNICAL ENGINEER CAN CERTIFY THE CONSTRUCTION OF THE DAM EMBANKMENT. THIS CERTIFICATION MUST ADDRESS THE TESTING FOR MATERIALS AND COMPACTION OF THE DAM EMBANKMENT.
- ALL CONSTRUCTION ACTIVITY RELATED TO THE PROPOSED STORMWATER CONTROL MEASURE SHALL BE PER THE DETAILS AND SPECIFICATIONS SHOWN IN THESE DRAWINGS. SOILS, COMPACTION, AND OTHER MISCELLANEOUS DETAILS AND SPECIFICATIONS MAY BE MODIFIED PER THE RECOMMENDATIONS OF THE ON-SITE GEOTECHNICAL ENGINEER. HOWEVER, PRIOR TO IMPLEMENTATION, THE DESIGN ENGINEER SHALL BE NOTIFIED OF ANY DEVIATION FROM THESE DESIGN DRAWINGS, INCLUDING SHOP DRAWINGS FOR ANY PROPOSED MODIFICATION.
- DURING THE INITIAL STAGES OF CONSTRUCTION, THE STORMWATER CONTROL MEASURE MAY BE USED AS A SEDIMENT BASIN FOR EROSION CONTROL PURPOSES. IF SO, THE CONTRACTOR SHALL FOLLOW THE GENERAL CONSTRUCTION SEQUENCE BELOW:
 - THE CONTRACTOR SHALL CONSTRUCT THE ENTIRE FACILITY (PERMANENT OUTLET STRUCTURE, DAM, KEY TRENCH, ETC.) WITH THE EXCEPTION OF THE INTERIOR FINE GRADING AND THE BIORETENTION MEDIA FOR THE FACILITY. THE INTERIOR FINE GRADING AND BIORETENTION MEDIA WILL BE CONSTRUCTED ONCE THE EROSION CONTROL PHASE IS COMPLETE.
 - THE TEMPORARY DRAW DOWN RISER (OR SKIMMER) SHALL BE CONNECTED TO THE 4" UNDERDRAIN OUTLET ORIFICE.
 - ONCE THE UPSTREAM DRAINAGE AREA IS STABILIZED AND THE EROSION CONTROL INSPECTOR APPROVES THE REMOVAL OF THE SEDIMENT BASIN, THE CONTRACTOR SHALL REMOVE THE TEMPORARY DRAW DOWN RISER (OR SKIMMER) AND CLEAN OUT THE BASIN. ALL SEDIMENT, TRASH, ETC. SHALL BE DISPOSED OF PROPERLY (I.E. PLACED IN A LANDFILL) AND NOT STOCKPILED IN AN AREA WHERE WATER QUALITY COULD BE ADVERSELY AFFECTED.
 - ONCE THE BASIN IS CLEANED OUT, AND ALL EROSION CONTROL DEVICES REMOVED, THE CONTRACTOR SHALL CONSTRUCT THE INTERIOR GRADING SHOWN ON THIS SHEET.
 - ONCE THE GRADING IS COMPLETE, THE CONTRACTOR SHALL REQUEST AN ON-SITE INSPECTION AND AN AS-BUILT SURVEY PRIOR TO INSTALLATION OF THE STORMWATER CONTROL MEASURE PLANTS. IF THE CONTRACTOR PLANTS THE PROPOSED VEGETATION PRIOR TO AN AS-BUILT SURVEY (AND SUBSEQUENT APPROVAL), ANY CHANGES TO THE GRADING / RE-PLANTING OF PLANTS WILL BE AT THE CONTRACTOR'S EXPENSE.
 - ONCE THE ENGINEER HAS APPROVED THE AS-BUILT GRADING, THE CONTRACTOR SHALL PLANT THE PROPOSED STORMWATER CONTROL MEASURE PLANTS SHOWN ON THE LANDSCAPE PLAN FOR THE FACILITY. AFTER COMPLETION OF THE PLANTING, THE LANDSCAPE CONTRACTOR SHALL PROVIDE A LETTER TO THE ENGINEER CERTIFYING THAT THE PLANTS HAVE BEEN INSTALLED PER THE APPROVED STORMWATER CONTROL MEASURE PLANTING PLAN. THE CONTRACTOR SHALL PROVIDE A ONE-YEAR WARRANTY FOR ALL PLANTS INSTALLED.
- ALL OSHA REQUIREMENTS FOR EXCAVATIONS (SHORING, DEPTH, ETC.) ARE THE RESPONSIBILITY OF THE CONTRACTOR. IF REQUIRED, THE CONTRACTOR SHALL PROVIDE AN EXCAVATION PLAN TO BE SEALED BY A P.E. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO DETERMINE IF AN EXCAVATION PLAN IS REQUIRED. THE JOHN R. MCADAMS COMPANY ASSUMES NO RESPONSIBILITY FOR ANY EXCAVATION DESIGN RELATED TO SAFETY OR OSHA REQUIREMENTS.
- IT IS ANTICIPATED THAT DEWATERING WILL BE NECESSARY IN THE EXCAVATION AREAS (E.G. - EMBANKMENT SUB GRADE, INTERIOR PORTIONS OF THE STORMWATER CONTROL MEASURE, KEY TRENCH, ETC.). THEREFORE, THE CONTRACTOR SHALL FURNISH, INSTALL, OPERATE, AND MAINTAIN ANY PUMPING EQUIPMENT, ETC. NEEDED FOR REMOVAL OF WATER FROM VARIOUS PARTS OF THE STORMWATER CONTROL MEASURE SITE. DURING PLACEMENT OF FILL WITHIN THESE AREAS, THE CONTRACTOR SHALL KEEP THE WATER LEVEL BELOW THE BOTTOM OF THE EXCAVATION / CONSTRUCTION AREAS. THE MANNER IN WHICH THE WATER IS REMOVED SHALL BE SUCH THAT THE EXCAVATION BOTTOM AND SIDE SLOPES ARE STABLE, WITH NO SEDIMENT DISCHARGED FROM THE SITE (I.E. PUMPED WATER MAY NEED TO BE DIRECTED TO AN APPROVED EROSION CONTROL DEVICE SUCH AS A DIRT BAG (ACT ENVIRONMENTAL), OR ENGINEER APPROVED EQUIVALENT, PRIOR TO DISCHARGE).
- PRIOR TO CONSTRUCTION, THE ONSITE GEOTECHNICAL ENGINEER SHALL VERIFY THE FILTRATION AND PERMEABILITY ASPECTS OF THE PROPOSED BIORETENTION MATERIALS. SPECIAL ATTENTION SHALL BE PAID TO PREVENT MIGRATION OF FINER SOIL PARTICLES THROUGH UNDERLYING GRAVEL LAYERS.
- PRIOR TO PLACING THE BIORETENTION AREA BACKFILL MATERIAL, THE CONTRACTOR SHALL REQUEST AN ON-SITE MEETING WITH THE DESIGN ENGINEER AND THE EROSION CONTROL INSPECTOR TO ENSURE THE UPSTREAM DRAINAGE AREA IS COMPLETELY STABILIZED (I.E. GOOD VEGETATIVE COVER). IF THE CONTRACTOR DECIDES TO PLACE THE BACKFILL FOR THE BIORETENTION AREA PRIOR TO APPROVAL FROM THE DESIGN ENGINEER AND THE EROSION CONTROL INSPECTOR, THEN THE CONTRACTOR SHALL EXCAVATE / REPLACE, AS NECESSARY, ANY BACKFILL MATERIAL NEEDED FOR THE SYSTEM TO FUNCTION PROPERLY AT HIS / HER EXPENSE SHOULD THE BIORETENTION AREA NOT FUNCTION PROPERLY (I.E. WILL NOT DRAIN DUE TO SEDIMENT DEPOSITION) DUE TO AN UNSTABILIZED UPSTREAM DRAINAGE AREA.
- THE GRADES SHOWN ON THIS PLAN ARE FINISHED GRADES. IF THE EXISTING SOIL LAYER AFTER CONSTRUCTION / COMPACTION IS NOT DETERMINED SUITABLE BY A LANDSCAPE PROFESSIONAL FOR THE BIORETENTION AREA PLANTINGS, THEN THE CONTRACTOR SHALL AMEND THE PLANTING AREA OF THE BIORETENTION AREA AS DIRECTED BY A LANDSCAPE PROFESSIONAL.
- PRIOR TO TOPSOIL INSTALLATION, THE CONTRACTOR SHALL SCARIFY THE TOP 2" - 3" OF THE BERM SECTION TO PROMOTE BONDING OF THE TOPSOIL. WITH THE TOPSOIL DEPTH SHALL RANGE FROM 3" - 4" ON THE DAM EMBANKMENT. PLEASE NOTE THE TOPSOIL SHALL BE AMENDED, AS DIRECTED BY A LANDSCAPE PROFESSIONAL, PRIOR TO INSTALLATION ON THE EMBANKMENT.
- ONCE CONSTRUCTION OF THE BIORETENTION INTERIOR IS COMPLETE, THE CONTRACTOR SHALL REQUEST AN ON-SITE INSPECTION AND AN AS-BUILT SURVEY PRIOR TO INSTALLATION OF ANY LANDSCAPING/PLANTS. IF THE CONTRACTOR PLANTS THE PROPOSED LANDSCAPING PRIOR TO AN AS-BUILT SURVEY (AND SUBSEQUENT APPROVAL), ANY CHANGES TO THE GRADING / RE-PLANTING OF PLANTS WILL BE AT THE CONTRACTOR'S EXPENSE.
- THE CONTRACTOR SHALL REFER TO THE LANDSCAPE PLAN ON SHEET C9.XX FOR THE PERMANENT PLANTING PLAN/SCHEDULE FOR THE INTERIOR OF THE BIORETENTION AREA. THE PERMANENT VEGETATION FOR THE PROPOSED DAM EMBANKMENT SHALL BE TALL FESCUE. PLEASE NOTE THAT NO TREES/SHRUBS OR WOODY VEGETATION OF ANY TYPE MAY BE PLANTED ON THE PROPOSED DAM EMBANKMENT (FILL AREAS). THE INTERIOR SLOPES OF THE BIORETENTION AREA ARE TO BE PROVIDED WITH A TALL FESCUE SOO STRIP AROUND THE ENTIRE PERIMETER OF THE CELL ABOVE THE MEDIA.
- ANY EXPOSED EDGE/SIDE OF THE BIORETENTION CELL SHALL BE SODDED AS SOON AS POSSIBLE AFTER CONSTRUCTION IS COMPLETE. PLEASE REFER TO THE LANDSCAPE PLAN FOR ADDITIONAL INFORMATION.

