

ORGANIC MULCH MATERIAL AND APPLICATION RATES

MULCHES	RATES		NOTES
	Per Acre	Per 1000 sq. ft.	
Straw or Hay	1-2 tons (Minimum 2 tons for winter cover)	70-90 lbs.	Free from weeds and coarse matter. Must be anchored. Spread with mulch blower or by hand.
Fiber Mulch	Minimum 1500 lbs.	35 lbs.	Do not use as mulch for winter cover or during hot, dry periods. Apply as slurry.
Corn Stalks	4-6 tons	185-275 lbs.	Cut or shredded in 4-6" lengths. Air-dried. Do not use in fine turf areas. Apply with mulch blower or by hand.
Wood Chips	4-6 tons	185-275 lbs.	Free of coarse matter. Air-dried. Treat with 12 lbs nitrogen per ton. Do not use in fine turf areas. Apply with mulch blower, chip handler, or by hand.
Bark Chips or Shredded Bark	50-70 cu. yds.	1-2 cu. yds.	Free of coarse matter. Air-dried. Do not use in fine turf areas. Apply with mulch blower, chip handler, or by hand.

* When fiber mulch is the only available mulch during periods when straw should be used, apply at a minimum rate of 2000 lbs./ac. or 45 lbs./1000 sq. ft.

- GENERAL NOTES:**
- ALL ELEVATIONS REFER TO THE NORTH AMERICAN VERTICAL DATUM (NAVD) 1988.
 - A DISTINCTION BETWEEN NEW AND EXISTING MATERIALS, EQUIPMENT AND STRUCTURES HAS BEEN MADE ON THE DRAWINGS BY LINE WEIGHT. HEAVY REPRESENTS NEW, LIGHT REPRESENTS EXISTING.
 - THE CONTRACTOR SHALL MAKE AN ON-SITE INSPECTION OF THE FACILITY AND RELATED CONDITIONS PRIOR TO BIDDING THIS CONTRACT.
 - THE CONTRACTOR IS RESPONSIBLE TO MAKE ALL MEASUREMENTS NECESSARY TO LOCATE, FABRICATE, ERECT, CONSTRUCT AND OTHERWISE INSTALL ALL NEW WORK IN LOCATIONS SHOWN AND RELOCATE AND REWORK EXISTING WORK ALL TO THE ARRANGEMENTS, GUIDANCE AND INSTRUCTIONS SHOWN AND REQUIRED FOR A COMPLETE TROUBLE-FREE OPERATING INSTALLATION.
 - THE CONTRACTOR IS RESPONSIBLE TO FABRICATE, ERECT, CONSTRUCT AND OTHERWISE INSTALL ALL NEW WORK CONNECTING TO EXISTING WORK AND MAKE ALL NECESSARY RELOCATIONS TO THE ARRANGEMENTS AND GENERAL DESIGN SHOWN. THE CONTRACTOR IS ALSO RESPONSIBLE TO MAKE ANY ADJUSTMENTS IN FABRICATION, ERECTION, CONSTRUCTION AND INSTALLATION NECESSARY TO CONSTRUCT AND FIT NEW WORK AND RELOCATIONS TO EXISTING CONDITIONS AND LOCATIONS TO CONFORM TO THE ARRANGEMENTS AND GENERAL DESIGN SHOWN. ADJUSTMENTS PROPOSED OR CONTEMPLATED BY THE CONTRACTOR SHALL CONFORM TO REQUIREMENTS AND STANDARDS OF THE CONTRACT DOCUMENTS.
 - LOCATIONS, ELEVATIONS AND DIMENSIONS OF EXISTING PIPING, EQUIPMENT, STRUCTURES AND OTHER EXISTING WORK ARE BASED ON INFORMATION FURNISHED BY VARIOUS SOURCES, INCLUDING FIELD MEASUREMENTS. THE CONTRACTOR IS RESPONSIBLE TO FIELD CHECK AND MEASURE LOCATIONS, ELEVATIONS AND DIMENSIONS AND TO FIT AND OTHERWISE INSTALL THE NEW WORK TO ACTUAL EXISTING LOCATIONS, ELEVATIONS AND DIMENSIONS FOR A COMPLETE AND TROUBLE-FREE OPERATING FACILITY.
 - EXISTING CONSTRUCTION OR WORK TO BE USED, IMPACTED OR OTHERWISE AFFECTED BY THE CONTRACTOR IN PERFORMANCE OF THE WORK UNDER THIS CONTRACT SHALL BE INSPECTED PRIOR TO STARTING WORK. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO REPAIR, MODIFY, UPGRADE, PROTECT, SUPPLEMENT OR SUPPORT EXISTING CONSTRUCTION OR WORK TO OBTAIN THE DEGREE OF SERVICE REQUIRED BY THE CONTRACTOR TO PERFORM THE WORK. THE CONTRACTOR SHALL RETURN EXISTING CONSTRUCTION OR WORK TO ITS FUNCTIONAL EQUIVALENCY FOUND PRIOR TO THE START OF THE CONTRACTOR'S WORK TO THE SATISFACTION OF THE ENGINEER.
 - EXISTING CONSTRUCTION SHALL BE REMOVED TO THE EXTENT SHOWN AND SPECIFIED AND AS NEEDED TO BE COMPATIBLE AND ACCOMMODATE NEW WORK OR REPLACEMENT WORK.
 - THE CONTRACTOR IS RESPONSIBLE TO ACCEPT ALL EXISTING CONSTRUCTION FOR WORK IN THE STATUS AND CONDITIONS THAT OCCUR WHEN WORK AT THE FACILITY COMMENCES. THE CONTRACTOR SHALL PERFORM ALL WORK NECESSARY TO PREPARE AND MAINTAIN THE EXISTING CONSTRUCTION AS NEEDED TO PERFORM ALL WORK UNDER THE CONTRACT. SUCH WORK INCLUDES BUT IS NOT NECESSARILY LIMITED TO IMPROVING AND UPGRADING THE OPERATION AND PERFORMANCE. THE CONTRACTOR IS RESPONSIBLE TO REMOVE AWAY FROM THE SITE OF THE WORK TO HIS OWN PLACE OF DISPOSAL ALL EXCESS ITEMS, MATERIAL AND SUBSTANCES REMOVED. AS PART OF THIS WORK THE CONTRACTOR IS RESPONSIBLE TO FURNISH ALL DESIGN, FABRICATION, ERECTION, LABOR, EQUIPMENT, MATERIALS AND SERVICES.
 - THE CONTRACTOR SHALL INCORPORATE ALL INFORMATION AND WORK REQUIRED UNDER THESE GENERAL NOTES ON HIS WORKING DRAWINGS. ALL SUCH INFORMATION AND WORK SHALL BE SO INCORPORATED PRIOR TO THE TIME WORKING DRAWINGS ARE SUBMITTED.
 - THE CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE ALL SUPPORT OR ANCILLARY ITEMS AND WORK FOR ITEMS SUBMITTED AS EQUIVALENT TO SPECIFIED ITEMS THAT ARE REQUIRED TO PROVIDE THE SAME FUNCTIONAL AND OPERATIONAL CAPABILITIES, NEEDS AND REQUIREMENTS SHOWN AND SPECIFIED FOR THE SPECIFIED ITEM. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE TO SUBMIT ALL SUPPORT AND ANCILLARY ITEMS AND WORK WITH HIS SUBMITTAL OF THE PROPOSED EQUIVALENT ITEM AND TO SHOW THAT THE PROPOSED EQUIVALENT ITEM HAS BEEN PROPERLY COORDINATED, INTERFACED AND OTHERWISE INCORPORATED INTO THE WORK. THE CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE ALL SUCH SUPPORT OR ANCILLARY ITEMS AND WORK WHETHER THE NEED FOR THEM HAS BEEN DETERMINED BEFORE, DURING OR AFTER APPROVAL OR ACCEPTANCE OF THE EQUIVALENT ITEM.
 - IF THERE IS DISAGREEMENT IN WORK SHOWN OR SPECIFIED, THE CONTRACTOR IS RESPONSIBLE TO PROVIDE THE MINIMUM WORK NEEDED TO SATISFY FUNCTIONAL, CONTROL AND INTERFACING REQUIREMENTS AND PROVIDE A TROUBLE-FREE OPERATING INSTALLATION.
 - THE CONTRACTOR SHALL LIMIT HIS ACCESS TO THE WORK FROM APPROVED PUBLIC RIGHTS-OF-WAY UNLESS HE OBTAINS HIS OWN APPROVALS FOR ALTERNATE ACCESS. IF THE CONTRACTOR OBTAINS ALTERNATE ACCESS LOCATIONS, DOCUMENTATION SHOWING APPROVAL FOR USE OF THESE LOCATIONS SHALL BE SUBMITTED TO THE ENGINEER PRIOR TO USE OF ACCESS.
 - THE CONTRACTOR SHALL LIMIT ALL CONSTRUCTION OPERATIONS TO WITHIN PUBLIC RIGHTS-OF-WAY AND THE LIMITS OF CONSTRUCTION SHOWN. IF ADDITIONAL TEMPORARY CONSTRUCTION AREA OR EASEMENTS ARE OBTAINED BY THE CONTRACTOR, THE LOCATIONS OF THESE EASEMENTS SHALL BE SUBMITTED TO THE ENGINEER PRIOR TO USE BY THE CONTRACTOR.
 - ALL WORK AND COSTS ASSOCIATED WITH COMPLIANCE WITH THESE GENERAL NOTES SHALL BE INCLUDED IN THE PRICES BID FOR THE VARIOUS CLASSIFIED UNIT PRICE AND LUMP SUM CONTRACT ITEMS AND NO SEPARATE PAYMENT WILL BE MADE THEREFOR.
 - CONTRACTOR SHALL SUPPORT, PROTECT AND RESTORE ALL UTILITIES AND APPURTENANCES AS REQUIRED TO COMPLETE THE WORK.
 - CONTRACTOR SHALL CONTAIN CONSTRUCTION OPERATIONS WITHIN THE LIMITS OF THE RIGHT-OF-WAY AND EASEMENTS INDICATED ON THE DRAWINGS AND SHALL USE CARE IN PLACING MATERIALS AND EQUIPMENT SO AS TO CAUSE THE LEAST POSSIBLE DAMAGE TO PROPERTY AND RESTORE PROPERTY TO PRE CONSTRUCTION CONDITIONS.
 - ALL CONSTRUCTION ACTIVITY TO BE PERFORMED IN COMPLIANCE WITH APPLICABLE OSHA STANDARDS FOR WORKER SAFETY.
 - TEMPORARY CONSTRUCTION FENCING SHALL BE INSTALLED AROUND ALL WORK AREAS AND OPEN EXCAVATIONS. OPEN EXCAVATIONS SHALL BE ADEQUATELY PROTECTED AT THE END OF EACH WORK DAY, WEEKEND, AND HOLIDAY. THE TEMPORARY EROSION AND SEDIMENT CONTROLS SHOWN ON THE CONTRACT DRAWINGS ARE INTENDED TO PROVIDE A GENERAL PLAN FOR CONTROLLING EROSION AND SILTATION WITHIN THE PROTECTED LIMITS. THE CONTRACTOR SHALL ADJUST THE LOCATION, QUANTITY, AND TYPE OF EROSION AND SILTATION CONTROLS AS REQUIRED BASED ON THE CONTRACTOR'S CONSTRUCTION SEQUENCE AND CONDITIONS IN THE FIELD.

DETAIL 3/C1 - TREE PROTECTION
 SCALE: NOT TO SCALE

DETAIL 4/C1 - TEMPORARY SEDIMENT TRAP
 SCALE: NOT TO SCALE

TABLE 3.31-C
TEMPORARY SEEDING PLANT MATERIALS, SEEDING RATES, AND DATES

SPECIES	SEEDING RATE Acre	1000 ft2	NORTH ^a		SOUTH ^b		PLANT CHARACTERISTICS	
			3/1 to 4/30	5/1 to 8/15	8/15 to 11/1	2/15 to 4/30		5/1 to 9/1
OATS (<i>Avena sativa</i>)	3 bu. (up to 100 lbs., not less than 50 lbs.)	2 lbs.	X	-	-	X	-	Use spring varieties (e.g., Noble).
RYEd (<i>Secale cereale</i>)	2 bu. (up to 110 lbs., not less than 50 lbs.)	2.5 lbs.	X	-	X	X	-	Use for late fall seedings, winter cover. Tolerates cold and low moisture.
GERMAN MILLET (<i>Setaria italica</i>)	50 lbs.	approx. 1 lb.	-	X	-	-	X	Warm-season annual. Dies at first frost. May be added to summer mixes.
ANNUAL RYEGRASS ^c (<i>Lolium multi-florum</i>)	60 lbs.	1.5 lbs.	X	-	X	X	-	May be added in mixes. Will mow out of most stands.
WEEPING LOVEGRASS (<i>Eragrostis curvula</i>)	15 lbs.	5.5 ozs.	-	X	-	-	X	Warm season perennial. May bunch. Tolerates hot, dry slopes and acid, infertile soils. May be added to mixes.
KOREAN LESPEDEZA ^d (<i>Lespedeza stipulacea</i>)	25 lbs.	approx. 1.5 lbs.	X	X	-	X	X	Warm season annual legume. Tolerates acid soils. May be added to mixes.

A. NORTHERN PIEDMONT AND MOUNTAIN REGION. SEE PLATES 3.22-1 AND 3.22-2. B. SOUTHERN PIEDMONT AND COASTAL PLAIN. C. MAY BE USED AS A COVER CROP WITH SPRING SEEDING. D. MAY BE USED AS A COVER CROP WITH FALL SEEDING. X MAY BE PLANTED BETWEEN THESE DATES. - MAY NOT BE PLANTED BETWEEN THESE DATES.

TABLE 3.32-D
PERMANENT SEEDING SPECIFICATIONS FOR PIEDMONT AREA

LAND USE	SPECIES	APPLICATION PER ACRE	TOTAL
Minimum Care Lawn (Commercial or Residential)	Tall Fescue1	95-100%	175-200 lbs.
	Perennial Ryegrass	0-5%	
	Kentucky Bluegrass1	0-5%	
High-Maintenance Lawn	Tall Fescue1	200-250 lbs.	200-250 lbs.
	Tall Fescue1	128 lbs.	
General Slope (3:1 or less)	Red Top Grass or Creeping Red Fescue	2 lbs.	150 lbs.
	Seasonal Nurse Crop2	20 lbs.	
Low-Maintenance Slope (Steeper than 3:1)	Tall Fescue1	108 lbs.	150 lbs.
	Red Top Grass or Creeping Red Fescue	2 lbs.	
	Seasonal Nurse Crop2	20 lbs.	
	Crownvetch3	20 lbs.	

1 - When selecting varieties of turfgrass, use the Virginia Crop Improvement Association (VCIA) recommended turfgrass variety list. Quality seed will bear a label indicating that they are approved by VCIA. A current turfgrass variety list is available at the local County Extension office or through VCIA at 804-746-4884 or at <http://sudan.cses.vt.edu/html/Turf/turf/publications/publications2.html>

2 - Use seasonal nurse crop in accordance with seeding dates as stated below:

SEEDING DATE	SEEDING DATE	SEEDING DATE
February 16th - April	Annual Rye	Annual Rye
May 1st - August 15th	Foxtail Millet	Foxtail Millet
August 16th - October	Annual Rye	Annual Rye
November - February 15th	Winter Rye	Winter Rye

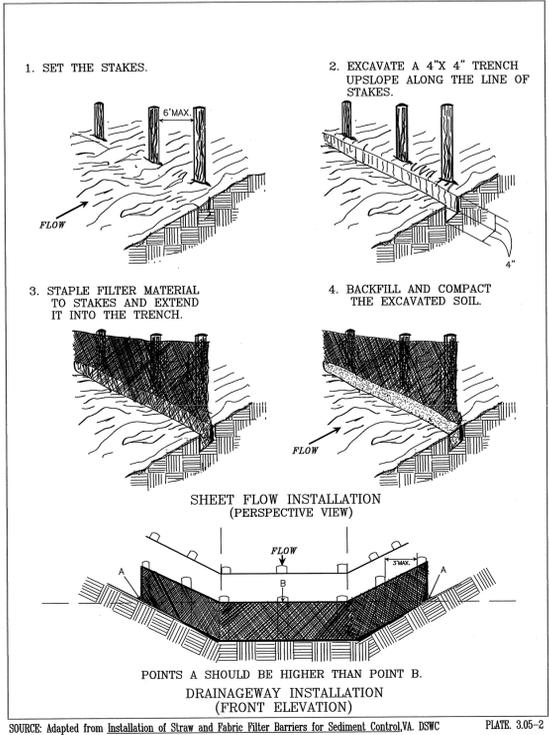
3 - Substitute *Secale lespedeza* for *Crownvetch* east of Farmville, VA (May through September use hulled seed, all other periods, use unhulled *Secale*). If *Floata* is used, increase rate to 30 lbs./acre. If *Weeping Lovegrass* is used, include in any slope or low maintenance mixture during warmer seeding periods, increase to 30-40

FERTILIZER & LIME

- Apply 10-20-10 fertilizer at a rate of 500 lbs. / acre (or 12 lbs. / 1,000 sq. ft.)
- Apply Pulverized Agricultural Limestone at a rate of 2 tons/acre (or 90 lbs. / 1,000 sq. ft.)

