COE BRANCH STREAM RESTORATION

STREAM RESTORATION DESIGN PLANS

CITY OF FALLS CHURCH, VIRGINIA

UTILITIES NOTES

1. ALL EXISTING UNDERGROUND UTILITIES SHALL BE MARKED IN THE FIELD BY MISS UTILITY PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SCHEDULING THE FIELD MARKING OF UTILITIES WITH MISS UTILITY.
2. ALL EXISTING UNDERGROUND UTILITIES SHALL BE PHYSICALLY LOCATED BY THE CONTRACTOR PRIOR TO THE BEGINNING OF ANY CONSTRUCTION IN THE VICINITY OF THESE UTILITIES.
3. THE CONTRACTOR SHALL CONFORM TO THE PROVISIONS AS SPECIFIED IN THE CURRENT VIRGINIA ADMINISTRATIVE CODE (VAC) SECTION 20 VAC 5 - 309-140, EXCAVATOR'S RESPONSIBILITIES TO AVOID DAMAGE, DISLOCATING OR DISTURBANCE OF UTILITY LINES, AS FOLLOWS:

   "ANY PERSON EXCAVATING AROUND UNDERGROUND UTILITY LINES SHALL TAKE ALL REASONABLE STEPS TO PROTECT SUCH UTILITY LINES. THESE STEPS SHALL INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING:

   1. THE EXCAVATOR SHALL PLAN THE EXCAVATION IN SUCH A MANNER TO AVOID DAMAGE TO, AND MINIMIZE INTERFERENCE WITH, UNDERGROUND UTILITY LINES IN AND NEAR THE CONSTRUCTION AREA.
   2. THE EXCAVATOR SHALL EXPOSE THE UNDERGROUND UTILITY LINE TO ITS EXTREMITIES BY HAND DIGGING WITHIN THE EXCAVATION AREA WHEN EXCAVATION IS EXPECTED TO COME WITHIN TWO FEET OF THE MARKED LOCATION OF THE UNDERGROUND UTILITY LINE.
   3. THE EXCAVATOR SHALL NOT UTILIZE MECHANIZED EQUIPMENT WITHIN TWO FEET OF THE EXTREMITIES OF ALL EXPOSED UTILITY LINES.
   4. THE EXCAVATOR SHALL MAINTAIN A REASONABLE CLEARANCE, TO INCLUDE THE WIDTH OF THE UTILITY LINE, IF KNOWN, PLUS 24 INCHES, BETWEEN THE MARKED OR STAKED LOCATION OF AN UNDERGROUND UTILITY LINE AND THE CUTTING EDGE OR POINT OF ANY MECHANIZED EQUIPMENT, CONSIDERING THE KNOWN LIMIT OF CONTROL OF THE CUTTING EDGE OR POINT TO AVOID DAMAGE TO THE UTILITY LINE.
   5. THE EXCAVATOR SHALL PROVIDE PROPER SUPPORT FOR UNDERGROUND UTILITY LINES DURING EXCAVATION ACTIVITIES. DURING BACKFILL OPERATIONS, THE EXCAVATOR SHALL USE THE SAME OR SIMILAR BACKFILL MATERIAL THAT WAS ORIGINALLY AROUND THE UTILITY LINE, ENSURE THERE IS PROPER COMPACTION AROUND THE UTILITY LINE, PROTECT ALL TRACER WIRES, AND PROTECT OR REPLACE WARNING TAPES."

4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT EXISTING UTILITIES ARE DISCONNECTED, PRIOR TO CLEARING THE SITE OF TREES, BUILDINGS, FOUNDATIONS, ETC. WITHIN THE LIMITS OF CONSTRUCTION IN ACCORDANCE WITH THE REQUIREMENTS INDICATED ON THE CONSTRUCTION PLANS.
5. CONTRACTORS SHALL NOTIFY OPERATORS WHO MAINTAIN UNDERGROUND UTILITY LINES IN THE AREA OF PROPOSED CONSTRUCTION, EXCAVATION OR BLASTING AT LEAST 2 WORKING DAYS, BUT NOT MORE THAN 10 WORKING DAYS PRIOR TO COMMENCEMENT OF EXCAVATION OR DEMOLITION IN ACCORDANCE WITH THE CITY OF FALLS CHURCH CODE. NAMES AND TELEPHONE NUMBERS OF THE OPERATORS OF UNDERGROUND UTILITY LINES IN CITY OF FALLS CHURCH APPEAR ON THIS SHEET. THESE NUMBERS WILL ALSO BE USED TO SERVE EMERGENCY CONDITION NOTICE AS REQUIRED BY OF THE CITY OF FALLS CHURCH CODE.

PRIMARY UTILITY COMPANIES

PRIMARY UTILITY COMPANIES	EMERGENCY
AMERICAN TELEPHONE & TELEGRAPH CO.	1-800-241-3624
COLUMBIA GAS OF VIRGINIA	1-800-543-8911 - 703-631-5363 (METRO)
COLUMBIA GAS TRANSMISSION CORP.	1-800-835-7191 (24 HRS)
COLONIAL PIPELINE CO.	1-800-926-2728
COX COMMUNICATIONS	703-378-2728
DOMINION VIRGINIA POWER	1-866-366-4357
FAIRFAX CITY WATER SERVICE	703-385-7984 OR 385-7924
FAIRFAX CO. WASTEWATER COLLECTION DIVISION	703-323-1211
CITY OF FALLS CHURCH PUBLIC SAFETY	703-691-2131 OR 911
FAIRFAX WATER	703-289-6395 OR 703-289-6323
MCI, INTERNATIONAL	
MCI, WORLD	1-800-624-9675
NORTHERN VIRGINIA ELEC. CO-OP	703-335-0500
TOWN OF HERNDON PUBLIC WORKS	703-435-6860 STATION 185 703-435-6846
TOWN OF VIENNA WATER SERVICE	703-255-6381 AFTER 5:00 PM., 703-255-6385
TRANSCO GAS PIPELINE CO.	1-800-440-8475 (24 HRS)
SMART TRAFFIC SIGNAL SYSTEM	703-383-2790
SPRINT (GLOBAL ONE)	1-800-521-0579 (24 HRS)
VERIZON (BELL ATLANTIC)	1-800-837-4966
VERIZON SOUTH	
WASHINGTON GAS	703-750-1000 (GAS LEAK 703-750-4831)
WORLD (METROPOLITAN FIBER SYSTEMS)	703-852-6700

FIBER OPTIC COMPANIES	EMERGENCY
Abovenet Communications	1-888-636-2778
AT&T	1-888-634-1840 (PAGER)
Comcast Communications in Reston	(AFTER HOURS 703-841-7700)
Elantic Telecom/Cavalier Telephone Company	1-888-662-5700
Fibergate	703-822-9743
Fiberlight, LCC	1-800-672-0181
Quest Government Services	1-800-388-6460
Qwest Communications	610-613-0979
Sprint	1-800-521-0579
Verizon Business (Formerly MCI)	703-391-5782; (CELL-703-598-1721)
XO Communications	1-866-295-9696
Xspedius Communications	1-800-937-7473
YIPES Communication, Inc.	1-877-740-6600

MISS UTILITY 1-800-552-7001 OR 811

TRAFFIC MAINTENANCE

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DAILY TRAFFIC CONTROL SUCH AS LANE CLOSURES, FLAGGERS DRIVEWAY ENTRANCES, ETC., TO PROPERLY MAINTAIN TRAFFIC THROUGHOUT THE PROJECT.
2. EXISTING SURFACE, BASE, AND SUBBASE MATERIAL WHICH WILL BE DEMOLISHED OR OBLITERATED DURING CONSTRUCTION AND WHICH IS DETERMINED SUITABLE BY THE ENGINEER, SHALL BE SALVAGED AND UTILIZED FOR TRAFFIC MAINTENANCE.
3. ALL REQUIRED CONSTRUCTION SIGNING, TEMPORARY PAVEMENT WIDENING, TEMPORARY LAND STABILIZATION, TRAFFIC BARRIERS, TEMPORARY PAVEMENT MARKINGS, ERADICATION, ETC., SHALL BE INCLUDED IN THE CONTRACTOR'S BID PRICE FOR TRAFFIC MAINTENANCE.
4. GROUP 2 CHANNELING DEVICES SHALL BE USED AT ALL DROP-OFFS GREATER THAN OR EQUAL TO SIX INCHES, BUT LESS THAN TWO FEET. DROP-OFFS SHALL BE BACKFILLED UNTIL A 6:1 TAPER IS OBTAINED.
5. CONCRETE BARRIERS SHALL BE USED AT ALL DROP-OFFS GREATER THAN OR EQUAL TO TWO FEET.
6. CONES WITH A MINIMUM HEIGHT OF 36" SHALL BE USED AT ALL TRANSITIONS. CONES USED DURING NIGHTTIME HOURS SHOULD HAVE THE APPROVED, REFLECTIVE SLEEVES ON THEM.
7. ALL TRAFFIC MAINTENANCE SHALL CONFORM TO THE VIRGINIA WORK AREA PROTECTION MANUAL, CURRENT EDITION.
8. ALL EXISTING SIGNS SHALL BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION.
9. CONTRACTOR SHALL MAINTAIN ACCESS TO ALL DRIVEWAY ENTRANCES DURING CONSTRUCTION.
10. TEMPORARY CLOSURE AFFECTING ACCESS TO ADJACENT PROPERTIES SHALL BE COORDINATED WITH AFFECTED PARTIES.
11. PEDESTRIAN DETOUR SHALL BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION ACCORDING TO VIRGINIA WORK AREA PROTECTION MANUAL AND MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES GUIDELINES.
12. CLEAR ZONE SHALL BE MAINTAINED FREE OF PARKED EQUIPMENT AND STORED MATERIAL AT ALL TIMES.

CONSTRUCTION NOTES

1. ALL CONSTRUCTION, INCLUDING ANY PROPOSED LANDSCAPING, SHALL CONFORM TO THE CURRENT EDITION OF THE CITY OF FALLS CHURCH PFM AND THE VIRGINIA DEPARTMENT OF TRANSPORTATION (V.D.O.T.) STANDARDS AND SPECIFICATIONS AND SHALL CONFORM TO THE CURRENT EDITION OF THE VIRGINIA UNIFORM STATEWIDE BUILDING CODE.
2. ALL CONSTRUCTION WITHIN THE V.D.O.T. RIGHT-OF-WAY SHALL CONFORM TO THE PROVISIONS CONTAINED IN THE V.D.O.T. LAND USE PERMIT ISSUED FOR THIS LOCATION. THE CONTRACTOR SHALL BE THOROUGHLY FAMILIARIZED WITH THE REQUIREMENTS OF THIS LAND USE PERMIT PRIOR TO THE START OF ANY CONSTRUCTION IN V.D.O.T. RIGHT-OF-WAY. THE SPECIAL PROVISIONS IN FORM MP-63 ARE A PART OF THE VDOT LAND USE PERMIT.
3. UNLESS MORE STRINGENT COMPACTION REQUIREMENTS ARE INDICATED ON THE PLANS OR IN THE SPECIFICATIONS, THE BACKFILL OF EMBANKMENT MATERIAL, THE INSTALLATION OF TRENCH BACKFILL AND THE RESTORATION OF DISTURBED AREAS SHALL BE COMPACTED IN ACCORDANCE WITH THE CURRENT EDITION OF THE V.D.O.T. ROAD AND BRIDGE SPECIFICATIONS. ALL COMPACTION SHALL BE AT ±2% OF THE OPTIMUM MOISTURE CONTENT.
4. ALL SUBGRADE, SUBBASE, BASE AND SHOULDER MATERIAL SHALL BE PLACED AND COMPACTED TO THE DENSITY SPECIFIED IN THE CURRENT EDITION OF THE V.D.O.T. ROAD AND BRIDGE SPECIFICATIONS. ALL COMPACTION SHALL BE AT ±2% OF THE OPTIMUM MOISTURE
5. THE CONTRACTOR SHALL PROVIDE ADEQUATE MEANS OF CLEANING TRUCKS AND/OR OTHER EQUIPMENT OF MUD PRIOR TO ENTERING CONTENT. THE V.D.O.T. RIGHT-OF-WAY. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CLEAN ALL STREETS, ALLAY DUST AND TO TAKE WHATEVER MEASURES NECESSARY TO ENSURE THE ROAD(S) ARE MAINTAINED IN A CLEAN, MUD AND DUST FREE CONDITION AT ALL TIMES.
6. TEMPORARY OR PERMANENT PAVEMENT PATCHES ARE TO BE PLACED IN ALL ROADWAY CUTS WITH HOT MIX WITHIN ONE DAY THE CUTTER MADE IN ACCORDANCE WITH V.D.O.T. REQUIREMENTS. SEE OPWES STANDARD DETAIL SHEET- SANITARY SEWER FOR REQUIREMENTS ON CUT REPLACEMENT IN ROADS WITH ASPHALT CONCRETE BASE AND SURFACE.
7. THE TOP ELEVATION OF EXISTING MANHOLES SHALL BE ADJUSTED TO MEET THE FINAL PAVEMENT ELEVATION AT THE TIME OF FINAL PAVING OPERATIONS. ALL MANHOLES ARE TO BE PROTECTED FROM THE TRAVELING PUBLIC.
8. CONTRACTOR TO ADJUST MANHOLE, VALVE, AND METER BOX COVERS BEFORE PLACING ASPHALT SEAL OAP.
9. THE CONTRACTOR SHALL VISIT THE SITE AND SHALL VERIFY EXISTING CONDITIONS PRIOR TO SUBMITTING A BID FOR THE CONSTRUCTION OF THE PROJECT.
10. WHERE EXISTING NATURAL DRAINAGE DITCHES OR STREAM BANKS ARE DISTURBED DURING CONSTRUCTION THE CONTRACTOR SHALL RESTORE THESE AREAS TO ORIGINAL ALIGNMENT, GRADE AND INVERT.
11. PROPOSED TOP OF CURB GRADES SHALL BE FIELD ADJUSTED AS REQUIRED TO CONFORM TO THE INTENT OF THE TYPICAL SECTION. A SMOOTH GRADE SHALL BE MAINTAINED FROM THE CENTERLINE TO THE PROPOSED EDGE OF PAVEMENT OR FACE OF CURB TO PRECLUDE THE FORMING OF FALSE GUTTERS AND/OR THE PONDING OF WATER ON THE ROADWAY. THE EXISTING PAVEMENT SHALL BE RECAPPED AND/OR REMOVED AND REPLACED AS REQUIRED TO ACCOMPLISH THIS REQUIREMENT. ALL CURB FORMS SHALL BE INSPECTED FOR HORIZONTAL AND VERTICAL ALIGNMENT BY CITY OF FALLS CHURCH OR THEIR AUTHORIZED REPRESENTATIVES PRIOR TO PLACING OF CONCRETE.
12. THE FOLLOWING PROVISIONS SHALL APPLY TO THE USE OF SHEETING AND SHORING:
    a) SHEETING AND SHORING OR OTHER APPROVED METHODS FOR TRENCH BRACING WILL BE REQUIRED ON THIS CONTRACT AS NEEDED TO MEET ALL SAFETY REQUIREMENTS.
    b) UNLESS OTHERWISE DIRECTED BY THE ENGINEER, SHEETING AND SHORING WILL BE REMOVED FROM ALL TRENCHES PRIOR TO BACKFILLING OPERATIONS.
    c) UNLESS SPECIFICALLY IDENTIFIED IN THE CONTRACT DOCUMENTS, NO ADDITIONAL COMPENSATION WILL BE ALLOWED FOR SHEETING AND SHORING.
13. THE CONTRACTOR SHALL RESTORE ALL DISTURBED AREAS WITH SEED AND MULCH OR SOD IN ACCORDANCE WITH THE RESTORATION SCHEDULE NOTED ON THE APPROPRIATE PLAN SHEET.
14. THE CONTRACTOR SHALL RESTORE ALL DRIVEWAYS DISTURBED DURING CONSTRUCTION. RESTORATION SHALL CONSIST OF THE FOLLOWING:
    - GRAVEL DRIVEWAY - PROVIDE MINIMUM 6" COMPACTED 21A
    - ASPHALT DRIVEWAY - PROVIDE 6" COMPACTED 21A WITH MINIMUM 2" SM-9.5A OVERLAY
    - CONCRETE DRIVEWAY - PROVIDE A NEAT SAWCUT CONNECTION, MINIMUM 4" COMPACTED 21A AND 5" CLASS A3 CONCRETE WITH WWF 6X6 - W2.9XW2.9
15. WHERE A PROPOSED PIPE CROSSES OR PARALLELS A STREET, THE ASPHALT SHALL BE NEATLY SAWCUT TO FULL DEPTH. AFTER INSTALLATION OF THE PIPE, THE ROADWAY SHALL BE PATCHED IN ACCORDANCE WITH THE V.D.O.T. LAND USE PERMIT ISSUED FOR THE PROJECT.
16. HORIZONTAL LOCATION OF THE SERVICE CONNECTIONS AT SANITARY SEWER MAINS, IF INDICATED ON THE CONSTRUCTION PLANS, WERE TAKEN FROM TELEVISION INSPECTION REPORTS. ALL SERVICE CONNECTIONS WERE SHOWN TO BE IN THE UPPER TWO QUADRANTS OF THE MAINS. EXCEPT FOR INTERPOLATION OF THE INVERT AT THE SANITARY MAINS, THE ELEVATIONS AND VERTICAL LOCATIONS OF THE SERVICE CONNECTIONS ARE NOT KNOWN. IN SEWER MAINS AS NOTED, TELEVISION INSPECTIONS DID NOT DETECT ANY SERVICE CONNECTIONS AND THE LOCATIONS SHOWN ON THE DRAWING ARE THE MOST PROBABLE POSITIONS FOR SERVICE CONNECTIONS.
17. THE PAVEMENT DESIGN IN THE CONSTRUCTION PLANS WAS PREPARED BASED ON AVAILABLE SUBSURFACE INFORMATION INCLUDING LABORATORY CALIFORNIA BEARING RATIO (CBR) TESTS THAT WERE PERFORMED DURING THE DESIGN SUBSURFACE INVESTIGATION. WHEN THE CONTRACTOR REACHES THE SUBGRADE ELEVATION, ADDITIONAL CBR TEST LOCATIONS MAY BE DIRECTED BY THE ENGINEER FOR SELECTED LOCATIONS BASED ON ACTUAL FIELD CONDITIONS OBSERVED. THE CBR SAMPLES AND TESTS SHALL BE PERFORMED BY A GEOTECHNICAL ENGINEERING FIRM UNDER CONTRACT WITH CITY OF FALLS CHURCH. THE RESULTS OF THE ENGINEER'S EVALUATION OF THE CBR LABORATORY TESTS SHALL BE OBTAINED IN WRITING PRIOR TO THE PLACEMENT OF ANY SUBBASE OR BASE MATERIAL IN THE AREA(S) UNDER CONSIDERATION. THE PROPOSED PAVEMENT DESIGN FOR THE AREA(S) UNDER CONSIDERATION WILL EITHER BE CONFIRMED OR ADJUSTED BY THE ENGINEER BASED ON THE RESULT OF THE CBR TEST RESULTS. THE CONTRACTOR SHALL COOPERATE WITH ENGINEER BY MODIFYING CONSTRUCTION ACTIVITIES AND/OR SCHEDULING IN ORDER TO PERMIT THE ADDITIONAL CBR TESTING. THE CONTRACTOR SHALL NOT BE ENTITLED TO ANY MONETARY DAMAGES WHATSOEVER FOR ANY DELAYS RESULTING FROM THIS TESTING. THE CONTRACTOR'S SOLE RELIEF IS A TIME EXTENSION GRANTED IN ACCORDANCE WITH ARTICLE 8.3.
18. THE CONTRACTOR SHALL RESTORE ALL PROPERTY MONUMENTS HARMED DURING CONSTRUCTION. ALL PROPERTY MONUMENTS LOCATED IN CONSTRUCTION LIMITS SHALL BE LOCATED AND DOCUMENTED BY A LICENSED LAND SURVEYOR PRIOR TO CONSTRUCTION. SHOULD PROPERTY MONUMENTS BE DESTROYED DURING THE COURSE OF CONSTRUCTION, THE CONTRACTOR SHALL HAVE THEM REPLACED TO THEIR ORIGINAL LOCATION BY A LICENSED LAND SURVEYOR AFTER PROJECT CONSTRUCTION IS COMPLETE.

STORM SEWER

1. A WATERTIGHT CONNECTION SHALL BE MADE AT ALL PIPES ENTERING DRAINAGE STRUCTURES. IN ADDITION, WATERTIGHT CONNECTIONS SHALL BE MADE BETWEEN SECTIONS OF PIPE.
2. LENGTHS OF PIPE SHOWN ON THE DRAWINGS ARE MEASURED FROM CENTER OF STRUCTURE TO CENTER OF STRUCTURE.
3. INVERT ELEVATIONS SHOWN ON THE DRAWINGS ARE TAKEN AT THE FACE OF THE STRUCTURE.
4. SHAPE THE INVERTS OF ALL STRUCTURES ACCORDING TO V.D.O.T. STANDARD IS-1.
5. STORM SEWER AND CULVERT PIPE SHALL BE REINFORCED CONCRETE PIPE TO CONFORM TO THE CURRENT A.A.S.H.T.O. DESIGNATION M170, UNLESS OTHERWISE DESIGNATED ON THE PLANS. CLASS III PIPE WILL BE REQUIRED WITHIN THE LIMITS OF V.D.O.T. RIGHT-OF-WAY.
6. MINOR FIELD ADJUSTMENTS IN THE ELEVATION AND ALIGNMENT OF THE STORM SEWER AND STRUCTURE MIGHT BE NECESSARY TO MEET EXISTING CONDITIONS AND PROPOSED FINAL GRADING. THE CONTRACTOR SHALL NOTIFY CITY OF FALLS CHURCH DEPARTMENT OF PUBLIC WORKS AND ENVIRONMENTAL SERVICES PRIOR TO MAKING ANY NECESSARY ADJUSTMENTS.
7. TOP OF STRUCTURES SHALL BE SET TO MATCH CURB AND GUTTER, SIDEWALK AND/OR DITCH CONSTRUCTION.

SANITARY SEWER

1. ALL SANITARY SEWERS IN THIS CONTRACT SHALL BE PVC SDR-35 UNLESS OTHERWISE NOTED.
2. LENGTHS OF PIPE SHOWN ON THE DRAWINGS ARE MEASURED FROM CENTER OF STRUCTURE TO CENTER OF STRUCTURE.
3. IF PVC PIPE IS USED, ALL LATERAL SPUR CONNECTIONS SHALL BE MADE WITH MANUFACTURED PVC "TEE" OR "WYE" FITTINGS. NO SADDLES SHALL BE USED.
4. LATERAL SPURS SHALL EXTEND 12' INSIDE PROPERTY LINES. IF THE UPPER ENDS OF THE LATERAL SPURS ARE GREATER THAN 6' BELOW THE GROUND SURFACE, THEN THE CONTRACTOR SHALL INSTALL TWO 45° BENDS AND A VERTICAL RISER (ALL 4" DIAMETER) TO WITHIN 4' OF THE GROUND SURFACE. THE INVERT SHOWN IN THE PROFILE IS AT THE BOTTOM OF THE LOWER 45° BEND.
5. AS-BUILT DRAWINGS FOR ALL NEW SANITARY SEWER INSTALLATIONS AND/OR ADJUSTMENTS TO EXISTING SANITARY SEWER FACILITIES SHALL BE PREPARED IN ACCORDANCE WITH THE CITY OF FALLS CHURCH.
6. WHEN AN EXISTING SANITARY SEWER LINE IS REPLACED, ALL EXISTING SANITARY SEWER LATERAL SPUR LINES SHALL BE RECONNECTED TO NEW SANITARY SEWER. THESE SANITARY SEWER LATERAL SPUR LINE STREET TAPS SHALL BE PROVIDED STARTING AT A POINT 2-FEET TO 6-FEET FROM THE MAIN SEWER, OR IF NECESSARY, AT A LONGER DISTANCE TO ENSURE THAT THE EXISTING SANITARY SEWER LATERAL PIPE IS IN GOOD CONDITION.
7. THE CONTRACTOR SHALL OBTAIN A CITY OF FALLS CHURCH PLUMBING PERMIT PRIOR TO THE CONNECTION OF ANY SANITARY SEWER SPUR LINE TO THE MAIN SANITARY SEWER.

SURVEY INFORMATION

THIS TOPOGRAPHY WAS COMPILED FROM JULY 17, 2013 TO AUGUST 08, 2013 FIELD LOCATIONS. DRAFTING WAS FINISHED ON AUGUST 15, 2013.

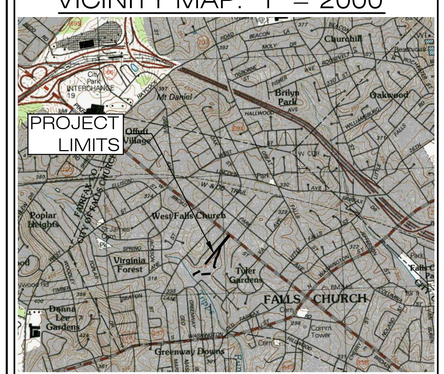
PROPERTY BOUNDARIES AS SHOWN ARE TAKEN FROM THE EXISTING DEEDS AND PLATS OF RECORD.

MONUMENTATION AS SHOWN WAS FIELD LOCATED, AND THE PROPRIETIES SHOWN ARE A" BEST FIT". A

BOUNDARY SURVEY WAS NOT PERFORMED BY PENNONI AND THIS SURVEY SHOULD NOT BE CONSTRUED AS SUCH.

THE COORDINATE GRID AND ELEVATIONS ARE VIRGINIA STATE GRID NAD 83, NGVD88 AND WAS BASED UPON FAIRFAX COUNTY MONUMENTS 45, 140, 150, 137.

VICINITY MAP: 1" = 2000'



SOURCE: USGS 7.5 MINUTE SERIES TOPOGRAPHIC MAP, FALLS CHURCH, VA QUADRANGLE, 1994.
LATITUDE: 38° 53' 2.66" N
LONGITUDE: 77° 10' 49.95" W

OWNER/DEVELOPER

CITY OF FALLS CHURCH
DEPARTMENT OF PUBLIC WORKS
300 PARK AVENUE, SUITE 100 WEST
FALLS CHURCH, VA 22046
PHONE: (703) 248-5350
ATTN: JASON WIDSTROM

BASE INFORMATION

PENNONI ASSOCIATES
208 CHURCH STREET, SE
LEESBURG, VIRGINIA 20175
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ENGINEER & DESIGNER

WILLIAMSBURG ENVIRONMENTAL GROUP, INC.
150 RIVERSIDE PARKWAY, SUITE 301
FREDERICKSBURG, VA 22406
PHONE: (540) 785-5544
ATTN: SCOTT BLOSSOM AND GEORGE RHODES

STATISTICAL DATA

DIRECTIONS TO THE SITE:
FROM FALLS CHURCH DEPARTMENT OF PUBLIC WORKS, HEAD NORTHWEST ON PARK AVENUE TOWARD NORTH VIRGINIA AVENUE. TAKE A LEFT ONTO NORTH VIRGINIA AVENUE, PASS WEST BROAD STREET (ROUTE 7) AND CONTINUE ONTO SOUTH VIRGIINA AVENUE. TURN RIGHT ONTO SOUTH VIRGINIA AVENUE AND THEN TAKE FIRST RIGHT ONTO ROLLINS STREET. PROJECT ENTRANCE WILL BE ON THE END OF ROLLINS STREET.

HORIZONTAL DATUM: NAD 83 VIRGINIA STATE PLANE NORTH
VERTICAL DATUM: NGVD 88.

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5A	CROSS SECTION PLAN UPPER	L1-04	TREE INVENTORY PLAN (PENNONI)
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27	STORMDRAIN RETROFIT		
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COMMONWEALTH OF VIRGINIA
SCOTT C. BLOSSOM
Lic. No. 40287
1/20/14
PROFESSIONAL ENGINEER

COMMONWEALTH OF VIRGINIA
GEORGE C. RHODES III
Lic. No. 000894
1/20/2014
LANDSCAPE ARCHITECT

DATE: 11/7/13
FIRST SUBMITTAL

REVISIONS:

DATE	
12/16/13	REVISIONS MADE PER REQUEST
	BY CITY OF FALLS CHURCH
01/20/14	REVISIONS MADE PER REQUEST
	BY CITY OF FALLS CHURCH

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Environmental Consultants

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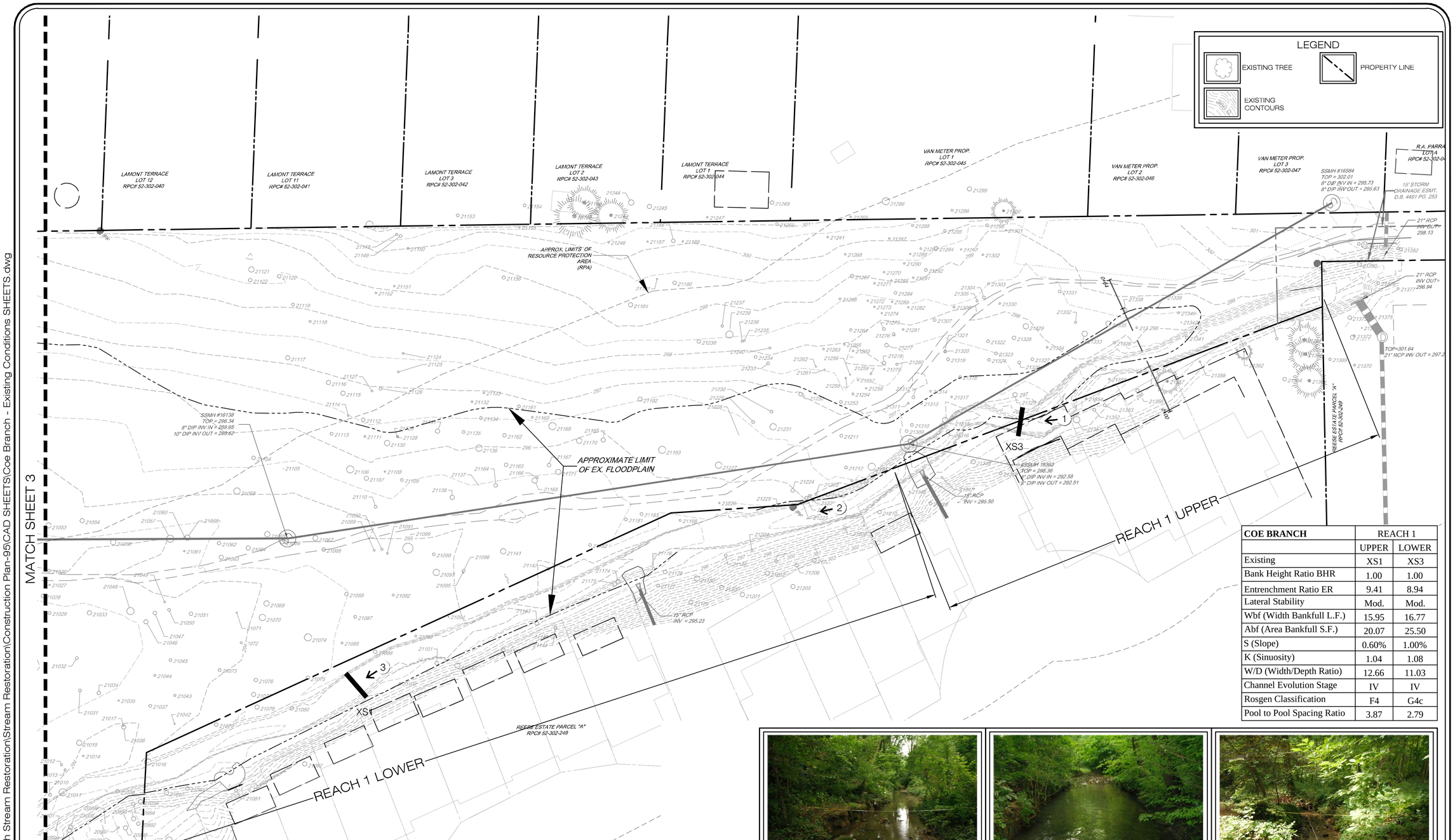

COE BRANCH	REACH 1	
	UPPER	LOWER
Existing	XS1	XS3
Bank Height Ratio BHR	1.00	1.00
Entrenchment Ratio ER	9.41	8.94
Lateral Stability	Mod.	Mod.
Wbf (Width Bankfull L.F.)	15.95	16.77
Abf (Area Bankfull S.F.)	20.07	25.50
S (Slope)	0.60%	1.00%
K (Sinuosity)	1.04	1.08
W/D (Width/Depth Ratio)	12.66	11.03
Channel Evolution Stage	IV	IV
Rosgen Classification	F4	G4c
Pool to Pool Spacing Ratio	3.87	2.79

COVERAGE VALUES	
Occasional	<5%
Light	5>15%
Moderate	15>30%
Heavy	>30%

INVASIVE SPECIES - COE BRANCH			
COMMON NAME	SCIENTIFIC NAME	INVASIVE LEVEL	COVERAGE
GARLIC MUSTARD	Alliaria petiolata	Highly	Occasional
PORCELAIN BERRY	Ampelopsis brevipedunculata	Highly	Occasional
ORIENTAL BITTERSWEET	Celastrus orbiculata	Highly	Moderate
BUSH HONEYSUCKLE	Lonicera morrowii	Highly	Moderate
JAPANESE STILIT GRASS	Microstegium vimineum	Highly	Light
ROSE	Rosa multiflora	Highly	Heavy
WINEBERRY	Rubus phoenicolasius	Highly	Light
MIMMOSA	Albizia julibrissin	Moderately	Occasional
WINTERCREEPER	Euonymus fortunei	Moderately	Heavy
GILL-OVER-THE-GROUND	Glechoma hederacea	Moderately	Light
ENGLISH IVY	Hedera helix	Moderately	Heavy
BAMBOO	Phyllostachys aurea	Moderately	Moderate
TRUMPET CREEPER	Campsis radicans	Occasionally	Light
RED MORNING-GLORY	Ipomoea coccinea	Occasionally	Occasional

REACH 1 LOWER: RIFFLE CROSS-SECTION 1 - LOOKING DOWNSTREAM:
- GOOD FLOODPLAIN CONNECTIVITY, ER 9.41
- MODERATE W/D RATIO, BHR 1.0
- SAND/GRAVEL SUBSTRATE WITH SOME COBBLE
- MATURE NATIVE RIPARIAN BUFFER WITH HEAVY INVASIVE UNDERSTORY

REACH 1 LOWER: POOL - LOOKING DOWNSTREAM:
- GOOD FLOODPLAIN CONNECTIVITY, ER 9.74
- MODERATE W/D RATIO, BHR 1.0
- SILT/SAND SUBSTRATE WITH SOME COBBLE/BOULDER
- MATURE NATIVE RIPARIAN BUFFER WITH HEAVY INVASIVE UNDERSTORY

REACH 1 UPPER: RIFFLE CROSS-SECTION 3 - LOOKING DOWNSTREAM:
- GOOD FLOODPLAIN CONNECTIVITY, ER 8.94
- MODERATE W/D RATIO, BHR 1.0
- SAND/GRAVEL SUBSTRATE WITH SOME COBBLE
- MATURE NATIVE RIPARIAN BUFFER WITH HEAVY INVASIVE UNDERSTORY

CONTOUR INTERVAL = 1/2 FOOT

20' 0' 10' 20' 40' 60'

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WILLIAMSBURG ENVIRONMENTAL GROUP, INC.
Environmental Consultants

EXISTING CONDITIONS
COE BRANCH STREAM RESTORATION
CITY OF FALLS CHURCH, VIRGINIA

COMMONWEALTH OF VIRGINIA
SCOTT C. BLOSSOM
Lic. No. 40287
11/2/13
PROFESSIONAL ENGINEER

REVISIONS:
DATE:

DRAWN BY: CDP, RH
DESIGNED BY: CDP
DATE: 11/07/2013
CHECKED BY: SCB, GCR
SCALE: 1"=20'

SHEET: 2 OF 43
JOB#: 4966

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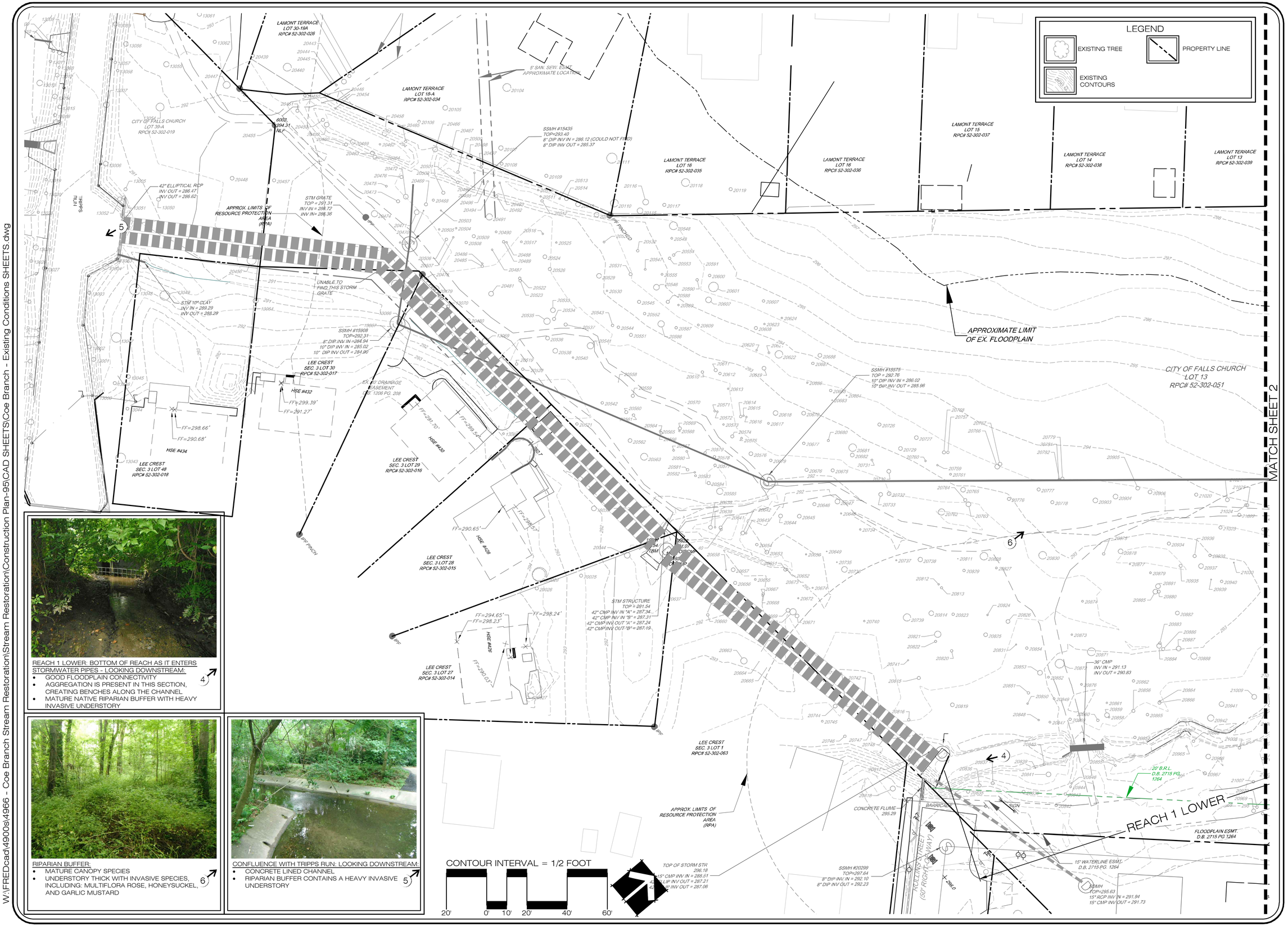