CONSTRUCTION PREPARATION

- PRIOR TO PLACEMENT OF THE NEW FILL, THE AREAS ON WHICH FILL IS TO BE PLACED SHALL BE CLEARED AND STRIPPED OF TOPSOIL, TREES, ROOTS, VEGETATION, AND OTHER OBJECTIONABLE MATERIAL. THE AREAS ON WHICH FILL IS TO BE PLACED SHALL BE SCARIFIED.
- FOUNDATION AREAS MAY REQUIRE UNDERCUTTING OF COMPRESSIBLE AND/OR UNSUITABLE SOILS IN ADDITION TO THAT INDICATED ON THE PLANS. ALL SUCH UNDERCUTTING SHALL BE PERFORMED AT THE DISCRETION OF THE GEOTECHNICAL ENGINEER AND SHALL BE MONITORED AND DOCUMENTED. IN NO CASE SHALL THERE BE AN ATTEMPT TO STABILIZE ANY PORTIONS OF THE FOUNDATION SOILS WITH CRUSHED STONE.
- TREATMENT OF SEEPAGE AREAS, SUBGRADE PREPARATION, FOUNDATION DEWATERING AND ROCK FORMATION PREPARATION (I.E., TREATMENT WITH SLUSH GROUTING, DENTAL CONCRETE, ETC.) MAY BE REQUIRED AT THE DISCRETION OF THE GEOTECHNICAL ENGINEER. ALL SUCH ACTIVITIES SHALL BE CLOSELY MONITORED AND DOCUMENTED BY THE GEOTECHNICAL ENGINEER.

BIORETENTION PLANTING SOIL MIX SPECIFICATIONS

- THE PLANTING SOIL SHALL BE A UNIFORM MIX, FREE OF STONES, STUMPS, ROOTS OR OTHER SIMILAR OBJECTS LARGER THAN ONE-HALF INCH IN DIAMETER. NO OTHER MATERIALS OR SUBSTANCES SHALL BE MIXED OR DUMPED WITHIN THE BIORETENTION AREA THAT MAY BE HARMFUL TO PLANT GROWTH, OR PROVE A HINDRANCE TO THE PLANTING OR MAINTENANCE OPERATIONS. THE PLANTING SOIL SHALL BE FREE OF BERMUDA GRASS, JOHNSON GRASS, QUACK GRASS, MUGWORT, NUTSEDGE, ROISON VY, CANADA THISTLE, OR OTHER NOXIOUS WEEDS.
- THE MEDIA SHALL BE A HOMOGENOUS SOIL MIX ENGINEERED MEDIA BLEND WITH APPROXIMATE VOLUMES OF:
 - 75% TO 85% MEDIUM TO COARSE WASHED SAND (ASTM C33, AASHTO M6/M80, ASTM C330, AASHTO M195, OR APPROVED EQUIVALENT)
 - 8% TO 15% FINES (SILT AND CLAY, PASSING #200 SIEVE)
 - 5% TO 10% ORGANIC MATTER
- THE P-INDEX OF THE MEDIA SHALL NOT EXCEED 30.
- THE FOLLOWING TEST FREQUENCIES SHALL APPLY TO THE ABOVE SOIL CONSTITUENTS: ALL BIORETENTION AREAS SHALL HAVE A MINIMUM OF ONE TEST PER 200 CUBIC YARDS. EACH TEST SHALL CONSIST OF BOTH THE STANDARD SOIL TEST FOR MIX COMPOSITION AND PHOSPHORUS. A TEXTURAL ANALYSIS IS REQUIRED FROM THE SITE STOCKPILED BIORETENTION SOIL.
 - NOTE:
 - SINCE DIFFERENT LABS CALIBRATE THEIR TESTING EQUIPMENT DIFFERENTLY, ALL TESTING RESULTS SHALL COME FROM THE SAME TESTING FACILITY.
- AFTER INSTALLATION OF THE MEDIA, AN INFILTRATION TEST SHALL BE PERFORMED. THE MINIMUM INFILTRATION RATE OF THE INSTALLED MEDIA IS 1.0 IN/HR.
- THE MEDIA SHALL NOT BE MECHANICALLY COMPACTED. IT IS RECOMMENDED TO EITHER WATER OR WALK ON THE MEDIA AS IT IS PLACED.
- TRIPLE SHREDDED HARDWOOD MULCH SHALL BE USED FOR THE BIORETENTION AREA. MULCH SHALL BE UNIFORMLY PLACED TWO TO FOUR INCHES DEEP.