NOTE:

- A soil test is necessary to determine the actual amount of lime required to adjust the soil pH of site.
- Incorporate the lime and fertilizer into the top 4-6 inches of the soil by disking or by other means.
- When applying Slowly Available Nitrogen, use rates available in Erosion & Sediment Control Technical Bulletin # 4, 2003 Nutrient Management for Development Sites at <http://www.dcr.state.va.us/sw/e&s.htm#pubs>



DETAIL 2/C1
SILT FENCE (WITHOUT WIRE SUPPORT)
 SCALE: NOT TO SCALE

GREELEY AND HANSEN
 9020 STONY POINT PARKWAY, SUITE 475
 RICHMOND, VIRGINIA 23235

DESIGNED BDC
 DRAWN DSS
 CHECKED EJC

APPROVED
 EDWARD J. CRONIN
 Lic. No. 035130
 8/29/2016
 PROFESSIONAL ENGINEER

NO.	DATE	APPD	REVISION

SCALE
 NOT TO SCALE

CITY OF LYNCHBURG, VIRGINIA
 DEPARTMENT OF WATER RESOURCES

SHEFFIELD ELEMENTARY SCHOOL BMP RETROFIT

CIVIL

FILE NAME LY9070C01

DWG **C1**

SHEET 2 OF 13

DATE AUGUST 2016 REV 0

GENERAL NOTES AND EROSION AND SEDIMENT CONTROL DETAILS

CLIENT: 0775 LYNCHBURG STORM MASTER PLAN 077593 TO 7 SLAF BMP DESIGN SHEFFIELD 21 CADDD 21.05 WORKING DWG 19070001 2016/08/29 12:44 PM CUSTALOW, BENJAMIN

E&S CONTROL MINIMUM STANDARDS (MS) NARRATIVE

4VAC50-30-40 MINIMUM STANDARD	DESCRIPTION OF HOW MS IS ADDRESSED ON PLANS
YES MS1: PERMANENT OR TEMPORARY SOIL STABILIZATION SHALL BE APPLIED TO DENUDED AREAS WITHIN SEVEN DAYS AFTER FINAL GRADE IS REACHED ON ANY PORTION OF THE SITE. TEMPORARY SOIL STABILIZATION SHALL BE APPLIED WITHIN SEVEN DAYS TO DENUDED AREAS THAT MAY NOT BE AT FINAL GRADE BUT WILL REMAIN DORMANT FOR LONGER THAN 14 DAYS. PERMANENT STABILIZATION SHALL BE APPLIED TO AREAS THAT ARE TO BE LEFT DORMANT FOR MORE THAN ONE YEAR.	SEE EROSION AND SEDIMENT CONTROL MEASURES NARRATIVE NOTE 1 AND SITE STABILIZATION NARRATIVE ON THIS SHEET
YES MS2: DURING CONSTRUCTION OF THE PROJECT, SOIL STOCK PILES AND BORROW AREAS SHALL BE STABILIZED OR PROTECTED WITH SEDIMENT TRAPPING MEASURES. THE APPLICANT IS RESPONSIBLE FOR THE TEMPORARY PROTECTION AND PERMANENT STABILIZATION OF ALL SOIL STOCKPILES ON SITE AS WELL AS BORROW AREAS AND SOIL INTENTIONALLY TRANSPORTED FROM THE PROJECT SITE.	SEE EROSION AND SEDIMENT CONTROL MEASURES NARRATIVE NOTE 1 AND SITE STABILIZATION NARRATIVE ON THIS SHEET
YES MS3: A PERMANENT VEGETATIVE COVER SHALL BE ESTABLISHED ON DENUDED AREAS NOT OTHERWISE PERMANENTLY STABILIZED. PERMANENT VEGETATION SHALL NOT BE CONSIDERED ESTABLISHED UNTIL A GROUND COVER IS ACHIEVED THAT IS UNIFORM, MATURE ENOUGH TO SURVIVE AND WILL INHIBIT EROSION.	SEE EROSION AND SEDIMENT CONTROL MEASURES NARRATIVE NOTE 1 AND SITE STABILIZATION NARRATIVE ON THIS SHEET
YES MS4: SEDIMENT BASINS AND TRAPS, PERIMETER DIKES, SEDIMENT BARRIERS AND OTHER MEASURES INTENDED TO TRAP SEDIMENT SHALL BE CONSTRUCTED AS A FIRST STEP IN ANY LAND-DISTURBING ACTIVITY AND SHALL BE MADE FUNCTIONAL BEFORE UPSLOPE LAND DISTURBANCE TAKES PLACE.	SEE EROSION AND SEDIMENT CONTROL MEASURES NARRATIVE NOTE 3 AND SITE STABILIZATION NARRATIVE ON THIS SHEET
N/A MS5: STABILIZATION MEASURES SHALL BE APPLIED TO EARTHEN STRUCTURES SUCH AS DAMS, DIKES AND DIVERSIONS IMMEDIATELY AFTER INSTALLATION.	PROJECT DOES NOT INCLUDE EARTHEN STRUCTURES
YES MS6: SEDIMENT TRAPS AND SEDIMENT BASINS SHALL BE DESIGNED AND CONSTRUCTED BASED UPON THE TOTAL DRAINAGE AREA TO BE SERVED BY THE TRAP OR BASIN.	SEE VESCH STANDARD DETAIL PLATE 3.13-2 ON SHEET C1
A. THE MINIMUM STORAGE CAPACITY OF A SEDIMENT TRAP SHALL BE 134 CUBIC YARDS PER ACRE OF DRAINAGE AREA AND THE TRAP SHALL ONLY CONTROL DRAINAGE AREAS LESS THAN THREE ACRES.	SEE VESCH STANDARD DETAIL PLATE 3.13-2 ON SHEET C1
B. SURFACE RUNOFF FROM DISTURBED AREAS THAT IS COMPRISED OF FLOW FROM DRAINAGE AREAS GREATER THAN OR EQUAL TO THREE ACRES SHALL BE CONTROLLED BY A SEDIMENT BASIN. THE MINIMUM STORAGE CAPACITY OF A SEDIMENT BASIN SHALL BE 134 CUBIC YARDS PER ACRE OF DRAINAGE AREA. THE OUTFALL SYSTEM SHALL, AT A MINIMUM, MAINTAIN THE STRUCTURAL INTEGRITY OF THE BASIN DURING A 25-YEAR STORM OF 24-HOUR DURATION. RUNOFF COEFFICIENTS USED IN RUNOFF CALCULATIONS SHALL CORRESPOND TO A BARE EARTH CONDITION OR THOSE CONDITIONS EXPECTED TO EXIST WHILE THE SEDIMENT BASIN IS UTILIZED.	SEDIMENT TRAP SERVES DRAINAGE FROM DISTURBED LAND THAT IS LESS THAN 3 ACRES. THEREFORE, NO SEDIMENT BASINS ARE REQUIRED.
YES MS7: CUT AND FILL SLOPES SHALL BE DESIGNED AND CONSTRUCTED IN A MANNER THAT WILL MINIMIZE EROSION. SLOPES THAT ARE FOUND TO BE ERODING EXCESSIVELY WITHIN ONE YEAR OF PERMANENT STABILIZATION SHALL BE PROVIDED WITH ADDITIONAL SLOPE STABILIZING MEASURES UNTIL THE PROBLEM IS CORRECTED.	THIS SITE IS DESIGNED WITH MINIMAL GRADING AND MILD SLOPES THAT MATCH OR NEARLY MATCH EXISTING TOPOGRAPHY.
YES MS8: CONCENTRATED RUNOFF SHALL NOT FLOW DOWN CUT OR FILL SLOPES UNLESS CONTAINED WITHIN AN ADEQUATE TEMPORARY OR PERMANENT CHANNEL, FLUME OR SLOPE DRAIN STRUCTURE.	ALL CONCENTRATED RUNOFF WILL BE CONTAINED WITHIN THE DRY SWALE.
N/A MS9: WHENEVER WATER SEEPS FROM A SLOPE FACE, ADEQUATE DRAINAGE OR OTHER PROTECTION SHALL BE PROVIDED.	GEOTECHNICAL INVESTIGATIONS SUGGEST THAT THERE WILL BE NO WATER SEEPAGE FROM SLOPE FACES
YES MS10: ALL STORM SEWER INLETS THAT ARE MADE OPERABLE DURING CONSTRUCTION SHALL BE PROTECTED SO THAT SEDIMENT-LADEN WATER CANNOT ENTER THE CONVEYANCE SYSTEM WITHOUT FIRST BEING FILTERED OR OTHERWISE TREATED TO REMOVE SEDIMENT.	NO INLETS WILL BE MADE OPERABLE DURING CONSTRUCTION.
YES MS11: BEFORE NEWLY CONSTRUCTED STORMWATER CONVEYANCE CHANNELS OR PIPES ARE MADE OPERATIONAL, ADEQUATE OUTLET PROTECTION AND ANY REQUIRED TEMPORARY OR PERMANENT CHANNEL LINING SHALL BE INSTALLED IN BOTH THE CONVEYANCE CHANNEL AND RECEIVING CHANNEL.	SUFFICIENT OUTLET PROTECTION WILL BE PROVIDED BY THE COBBLE STONE SPILLWAY ON THE CHECK DAM. NO CHANNEL LINING IS REQUIRED (SEE SWALE VELOCITY CALCULATIONS ON SHEET C3).
N/A MS12: WHEN WORK IN A LIVE WATERCOURSE IS PERFORMED, PRECAUTIONS SHALL BE TAKEN TO MINIMIZE ENCROACHMENT, CONTROL SEDIMENT TRANSPORT AND STABILIZE THE WORK AREA TO THE GREATEST EXTENT POSSIBLE DURING CONSTRUCTION. NONERODIBLE MATERIAL SHALL BE USED FOR THE CONSTRUCTION OF CAUSEWAYS AND COFFERDAMS. EARTHEN FILL MAY BE USED FOR THESE STRUCTURES IF ARMORED BY NONERODIBLE COVER MATERIALS.	PROJECT DOES NOT INCLUDE WORK IN A LIVE WATER COURSE
N/A MS13: WHEN A LIVE WATERCOURSE MUST BE CROSSED BY CONSTRUCTION VEHICLES MORE THAN TWICE IN ANY SIX-MONTH PERIOD, A TEMPORARY VEHICULAR STREAM CROSSING CONSTRUCTED OF NONERODIBLE MATERIAL SHALL BE PROVIDED.	PROJECT DOES NOT INCLUDE CROSSING A LIVE WATER COURSE
N/A MS14: ALL APPLICABLE FEDERAL, STATE AND LOCAL CHAPTERS PERTAINING TO WORKING IN OR CROSSING LIVE WATERCOURSES SHALL BE MET	PROJECT DOES NOT INCLUDE WORKING IN OR CROSSING A LIVE WATER COURSE
N/A MS15: THE BED AND BANKS OF A WATERCOURSE SHALL BE STABILIZED IMMEDIATELY AFTER WORK IN THE WATERCOURSE IS COMPLETED.	PROJECT DOES NOT INCLUDE WORK IN A LIVE WATER COURSE

4VAC50-30-40 MINIMUM STANDARD	DESCRIPTION OF HOW MS IS ADDRESSED ON PLANS
YES MS16: UNDERGROUND UTILITY LINES SHALL BE INSTALLED IN ACCORDANCE WITH THE FOLLOWING STANDARDS IN ADDITION TO OTHER APPLICABLE CRITERIA:	SEE EROSION AND SEDIMENT CONTROL MEASURES NARRATIVE NOTE 1 ON THIS SHEET.
A. NO MORE THAN 500 LINEAR FEET OF TRENCH MAY BE OPENED AT ONE TIME.	PROJECT INVOLVES LESS THAN 500' OF UTILITY LINE (UNDERDRAIN) INSTALLATION
B. EXCAVATED MATERIAL SHALL BE PLACED ON THE UPHILL SIDE OF TRENCHES.	SEE EROSION AND SEDIMENT CONTROL MEASURES NARRATIVE NOTE 1 ON THIS SHEET.
C. EFFLUENT FROM DEWATERING OPERATIONS SHALL BE FILTERED OR PASSED THROUGH AN APPROVED SEDIMENT TRAPPING DEVICE, OR BOTH, AND DISCHARGED IN A MANNER THAT DOES NOT ADVERSELY AFFECT FLOWING STREAMS OR OFF-SITE PROPERTY.	GEOTECHNICAL INVESTIGATIONS SUGGEST THAT DEWATERING WILL NOT BE NECESSARY DUE TO LOW GROUNDWATER TABLE.
D. MATERIAL USED FOR BACKFILLING TRENCHES SHALL BE PROPERLY COMPACTED IN ORDER TO MINIMIZE EROSION AND PROMOTE STABILIZATION.	SEE EROSION AND SEDIMENT CONTROL MEASURES NARRATIVE NOTE 1 ON THIS SHEET.
E. RESTABILIZATION SHALL BE ACCOMPLISHED IN ACCORDANCE WITH THIS CHAPTER.	SEE EROSION AND SEDIMENT CONTROL MEASURES NARRATIVE NOTE 1 ON THIS SHEET.
F. APPLICABLE SAFETY CHAPTERS SHALL BE COMPLIED WITH.	SEE EROSION AND SEDIMENT CONTROL MEASURES NARRATIVE NOTE 1 ON THIS SHEET.
YES MS17: WHERE CONSTRUCTION VEHICLE ACCESS ROUTES INTERSECT PAVED OR PUBLIC ROADS, PROVISIONS SHALL BE MADE TO MINIMIZE THE TRANSPORT OF SEDIMENT BY VEHICULAR TRACKING ONTO THE PAVED SURFACE. WHERE SEDIMENT IS TRANSPORTED ONTO A PAVED OR PUBLIC ROAD SURFACE, THE ROAD SURFACE SHALL BE CLEANED THOROUGHLY AT THE END OF EACH DAY. SEDIMENT SHALL BE REMOVED FROM THE ROADS BY SHOVELING OR SWEEPING AND TRANSPORTED TO A SEDIMENT CONTROL DISPOSAL AREA. STREET WASHING SHALL BE ALLOWED ONLY AFTER SEDIMENT IS REMOVED IN THIS MANNER. THIS PROVISION SHALL APPLY TO INDIVIDUAL DEVELOPMENT LOTS AS WELL AS TO LARGER LAND-DISTURBING ACTIVITIES.	SEE EROSION AND SEDIMENT CONTROL MEASURES NARRATIVE NOTE 1 ON THIS SHEET.
YES MS18: ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL BE REMOVED WITHIN 30 DAYS AFTER FINAL SITE STABILIZATION OR AFTER THE TEMPORARY MEASURES ARE NO LONGER NEEDED, UNLESS OTHERWISE AUTHORIZED BY THE VESCP AUTHORITY. TRAPPED SEDIMENT AND THE DISTURBED SOIL AREAS RESULTING FROM THE DISPOSITION OF TEMPORARY MEASURES SHALL BE PERMANENTLY STABILIZED TO PREVENT FURTHER EROSION AND SEDIMENTATION.	SEE EROSION AND SEDIMENT CONTROL MEASURES NARRATIVE NOTE 1 ON THIS SHEET.
N/A MS19: PROPERTIES AND WATERWAYS DOWNSTREAM FROM DEVELOPMENT SITES SHALL BE PROTECTED FROM SEDIMENT DEPOSITION, EROSION AND DAMAGE DUE TO INCREASES IN VOLUME, VELOCITY AND PEAK FLOW RATE OF STORMWATER RUNOFF FOR THE STATED FREQUENCY STORM OF 24-HOUR DURATION IN ACCORDANCE WITH THE FOLLOWING STANDARDS AND CRITERIA. STREAM RESTORATION AND RELOCATION PROJECTS THAT INCORPORATE NATURAL CHANNEL DESIGN CONCEPTS ARE NOT MAN-MADE CHANNELS AND SHALL BE EXEMPT FROM ANY FLOW RATE CAPACITY AND VELOCITY REQUIREMENTS FOR NATURAL OR MAN-MADE CHANNELS.	PROJECT DOES NOT INCREASE STORMWATER RUNOFF.

E&S LEGEND	
ROCK CHECK DAM	CD
TREE PROTECTION	TP
TREE PROTECTION LIMITS	---
INLET PROTECTION	IP
CULVERT INLET PROTECTION	CIP
SILT FENCE	SF
SAFETY FENCE	SAF
TEMPORARY FILL DIVERSION	FD
MULCHING (EXTENDS)	MU
PERMANENT SEEDING (EXTENDS)	PS
TEMPORARY SEEDING (EXTENDS)	TS
CONSTRUCTION ENTRANCE	CE
TEMPORARY SEDIMENT TRAP	ST

GENERAL E&S NOTES:

- IT IS THE INTENT OF THIS PHASE 1 EROSION CONTROL PLAN TO INDICATE THE EROSION CONTROL MEASURES REQUIRED FOR THE INITIAL CLEARING AND GRADING OF THE PROJECT SITE. ADDITIONAL REVIEW AND APPROVAL BY THE CITY OF LYNCHBURG IS REQUIRED FOR FINAL SITE PLAN APPROVAL PRIOR TO FINAL GRADING, INSTALLATION OF POST-CONSTRUCTION STORMWATER MEASURES, UTILITY INSTALLATIONS, SITE CONSTRUCTION AND/OR BUILDING IMPROVEMENTS. NO LAND DISTURBANCE WORK WILL BE ALLOWED OUTSIDE THE SCOPE OF THIS PHASE 1 PLAN UNTIL FINAL SITE PLAN APPROVAL IS ISSUED FOR THE PROJECT.
- GRADING WILL BE LIMITED TO FIFTEEN (15) TO TWENTY (20) ACRE PHASES WITH CUT AND FILL AREAS BALANCED BETWEEN PHASES, AS INDICATED ON THIS PHASE 1 EROSION CONTROL PLAN. EACH PHASE OF THE PROJECT MUST BE STABILIZED IN ACCORDANCE WITH THE MEASURES IDENTIFIED ON THE SITE PLAN PRIOR TO INITIATING A SUBSEQUENT GRADING PHASE OF THE PROJECT.