REACH 1 LOWER: BOTTOM OF REACH AS IT ENTERS STORMWATER PIPES - LOOKING DOWNSTREAM:

- GOOD FLOODPLAIN CONNECTIVITY
- AGGREGATION IS PRESENT IN THIS SECTION, CREATING BENCHES ALONG THE CHANNEL
- MATURE NATIVE RIPARIAN BUFFER WITH HEAVY INVASIVE UNDERSTORY

4

RIPARIAN BUFFER:

- MATURE CANOPY SPECIES
- UNDERSTORY THICK WITH INVASIVE SPECIES, INCLUDING: MULTIFLORA ROSE, HONEYSUCKEL, AND GARLIC MUSTARD

6

CONFLUENCE WITH TRIPPS RUN: LOOKING DOWNSTREAM:

- CONCRETE LINED CHANNEL
- RIPARIAN BUFFER CONTAINS A HEAVY INVASIVE UNDERSTORY

5

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(540) 759-5544

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EXISTING CONDITIONS
COE BRANCH STREAM RESTORATION
CITY OF FALLS CHURCH, VIRGINIA

COMMONWEALTH OF VIRGINIA
SCOTT C. BLOSSOM
Lic. No. 40287
11/2/13
PROFESSIONAL ENGINEER

REVISIONS:
DATE:

DRAWN BY: CDP, RH
DESIGNED BY: CDP
DATE: 11/07/2013
CHECKED BY: SCB, GCR
SCALE: 1"=20'

SHEET: 3 OF 43
JOB#: 4966

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CONTOUR INTERVAL = 1/2 FOOT

40' 0' 20' 40' 80' 120'

LEGEND

- EXISTING TREE
- EXISTING CONTOURS
- PROPOSED LIMITS OF DISTURBANCE
- PROPOSED LIMITS OF GRADING
- PROPOSED ROOT PRUNING
- PROPERTY LINE
- PROPOSED CONTOURS
- PROPOSED TOE PROTECTION (SEE SHEETS 5A AND 6A FOR STATIONING OF ROCK AND BOULDER TOE)
- PROPOSED RAISED TRAL

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MASTER PLAN
COE BRANCH STREAM RESTORATION
CITY OF FALLS CHURCH, VIRGINIA

COMMONWEALTH OF VIRGINIA
SCOTT C. BLOSSOM
Lic. No. 40287
12/16/13
PROFESSIONAL ENGINEER

REVISIONS:

DATE:	
12/16	REVISIONS MADE PER REQUEST BY CITY OF FALLS CHURCH

DRAWN BY: CDP, RH
DESIGNED BY: CDP
DATE: 11/07/2013
CHECKED BY: SCB, GCR
SCALE: 1"=40'

SHEET: 4 OF 43
JOB#: 4966

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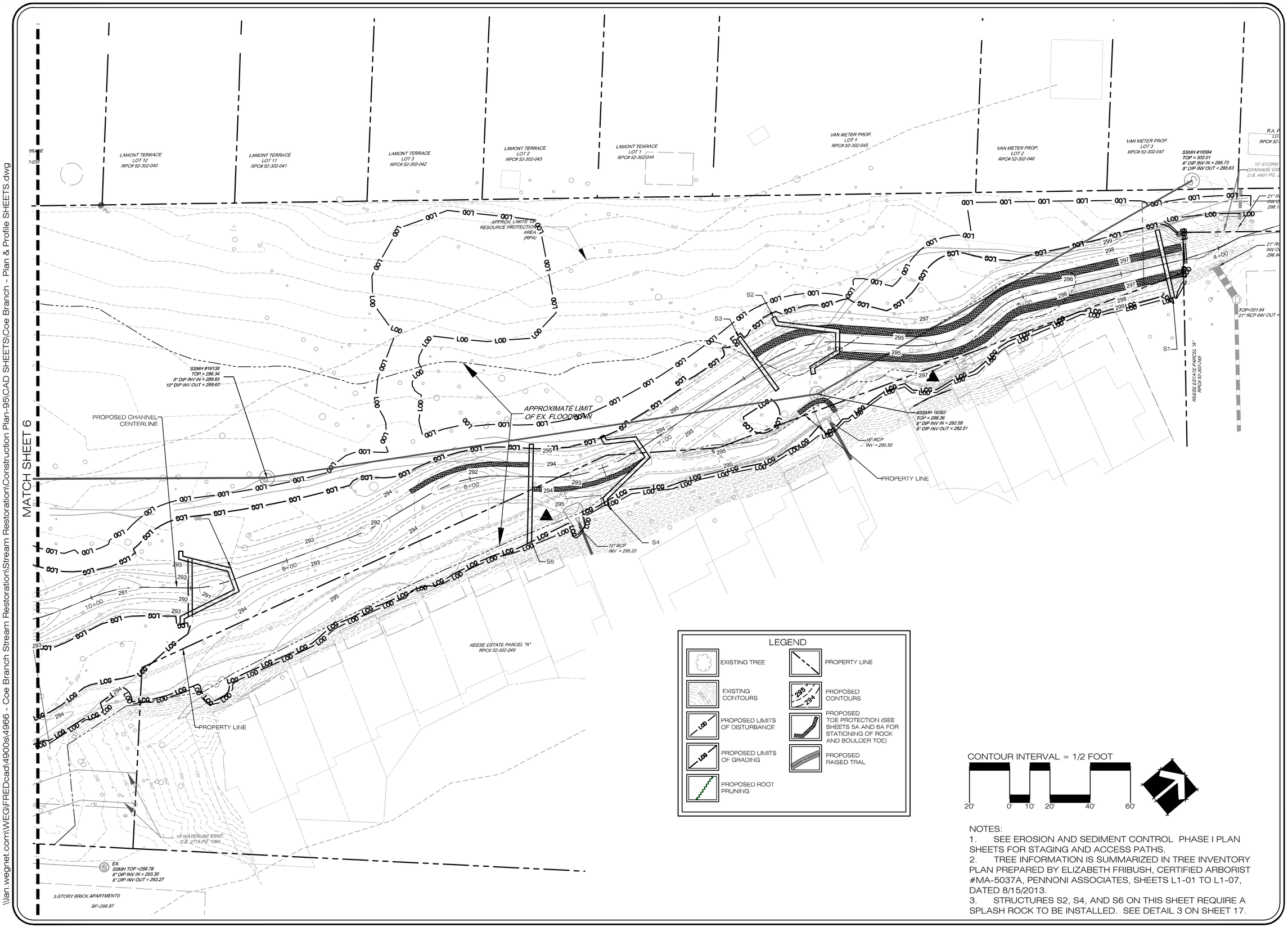

LEGEND

- EXISTING TREE
- EXISTING CONTOURS
- PROPOSED LIMITS OF DISTURBANCE
- PROPOSED LIMITS OF GRADING
- PROPOSED ROOT PRUNING
- PROPERTY LINE
- PROPOSED CONTOURS
- PROPOSED TOE PROTECTION (SEE SHEETS 5A AND 6A FOR STATIONING OF ROCK AND BOULDER TOE)
- PROPOSED RAISED TRAL

CONTOUR INTERVAL = 1/2 FOOT

20' 0' 10' 20' 40' 60'

NOTES:

1. SEE EROSION AND SEDIMENT CONTROL PHASE I PLAN SHEETS FOR STAGING AND ACCESS PATHS.
2. TREE INFORMATION IS SUMMARIZED IN TREE INVENTORY PLAN PREPARED BY ELIZABETH FRIBUSH, CERTIFIED ARBORIST #MA-5037A, PENNONI ASSOCIATES, SHEETS L1-01 TO L1-07, DATED 8/15/2013.
3. STRUCTURES S2, S4, AND S6 ON THIS SHEET REQUIRE A SPLASH ROCK TO BE INSTALLED. SEE DETAIL 3 ON SHEET 17.

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RESTORATION PLAN UPPER COE BRANCH STREAM RESTORATION CITY OF FALLS CHURCH, VIRGINIA

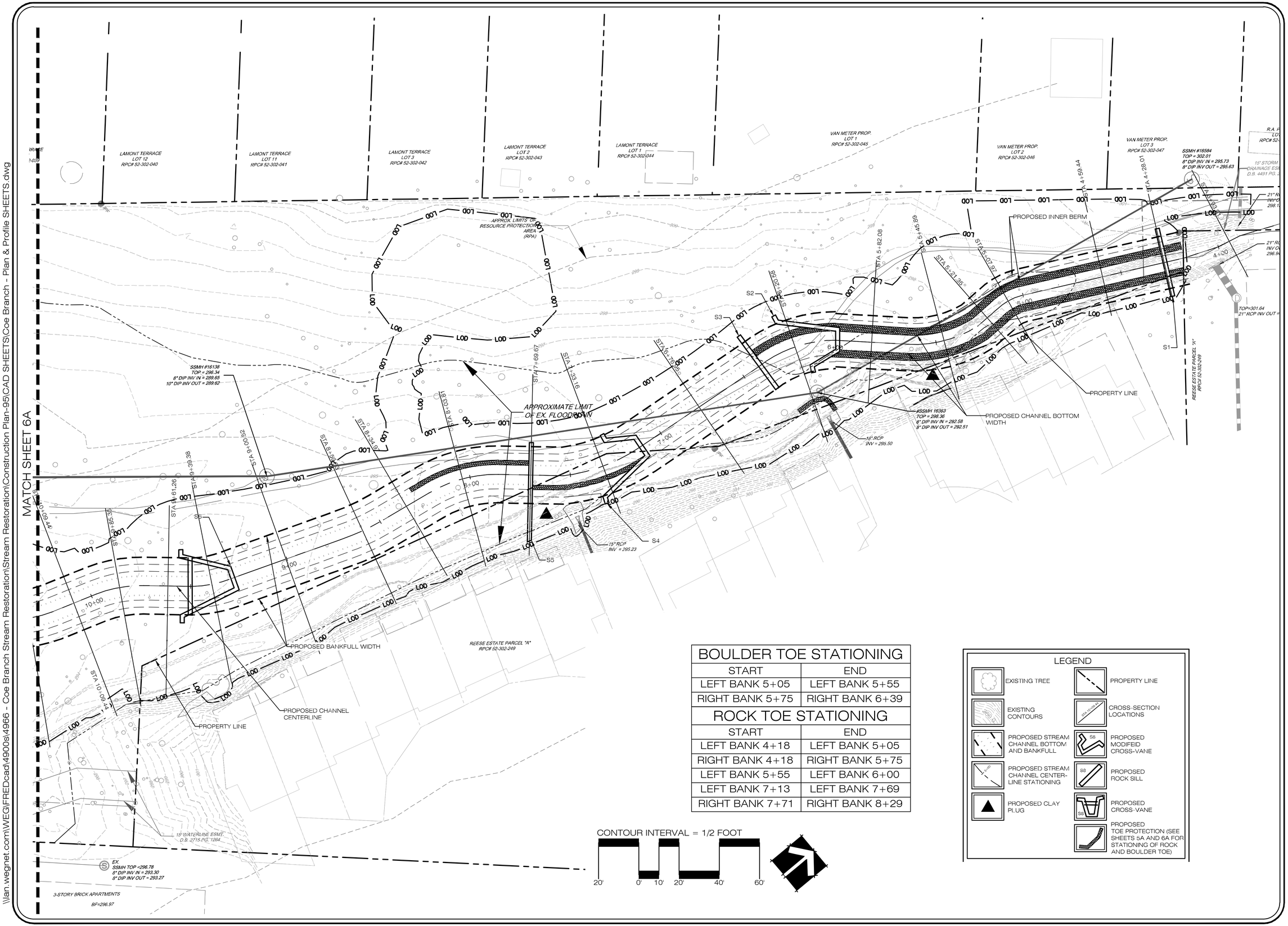
COMMONWEALTH OF VIRGINIA
SCOTT C. BLOSSOM
Lic. No. 40287
12/16/13
PROFESSIONAL ENGINEER

REVISIONS:

DATE:	
12/16/13	REVISIONS MADE PER REQUEST BY CITY OF FALLS CHURCH

DRAWN BY: CDP, RH
DESIGNED BY: CDP
DATE: 11/07/2013
CHECKED BY: SCB, GCR
SCALE: 1"=20'

SHEET: 5 OF 43
JOB#: 4966



BOULDER TOE STATIONING	
START	END
LEFT BANK 5+05	LEFT BANK 5+55
RIGHT BANK 5+75	RIGHT BANK 6+39
ROCK TOE STATIONING	
START	END
LEFT BANK 4+18	LEFT BANK 5+05
RIGHT BANK 4+18	RIGHT BANK 5+75
LEFT BANK 5+55	LEFT BANK 6+00
LEFT BANK 7+13	LEFT BANK 7+69
RIGHT BANK 7+71	RIGHT BANK 8+29

LEGEND

- EXISTING TREE
- EXISTING CONTOURS
- PROPOSED STREAM CHANNEL BOTTOM AND BANKFULL
- PROPOSED STREAM CHANNEL CENTER-LINE STATIONING
- PROPOSED CLAY PLUG
- PROPERTY LINE
- CROSS-SECTION LOCATIONS
- PROPOSED MODIFEID CROSS-VANE
- PROPOSED ROCK SILL
- PROPOSED CROSS-VANE
- PROPOSED TOE PROTECTION (SEE SHEETS 5A AND 6A FOR STATIONING OF ROCK AND BOULDER TOE)

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CROSS-SECTION PLAN UPPER
COE BRANCH STREAM RESTORATION
CITY OF FALLS CHURCH, VIRGINIA

COMMONWEALTH OF VIRGINIA
SCOTT C. BLOSSOM
Lic. No. 40287
12/16/13
PROFESSIONAL ENGINEER

REVISIONS:

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DRAWN BY: CDP, RH
DESIGNED BY: CDP
DATE: 11/07/2013
CHECKED BY: SCB, GCR
SCALE: 1"=20'

SHEET: 5A OF 43
JOB#: 4966

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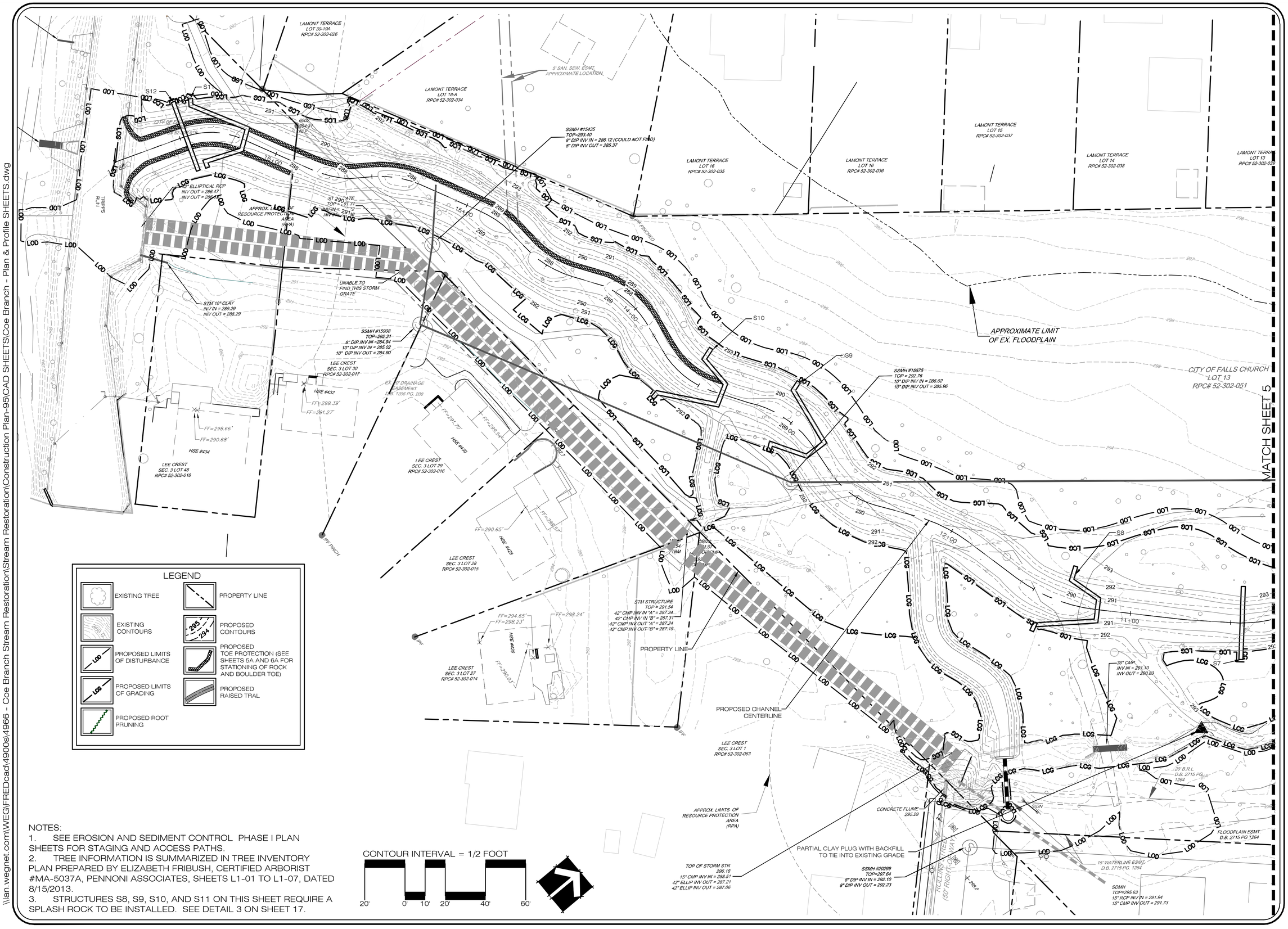

NOTES:

1. SEE EROSION AND SEDIMENT CONTROL PHASE I PLAN SHEETS FOR STAGING AND ACCESS PATHS.
2. TREE INFORMATION IS SUMMARIZED IN TREE INVENTORY PLAN PREPARED BY ELIZABETH FRIBUSH, CERTIFIED ARBORIST #MA-5037A, PENNONI ASSOCIATES, SHEETS L1-01 TO L1-07, DATED 8/15/2013.
3. STRUCTURES S8, S9, S10, AND S11 ON THIS SHEET REQUIRE A SPLASH ROCK TO BE INSTALLED. SEE DETAIL 3 ON SHEET 17.

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RESTORATION PLAN LOWER COE BRANCH STREAM RESTORATION CITY OF FALLS CHURCH, VIRGINIA

COMMONWEALTH OF VIRGINIA
SCOTT C. BLOSSOM
Lic. No. 40287
PROFESSIONAL ENGINEER

REVISIONS:

DATE:	
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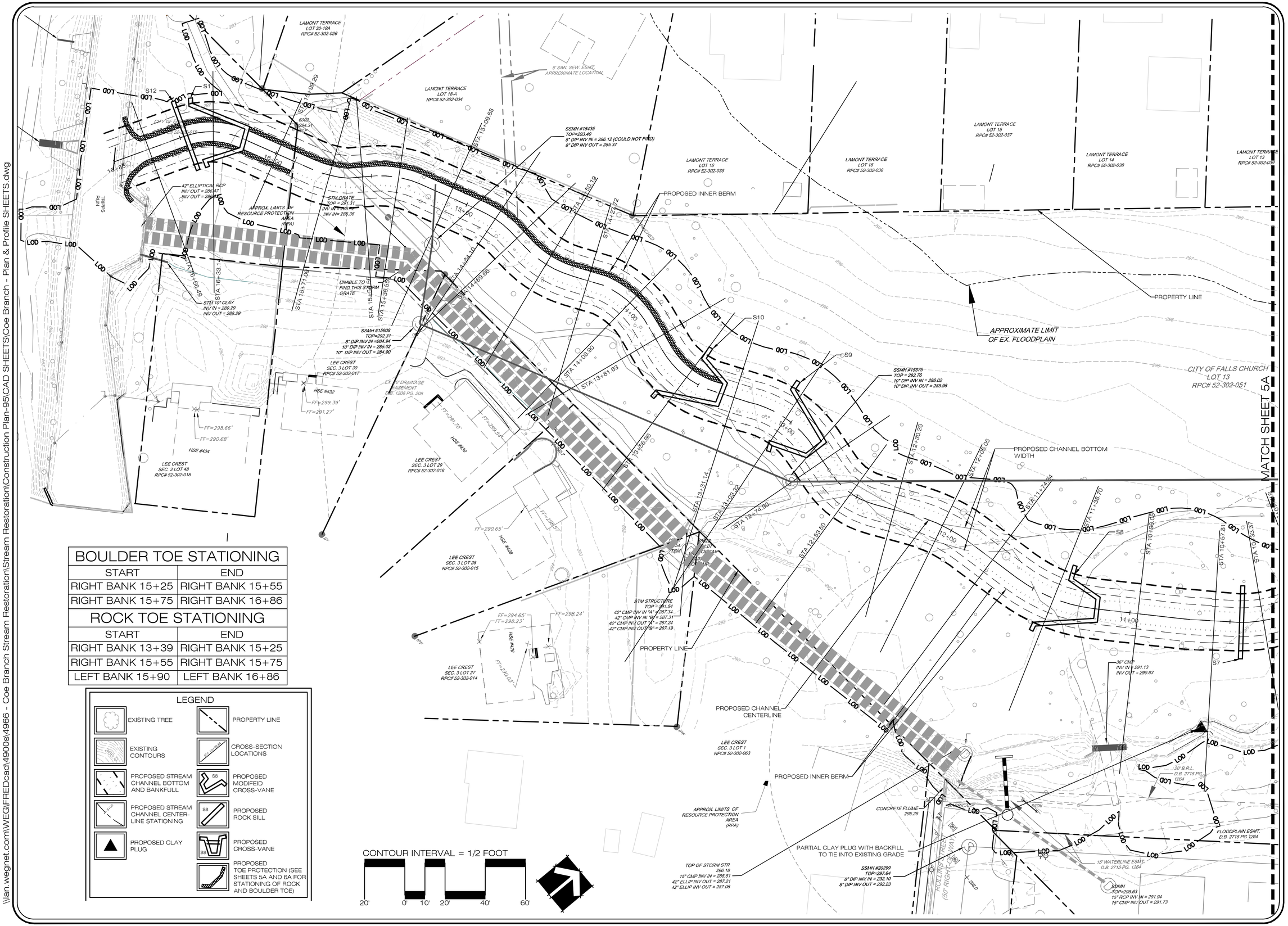
DRAWN BY: CDP, RH
DESIGNED BY: CDP
DATE: 11/07/2013
CHECKED BY: SCB, GCR
SCALE: 1"=20'

SHEET: 6 OF 43
JOB#: 4966



BOULDER TOE STATIONING	
START	END
RIGHT BANK 15+25	RIGHT BANK 15+55
RIGHT BANK 15+75	RIGHT BANK 16+86
ROCK TOE STATIONING	
START	END
RIGHT BANK 13+39	RIGHT BANK 15+25
RIGHT BANK 15+55	RIGHT BANK 15+75
LEFT BANK 15+90	LEFT BANK 16+86

LEGEND

- EXISTING TREE
- EXISTING CONTOURS
- PROPOSED STREAM CHANNEL BOTTOM AND BANKFULL
- PROPOSED STREAM CHANNEL CENTER-LINE STATIONING
- PROPOSED CLAY PLUG
- PROPERTY LINE
- CROSS-SECTION LOCATIONS
- PROPOSED MODIFEID CROSS-VANE
- PROPOSED ROCK SILL
- PROPOSED CROSS-VANE
- PROPOSED TOE PROTECTION (SEE SHEETS 5A AND 6A FOR STATIONING OF ROCK AND BOULDER TOE)

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CROSS-SECTION PLAN LOWER
COE BRANCH STREAM RESTORATION
CITY OF FALLS CHURCH, VIRGINIA

COMMONWEALTH OF VIRGINIA
SCOTT C. BLOSSOM
Lic. No. 40287
PROFESSIONAL ENGINEER

REVISIONS:

DATE:	
12/16/13	REVISIONS MADE PER REQUEST BY CITY OF FALLS CHURCH

DRAWN BY: CDP, RH
DESIGNED BY: CDP
DATE: 11/07/2013
CHECKED BY: SCB, GCR
SCALE: 1"=20'

SHEET: 6A OF 43
JOB#: 4966

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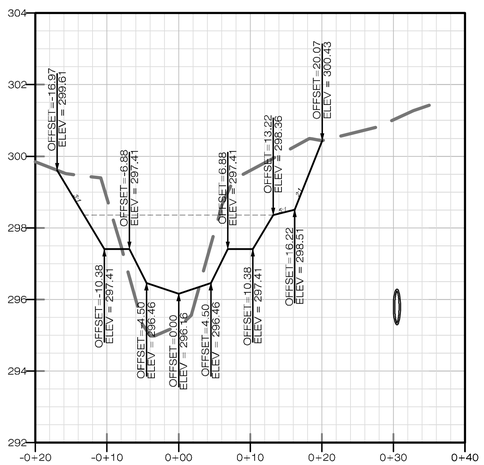
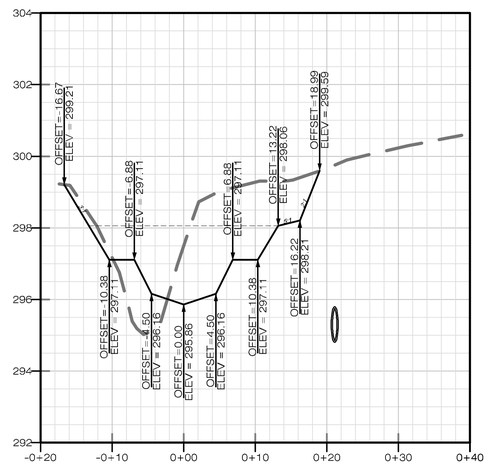


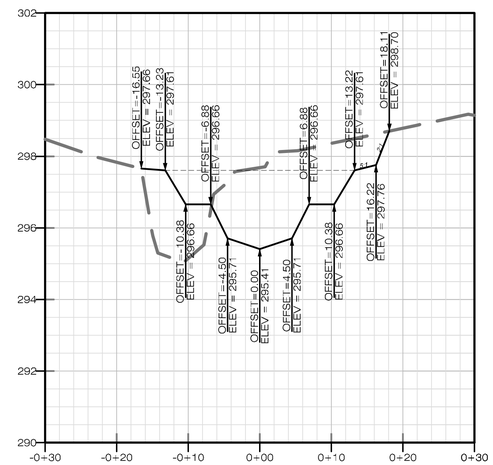
CROSS-SECTION STA. 4+28.01

VERTICAL SCALE: 1" = 2' HORIZONTAL SCALE: 1" = 10'



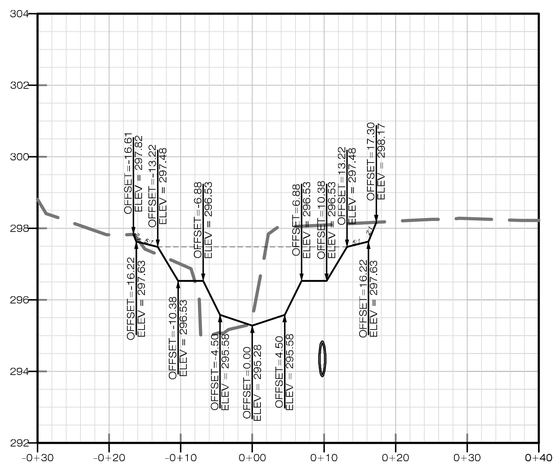
CROSS-SECTION STA. 4+59.44

VERTICAL SCALE: 1" = 2' HORIZONTAL SCALE: 1" = 10'



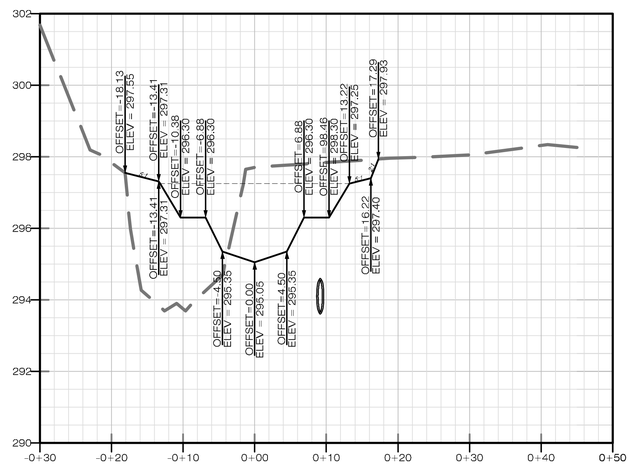
CROSS-SECTION STA. 5+07.97

VERTICAL SCALE: 1" = 2' HORIZONTAL SCALE: 1" = 10'



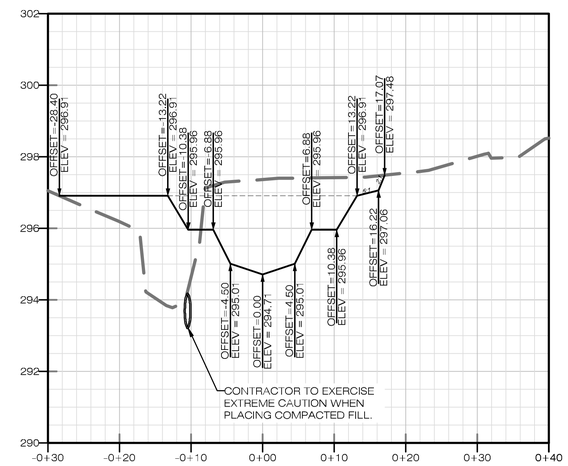
CROSS-SECTION STA. 5+21.35

VERTICAL SCALE: 1" = 2' HORIZONTAL SCALE: 1" = 10'



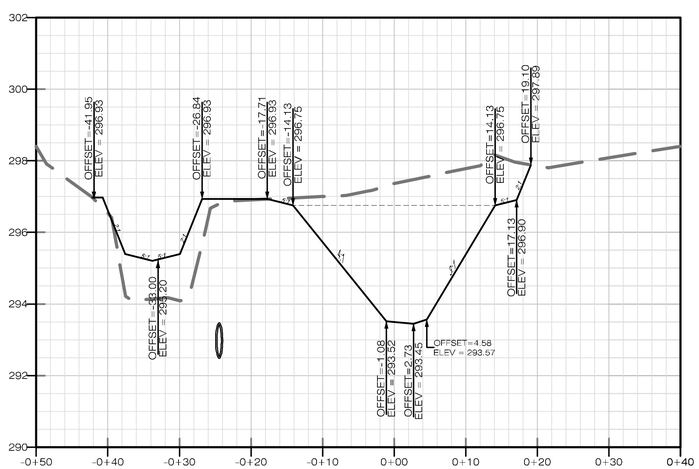
CROSS-SECTION STA. 5+45.89

VERTICAL SCALE: 1" = 2' HORIZONTAL SCALE: 1" = 10'



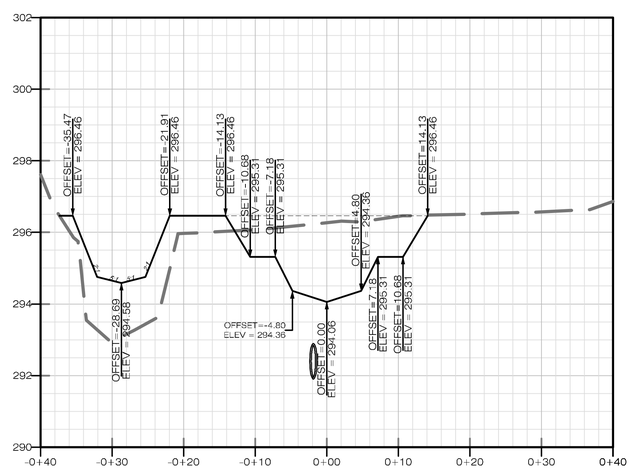
CROSS-SECTION STA. 5+82.08

VERTICAL SCALE: 1" = 2' HORIZONTAL SCALE: 1" = 10'



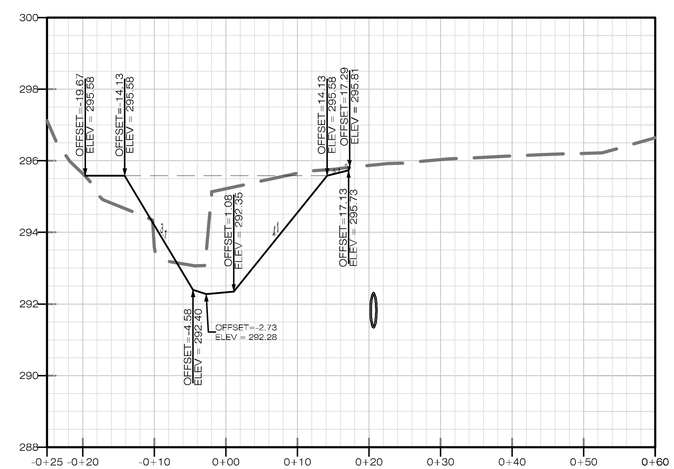
CROSS-SECTION STA. 6+20.58

VERTICAL SCALE: 1" = 2' HORIZONTAL SCALE: 1" = 10'



CROSS-SECTION STA. 6+76.95

VERTICAL SCALE: 1" = 2' HORIZONTAL SCALE: 1" = 10'



CROSS-SECTION STA. 7+33.16

VERTICAL SCALE: 1" = 2' HORIZONTAL SCALE: 1" = 10'

LEGEND

- EXISTING GRADE
- PROPOSED GRADE
- PROPOSED BANKFULL
- EXISTING SANITARY SEWER LINE

NOTES:

- INSTREAM STRUCTURES ARE INTENTIONALLY NOT SHOWN IN THESE CROSS-SECTIONS. THE CROSS-SECTIONS ARE MEANT TO HIGHLIGHT THE EXISTING AND PROPOSED GRADE CONDITIONS, SLOPES, AND ELEVATIONS.
- REFER TO OTHER SHEETS FOR INFORMATION RELATED TO INSTREAM STRUCTURES, STREAMBED REINFORCEMENT, BOULDER TOE PROTECTION, BURIED ROCK TOE PROTECTION, COIR MATTING, SEEDING, AND PLANTING.
- CONTRACTOR TO PLACE COMPACTED STRUCTURAL FILL ACCORDING TO SPECIFICATIONS PROVIDED IN GEOTECNICAL REPORT IN ALL AREAS DEPICTED IN CROSS-SECTIONS BETWEEN EXISTING AND PROPOSED GRADE.
- ALL CROSS-SECTIONS SHOWN ARE LOOKING DOWN STREAM.

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WILLIAMSBURG ENVIRONMENTAL GROUP, INC.
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PROPOSED CROSS SECTIONS
COE BRANCH STREAM RESTORATION
CITY OF FALLS CHURCH, VIRGINIA

COMMONWEALTH OF VIRGINIA
SCOTT C. BLOSSOM
Lic. No. 40287
11/2/13
PROFESSIONAL ENGINEER

REVISIONS:
DATE:

DRAWN BY: CDP, RH
DESIGNED BY: CDP
DATE: 11/07/2013
CHECKED BY: SCB, GCR
SCALE: 1"=20'

SHEET: 7 OF 43
JOB#: 4966

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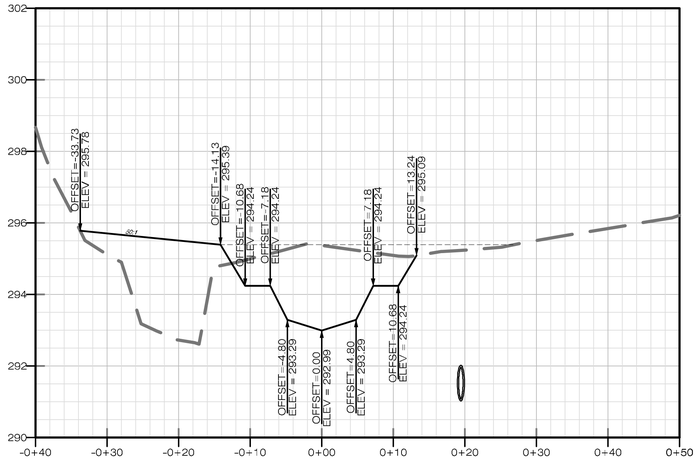
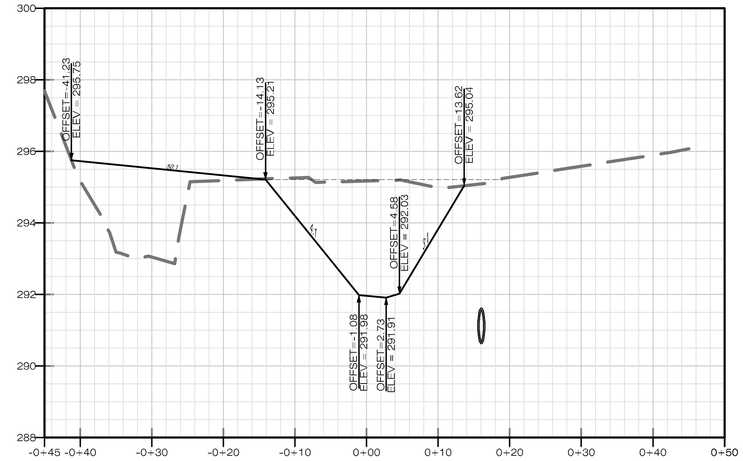


CROSS-SECTION STA. 7+69.67

VERTICAL SCALE: 1" = 2' HORIZONTAL SCALE: 1" = 10'



CROSS-SECTION STA. 8+03.81

VERTICAL SCALE: 1" = 2' HORIZONTAL SCALE: 1" = 10'

LEGEND

- EXISTING GRADE
- PROPOSED GRADE
- PROPOSED BANKFULL
- EXISTING SANITARY SEWER LINE

NOTES:

- INSTREAM STRUCTURES ARE INTENTIONALLY NOT SHOWN IN THESE CROSS-SECTIONS. THE CROSS-SECTIONS ARE MEANT TO HIGHLIGHT THE EXISTING AND PROPOSED GRADE CONDITIONS, SLOPES, AND ELEVATIONS.
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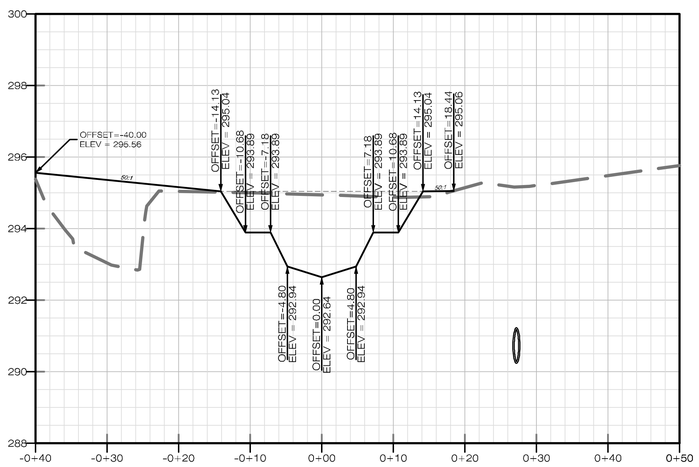
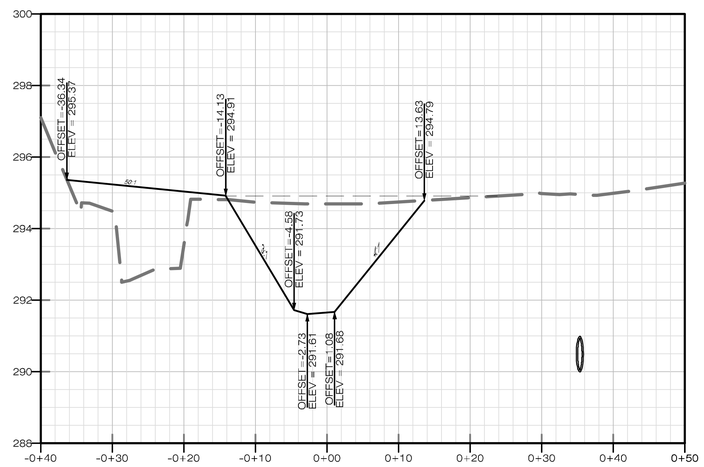
- CONTRACTOR TO PLACE COMPACTED STRUCTURAL FILL ACCORDING TO SPECIFICATIONS PROVIDED IN GEOTECNICAL REPORT IN ALL AREAS DEPICTED IN CROSS-SECTIONS BETWEEN EXISTING AND PROPOSED GRADE.
- ALL CROSS-SECTIONS SHOWN ARE LOOKING DOWN STREAM.