TESTING OF THE EMBANKMENT

- TESTING OF THE NEW FILL MATERIALS SHALL BE PERFORMED TO VERIFY THAT THE RECOMMENDED LEVEL OF COMPACTION IS ACHIEVED DURING CONSTRUCTION. THEREFORE, ONE DENSITY TEST SHALL BE PERFORMED FOR EVERY 2,500 SQUARE FEET OF AREA FOR EVERY LIFT OF FILL. THE CONTRACTOR SHALL PROVIDE THE ENGINEER WITH REPORTS TO VERIFY THAT THE DAM EMBANKMENT MEETS THE SPECIFIED COMPACTION REQUIREMENTS. COMPACTION REPORTS WILL BE NEEDED DURING THE AS-BUILT CERTIFICATION PROCESS FOR THIS STORMWATER FACILITY. THEREFORE, IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE COMPACTION TESTS ARE PROPERLY PERFORMED DURING CONSTRUCTION.
- TESTING WILL BE REQUIRED ALONG THE Ø O-RING OUTLET BARRELS AT A FREQUENCY OF ONE TEST PER 25 LF OF PIPE PER VERTICAL FOOT OF FILL.
- TESTING OF THE DEGREE (%) OF COMPACTION OF THE PLACED FILL IN THE DAM SHALL BE PERFORMED AS A PART OF THE PERMITTEE'S NORMAL QUALITY CONTROL PROGRAM FOR THE CONSTRUCTION OF THE DAM. TESTS SHALL BE CONDUCTED CONCURRENT WITH THE INSTALLATION OF COMPACTED FILL AND THE CONTRACTOR SHALL COORDINATE THE CONSTRUCTION OF THE DAM SO THAT TESTING CAN BE COMPLETED. SHOULD THE RESULTS OF THE TESTS INDICATE THAT THE SPECIFIED DEGREE OF COMPACTION HAS NOT BEEN OBTAINED, THE PORTIONS OF THE DAM REPRESENTED BY SUCH TESTS SHALL BE REWORKED OR REBUILT. ALL PORTIONS OF THE DAM SHALL ACHIEVE THE SPECIFIED MINIMUM DEGREE OF COMPACTION.

BIORETENTION AREA MATERIAL SPECIFICATIONS

- THE MULCH SHALL CONSIST OF DOUBLE OR TRIPLE SHREDDED HARDWOOD. MULCH SHALL BE WELL-AGED AND UNIFORM IN COLOR. WELL-AGED MULCH IS DEFINED AS MULCH THAT HAS BEEN STOCKPILED OR STORED FOR AT LEAST 12 MONTHS. MULCH SHOULD BE FREE OF WEED SEEDS, SOIL, ROOTS, OR ANY OTHER SUBSTANCES THAT NOT CONSISTING OF EITHER SOIL OR BRANCH WOOD AND BARK. THE MULCH DEPTH SHALL BE 2-4 INCHES UNIFORMLY PLACED. GRASS CLIPPINGS ARE UNSUITABLE FOR MULCH AND SHOULD BE AVOIDED FOR USE WITHIN THE BIORETENTION AREA.
- THE GRAVEL LAYER SHALL CONSIST OF NCDOT WASHED #57 STONE OR ENGINEER APPROVED EQUIVALENT
- THE WASHED SAND SHALL MEET REQUIREMENTS OF WASHED ASTM-C-33 FINE AGGREGATE CONCRETE SAND. IN ADDITION TO THE ASTM-C-33 SPECIFICATION, THE WASHED SAND MUST MEET THE FOLLOWING CONDITIONS:
 - SAND MUST MEET GRADATION REQUIREMENTS FOR ASTM-C-33 FINE AGGREGATE CONCRETE SAND. AASHTO M-6/M-80, ASTM C330, AASHTO M195 GRADATION IS ALSO ACCEPTABLE.
 - SAND MUST BE SILICA BASED. NO LIMESTONE BASED PRODUCTS MAY BE USED. IF THE MATERIAL IS WHITE OR GRAY IN COLOR, IT IS PROBABLY 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.
- THE CHOKING STONE LAYER SHALL BE WASHED #8 OR WASHED #89 STONE LAYER MEETING THE REQUIREMENTS OF ASTM-C-33.
- THE UNDERDRAIN PIPING FOR THE BIORETENTION AREAS SHALL BE 4"Ø ADS N-12 PIPE. THE PIPE AND FITTINGS SHALL BE TYPE 'S' AND SHALL MEET THE REQUIREMENTS OF AASHTO M-252. THE 6"Ø PERFORATED PIPE SHALL CONTAIN CIRCULAR PERFORATIONS MEETING AASHTO CLASS II. THE PERFORATIONS SHALL BE ¾" DIAMETER AT 6" ON CENTER MEETING PERFORATION PATTERN 'E' (6 AT 60").

BIORETENTION AREA BACKFILLING SEQUENCE

- UNDERCUT BIORETENTION AREA TO NECESSARY DEPTH (SEE BIORETENTION AREA CROSS SECTION ON SHEET C9.01).
- PLACE 4"Ø SCHEDULE 40 OR SDR 35 SMOOTH WALL PVC UNDERDRAIN PIPES AND GEOTEXTILE LAYER. GEOTEXTILE SHALL BE SPECIFIED BY THE ON-SITE GEOTECHNICAL ENGINEER. THE ENDS OF THE UNDERDRAIN PIPES NOT TERMINATING IN AN OBSERVATION WELL SHALL BE CAPPED. THE COLLECTOR PIPES SHALL BE CONSTRUCTED AT A MINIMUM SLOPE OF 0.5%.
- PLACE 2" OF CHOKING STONE AND 4" OF WASHED SAND PER THE CROSS-SECTION ON SHEET C9.01.
- PLACE LAYER OF PLANTING SOIL (PER PLANTING SOIL SPECIFICATION) TO ELEVATION XXX.XX'. PLACEMENT OF THE SOIL IN THE BIORETENTION AREA SHOULD BE IN LIFTS OF 18" OR LESS AND LIGHTLY COMPACTED.
- PLACE 3" LAYER OF MULCH (PER MULCH SPECIFICATIONS) TO GRADE.
- BIORETENTION SURFACE AREA SHALL BE AS STATED IN SHEET C9.00. THIS REQUIRED SURFACE AREA EXCLUDES THE SURFACE AREA OCCUPIED BY THE INLET RIPRAP VELOCITY DISSIPATOR.