PHASE 1 EROSION & SEDIMENT CONTROL APPROVAL

TRC: _____ DATE: _____
E&S: _____ DATE: _____

PROJECT DESCRIPTION:

THIS PROJECT CONSISTS OF THE CONSTRUCTION OF A DRY SWALE WITHIN AN EXISTING DITCH AND THE CONVERSION OF AN EXISTING DRY POND TO A SEDIMENT FOREBAY. THE PROJECT IS LOCATED ALONG THE NORTHERN PROPERTY BOUNDARY OF THE SHEFFIELD ELEMENTARY SCHOOL SITE (115 KENWOOD PLACE). THE PURPOSE OF THE PROJECT IS TO TREAT URBAN STORMWATER RUNOFF FROM THE SCHOOL PARKING LOT, CITY STREETS, AND SURROUNDING AREA. THE PROJECT IS PART OF THE CITY'S CHESAPEAKE BAY TMDL ACTION PLAN TO IMPROVE WATER QUALITY AND MEET THE URBAN STORMWATER POLLUTANT REDUCTION REQUIREMENTS IN THE CITY'S MS4 PERMIT.

PROJECT INFORMATION:

PERTINENT PROJECT INFORMATION RELATED TO THIS PROJECT ARE PROVIDED BELOW:
DISTURBED AREA: 0.25 ACRES
DRAINAGE AREA (TOTAL): 7.19 ACRES
DRAINAGE AREA (IMPERVIOUS): 1.54 ACRES
DRAINAGE AREA (PERVIOUS): 5.66 ACRES

EXISTING SITE CONDITION:

THE PORTION OF THE SITE WHERE WORK WILL BE PERFORMED IS A GRASSED LAWN WITH A 2,500 SF DRY POND FOLLOWED BY A 6' WIDE DITCH. THE DITCH IS COMPRISED OF 140 LF OF RIP RAP CHANNEL FOLLOWED BY 310 LF OF GRASS CHANNEL WITH ONE (1) 24-INCH SPANISH OAK WITHIN THE EXISTING DITCH, AND ADDITIONAL TREES BORDERING THE DITCH FROM NEIGHBORING PROPERTIES. THE WORK AREA IS BORDERED BY THE REAR PROPERTY BOUNDARY LINES OF HOMES FROM 1100 - 1128 GLENFIELD DRIVE TO THE NORTH, THE SCHOOL PARKING LOT AND KENWOOD PLACE TO THE EAST, THE SCHOOL ATHLETIC FIELD TO THE SOUTH, AND A FORESTED AREA IN THE BACKYARDS OF 1324 - 1328 FENWICK DRIVE ON THE WEST, WHERE THE DITCH DISCHARGES TO A NATURAL CHANNEL. THE SITE IS SLOPED GENTLY TO THE SOUTHWEST AT AN AVERAGE GRADE OF 3%. STORMWATER RUNOFF FROM THE SITE DISCHARGES FROM THE END OF THE DITCH TO A NATURAL CHANNEL WHICH CROSSES FENWICK DRIVE THROUGH STORMWATER PIPES AND ULTIMATELY DISCHARGES TO ROCK CASTLE CREEK.

ADJACENT PROPERTIES / OFFSITE DAMAGE:

THIS PROJECT WILL INVOLVE WORK ALONG THE REAR PROPERTY BOUNDARY OF 1100 - 1128 GLENFIELD DRIVE. ALL GRADING WILL OCCUR WITHIN THE BOUNDARY OF THE SCHOOL PROPERTY. IF A TEMPORARY CONSTRUCTION EASEMENT IS DEEMED NECESSARY TO INSTALL THE WORK, THE CONTRACTOR SHALL NOTIFY THE CITY IN WRITING PRIOR TO COMMENCING WORK. OBTAINING ANY NECESSARY TEMPORARY CONSTRUCTION EASEMENTS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE INCLUDED IN THE CONTRACTORS BID PRICE.

ENVIRONMENTALLY SENSITIVE AREAS:

THERE ARE NO ENVIRONMENTALLY SENSITIVE AREAS THAT WILL BE IMPACTED BY THIS PROJECT. THE EXISTING SLOPES AT THE END OF THE DITCH WILL BE STABILIZED WITH OUTLET PROTECTION WHERE THE UNDERDRAIN DISCHARGES.

PERIMETER CONTROLS:

A TEMPORARY CONSTRUCTION SAFETY FENCE WILL BE USED TO CONTROL THE PERIMETER OF THE PROJECT AND PROTECT PUBLIC SAFETY.

SOILS NARRATIVE:

TWO (2) STANDARD PENETRATION TESTS WERE PERFORMED TO A DEPTH OF 10 FEET WITHIN THE EXISTING DRY POND IMMEDIATELY UPSTREAM OF THE DITCH ON AUGUST 11, 2015. THE RESULTS OF THESE TESTS ARE PROVIDED FOR REFERENCE IN THE PROJECT SPECIFICATIONS. THE TESTS SHOW THE ONSITE SOILS CONSIST OF A 2 FOOT LAYER OF FILL COMPRISED OF FINE GRAIN ELASTIC SILT (ML) UNDERLAIN BY LAYERS OF RESIDUAL SOILS WHICH ARE COMPRISED OF ELASTIC SILT (MH) AND SILTY SAND (ML). THE FINE GRAIN SILTS HAD A CONSISTENCY OF SOFT TO STIFF WITH SPT "N" VALUES RANGING FROM 7 TO 15. THE COARSE GRAIN SAND WAS MOSTLY DENSE WITH "N" VALUES RANGING FROM 14 TO 61, WITH THE EXCEPTION OF SOME LOOSE MATERIALS AT THE DEEPEST POINT, WHERE THE TEST TERMINATED. NO EVIDENCE OF BEDROCK CONDITIONS OR GROUNDWATER WERE IDENTIFIED WITHIN 12 FT OF THE EXISTING GROUND SURFACE. THE SOILS WERE FOUND TO HAVE POOR INFILTRATION PROPERTIES WITH AN AVERAGE INFILTRATION RATE OF 0.17 IN/HR.

SOIL STOCKPILES AND OFF-SITE AREAS NARRATIVE:

THERE WILL BE NO OFF-SITE LAND DISTURBING ACTIVITIES ASSOCIATED WITH THIS PROJECT. BIORETENTION SOIL MEDIA WILL BE STORED ON-SITE ON PLASTIC SHEETING, SURROUNDED BY SILT FENCE OR OTHER EROSION AND SEDIMENT CONTROL MEASURES TO PREVENT THE MEDIA FROM WASHING OFF-SITE. SPOILS FROM THE EXCAVATION OF THE DRY SWALE AREA SHALL BE STABILIZED IN ACCORDANCE WITH THE STATE MINIMUM STANDARDS AND HAULED OFF-SITE FOR DISPOSAL. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SECURING AN OFF-SITE DISPOSAL LOCATION AND SHALL INCLUDE ALL COSTS RELATED TO SPOILS DISPOSAL IN HIS BID PRICE.

CRITICAL AREAS NARRATIVE:

THERE ARE NO CRITICAL AREAS ASSOCIATED WITH THIS PROJECT. THE EXISTING SLOPES AT THE END OF THE DITCH WILL BE STABILIZED WITH OUTLET PROTECTION WHERE THE UNDERDRAIN DISCHARGES.

EROSION AND SEDIMENT CONTROL MEASURES:

- THE CONTRACTOR SHALL AT ALL TIMES COMPLY WITH THE MINIMUM STANDARDS AND SPECIFICATIONS SET FORTH IN STATE GUIDELINES.
- THE CONTRACTOR SHALL UTILIZE STATE APPROVED EROSION AND SEDIMENT CONTROL MEASURES. SHOP DRAWINGS FOR ANY NEW OR UNAPPROVED MEASURES SHALL BE SUBMITTED TO THE CITY FOR REVIEW AND ACCEPTANCE PRIOR TO BEING UTILIZED ON-SITE.
- THE CONTRACTOR SHALL INSTALL EROSION AND SEDIMENT CONTROL MEASURES PRIOR TO ANY LAND DISTURBING ACTIVITY.
- THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT THE EROSION AND SEDIMENT CONTROL PLAN SHOWN HEREIN IS SUFFICIENT FOR EFFECTIVELY PREVENTING EROSION AND SEDIMENT DISCHARGES OFF-SITE DURING CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR IDENTIFYING ANY DEFICIENCIES IN THE EROSION AND SEDIMENT CONTROL PLAN AND MAKING ANY NECESSARY ADJUSTMENTS TO THE PLAN (AS SHOWN), WHERE NEEDED.
- THE CONTRACTOR SHALL INSTALL SILT FENCE ALONG THE EDGES OF THE PROPOSED DRY SWALE, AS SHOWN IN THE DRAWINGS.
- AFTER ACQUIRING ALL NECESSARY PERMITS, THE CONTRACTOR SHALL INSTALL A SEDIMENT TRAP AT THE END OF THE EXISTING DITCH.
- ACCUMULATED SEDIMENTS SHALL BE PERIODICALLY REMOVED FROM THE SEDIMENT TRAP AS NEEDED TO PREVENT SEDIMENT FROM WASHING OUT OF THE TRAP DURING WET WEATHER EVENTS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PERIODICALLY HAULING SEDIMENTS CAPTURED BY THE SEDIMENT TRAP OFFSITE FOR DISPOSAL.
- THE CONTRACTOR IS RESPONSIBLE FOR INSPECTING, REPAIRING, AND MAINTAINING ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES THROUGHOUT CONSTRUCTION OF THE PROJECT.
- THE CONTRACTOR SHALL INSPECT ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES DAILY AND IMMEDIATELY AFTER ANY WEATHER EVENT EXCEEDING 1-INCH OF RAINFALL.
- UPON ACCEPTANCE OF THE WORK BY THE CITY, THE CONTRACTOR SHALL REMOVE ALL TEMPORARY SEDIMENT CONTROL MEASURES.

THE EROSION AND SEDIMENT CONTROL MEASURES THAT ARE PROPOSED FOR USE IN THIS PLAN ARE SUMMARIZED IN THE TABLE BELOW:

VESCH NO.	MEASURE	ABBREVIATION	QUANTITY
3.02	CONSTRUCTION ENTRANCE	CE	1
3.05	SILT FENCE	SF	1,100 LF
3.13	TEMPORARY SEDIMENT TRAP	ST	1
3.31	TEMPORARY SEEDING	TS	0.25 ACRES
3.32	PERMANENT SEEDING	PS	0.25 ACRES
3.35	MULCHING	MU	0.25 ACRES

SITE STABILIZATION NARRATIVE:

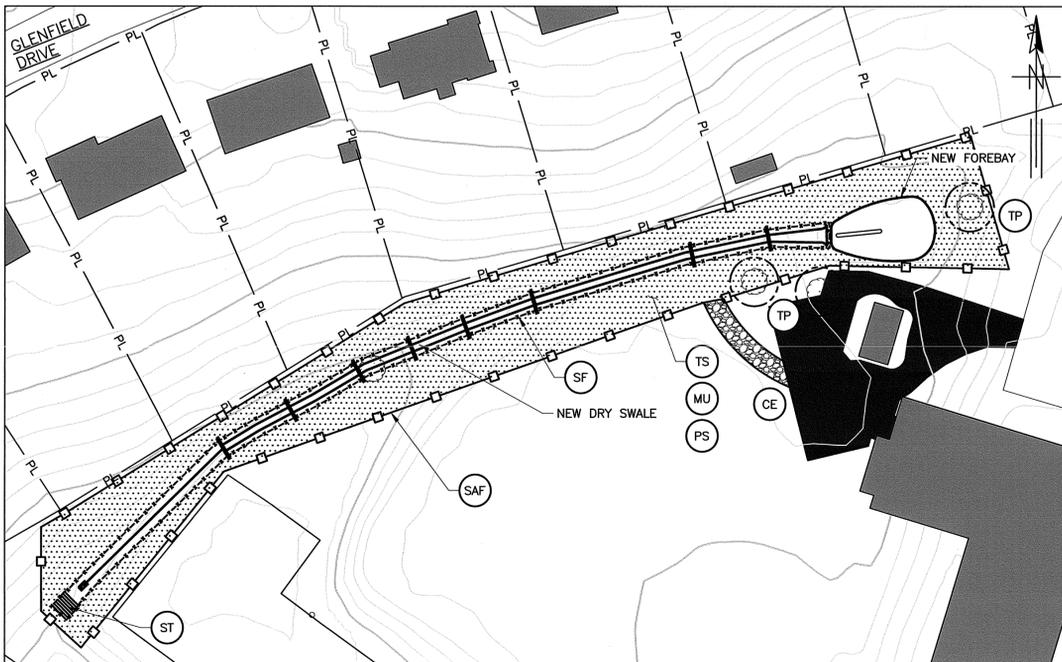
THE CONTRACTOR SHALL STABILIZE ANY DENUDED AREAS AROUND THE PROJECT SITE BY SEEDING THE AREA IN ACCORDANCE WITH TABLE 3.32-D OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK (VESCH). SEEDING SHALL OCCUR IMMEDIATELY FOLLOWING FINAL GRADING. MULCH (STRAW OR FIBER) SHALL BE APPLIED TO FLAT AREAS IN ACCORDANCE WITH VESCH TABLE 3.35-A AFTER SEED FERTILIZER AND LIME HAVE BEEN APPLIED.

STORMWATER RUNOFF NARRATIVE:

THIS PURPOSE OF THIS PROJECT IS TO INSTALL A PERMANENT STORMWATER FACILITY TO TREAT URBAN RUNOFF AND IMPROVE WATER QUALITY. THERE IS NO DEVELOPMENT, INCREASE IN IMPERVIOUS AREA, OR INCREASE IN STORMWATER FLOWS ASSOCIATED WITH THIS PROJECT. THIS PROJECT WILL DECREASE STORMWATER RUNOFF AND ATTENUATE PEAK STORMWATER DISCHARGES FROM THE SITE.

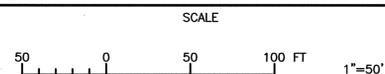
ADEQUATE CHANNEL NARRATIVE:

THIS PROJECT DOES NOT INCREASE STORMWATER FLOWS AND WILL HELP TO ATTENUATE PEAK STORMWATER DISCHARGES FROM THE SITE. STORMWATER RUNOFF FROM THE SITE DISCHARGES FROM THE END OF THE DITCH TO A NATURAL CHANNEL WHICH CROSSES FENWICK DRIVE THROUGH A 24-INCH STORMWATER PIPE. SINCE THIS PROJECT WILL NOT INCREASE STORMWATER FLOWS, BUT WILL REDUCE PEAK FLOWS TO EXISTING STORMWATER CHANNELS, THE EXISTING CHANNELS WERE DEEMED TO BE ADEQUATE.



EROSION AND SEDIMENT CONTROL PLAN

SCALE: 1" = 50'



CITY OF LYNCHBURG, VIRGINIA
DEPARTMENT OF WATER RESOURCES

CIVIL

SHEFFIELD ELEMENTARY SCHOOL BMP RETROFIT

EROSION AND SEDIMENT CONTROL PLAN

FILE NAME LY9070C02

DWG **C2**
SHEET 3 OF 13
DATE AUGUST 2016 REV 0

S:\CLIENT\0775 LYNCHBURG STORM MASTER PLAN 07759\TO 7 SLAF BMP DESIGN\SHEETFIELD 21 CAD\01.05 WORKING DWGS\LY9070C02 2016.08.29 12:44 PM CUSTALOW, BENJAMIN

GREELEY AND HANSEN
9020 STONY POINT PARKWAY, SUITE 475
RICHMOND, VIRGINIA 23235

DESIGNED BDC
DRAWN DSS
CHECKED EJC

APPROVED
EDWARD J. CRONIN
Lic. No. 035130
8/29/2016
PROFESSIONAL ENGINEER

NO.	DATE	APPD	REVISION

S:\CLIENT\0775 LYNCHBURG\STORM MASTER PLAN 077593\10 7 SLAE BMP DESIGN\SHEFFIELD.21 CAD\21.05 WORKING DWG\SL9070C03 2016/08/29 12:45 PM CUSTALOW, BENJAMIN

TIME OF CONCENTRATION CALCULATION

1. OVERLAND FLOW TIME (SEELY METHOD)		UNIT	VALUE
A. PERVIOUS AREA (LAWN, ETC.) - SEGMENT 1			
1	OVERLAND FLOW PATH LENGTH	FT	60
2	SLOPE OF OVERLAND FLOW PATH	FT/FT	10.00%
3	RUNOFF COEFFICIENT (1)		0.20
4	OVERLAND FLOW TIME	MIN	9.73
B. PERVIOUS AREA (LAWN, ETC.) - SEGMENT 2			
1	OVERLAND FLOW PATH LENGTH	FT	250
2	SLOPE OF OVERLAND FLOW PATH	FT/FT	1.60%
3	RUNOFF COEFFICIENT (1)		0.20
4	OVERLAND FLOW TIME	MIN	25.09
C. PERVIOUS AREA (LAWN, ETC.) - SEGMENT 3			
1	OVERLAND FLOW PATH LENGTH	FT	20
2	SLOPE OF OVERLAND FLOW PATH	FT/FT	10.00%
3	RUNOFF COEFFICIENT (1)		0.20
4	OVERLAND FLOW TIME	MIN	6.13
2. SHALLOW CONCENTRATED FLOW TIME (FHWA EQUATION)			
A. PERVIOUS AREA - SEGMENT 4			
1	INTERCEPT COEFFICIENT, K (2)		0.49
2	AVERAGE SLOPE, PERCENT	FT/FT	4.17%
3	AVERAGE VELOCITY	FPS	3.29
4	SHALLOW CONCENTRATED FLOW PATH LENGTH	FT	190.00
5	TRAVEL TIME	MIN	0.96
3. TIME OF CONCENTRATION		MIN	42

- RUNOFF COEFFICIENTS BASED UPON VALUES PROVIDED IN THE VIRGINIA RUNOFF REDUCTION METHOD SPREADSHEET VERSION 2.8, JUNE 2014
- VALUE OBTAINED FROM THE FHWA HEC 22-URBAN DRAINAGE DESIGN MANUAL TABLE 3-3; INTERCEPT COEFFICIENT FOR UNPAVED SHALLOW CONCENTRATED FLOW.