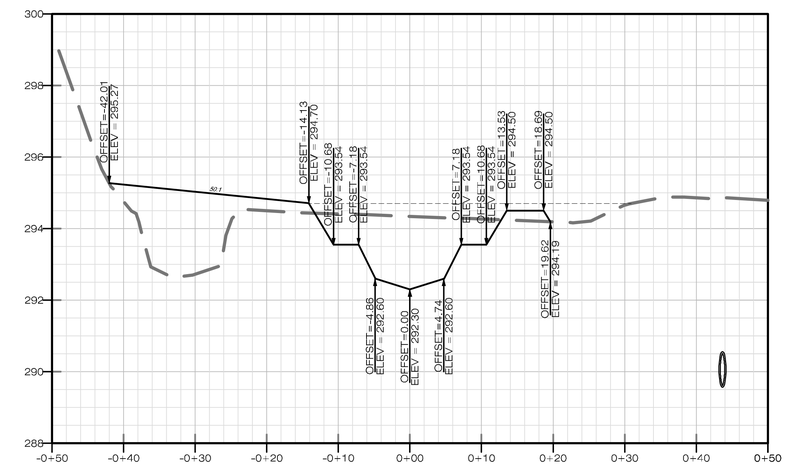
CROSS-SECTION STA. 8+34.97

VERTICAL SCALE: 1" = 2' HORIZONTAL SCALE: 1" = 10'



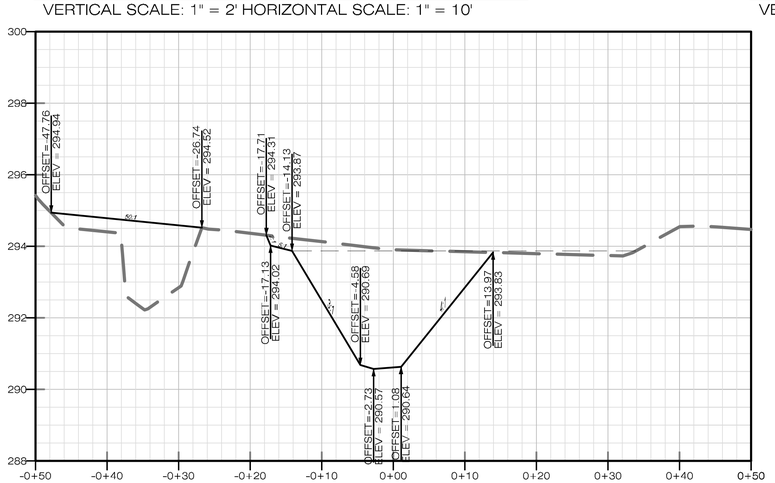
CROSS-SECTION STA. 8+59.83

VERTICAL SCALE: 1" = 2' HORIZONTAL SCALE: 1" = 10'



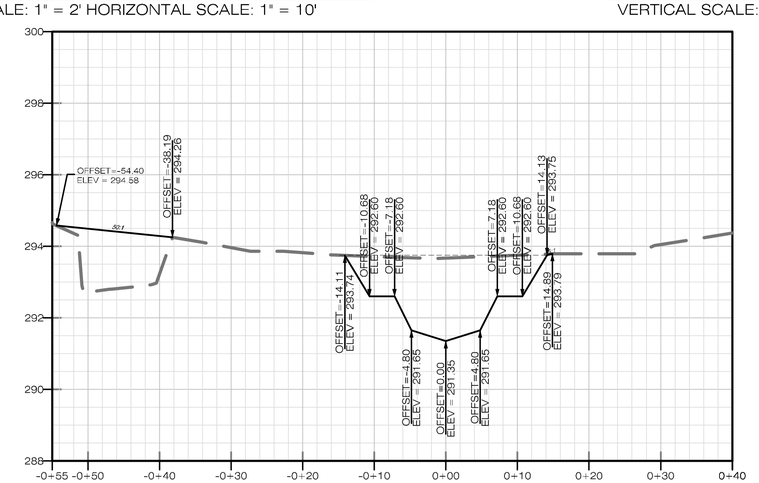
CROSS-SECTION STA. 9+00.52

VERTICAL SCALE: 1" = 2' HORIZONTAL SCALE: 1" = 10'



CROSS-SECTION STA. 9+39.38

VERTICAL SCALE: 1" = 2' HORIZONTAL SCALE: 1" = 10'



CROSS-SECTION STA. 9+61.26

VERTICAL SCALE: 1" = 2' HORIZONTAL SCALE: 1" = 10'

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PROPOSED CROSS SECTION
COE BRANCH STREAM RESTORATION
CITY OF FALLS CHURCH, VIRGINIA

COMMONWEALTH OF VIRGINIA
SCOTT C. BLOSSOM
Lic. No. 40287
11/2/13
PROFESSIONAL ENGINEER

REVISIONS:
DATE:

DRAWN BY: CDP, RH
DESIGNED BY: CDP
DATE: 11/07/2013
CHECKED BY: SCB, GCR
SCALE: 1"=20'

SHEET: 8 OF 43
JOB#: 4966

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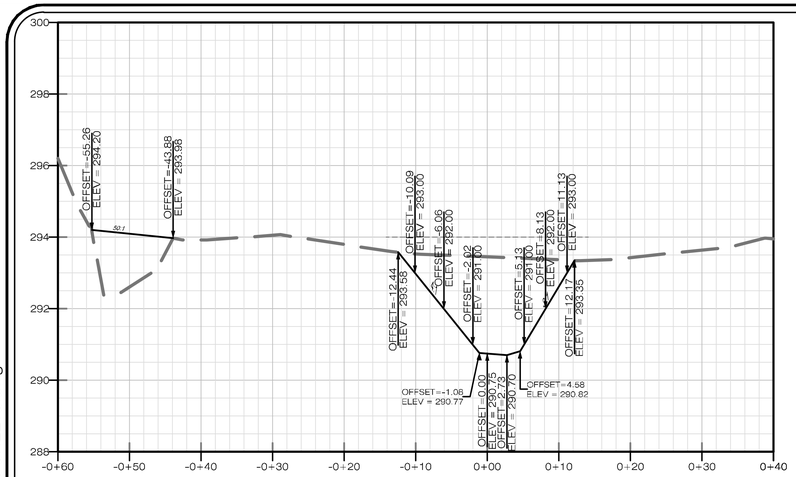
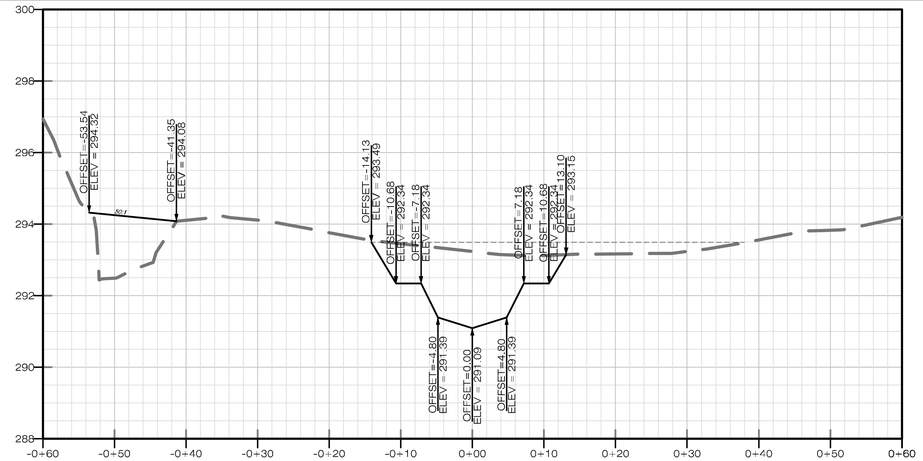


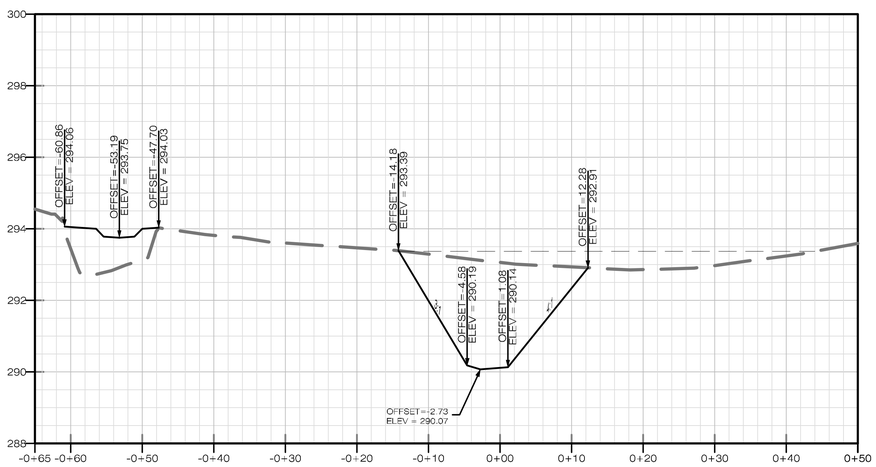
CROSS-SECTION STA. 9+85.35

VERTICAL SCALE: 1" = 2' HORIZONTAL SCALE: 1" = 10'



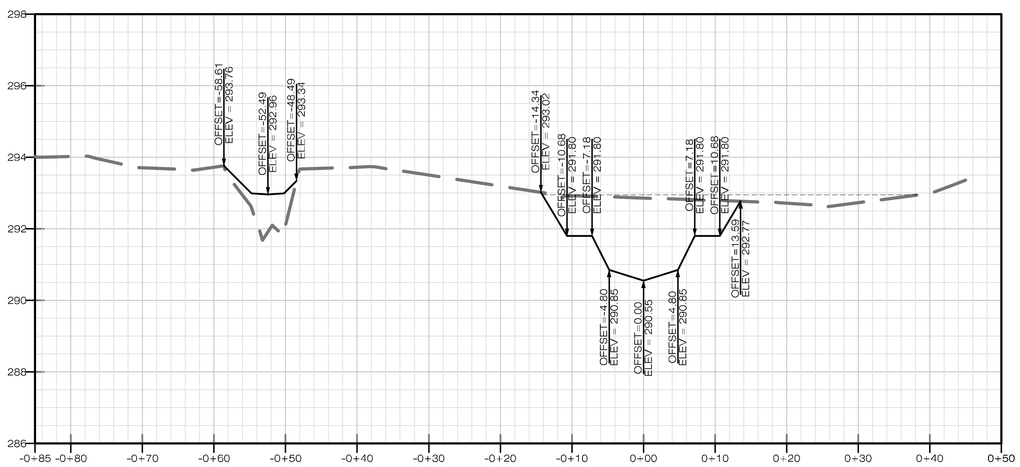
CROSS-SECTION STA. 10+09.44

VERTICAL SCALE: 1" = 2' HORIZONTAL SCALE: 1" = 10'



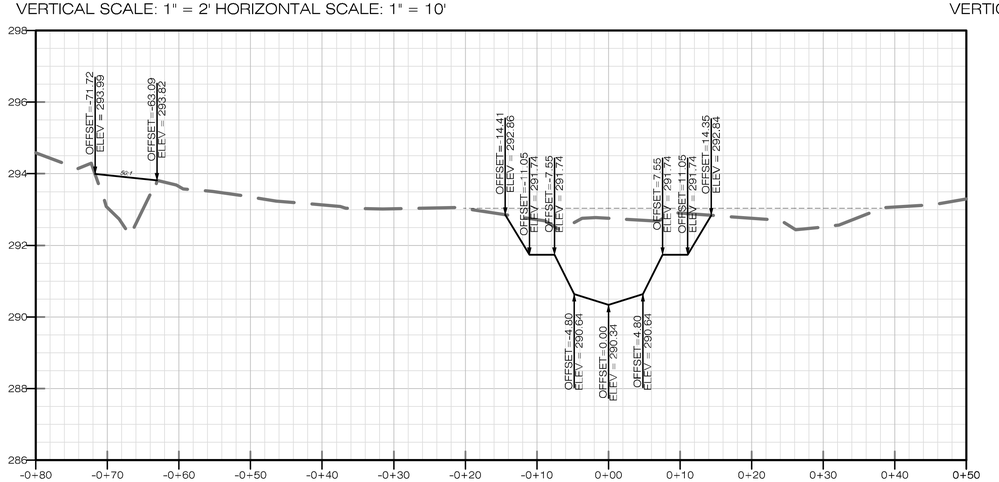
CROSS-SECTION STA. 10+33.37

VERTICAL SCALE: 1" = 2' HORIZONTAL SCALE: 1" = 10'



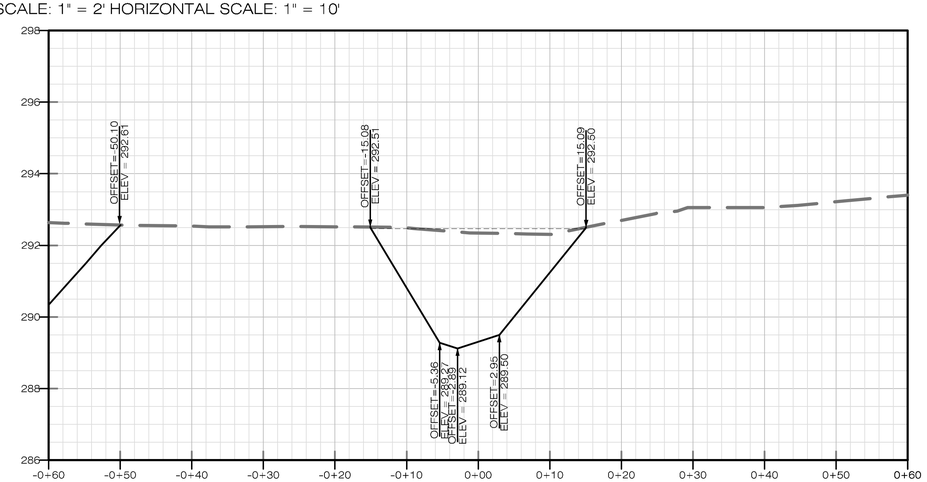
CROSS-SECTION STA. 10+57.81

VERTICAL SCALE: 1" = 2' HORIZONTAL SCALE: 1" = 10'



CROSS-SECTION STA. 10+96.05

VERTICAL SCALE: 1" = 2' HORIZONTAL SCALE: 1" = 10'



CROSS-SECTION STA. 11+38.70

VERTICAL SCALE: 1" = 2' HORIZONTAL SCALE: 1" = 10'

LEGEND

- EXISTING GRADE
- PROPOSED GRADE
- PROPOSED BANKFULL
- EXISTING SANITARY SEWER LINE

NOTES:

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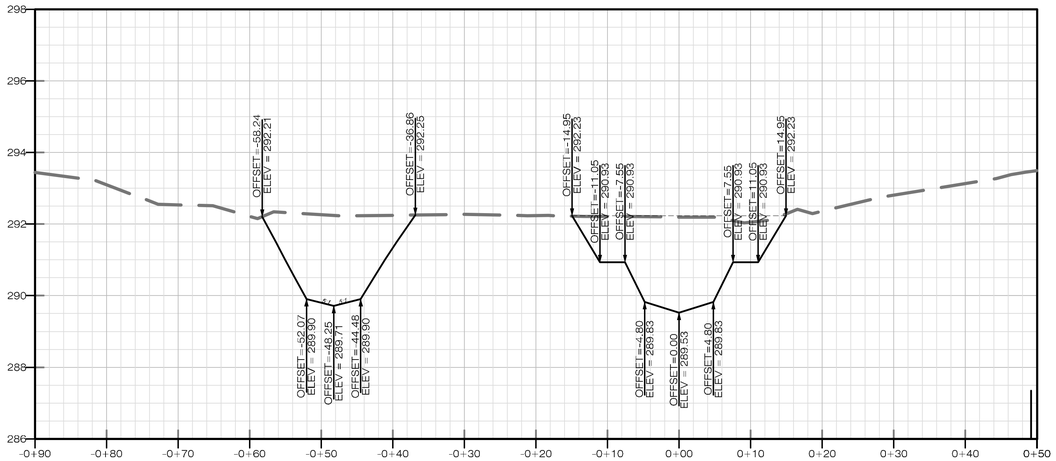
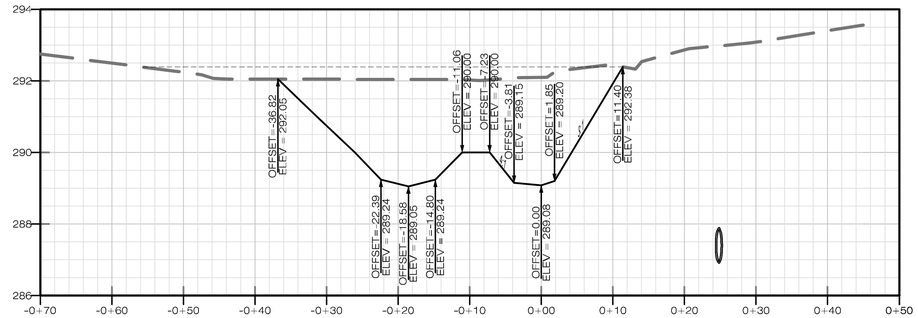


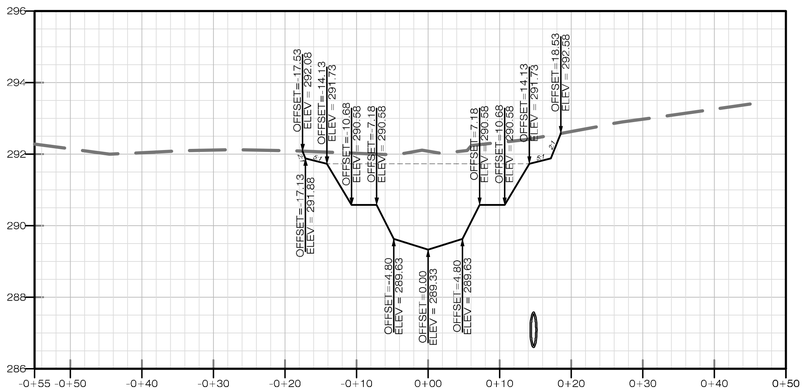
CROSS-SECTION STA. 11+74.84

VERTICAL SCALE: 1" = 2' HORIZONTAL SCALE: 1" = 10'



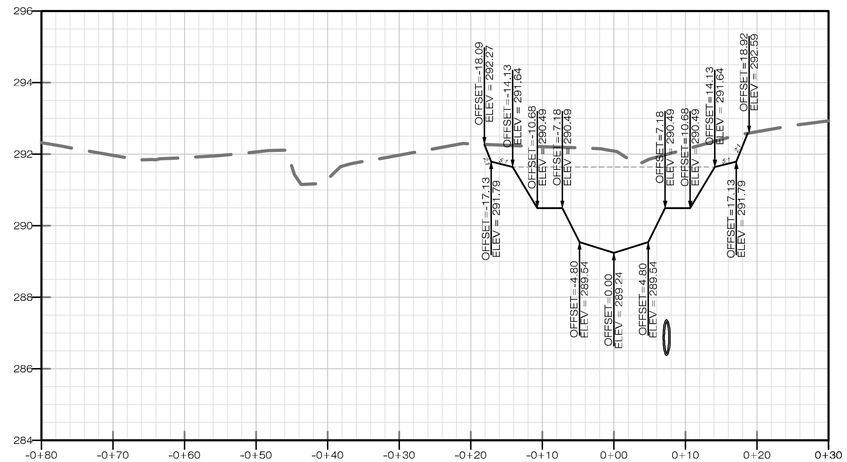
CROSS-SECTION STA. 12+05.05

VERTICAL SCALE: 1" = 2' HORIZONTAL SCALE: 1" = 10'



CROSS-SECTION STA. 12+30.26

VERTICAL SCALE: 1" = 2' HORIZONTAL SCALE: 1" = 10'



CROSS-SECTION STA. 12+53.50

VERTICAL SCALE: 1" = 2' HORIZONTAL SCALE: 1" = 10'

LEGEND

- EXISTING GRADE
- PROPOSED GRADE
- PROPOSED BANKFULL
- EXISTING SANITARY SEWER LINE

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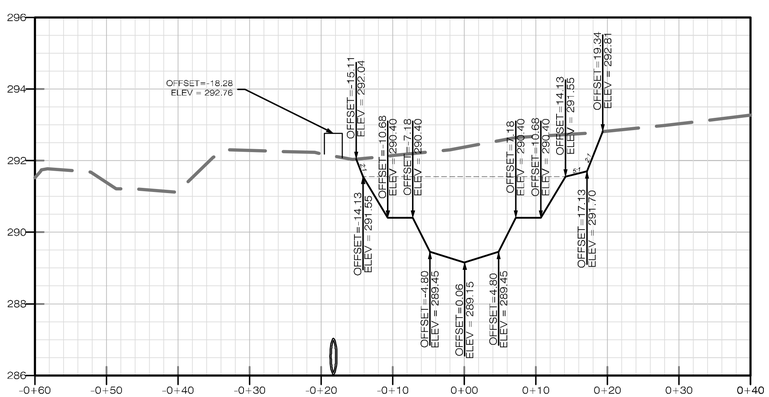
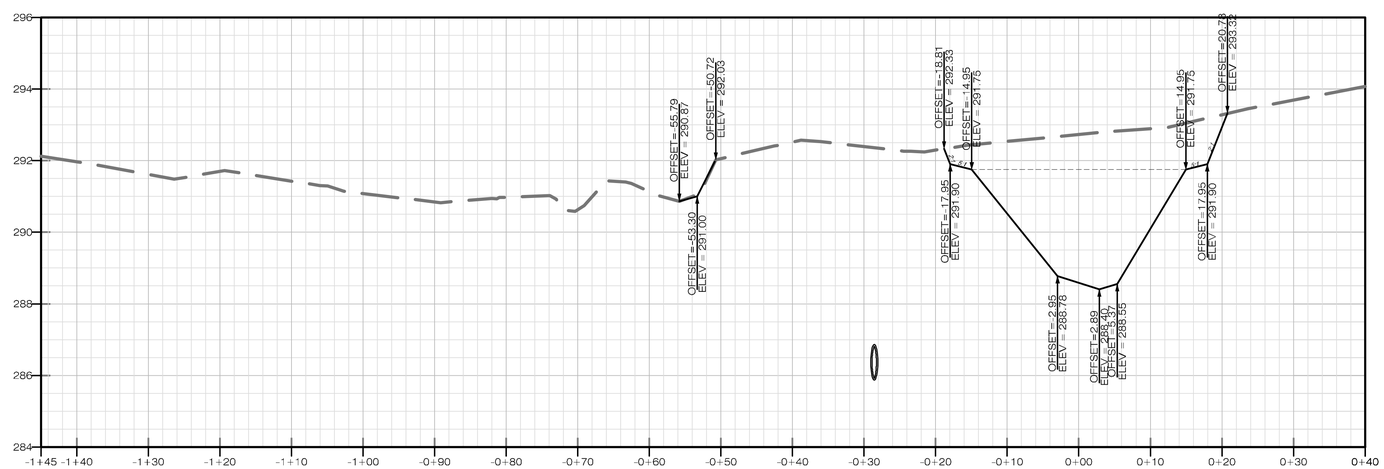


CROSS-SECTION STA. 12+74.93

VERTICAL SCALE: 1" = 2' HORIZONTAL SCALE: 1" = 10'



CROSS-SECTION STA. 13+03.32

VERTICAL SCALE: 1" = 2' HORIZONTAL SCALE: 1" = 10'

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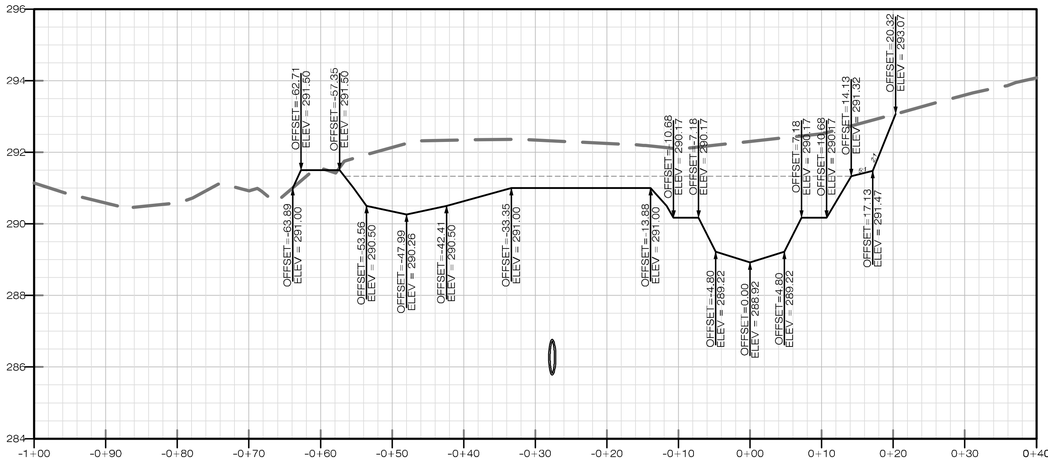
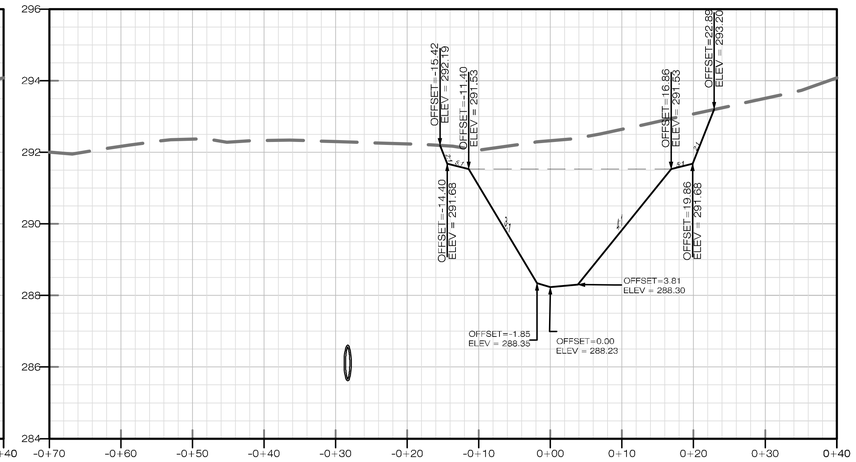
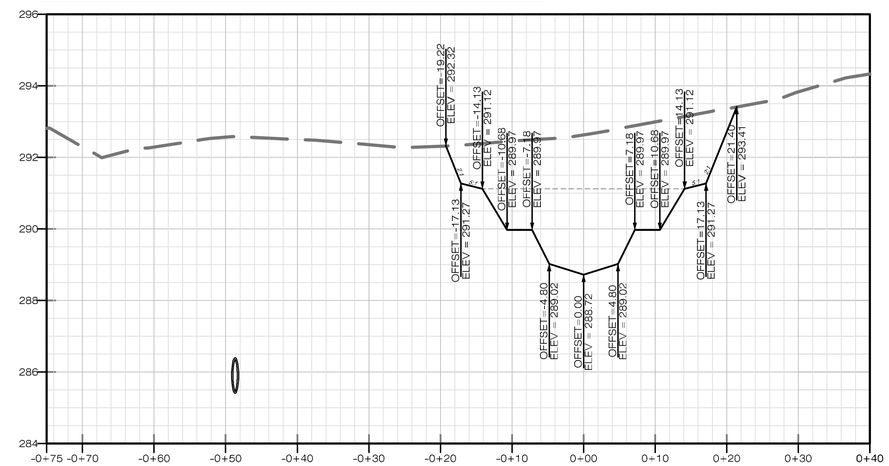


CROSS-SECTION STA. 13+31.14

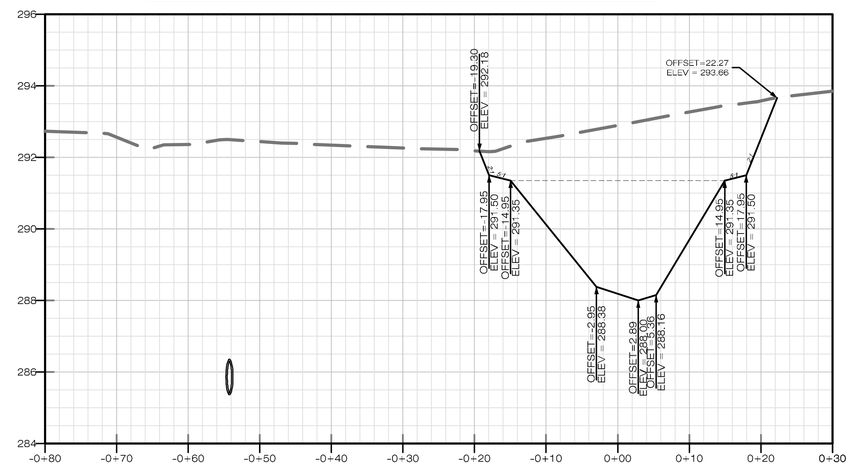


CROSS-SECTION STA. 13+56.96



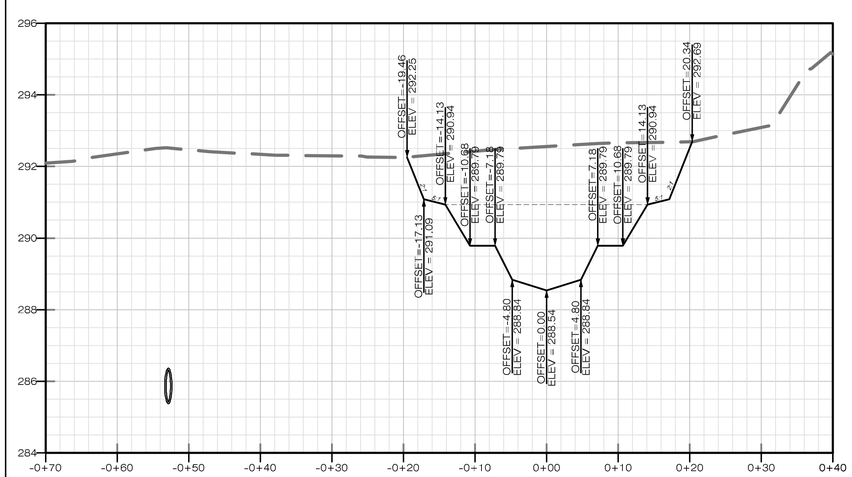
CROSS-SECTION STA. 13+81.63

VERTICAL SCALE: 1" = 2' HORIZONTAL SCALE: 1" = 10'



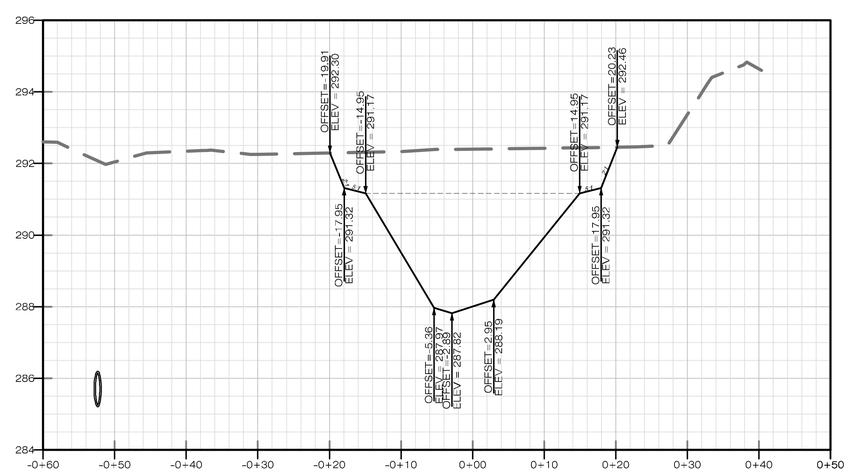
CROSS-SECTION STA. 14+03.90

VERTICAL SCALE: 1" = 2' HORIZONTAL SCALE: 1" = 10'



CROSS-SECTION STA. 14+27.72

VERTICAL SCALE: 1" = 2' HORIZONTAL SCALE: 1" = 10'



CROSS-SECTION STA. 14+50.19

VERTICAL SCALE: 1" = 2' HORIZONTAL SCALE: 1" = 10'

LEGEND

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- PROPOSED GRADE
- PROPOSED BANKFULL
- EXISTING SANITARY SEWER LINE

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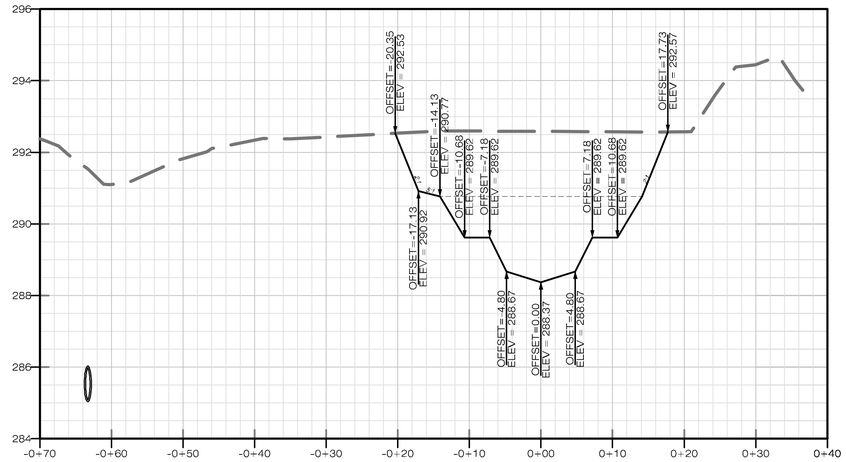
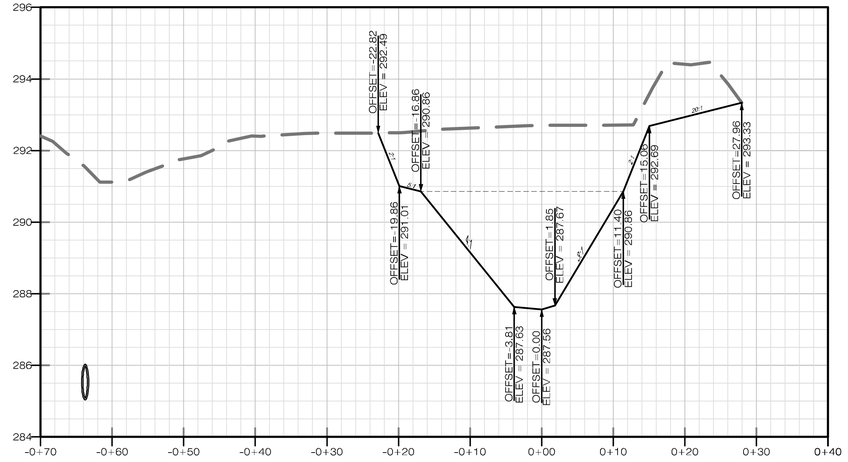


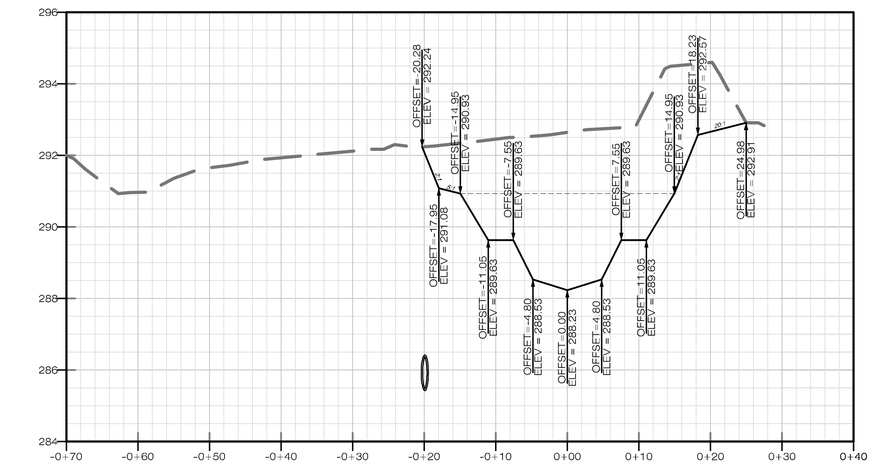
CROSS-SECTION STA. 14+69.66

VERTICAL SCALE: 1" = 2' HORIZONTAL SCALE: 1" = 10'



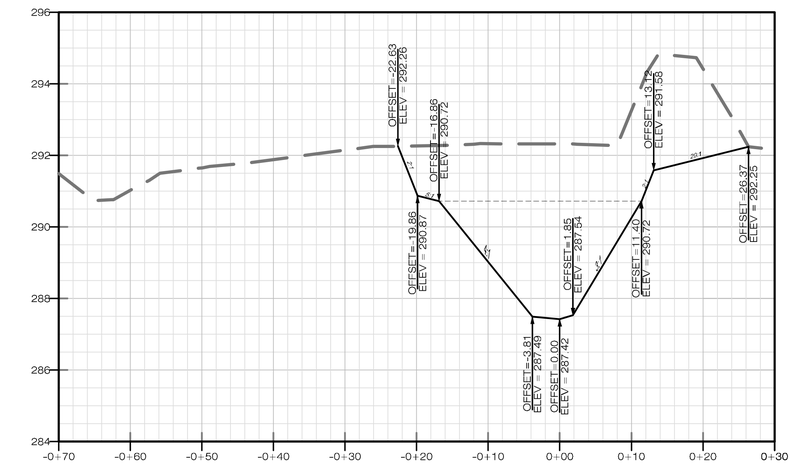
CROSS-SECTION STA. 14+84.10

VERTICAL SCALE: 1" = 2' HORIZONTAL SCALE: 1" = 10'



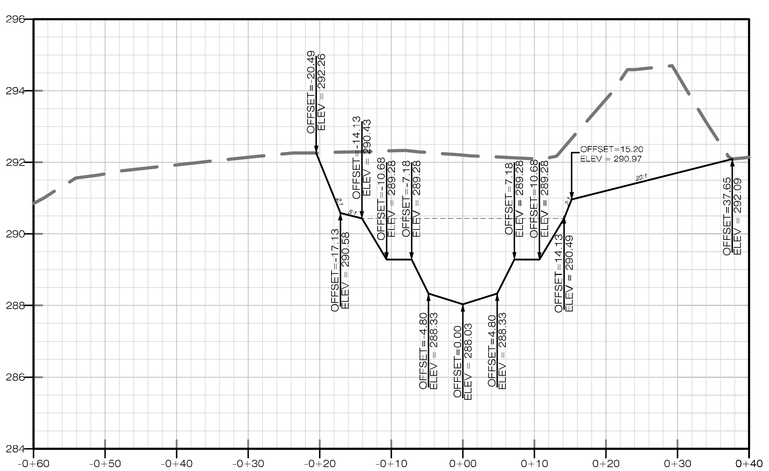
CROSS-SECTION STA. 15+09.68

VERTICAL SCALE: 1" = 2' HORIZONTAL SCALE: 1" = 10'