COMPACTION OF THE BIORETENTION AREA

- CONTRACTOR SHALL MINIMIZE THE COMPACTION OF BOTH THE BASE OF THE BIORETENTION AREA AND THE REQUIRED BACKFILL. WHEN POSSIBLE, CONTRACTOR SHALL USE EXCAVATION HOES TO REMOVE THE ORIGINAL SOIL. IF THE BIORETENTION AREA IS EXCAVATED USING A LOADER, THE CONTRACTOR SHALL USE WIDE TRACK OR MARSH TRACK EQUIPMENT, OR LIGHT EQUIPMENT WITH TIRE TYPE TIRES. COMPACTION AT THE BASE OF THE BIORETENTION AREA CAN BE ALLEVATED BY USING A PRIMARY TILLING OPERATION SUCH AS A CHISEL PLOW, RIPPER, OR SUBSOILER. THESE TILLING OPERATIONS ARE TO REFRACURE THE SOIL PROFILE THROUGH THE 12 INCH COMPACTION ZONE. SUBSTITUTE METHODS MUST BE APPROVED BY THE ENGINEER. ROTOTILLERS DO NOT TILL DEEP ENOUGH TO REDUCE THE EFFECTS OF COMPACTION FROM HEAVY EQUIPMENT.
- ROTOTILL 2 TO 3 INCHES OF SAND INTO THE BASE OF THE BIORETENTION FACILITY BEFORE BACKFILLING THE REQUIRED GRAVEL LAYER. PUMP ANY PONDED WATER BEFORE PREPARING (ROTOTILLING) BASE.
- WHEN BACKFILLING THE BIORETENTION AREA, PLACE SOIL IN LIFTS OF 12 INCHES TO 18 INCHES. DO NOT USE HEAVY EQUIPMENT WITHIN THE BIORETENTION AREA. HEAVY EQUIPMENT CAN BE USED AROUND THE PERIMETER TO SUPPLY SOILS AND SAND. GRADE BIORETENTION MATERIALS WITH LIGHT EQUIPMENT SUCH AS A COMPACT LOADER OR A DOZER/LOADER WITH MARSH TRACKS.

BERM SOIL AND COMPACTION SPECIFICATIONS

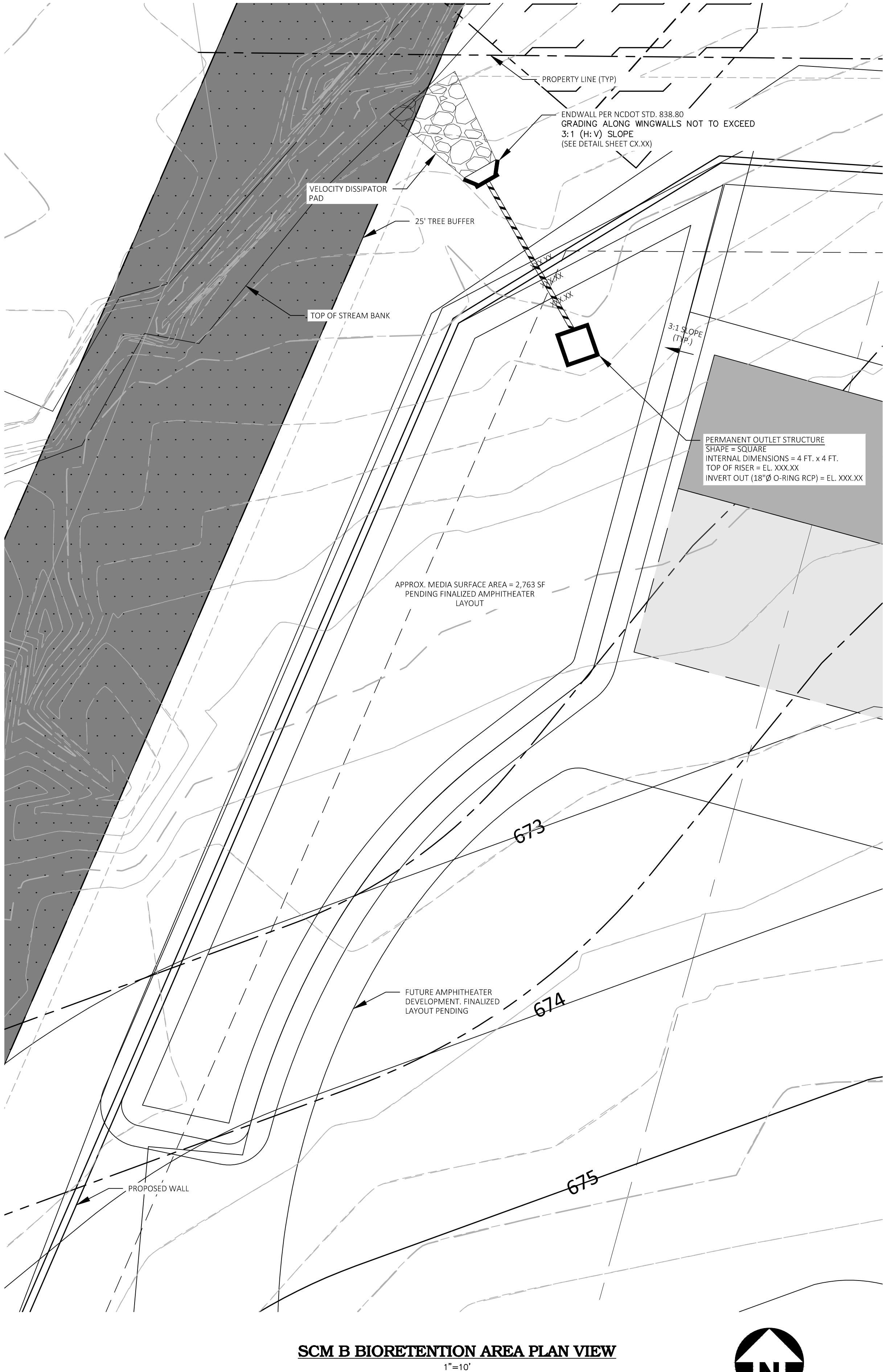
- PRIOR TO CONSTRUCTION, THE ON-SITE GEOTECHNICAL ENGINEER SHALL IDENTIFY BORROW / FILL AREAS AND VERIFY THEIR SUITABILITY FOR USE WITHIN THE DAM EMBANKMENT. ALSO, THE ON-SITE GEOTECHNICAL ENGINEER SHALL PERFORM STANDARD PROCTORS ON THE PROPOSED BORROW MATERIAL TO ENSURE THAT OPTIMUM MOISTURE CONTENT AND COMPACTION CAN BE ACHIEVED / CONTROLLED DURING CONSTRUCTION.
- ALL FILL MATERIALS TO BE USED FOR THE DAM EMBANKMENT SHALL BE TAKEN FROM BORROW AREAS APPROVED BY THE ON-SITE GEOTECHNICAL ENGINEER. THE FILL MATERIAL SHALL BE FREE FROM ROOTS, STUMPS, WOOD, STONES GREATER THAN 6", AND FROZEN OR OTHER OBJECTIONABLE MATERIAL. THE FOLLOWING SOIL TYPES ARE SUITABLE FOR USE AS FILL WITHIN THE DAM EMBANKMENT AND KEY TRENCH: ML AND CL. ALL FILL MATERIALS SHALL BE APPROVED BY THE ONSITE GEOTECHNICAL ENGINEER FOR THE INTENDED USE.
- FILL PLACEMENT FOR THE EMBANKMENT SHALL NOT EXCEED A MAXIMUM 8" LIFT (UNCOMPACTED). EACH LIFT SHALL BE CONTINUOUS FOR THE ENTIRE LENGTH OF EMBANKMENT. BEFORE PLACEMENT OF FILL FOR THE BERM SECTION, ALL UNSUITABLE MATERIAL SHALL BE REMOVED AND THE SURFACE PROPERLY PREPARED FOR FILL PLACEMENT. FILL MATERIAL ADJACENT TO ALL SPILLWAY AND DRAINAGE STRUCTURES SHALL BE PLACED IN 4-INCH (UNCOMPACTED) LIFTS AND HAND-COMPACTED TO THE SAME COMPACTION AND MOISTURE REQUIREMENTS AS THE ENTIRE EMBANKMENT.
- ALL FILL SOILS USED IN THE EMBANKMENT CONSTRUCTION SHALL BE COMPACTED TO AT LEAST 95% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY (ASTM D-698). THE FILL SOILS SHALL BE COMPACTED AT A MOISTURE CONTENT WITHIN -1 TO +3 PERCENT OF ITS OPTIMUM MOISTURE CONTENT. COMPACTION TESTS SHALL BE PERFORMED BY THE ON-SITE GEOTECHNICAL ENGINEER DURING CONSTRUCTION TO VERIFY THAT THE PROPER COMPACTION LEVEL HAS BEEN REACHED. THE FILL SHOULD BE COMPACTED USING A SHEEPSFOOT TYPE COMPACTOR. IN ORDER TO PREVENT DAMAGE TO THE PIPE, NO COMPACTION EQUIPMENT SHALL CROSS ANY PIPE UNTIL MINIMUM COVER IS ESTABLISHED ALONG THE PIPE.
- THE DESIGN ENGINEER SHALL BE PROVIDED WITH REPORTS AND CERTIFICATION, BY THE ON-SITE GEOTECHNICAL ENGINEER, THAT THE GEOTECHNICAL ASPECTS OF THE FACILITY HAVE BEEN CONSTRUCTED PER PLAN. THIS CERTIFICATION MUST ADDRESS THE TESTING FOR MATERIALS AND COMPACTION OF THE DAM EMBANKMENT AND SPILLWAY. THESE REPORTS AND CERTIFICATION WILL BE NEEDED DURING THE AS-BUILT CERTIFICATION PROCESS FOR THIS STORMWATER CONTROL MEASURE. THEREFORE, IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE TESTING AND OBSERVATION WITH THE ON-SITE GEOTECHNICAL ENGINEER.
- TESTING OF THE NEW FILL MATERIALS SHALL BE PERFORMED TO VERIFY THAT THE RECOMMENDED LEVEL OF COMPACTION IS ACHIEVED DURING CONSTRUCTION. THEREFORE, ONE DENSITY TEST SHALL BE PERFORMED FOR EVERY 2,500 SQUARE FEET OF AREA FOR EVERY LIFT OF FILL OR AS RECOMMENDED BY THE ON-SITE GEOTECHNICAL ENGINEER.
- TESTING WILL BE REQUIRED ALONG THE RCP OUTLET BARREL AT A FREQUENCY OF ONE TEST PER 25 LF OF PIPE PER VERTICAL FOOT OF FILL OR AS DIRECTED BY THE ON-SITE GEOTECHNICAL ENGINEER.