STORMWATER RUNOFF CALCULATIONS

RETURN FREQUENCY	2-YR	10-YR	25-YR	100-YR
RAINFALL INTENSITY (IN/HR)	1.56	2.24	2.68	3.26
TIME OF CONCENTRATION (MIN)	42	42	42	42
COMPOSITE RUNOFF COEFFICIENT	0.36	0.36	0.36	0.36
DRAINAGE AREA (ACRES)	7.19	7.19	7.19	7.19
CALCULATED FLOW (CFS)	4.04	5.80	6.94	8.45

- VALUES WERE DETERMINED USING THE RATIONAL METHOD, PER THE VDOT DRAINAGE MANUAL (APRIL 2002) EQUATION 6.14 AND FACTORS OBTAINED FROM APPENDIX 6C-2 FOR THE CITY OF LYNCHBURG.

CHANNEL PROTECTION

MANNING'S N VALUE	0.05
MAXIMUM EFFECTIVE SWALE SLOPE (1)	2.00%
SWALE WIDTH (FT)	4.00
MAXIMUM SIDE SLOPE	33.33%
2-YR PEAK FLOW DEPTH (FT) (2)	0.40
2-YR PEAK VELOCITY (FPS)	1.97
VELOCITY NON-EROSIVE?	YES

- VALUE BASED UPON CHECK DAM SPACING TABLE 10.4 OF VA DCR STORMWATER SPECIFICATION NO. 10 (JANUARY 1, 2013)
- VALUE CALCULATED USING MANNING'S EQUATION

FLOODING PROTECTION

CHECK DAM HEIGHT (FT) (1)	0.46
MINIMUM CHECK DAM LENGTH (FT) (2)	10.25
WEIR NOTCH HEIGHT (FT) (1)	0.58
MINIMUM FREEBOARD ABOVE WEIR (FT) (2)	0.25
WEIR NOTCH LENGTH (FT)	4.00
MAX FLOW THROUGH WEIR NOTCH (CFS) (3)	5.92
MAX FLOW ACROSS WEIR (CFS) (3)	10.17
10-YR PEAK FLOW (CFS)	5.80
25-YR PEAK FLOW (CFS)	6.94
10-YR STORM CONTAINED WITH 3" FREEBOARD?	YES
25-YR STORM CONTAINED?	YES

- VALUE BASED UPON TYPICAL 6"x6" AND 2"x6" LUMBER DIMENSIONS
- VALUE CALCULATED USING MAXIMUM SIDE SLOPE
- VALUE CALCULATED USING A COEFFICIENT OF DISCHARGE OF 0.62 AND THE FRANCIS FORMULA FOR THE RECTANGULAR WEIR EQUATION.

WATER QUALITY CALCULATIONS

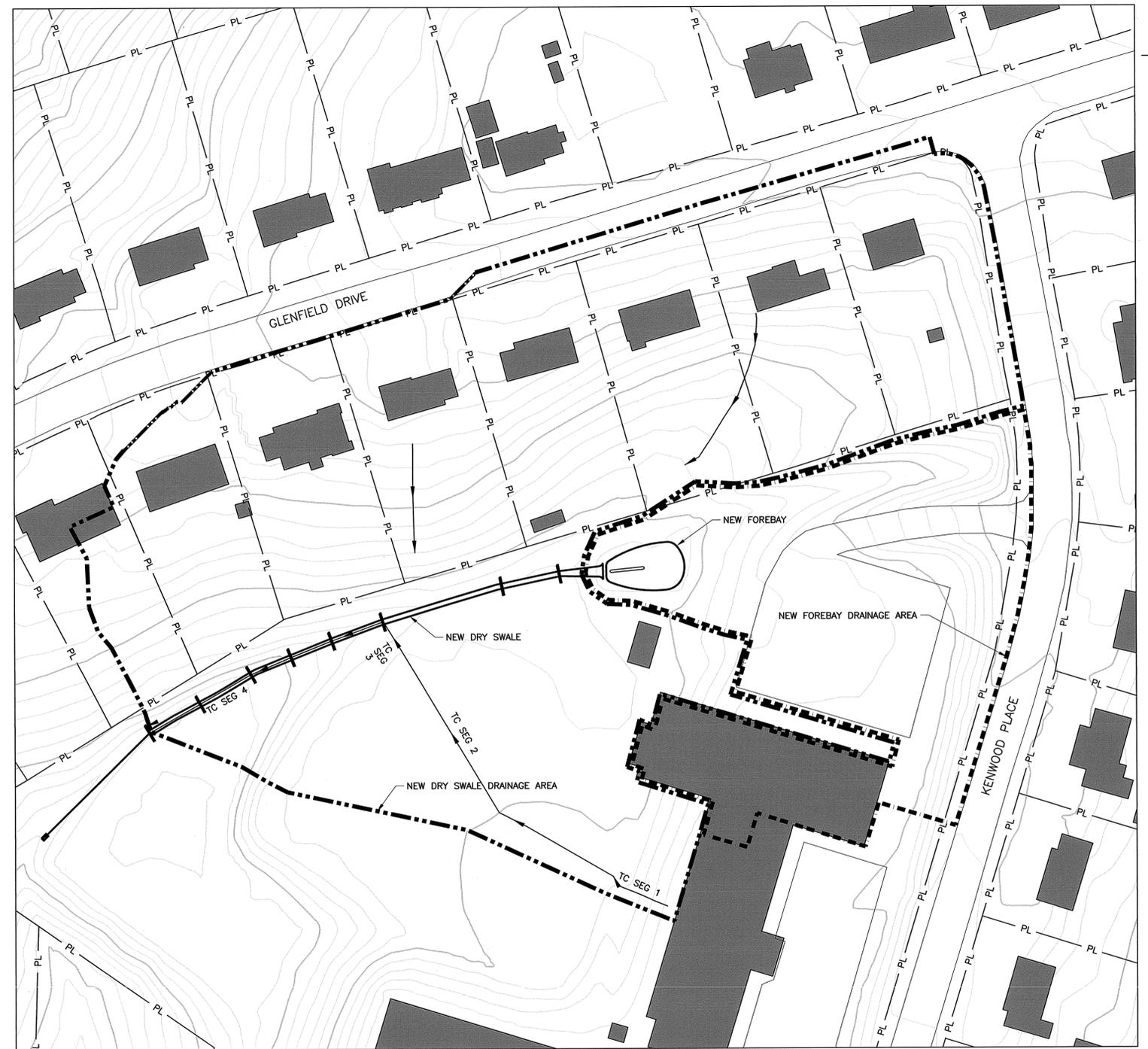
DESIGN DRAINAGE AREA, DA (ACRE)	7.19
IMPERVIOUS AREA (ACRE)	1.54
PERVIOUS AREA (ACRE)	5.66
RUNOFF COEFFICIENT FOR IMPERVIOUS AREA (1)	0.95
RUNOFF COEFFICIENT FOR PERVIOUS AREA (HSG B) (1)	0.20
COMPOSITE RUNOFF COEFFICIENT (RV)	0.36
EFFECTIVE RUNOFF AREA (DA X RV) (ACRE)	2.59
SOIL MEDIA VOLUME (CF)	2,490
SOIL MEDIA VOID RATIO	0.25
GRAVEL STORAGE VOLUME (CF)	2,076
GRAVEL VOID RATIO	0.40
SURFACE STORAGE VOLUME (CF)	2,722
SURFACE STORAGE VOID RATIO	1.00
TOTAL STORAGE VOLUME (FT)	4,175
RUNOFF DEPTH CAPTURED (IN) (2)	0.75

- RUNOFF COEFFICIENTS BASED UPON VALUES PROVIDED IN THE VIRGINIA RUNOFF REDUCTION METHOD SPREADSHEET VERSION 2.8, JUNE 2014
- CALCULATION UTILIZES THE RUNOFF DEPTH EQUATION FROM THE RECOMMENDATIONS OF THE EXPERT PANEL TO DEFINE REMOVAL RATES FOR URBAN STORMWATER RETROFIT PROJECTS REPORT

POC REMOVAL CALCULATIONS

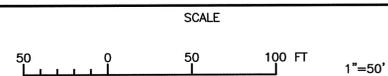
	TN	TP	TSS
POC LOAD (LB/ YR) (1)	42.26	5.91	1,611
DRY SWALE BMP EFFICIENCY (2)	54%	63%	68%
POC REDUCTION (LB/YR)	22.95	3.75	1,096
POC REDUCTION FROM EXISTING BMP (LB/YR)	0.49	0.14	41
NET POC REDUCTION CREDIT (LB/YR)	22.46	3.61	1,055

- CALCULATION UTILIZES THE VIRGINIA RUNOFF REDUCTION METHOD SPREADSHEET VERSION 2.8, JUNE 2014
- CALCULATION UTILIZES THE RETROFIT REMOVAL ADJUSTOR CURVES FROM THE RECOMMENDATIONS OF THE EXPERT PANEL TO DEFINE REMOVAL RATES FOR URBAN STORMWATER RETROFIT PROJECTS REPORT



DRAINAGE AREA PLAN VIEW

SCALE: 1" = 50'



CITY OF LYNCHBURG, VIRGINIA
DEPARTMENT OF WATER RESOURCES

SHEFFIELD ELEMENTARY SCHOOL BMP RETROFIT

CIVIL

STORMWATER CALCULATIONS

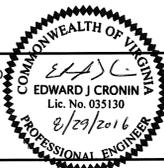
FILE NAME LY9070C03

DWG **C3**
SHEET 4 OF 13
DATE AUGUST 2016 REV 0

GREELEY AND HANSEN
9020 STONY POINT PARKWAY, SUITE 475
RICHMOND, VIRGINIA 23235

DESIGNED BDC
DRAWN DSS
CHECKED EJC

APPROVED



NO.	DATE	APPD	REVISION

**STATION AND CURVE TABLE
SWALE CENTERLINE**

DESCRIPTION	STATION	TANGENT DATA NORTHING	EASTING
START:	10+00.00	3657785.7522	11282038.0691
END:	10+22.42	3657797.2856	11282057.3006
LENGTH:	22.42	COURSE:	N 59° 02' 54.2452" E

DESCRIPTION	STATION	TANGENT DATA NORTHING	EASTING
START:	10+22.42	3657797.2856	11282057.3006
END:	10+59.98	3657814.8239	11282090.5088
LENGTH:	37.55	COURSE:	N 62° 09' 36.1973" E

DESCRIPTION	STATION	TANGENT DATA NORTHING	EASTING
START:	10+59.98	3657814.8239	11282090.5088
END:	10+69.92	3657819.7781	11282099.1233
LENGTH:	9.94	COURSE:	N 60° 05' 48.7899" E

DESCRIPTION	STATION	TANGENT DATA NORTHING	EASTING
START:	10+69.92	3657819.7781	11282099.1233
END:	10+96.03	3657833.1381	11282121.5654
LENGTH:	26.12	COURSE:	N 59° 14' 03.5862" E

DESCRIPTION	STATION	TANGENT DATA NORTHING	EASTING
START:	10+96.03	3657833.1381	11282121.5654
END:	11+59.95	3657856.8172	11282180.9337
LENGTH:	63.92	COURSE:	N 68° 15' 19.3212" E

DESCRIPTION	STATION	TANGENT DATA NORTHING	EASTING
START:	11+59.95	3657856.8172	11282180.9337
END:	12+04.03	3657871.8817	11282222.3575
LENGTH:	44.08	COURSE:	N 70° 00' 54.8980" E

DESCRIPTION	STATION	TANGENT DATA NORTHING	EASTING
START:	12+04.03	3657871.8817	11282222.3575
END:	12+57.72	3657887.3902	11282273.7625
LENGTH:	53.69	COURSE:	N 73° 12' 42.6029" E

DESCRIPTION	STATION	TANGENT DATA NORTHING	EASTING
START:	12+57.72	3657887.3902	11282273.7625
END:	12+97.31	3657898.5970	11282311.7313
LENGTH:	39.59	COURSE:	N 73° 33' 20.1827" E

DESCRIPTION	STATION	TANGENT DATA NORTHING	EASTING
START:	12+97.31	3657898.5970	11282311.7313
END:	13+48.26	3657909.0926	11282361.5877
LENGTH:	50.95	COURSE:	N 78° 06' 42.7493" E

DESCRIPTION	STATION	TANGENT DATA NORTHING	EASTING
START:	13+48.26	3657909.0926	11282361.5877
END:	13+79.05	3657910.6161	11282392.3422
LENGTH:	30.79	COURSE:	N 87° 09' 50.4441" E

DESCRIPTION	STATION	TANGENT DATA NORTHING	EASTING
START:	13+79.05	3657910.6161	11282392.3422
END:	13+89.05	3657910.7720	11282402.3410
LENGTH:	10	COURSE:	N 89° 06' 24.7047" E

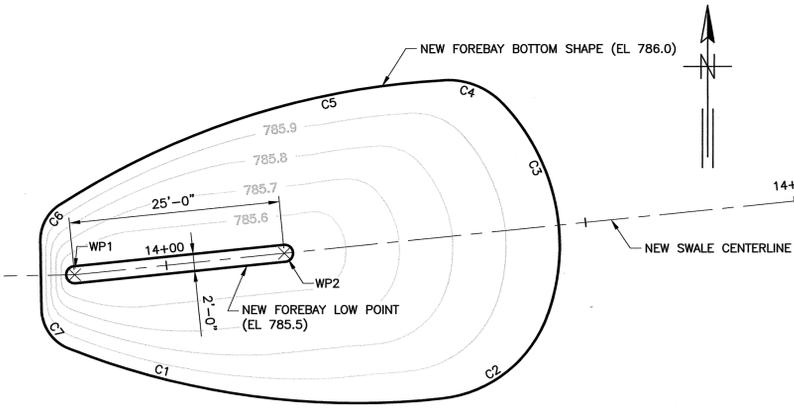
DESCRIPTION	STATION	TANGENT DATA NORTHING	EASTING
START:	13+89.05	3657910.7720	11282402.3410
END:	14+74.95	3657919.3295	11282487.8126
LENGTH:	85.9	COURSE:	N 84° 16' 57.2447" E

SEQUENCE OF CONSTRUCTION:

- THE CONTRACTOR SHALL SCHEDULE A PRE-CONSTRUCTION MEETING WITH THE CITY PRIOR TO ANY LAND DISTURBING ACTIVITIES.
- THE CONTRACTOR SHALL NOTIFY THE PLAN APPROVING AUTHORITY AT LEAST ONE (1) WEEK PRIOR TO THE PRE-CONSTRUCTION MEETING, ONE (1) WEEK PRIOR TO COMMENCING LAND DISTURBING ACTIVITIES, AND ONE (1) WEEK PRIOR TO FINAL WALKTHROUGH INSPECTION.
- THE CONTRACTOR SHALL OBTAIN ALL REQUIRED LAND DISTURBANCE AND EROSION AND SEDIMENT CONTROL PERMITS PRIOR TO ANY LAND DISTURBING ACTIVITIES.
- THE CONTRACTOR SHALL CONTACT MISS UTILITY AT 811 PRIOR ANY LAND DISTURBING ACTIVITY.
- THE CONTRACTOR SHALL INSTALL ALL TEMPORARY EROSION AND SEDIMENT CONTROL DEVICES PRIOR TO ANY LAND DISTURBING ACTIVITY.
- THE CONTRACTOR SHALL INSTALL THE SEDIMENT TRAP TO TRAP SEDIMENTS AS THE FIRST STEP IN CONSTRUCTION, PRIOR TO ANY WORK ON THE DRY SWALE.
- THE CONTRACTOR SHALL AT ALL TIMES COMPLY WITH DEQ SPECIFICATION NO. 10 VERSION 2.0 (JANUARY 1, 2013).
- ALL CONSTRUCTION EQUIPMENT SHALL OPERATE FROM THE SIDES OF THE DRY SWALE. UNDER NO CIRCUMSTANCES SHALL CONSTRUCTION EQUIPMENT BE PERMITTED TO OPERATE FROM WITHIN THE FOOTPRINT OF A DRY SWALE.
- THE CONTRACTOR SHALL STABILIZE ANY TEMPORARY SOIL STOCKPILES AND INSTALL TEMPORARY EROSION AND SEDIMENT CONTROLS TO PREVENT SOILS FROM WASHING OFFSITE.
- THE CONTRACTOR SHALL PERIODICALLY HAUL SOIL STOCKPILES OFFSITE FOR DISPOSAL AS NEEDED OR AS DIRECTED BY THE OWNER.
- THE CONTRACTOR SHALL RIP THE SUBGRADE A MINIMUM OF SIX (6) INCHES BELOW THE ELEVATION OF THE STONE SUMP WITHIN THE FOREBAY AND SWALE FOR THE PURPOSE OF LOOSENING THE SOIL IN ORDER TO PROMOTE GREATER INFILTRATION.
- THE CONTRACTOR SHALL THEN INSTALL THE STONE SUMP, UNDERDRAIN, AND CHOKER STONE LAYER AT THE DEPTH SHOWN IN THE DETAILS AND SECTIONS.
- THE CONTRACTOR SHALL DAYLIGHT THE UNDERDRAIN AT THE LOCATION SHOWN ON THE PLAN AND INSTALL OUTLET PROTECTION AT THAT LOCATION.
- THE CONTRACTOR SHALL INSTALL THE TIMBER CHECK DAMS AT THE LOCATIONS SHOWN ON THE PLAN AND SECURELY ANCHOR THEM INTO THE SIDE SLOPES OF THE SWALE. SWALE SIDE SLOPES SHALL BE COMPACTED TO 90 PERCENT OF THE MAXIMUM DRY DENSITY OBTAINABLE BY ASTM D 1557 AND SEEDED IN ACCORDANCE WITH THE TABLES ON SHEET C1.
- THE CONTRACTOR SHALL INSTALL THE COMPACTED CLAY PLUG AT THE DOWNSTREAM END OF THE SWALE AND THE COMPACTED CLAY EMBANKMENT BETWEEN THE FOREBAY AND SWALE. CLAY SHALL BE COMPACTED TO 95 PERCENT OF THE MAXIMUM DRY DENSITY OBTAINABLE BY ASTM D 1557 AND SEEDED IN ACCORDANCE WITH THE TABLES ON SHEET C1.
- THE CONTRACTOR SHALL OBTAIN ENGINEERED SOIL MEDIA FROM A QUALIFIED VENDOR AND STORE IT ON PLASTIC SHEETING.
- THE CONTRACTOR SHALL SUPPLY THE CITY WITH DOCUMENTATION FROM THE SUPPLIER CERTIFYING THAT THE ENGINEERED SOIL MEDIA USED ON THIS PROJECT MEETS THE PROJECT SPECIFICATIONS PRIOR TO CONSTRUCTION.
- THE CONTRACTOR SHALL INSTALL THE ENGINEERED SOIL MEDIA MEDIA AT A MAXIMUM OF 12 INCH LIFTS UNTIL THE DESIRED SURFACE ELEVATION OF THE SWALE HAS BEEN ACHIEVED.
- PRIOR TO ANY LANDSCAPING WORK, THE CONTRACTOR SHALL WAIT FOR A MINIMUM OF 48 HOURS AFTER INSTALLING THE ENGINEERED SOIL MEDIA TO CHECK FOR SETTLEMENT. THE CONTRACTOR SHALL ADD ANY ADDITIONAL MEDIA REQUIRED TO ACHIEVE THE DESIRED SURFACE ELEVATION.
- THE CONTRACTOR SHALL INSTALL ALL VEGETATION IN ACCORDANCE WITH THE LANDSCAPING PLAN AND PROJECT SPECIFICATIONS.
- THE CONTRACTOR SHALL FILL IN THE SEDIMENT TRAP TO CONNECT THE EXISTING DITCH TO THE NEW SWALE.
- THE CONTRACTOR SHALL SCHEDULE A FINAL WALKTHROUGH INSPECTION MEETING WITH THE CITY AND ADDRESS ANY AND ALL CONSTRUCTION DEFICIENCIES WITHIN A REASONABLE TIMEFRAME.
- UPON CITY ACCEPTANCE OF THE WORK PERFORMED, THE CONTRACTOR MAY REMOVE THE TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES AND VACATE THE SITE.