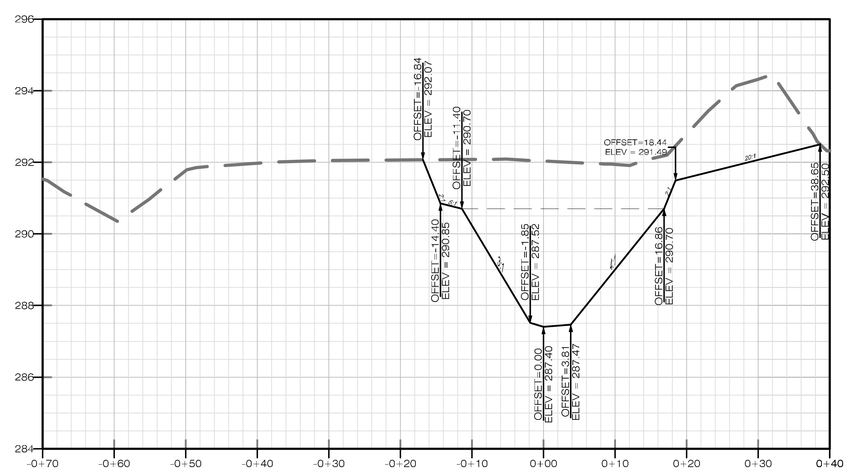
CROSS-SECTION STA. 15+36.55

VERTICAL SCALE: 1" = 2' HORIZONTAL SCALE: 1" = 10'



CROSS-SECTION STA. 15+54.56

VERTICAL SCALE: 1" = 2' HORIZONTAL SCALE: 1" = 10'



CROSS-SECTION STA. 15+71.09

VERTICAL SCALE: 1" = 2' HORIZONTAL SCALE: 1" = 10'

LEGEND

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- PROPOSED BANKFULL
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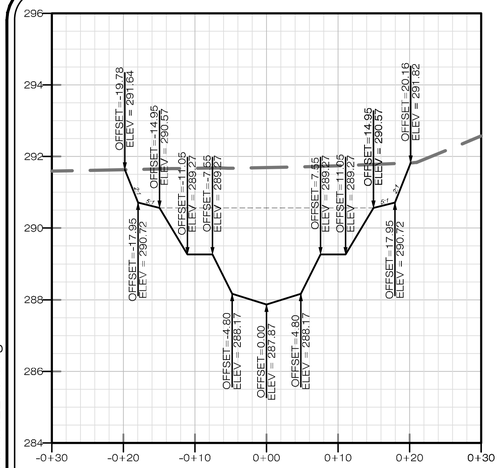
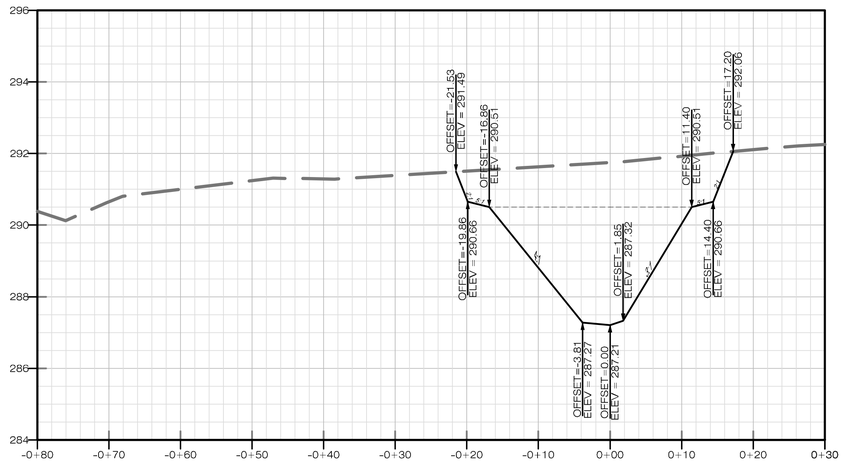


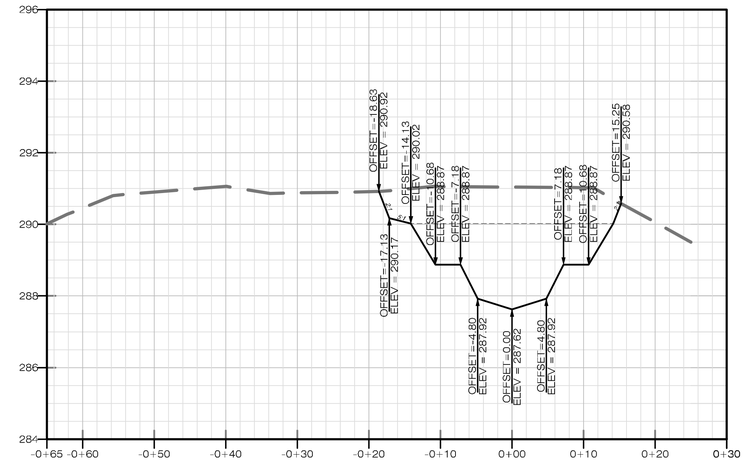
CROSS-SECTION STA. 15+99.29

VERTICAL SCALE: 1" = 2' HORIZONTAL SCALE: 1" = 10'



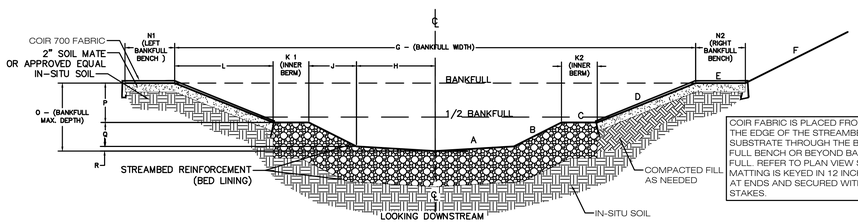
CROSS-SECTION STA. 16+33.14

VERTICAL SCALE: 1" = 2' HORIZONTAL SCALE: 1" = 10'



CROSS-SECTION STA. 16+66.49

VERTICAL SCALE: 1" = 2' HORIZONTAL SCALE: 1" = 10'



COIR FABRIC IS PLACED FROM THE EDGE OF THE STREAMBED SUBSTRATE THROUGH THE BANK-FULL BENCH OR BEYOND BANK-FULL. REFER TO PLAN VIEW SHEETS MATTING IS KEYED IN 12 INCHES AT ENDS AND SECURED WITH STAKES.

BANKFULL DIMENSIONS	
41.4 SQ.FT.	AREA
28.3 FT.	WIDTH
1.5 FT.	MEAN DEPTH
2.4 FT.	MAX. DEPTH
19.3	WIDTH/DEPTH RATIO
~172.6 CFS	Qbkf

STREAMBED REINFORCEMENT SPECIFICATION	
PROPOSED BED LINING	PROPOSED BED LINING DEPTH
75% GRADED COBBLE/GRAVEL MIX (6-8 INCH DIAMETER), 25% GRAVEL MIX (3-6 INCH DIAMETER). LESS THAN 15% FINES AND COARSE SAND (0.04 TO 0.08 INCH)	MIN. 1.33 FEET (16 INCHES)

- TOTAL DEPTH OF STREAMBED REINFORCEMENT IS MIN. 1.33 FEET, UNLESS OTHERWISE SHOWN.
- THIS SPECIFICATON APPLIES TO THE MAIN STEM OF COE BRANCH AND THE 15" STORM DRAIN RETROFIT CHANNEL

LEGEND

- EXISTING GRADE
- PROPOSED GRADE
- PROPOSED BANKFULL
- EXISTING SANITARY SEWER LINE

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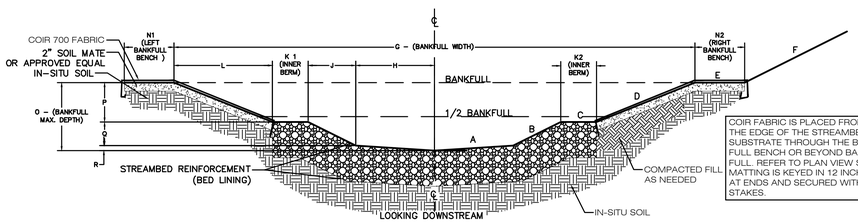
SECTION LOCATION			RIFFLE CROSS-SECTION PARAMETERS																	
REACH	STATION																			NOTES
	FROM	TO	A	B	C	D	E	G	H	J	K1	K2	L	N1	N2	O	P	Q	R	
	4+06.99	5+00	5:1	2.5:1	LEVEL	3:1	5:1	26.45'	4.8'	2.3'	3.5'	3.5'	2.85'	0.0'	3.0'	2.2'	0.95'	0.95'	0.30'	
	5+00	6+00	5:1	2.5:1	LEVEL	3:1	5:1	26.45'	4.8'	2.3'	3.5'	3.5'	2.85'	3.0'	3.0'	2.2'	0.95'	0.95'	0.30'	
	6+41.13	7+09.75	5:1	2.5:1	LEVEL	3:1	5:1	28.26'	4.8'	2.38'	3.5'	3.5'	3.45'	7.78'	0.0'	2.4'	1.15'	0.95'	0.30'	
	7+70.50	7+85.79	5:1	2.5:1	LEVEL	3:1	5:1	28.26'	4.8'	2.38'	3.5'	3.5'	3.45'	0.0'	0.0'	2.4'	1.15'	0.95'	0.30'	
	8+21.81	8+48.11	5:1	2.5:1	LEVEL	3:1	5:1	28.26'	4.8'	2.38'	3.5'	3.5'	3.45'	0.0'	4.31'	2.4'	1.15'	0.95'	0.30'	
	8+71.50	9+26.51	5:1	2.5:1	LEVEL	3:1	5:1	28.26'	4.8'	2.38'	3.5'	3.5'	3.45'	0.0'	5.16'	2.4'	1.15'	0.95'	0.30'	
	9+49.25	9+73.25	5:1	2.5:1	LEVEL	3:1	5:1	28.26'	4.8'	2.38'	3.5'	3.5'	3.45'	0.0'	0.76'	2.4'	1.15'	0.95'	0.30'	
	9+97.43	10+21.43	5:1	2.5:1	LEVEL	3:1	5:1	28.26'	4.8'	2.38'	3.5'	3.5'	3.45'	0.0'	0.0'	2.4'	1.15'	0.95'	0.30'	
	10+45.30	10+75	5:1	2.5:1	LEVEL	3:1	5:1	28.26'	4.8'	2.38'	3.5'	3.5'	3.45'	0.0'	0.0'	2.4'	1.15'	0.95'	0.30'	

RIFFLE TYPE 1 - REACH 1 UPPER

NOT TO SCALE



COIR FABRIC IS PLACED FROM THE EDGE OF THE STREAMBED SUBSTRATE THROUGH THE BANK-FULL BENCH OR BEYOND BANK-FULL. REFER TO PLAN VIEW SHEETS MATTING IS KEYED IN 12 INCHES AT ENDS AND SECURED WITH STAKES.

BANKFULL DIMENSIONS	
48.8 SQ.FT.	AREA
29.9 FT.	WIDTH
1.6 FT.	MEAN DEPTH
2.7 FT.	MAX. DEPTH
18.3	WIDTH/DEPTH RATIO
~219.0 CFS	Qbkf

SECTION LOCATION			RIFFLE CROSS-SECTION PARAMETERS																	
REACH	STATION																			NOTES
	FROM	TO	A	B	C	D	E	G	H	J	K1	K2	L	N1	N2	O	P	Q	R	
	10+75	11+14.55	5:1	2.5:1	LEVEL	3:1	5:1	29.9'	4.8'	2.75'	3.5'	3.5'	3.9'	0.0'	0.0'	2.7'	1.3'	1.1'	0.30'	
	11+59.83	11+89.83	5:1	2.5:1	LEVEL	3:1	5:1	29.9'	4.8'	2.75'	3.5'	3.5'	3.9'	0.0'	0.0'	2.7'	1.3'	1.1'	0.30'	
	12+20.25	12+83.10	5:1	2.5:1	LEVEL	3:1	5:1	28.26'	4.8'	2.38'	3.5'	3.5'	3.45'	0.0'	3.0'	2.4'	1.15'	0.95'	0.30'	
	13+23.51	13+35.74	5:1	2.5:1	LEVEL	3:1	5:1	28.26'	4.8'	2.38'	3.5'	3.5'	3.45'	3.0'	3.0'	2.4'	1.15'	0.95'	0.30'	
	13+75.15	13+88.08	5:1	2.5:1	LEVEL	3:1	5:1	28.26'	4.8'	2.38'	3.5'	3.5'	3.45'	3.0'	3.0'	2.4'	1.15'	0.95'	0.30'	
	14+19.70	14+35.70	5:1	2.5:1	LEVEL	3:1	5:1	28.26'	4.8'	2.38'	3.5'	3.5'	3.45'	3.0'	3.0'	2.4'	1.15'	0.95'	0.30'	
	14+64.65	14+74.65	5:1	2.5:1	LEVEL	3:1	5:1	28.26'	4.8'	2.38'	3.5'	3.5'	3.45'	3.0'	0.0'	2.4'	1.15'	0.95'	0.30'	
	14+93.54	15+25.80	5:1	2.5:1	LEVEL	3:1	5:1	29.9'	4.8'	2.75'	3.5'	3.5'	3.9'	3.0'	0.0'	2.7'	1.3'	1.1'	0.30'	
	15+47.28	15+61.83	5:1	2.5:1	LEVEL	3:1	5:1	28.26'	4.8'	2.38'	3.5'	3.5'	3.45'	3.0'	0.0'	2.4'	1.15'	0.95'	0.30'	
	15+80.33	16+15.23	5:1	2.5:1	LEVEL	3:1	5:1	29.9'	4.8'	2.75'	3.5'	3.5'	3.9'	3.0'	3.0'	2.7'	1.3'	1.1'	0.30'	
	16+51.04	16+84.94	5:1	2.5:1	LEVEL	3:1	5:1	28.26'	4.8'	2.38'	3.5'	3.5'	3.45'	3.0'	0.0'	2.4'	1.15'	0.95'	0.30'	

RIFFLE TYPE 2 - REACH 1 LOWER

NOT TO SCALE

5209 Center Street
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(540) 693-5344
WILLIAMSBURG ENVIRONMENTAL GROUP, INC.
Environmental Consultants

PROPOSED CROSS SECTION
COE BRANCH STREAM RESTORATION
CITY OF FALLS CHURCH, VIRGINIA

COMMONWEALTH OF VIRGINIA
SCOTT C. BLOSSOM
Lic. No. 40287
11/2/13
PROFESSIONAL ENGINEER

REVISIONS:
DATE:

DRAWN BY: CDP, RH
DESIGNED BY: CDP
DATE: 11/07/2013
CHECKED BY: SCB, GCR
SCALE: 1"=20'

SHEET: 13 OF 43
JOB#: 4966

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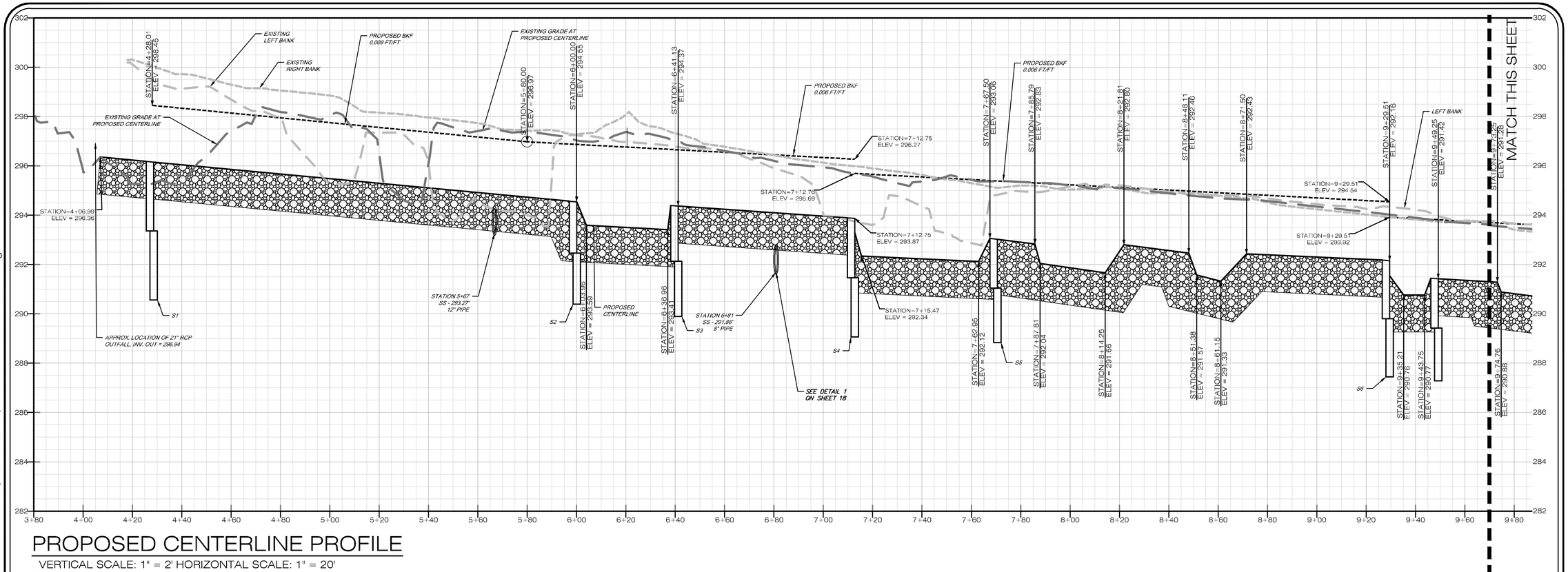
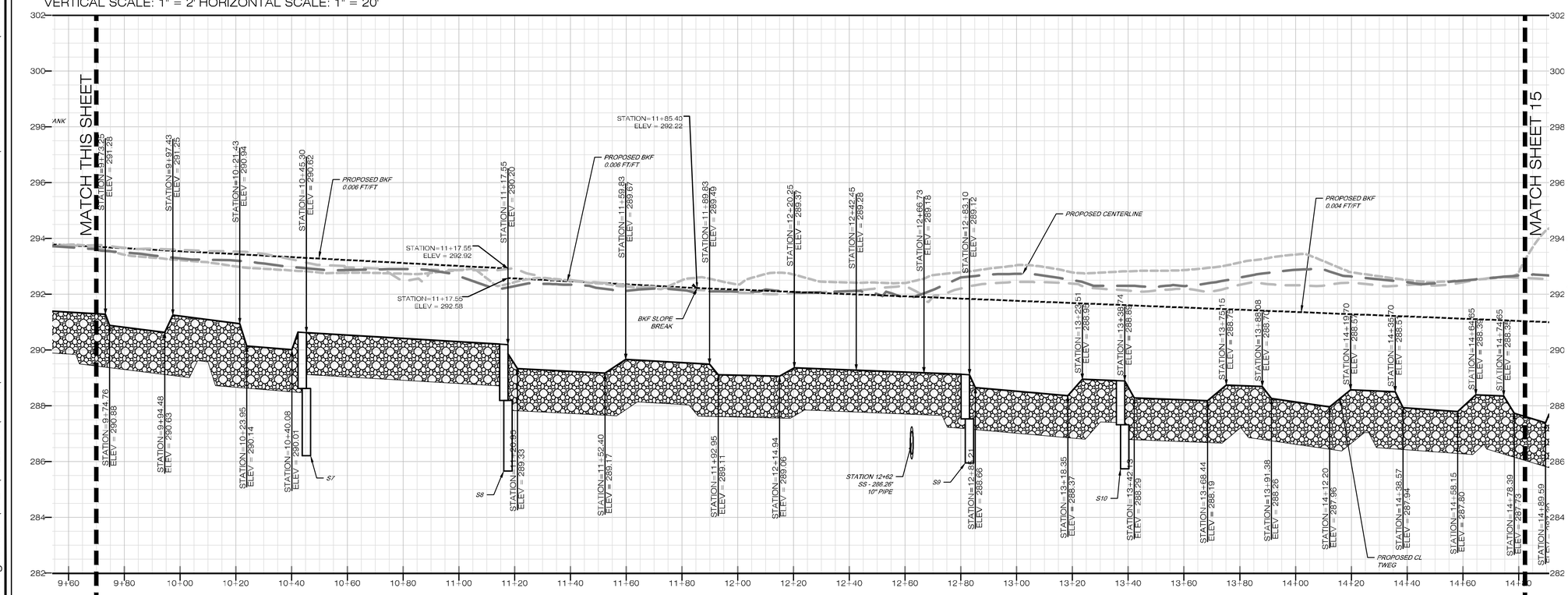


PROPOSED CENTERLINE PROFILE

VERTICAL SCALE: 1" = 2' HORIZONTAL SCALE: 1" = 20'



PROPOSED CENTERLINE PROFILE

VERTICAL SCALE: 1" = 2' HORIZONTAL SCALE: 1" = 20'

LEGEND

- EXISTING GRADE
- EXISTING LEFT BANK GRADE
- EXISTING RIGHT BANK GRADE
- STREAMBED REINFORCEMENT
- PROPOSED BANKFULL
- EXISTING SANITARY SEWER LINE

NOTES:

- FOR REINFORCED SUBSTRATE IN RIFFLES, SEE TYPICAL RIFFLE CROSS-SECTION DETAILS ON SHEET 13.
- FOR REINFORCED SUBSTRATE IN POOLS, SEE CONSTRUCTED POOL DETAIL ON SHEET 17.

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PROFESSIONAL ENGINEER

REVISIONS:
DATE:

DRAWN BY: CDP, RH
DESIGNED BY: CDP
DATE: 11/07/2013
CHECKED BY: SCB, GCR
SCALE: 1"=20' HORZ. 1"=2' VERT.

SHEET: 14 OF 43
JOB#: 4966

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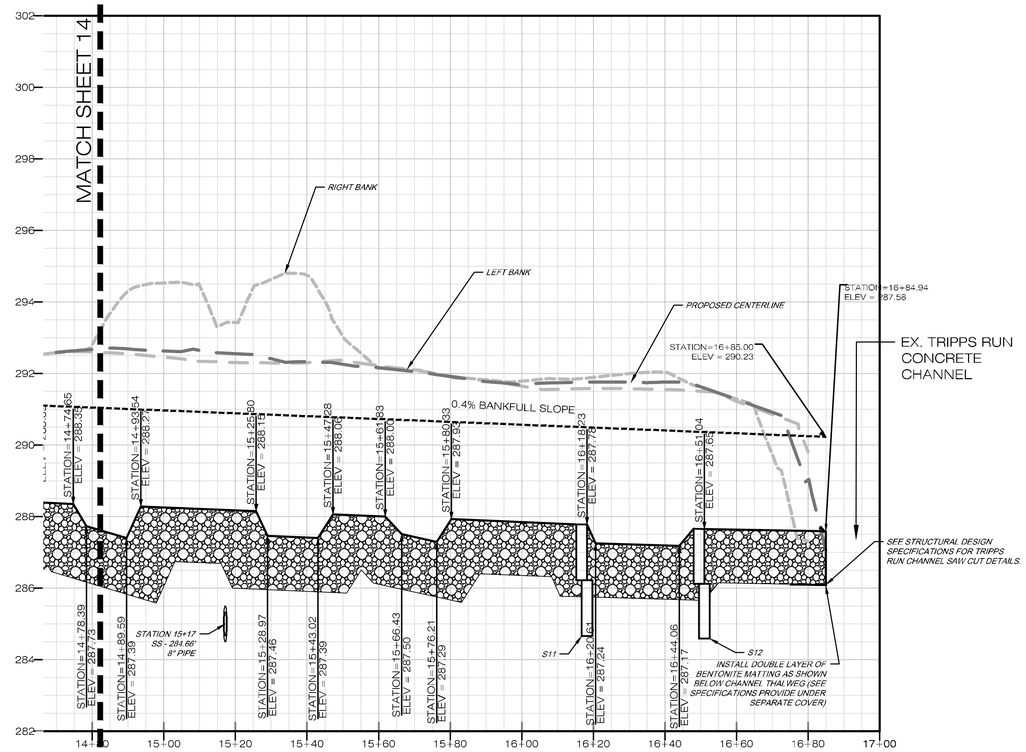

PROPOSED CENTERLINE PROFILE

VERTICAL SCALE: 1" = 2' HORIZONTAL SCALE: 1" = 20'

LEGEND

- EXISTING GRADE
- EXISTING LEFT BANK GRADE
- EXISTING RIGHT BANK GRADE
- STREAMBED REINFORCEMENT
- PROPOSED BANKFULL
- EXISTING SANITARY SEWER LINE

NOTES:

- FOR REINFORCED SUBSTRATE IN RIFFLES, SEE TYPICAL RIFFLE CROSS-SECTION DETAILS ON SHEET 13.
- FOR REINFORCED SUBSTRATE IN POOLS, SEE CONSTRUCTED POOL DETAIL ON SHEET 17.

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Lic. No. 40287
11/2/13
PROFESSIONAL ENGINEER

REVISIONS:
DATE:

DRAWN BY: CDP, RH	DESIGNED BY: CDP
DATE: 11/07/2013	CHECKED BY: SCB, GCR

SCALE: 1"=20' HORZ. 1"=2' VERT.

SHEET: 15 OF 43
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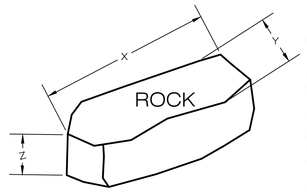

ROCK AXIS DEFINITION
X = LONGEST DIMENSION
Y = INTERMEDIATE DIMENSION
Z = SHORTEST DIMENSION

NOTES:

1.) BOULDERS/ROCKS SHALL BE RELATIVELY FLAT, RECTANGULAR SHAPED, AND UNIFORM IN SIZE.

2.) BOULDERS/ROCKS SHALL BE INSTALLED IN AN OVERLAPPING (IMBRICATED) MANNER WHEN POSSIBLE, WITH STEP BOULDERS OFFSET UPSTREAM.

3.) SEE ROCK SIZING TABLE FOR MODIFIED CROSS VANE, CROSS VANE, AND ROCK SILLS IN THE TECHNICAL SPECIFICATIONS DOCUMENT FOR SPECIFIC ROCK SIZES FOR EACH STRUCTURE.

STRUCTURE ROCK SIZE SPECIFICATION TABLE

STRUCTURE	X-AXIS DIMENSION	Y-AXIS DIMENSION	Z-AXIS DIMENSION
CROSS VANE & MODIFIED CROSS VANE	2.5-3 FT HEADER & FOOTER 1-2 FT SILL 2.5-3 FT SPLASH	1.5-2 FT HEADER & FOOTER 1-2 FT SILL 1.5-2 FT SPLASH	2 FT HEADER & FOOTER 1-2 FT SILL 1-2 FT SPLASH
BURIED SILL	2-2.5 FT	1-1.5 FT	1.50 Ft
BOULDER TOE PROTECTION	1.75-2.25 FT TOP & FOOTER	1.75-2.25 FT TOP & FOOTER ROCK	2.25-2.75 FT TOP & FOOTER ROCK

1/16 DETAIL : BOULDER/ROCK DEFINITION

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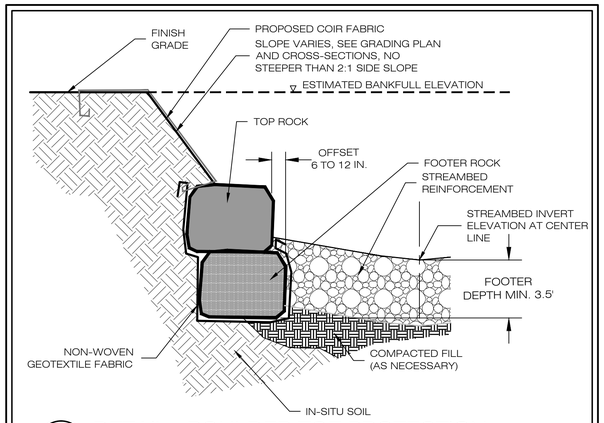

2/16 DETAIL : BOULDER TOE PROTECTION

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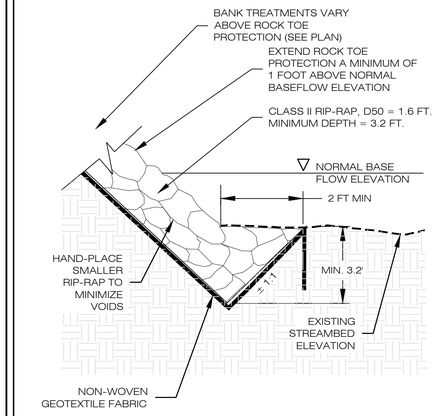

3/16 DETAIL : ROCK TOE PROTECTION DETAIL (TYP)

(ADAPTED FROM VIRGINIA E & S MANUAL STD & SPEC 3.19)

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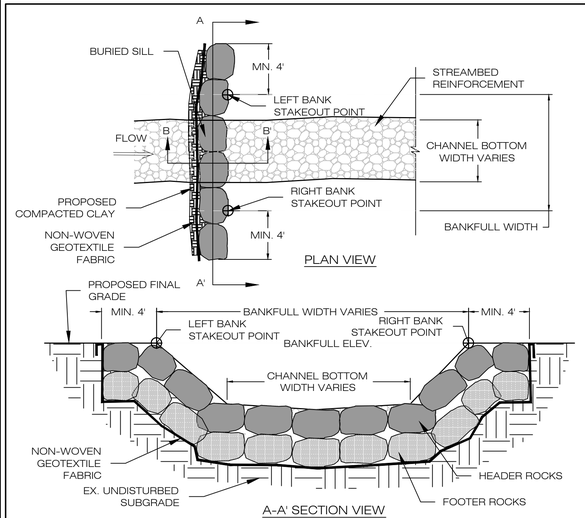

4/16 DETAIL: BURIED SILL (TYP.)

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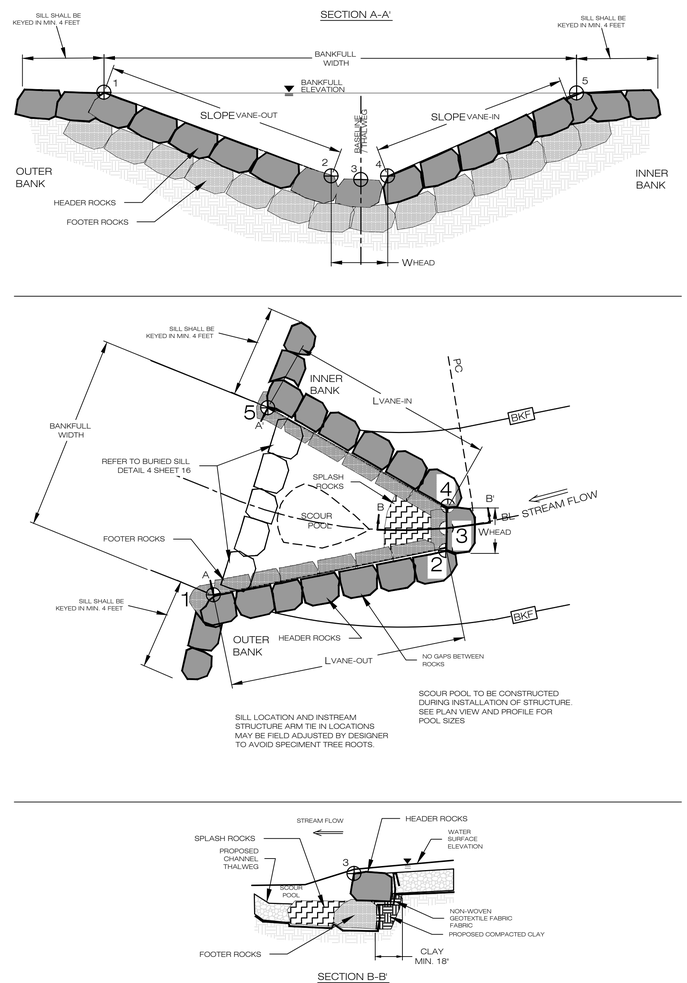

CONSTRUCTION SPECIFICATIONS

1. EXCAVATE TRENCH ALONG THE BOTTOM OF THE STREAM BED AND TO THE BANKFULL ELEVATION IN THE STREAMBANK FOR THE PLACEMENT OF THE VANE ARM. PLACE THE ROCKS AT THE END OF THE VANE ARM IN ORDER TO ENCOURAGE LATERAL FLOW INTO THE EXCAVATED SCOUR POOL. NOTE: VANE ARMS MUST BE PROPERLY TIED INTO THE BANK AT BANKFULL ELEVATION.
2. PLACE ONE OR TWO COURSE OF FOOTER BOULDERS TO THE MINIMUM SPECIFIED FOOTER DEPTH, AND INSTALL SPLASH ROCKS.
3. PLACE VANE ARM ROCKS ON TOP OF FOOTER ROCKS SO THAT THE VANE ARM ROCK RESTS ON ONE HALF TO TWO-THIRDS OF A FOOTER ROCK BELOW. OFFSET THE VANE ARM ROCK IN THE UPSTREAM DIRECTION AND PLACE SO THEY SLOPE SLIGHTLY AGAINST THE FLOW DIRECTION.
4. EXTEND THE STRUCTURE INTO THE BANK (I.E. SILL ROCKS) AND ARMOUR UPSTREAM AND DOWNSTREAM FOR STABILITY WITH ROCK AND/OR STREAMBED REINFORCEMENT, AND COMPACTED FILL MATERIALS.
5. AT THE BANKFULL ELEVATION, CREATE A SILL OF PLACED ROCK PERPINDICULAR TO THE STREAMBANK EXTENDING AWAY FROM THE VANE WING ARM. CONSTRUCT THE SILL PER VSRDM 4.5: CUT OFF SILLS AND LINEAR DEFLECTORS.
6. SEAL THE STRUCTURE ON THE UPSTREAM SIDE AS DESCRIBED BELOW.
7. EXCAVATE THE SCOUR POOL TO THE DESIGN DEPTH.

CONSTRUCTION GUIDELINES

1. USE AT LEAST TWO ROCKS FOR THE WIDTH OF THE HEADER (WHEAD) OF THE STRUCTURE.
2. PLACEMENT OF LARGE ROCK MAY REQUIRE A SMALL TRACK HOE.
3. THE ROCK MATERIAL SHALL BE INSPECTED BY THE CITY OR THE ENGINEER BEFORE IT IS PLACED.
4. STRUCTURES MUST BE SEALED WITH NON-WOVEN GEOTEXTILE FABRIC AND PROPOSED STREAMBED REINFORCEMENT.
5. CONTRACTOR SHALL ENSURE NO LEAKAGE/FLOW UNDER OR AROUND THE STRUCTURE BY PROPERLY GRADING, SEALING, AND COMPACTING UNDER AND AROUND THE STRUCTURE.
6. AFTER INSTALLATION, CHECK PROPER FUNCTION/FLOW PATH BY OBSERVING FLOW OVER THE STRUCTURE.

LEGEND

5 — STAKEOUT POINT

REINFORCED STREAMBED SUBSTRATE

IN-SITU MATERIAL OR COMPACTED STRUCTURAL FILL

NOTES:

1. SEE STAKEOUT SHEETS FOR STAKEOUT POINT INFORMATION.
2. REFER TO CONSTRUCTION SPECIFICATIONS FOR EARTH FILL REQUIREMENTS.

5/16 DETAIL: PROPOSED CROSS VANE (TYP.)

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STREAM RESTORATION DETAILS
COE BRANCH STREAM RESTORATION
CITY OF FALLS CHURCH, VIRGINIA

COMMONWEALTH OF VIRGINIA
SCOTT C. BLOSSOM
Lic. No. 40287
11/7/13
PROFESSIONAL ENGINEER

REVISIONS:
DATE:

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DESIGNED BY: CDP
DATE: 11/07/2013
CHECKED BY: SCB, GCR
SCALE: VARIES
JOB#: 4966
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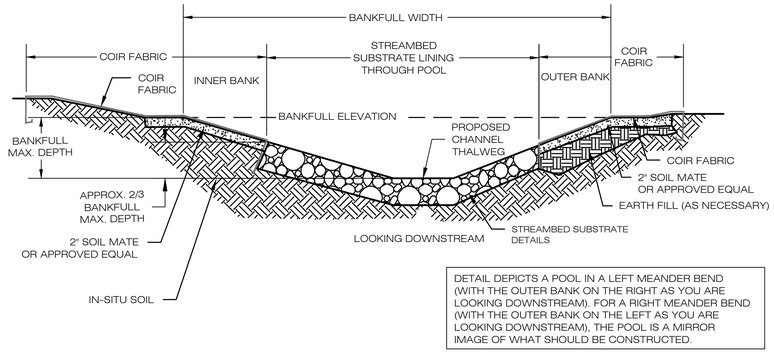

DETAIL DEPICTS A POOL IN A LEFT MEANDER BEND (WITH THE OUTER BANK ON THE RIGHT AS YOU ARE LOOKING DOWNSTREAM). FOR A RIGHT MEANDER BEND (WITH THE OUTER BANK ON THE LEFT AS YOU ARE LOOKING DOWNSTREAM), THE POOL IS A MIRROR IMAGE OF WHAT SHOULD BE CONSTRUCTED.

1/17 CONSTRUCTED POOL DETAIL (TYP.)

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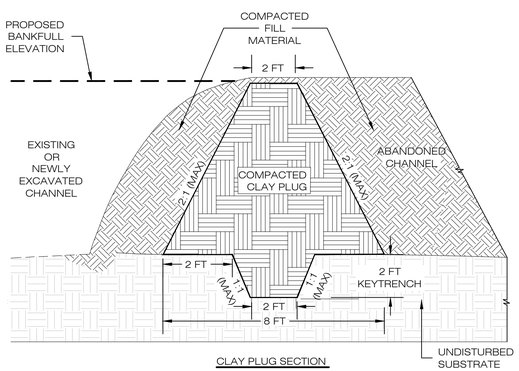
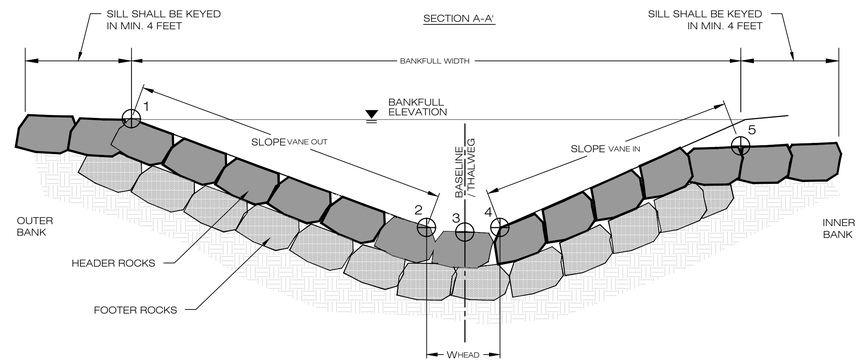
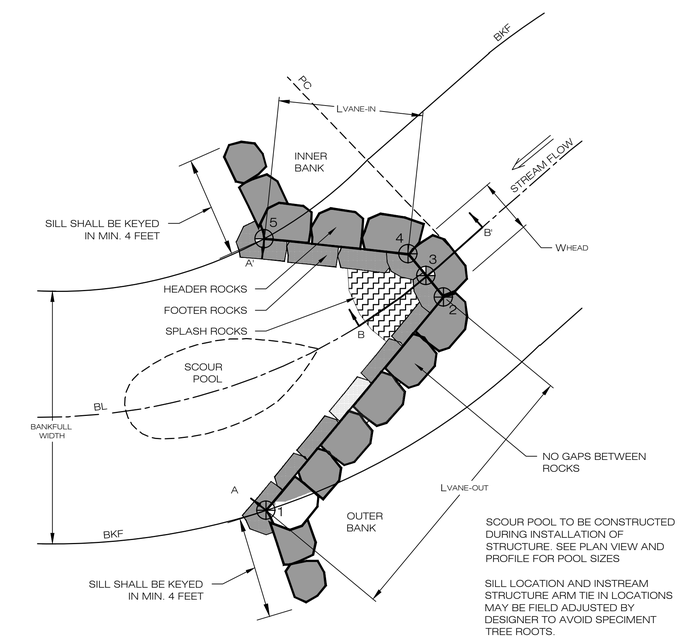
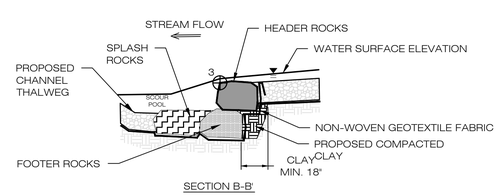


2/17 DETAIL : CLAY PLUG

NTS







3/17 DETAIL: PROPOSED MODIFIED CROSS VANE (TYP.)