OUTLET STRUCTURE MATERIAL SPECIFICATIONS

- THE RCP OUTLET BARREL SHALL BE CLASS III RCP, MODIFIED BELL AND SPIGOT, MEETING THE REQUIREMENTS OF ASTM C76-LATEST. THE PIPES SHALL HAVE CONFINED O-RING RUBBER GASKET JOINTS MEETING ASTM C-443-LATEST. THE PIPE JOINTS SHALL BE TYPE R-4
- THE STRUCTURAL DESIGN FOR THE 4' X 4' (INTERNAL DIMENSIONS) RISER BOX WITH EXTENDED BASE SHALL BE BY OTHERS. PRIOR TO ORDERING THE STRUCTURES, THE CONTRACTOR SHALL PROVIDE, TO THE DESIGN ENGINEER FOR REVIEW, SHOP DRAWINGS AND SUPPORTING STRUCTURAL CALCULATIONS SEALED BY A P.E. REGISTERED IN NORTH CAROLINA DEMONSTRATING THE PERTINENT VERTICAL LOADS ARE SUPPORTED BY THE CONCRETE RISER STRUCTURE.
- THE RISER BOX OUTLET STRUCTURE SHALL BE PROVIDED WITH STEPS 16" ON CENTER. STEPS SHALL BE PROVIDED ON THE INNER WALL OF THE RISER BOX. STEPS SHALL BE IN ACCORDANCE WITH NCDOT STD. 840.66. PLEASE REFER TO SHEET C9.03 FOR LOCATION OF THE RISER STEPS. NOTE THE STEPS SHALL LINE UP WITH THE ACCESS HATCH OF THE TRASH RACK.
- THE CONCRETE ANTI-FLOTATION BLOCK SHALL BE CAST-IN-PLACE. STEEL REINFORCEMENT AND CONNECTION TO THE RISER SHALL BE PROVIDED IN ACCORDANCE WITH THE DETAIL ON SHEET C9.03. THE CONTRACTOR SHALL ENSURE THE WEIGHT OF THE ENTIRE RISER STRUCTURE IS GREATER THAN OR EQUAL TO XXX.XXX LBS. IN LIEU OF CAST-IN-PLACE, THE CONTRACTOR MAY OPT FOR A PRECAST ANTI-FLOTATION BLOCK. SHOP DRAWINGS FOR THE PRECAST BLOCK SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW. THE PRECAST ANTI-FLOTATION BLOCK SHALL HAVE A SHIPPING WEIGHT OF XX.XXX LBS.
- THE RISER BOX JOINTS SHALL BE SEALED USING BUTYL RUBBER SEALANT CONFORMING TO ASTM-C990-LATEST. IF NECESSARY, THE CONTRACTOR SHALL INCORPORATE A WATERSTOP INTO THE RISER BOX JOINT TO ENSURE A TIGHT CONNECTION. THE CONTRACTOR SHALL PARGE JOINTS ON BOTH THE INSIDE AND OUTSIDE WITH NON-SHRINK GROUT. JOINT STRAPS SHALL BE PROVIDED PER THE DETAIL ON C9.03.
- PRIOR TO ORDERING, THE CONTRACTOR SHALL SUBMIT TRASH RACK SHOP DRAWINGS TO THE ENGINEER FOR REVIEW. CONTRACTOR SHALL ENSURE THAT AN ACCESS HATCH IS PROVIDED WITHIN THE TRASH RACK (SEE DETAIL FOR LOCATION) THAT WILL ALLOW FOR FUTURE MAINTENANCE ACCESS. CONTRACTOR SHALL ALSO PROVIDE A CHAIN AND LOCK FOR SECURING THE ACCESS HATCH. NOTE THE ACCESS HATCH SHALL LINE UP WITH THE ACCESS STEPS AFTER INSTALLATION.
- ALL POURED CONCRETE SHALL MEET THE FOLLOWING SPECIFICATIONS UNLESS OTHERWISE NOTED:
 - MINIMUM 3000 PSI (28 DAY)
 - SLUMP = 3" - 5"
 - EN-TRAINED AIR = 5% - 7%PLEASE NOTE NO CONCRETE SHALL BE POURED WHEN THE AMBIENT AIR TEMPERATURES ARE EXPECTED TO BE ABOVE 85°F OR BELOW 40°F. CAST-IN-PLACE CONCRETE SHALL BE "WET CURED" AFTER FINISHING FOR A MINIMUM OF 48 HOURS.
- ON-SITE GEOTECHNICAL ENGINEER TO ENSURE AND CERTIFY ALL POURED CONCRETE MEETS THE ABOVE SPECIFICATIONS.
- GEOTEXTILE FABRIC FOR THE RCP OUTLET BARREL JOINTS SHALL BE MIRAFI 180N OR ENGINEER APPROVED EQUAL (NON-WOVEN FABRIC).