NOTES:

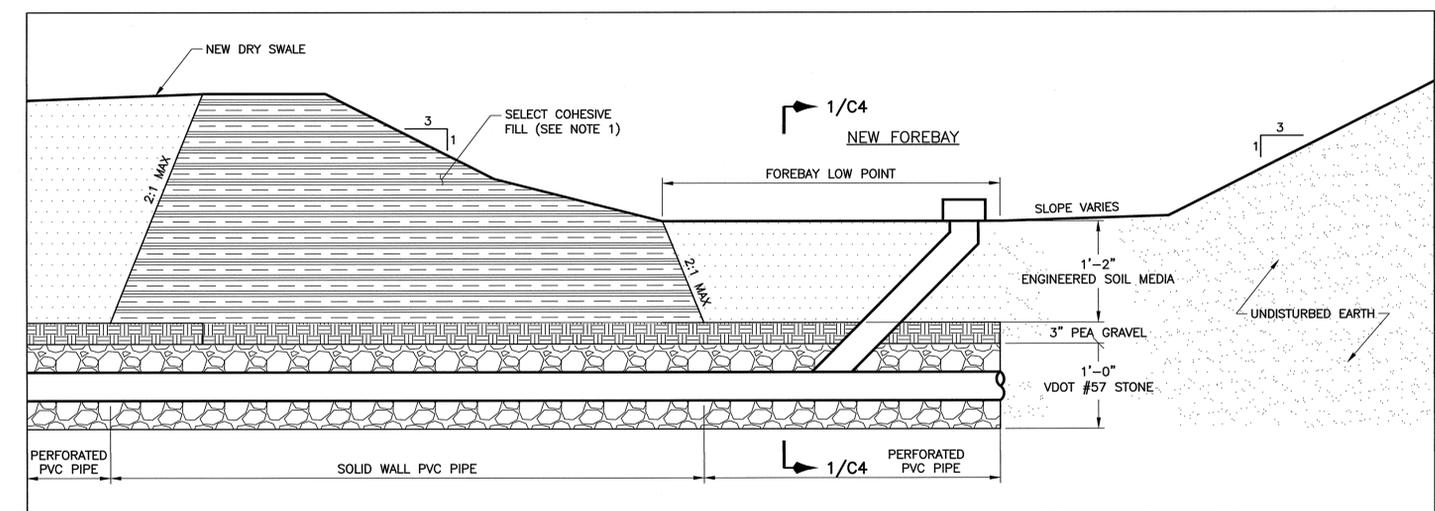
- SELECT COHESIVE FILL SHALL HAVE A UCS CLASSIFICATION OF "CL", A LIQUID LIMIT LESS THAN OR EQUAL TO 40 AND A PLASTICITY INDEX LESS THAN OR EQUAL TO 20. ONSITE EXCAVATED MATERIALS MAY BE USED AS SELECT COHESIVE FILL, PROVIDED IT MEETS THE SPECIFICATIONS ABOVE. THE CLAY SHALL BE COMPACTED TO A TO 95% OF THE MAXIMUM DRY DENSITY OBTAINABLE BY ASTM D 1557.



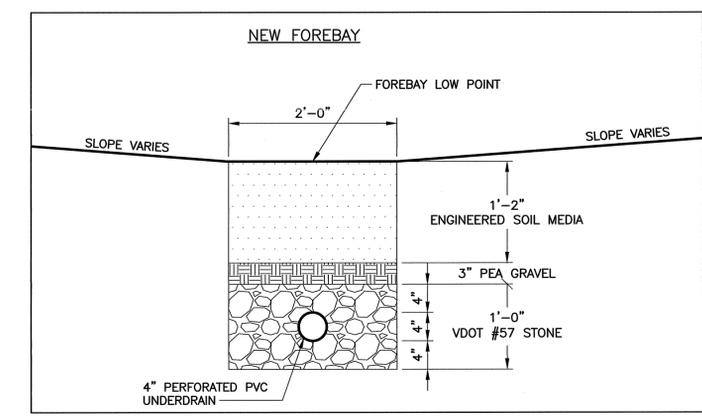
CURVE NO.	CURVE START	CURVE END	RADIUS	LENGTH	DELTA	CHORD LENGTH	CHORD BEARING
C1	N=3657902.1395 E=11282401.5786	N=3657896.2022 E=11282445.9880	94.00'	45.24'	027° 34' 30.2683"	44.80'	S82° 23' 06.1822"E
C2	N=3657896.2022 E=11282445.9880	N=3657906.0881 E=11282458.5077	15.00'	16.82'	064° 14' 46.8569"	15.95'	N51° 42' 15.2552"E
C3	N=3657906.0881 E=11282458.5077	N=3657930.8277 E=11282453.1362	24.00'	26.67'	063° 39' 43.4690"	25.32'	N12° 14' 59.9078"W
C4	N=3657930.8277 E=11282453.1362	N=3657933.5547 E=11282446.2088	9.00'	7.68'	048° 51' 44.4953"	7.44'	N68° 30' 43.8900"W
C5	N=3657933.5547 E=11282446.2088	N=3657918.9997 E=11282400.5957	94.00'	48.41'	029° 30' 31.6966"	47.88'	S72° 18' 08.0141"W
C6	N=3657918.9997 E=11282400.5957	N=3657914.7025 E=11282398.2793	5.00'	5.10'	058° 26' 27.4610"	4.88'	S28° 19' 38.4352"W
C7	N=3657906.7167 E=11282398.4037	N=3657902.1395 E=11282401.5786	5.00'	5.91'	067° 42' 15.7528"	5.57'	S34° 44' 43.1718"E

NEW WORK CONTROL POINTS			
WORKING POINT	NORTHING	EASTING	DESCRIPTION
WP1	3657910.7720	11282402.3410	WESTERN LOW POINT CL
WP2	3657913.2625	11282427.2166	EASTERN LOW POINT CL

**DETAIL 1/C4
FOREBAY LAYOUT DETAIL**
SCALE: NOT TO SCALE



**DETAIL 2/C4
FOREBAY DETAIL**
SCALE: NOT TO SCALE



SECTION 1/C4
SCALE: NOT TO SCALE

S:\CLIENT\0775_LYNCHBURG STORM MASTER PLAN_077593\TO 7_SLAFF BMP DESIGN\SHEFFIELD\21_CADD\21.05_WORKING_DWG\S\LY9070C04_2016\08\29_12:46 PM_CUSTALOW, BENJAMIN

GREELEY AND HANSEN
9020 STONY POINT PARKWAY, SUITE 475
RICHMOND, VIRGINIA 23235

DESIGNED BDC
DRAWN DRH
CHECKED EJC

APPROVED
EDWARD J. CRONIN
Lic. No. 035130
8/29/16
PROFESSIONAL ENGINEER

NO.	DATE	APPD	REVISION

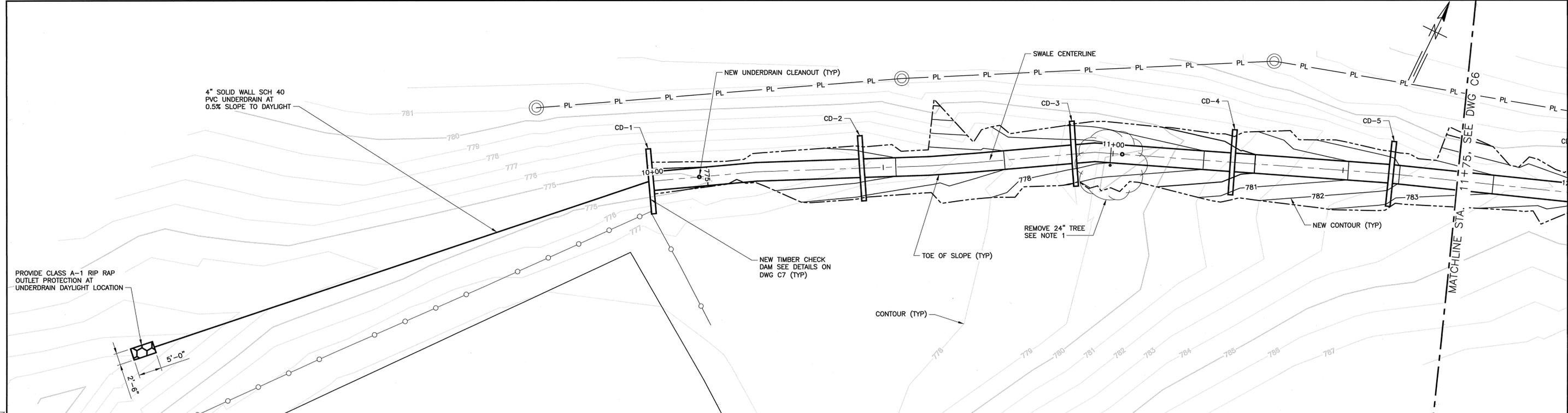
SCALE
NOT TO SCALE

CITY OF LYNCHBURG, VIRGINIA
DEPARTMENT OF WATER RESOURCES
SHEFFIELD ELEMENTARY SCHOOL BMP RETROFIT

CIVIL
STATION CURVE TABLE, SEQUENCE OF CONSTRUCTION AND MAINTENANCE NOTES, AND FOREBAY DETAIL

FILE NAME LY9070C04
DWG C4
SHEET 5 OF 13
DATE AUGUST 2016 REV 0

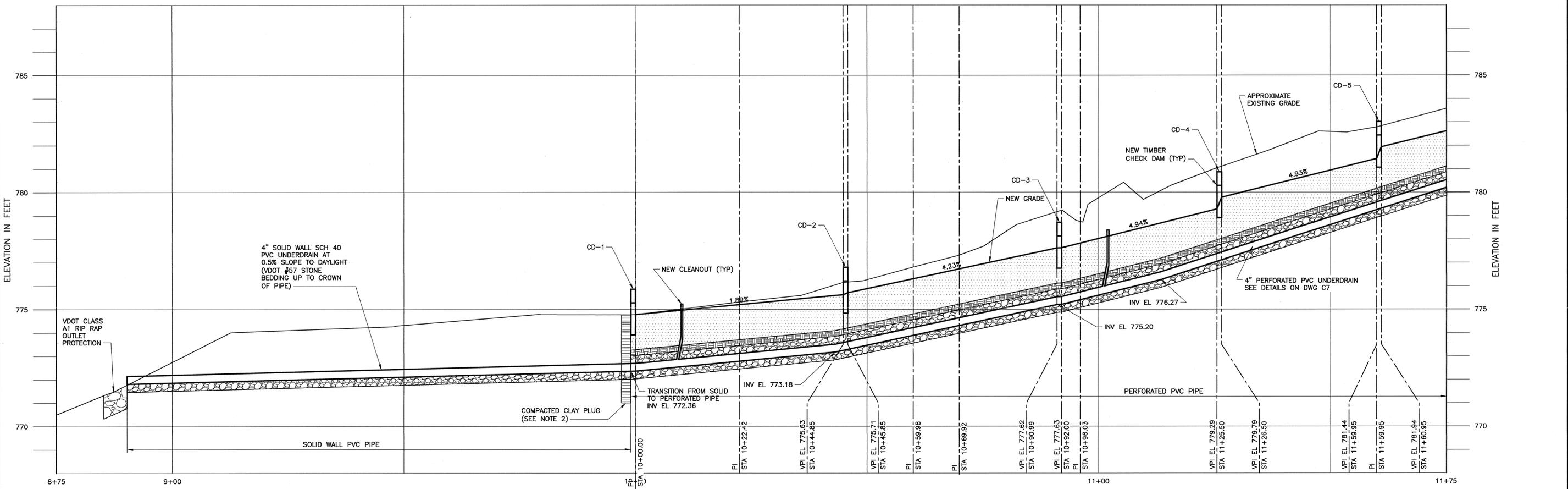
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- NOTES:**
- FELLED TREE TRUNK TO BE CUT IN 1-FOOT SECTIONS FOR SEATING AROUND FOREBAY.

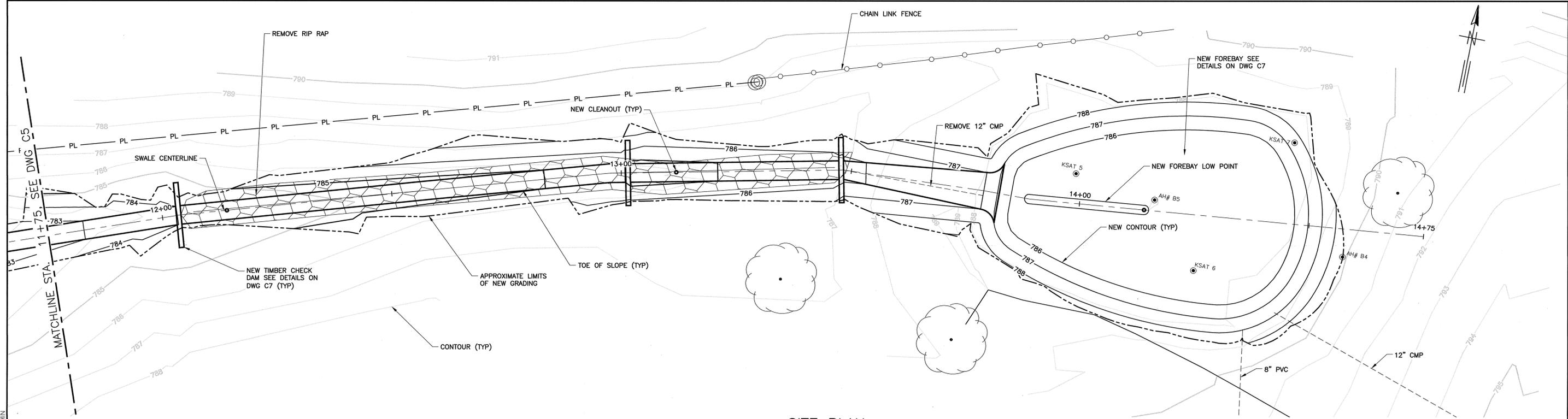
SITE PLAN
SCALE: 1" = 10'

- NOTES (CONT.):**
- COMPACTED CLAY PLUG SHALL EXTEND A MINIMUM OF 1 FOOT BEYOND THE BOTTOM AND SIDEWALLS OF THE TRENCH. CLAY MATERIAL SHALL HAVE A UCS CLASSIFICATION OF "CL", A LIQUID LIMIT LESS THAN OR EQUAL TO 40, AND A PLASTICITY INDEX LESS THAN OR EQUAL TO 20. EXCAVATED CLAY MATERIAL FROM THE PROJECT SITE MAY BE USED, PROVIDED IT MEETS THE ABOVE REQUIREMENTS. THE CLAY PLUG SHALL BE COMPACTED TO 95% OF THE MAXIMUM DRY DENSITY OBTAINABLE BY ASTM D 1557.