NTS

CONSTRUCTION SPECIFICATIONS

1. EXCAVATE TRENCH ALONG THE BOTTOM OF THE STREAM BED AND TO THE BANKFULL ELEVATION IN THE STREAMBANK FOR THE PLACEMENT OF THE WING OF THE VANE. THE TRENCH SHOULD BE $\frac{1}{3}$ BANKFULL WIDTH AND TO THE DESIGN ANGLE FOR THE WING PORTION OF THE HOOK. PLACE THE HOOK ROCKS AT THE END OF THE VANE ARM IN ORDER TO ENCOURAGE LATERAL FLOW INTO THE EXCAVATED SCOUR POOL. NOTE: VANE WING MUST BE PROPERLY TIED INTO THE BANK AT BANKFULL ELEVATION.
2. PLACE ONE OR TWO COURSE OF FOOTER BOULDERS TO THE MINIMUM SPECIFIED FOOTER DEPTH.
3. PLACE VANE ROCKS ON TOP OF FOOTER ROCKS SO THAT THE VANE ROCK RESTS ON ONE HALF OF A FOOTER ROCK BELOW. OFFSET THE VANE ROCK IN THE UPSTREAM DIRECTION AND PLACE SO THEY SLOPE SLIGHTLY AGAINST THE FLOW DIRECTION.
4. EXTEND THE STRUCTURE INTO THE BANK (I.E. SILL ROCKS) AND ARMOUR UPSTREAM AND DOWNSTREAM FOR STABILITY WITH RIP RAP AND COMPACTED FILL MATERIALS.
5. AT THE BANKFULL ELEVATION, CREATE A SILL OF PLACED ROCK PERPINDICULAR TO THE STREAMBANK EXTENDING AWAY FROM THE VANE WING ARM. CONSTRUCT THE SILL PER VSRDM 4.5: CUT OFF SILLS AND LINEAR DEFLECTORS.
6. SEAL THE STRUCTURE ON THE UPSTREAM SIDE AS DESCRIBED BELOW.
7. EXCAVATE THE SCOUR POOL TO THE DESIGN DEPTH.

CONSTRUCTION GUIDELINES

1. ALWAYS USE AT LEAST TWO ROCKS FOR THE HOOK OF THE STRUCTURE.
2. PLACEMENT OF LARGE ROCK MAY REQUIRE A SMALL TRACK HOE.
3. THE ROCK MATERIAL SHALL BE INSPECTED BY THE CITY OR THE ENGINEER BEFORE IT IS PLACED.
4. STRUCTURES MUST BE SEALED WITH NON-WOVEN FILTER FABRIC AND PROPOSED STREAMBED REINFORCEMENT.
5. CONTRACTOR SHALL ENSURE NO LEAKAGE/FLOW UNDER OR AROUND THE STRUCTURE BY PROPERLY GRADING, SEALING, AND COMPACTING UNDER AND AROUND THE STRUCTURE.
6. AFTER INSTALLATION, CHECK PROPER FUNCTION/FLOW PATH BY OBSERVING FLOW OVER THE STRUCTURE.

LEGEND

5	STAKEOUT POINT
	REINFORCED STREAMBED SUBSTRATE
	IN-SITU MATERIAL OR COMPACTED STRUCTURAL FILL

NOTES:

1. SEE STAKEOUT SHEETS FOR STAKEOUT POINT INFORMATION.
2. REFER TO CONSTRUCTION SPECIFICATIONS FOR EARTH FILL REQUIREMENTS.

PLAN VIEW DEPICTS A STRUCTURE IN A RIGHT MEANDER (WITH THE OUTER BANK ON THE LEFT AS YOU ARE LOOKING DOWNSTREAM). FOR A LEFT MEANDER STRUCTURE (WITH THE OUTER BANK ON THE RIGHT AS YOU ARE LOOKING DOWNSTREAM), THE PLAN VIEW IS A MIRROR IMAGE OF WHAT SHOULD BE CONSTRUCTED. THE LONGER VANE ARM IS ALWAYS SITUATED ON THE OUTER BANK.

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CHECKED BY: SCB, GCR
SCALE: VARIES
SHEET: 17 OF 43
JOB#: 4966

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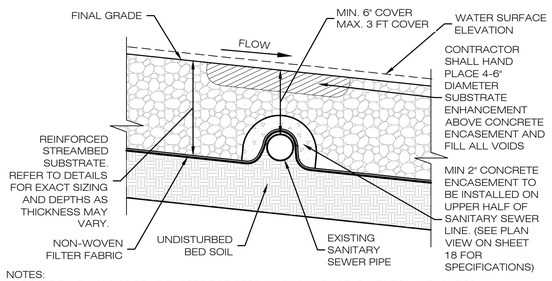
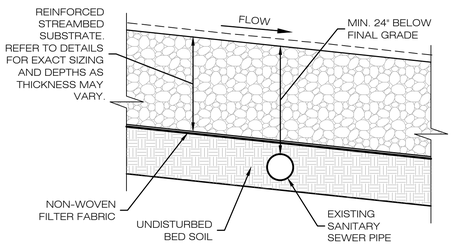


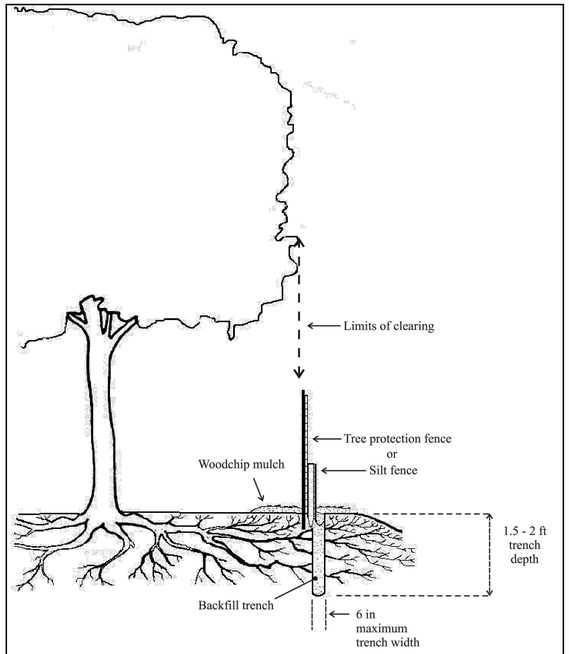
NOTES:
1. REFER TO PLAN & PROFILE SHEETS FOR STREAM CHANNEL STABILIZATION MEASURES PROPOSED UP & DOWN STREAM OF EXISTING SANITARY SEWER.
2. PROPOSED DEPTH OF COVER OVER EXISTING SANITARY SEWER VARIES. REFER TO PLAN & PROFILE SHEETS FOR ACTUAL ELEVATIONS.

1/18 DETAIL: STREAMBED CROSSING OVER EXISTING SANITARY SEWER - SHALLOW
NTS



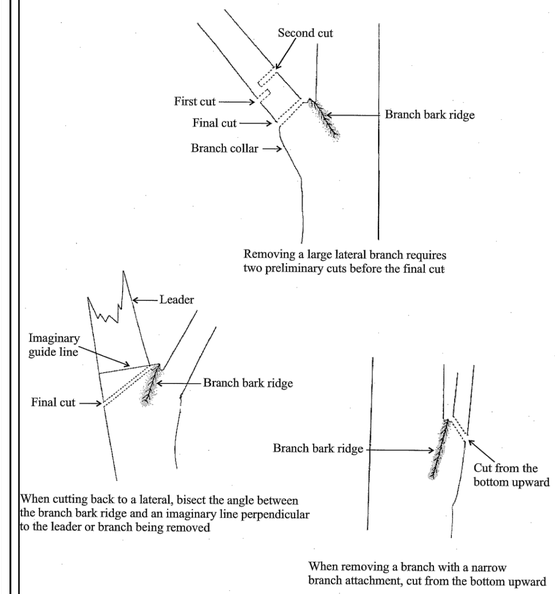
NOTES:
1. REFER TO PLAN & PROFILE SHEETS FOR STREAM CHANNEL STABILIZATION MEASURES PROPOSED UP & DOWN STREAM OF EXISTING SANITARY SEWER.
2. PROPOSED DEPTH OF COVER OVER EXISTING SANITARY SEWER VARIES. REFER TO PLAN & PROFILE SHEETS FOR ACTUAL ELEVATIONS.

2/18 DETAIL: STREAMBED CROSSING OVER EXISTING SANITARY SEWER - DEEP
NTS



Ref. Sec. 12-0702.1 Rev. 10-08	ROOT PRUNING	PLATE NO. 7-12	STD. NO.

3/18 DETAIL : ROOT PRUNING
NTS



Adapted from: ***Tree, Shrub and Other Woody Plant Maintenance - Standard Practices - American National Standard for Tree Care Operations***, American National Standards Institute

Ref. Sec. 12-0706.5A Rev. 2-02, 2011 Reprint	PRUNING CUTS	PLATE NO. 9-12	STD. NO.

4/18 DETAIL: TREE CARE
NTS

5209 Center Street
Williamsburg, Virginia 23188
(757) 220-6869
1011 Boulder Springs Drive, Suite 225
Richmond, Virginia 23225
(804) 267-3474
150 Riverside Parkway, Suite 301
Fredericksburg, Virginia 22406
(540) 763-5544
WILLIAMSBURG ENVIRONMENTAL GROUP, INC.
Environmental Consultants

STREAM RESTORATION DETAILS
COE BRANCH STREAM RESTORATION
CITY OF FALLS CHURCH, VIRGINIA

COMMONWEALTH OF VIRGINIA
SCOTT C. BLOSSOM
Lic. No. 40287
11/2/13
PROFESSIONAL ENGINEER

REVISIONS:
DATE:

DRAWN BY: CDP, RH
DESIGNED BY: CDP
DATE: 11/07/2013
CHECKED BY: SCB, GCR
SCALE: VARIES
SHEET: 18 OF 43
JOB#: 4966

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TREE PRESERVATION PROCEDURES AND SPECIFICATIONS
City of Falls Church, VA – Urban Forestry / Development Services

1. Prior to allowing any vehicle or construction equipment to enter the site, the construction foreman and project arborist (also foreman of company doing actual tree work if different from project arborist) is to meet the City Arborist to mark the location of the *limits of clearing/ tree preservation fencing*, erosion control fabric, and root pruning line (where required), access routes, storage areas, and parking areas. The location of the LIMITS OF CLEARING/TREE PRESERVATION FENCING is to be installed in accordance with the approved plan and field located from existing benchmarks, landmarks, and building stakeout survey markers. All work procedures and tree preservation measures are to be discussed at this time. An appointment must be made with the arborist for the City a minimum of three days prior to the establishment of the tree preservation measures is required by City Code (Sec. 35-15 (b), see enclosed. Contact the City Arborist for an appointment at 703-248-5183.

2. Trees to be removed shall be clearly marked and approved by the City Arborist prior to demolition or entry of any equipment on site. A tree contractor licensed and bonded to work in the City shall perform all tree work, including all tree removals. Check with the City Arborist for a copy of the most recent list of Tree Contractors.

3. *Tree preservation fencing* shall be either of the following:

   a. Six (6) foot high chain link fence sections attached to one and five eights (1 5/8) inch outside diameter pipe with eleven (11) -gauge mesh in a two (2) inch diamond pattern. The fencing noted above may be temporary panels set in concrete blocks at the base and secured at the top with saddle clamps
   or
   b. Four (4) foot high fourteen (14) gauge welded wire fence supported by six (6) foot long metal stakes (2" width) to be spaced eight (8) feet on center and sunk into the ground.

   Both of the fencing types noted above shall be flagged with brightly colored surveyor ribbon to improve their visibility. The contractor must maintain fencing in place throughout construction. **In the event fencing must be temporarily removed for any reason, contact must be made first with the arborist at 703-248-5183**. The City Arborist must grant approval before any tree preservation fencing is removed, even temporarily.

4. Erosion and sediment control fencing shall be placed on the inside (toward construction) from the tree preservation fencing and any root-pruning trenches.
   Erosion control devices such as silt fencing, debris basins, and water diversion structures shall be installed to prevent siltation and/or erosion within the tree protection zone.
   Property owners are advised to impose fines in contracts with construction companies if tree preservation measures are violated.

5. Demolition and Site Clearing**:**

   a. The City Arborist shall be notified a minimum of three (3) days in advance of commencing any form of tree work. Call 703-248-5183 for an appointment.

   b. Trees to be removed shall be felled so as to fall away from tree protection zones and to avoid pulling breaking of roots of trees to remain. If roots are entwined, the consultant may require first severing the major woody root mass before extracting the trees. This may be accomplished by cutting through the roots by hand, with a vibrating knife, rock saw, and narrow trencher with sharp blades, or other approved root-pruning equipment.
   c. Trees being cut within the tree preservation zone shall be cut near ground level and the stumps ground out with a walk-behind grinding machine.
   d. All downed brush and trees shall be removed from the tree protection zone either by hand or with equipment sitting outside the tree protection zone. Extraction shall occur by lifting the material out, not by skidding it across the ground.
   e. Brush shall be chipped and placed in the tree protection zone to a depth of 6 inches, with no chips against the trunks of trees.
   f. Structures and underground features to be removed within the tree protection zone shall use the smallest equipment possible and operate from outside the tree protection zone. The City Arborist shall be present during all such operations within the tree protection zone to monitor demolition activity. Phone 703-248-5183 at least three (3) days in advance for an appointment.
   g. Any damage to trees due to demolition activities shall be reported to the City Arborist within 6 hours so that prompt remedial action can be taken.
   h. If temporary haul or access roads must pass over the root area of trees to be retained, a roadbed of at least 10 inches of mulch shall be created to protect the soil. The roadbed material shall be replenished as necessary to maintain a10-inch depth. The City Arborist must approve the use of any such temporary road in the tree protection area.

6. Pruning & Other Preservation Measures Specifications:
   a. The City Arborist shall be notified a minimum of three (3) days in advance of commencing any form of tree work. Call 703-248-5183 for an appointment.
   b. Root pruning, where required, shall be mechanically done with a narrow trencher with sharp blades. Once a trench is opened up, approximately 18-24" in depth and 4" wide all exposed roots will be hand pruned so that the clean-cut ends can regrow.
   The tree preservation fencing shall be placed 6-12" outside the root-pruning trench (construction side of the trench). The erosion and sediment fencing shall be placed outside the tree preservation fencing (construction side of the fence).
      - Where required, apply a slow-release complete fertilizer containing major and trace elements, but low in water-soluble nitrogen during the season before the commencement of construction. An application of a *mycborrizae* product may also be required to assist in the preservation of highly stressed trees.
   c. All trees to be saved will be pruned (in accordance with American National Standards Institute (ANSI) Standard Practices for Trees, Shrubs, and Other Woody Plan Maintenance ANSI A300 and adhere to the most recent edition of ANSI Z133.1.
   d. Treat any disease or insect pest as required to reduce stress on trees.
   e. Remove all invasive vines growing on trees and from the area around the trees
   f. Specifications for work to be performed on individual trees shall be indicated under the "maintenance" column of the Tree Survey.
   g. All trees within the project area shall be pruned to:
      - clear the crown of diseased, crossing, weak, and dead wood to a minimum size of 1 ½ inches diameter;
      - provide 14 feet of vertical clearance over streets and 8 feet over sidewalks;

      - remove stubs, cutting outside the woundwood tissue that has formed around the branch;
      - reduce end weight on heavy, horizontal branches selectively removing small diameter branches, no greater than 2 to 3 inches near the ends of the scaffolds.
   h. Where temporary clearance is needed for access, branches shall be tied back to hold them out of the clearance zone. The City Arborist must approve such tying.
   i. Pruning shall not be performed during periods of flight of adult boring insects because fresh wound attract pests. Pruning shall be performed only when the danger of infestation is past.
   j. All work must be performed by a tree contractor licensed and bonded to work in the City and in accordance with the direction of the project certified arborist and the City Arborist.
   k. Interior branches shall not be stripped out.
   l. Pruning cuts larger than 4 inches in diameter, except for dead wood, shall be avoided.
   m. Pruning cuts that expose heartwood shall be avoided whenever possible.
   n. No more than 20 percent of live foliage shall be removed from a tree at on time.
   o. While in the tree, the arborist shall perform an aerial inspection to identify defects that require treatment. Any addition work needed shall be reported to the City Arborist.
   p. Brush shall be chipped and chips shall be spread underneath trees within the tree protection zone to a maximum depth of 6 inches, leaving the trunk and root flare clear of chips.
   q. It may also be necessary to fertilize, aerate and otherwise treat the "trees to be saved" as required by the arborist for the City, following a meeting with the owner's/developer's arborist and approval of the "tree preservation plan". <u>All tree work must be completed prior to construction.</u>
   r. 'Selective clearing' in wooded areas will be allowed only under the direction of the City Arborist. Trees to be removed will be felled by hand so that minimal damage is done to "trees to be saved".
   s. No vehicles or storage of materials of any kind will be allowed inside the limits of clearing. No storage of material or debris will be allowed within the "tree save area". No burning will be allowed on site.
7. Construction Specifications:
   a. Supplemental water shall be supplied to trees being preserved when natural rainfall is less than 1" a week, from early spring until the ground freezes in the fall. Irrigation should be designed to wet the soil to a depth of 2-3 feet. Lacking a source of water early on the construction site, this may be accomplished by constructing a 6" berm around the tree protection zone and filling the basin with a water truck or by injecting the soil using a pressure system from a truck mounted water tank. Shallow frequent watering should be avoided
   b. Have a licensed and bonded tree contractor remove torn, hazardous, or prominent deadwood as it occurs, using ANSI standards noted under # 4 above. .
   c. Where construction traffic must occur in the area of tree roots it shall be necessary to apply the following procedure: cover undisturbed soil with 10-15 inches wood chips and topped with chain link fence pulled taught and anchored or topped with 5/8 to 3/4 inch plywood with non-skid surface.
   d. Where compaction occurs during construction, vertical mulch with good quality compost.
   e. Before grading, pad preparation, or excavation for foundations, footings, walls, or trenching, relevant trees shall be root pruned 1 foot outside the tree protection zone

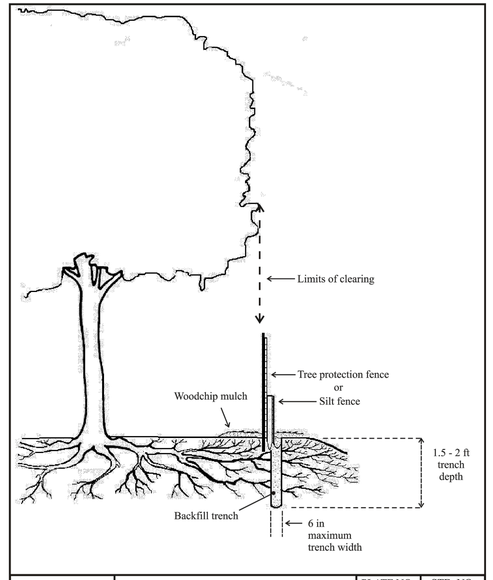
   by cutting all roots cleanly to a depth of 24 inches to the maximum depth of root penetration, (usually 3 feet). Roots shall be cut by manually digging a trench and cutting exposed roots with a saw, vibrating knife, rock saw, narrow trencher with sharp blades, or other approved root-pruning equipment. Pruned roots shall be promptly covered with soil.
   f. Any roots damaged during grading or construction shall be exposed to sound tissue and cut leanly with a saw and promptly covered with moist soil.
   g. Soil from trenches, basements or other excavations shall not be placed within the tree protection zone, either temporarily or permanently. Soil stockpiles should be placed only in previously designated areas. No vehicles or construction equipment shall be parked in the tree protection zone.
   h. No burn piles or debris pits shall be placed within the tree protection zone. No ashes, debris or garbage may be dumped or buried within the tree protection zone. No materials of any kind shall be stored in the tree protection zone.
   i. Maintain fire-safe areas around fenced areas. Also, no heat sources, flames, ignition sources, or smoking is allowed near mulch of trees.
   j. A copy of the "approved plan" and TREE PRESERVATION PROCEDURES AND SPECIFICATIONS must be maintained on site at all times.
   k. All underground utilities and drain or irrigation lines shall be routed outside the tree protection zone. If lines must traverse the protection area, they shall be tunneled or bored under the tree(s) with the approval of the City Arborist.
   l. A licensed and bonded tree contractor must perform additional tree pruning required for clearance during construction under the direction of the City Arborist. Construction workers shall not be allowed to prune trees.
   m. Any herbicides placed under paving materials must be safe for use around trees and labeled for that use. Any pesticides used on site must be tree-safe and not easily transported by water.
   n. If injury should occur to any tree during construction, it should be treated as soon as possible under the direction of the City Arborist.
   o. The City Arborist must monitor any grading, construction, demolition, or other work that is expected to encounter tree roots.
   p. At the completion of construction (and all equipment has been removed from site), notify the City Arborist for an inspection before removing the tree preservation fencing. At this time, all trees will be inspected and any repairs needed will be stipulated by the City and promptly made by the Contractor. (Refer to Sec. 35-15(b) of the City Code for guidance on finalizing the requirements of the bond agreement.

8. The planting of the new tree(s) specified on the plan shall take place after the completion of construction. The City Arborist must inspect the trees prior to planting (see Arborist Notification) and also inspect the placement and installation of the tree(s). All products and workmanship related to the planting of the tree(s) must be in accordance with the **Tree Planting Specifications** attached. The Contractor/Owner must present the City with a copy of a one-year guarantee from the landscape contractor for the newly planted tree(s). The tree will need to be thriving and in good condition one year from the date of planting or will need to be replaced.

If you have questions on any of the "procedures" or "specifications" noted above or concerns that may arise during construction, please contact the City Arborist at (703) 248-5183 or the Senior Urban Forester at (703) 248-5016.

TREE PRESERVATION PROCEDURES AND SPECIFICATIONS

FAIRFAX COUNTY PUBLIC FACILITIES MANUAL

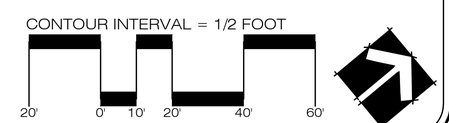


Ref. Sec. 12-0702.1 Rev. 10-08	ROOT PRUNING	PLATE NO.	STD. NO.
		7-12	

NOTE:
ALL PRUNING SHALL BE CONDUCTED BY AN ISA CERTIFIED ARBORIST IN ACCORDANCE WITH ANSI A300 PRUNING STANDARDS.

NOTE:
IN THE CASE OF CONFLICTING NOTES OR DETAILS, THE CITY OF FALLS CHURCH STANDARD NOTES AND DETAILS FOR TREE PRESERVATION AND PLANTING SHALL SUPERSEDE ANY OTHER DETAILS UNLESS OTHERWISE AUTHORIZED BY THE CITY ARBORIST.

CONTOUR INTERVAL = 1/2 FOOT



5209 Center Street
Williamsburg, Virginia 23188
(757) 220-6869
1011 Boulder Springs Drive, Suite 225
Richmond, Virginia 23225
(804) 267-3474
150 Riverside Parkway, Suite 301
Fredericksburg, Virginia 22406
(540) 785-5544
WILLIAMSBURG ENVIRONMENTAL GROUP, INC.
Environmental Consultants

TREE PRESERVATION DETAILS
COE BRANCH STREAM RESTORATION
CITY OF FALLS CHURCH, VIRGINIA

COMMONWEALTH OF VIRGINIA
SCOTT C. BLOSSOM
Lic. No. 40287
PROFESSIONAL ENGINEER

REVISIONS:

DATE:	
12/16/13	REVISIONS MADE PER REQUEST BY CITY OF FALLS CHURCH

DRAWN BY: CDP, RH
DESIGNED BY: CDP
DATE: 11/07/2013
CHECKED BY: SCB, GCR
SCALE:
SHEET: 20 OF 43
JOB#: 4966

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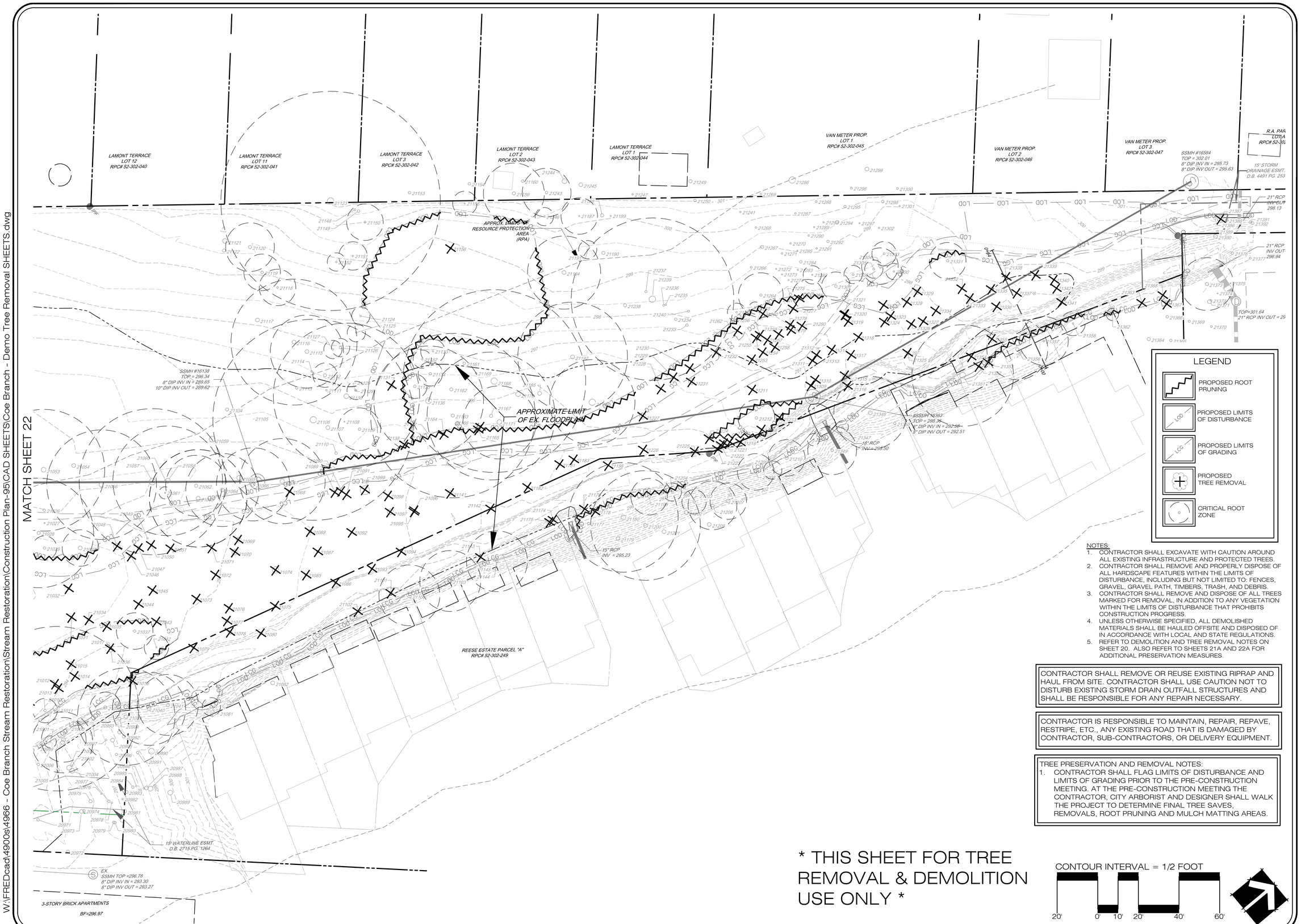

NOTES:

1. CONTRACTOR SHALL EXCAVATE WITH CAUTION AROUND ALL EXISTING INFRASTRUCTURE AND PROTECTED TREES.
2. CONTRACTOR SHALL REMOVE AND PROPERLY DISPOSE OF ALL HARDSCAPE FEATURES WITHIN THE LIMITS OF DISTURBANCE, INCLUDING BUT NOT LIMITED TO: FENCES, GRAVEL, GRAVEL PATH, TIMBERS, TRASH, AND DEBRIS.
3. CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL TREES MARKED FOR REMOVAL, IN ADDITION TO ANY VEGETATION WITHIN THE LIMITS OF DISTURBANCE THAT PROHIBITS CONSTRUCTION PROGRESS.
4. UNLESS OTHERWISE SPECIFIED, ALL DEMOLISHED MATERIALS SHALL BE HAULED OFFSITE AND DISPOSED OF IN ACCORDANCE WITH LOCAL AND STATE REGULATIONS.
5. REFER TO DEMOLITION AND TREE REMOVAL NOTES ON SHEET 20. ALSO REFER TO SHEETS 21A AND 22A FOR ADDITIONAL PRESERVATION MEASURES.

CONTRACTOR SHALL REMOVE OR REUSE EXISTING RIPRAP AND HAUL FROM SITE. CONTRACTOR SHALL USE CAUTION NOT TO DISTURB EXISTING STORM DRAIN OUTFALL STRUCTURES AND SHALL BE RESPONSIBLE FOR ANY REPAIR NECESSARY.

CONTRACTOR IS RESPONSIBLE TO MAINTAIN, REPAIR, REPAVE, RESTRIPE, ETC., ANY EXISTING ROAD THAT IS DAMAGED BY CONTRACTOR, SUB-CONTRACTORS, OR DELIVERY EQUIPMENT.

TREE PRESERVATION AND REMOVAL NOTES:

1. CONTRACTOR SHALL FLAG LIMITS OF DISTURBANCE AND LIMITS OF GRADING PRIOR TO THE PRE-CONSTRUCTION MEETING. AT THE PRE-CONSTRUCTION MEETING THE CONTRACTOR, CITY ARBORIST AND DESIGNER SHALL WALK THE PROJECT TO DETERMINE FINAL TREE SAVES, REMOVALS, ROOT PRUNING AND MULCH MATTING AREAS.

* THIS SHEET FOR TREE REMOVAL & DEMOLITION USE ONLY *

CONTOUR INTERVAL = 1/2 FOOT

20' 0' 10' 20' 40' 60'

5209 Center Street
Williamsburg, Virginia 23188
(757) 220-6869
1011 Boulder Springs Drive, Suite 225
Richmond, Virginia 23225
(804) 267-3474
150 Riverside Parkway, Suite 301
Fredericksburg, Virginia 22406
(540) 785-5944
WILLIAMSBURG ENVIRONMENTAL GROUP, INC.
Environmental Consultants

TREE REMOVAL & DEMOLITION PLAN
COE BRANCH STREAM RESTORATION
CITY OF FALLS CHURCH, VIRGINIA

COMMONWEALTH OF VIRGINIA
SCOTT C. BLOSSOM
Lic. No. 40287
1/22/14
PROFESSIONAL ENGINEER

REVISIONS:

DATE:	
12/16/13	REVISIONS MADE PER REQUEST BY CITY OF FALLS CHURCH
01/20/14	REVISIONS MADE PER REQUEST BY CITY OF FALLS CHURCH

DRAWN BY: CDP, RH
DESIGNED BY: CDP
DATE: 11/07/2013
CHECKED BY: SCB, GCR
SCALE:

SHEET: 21 OF 43
JOB#: 4966

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MATCH SHEET 22A

LAMONT TERRACE LOT 12 RPC# 52-302-040

LAMONT TERRACE LOT 11 RPC# 52-302-041

LAMONT TERRACE LOT 3 RPC# 52-302-042

LAMONT TERRACE LOT 2 RPC# 52-302-043

LAMONT TERRACE LOT 1 RPC# 52-302-044

VAN METER PROP. LOT 1 RPC# 52-302-045

VAN METER PROP. LOT 2 RPC# 52-302-046

VAN METER PROP. LOT 3 RPC# 52-302-047

R.A. PAR LOT A RPC# 52-30

APPROX. LIMIT OF RESOURCE PROTECTION AREA (RPA)

APPROXIMATE LIMIT OF EX. FLOODPLAIN

SSMH #16584
TOP = 302.01
8" DIP INV IN = 295.73
8" DIP INV OUT = 295.63

15' STORM DRAINAGE ESMT. D.B. 4491 PG. 253

21" RCP INV OUT 298.13

21" RCP INV OUT 296.94

TOP=301.64
21" RCP INV OUT = 29

SSMH #16538
TOP = 296.34
8" DIP INV IN = 289.65
10" DIP INV OUT = 289.62

SSMH #16363
TOP = 298.36
8" DIP INV IN = 292.58
8" DIP INV OUT = 292.51

18" RCP INV = 288.50

15" RCP INV = 295.23

REESE ESTATE PARCEL "A" RPC# 52-302-249

15' WATERLINE ESMT. D.B. 2715 PG. 1264

EX. SSMH TOP =296.78
8" DIP INV IN = 293.30
8" DIP INV OUT = 293.27

3-STORY BRICK APARTMENTS
BF=296.97

LEGEND

- PROPOSED ROOT PRUNING
- PROPOSED LIMITS OF DISTURBANCE
- PROPOSED LIMITS OF GRADING
- PROPOSED TREE REMOVAL
- CRITICAL ROOT ZONE
- MULCH TRAIL
- TREE PROTECTION FENCING
- GRAVEL CONSTRUCTION ROAD STABILIZATION
- TEMPORARY STONE CONSTRUCTION ENTRANCE
- TIMBER MATS

ARBORIST NOTIFICATION AND VERIFICATION:

PRIOR TO THE SIGN OFF AND SUBSEQUENT RELEASE OF THE GRADING PLAN ALL PRESERVATION MEASURES REQUIRED, AS PART OF THE LANDSCAPE CONSERVATION PLAN, MUST BE INSPECTED AND APPROVED BY THE CITY OF FALLS CHURCH ARBORIST. THIS MAY INCLUDE BUT IS NOT LIMITED TO TREE WORK, FENCING, MULCHING AND ROOT PRUNING. VIOLATIONS OF THE LANDSCAPE CONSERVATION PLAN SHALL RESULT IN FINES, STOP WORK ORDERS AND/OR THE RESUBMISSION OF A "MITIGATION PLAN".

THE REQUIRED REPLACEMENT VEGETATION SHALL BE INSPECTED PRIOR TO PLANTING BY THE CITY ARBORIST. VEGETATION THAT IS INSTALLED UNINSPECTED WILL BE REJECTED. TO ARRANGE AN APPOINTMENT CALL THE SENIOR URBAN FORESTER (703) 248-5183.

* THIS SHEET FOR TREE PRESERVATION PRACTICES ONLY*

CONTOUR INTERVAL = 1/2 FOOT

20' 0' 10' 20' 40' 60'

5200 Center Street
Williamsburg, Virginia 23188
(757) 220-6869

1011 Boulder Springs Drive, Suite 225
Richmond, Virginia 23225
(804) 267-3474

150 Riverside Parkway, Suite 301
Fredericksburg, Virginia 22406
(540) 785-5544

WILLIAMSBURG ENVIRONMENTAL GROUP, INC.
Environmental Consultants

TREE PRESERVATION PLAN (UPPER)
COE BRANCH STREAM RESTORATION
CITY OF FALLS CHURCH, VIRGINIA

COMMONWEALTH OF VIRGINIA
SCOTT C. BLOSSOM
Lic. No. 40287
1/20/14
PROFESSIONAL ENGINEER

REVISIONS:

DATE:	
12/16/13	REVISIONS MADE PER REQUEST BY CITY OF FALLS CHURCH
01/20/14	REVISIONS PER REQUEST BY CITY OF FALLS CHURCH

DRAWN BY: CDP, RH
DESIGNED BY: CDP
DATE: 11/07/2013
CHECKED BY: SCB, GCR
SCALE:

SHEET: 21A OF 43
JOB#: 4966

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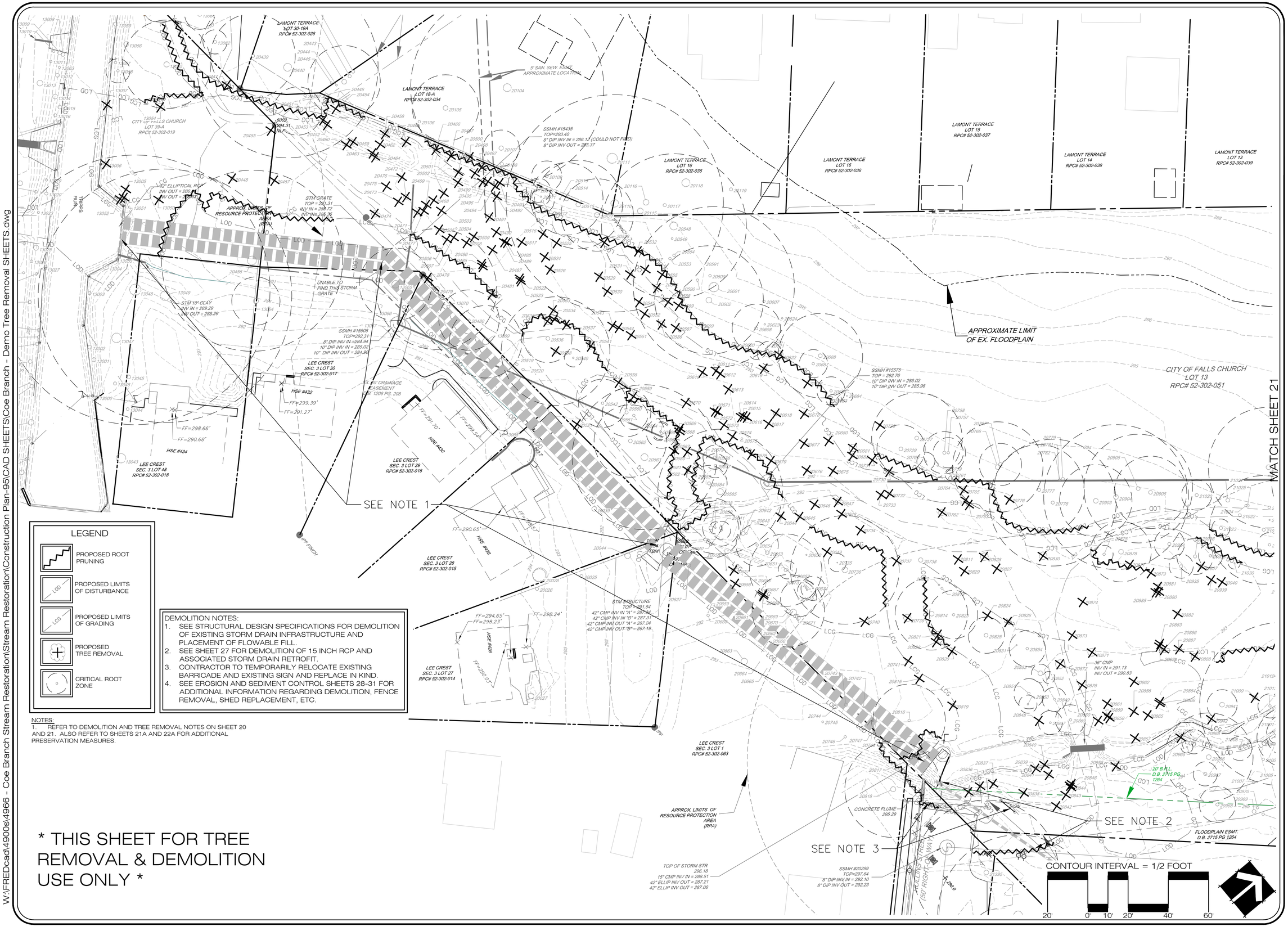

LEGEND

- PROPOSED ROOT PRUNING
- PROPOSED LIMITS OF DISTURBANCE
- PROPOSED LIMITS OF GRADING
- PROPOSED TREE REMOVAL
- CRITICAL ROOT ZONE

DEMOLITION NOTES:

1. SEE STRUCTURAL DESIGN SPECIFICATIONS FOR DEMOLITION OF EXISTING STORM DRAIN INFRASTRUCTURE AND PLACEMENT OF FLOWABLE FILL.
2. SEE SHEET 27 FOR DEMOLITION OF 15 INCH RCP AND ASSOCIATED STORM DRAIN RETROFIT.
3. CONTRACTOR TO TEMPORARILY RELOCATE EXISTING BARRICADE AND EXISTING SIGN AND REPLACE IN KIND.
4. SEE EROSION AND SEDIMENT CONTROL SHEETS 28-31 FOR ADDITIONAL INFORMATION REGARDING DEMOLITION, FENCE REMOVAL, SHED REPLACEMENT, ETC.