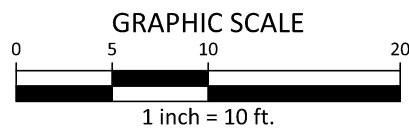
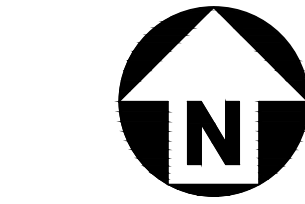
STATEMENT OF RESPONSIBILITY

ALL REQUIRED MAINTENANCE AND INSPECTIONS OF THIS FACILITY SHALL BE THE RESPONSIBILITY OF THE PROPERTY OWNER, PER THE EXECUTED OPERATION AND MAINTENANCE AGREEMENT FOR THIS FACILITY.

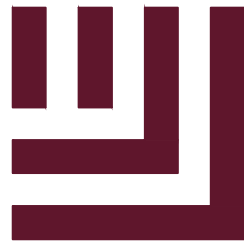


SCM B BIORETENTION AREA PLAN VIEW

1"=10'



PRELIMINARY DRAWING - NOT RELEASED FOR CONSTRUCTION



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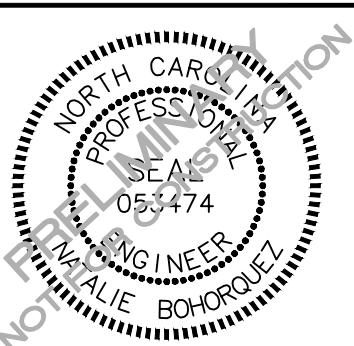
CLIENT