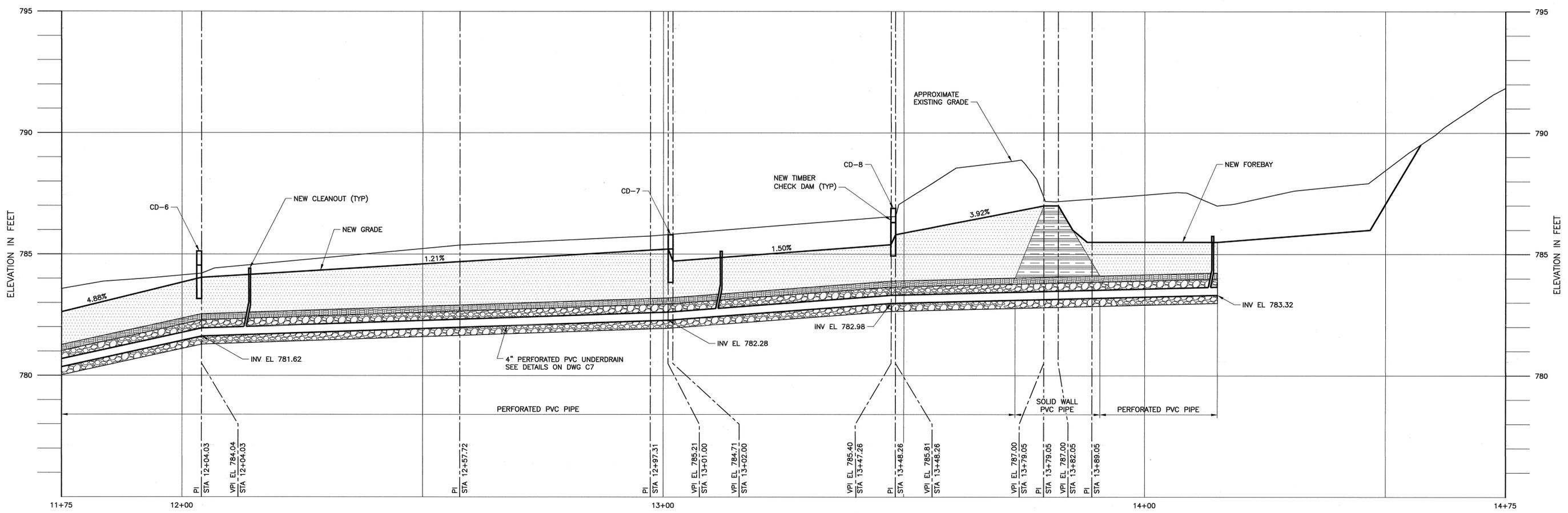


DRY SWALE AND FOREBAY PROFILE
SCALE: HORIZONTAL 1" = 10'
VERTICAL 1" = 2'

GREELEY AND HANSEN 9020 STONY POINT PARKWAY, SUITE 475 RICHMOND, VIRGINIA 23235	DESIGNED BDC	APPROVED 	NO.	DATE	APPD	REVISION	SCALE 0 2 4 FT 1"=2'-0" 0 10 20 FT 1"=10'	CITY OF LYNCHBURG, VIRGINIA DEPARTMENT OF WATER RESOURCES SHEFFIELD ELEMENTARY SCHOOL BMP RETROFIT	CIVIL SITE PLAN AND SWALE PROFILE	FILE NAME LY9070C05
	DRAWN DRH		DWG C5							
CHECKED EJC	DATE AUGUST 2016	REV 0								



SITE PLAN
SCALE: 1" = 10'



DRY SWALE AND FOREBAY PROFILE
SCALE: HORIZONTAL 1" = 10'
VERTICAL 1" = 2'

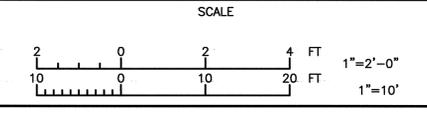
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GREELEY AND HANSEN
9020 STONY POINT PARKWAY, SUITE 475
RICHMOND, VIRGINIA 23235

DESIGNED BDC
DRAWN DRH
CHECKED EJC

APPROVED
EDWARD J. CRONIN
Lic. No. 035130
8/29/2016
PROFESSIONAL ENGINEER

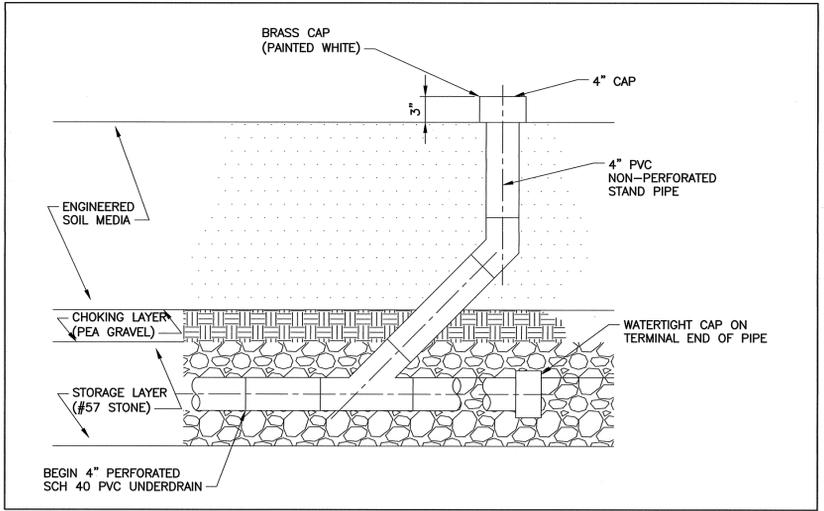
NO.	DATE	APPD	REVISION



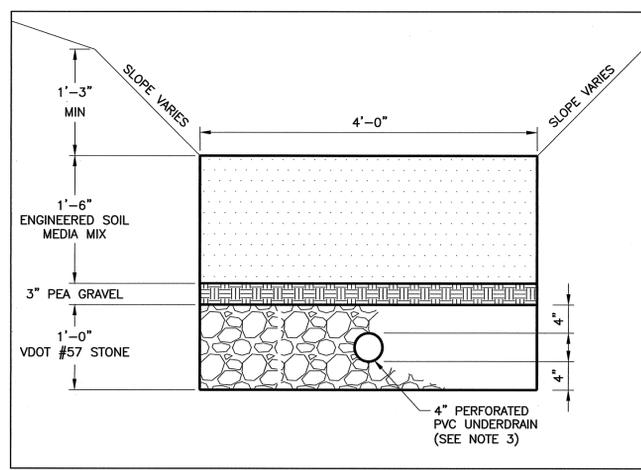
CITY OF LYNCHBURG, VIRGINIA
DEPARTMENT OF WATER RESOURCES
SHEFFIELD ELEMENTARY SCHOOL BMP RETROFIT

CIVIL
SITE PLAN AND SWALE PROFILE

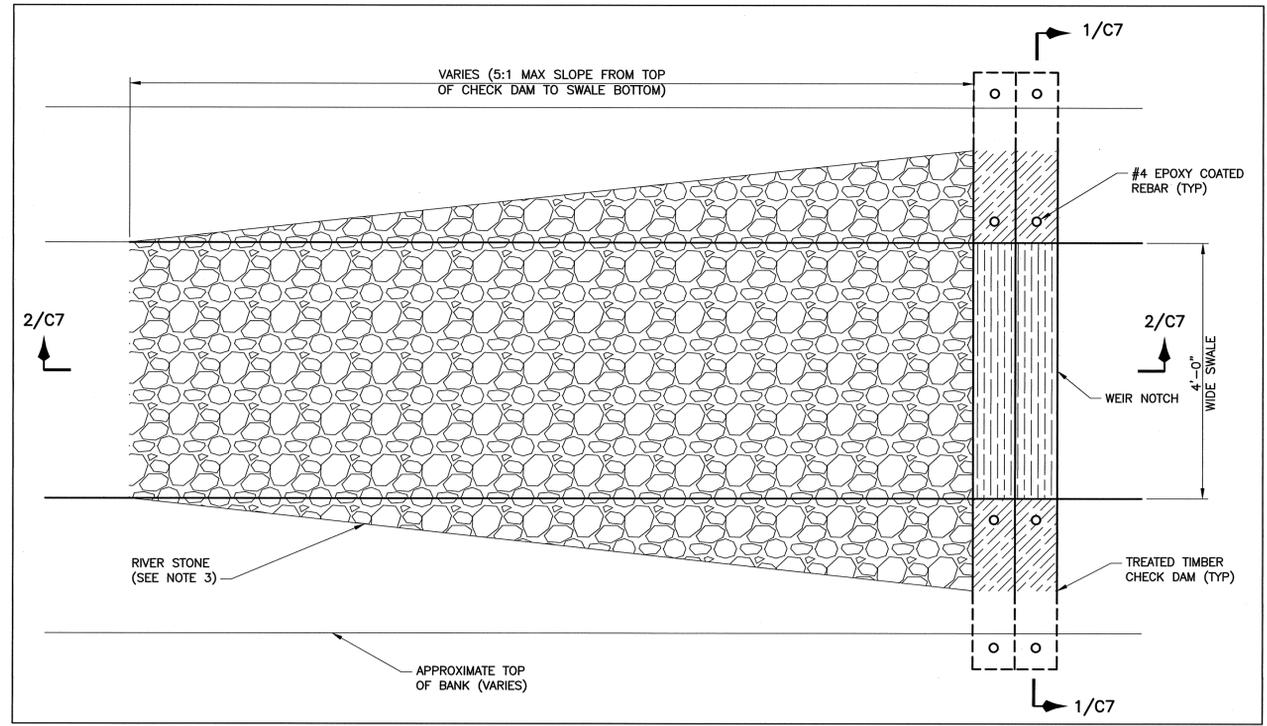
FILE NAME LY9070C06
DWG **C6**
SHEET 7 OF 13
DATE AUGUST 2016 REV 0



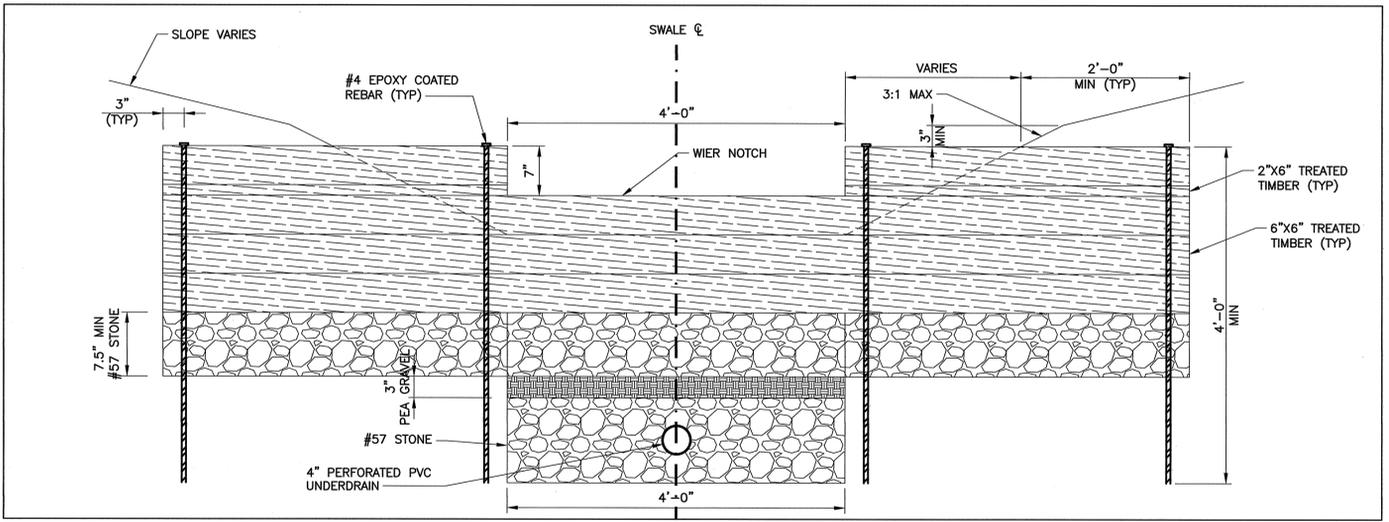
**TYPICAL DETAIL 1/C7
PVC CLEANOUT**
SCALE: NOT TO SCALE



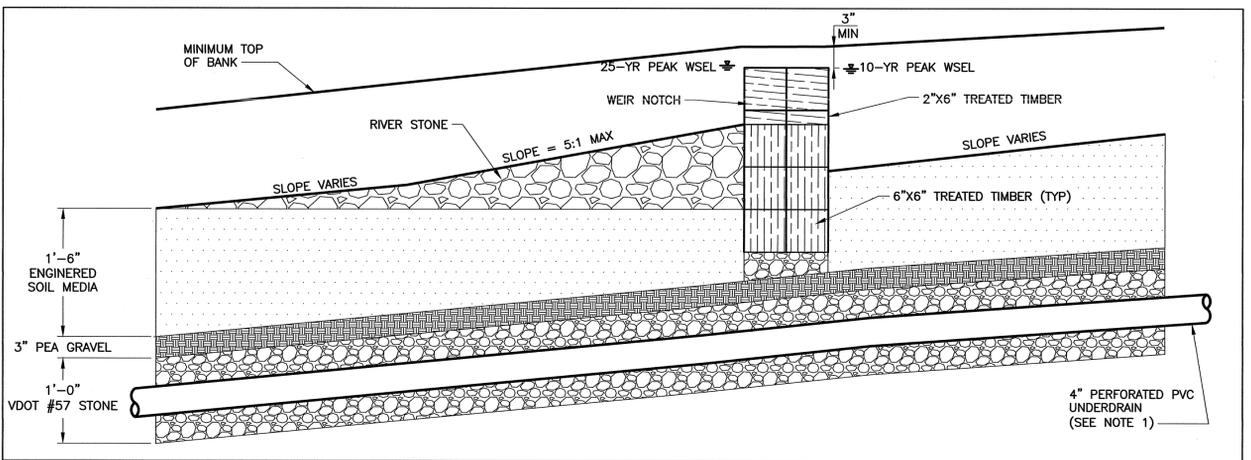
**DETAIL 3/C7
TYPICAL DRY SWALE SECTION**
SCALE: NOT TO SCALE



**DETAIL 2/C7
TIMBER CHECK DAM**
SCALE: NOT TO SCALE



TYPICAL SECTION 1/C7
SCALE: NOT TO SCALE



TYPICAL SECTION 2/C7
SCALE: NOT TO SCALE

DRY SWALE MATERIAL SPECIFICATIONS

MATERIAL	SPECIFICATION	NOTES
FILTER MEDIA COMPOSITION	FILTER MEDIA TO CONTAIN: 80%-90% SAND 10%-20% SOIL FINES 3%-5% ORGANIC MATTER	THE VOLUME OF FILTER MEDIA BASED ON 110% OF THE PLAN VOLUME, TO ACCOUNT FOR SETTLING OR COMPACTION.
FILTER MEDIA TESTING	AVAILABLE P BETWEEN L+ AND M PER DCR 2005 NUTRIENT MANAGEMENT CRITERIA.	THE MEDIA SHOULD BE CERTIFIED BY THE SUPPLIER.
SURFACE COVER	MULCH (REFER TO LANDSCAPING PLANS)	
CHOKING LAYER	3 INCHES OF PEA GRAVEL	
STONE AND/OR STORAGE LAYER	A 12-INCH LAYER OF #57 STONE SHOULD BE DOUBLE-WASHED AND CLEAN AND FREE OF ALL SOIL AND FINES.	
UNDERDRAINS, CLEANOUTS, AND OBSERVATION WELLS	4-INCH RIGID SCHEDULE 40 PVC PIPE, WITH 3/8-INCH PERFORATIONS AT 6-INCHES ON CENTER (EXCEPT WHERE SHOWN AS SOLID WALL PIPE).	INSTALL PERFORATED AND SOLID WALL SEGMENTS AS SHOWN ON THE PLANS. DAYLIGHT AT DOWNSTREAM END OF PRACTICE WITH OUTLET PROTECTION.
VEGETATION	PLANT SPECIES AS SPECIFIED ON THE LANDSCAPING PLAN.	
CHECK DAMS	LUMBER SHALL BE SOUTHER PINE, GRADE #2 OR BETTER AND PRESERVATIVE TREATED IN ACCORDANCE WITH AMERICAN WOOD PRESERVERS' ASSOCIATION STANDARDS FOR GROUND CONTACT. EXPOSED VERTICAL TIMBER EDGES (I.E. LEFT AND RIGHT WEIR NOTCH EDGES) SHALL BE SANDED FOR A SMOOTH FINISH.	
RIVER STONE	RIVER STONE SHALL COMPOSE OF A WELL-GRADED MIXTURE WITH ROUNDED AGGREGATE OF 3" - 4" DIAMETER, PLACED AT THE LOCATIONS AND DIMENSIONS SPECIFIED IN THE CONTRACT DOCUMENTS. ALL FINES SHALL BE SCREENED FROM THE AGGREGATE WITHIN A ONE-QUARTER INCH (1/4") TOLERANCE. THE MATERIAL SHALL BE FREE OF ORGANIC AND INORGANIC DEBRIS AND TRASH. RIVER STONE MIXTURE SHALL MEET THE FOLLOWING CRITERIA: D15: 3" D50: 4" D85: 6"	

CHECK DAM ELEVATIONS

CHECK DAM NO.	STATION	SWALE SURFACE ELEVATION (1)	WEIR NOTCH ELEVATION (2)	TOP OF CHECK DAM ELEVATION (3)
CD-1	10+00.00	774.78	775.28	775.86
CD-2	10+45.85	775.71	776.21	776.79
CD-3	10+92.00	777.63	778.13	778.71
CD-4	11+26.50	779.79	780.29	780.87
CD-5	11+60.95	781.94	782.44	783.02
CD-6	12+04.03	784.04	784.54	785.12
CD-7	13+02.00	784.71	785.21	785.79
CD-8	13+48.26	785.81	786.31	786.89

- (1) AT UPSTREAM FACE OF CHECK DAM
- (2) 6 INCHES ABOVE SWALE SURFACE ELEVATION
- (3) 7 INCHES ABOVE WEIR NOTCH ELEVATION

NOTES:

- DEFLECT PVC UNDERDRAIN AS NECESSARY WITHIN THE STORAGE LAYER TO ACCOMMODATE FOR ELEVATION CHANGES AT CHECK DAMS.
- CENTER UNDERDRAIN VERTICALLY IN 12" LAYER OF #57 STONE
- PLACE RIVER STONE UP TO THE WEIR NOTCH WITHIN SWALE AND UP TO THE TOP OF THE CHECK DAM ALONG THE SWALE SIDE SLOPES
- EACH VERTICAL LAYER OF THE CHECK DAM SHALL BE COMPRISED OF A SINGLE CONTIGUOUS TIMBER, UNLESS OTHERWISE APPROVED BY THE OWNER. THE USE OF SPLICED TIMBERS (IF APPROVED) SHALL REQUIRE ADDITIONAL REBAR (BEYOND WHAT IS SHOWN) TO SECURE THE TIMBERS.