NOTES:

1. REFER TO DEMOLITION AND TREE REMOVAL NOTES ON SHEET 20 AND 21. ALSO REFER TO SHEETS 21A AND 22A FOR ADDITIONAL PRESERVATION MEASURES.

* THIS SHEET FOR TREE REMOVAL & DEMOLITION USE ONLY *

5209 Center Street
Williamsburg, Virginia 23188
(757) 220-6669
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WILLIAMSBURG ENVIRONMENTAL GROUP, INC.
Environmental Consultants

TREE REMOVAL & DEMOLITION PLAN
COE BRANCH STREAM RESTORATION
CITY OF FALLS CHURCH, VIRGINIA

COMMONWEALTH OF VIRGINIA
SCOTT C. BLOSSOM
Lic. No. 40287
1/20/14
PROFESSIONAL ENGINEER

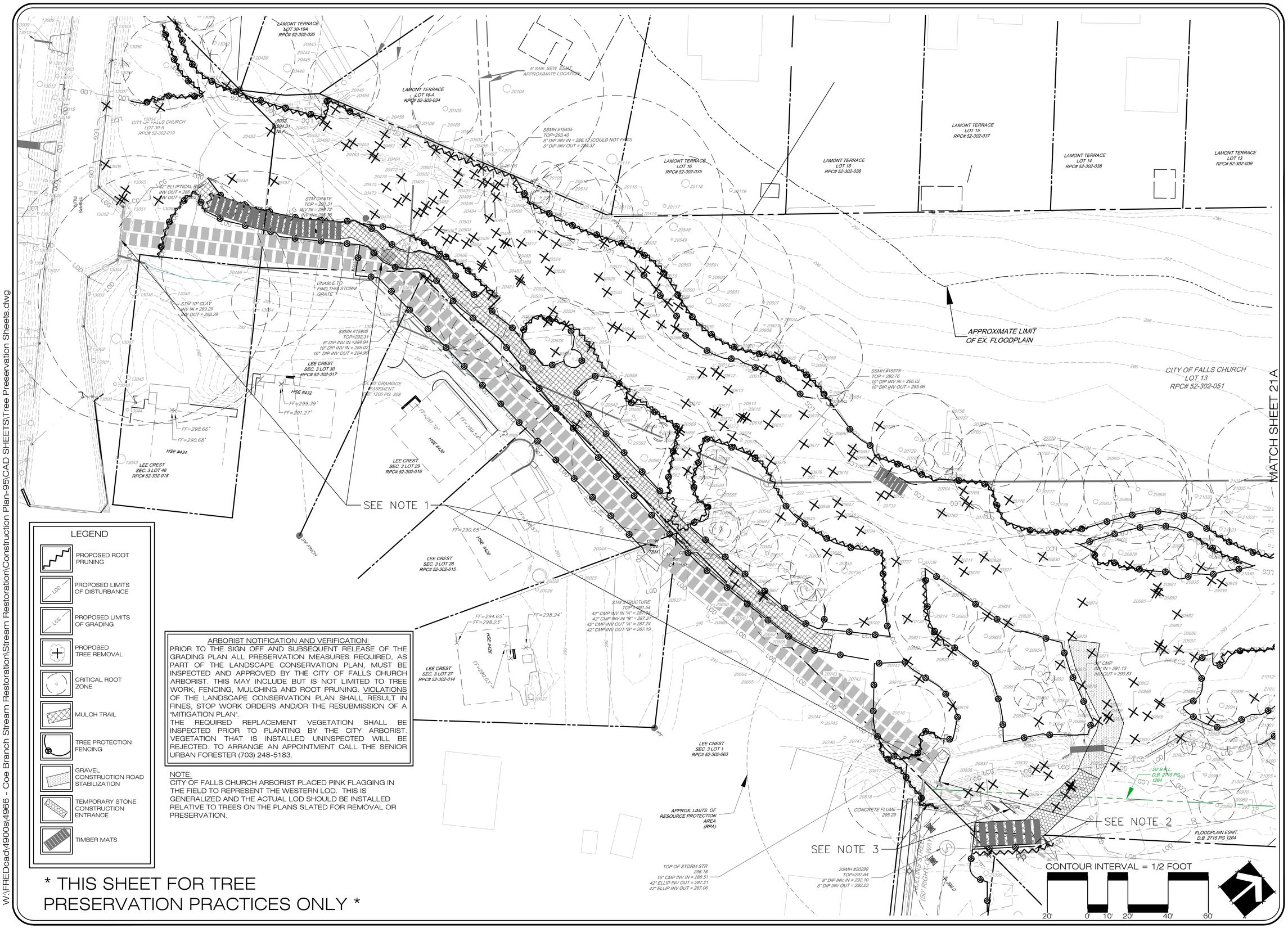
REVISIONS:

DATE:	
12/16/13	REVISIONS MADE PER REQUEST BY CITY OF FALLS CHURCH
01/20/14	REVISIONS MADE PER REQUEST BY CITY OF FALLS CHURCH

DRAWN BY: CDP, RH
DESIGNED BY: CDP
DATE: 11/07/2013
CHECKED BY: SCB, GCR
SCALE:

SHEET: 22 OF 43
JOB#: 4966

W:\FREDcad\4900s\4966 - Coe Branch Stream Restoration\Stream Restoration\Construction Plan-95\CAD SHEETS\Tree Preservation Sheets.dwg



LEGEND

- PROPOSED ROOT PRUNING
- PROPOSED LIMITS OF DISTURBANCE
- PROPOSED LIMITS OF GRADING
- PROPOSED TREE REMOVAL
- CRITICAL ROOT ZONE
- MULCH TRAIL
- TREE PROTECTION FENCING
- GRAVEL CONSTRUCTION ROAD STABILIZATION
- TEMPORARY STONE CONSTRUCTION ENTRANCE
- TIMBER MATS

ARBORIST NOTIFICATION AND VERIFICATION:

PRIOR TO THE SIGN OFF AND SUBSEQUENT RELEASE OF THE GRADING PLAN ALL PRESERVATION MEASURES REQUIRED, AS PART OF THE LANDSCAPE CONSERVATION PLAN, MUST BE INSPECTED AND APPROVED BY THE CITY OF FALLS CHURCH ARBORIST. THIS MAY INCLUDE BUT IS NOT LIMITED TO TREE WORK, FENCING, MULCHING AND ROOT PRUNING. VIOLATIONS OF THE LANDSCAPE CONSERVATION PLAN SHALL RESULT IN FINES, STOP WORK ORDERS AND/OR THE RESUBMISSION OF A "MITIGATION PLAN".

THE REQUIRED REPLACEMENT VEGETATION SHALL BE INSPECTED PRIOR TO PLANTING BY THE CITY ARBORIST. VEGETATION THAT IS INSTALLED UNINSPECTED WILL BE REJECTED. TO ARRANGE AN APPOINTMENT CALL THE SENIOR URBAN FORESTER (703) 248-5183.

NOTE:

CITY OF FALLS CHURCH ARBORIST PLACED PINK FLAGGING IN THE FIELD TO REPRESENT THE WESTERN LOD. THIS IS GENERALIZED AND THE ACTUAL LOD SHOULD BE INSTALLED RELATIVE TO TREES ON THE PLANS SLATED FOR REMOVAL OR PRESERVATION.

* THIS SHEET FOR TREE PRESERVATION PRACTICES ONLY *

5209 Center Street
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(540) 785-5544
WILLIAMSBURG ENVIRONMENTAL GROUP, INC.
Environmental Consultants

TREE PRESERVATION PLAN (LOWER)
COE BRANCH STREAM RESTORATION
CITY OF FALLS CHURCH, VIRGINIA

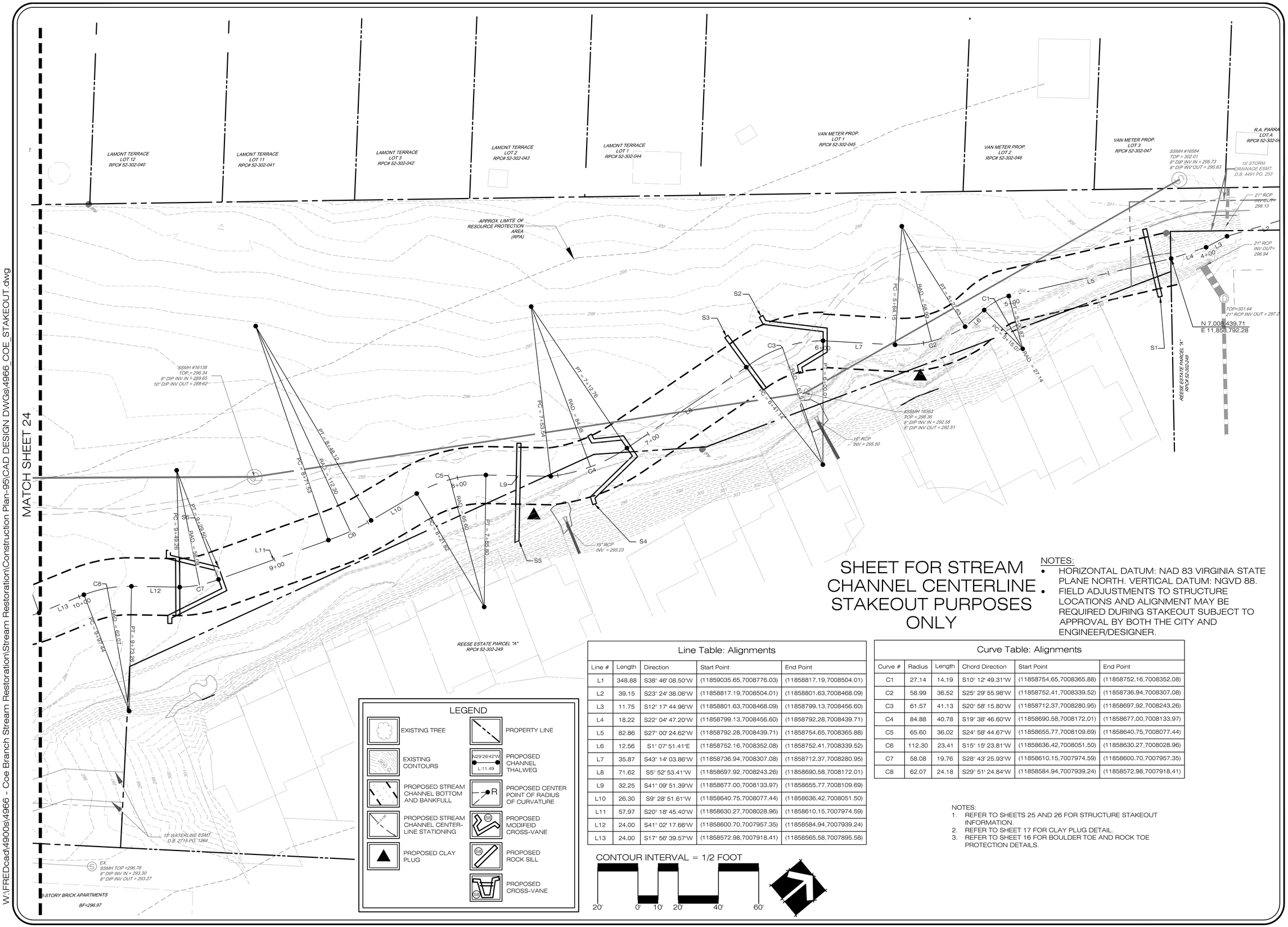
COMMONWEALTH OF VIRGINIA
SCOTT C. BLOSSOM
Lic. No. 40287
1/30/14
PROFESSIONAL ENGINEER

REVISIONS:

DATE:	
12/16/13	REVISIONS MADE PER REQUEST BY CITY OF FALLS CHURCH
01/20/14	REVISIONS PER REQUEST BY CITY OF FALLS CHURCH

DRAWN BY: CDP, RH
DESIGNED BY: CDP
DATE: 11/07/2013
CHECKED BY: SCB, GCR
SCALE:

SHEET: 22A OF 43
JOB#: 4966



SHEET FOR STREAM CHANNEL CENTERLINE STAKEOUT PURPOSES ONLY

NOTES:

- HORIZONTAL DATUM: NAD 83 VIRGINIA STATE PLANE NORTH. VERTICAL DATUM: NGVD 88. FIELD ADJUSTMENTS TO STRUCTURE LOCATIONS AND ALIGNMENT MAY BE REQUIRED DURING STAKEOUT SUBJECT TO APPROVAL BY BOTH THE CITY AND ENGINEER/DESIGNER.

LEGEND

- EXISTING TREE
- PROPERTY LINE
- EXISTING CONTOURS
- PROPOSED CHANNEL THALWEG (N29°26'42"W, L=11.49)
- PROPOSED STREAM CHANNEL BOTTOM AND BANKFULL
- PROPOSED CENTER POINT OF RADIUS OF CURVATURE
- PROPOSED STREAM CHANNEL CENTER-LINE STATIONING
- PROPOSED MODIFIED CROSS-VANE
- PROPOSED CLAY PLUG
- PROPOSED ROCK SILL
- PROPOSED CROSS-VANE

Line Table: Alignments

Line #	Length	Direction	Start Point	End Point
L1	348.88	S38° 46' 08.50"W	(11859035.65,7008776.03)	(11858817.19,7008504.01)
L2	39.15	S23° 24' 38.06"W	(11858817.19,7008504.01)	(11858801.63,7008468.09)
L3	11.75	S12° 17' 44.96"W	(11858801.63,7008468.09)	(11858799.13,7008456.60)
L4	18.22	S22° 04' 47.20"W	(11858799.13,7008456.60)	(11858792.28,7008439.71)
L5	82.86	S27° 00' 24.62"W	(11858792.28,7008439.71)	(11858754.65,7008365.88)
L6	12.56	S1° 07' 51.41"E	(11858752.16,7008352.08)	(11858752.41,7008339.52)
L7	35.87	S43° 14' 03.86"W	(11858736.94,7008307.08)	(11858712.37,7008280.95)
L8	71.62	S5° 52' 53.41"W	(11858697.92,7008243.26)	(11858690.58,7008172.01)
L9	32.25	S41° 09' 51.39"W	(11858677.00,7008133.97)	(11858655.77,7008109.69)
L10	26.30	S9° 28' 51.61"W	(11858640.75,7008077.44)	(11858636.42,7008051.50)
L11	57.97	S20° 18' 45.40"W	(11858630.27,7008028.96)	(11858610.15,7007974.59)
L12	24.00	S41° 02' 17.66"W	(11858600.70,7007957.35)	(11858584.94,7007939.24)
L13	24.00	S17° 56' 39.57"W	(11858572.98,7007918.41)	(11858565.58,7007895.58)

Curve Table: Alignments

Curve #	Radius	Length	Chord Direction	Start Point	End Point
C1	27.14	14.19	S10° 12' 49.31"W	(11858754.65,7008365.88)	(11858752.16,7008352.08)
C2	58.99	36.52	S25° 29' 55.98"W	(11858752.41,7008339.52)	(11858736.94,7008307.08)
C3	61.57	41.13	S20° 58' 15.80"W	(11858712.37,7008280.95)	(11858697.92,7008243.26)
C4	84.88	40.78	S19° 38' 46.60"W	(11858690.58,7008172.01)	(11858677.00,7008133.97)
C5	65.60	36.02	S24° 58' 44.67"W	(11858655.77,7008109.69)	(11858640.75,7008077.44)
C6	112.30	23.41	S15° 15' 23.81"W	(11858636.42,7008051.50)	(11858630.27,7008028.96)
C7	58.08	19.76	S28° 43' 25.93"W	(11858610.15,7007974.59)	(11858600.70,7007957.35)
C8	62.07	24.18	S29° 51' 24.84"W	(11858584.94,7007939.24)	(11858572.98,7007918.41)

CONTOUR INTERVAL = 1/2 FOOT

20' 0' 10' 20' 40' 60'

NOTES:

1. REFER TO SHEETS 25 AND 26 FOR STRUCTURE STAKEOUT INFORMATION.
2. REFER TO SHEET 17 FOR CLAY PLUG DETAIL.
3. REFER TO SHEET 16 FOR BOULDER TOE AND ROCK TOE PROTECTION DETAILS.

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WILLIAMSBURG ENVIRONMENTAL GROUP, INC.
Environmental Consultants

STAKEOUT PLAN UPPER COE BRANCH STREAM RESTORATION CITY OF FALLS CHURCH, VIRGINIA

COMMONWEALTH OF VIRGINIA
SCOTT C. BLOSSOM
Lic. No. 40287
11/2/13
PROFESSIONAL ENGINEER

REVISIONS:
DATE:

DRAWN BY: CDP, RH
DESIGNED BY: CDP
DATE: 11/07/2013
CHECKED BY: SCB, GCR
SCALE: 1"=20'

SHEET: 23 OF 43
JOB#: 4966

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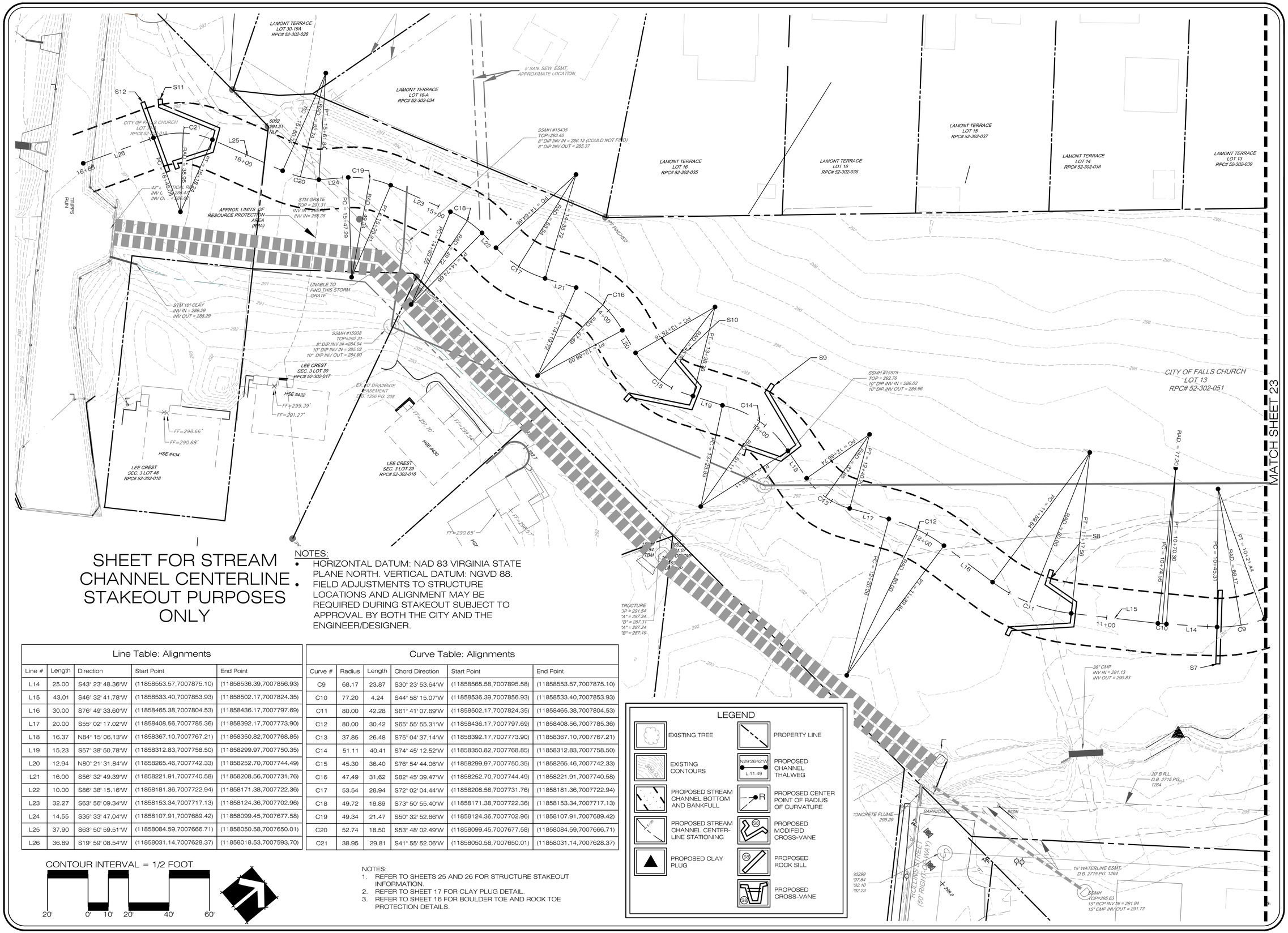

SHEET FOR STREAM CHANNEL CENTERLINE STAKEOUT PURPOSES ONLY

NOTES:

- HORIZONTAL DATUM: NAD 83 VIRGINIA STATE PLANE NORTH. VERTICAL DATUM: NGVD 88.
- FIELD ADJUSTMENTS TO STRUCTURE LOCATIONS AND ALIGNMENT MAY BE REQUIRED DURING STAKEOUT SUBJECT TO APPROVAL BY BOTH THE CITY AND THE ENGINEER/DESIGNER.

Line Table: Alignments				
Line #	Length	Direction	Start Point	End Point
L14	25.00	S43° 23' 48.36"W	(11858553.57,7007875.10)	(11858536.39,7007856.93)
L15	43.01	S46° 32' 41.78"W	(11858533.40,7007853.93)	(11858502.17,7007824.35)
L16	30.00	S76° 49' 33.60"W	(11858465.38,7007804.53)	(11858436.17,7007797.69)
L17	20.00	S55° 02' 17.02"W	(11858408.56,7007785.36)	(11858392.17,7007773.90)
L18	16.37	N84° 15' 06.13"W	(11858367.10,7007767.21)	(11858350.82,7007768.85)
L19	15.23	S57° 38' 50.78"W	(11858312.83,7007758.50)	(11858299.97,7007750.35)
L20	12.94	N80° 21' 31.84"W	(11858265.46,7007742.33)	(11858252.70,7007744.49)
L21	16.00	S56° 32' 49.39"W	(11858221.91,7007740.58)	(11858208.56,7007731.76)
L22	10.00	S86° 38' 15.16"W	(11858181.36,7007722.94)	(11858171.38,7007722.36)
L23	32.27	S63° 56' 09.34"W	(11858153.34,7007717.13)	(11858124.36,7007702.96)
L24	14.55	S35° 33' 47.04"W	(11858107.91,7007689.42)	(11858099.45,7007677.58)
L25	37.90	S63° 50' 59.51"W	(11858084.59,7007666.71)	(11858050.58,7007650.01)
L26	36.89	S19° 59' 08.54"W	(11858031.14,7007628.37)	(11858018.53,7007593.70)

Curve Table: Alignments					
Curve #	Radius	Length	Chord Direction	Start Point	End Point
C9	68.17	23.87	S30° 23' 53.64"W	(11858565.58,7007895.58)	(11858553.57,7007875.10)
C10	77.20	4.24	S44° 58' 15.07"W	(11858536.39,7007856.93)	(11858533.40,7007853.93)
C11	80.00	42.28	S61° 41' 07.69"W	(11858502.17,7007824.35)	(11858465.38,7007804.53)
C12	80.00	30.42	S65° 55' 55.31"W	(11858436.17,7007797.69)	(11858408.56,7007785.36)
C13	37.85	26.48	S75° 04' 37.14"W	(11858392.17,7007773.90)	(11858367.10,7007767.21)
C14	51.11	40.41	S74° 45' 12.52"W	(11858350.82,7007768.85)	(11858312.83,7007758.50)
C15	45.30	36.40	S76° 54' 44.06"W	(11858299.97,7007750.35)	(11858265.46,7007742.33)
C16	47.49	31.62	S82° 45' 39.47"W	(11858252.70,7007744.49)	(11858221.91,7007740.58)
C17	53.54	28.94	S72° 02' 04.44"W	(11858208.56,7007731.76)	(11858181.36,7007722.94)
C18	49.72	18.89	S73° 50' 55.40"W	(11858171.38,7007722.36)	(11858153.34,7007717.13)
C19	49.34	21.47	S50° 32' 52.66"W	(11858124.36,7007702.96)	(11858107.91,7007689.42)
C20	52.74	18.50	S53° 48' 02.49"W	(11858099.45,7007677.58)	(11858084.59,7007666.71)
C21	38.95	29.81	S41° 55' 52.06"W	(11858050.58,7007650.01)	(11858031.14,7007628.37)

CONTOUR INTERVAL = 1/2 FOOT

20' 0' 10' 20' 40' 60'

NOTES:

1. REFER TO SHEETS 25 AND 26 FOR STRUCTURE STAKEOUT INFORMATION.
2. REFER TO SHEET 17 FOR CLAY PLUG DETAIL.
3. REFER TO SHEET 16 FOR BOULDER TOE AND ROCK TOE PROTECTION DETAILS.

LEGEND

- EXISTING TREE
- PROPERTY LINE
- EXISTING CONTOURS
- PROPOSED CHANNEL THALWEG (N29°26'42"W, L:11.49)
- PROPOSED STREAM CHANNEL BOTTOM AND BANKFULL
- PROPOSED CENTER POINT OF RADIUS OF CURVATURE
- PROPOSED STREAM CHANNEL CENTER-LINE STATIONING
- PROPOSED MODIFEID CROSS-VANE
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WILLIAMSBURG ENVIRONMENTAL GROUP, INC.
Environmental Consultants

STAKEOUT PLAN LOWER COE BRANCH STREAM RESTORATION

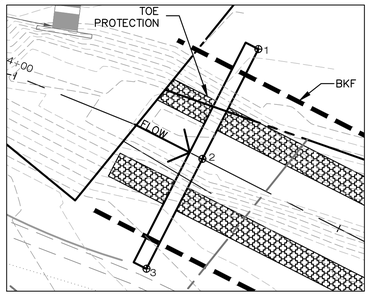
CITY OF FALLS CHURCH, VIRGINIA

COMMONWEALTH OF VIRGINIA
SCOTT C. BLOSSOM
Lic. No. 40287
11/2/13
PROFESSIONAL ENGINEER

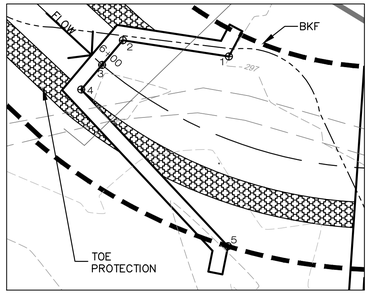
REVISIONS:
DATE:

DRAWN BY: CDP, RH
DESIGNED BY: CDP
DATE: 11/07/2013
CHECKED BY: SCB, GCR
SCALE: 1"=20'

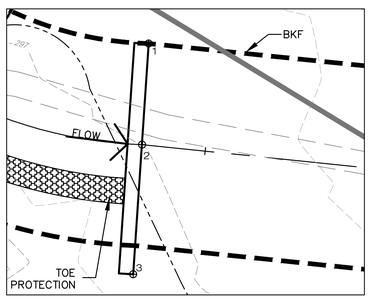
SHEET: 24 OF 43
JOB#: 4966



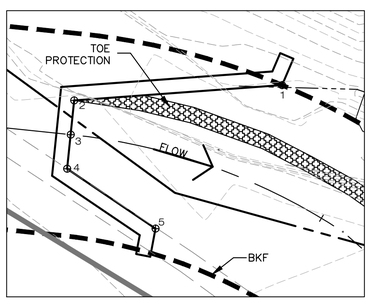
STAKEOUT STRUCTURE ID					S1	
TYPE	BURIED SILL					
Whead			Lvane-out	Lvane-in	SLOPEvane-out	SLOPEvane-in
(FT)			(FT)	(FT)	(FT/FT)	(FT/FT)
9.00			N/A	N/A	N/A	N/A
Point #	STATION	ELEVATION AT POINT	NORTHING	EASTING		
	(FT)					
1	4+28.62	296.15	7008422.44	11858802.81		
2	4+28.62	296.15	7008430.26	11858787.46	349.24	
3	4+28.62	296.15	7008438.08	11858772.11		
					348.97	



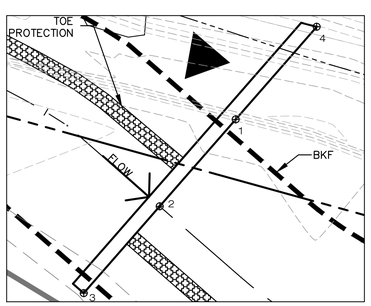
STAKEOUT STRUCTURE ID					S2	
TYPE	MODIFIED CROSS-VANE					
Whead			Lvane-out	Lvane-in	SLOPEvane-out	SLOPEvane-in
(FT)			(FT)	(FT)	(FT/FT)	(FT/FT)
9.00			30.00	15.00	0.0726	0.0726
Point #	STATION	ELEVATION AT POINT	NORTHING	EASTING		
	(FT)					
1	6+23.50	296.73	7008263.23	11858713.54		
2	6+00.00	294.55	7008278.05	11858715.82		
3	6+00.00	294.55	7008280.96	11858712.38		
4	6+00.00	294.55	7008283.86	11858708.93		
5	6+15.25	295.64	7008263.36	11858687.03		



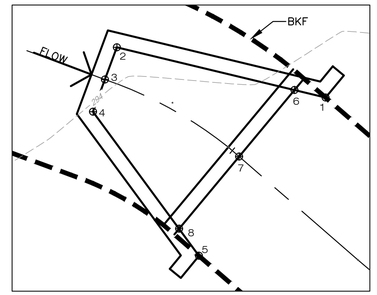
STAKEOUT STRUCTURE ID					S3	
TYPE	BURIED SILL					
Whead			Lvane-out	Lvane-in	SLOPEvane-out	SLOPEvane-in
(FT)			(FT)	(FT)	(FT/FT)	(FT/FT)
9.61			N/A	N/A	N/A	N/A
Point #	STATION	ELEVATION AT POINT	NORTHING	EASTING		
	(FT)					
1	6+41.11	294.37	7008242.33	11858712.05		
2	6+41.11	294.37	7008243.26	11858697.92		
3	6+41.11	294.37	7008244.50	11858679.80		



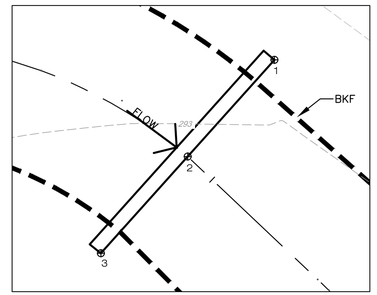
STAKEOUT STRUCTURE ID					S4	
TYPE	MODIFIED CROSS-VANE					
Whead			Lvane-out	Lvane-in	SLOPEvane-out	SLOPEvane-in
(FT)			(FT)	(FT)	(FT/FT)	(FT/FT)
9.61			29.13	14.91	0.072600	0.072600
Point #	STATION	ELEVATION AT POINT	NORTHING	EASTING		
	(FT)					
1	7+41.89	295.98	7008142.47	11858697.50		
2	7+12.76	293.87	7008171.52	11858695.36		
3	7+12.76	293.87	7008172.01	11858690.58		
4	7+12.76	293.87	7008172.50	11858685.81		
5	727.670000	294.95	7008160.15	11858677.44		



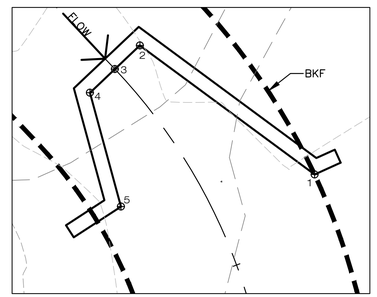
STAKEOUT STRUCTURE ID					S5	
TYPE	BURIED SILL					
Whead			Lvane-out	Lvane-in	SLOPEvane-out	SLOPEvane-in
(FT)			(FT)	(FT)	(FT/FT)	(FT/FT)
9.61			N/A	N/A	N/A	N/A
Point #	STATION	ELEVATION AT POINT	NORTHING	EASTING		
	(FT)					
1	7+70.50	293.02	7008110.47	11858677.86		
2	7+70.50	293.02	7008121.08	11858665.72		
3	7+70.50	293.02	7008131.69	11858653.59		
4	7+70.51	294.87	7008099.14	11858690.82		



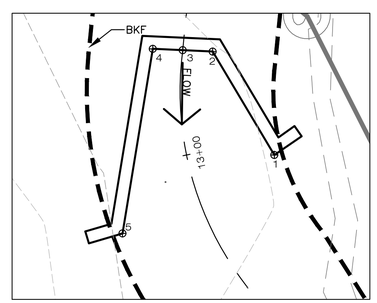
STAKEOUT STRUCTURE ID					S6	
TYPE	CROSS-VANE					
Whead			Lvane-out	Lvane-in	SLOPEvane-out	SLOPEvane-in
(FT)			(FT)	(FT)	(FT/FT)	(FT/FT)
9.61			30.00	25.00	0.0600	0.0600
Point #	STATION	ELEVATION AT POINT	NORTHING	EASTING		
	(FT)					
1	9+55.32	293.66	7007943.76	11858607.63		
2	9+29.50	292.16	7007972.98	11858614.67		
3	9+29.50	292.16	7007974.59	11858610.15		
4	9+29.50	292.16	7007976.26	11858605.65		
5	9+55.73	293.96	7007961.45	11858585.51		
6	9+49.26	293.69	7007948.11	11858608.68		
7	9+49.26	291.42	7007957.35	11858600.70		
8	9+49.26	293.38	7007964.23	11858589.29		



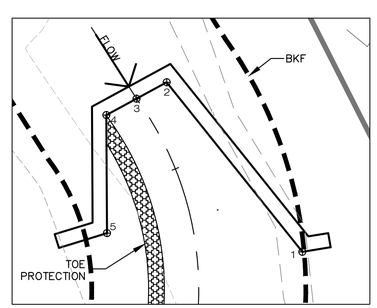
STAKEOUT STRUCTURE ID					S7	
TYPE	BURIED SILL					
Whead			Lvane-out	Lvane-in	SLOPEvane-out	SLOPEvane-in
(FT)			(FT)	(FT)	(FT/FT)	(FT/FT)
9.61			N/A	N/A	N/A	N/A
Point #	STATION	ELEVATION AT POINT	NORTHING	EASTING		
	(FT)					
1	10+45.31	290.62	7007862.97	11858567.08		
2	10+45.31	290.62	7007875.10	11858553.57		
3	10+45.31	290.62	7007887.23	11858540.05		



STAKEOUT STRUCTURE ID					S8	
TYPE	MODIFIED CROSS-VANE					
Whead			Lvane-out	Lvane-in	SLOPEvane-out	SLOPEvane-in
(FT)			(FT)	(FT)	(FT/FT)	(FT/FT)
9.61			30.35	16.49	0.0600	0.0600
Point #	STATION	ELEVATION AT POINT	NORTHING	EASTING		
	(FT)					
1	11+42.97	292.02	7007796.44	11858487.44		
2	11+17.56	290.20	7007820.86	11858505.47		
3	11+17.56	290.20	7007824.35	11858502.17		
4	11+17.56	290.20	7007827.83	11858498.87		
5	11+34.32	291.19	7007823.50	11858482.96		



STAKEOUT STRUCTURE ID					S9	
TYPE	MODIFIED CROSS-VANE					
Whead			Lvane-out	Lvane-in	SLOPEvane-out	SLOPEvane-in
(FT)			(FT)	(FT)	(FT/FT)	(FT/FT)
9.00			30.00	19.32	0.0600	0.0600
Point #	STATION	ELEVATION AT POINT	NORTHING	EASTING		
	(FT)					
1	13+03.94	290.28	7007754.16	11858334.01		
2	12+83.11	289.12	7007764.09	11858350.27		
3	12+83.11	289.12	7007768.85	11858350.82		
4	12+83.11	289.12	7007773.62	11858351.37		
5	13+09.11	290.92	7007778.51	11858321.43		



STAKEOUT STRUCTURE ID					S10	
TYPE	MODIFIED CROSS-VANE					
Whead			Lvane-out	Lvane-in	SLOPEvane-out	SLOPEvane-in
(FT)			(FT)	(FT)	(FT/FT)	(FT/FT)
9.61			30.35	16.49	0.0600	0.0600
Point #	STATION	ELEVATION AT POINT	NORTHING	EASTING		
	(FT)					
1	13+64.44	290.71	7007727.17	11858278.56		
2	13+38.76	288.89	7007746.13	11858302.26		
3	13+38.76	288.89	7007750.35	11858299.97		
4	13+38.76	288.89	7007754.57	11858297.67		
5	13+55.68	289.88	7007754.47	11858281.18		

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Environmental Consultants

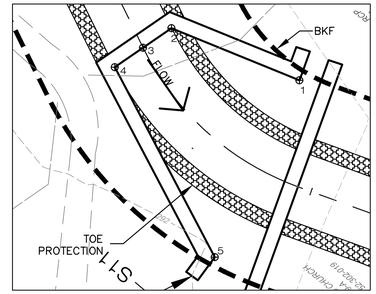
STRUCTURE STAKEOUT PLAN
COE BRANCH STREAM RESTORATION
CITY OF FALLS CHURCH, VIRGINIA

COMMONWEALTH OF VIRGINIA
SCOTT C. BLOSSOM
Lic. No. 40287
11/2/13
PROFESSIONAL ENGINEER

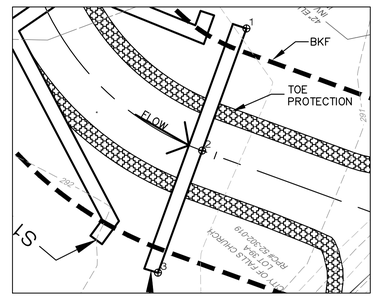
REVISIONS:
DATE:

DRAWN BY: CDP, RH
DESIGNED BY: CDP
DATE: 11/07/2013
CHECKED BY: SCB, GCR
SCALE:

SHEET: 25 OF 43
JOB#: 4966



	STAKEOUT STRUCTURE ID				S11	
TYPE	MODIFIED CROSS-VANE					
Whead			Lvane-out	Lvane-in	SLOPEvane-out	SLOPEvane-in
(FT)			(FT)	(FT)	(FT/FT)	(FT/FT)
9.61			30.00	19.32	0.0600	0.0600
Point #	STATION	ELEVATION AT POINT	NORTHING	EASTING		
	(FT)					
1	16+43.16	289.58	7007628.16	11858046.02		
2	16+18.24	287.78	7007646.05	11858053.30		
3	16+18.24	287.78	7007650.01	11858050.58		
4	16+18.24	287.78	7007653.96	11858047.86		
5	16+40.43	288.94	7007640.00	11858021.30		



	STAKEOUT STRUCTURE ID				S12	
TYPE	BURIED SILL					
Whead			Lvane-out	Lvane-in	SLOPEvane-out	SLOPEvane-in
(FT)			(FT)	(FT)	(FT/FT)	(FT/FT)
9.61			N/A	N/A	N/A	N/A
Point #	STATION	ELEVATION AT POINT	NORTHING	EASTING		
	(FT)					
1	16+48.05	287.65	7007622.18	11858048.21		
2	16+48.05	287.65	7007628.37	11858031.14		
3	16+48.05	287.65	7007634.55	11858014.07		

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STRUCTURE STAKEOUT PLAN
COE BRANCH STREAM RESTORATION
CITY OF FALLS CHURCH, VIRGINIA

COMMONWEALTH OF VIRGINIA
SCOTT C. BLOSSOM
Lic. No. 40287
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REVISIONS:
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DRAWN BY: CDP, RH
DESIGNED BY: CDP
DATE: 11/07/2013
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SCALE:

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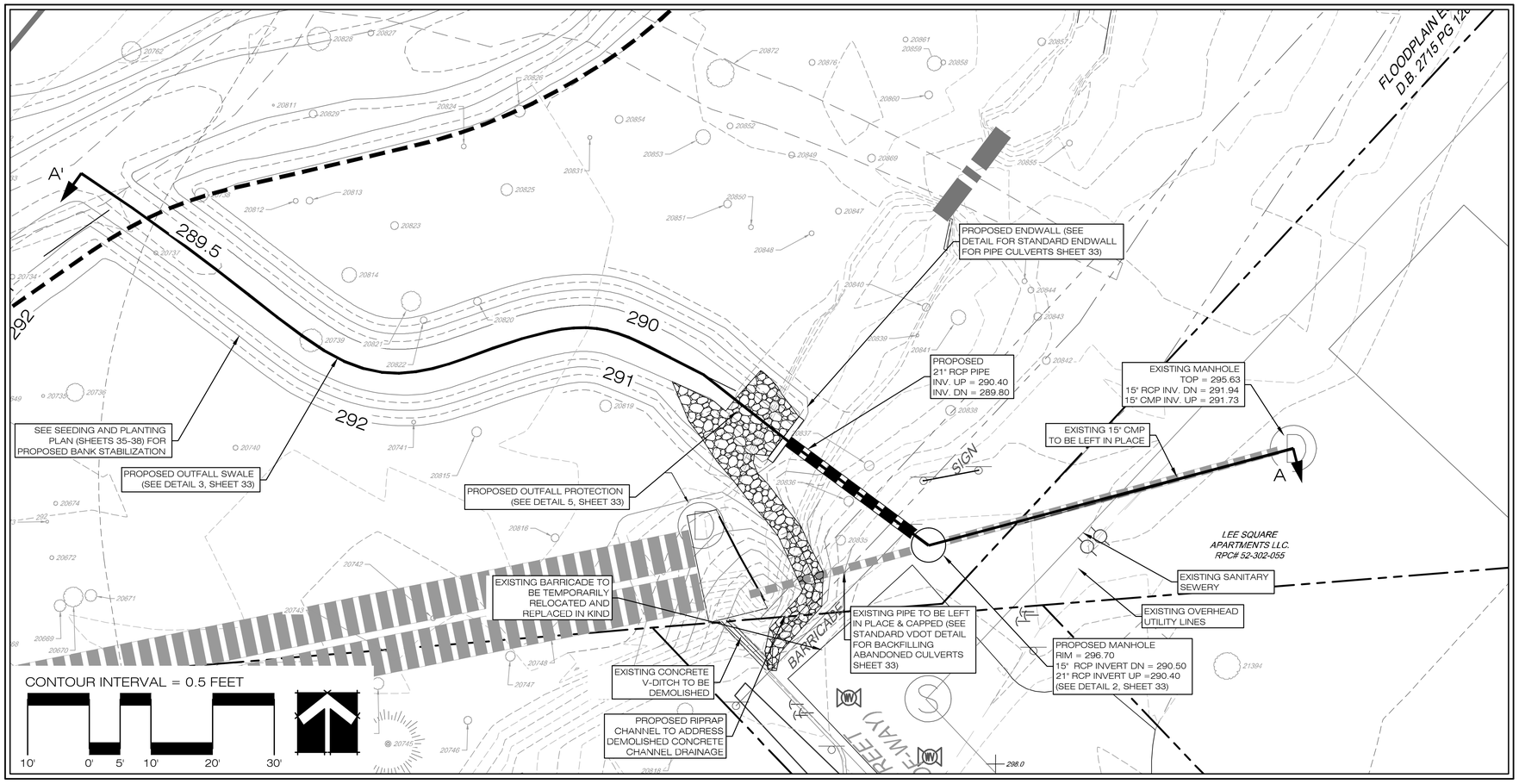
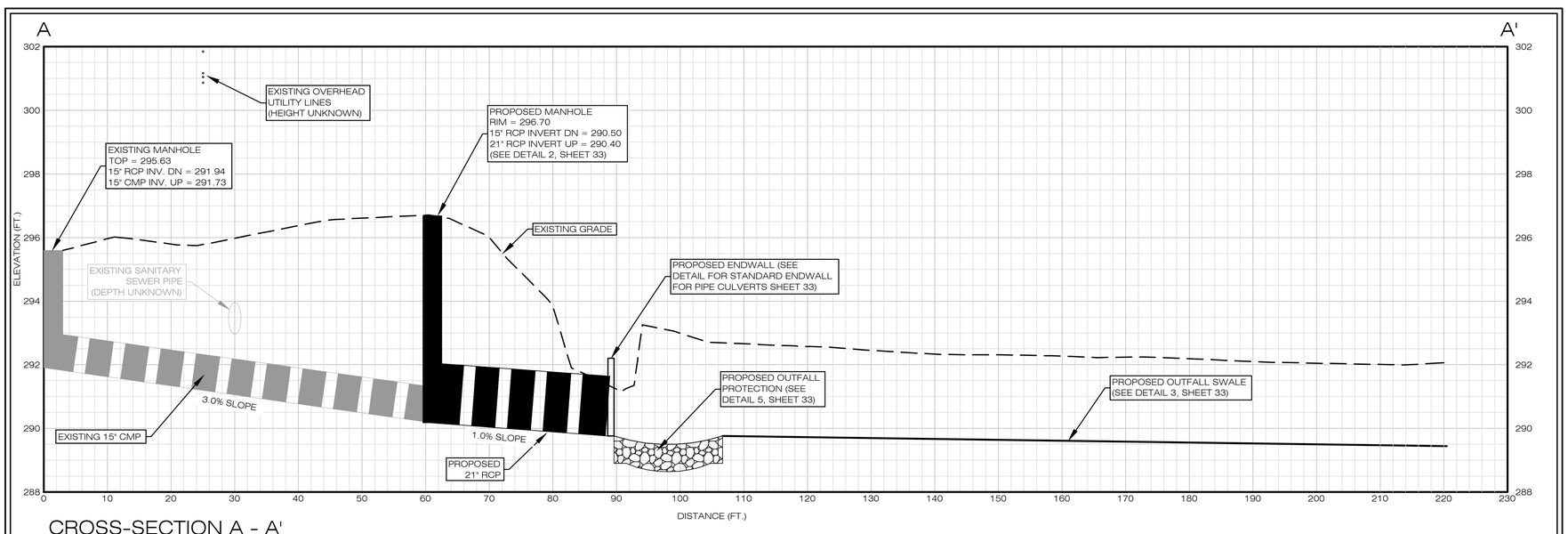
JOB#: 4966





CROSS-SECTION A - A'

VERTICAL SCALE: 1" = 2' HORIZONTAL SCALE: 1" = 10'

LEGEND:

- PROPOSED 21" RCP CULVERT
- PROPOSED CONTOURS
- EXISTING CONTOURS
- EXISTING RCP CULVERT
- PROPOSED RIPRAP
- EXISTING TREE

NOTES

REINFORCED CONCRETE PIPE

1. MATERIALS - REINFORCED CONCRETE PIPE (RCP) SHOULD HAVE BELL AND SINGULAR SPIGOT JOINTS WITH RUBBER GASKETS AND SHOULD CONSIST OF CLASS IV PIPE OR STRONGER, AS DEFINED BY THE 2008 VDOT ROAD AND BRIDGE STANDARDS AND SPECIFICATIONS.
2. BEDDING - ALL RCP CONDUITS SHOULD BE LAID IN APPROPRIATE BEDDING MATERIAL AND DIMENSIONS AS SPECIFIED IN APPLICABLE ASTM STANDARDS. THE CONTRACTOR SHALL ENSURE PROPER COMPACTION BENEATH AND AROUND THE PIPES IN ACCORDANCE WITH THE GEOTECHNICAL RECOMMENDATIONS. IF PROPER COMPACTION AROUND SUCH PIPES CAN NOT BE OBTAINED, AN ALTERNATIVE METHOD (SUCH AS A CONCRETE CRADLE, FLOWABLE FILL, BENTONITE SOIL AMENDMENTS) MAY BE EMPLOYED AS DIRECTED BY THE GEOTECHNICAL ENGINEER ONSITE.
3. LAYING PIPE - BELL AND SPIGOT SHOULD BE PLACED WITH THE BELL END UPSTREAM. JOINTS SHOULD BE MADE PER RECOMMENDATIONS FROM THE MANUFACTURER. AFTER THE JOINTS ARE SEALED FOR THE ENTIRE RUN OF PIPE, THE BEDDING SHOULD BE PLACED SO THAT ALL SPACES UNDER THE PIPE ARE FILLED. CARE SHOULD BE TAKEN TO PREVENT ANY DEVIATION FROM THE ORIGINAL LINE AND GRADE OF THE PIPE.
4. BACK FILL - ALL BACKFILL MATERIAL AND PLACEMENT SHOULD CONFORM TO THE RECOMMENDATIONS OF THE GEOTECHNICAL ENGINEER.

MANHOLE

5. SHOP DRAWINGS FOR THE PROPOSED OUTLET STRUCTURE AND ENDWALL SHALL BE REVIEWED AND SEALED BY STRUCTURAL ENGINEER AT CONTRACTOR OR PRECASTER EXPENSE.
6. PRECAST STRUCTURES WILL CONFORM WITH DESIGN SPECIFICATIONS DESCRIBED HEREIN.
7. CONTRACTOR PROVIDED SHOP DRAWINGS SHOULD DEMONSTRATE WATERTIGHT SEALS AND CONNECTORS ADEQUATE TO RESIST BUOYANT FORCES.
8. OVERALL HEIGHT DIMENSIONS ARE APPROXIMATE ONLY FOR ESTIMATING PURPOSES. ACTUAL DIMENSIONS SHALL BE DETERMINED BY THE CONTRACTOR FROM FIELD CONDITIONS WITH ENGINEER APPROVAL.
9. ALL PRECAST STRUCTURES TO BE CONSTRUCTED WITH MINIMUM CLASS A3 (3200 PSI) CONCRETE
10. MANHOLE STEPS TO BE PROVIDED TO MEET LATEST OSHA REGULATION 29 CFS 1910.27, SECTION 16 OF ASTM SPECIFICATION C478 AND SECTION 10 OF ASTM SPECIFICATION C497.
11. ALL BASE, REDUCER, AND RISER UNITS ARE TO BE IN ACCORDANCE WITH THE REQUIREMENTS OF AASHTO M199, (ASTM C478).
12. BASE SECTION TO BE CAST MONOLITHIC.
13. THE REQUIRED OPENINGS FOR PIPES SHALL BE FORMED, DRILLED, OR NEATLY CUT AS APPROVED BY THE ENGINEER. THE CONTRACTOR WILL FURNISH THE FABRICATOR WITH THE ANGLES BETWEEN CENTER LINES, THE INVERT ELEVATIONS, AND THE SIZE OF ALL PIPES TO ENTER THE BASE UNIT. FOR PIPE PENETRATIONS, THE HOLES ARE TO BE A MINIMUM OF 4" TO 8" LARGER THAN THE OUTSIDE DIAMETER OF THE PROPOSED PIPE.
14. ALL PIPE CONNECTIONS TO BE WATERTIGHT, FLEXIBLE, AND DEFLECTION RESISTANT.
15. DIMENSIONS SHOWN ARE MINIMUM. ACTUAL DIMENSIONS MAY VARY WITH MANUFACTURER.
16. JOINT SEALANT AND INSIDE AND OUTSIDE GROUT TO BE PROVIDED FOR ALL JOINTS. JOINT SEALANT IS BUTYL RUBBER MASTIC TYPE SEAL THAT CONFORMS TO LATEST AASHTO SPECIFICATION M-198.
17. REINFORCING STEEL WELDED WIRE FABRIC CONFORMS TO LATEST ASTM SPECIFICATION A185.
18. REINFORCING STEEL DEFORMED BARS CONFORM TO LATEST ASTM SPECIFICATION A6.

CONSTRUCTION SEQUENCE

19. AFTER MAIN CHANNEL IS ON-LINE AND TRIBUTARY IS EXCAVATED AND STABILIZED, (INCLUDING CONCRETE FLUME DEMOLITION AND RIPRAP CHANNEL CONSTRUCTION), WORK SHALL BE PERFORMED FROM ENDWALL TO PROPOSED MANHOLE IN ORDER TO KEEP EXISTING STORM DRAIN ON-LINE UNTIL MANHOLE INSTALLATION.
20. DURING INSTALLATION OF MANHOLE, PUMP AROUND PRACTICE MUST BE EMPLOYED AT UPSTREAM DROP INLET AS NEEDED.
21. AFTER COMPLETION OF MANHOLE INSTALLATION, SEALING OPERATION SHALL BE COMPLETED. FLOWABLE FILL ACTIVITIES MAY COMMENCE AFTER 15" STORMDRAIN RETROFIT.

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STORMDRAIN RETROFIT
COE BRANCH STREAM RESTORATION
CITY OF FALLS CHURCH, VIRGINIA

COMMONWEALTH OF VIRGINIA
SCOTT C. BLOSSOM
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PROFESSIONAL ENGINEER

REVISIONS:
DATE:

DRAWN BY: CSA/AWT
DESIGNED BY: SCB/CSA
DATE: 11/07/2013
CHECKED BY: SCB
SCALE: 1" = 10'
SHEET: 27 OF 43
JOB#: 4966

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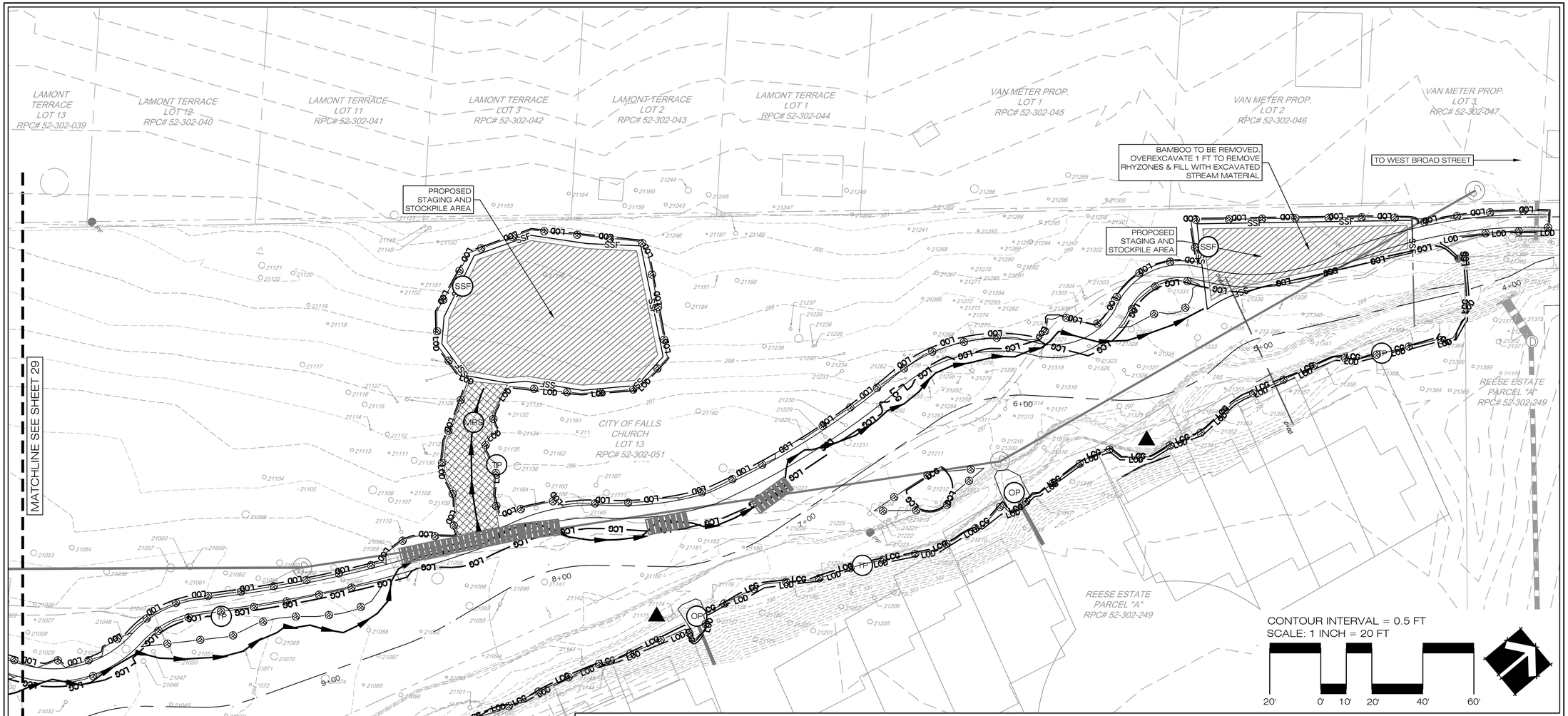

NOTES:

- PHASE I EROSION & SEDIMENT CONTROL PLAN ADDRESSES THE EROSION & SEDIMENT CONTROLS THAT SHOULD BE INSTALLED AND STABILIZED PRIOR TO CONDUCTING STAKE CONSTRUCTION ACTIVITIES. REFER TO SHEET 32 FOR PHASE I SEQUENCE OF CONSTRUCTION.
- ALL EXISTING TREES WITHIN THE LIMITS OF CLEARING AND GRADING SHOULD BE SAVED TO THE MAXIMUM EXTENT PRACTICABLE UNLESS OTHERWISE SPECIFIED.
- ALL TREES MARKED FOR REMOVAL OUTSIDE LIMITS OF DISTURBANCE SHALL BE CUT FLUSH AND LEFT IN PLACE. NO VEHICULAR ACCESS ALLOWED.

LEGEND

- EXISTING CONTOURS
- PROPOSED ACCESS ROUTE
- PROPOSED STAGING & STOCKPILE LOCATION (TO BE DETERMINED IN COORDINATION WITH MATERIALS DELIVERY)
- OUTFALL PROTECTION (OP)
- PROPOSED SILT FENCE (SF)
- PROPOSED TREE PROTECTION (SAFETY FENCE) (TP)
- PROPOSED STREAM CHANNEL ALIGNMENT
- PROPOSED MULCH CONSTRUCTION ROAD STABILIZATION
- PROPOSED SUPER SILT FENCE (SSF)
- PROPOSED LIMITS OF DISTURBANCE
- PROPOSED LIMITS OF GRADING
- TEMPORARY STREAM CROSSING (TSC)
- EXISTING TREE
- EXISTING PARCEL LIMIT
- TEMPORARY TIMBER MAT
- EXISTING SANITARY SEWER LINE

NOTES

1.) SEE TREE PRESERVATION PLAN SHEETS 21 AND 22 TO REFERENCE CRITICAL ROOT ZONES USED TO DEVELOP TREE PROTECTION PERIMETERS AND LIMITS OF DISTURBANCE. MINOR MODIFICATIONS TO IMPROVE CONSTRUCTION ACCESSIBILITY MAY BE APPROVED INDIVIDUALLY BY THE CITY AND/OR ENGINEER/DESIGNER

2.) THE PROPOSED LIMITS OF DISTURBANCE REPRESENT THE FURTHEST EXTENT OF CLEARING, BUT DO NOT IMPLY FULL CLEARING OF ALL AREAS WITHIN THESE LIMITS. THE SITES SHALL BE SELECTIVELY CLEARED TO ALLOW FOR SAFE ACCESS WHILE PRESERVING SPECIMEN TREES WHERE PRACTICABLE.

3.) LIMIT CLEARING TO THE IMMEDIATE WORK AREA TO AVOID EXCESSIVE DISTURBANCE BETWEEN STABILIZATION ACTIVITIES.

4.) CUT-TO-HAUL STOCKPILE LOCATIONS WILL BE VERIFIED AND COORDINATED IN THE FIELD WITH THE CITY AND DESIGNER OR ENGINEER PRIOR TO COMMENCING CONSTRUCTION ACTIVITIES.

5.) LOCATION OF ALL DEWATERING STRUCTURES SHALL BE COORDINATED IN THE FIELD WITH THE CITY AND DESIGNER OR ENGINEER PRIOR TO CONSTRUCTION. DEWATERING STRUCTURES MAY NOT BE PLACED IN OR ADJACENT TO FILL AREAS.

6.) ALL MATERIAL STOCKPILED MUST BE MOVED TO THE FINAL CUT-TO-HAUL STOCKPILE LOCATIONS AT THE END OF EACH DAY.

EROSION AND SEDIMENT CONTROL NARRATIVE

AN EROSION AND SEDIMENT CONTROL PLAN HAS BEEN DEVELOPED TO PROTECT THE DOWNSTREAM STREAMS, WETLANDS, WATERCOURSES, AND OTHER AQUATIC RESOURCES FROM ADDITIONAL DEGRADATION FROM EROSION AND SEDIMENT-LADEN WATER. CARE SHALL BE TAKEN TO ENSURE THAT ALL DOWNSTREAM WATERCOURSES REMAIN FREE OF ADDITIONAL SEDIMENT DURING CONSTRUCTION. EROSION & SEDIMENT CONTROL WILL BE PROVIDED USING A COMBINATION OF MEASURES WHICH INCLUDE 1) SILT FENCE, 2) BLANKETING AND MATTING, 3) OUTLET PROTECTION, 4)CHECK DAMS, (5) PUMP AROUND DIVERSIONS, AND 6) CONSTRUCTION ROAD STABILIZATION. THESE PRACTICES WILL BE CONSTRUCTED IN ACCORDANCE WITH THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK 3RD EDITION (1992).

THE EXISTING SITE CONSISTS OF A PARK AREA WITH MATURE HARDWOODS SURROUNDED BY RESIDENTIAL AND COMMERCIAL DEVELOPMENT. THE EXSITING STREAM IS ACTIVELY DEGRADING, WITH SIGNS OF INCISION AND UNDERCUTTING OF THE BANKS INCLUDING SOME PROPERTY LOSS DUE TO EROSION. THE EROSION AND SEDIMENT CONTROL PLAN WILL RELY PREDOMINANTLY ON PUMP AROUND DIVERSIONS WHEN BASEFLOW IS PRESENT AND EROSION CONTROL MATTING TO CONTROL THE SEDIMENT ACCUMULATION FROM THE STREAM GRADING AND STABILIZATION. THE PUMP AROUND DIVERSIONS WILL ALLOW THE EXISTING CHANNEL DISCHARGE TO CONTINUE NORMAL FLOW THROUGH THE SITE AND MINIMIZE THE AMOUNT OF SEDIMENT BEING TRANSPORTED DOWNSTREAM INTO UNDISTURBED AREAS. SILT FENCE WILL BE PLACED AT THE DOWNSLOPE SIDE OF ACCESS ROADS, STAGING AND STOCKPILING AREAS AND THE FINAL SPOIL AREAS TO PREVENT SEDIMENT FROM ENTERING THE STREAM LIMITING THE DISTURBED AREAS BY IMPLEMENTING A PHASED EROSION AND SEDIMENT CONTROL PLAN UTILIZING THE AFFECT OF STABILIZING ONE AREA BEFORE CONSTRUCTION BEGINS ON ANOTHER. ADDITIONALLY, ALL DISTURBED AREAS SHALL BE IMMEDIATELY STABILIZED FOLLOWING GRADING ACTIVITIES. ALL EROSION AND SEDIMENT CONTROL MEASURES IMPLEMENTED IN THE FIELD THAT ARE NOT INCLUDED HEREIN MUST BE IN ACCORDANCE WITH THE STANDARDS AND SPECIFICATIONS NOTED ABOVE AND APPROVED BY THE ENGINEER.

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Environmental Consultants

EROSION & SEDIMENT CONTROL PLAN (UPPER) (PHASE I)
COE BRANCH STREAM RESTORATION
CITY OF FALLS CHURCH, VIRGINIA

COMMONWEALTH OF VIRGINIA
SCOTT C. BLOSSOM
Lic. No. 40287
1/20/14
PROFESSIONAL ENGINEER

REVISIONS:

DATE:	
12/16/13	REVISIONS MADE PER REQUEST BY CITY OF FALLS CHURCH
01/20/14	REVISIONS MADE PER REQUEST BY CITY OF FALLS CHURCH

DRAWN BY: CSA/AWT
DESIGNED BY: SCB/CSA
DATE: 11/07/2013
CHECKED BY: SCB
SCALE: 1" = 20'

SHEET: 28 OF 43
JOB#: 4966

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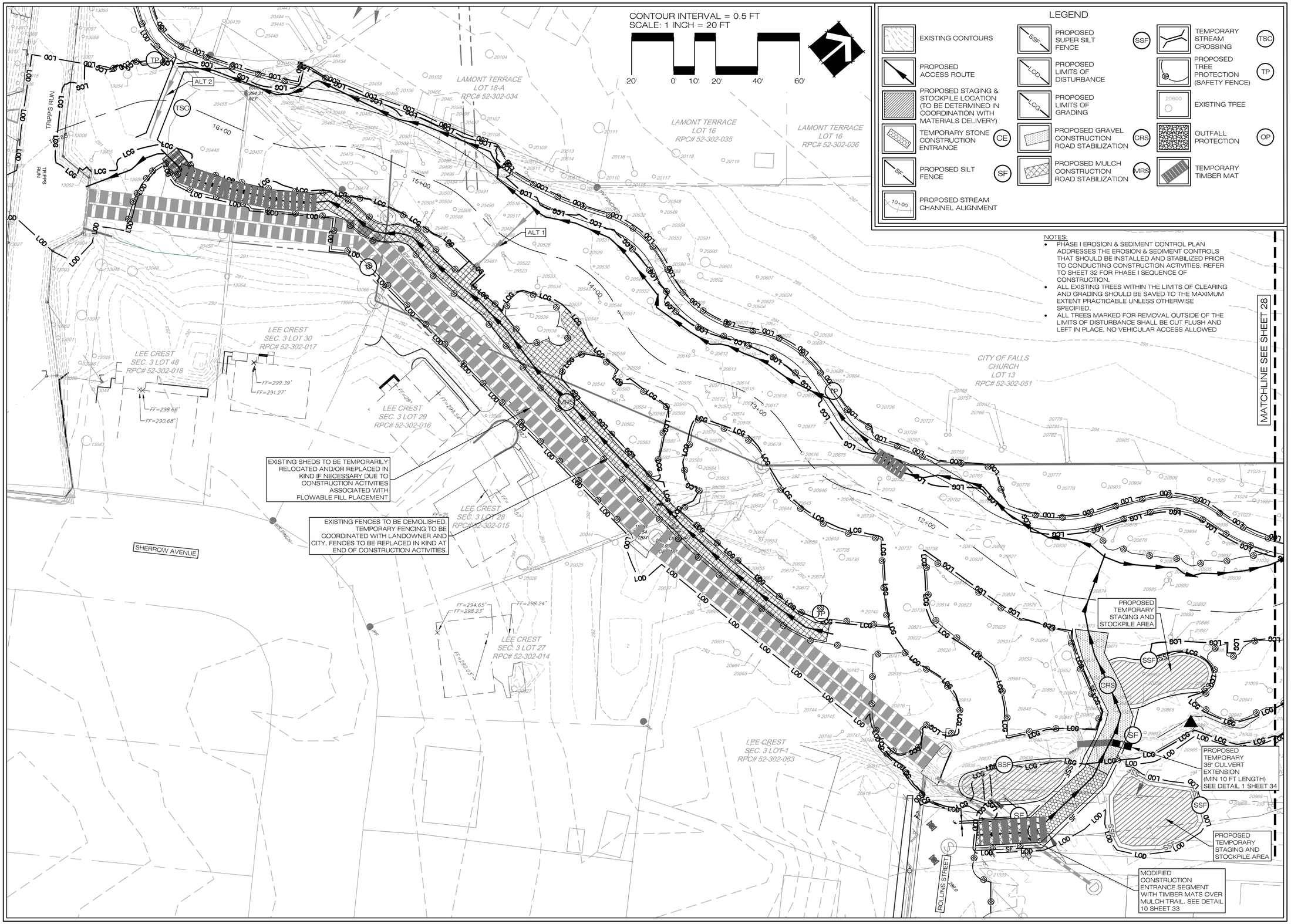

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EROSION & SEDIMENT CONTROL PLAN (LOWER)(PHASE I) COE BRANCH STREAM RESTORATION CITY OF FALLS CHURCH, VIRGINIA

COMMONWEALTH OF VIRGINIA
SCOTT C. BLOSSOM
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1/22/14
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DATE:	
12/16/13	REVISIONS MADE PER REQUEST BY CITY OF FALLS CHURCH
01/20/14	REVISIONS MADE PER REQUEST BY CITY OF FALLS CHURCH

DRAWN BY: CSA/AWT
DESIGNED BY: SCB/CSA
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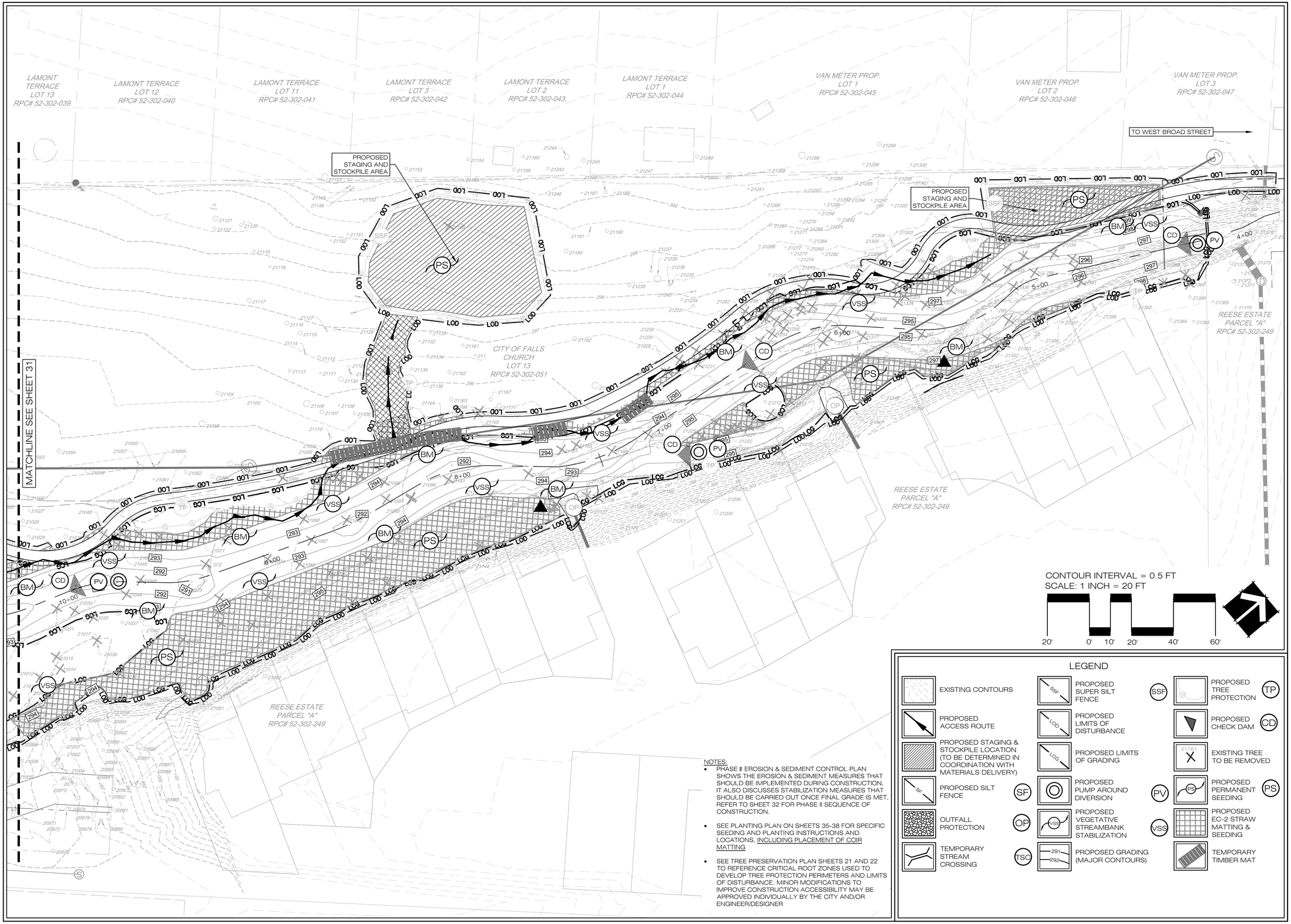

NOTES:

- PHASE II EROSION & SEDIMENT CONTROL PLAN SHOWS THE EROSION & SEDIMENT MEASURES THAT SHOULD BE IMPLEMENTED DURING CONSTRUCTION. IT ALSO DISCUSSES STABILIZATION MEASURES THAT SHOULD BE CARRIED OUT ONCE FINAL GRADE IS MET. REFER TO SHEET 32 FOR PHASE II SEQUENCE OF CONSTRUCTION.
- SEE PLANTING PLAN ON SHEETS 35-38 FOR SPECIFIC SEEDING AND PLANTING INSTRUCTIONS AND LOCATIONS, INCLUDING PLACEMENT OF COIR MATTING
- SEE TREE PRESERVATION PLAN SHEETS 21 AND 22 TO REFERENCE CRITICAL ROOT ZONES USED TO DEVELOP TREE PROTECTION PERIMETERS AND LIMITS OF DISTURBANCE. MINOR MODIFICATIONS TO IMPROVE CONSTRUCTION ACCESSIBILITY MAY BE APPROVED INDIVIDUALLY BY THE CITY AND/OR ENGINEER/DESIGNER

LEGEND

	EXISTING CONTOURS		PROPOSED SUPER SILT FENCE	SSF	SSF	PROPOSED TREE PROTECTION	TP
	PROPOSED ACCESS ROUTE		PROPOSED LIMITS OF DISTURBANCE			PROPOSED CHECK DAM	CD
	PROPOSED STAGING & STOCKPILE LOCATION (TO BE DETERMINED IN COORDINATION WITH MATERIALS DELIVERY)		PROPOSED LIMITS OF GRADING		21101	EXISTING TREE TO BE REMOVED	
SF	PROPOSED SILT FENCE	SF	PROPOSED PUMP AROUND DIVERSION	PV	PS	PROPOSED PERMANENT SEEDING	PS
	OUTFALL PROTECTION	OP	PROPOSED VEGETATIVE STREAMBANK STABILIZATION	VSS		PROPOSED EC-2 STRAW MATTING & SEEDING	
	TEMPORARY STREAM CROSSING	TSC	291 292 PROPOSED GRADING (MAJOR CONTOURS)			TEMPORARY TIMBER MAT	

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EROSION & SEDIMENT CONTROL PLAN (UPPER) (PHASE II) COE BRANCH STREAM RESTORATION CITY OF FALLS CHURCH, VIRGINIA

COMMONWEALTH OF VIRGINIA
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1/20/14
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DATE:	
12/16/13	REVISIONS MADE PER REQUEST BY CITY OF FALLS CHURCH
01/20/14	REVISIONS MADE PER REQUEST BY CITY OF FALLS CHURCH

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DESIGNED BY: SCB/CSA
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SHEET: 30 OF 43

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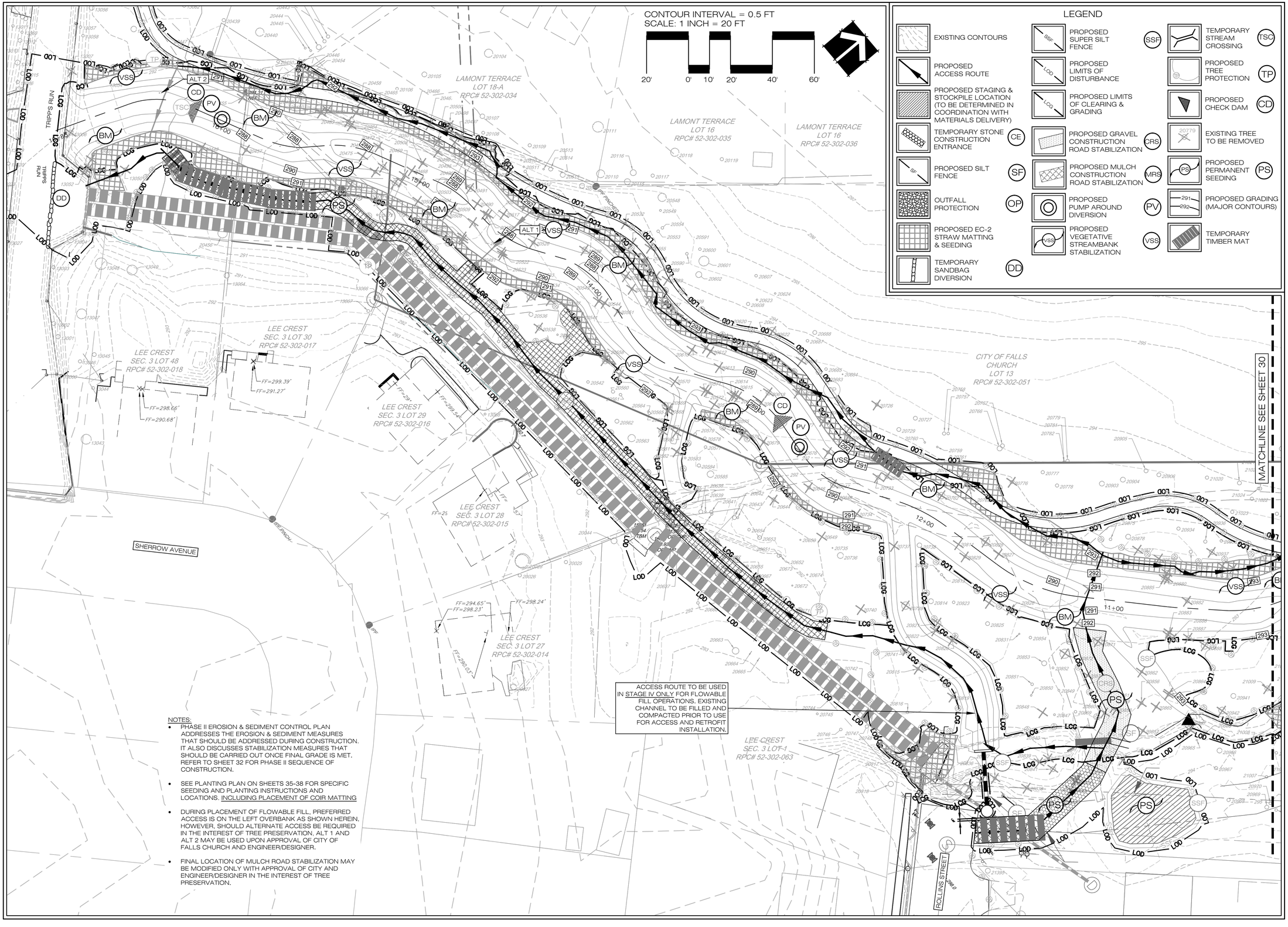

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- SEE PLANTING PLAN ON SHEETS 35-38 FOR SPECIFIC SEEDING AND PLANTING INSTRUCTIONS AND LOCATIONS. INCLUDING PLACEMENT OF COIR MATTING
- DURING PLACEMENT OF FLOWABLE FILL, PREFERRED ACCESS IS ON THE LEFT OVERBANK AS SHOWN HEREIN. HOWEVER, SHOULD ALTERNATE ACCESS BE REQUIRED IN THE INTEREST OF TREE PRESERVATION, ALT 1 AND ALT 2 MAY BE USED UPON APPROVAL OF CITY OF FALLS CHURCH AND ENGINEER/DESIGNER.
- FINAL LOCATION OF MULCH ROAD STABILIZATION MAY BE MODIFIED ONLY WITH APPROVAL OF CITY AND ENGINEER/DESIGNER IN THE INTEREST OF TREE PRESERVATION.