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PHONE: 704. 843. 1680



Village of Marvin
Enriched by Nature

VILLAGE OF MARVIN
TOWN HALL
10006 MARVIN SCHOOL RD
MARVIN, NC, 28173



REVISIONS

NO. DATE

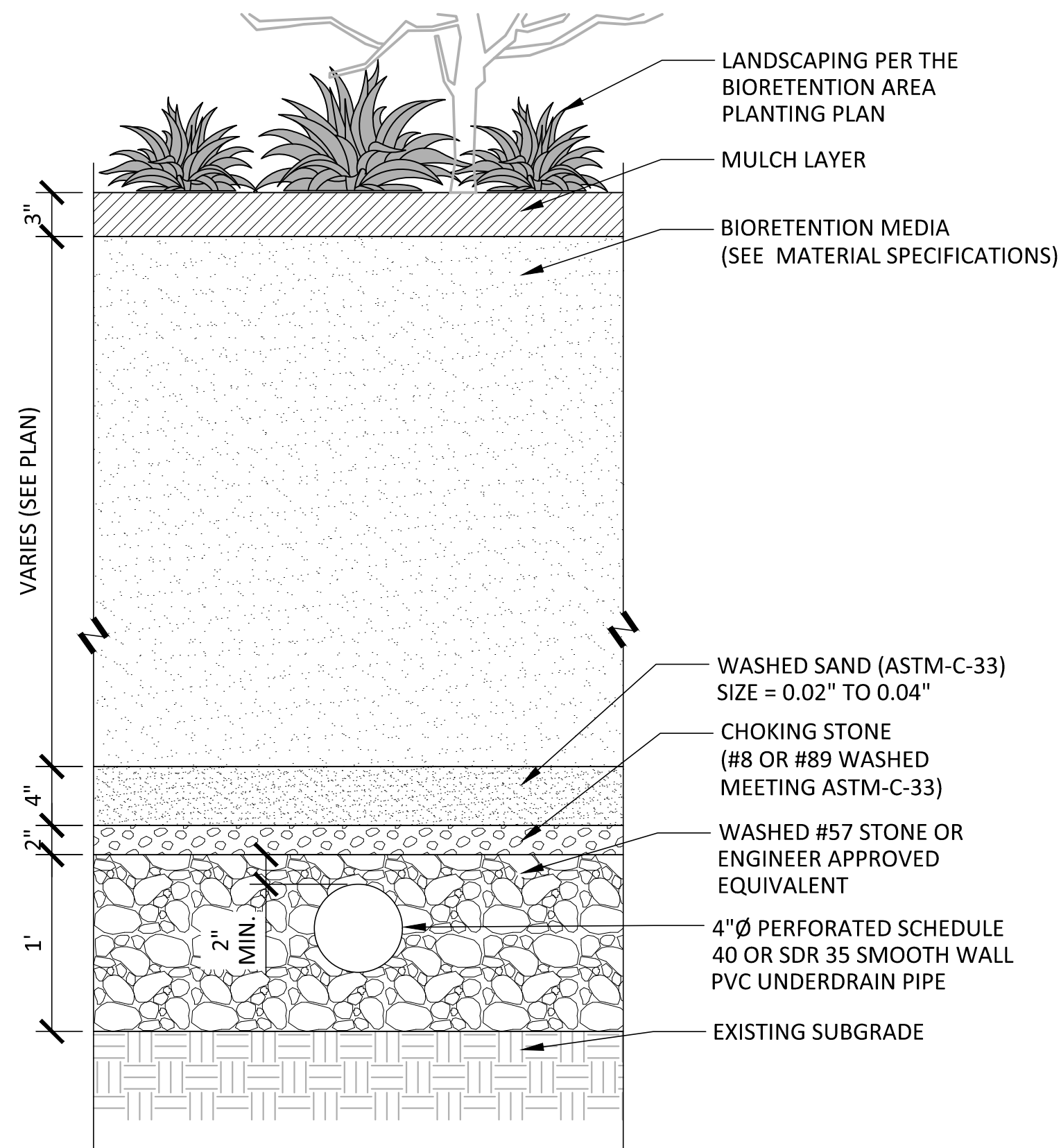
PLAN INFORMATION

PROJECT NO. VOM-23001
FILENAME VOM23001 - BIO
CHECKED BY NB
DRAWN BY EKB
SCALE 1"=20'
DATE 07.19.2023

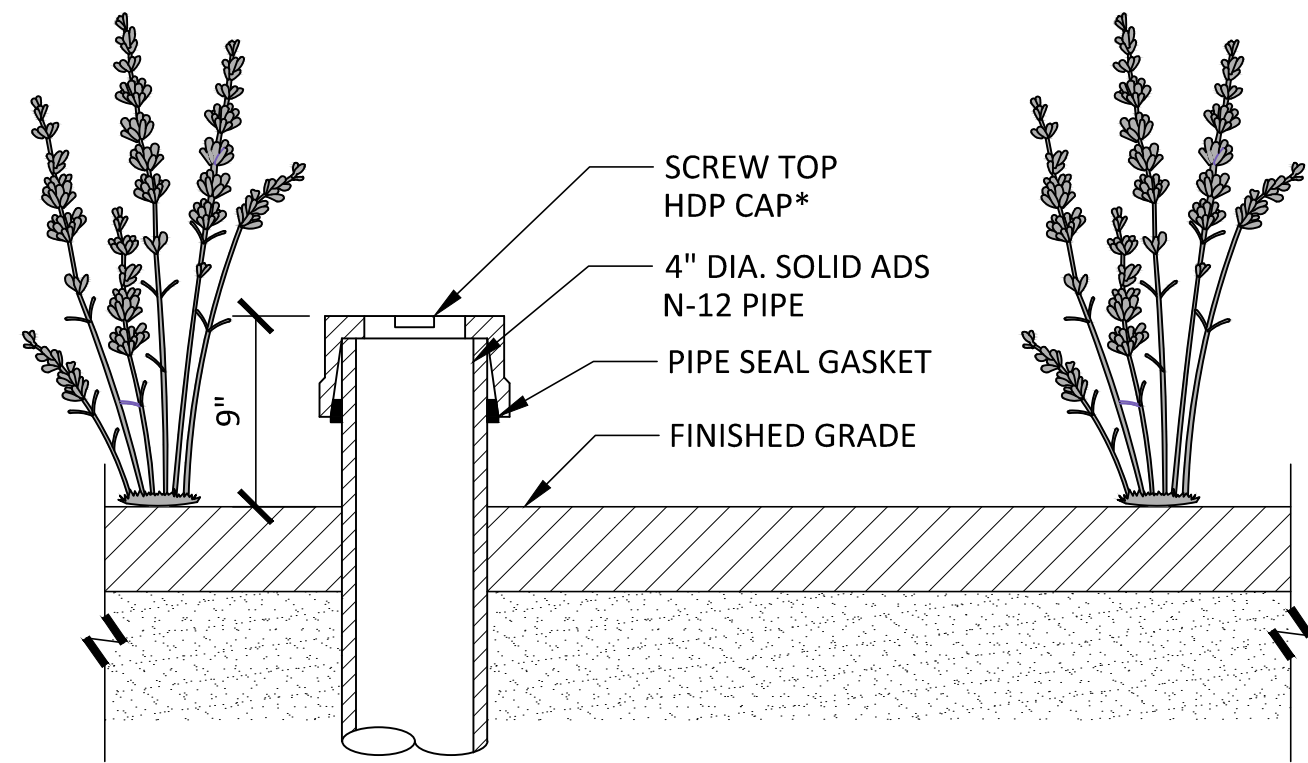
SHEET

SCM B PLAN VIEW

C9.03



01 BIORETENTION SECTION - WOODY PLANTS
SCALE: 1" = 1'-0"

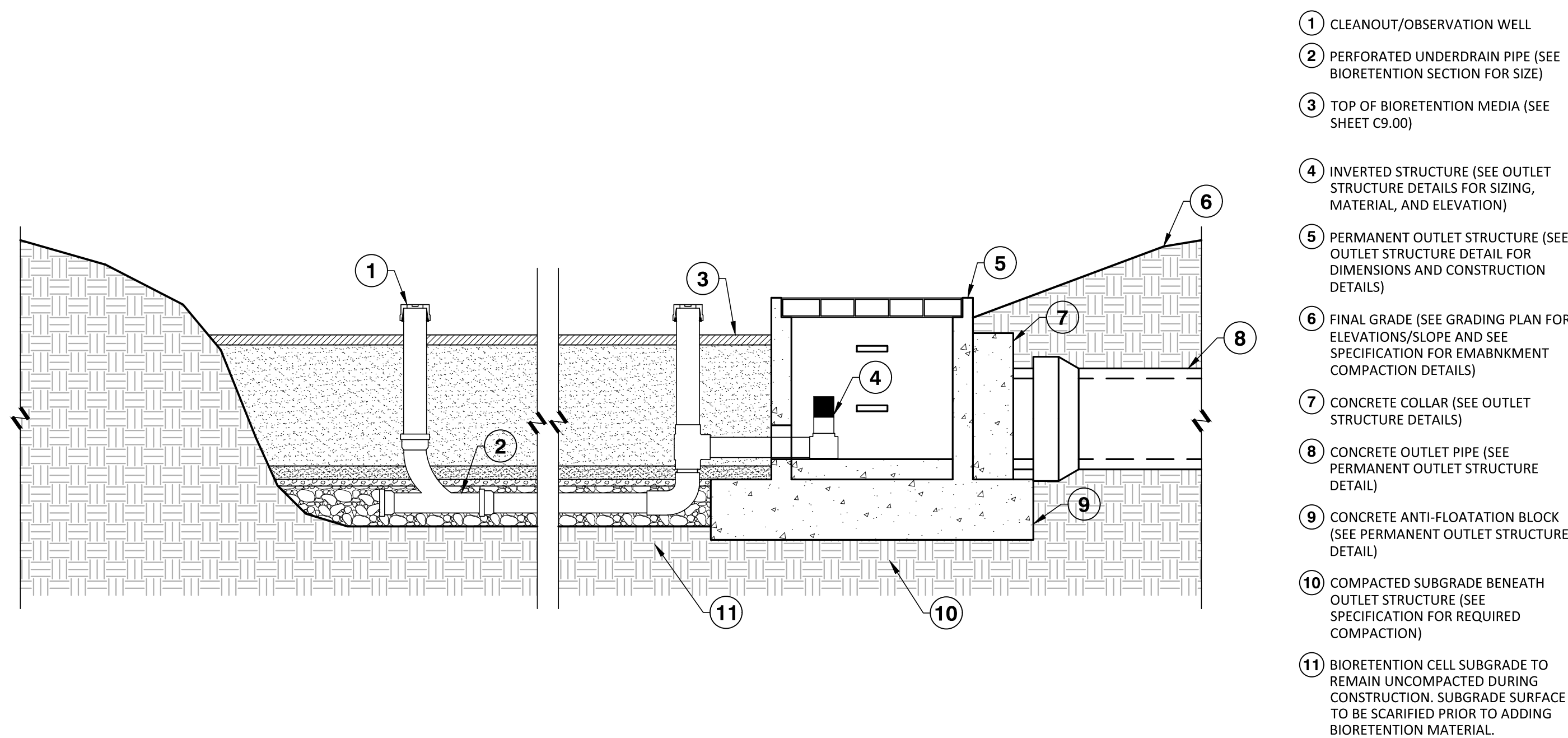


* DETAIL NOT PROVIDED FOR SCREW TOP PVC (OR HDPE) WELL CAPS, SCHEMATIC FOR DISPLAY PURPOSES ONLY

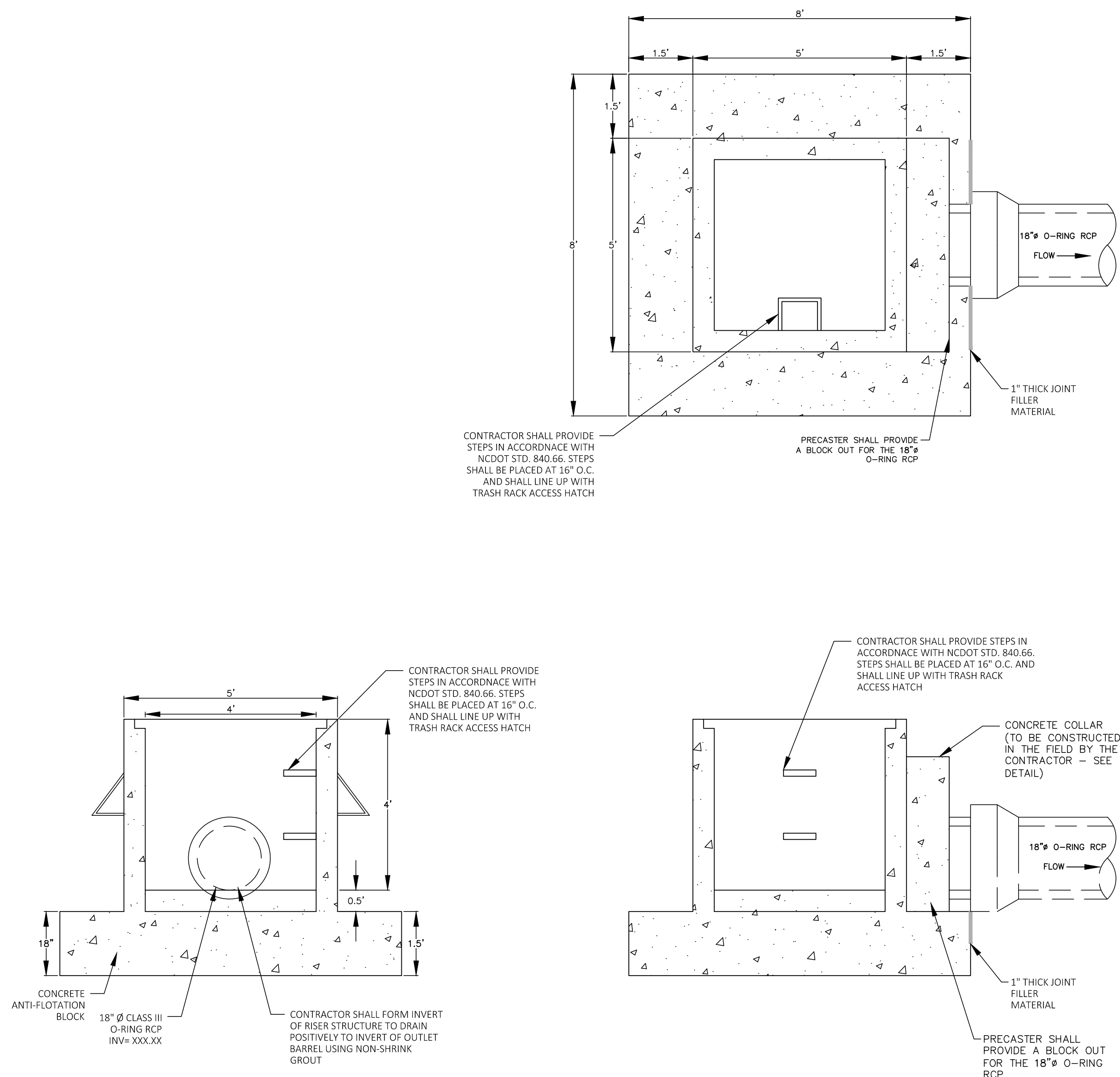
NOTES:

- CLEANOUTS TO BE EXTENDED 9" ABOVE FINISHED GRADE UNLESS OTHERWISE NOTED ON PLANS (SEE PLANS FOR PONDING DEPTH)