S:\CLIENTS\0775 LYNCHBURG STORM MASTER PLAN_07759\TO 7 SLAF BMP DESIGN\SHEEFIELD\21_CADD\21.05 WORKING DWGS\LY9070C07_2016.08.29 12:48 PM CUSTALOW, BENJAMIN

GREELEY AND HANSEN
9020 STONY POINT PARKWAY, SUITE 475
RICHMOND, VIRGINIA 23235

DESIGNED BDC
DRAWN DSS
CHECKED EJC

APPROVE
EDWARD J CRONIN
Lic. No. 035130
8/29/2016
PROFESSIONAL ENGINEER

NO.	DATE	APPD	REVISION

SCALE
NOT TO SCALE

CITY OF LYNCHBURG, VIRGINIA
DEPARTMENT OF WATER RESOURCES

SHEFFIELD ELEMENTARY SCHOOL BMP RETROFIT

CIVIL

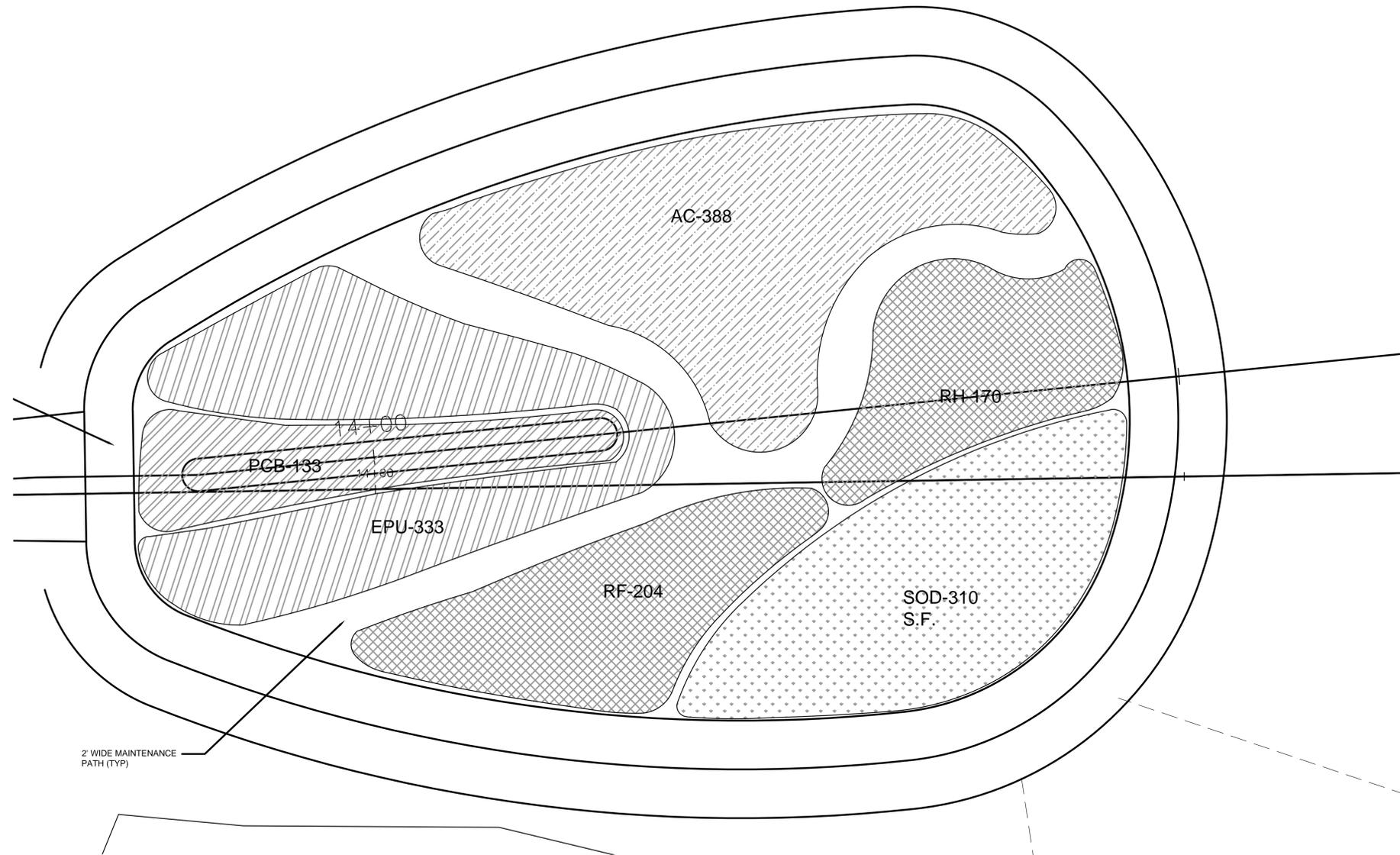
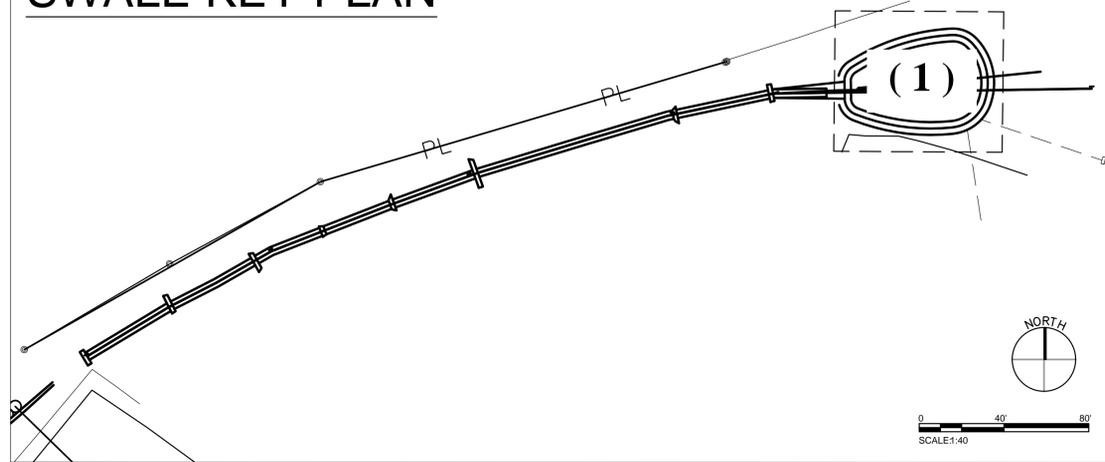
FILE NAME LY9070C07

DWG **C7**

SHEET 8 OF 13

DATE AUGUST 2016 REV 0

SWALE KEY PLAN



L1 PLANTING ENLARGEMENT 1 (SEE KEY PLAN)
1/4"=1'-0"

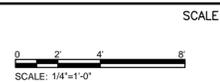


GREELEY AND HANSEN
9020 STONY POINT PARKWAY, SUITE 475
RICHMOND, VIRGINIA 23235

DESIGNED CEA
DRAWN NJH
CHECKED CEA

APPROVED

NO.	DATE	APPD	REVISION

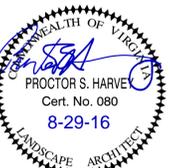


CITY OF LYNCHBURG, VIRGINIA
DEPARTMENT OF WATER RESOURCES

SHEFFIELD ELEMENTARY SCHOOL BMP RETROFIT

LANDSCAPING

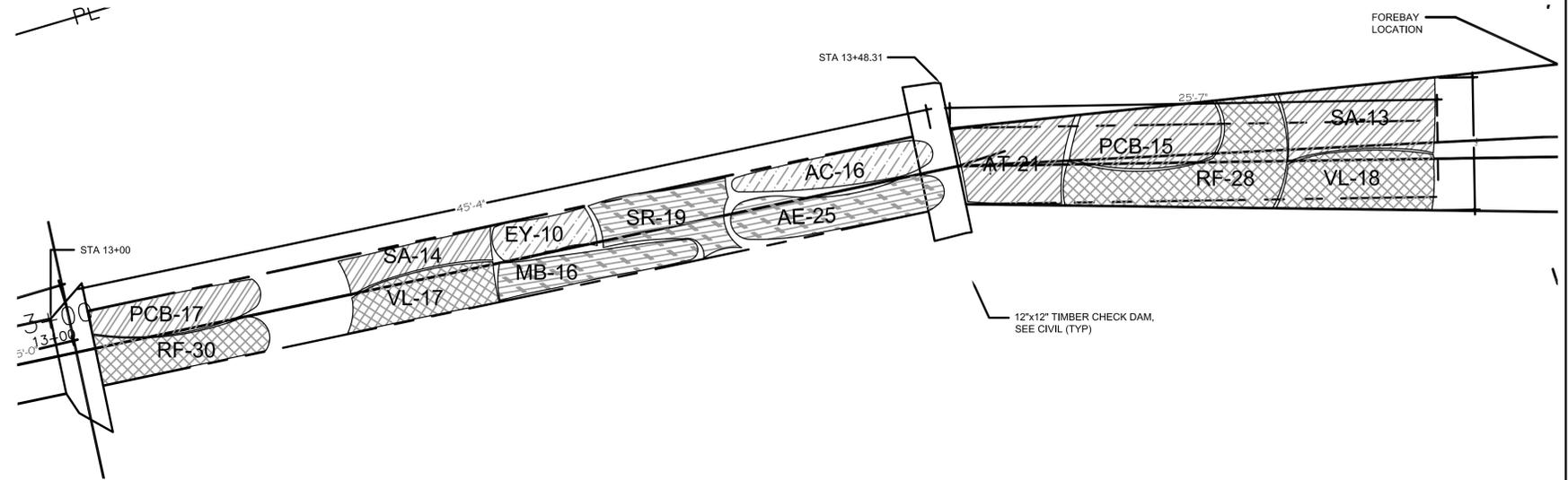
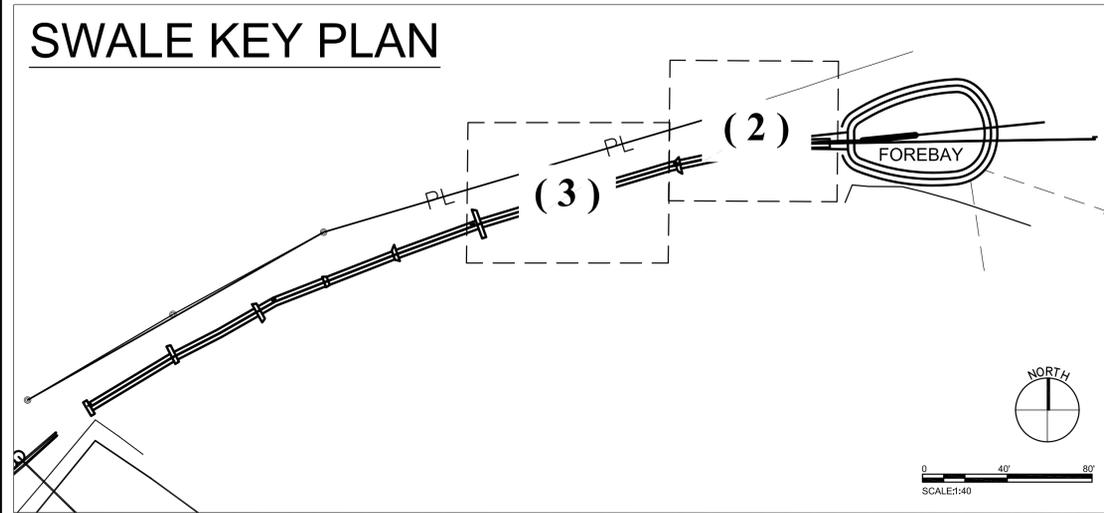
DRY SWALE PLANTING PLAN



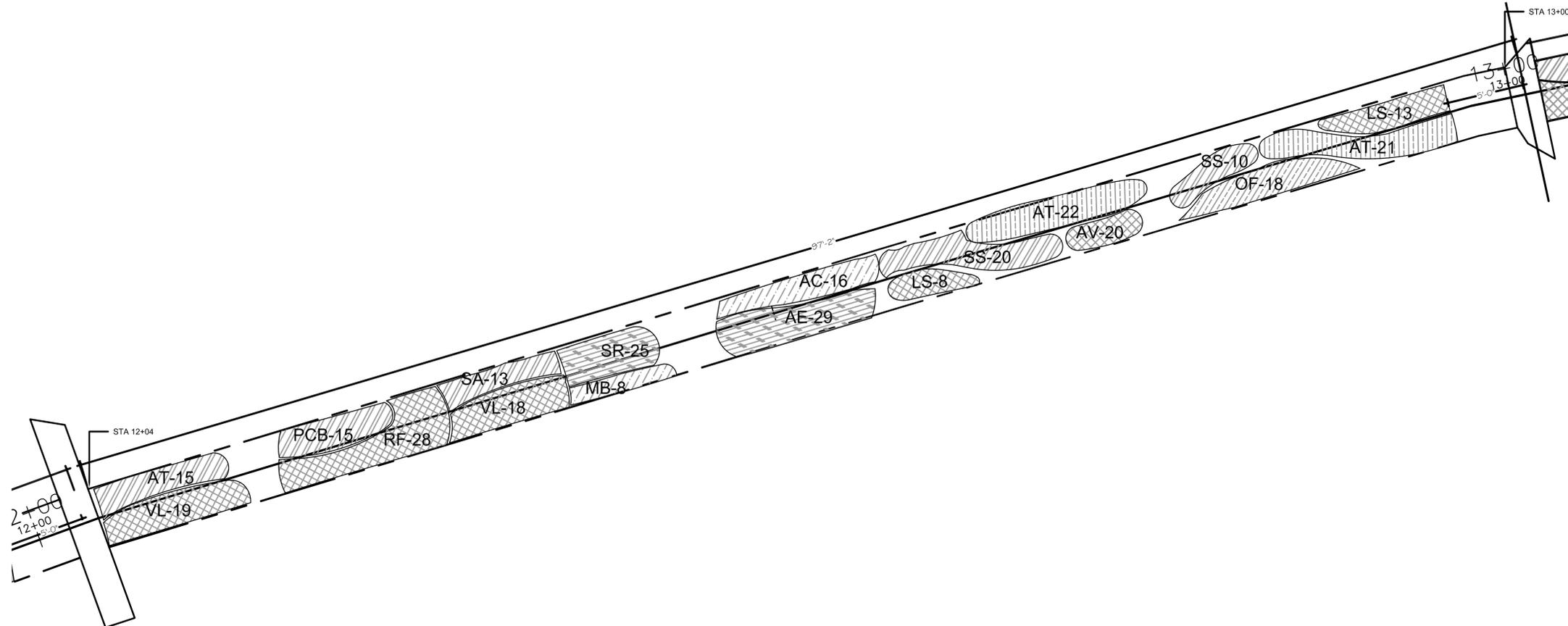
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DWG	L1		
SHEET	9	OF	13
DATE	AUGUST 2016	REV	0

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SWALE KEY PLAN



L2 PLANTING ENLARGEMENT 2 (SEE KEY PLAN)
1/4"=1'-0"



L2 PLANTING ENLARGEMENT 3 (SEE KEY PLAN)
1/4"=1'-0"