- FOR AN UNDERGROUND OBSERVATION WELL/CLEANOUT, PROVIDE A TUBE MADE OF NON-CORROSIVE MATERIAL, SCHEDULE 40 OR EQUAL, AT LEAST 3 FEET LONG, WITH AN INSIDE DIAMETER OF AT LEAST 4 INCHES.
- THE TUBE SHALL HAVE A FACTORY ATTACHED CAST IRON OR HIGH IMPACT PLASTIC COLLAR WITH RIBS TO PREVENT ROTATION WHEN REMOVING SCREW TOP LID. THE SCREW TOP LID SHALL BE CAST IRON OR HIGH IMPACT PLASTIC THAT WILL WITHSTAND ULTRAVIOLET RAYS

03 OBSERVATION WELL / CLEANOUT DETAIL
SCALE: 1" = 1'-0"



02 BIORETENTION AREA SECTION
SCALE: 3/8" = 1'-0"



04 PERMANENT OUTLET STRUCTURE DETAILS
SCALE: 1" = 2'-0"



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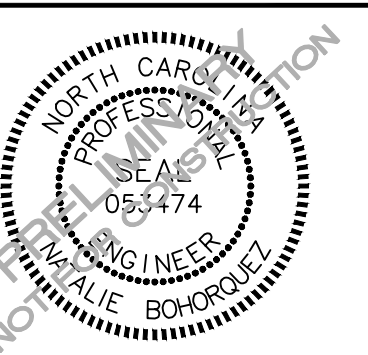
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REVISIONS

NO. DATE

PLAN INFORMATION

PROJECT NO. VOM-23001
FILENAME VOM23001 - BIO
CHECKED BY NB
DRAWN BY EKB
SCALE NTS
DATE 08.11.2023

SHEET

SCM B DETAILS

C9.04