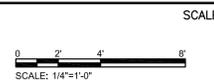


GREELEY AND HANSEN
9020 STONY POINT PARKWAY, SUITE 475
RICHMOND, VIRGINIA 23235

DESIGNED CEA
DRAWN NJH
CHECKED CEA

APPROVED

NO.	DATE	APPD	REVISION



CITY OF LYNCHBURG, VIRGINIA
DEPARTMENT OF WATER RESOURCES

SHEFFIELD ELEMENTARY SCHOOL BMP RETROFIT

LANDSCAPING

DRY SWALE PLANTING PLAN

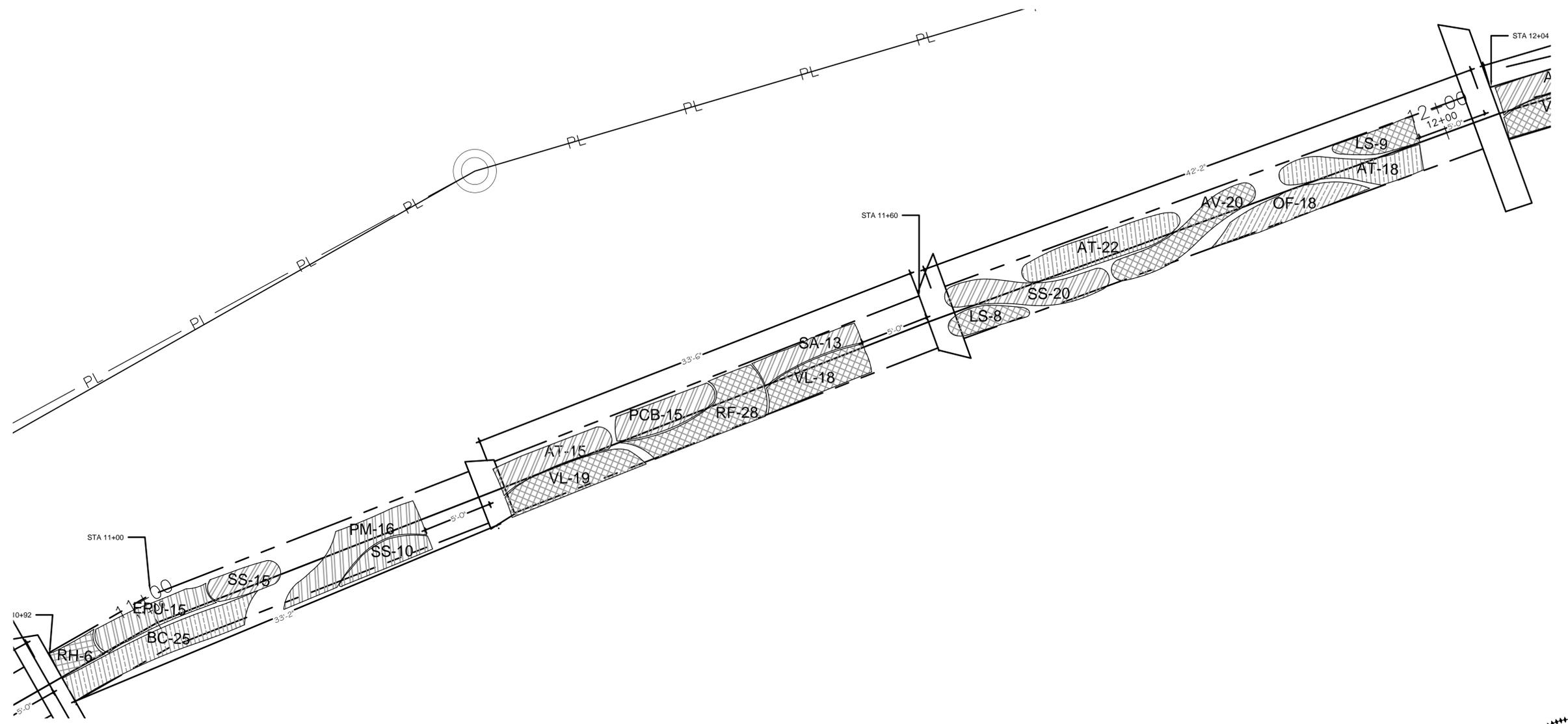
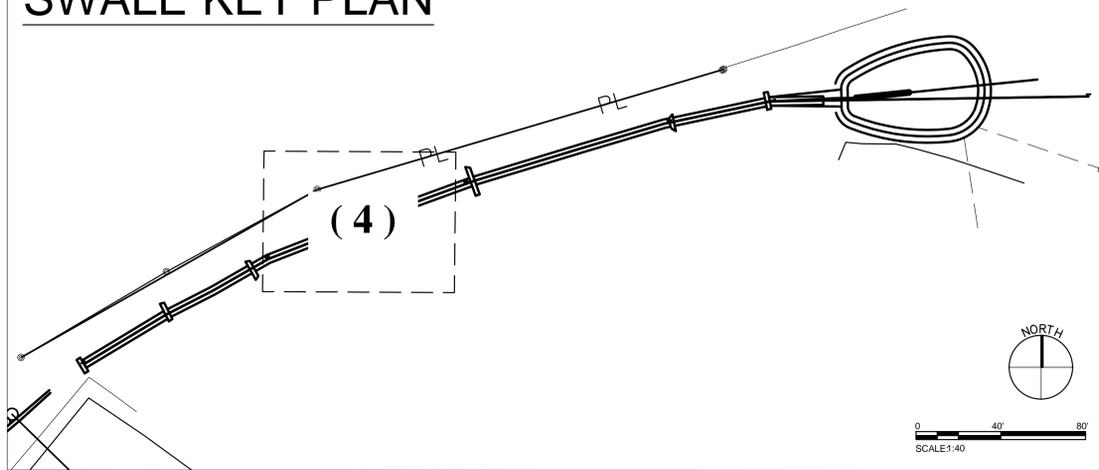


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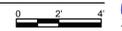
DWG **L2**
SHEET 10 OF 13
DATE AUGUST 2016 REV 0

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SWALE KEY PLAN



L3 PLANTING ENLARGEMENT 4 (SEE KEY PLAN)
1/4"=1'-0"

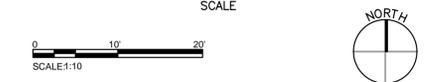


GREELEY AND HANSEN
9020 STONY POINT PARKWAY, SUITE 475
RICHMOND, VIRGINIA 23235

DESIGNED CEA
DRAWN NJH
CHECKED CEA

APPROVED

NO.	DATE	APPD	REVISION



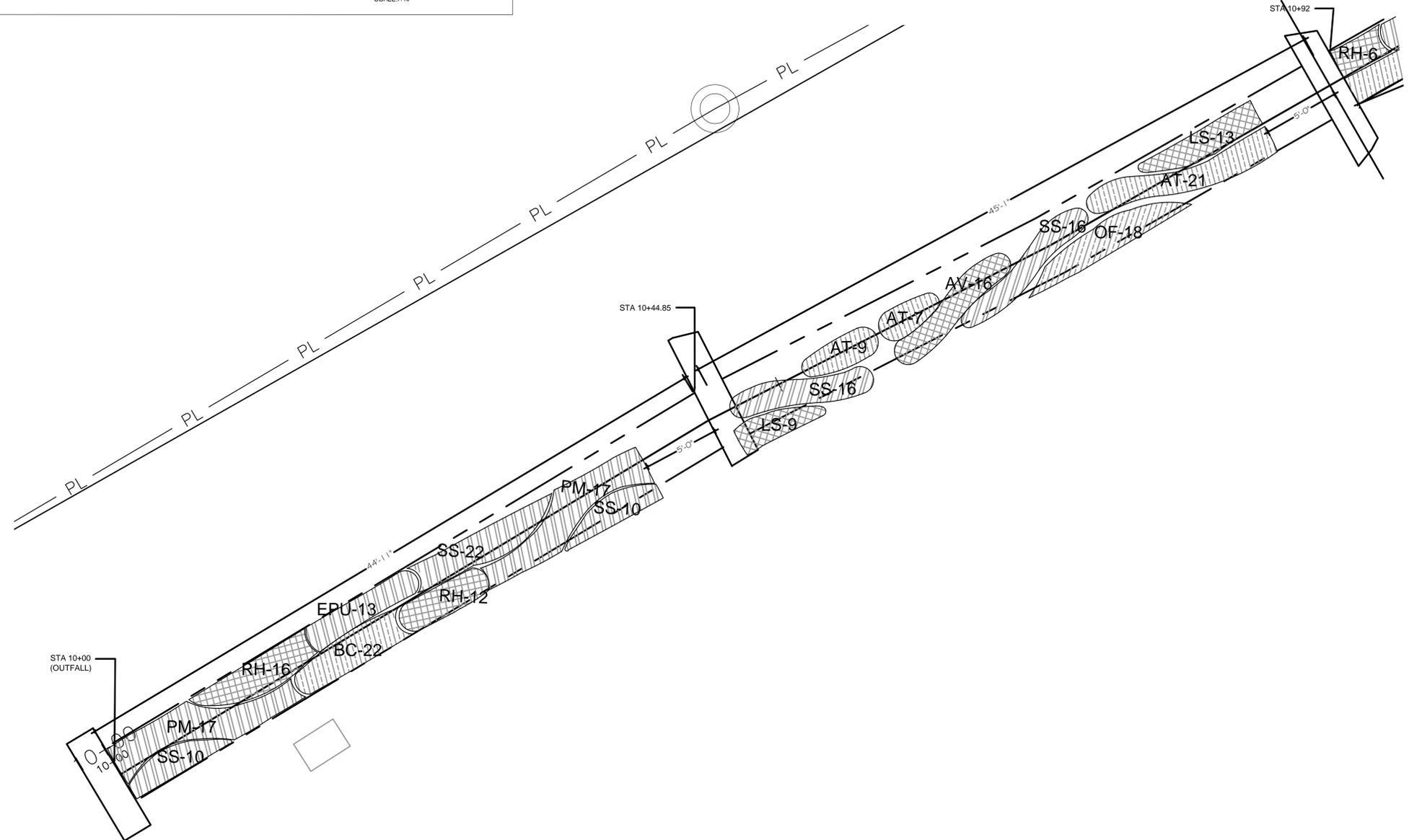
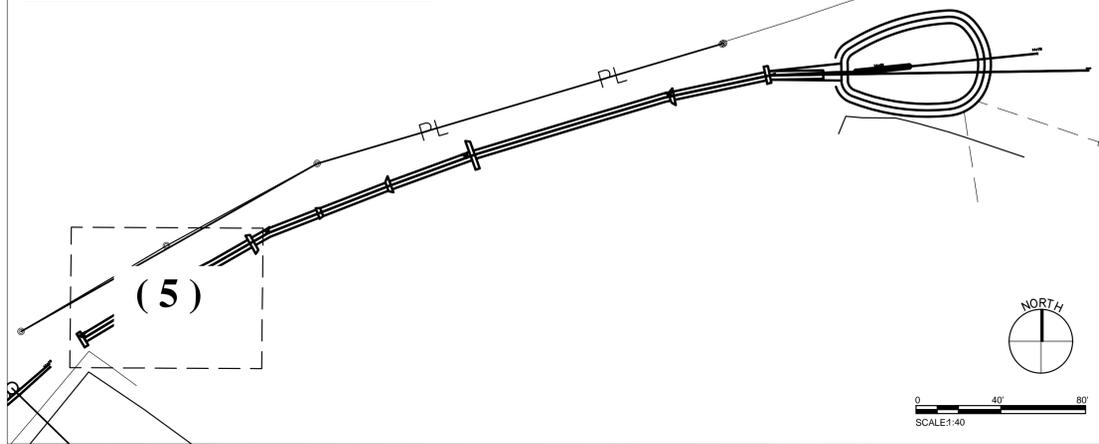
CITY OF LYNCHBURG, VIRGINIA
DEPARTMENT OF WATER RESOURCES
SHEFFIELD ELEMENTARY SCHOOL BMP RETROFIT

LANDSCAPING
DRY SWALE PLANTING PLAN

FILE NAME	HDLA LSCAPE PLAN 8-29-16		
DWG	L3		
SHEET	11	OF	13
DATE	AUGUST 2016	REV	0

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SWALE KEY PLAN



L4 PLANTING ENLARGEMENT 5 (SEE KEY PLAN)
1/4"=1'-0"



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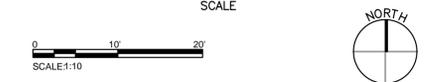


GREELEY AND HANSEN
9020 STONY POINT PARKWAY, SUITE 475
RICHMOND, VIRGINIA 23235

DESIGNED CEA
DRAWN NJH
CHECKED CEA

APPROVED

NO.	DATE	APPD	REVISION



CITY OF LYNCHBURG, VIRGINIA
DEPARTMENT OF WATER RESOURCES
SHEFFIELD ELEMENTARY SCHOOL BMP RETROFIT

LANDSCAPING
DRY SWALE PLANTING PLAN

FILE NAME	HDLA\SCAPE PLAN 8-29-16		
DWG	L4		
SHEET	12	OF	13
DATE	AUGUST 2016	REV	0



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How to Use Landscape Plugs

Tips for Highest Survival Rates

When to Plant

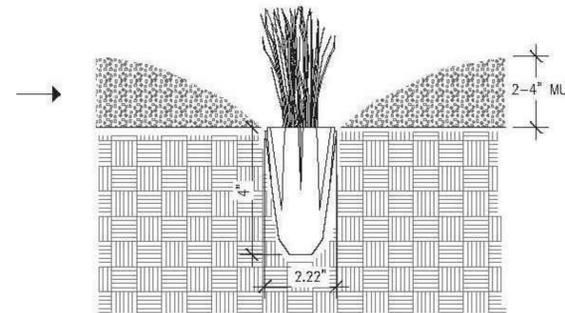
- Install LP50's and LP32's while they are in active growth only. Depending on temperature most species will break winter dormancy in early spring.
- Installation windows vary by species and plant metabolism—consult our ecological sales team for guidance on proper species selection.
- Installing outside optimal planting windows may require higher initial management inputs and result in plant loss.
- In order to plant efficiently and reduce soil compaction, monitor weather conditions and (unless planting into hydric soil) avoid planting if soil on site is too wet.

Site Preparation

- If planting into a dressing of mulch, apply prior to planting to save time. To protect plant crowns, only apply an appropriate layer of mulch (2-4").
- Avoid all unnecessary soil compaction while preparing and planting the site (foot traffic, machinery, etc).
- Water plug trays thoroughly prior to laying out plants.
- Maintain the site's hydrologic functions: <http://www2.epa.gov/polluted-runoff-nonpoint-source-pollution>

How to Plant

- Remove plugs from trays by pushing up through bottom of liner.
- Do not pull the plant by the vegetative material.
- Do not 'tease' the root system apart.
- Ensure that native soil level evenly matches up to the top of the soil of the Landscape Plug.
- Tamp in soil around Landscape Plug to increase soil-root contact and minimize potential for frost heaving.
- Water immediately to reduce air pockets and maximize contact between LP roots and soil nutrients.



Installation

SHEFFIELD ELEMENTARY SWALE PLANTING (REVISED 2-5-16)									
PLANT INFORMATION				PLANT SIZE				MARK	NOTES
MARK	QTY	COMMON TRADE	BOTANICAL OR LATIN	INSTALLATION		MATURITY			
				CAL(IN.)	HEIGHT	CONT	HEIGHT	CANOPY	
SWALE PLANTS									
AC	32	NODDING ONION	ALLIUM CERNUUM				12-18"		12" O.C.
AE	54	HEATH ASTER	ASTER ERICOIDES 'SNOW FLURRY'				6-8"		10" O.C.
AT	171	BUTTERFLY WEED	ASCLEPIAS TUBEROSA				18-24"		12" O.C.
AV	24	HORSETAIL MILKWEED	ASCLEPIAS VERTICILLATA				1-3FT		12" O.C.
BC	47	SIDEOATS GRAMA	BOUTELOUA CURTIPENDULA				18-24"		12" O.C.
EPU	28	PURPLE CONEFLOWER	ECHINACEA PURPUREA 'RUBY STAR'				2-3FT		12" O.C.
EY	10	BUTTON ERYNGO	ERYNGIUM YUCCIFOLIUM				4-5FT		12" O.C.
LS	60	SPIKE GAYFEATHER	LIATRIS SPICATA				3-5FT		12" O.C.
MB	24	EASTERN BEEBALM	MONARDA BRADBURIANA				1-2FT		12" O.C.
OF	54	SUNDROPS	OENOTHERA FRUTICOSA				15-24"		12" O.C.
PCB	62	SWITCHGRASS	PANICUM 'CAPE BREEZE'				24-30"		12" O.C.
PM	50	SHORT TOOTHED MOUNTAIN MINT	PYCNANTHEMUM MUTICUM				2-3FT		18" O.C.
RF	102	BLACK EYED SUSAN	RUDBECKIA FULGIDA 'GOLDSTRUM'				2-3FT		12" O.C.
RH	34	WILD PETUNIA	RUPELLIA HUMILIS				2-3FT		12" O.C.
SA	53	BLUE EYED GRASS	SISYRINCHIUM ANGUSTIFOLIUM 'LUCERNE'				18-24"		10" O.C.
SR	35	GOLDENROD	SOLIDAGO RUGOSA 'FIREWORKS'				3-4FT		12" O.C.
SS	149	LITTLE BLUESTEM	SCHIZACHYRIUM SCOPARIUM 'STANDING OVATION'				3-4FT		12" O.C.
VL	109	IRONWEED	VERNONIA LETTERMANNI 'IRON BUTTERFLY'				30-36"		12" O.C.

GENERAL NOTES FOR CONTRACTOR:

1. PRECISELY FOLLOW INSTALLATION INSTRUCTIONS FOR LANDSCAPE PLUGS
2. CONTRACTOR TO INSTALL 2" LAYER OF DOUBLE-SHREDDED HARDWOOD MULCH PRIOR TO INSTALLATION OF LANDSCAPE PLUGS. MULCH LAYER TO BE INSTALLED DIRECTLY ON TOP OF BIORETENTION MIX
3. CONTRACTOR TO SUBMIT BAGGED SAMPLE OF MULCH FOR APPROVAL PRIOR TO DELIVERY TO SITE AND INSTALLATION
4. CONTRACTOR IS RESPONSIBLE FOR ALL MAINTENANCE AND WATERING OF PLANT MATERIAL UNTIL FINAL ACCEPTANCE BY THE OWNER. PLANT MATERIAL SHALL HAVE A ONE YEAR WARRANTY WITH WARRANTY PERIOD BEGINNING UPON FINAL ACCEPTANCE.

COMMUNITY PLANTING DAY:

1. THE SCHOOL WOULD LIKE TO PLAN A "COMMUNITY PLANTING DAY" ONCE CONSTRUCTION REACHES A STAGE OF COMPLETION TO INSTALL PLANT MATERIAL. THE CONTRACTOR SHALL COORDINATE THESE ACTIVITIES WITH THE SCHOOL, AND ENSURE THE SITE IS SAFELY ACCESSIBLE FOR VOLUNTEER PARTICIPATION.



GREELEY AND HANSEN
9020 STONY POINT PARKWAY, SUITE 475
RICHMOND, VIRGINIA 23235

DESIGNED CEA
DRAWN NJH
CHECKED CEA

APPROVED

NO.	DATE	APPD	REVISION

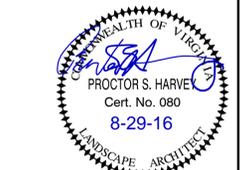
SCALE

CITY OF LYNCHBURG, VIRGINIA
DEPARTMENT OF WATER RESOURCES

SHEFFIELD ELEMENTARY SCHOOL BMP RETROFIT

LANDSCAPING

DRY SWALE DETAILS & PLANT SCHEDULE



FILE NAME HDLA LSCAPE PLAN 8-29-16
DWG **L5**
SHEET 13 OF 13
DATE AUGUST 2016 REV 0