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1/30/14
PROFESSIONAL ENGINEER

REVISIONS:

DATE:	
12/16/13	REVISIONS MADE PER REQUEST BY CITY OF FALLS CHURCH
01/20/14	REVISIONS MADE PER REQUEST BY CITY OF FALLS CHURCH

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EROSION AND SEDIMENT CONTROL CONSTRUCTION NOTES

ALL CONSTRUCTION METHODS AND MATERIALS SHALL CONFORM TO THE CONSTRUCTION STANDARDS AND SPECIFICATIONS OF THE CITY OF FALLS CHURCH AND THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK, 3RD EDITION, 1993

THE CONTRACTOR OR DEVELOPER IS REQUIRED TO NOTIFY THE CITY OF FALLS CHURCH (CITY) PUBLIC WORKS DEPARTMENT, STORMWATER AND FLOODPLAIN DIVISION IN WRITING AT LEAST THREE (3) DAYS PRIOR TO ANY CONSTRUCTION, INCLUDING, BUT NOT LIMITED TO THE FOLLOWING:

A. INSTALLATION OF APPROVED EROSION CONTROL DEVICES
B. CLEARING AND GRUBBING
C. SUBGRADE EXCAVATION
D. INSTALLING STORM SEWERS OR CULVERTS

BEFORE ANY WORK BEGINS A PRE-CONSTRUCTION CONFERENCE SHALL BE HELD TO ENSURE THAT ALL AFFECTED PARTIES (DESIGN ENGINEER, CONSTRUCTION CONTRACTOR, CITY STAFF) TO ENSURE COORDINATED UNDERSTANDING OF E&S CONTROL PLANS, SPECIFICATIONS, AND SEQUENCE OF CONSTRUCTION.

PLAN APPROVAL IN NO WAY RELIEVES THE CONTRACTOR OF THE RESPONSIBILITIES CONTAINED WITHIN THE EROSION AND SEDIMENT CONTROL REGULATIONS.

AN APPROVED SET OF PLANS AND ALL PERMITS SHALL BE AVAILABLE ON THE CONSTRUCTION SITE AT ALL TIME.

ALL UNSUITABLE MATERIAL SHALL BE REMOVED FROM THE CONSTRUCTION LIMITS OF THE PROJECT AS PER VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY (VDEQ) GUIDELINES.

CONSTRUCTION DEBRIS SHALL BE CONTAINERIZED IN ACCORDANCE WITH THE VIRGINIA LITTER CONTROL ACT. NO LESS THAN ONE LITTER RECEPTACLE SHALL BE PROVIDED ON SITE.

THE CONTRACTOR SHALL PROVIDE ADEQUATE MEANS OF CLEANING MUD FROM TRUCKS AND/OR OTHER EQUIPMENT PRIOR TO ENTERING PUBLIC STREETS. IT IS THE CONTRACTORS RESPONSIBILITY TO INSURE THAT THE STREETS ARE IN A CLEAN, MUD AND DUST FREE CONDITION AT ALL TIMES.

ALL WORK SHALL BE SUBJECT TO INSPECTION AND APPROVAL BY CITY INSPECTORS.

FIELD CORRECTIONS SHALL BE APPROVED BY THE DESIGN ENGINEER AND THE CITY. WRITTEN DOCUMENTATION OF ANY DESIGN CHANGES DURING CONSTRUCTION ARE TO BE DOCUMENTED IN WRITING AND SUBMITTED TO THE CITY.

GENERAL EROSION AND SEDIMENT CONTROL NOTES

1. ALL SOIL EROSION & SEDIMENT CONTROL MEASURES SHALL BE ACCOMPLISHED IN STRICT ACCORDANCE WITH THE STANDARDS AND SPECIFICATIONS CONTAINED IN THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK, LATEST EDITION
2. THE APPROVING AUTHORITY, CITY, MAY ADD TO, DELETE, RELOCATE, CHANGE, OR OTHERWISE MODIFY CERTAIN EROSION AND SEDIMENT CONTROL MEASURES WHERE FIELD CONDITIONS ARE ENCOUNTERED THAT WARRANT SUCH MODIFICATIONS.
3. ALL SOIL EROSION AND SEDIMENT CONTROL MEASURES AS SHOWN ON THE PLAN SHALL BE PLACED AND INSPECTED AND APPROVED BY THE CITY IN ADVANCE OF THE WORK BEING PERFORMED.
4. IN NO CASE DURING CONSTRUCTION SHALL WATER RUNOFF BE DIVERTED OR ALLOWED TO FLOW TO LOCATIONS WHERE ADEQUATE PROTECTION HAS NOT BEEN PROVIDED.
5. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO LEAVE THE SITE ADEQUATELY PROTECTED AGAINST EROSION, SEDIMENTATION, OR ANY DAMAGE TO ANY ADJACENT PROPERTY AT THE END OF EACH DAY'S WORK.
6. FOR THE EROSION CONTROL KEY SYMBOLS SHOWN ON THE PLANS, REFER TO THE VIRGINIA UNIFORM CODING SYSTEM FOR EROSION AND SEDIMENT CONTROL PRACTICES CONTAINED IN THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK, LATEST EDITION.
7. UNLESS OTHERWISE INDICATED, ALL VEGETATIVE AND STRUCTURAL EROSION AND SEDIMENT CONTROL PRACTICES WILL BE CONSTRUCTED AND MAINTAINED ACCORDING TO MINIMUM STANDARDS AND SPECIFICATIONS OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK AND VIRGINIA REGULATIONS 4VAC50-30 EROSION AND SEDIMENT CONTROL REGULATIONS
8. ALL EROSION AND SEDIMENT CONTROL MEASURES ARE TO BE PLACED AND INSPECTED AND APPROVED BY THE CITY PRIOR TO OR AS THE FIRST STEP IN CLEARING.
9. A COPY OF THE APPROVED EROSION AND SEDIMENT CONTROL PLAN SHALL BE MAINTAINED ON THE SITE AT ALL TIMES.
10. PRIOR TO COMMENCING LAND DISTURBING ACTIVITIES IN AREAS OTHER THAN INDICATED ON THESE PLANS (INCLUDING, BUT NOT LIMITED TO, OFF-SITE BORROW OR WASTE AREAS), THE CONTRACTOR SHALL SUBMIT A SUPPLEMENTARY EROSION CONTROL PLAN TO THE OWNER FOR REVIEW AND APPROVAL BY THE PLAN APPROVING AUTHORITY.
11. THE CONTRACTOR IS RESPONSIBLE FOR INSTALLATION OF ANY ADDITIONAL EROSION CONTROL MEASURES NECESSARY TO PREVENT EROSION AND SEDIMENTATION AS DETERMINED BY THE PLAN APPROVING AUTHORITY.
12. ALL DISTURBED AREAS ARE TO DRAIN TO APPROVED SEDIMENT CONTROL MEASURES AT ALL TIMES DURING LAND DISTURBING ACTIVITIES AND DURING SITE DEVELOPMENT UNTIL FINAL STABILIZATION IS ACHIEVED.
13. DURING DEWATERING OPERATIONS, WATER WILL BE PUMPED INTO AN APPROVED FILTERING DEVICE.
14. THE CONTRACTOR SHALL INSPECT ALL EROSION CONTROL MEASURES PERIODICALLY AND AFTER EACH RUNOFF-PRODUCING RAINFALL EVENT. ANY NECESSARY REPAIRS OR CLEANUP TO MAINTAIN THE EFFECTIVENESS OF THE EROSION CONTROL DEVICES SHALL BE MADE IMMEDIATELY.

EROSION, SEDIMENTATION, AND LAND CONSERVATION NOTES

1. MEASURES TO CONTROL EROSION AND SILTATION SHALL BE PROVIDED PURSUANT TO AND IN COMPLIANCE WITH CURRENT FEDERAL, STATE, AND LOCAL REGULATIONS. THE INFORMATION CONTAINED IN THE CONSTRUCTION PLANS AND/OR THE APPROVAL OF THE PLANS SHALL IN NO WAY RELIEVE THE CONTRACTOR OR HIS AGENT OF ANY LEGAL RESPONSIBILITY WHICH MAY BE REQUIRED BY THE CODE OF VIRGINIA OR ANY ORDINANCE ENACTED BY THE CITY.
2. ALL AREAS, ON OR OFF-SITE, WHICH ARE DISTURBED BY THIS CONSTRUCTION AND WHICH ARE NOT PAVED OR BUILT UPON SHALL BE ADEQUATELY STABILIZED TO CONTROL EROSION AND SEDIMENTATION. ACCEPTABLE STABILIZATION SHALL CONSIST OF PERMANENT GRASS SEED MIXTURE INSTALLED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS. ALL SLOPES 2:1 AND GREATER SHALL BE SODDED AND STAKED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE ENGINEER.
3. ANY DISTURBED AREA NOT PAVED, PERMANENTLY SEEDED, SODDED, OR BUILT UPON BY 1 NOVEMBER OR DISTURBED AFTER THAT DATE, IS TO BE SEEDED WITHIN 14 DAYS WITH TALL FESCUE OR APPROVED EQUIVALENT, AND MULCHED WITH HAY OR STRAW MULCH AT THE RATE OF 2 TONS PER ACRE. FOR ADDITIONAL DETAILS, REFER TO THE CURRENT EDITION OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK
4. NO AREA SHALL BE DENUDED AND NOT BE DISTURBED FOR A PERIOD LONGER THAN 14 DAYS.
5. TEMPORARY DIVERSIONS, SEEDED AND MULCHED AND OTHER CONTROL MEASURES NECESSARY, ARE TO BE PLACED AS INDICATED ON THE DRAWINGS PRIOR TO OR AS THE FIRST STEP IN EXCAVATION.
6. WHEN IN ACCORDANCE WITH STATE AND FEDERAL JOB SAFETY REQUIREMENTS, ALL EXCAVATED MATERIAL IS TO BE PLACED ON THE UPHILL SIDE OF TRENCHES. NO MATERIAL OR EQUIPMENT IS TO BE PLACED IN AN ACTIVE STREAM. ANY STOCKPILED MATERIAL WHICH WILL REMAIN IN PLACE LONGER THAN 14 DAYS IS TO BE SEEDED FOR TEMPORARY VEGETATION AND MULCHED. WHERE SPOIL IS PLACED ON DOWNHILL SIDE OF TRENCH, IT IS TO BE BACK-SLOPED TO DRAIN TOWARD TRENCH. WHEN NECESSARY TO DEWATER THE TRENCH, THE PUMP DISCHARGE HOSE MUST OUTLET IN A STABILIZED AREA OR A SEDIMENT BASIN.
7. WHERE STREAM CROSSINGS ARE REQUIRED FOR EQUIPMENT, TEMPORARY CULVERTS SHALL BE PROVIDED.
8. DURING CONSTRUCTION, ALL STORM SEWER INLETS WILL BE PROTECTED BY SILT TRAPS, MAINTAINED AND MODIFIED AS REQUIRED BY CONSTRUCTION PROGRESS.
9. ALL DISTURBED AREAS ARE TO BE SEEDED AND MULCHED OR SODDED WITHIN 5 DAYS AFTER BACKFILL OF THE APPLICABLE TRENCH SECTION, IN ACCORDANCE WITH THE PROVISIONS CONTAINED IN THE PROJECT SPECIFICATIONS RELATING TO SEEDING AND SODDING (IF APPLICABLE). SPEED IS THE ESSENTIAL LAND CONSERVATION ELEMENT FOR A LINEAR PROJECT.
10. FOR FURTHER REQUIREMENTS AND DETAILS OF TREE PRESERVATION, PLANTING, EROSION AND SEDIMENT CONTROL, REFER TO THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK.

EROSION AND SEDIMENT CONTROL NARRATIVES

I. PROJECT DESCRIPTION
THE STREAM RESTORATION / STABILIZATION PROJECT WILL RESTORE APPROXIMATELY 1,685 LINEAR FEET OF STREAM. THE SITE IS LOCATED WITHIN THE TRIPPS RUN WATERSHED. THE TOTAL LIMITS OF DISTURBANCE PROPOSED ARE 2.48 ACRES.

II. EXISTING SITE CONDITIONS
THE PROJECT IS LOCATED WITHIN THE HOWARD E. HERMAN STREAM VALLEY PARK IN THE CITY OF FALLS CHURCH, VIRGINIA. THE ADJACENT WATERSHED IS CHARACTERIZED BY A VARIABLE WIDTH MATURE HARDWOOD FOREST RIPARIAN BUFFER. THE EXISTING STREAM CHANNEL IS CONTROLLED AT THE UPSTREAM END BY A RIPRAP CHANNEL AND THE DOWNSTREAM END AT ANOTHER EXISTING STORMWATER PIPE SYSTEM THAT FLOWS TO TRIPPS RUN. THE STREAM CHANNEL IS AND IN CLOSE PROXIMITY TO ADJACENT PROPERTIES.ACTIVELY ERODING.

III. ADJACENT PROPERTY
THE SITE IS BOUNDED BY INTENSE URBAN DEVELOPMENT, BOTH RESIDENTIAL AND COMMERCIAL PROPERTIES.

IV. OFF-SITE AREAS
THERE WILL BE NO OFF-SITE DISTURBANCE.

V. CRITICAL AREAS
PORTIONS OF THE STREAM RESTORATION PROJECT ARE LOCATED WITHIN A CITY DEFINED RESOURCE PROTECTION AREA. THE PROPOSED IMPROVEMENTS ARE INTENDED TO CREATE A STABLE CHANNEL AND TO TAKE THE EXISTING ACTIVELY DEGRADING CHANNEL OFFLINE THUS IMPROVING THE WATER QUALITY OF THE DOWNSTREAM RECEIVING WATER. ALL APPLICABLE PERMITS SHALL BE ACQUIRED BEFORE WORK COMMENCES. NO SLOPES GREATER THAN 25% WILL BE DISTURBED WITHOUT CONSENT AND PROPER PERMITTING FROM THE CITY OF FALLS CHURCH.

VI. SOIL
GEOCONCEPTS ENGINEERING INC. REPORTED SOIL INVESTIGATIONS AUGUST 2013. THE SOILS PROFILE WAS FOUND TO BE MADE UP OF MOSTLY NATURAL SOILS COMPRISED OF ALLUVIAL SILT LOAMS DERIVED FROM SCHIST AND/OR PHYLLITE. SMALL AREAS TO THE NORTHEAST AND NORTHWEST OF THE PROJECT SITE CONTAIN SOME SOILS DERIVED FROM MINE SPOILS OR FILL MATERIALS. ACCORDING TO USGS WEB SOIL SURVEY FINDINGS, THE SOIL NAMES PRESENT ON THE SITE INCLUDE SUMMERDUCK SILT LOAM, URBANLAND-WHEATON COMPLEX, AND WHEATON-MEADOWVILLE COMPLEX.

VII. EROSION AND SEDIMENT CONTROL MEASURES
THE FOLLOWING EROSION AND SEDIMENT CONTROL MEASURES SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK (VESCH, 1992). ALL SPECIFICATION NUMBERS LISTED BELOW REFER TO THE PRACTICES' PLATE NUMBER IN THE VESCH.

A. STRUCTURAL PRACTICES

TEMPORARY STONE CONSTRUCTION ENTRANCE - 3.02
SILT FENCE AND SUPER SILT FENCE - 3.05
VEGETATIVE STREAMBANK STABILIZATION - 3.22
STRUCTURAL STREAMBANK STABILIZATION - 3.23
DEWATERING STRUCTURE - 3.26
SOIL STABILIZATION BLANKETS AND MATTING - 3.36
TREE PRESERVATION AND PROTECTION - 3.38 (TO ACT AS SAFETY FENCE)
ROCK CHECK DAMS - 3.20
PUMP AROUND DIVERSION - 3.12
OUTLET PROTECTION - 3.18
CONSTRUCTION ROAD STABILIZATION - 3.03
TEMPORARY DIVERSION DIKE - 3.12
TEMPORARY STREAM CROSSING - 3.24

B. VEGETATIVE PRACTICES

TOPSOIL (STOCKPILE) - 3.30 - EXCAVATED TOPSOIL SHALL BE REAPPLIED TO AREAS BEING PLANTED AFTER CONSTRUCTION TO PROVIDE A SUITABLE GROWTH MEDIUM FOR FINAL SITE STABILIZATION WITH VEGETATION. COMPOST SHALL BE APPLIED TO PLANTING AREAS ON AN AS NEEDED BASIS TO SUPPLEMENT STOCKPILED TOPSOIL IN THE CASE THAT TOPSOIL IS NOT ADEQUATE OR AVAILABLE IN QUANTITY DEPICTED HEREIN

TEMPORARY SEEDING - 3.31 - RAPIDLY GROWING ANNUAL PLANTS SHALL BE SEEDED ON DISTURBED AREAS NOT YET BROUGHT TO FINAL GRADE.

PERMANENT SEEDING - 3.32 - THE ESTABLISHMENT OF PERENNIAL VEGETATIVE COVER ON DISTURBED AREAS BY PLANTING SEED.

TEMPORARY STABILIZATION: REFER TO SEEDING SCHEDULE ON SHEET 38 (PLANTING PLAN: SEEDING UPPER).

MULCHING - STD & SPEC. 3.35: MULCH SHALL BE APPLIED TO AREAS THAT REQUIRE TEMPORARY SEEDING AND IN DISTURBED AREAS NOT SPECIFICALLY STABILIZED WITH MATTING TO PREVENT EROSION BY PROTECTING THE SOIL SURFACE FROM RAINDROP IMPACT AND REDUCING THE VELOCITY OF OVERLAND FLOW. IN ADDITION, THE MULCH WILL FOSTER THE GROWTH OF VEGETATION BY INCREASING AVAILABLE MOISTURE AND PROVIDING INSULATION AGAINST EXTREME HEAT OR COLD. STRAW MULCH SHALL BE APPLIED AT 2 TONS/ACRE. MULCH MUST BE WEED FREE.

NO CONTRACTOR MIXES (FESCUE, ETC.) WILL BE USED ON THIS PROJECT.

C. MANAGEMENT STRATEGIES

1. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED, INSPECTED, AND APPROVED BY CITY STAFF PRIOR TO WORK PROGRESSING INTO NEW AND UNPROTECTED AREAS.
2. THE STABILIZED CONSTRUCTION ENTRANCE SHALL BE A FIRST STEP IN THE CONSTRUCTION.
3. TEMPORARY SEEDING OR OTHER STABILIZATION WILL FOLLOW IMMEDIATELY AFTER GRADING.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE INSTALLATION AND MAINTENANCE OF ALL EROSION AND SEDIMENT CONTROL PRACTICES.
5. AFTER ACHIEVING ADEQUATE STABILIZATION, THE TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES WILL BE CLEANED AND REMOVED. NO EROSION AND SEDIMENT CONTROL MEASURES CAN BE REMOVED WITHOUT APPROVAL OF THE CITY OF FALLS CHURCH INSPECTOR.

D. PERMANENT STABILIZATION

ALL OF THE STREAMBANKS WILL BE STABILIZED WITH COBBLE/GRAVEL BED LINING, ROCK BANK PROTECTION, EROSION CONTROL MATTING (I.E. COIR), SEED, NATIVE GRASSES, OR LIVE STAKE PLANTINGS AS SHOWN ON SHEETS 5, 5A, 6, 6A AND PLANTING SHEETS 35-38. THE LIVE STAKE PLANTINGS CAN ONLY BE INSTALLED DURING THE DORMANT SEASON. ALL OTHER AREAS (I.E. SIDE SLOPES DRAINING TOWARDS THE STREAM CHANNELS) DISTURBED BY CONSTRUCTION SHALL BE STABILIZED WITH PERMANENT SEEDING AND EROSION CONTROL MATTING IMMEDIATELY FOLLOWING FINISH GRADING. SEEDING SHALL BE PERFORMED AS SPECIFIED ON SHEETS 35 AND 36.

VIII. STORMWATER MANAGEMENT

THIS PROJECT WILL PROVIDE WATER QUALITY AS WELL AS CHANNEL PROTECTION. THERE IS NO PROPOSED IMPERVIOUS SURFACE WITH THIS PROJECT.

IX. MAINTENANCE

IN GENERAL, ALL EROSION AND SEDIMENT CONTROL MEASURES WILL BE CHECKED DAILY AND AFTER EACH SIGNIFICANT RAINFALL. THE FOLLOWING WILL BE CHECKED IN PARTICULAR:

1. TREE PROTECTION MEASURES SHALL BE ADEQUATE TO ENSURE THAT EXISTING VEGETATION IS PROTECTED AND APPROVED BY CITY BEFORE DISTRUBANCE BEGINS.
2. THE CONSTRUCTION ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOW OF MUD ONTO PUBLIC RIGHT-OF-WAYS. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE OR THE WASHING AND REWORKING OF EXISTING STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY STRUCTURES USED TO TRAP SEDIMENT. ALL MATERIALS SPILLED, DROPPED, WASHED, OR TRACKED FROM VEHICLES ONTO ROADWAYS OR INTO STORM DRAINS MUST BE REMOVED IMMEDIATELY. THE USE OF WATER TRUCKS TO REMOVE MATERIALS WILL NOT BE PERMITTED UNDER ANY CIRCUMSTANCES.
3. SILT FENCE AND SUPER SILT FENCE BARRIERS SHALL BE CHECKED REGULARLY FOR UNDERMINING OR DETERIORATION OF THE FABRIC. SEDIMENT SHALL BE REMOVED WHEN THE LEVEL OF DEPOSITION REACHES HALF THE HEIGHT OF THE BARRIER. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE SILT FENCE IS NO LONGER REQUIRED SHALL BE DRESSED TO CONFORM TO THE EXISTING GRADE, PREPARED AND SEEDED.
4. ALL PUMP-AROUNDS, FLOW BARRIERS, AND FILTER BAGS SHALL BE CHECKED ON A DAILY BASIS AND MAINTAINED AS REQUIRED TO PERFORM TO SPECIFICATION.
5. TEMPORARY STOCKPILE AREAS MUST BE STABILIZED AND CHECKED REGULARLY TO ENSURE THAT A GOOD STAND IS MAINTAINED.
6. TEMPORARY STREAM CROSSINGS SHOULD BE CHECKED PERIODICALLY TO ENSURE THAT THERE IS NO UNDERMINING OF THE STRUCTURES OR THE CHANNEL.

CONSTRUCTION SEQUENCE

PRE-CONSTRUCTION

1. PRIOR TO PRE-CONSTRUCTION MEETING, THE CONTRACTOR SHALL CLEARLY STAKE THE LIMITS OF DISTURBANCE (LOD), LIMITS OF CLEARING AND GRADING (LCG), ACCESS, AND STOCKPILE LOCATIONS. CARE SHALL BE TAKEN TO AVOID LARGE WOODY VEGETATION WHERE POSSIBLE.
2. CONTRACTOR TO CONDUCT AN ON-SITE PRE-CONSTRUCTION MEETING WITH THE CITY OF FALLS CHURCH (CITY) AND THE ENGINEER OR DESIGNER (WEG). THE CITY AND ENGINEER SHALL APPROVE THE STAKED LIMITS PRIOR TO CONSTRUCTION ACTIVITIES. DURING THIS PRE-CONSTRUCTION MEETING, THE CITY OR ENGINEER MAY CHOOSE TO ALTER THE STAKED LIMITS TO AVOID LARGE WOODY VEGETATION
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE EXACT LOCATIONS OF ALL EXISTING UTILITIES WITHIN THE PROJECT AREA PRIOR TO CONSTRUCTION OPERATIONS, AND MUST CONTACT MISS UTILITY (811) PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION ACTIVITIES

STAGE I - SITE PREPARATION

4. INSTALL STONE CONSTRUCTION ENTRANCE PER STD. AND SPEC. 3.02 OFF OF ROLLINS STREET.
5. TREE ROOT PRUNING SHALL OCCUR PRIOR TO GRADING (CUT) ACTIVITIES, AND/OR PRIOR TO RUNNING HEAVY EQUIPMENT UNDER CERTAIN SPECIMEN (SEE SHEETS 21 - 22) CANOPY TREES. IN ADDITION, BRANCH PRUNING SHALL OCCUR DURING CONSTRUCTION IN ORDER TO SAVE EXISTING VEGETATION TO THE GREATEST EXTENT PRACTICABLE AND ALLOW A REASONABLE WORK AREA. ALL TREE CANOPY PRUNING MUST BE DONE BY AN ISA CERTIFIED ARBORIST WHO ALSO HOLDS A CITY OF FALLS CHURCH TREE CONTRACTOR'S LICENSE.
6. INSTALL SILT FENCE AND TREE PROTECTION AS SHOWN ON THE PLANS. INSTALLATION OF TIMBER MATS, MULCH ACCESS ROAD STABILIZATION, OR GRAVEL ACCESS ROAD STABILIZATION AS SHOWN IN THESE PLANS (SHEETS 28-31) SHALL BE INSTALLED PROGRESSIVELY IN ADVANCE OF HEAVY EQUIPMENT USED TO PLACE THESE PRACTICES SUCH THAT THE WEIGHT OF THE EQUIPMENT IS BORNE BY PREVIOUSLY INSTALLED SECTION OF THE ROAD AS IT IS CONSTRUCTED.
7. TREE PROTECTION FENCE SHALL BE PLACED ALONG THE LOD, AND AROUND ALL TREES SPECIFIED TO BE SAVED WITHIN THE LOD AS DEPICTED ON SHEETS 21 AND 22.
8. INVASIVE PLANT SPECIES SHALL BE REMOVED AND/OR CONTROLLED AS DETAILED ON SHEET 41
9. INSTALL ALL PHASE I EROSION AND SEDIMENT CONTROL MEASURES ACCORDING TO STANDARDS SET FORTH IN THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK, THIRD EDITION 1992. THESE MEASURES SHALL BE IMPLEMENTED PRIOR TO THE COMMENCEMENT OF ANY EARTHWORK ACTIVITIES ON-SITE.
10. TREE REMOVAL, CLEARING, AND GRUBBING SHALL BE PERFORMED AS NEEDED FOR THE ACCESS ROADS SHOWN ON THE PLANS. PROTECT THE ACCESS ROADS IN AN APPROVED MANNER AND UTILIZE CONSTRUCTION ROAD STABILIZATION AS NEEDED.
11. CLEAR THE CORRIDOR OF THE PHASE BEING CONSTRUCTED. CONTRACTOR SHALL ONLY CLEAR THAT WHICH CAN BE STABILIZED IN THE SAME WORKING DAY.
12. IT IS THE INTENT OF THESE PLANS TO AVOID CLEARING TO THE GREATEST EXTENT PRACTICAL. HOWEVER, CLEARING AND GRUBBING OPERATIONS SHALL PROCEED AS NECESSARY TO FACILITATE EARTHWORK ACTIVITIES. EXISTING VEGETATION CALLED OUT TO BE PRESERVED SHALL BE PROTECTED FROM DISTURBANCE AND COMPACTION OF HEAVY EQUIPMENT. ALL ADDITIONAL CLEARED WOODY VEGETATION SHALL BE REMOVED, CHIPPED, STOCKPILED, AND USED FOR ORGANIC MATTER ON-SITE.
13. PROTECT ALL SANITARY PIPES AND STORM PIPES CROSSED THROUGHOUT THE PROJECT USING TIMBER MATTING OR APPROVED ALTERNATIVE.

STAGE II - CHANNEL CONSTRUCTION, LOWER SEGMENT (10+00 - TRIPPS RUN)

14. CONSTRUCTION SHALL BE PERFORMED IN REACH SEGMENTS IN AN EFFORT TO MINIMIZE DISTURBANCE. GRADING OPERATIONS SHALL BEGIN FIRST ON THE MAIN RESTORATION/RELOCATION CHANNEL BEGINNING AT STATION 10+00 AND SHALL BE PERFORMED UPSTREAM TO DOWNSTREAM (FLOW REMAINS IN EXISTING CHANNEL AND EXISTING CULVERTS DURING CONSTRUCTION OF REACH STATIONS 10+00 - TRIPPS RUN)
15. ALL STREAM WORK SHALL BE PERFORMED IN THE DRY. APPROVED CLEAN WATER DIVERSION MEASURES (PUMP AROUND DIVERSION PUMP WITH DE-WATERING BAG) SHALL BE USED TO ENSURE THAT SEDIMENT LADEN WATER IS NOT DISCHARGED INTO TRIPPS RUN. THE CLEAN WATER DIVERSION SHALL BE OF SUFFICIENT LENGTH TO ENSURE THAT ALL WORK WITHIN THE DAILY WORK ZONE IS PERFORMED IN THE DRY. THE CONSTRUCTION SEGMENTS SHALL BE DETERMINED BY THE CONTRACTOR BUT THE STREAM WILL BE STABILIZED AT THE END OF EACH WORK DAY.
16. COMMENCE WITH GRADING OF THE NEW STREAM CHANNEL, SECTIONS, PROFILE, AND INSTALLATION OF CONSTRUCTED RIFFLES, ROCK SILLS, CROSS-VANES, AND J-HOOKS AS CONSTRUCTION MOVES DOWNSTREAM.
17. DURING GRADING OPERATIONS, STRIP EXISTING TOPSOIL TO EXTENT AVAILABLE WITHIN LIMITS OF GRADING AND THE SEGMENT TO BE EXCAVATED AND STOCKPILE SEPARATELY. TOPSOIL MUST BE FREE OF UNSUITABLES.
18. NO STREAM BANKS SHALL BE LEFT DENUDED (I.E. BARE) AT THE END OF THE WORK DAY. ALL STREAMBANKS SHALL BE COVERED WITH MATTING BEFORE THE CONTRACTOR STOPS WORK FOR THE DAY. CONTRACTOR SHALL TEMPORARILY COVER ANY DISTURBED AREAS WITH MATTING AT THE END OF EACH WORK DAY, ONLY IF FINAL STABILIZATION IS NOT COMPLETED BY THE END OF THE DAY. IN ADDITION, ANY REMAINING DISTURBED AREAS IN THE OVERBANK ZONES SHALL BE PROTECTED FROM SHEET FLOW WITH SILT FENCE UNTIL WORK CONTINUES THE NEXT DAY.
19. BY REACH SECTION, AND UPON REACHING FINAL GRADE, INSTALL STREAMBANK STABILIZATION MEASURES, APPLY COMPOST, APPLY PERMANENT SEEDING, AND COIR MATTING. SEE PLANTING PLAN (SHEET 38) FOR PERMANENT SEEDING PLAN AND SPECIES.
20. PRIOR TO REACHING THE CONFLUENCE WITH TRIPPS RUN SEGMENT, CONTRACTOR SHALL ENSURE THAT ALL UPSTREAM AREAS ARE STABILIZED AND SEDIMENT LADEN WATER HAS BEEN REMOVED FROM THE NEW CHANNEL.
21. PROCEED WITH DEMOLITION OF CONCRETE BANKS AT TRIPPS RUN AND GRADING TERMINAL SEGMENT OF PHASE II. STABILIZE SEGMENT AND INSTALL CHECK DAM AT CONFLUENCE.
22. ENGINEER OR DESIGNER TO APPROVE FINAL STABILIZATION OF PHASE II SEGMENT. ALL EROSION AND SEDIMENT CONTROL PRACTICES TO REMAIN IN PLACE THROUGH CONSTRUCTION OF STAGE III

STAGE III - CHANNEL CONSTRUCTION, UPPER SEGMENT (4+07 - 10+00)

23. INSTALL CHECK DAM AND PUMP AROUND AT OUTLET OF RIPRAP CHANNEL (STATION 04+07). PUMP AROUND SHALL OUTFALL TO THE EXISTING COE BRANCH CHANNEL NEAR ALIGNMENT STATION 06+00 WITH FILTER BAG OUTLET PROTECTION.
24. CONSTRUCTION SHALL BE PERFORMED IN SEGMENTS IN AN EFFORT TO MINIMIZE DISTURBANCE. GRADING OPERATIONS SHALL BE CONTINUED AT THE HEAD OF THE PROPOSED CHANNEL (STATION 04+05) AND SHALL BE PERFORMED UPSTREAM TO DOWNSTREAM.
25. ALL STREAM WORK SHALL BE PERFORMED IN THE DRY. APPROVED CLEAN WATER DIVERSION MEASURES (PUMP AROUND DIVERSION PUMP WITH DE-WATERING BAG) SHALL BE USED TO ENSURE THAT SEDIMENT LADEN WATER IS NOT DISCHARGED INTO TRIPPS RUN. THE CLEAN WATER DIVERSION SHALL BE OF SUFFICIENT LENGTH TO ENSURE THAT ALL WORK WITHIN THE DAILY WORK ZONE IS PERFORMED IN THE DRY. THE CONSTRUCTION SEGMENTS SHALL BE DETERMINED BY THE CONTRACTOR BUT THE STREAM WILL BE STABILIZED AT THE END OF EACH WORK DAY.
26. COMMENCE WITH GRADING OF THE NEW STREAM CHANNEL, SECTIONS, PROFILE, AND INSTALLATION OF CONSTRUCTED RIFFLES, ROCK SILLS, CROSS-VANES, AND J-HOOKS AS CONSTRUCTION MOVES DOWNSTREAM.
27. DURING GRADING OPERATIONS, STRIP EXISTING TOPSOIL TO EXTENT AVAILABLE WITHIN LIMITS OF GRADING AND THE SEGMENT TO BE EXCAVATED AND STOCKPILE SEPARATELY. TOPSOIL MUST BE FREE OF UNSUITABLES.
28. NO STREAMBANKS SHALL BE LEFT DENUDED (I.E. BARE) AT THE END OF THE WORK DAY. ALL STREAM BANKS SHALL BE COVERED WITH MATTING BEFORE THE CONTRACTOR STOPS WORK FOR THE DAY. CONTRACTOR SHALL TEMPORARILY COVER ANY DISTURBED AREAS WITH MATTING AT THE END OF EACH WORK DAY, ONLY IF FINAL STABILIZATION IS NOT COMPLETED BY THE END OF THE DAY. IN ADDITION, ANY REMAINING DISTURBED AREAS IN THE OVERBANK ZONES SHALL BE PROTECTED FROM SHEET FLOW WITH SILT FENCE UNTIL WORK CONTINUES THE NEXT DAY.
29. BY SECTION, AND UPON REACHING FINAL GRADE, INSTALL STREAMBANK STABILIZATION MEASURES, APPLY COMPOST, APPLY PERMANENT SEEDING, AND COIR MATTING. SEE PLANTING PLAN (SHEETS 35-38) FOR PERMANENT SEEDING PLAN AND SPECIES.
30. AS CONSTRUCTION APPROACHES STATION 07+00 INSTALL SECOND CHECK DAM AND/OR ROCK PLUG IN THE EXISTING COE BRANCH CHANNEL AND PUMP AROUND TO THE EXISTING CHANNEL BEYOND STATION 08+10
31. PRIOR TO JOINING THE UPPER AND PREVIOUSLY CONSTRUCTED LOWER SECTION OF THE NEW CHANNEL, THE CONTRACTOR SHALL ENSURE THAT ALL UPSTREAM AREAS ARE STABILIZED AND SEDIMENT LADEN WATER HAS BEEN REMOVED FROM THE NEW CHANNEL.
32. PROCEED WITH JOINING CHANNEL SEGMENTS AND PLACE CLAY PLUG IN ABANDONED REACH.

STAGE IV - EXISTING CHANNEL FILL, FLOWABLE FILL OPERATION, LATERAL CHANNEL CONSTRUCTION

33. PROCEED WITH FILL OPERATIONS ON THE EXISTING COE BRANCH CHANNEL (APPROXIMATE STATIONS 04+05 - 11+50). SEE GEOTECHNICAL RECOMMENDATIONS FOR COMPACTION AND PLACEMENT OF FILL MATERIAL.
34. CONTRACTOR SHALL INSTALL OUTLET PROTECTION AS SPECIFIED IN DETAIL 5 SHEET 33 AND CONSTRUCT ASSOCIATED LATERAL CHANNELS FOR REES PLACE CULVERTS.
35. AFTER ALL STREAM RESTORATION WORK IS COMPLETE AND APPROVED BY THE ENGINEER AND CITY, THE CONTRACTOR MAY COMMENCE WITH DEMOBILIZING PUMP-AROUND DIVERSIONS.
36. CONTRACTOR SHALL COMMENCE DEMOLITION AND FLOWABLE FILL OPERATIONS FOR THE EXISTING 4X6 STORM SEWERS ONLY AFTER THE NEW CHANNEL STABILIZATION AND EXISTING CHANNEL FILL HAVE BEEN APPROVED BY ENGINEER AND THE NEWLY CONSTRUCTED/STABILIZED CHANNEL IS BROUGHT ON-LINE AND FUNCTIONING ADEQUATELY FOR FLOW CONVEYANCE (SEE STEPS 30-32 ABOVE).
37. CONTRACTOR TO DEMOLISH ABOVE GROUND SECTION OF UPSTREAM DROP STRUCTURE OF THE CULVERTS TO BE FILLED. CULVERT FILL OPERATIONS SHALL BE PERFORMED IN ACCORDANCE WITH VDOT SPECIAL PROVISION FOR FLOWABLE BACKFILL (S302G02-0610) AND AS DEPICTED IN VDOT ROAD AND BRIDGE STANDARD 107.23.
38. WHEN FILL OPERATIONS HAVE BEEN COMPLETED, INSTALL LATERAL CHANNEL PROPOSED AT DE-COMMISIONED DROP STRUCTURE IN THE CHANNEL LEFT FLOODPLAIN NEAR STATION 13+40 AS SHOWN IN PLAN VIEW ON SHEETS 6 AND 6A. THIS CHANNEL SHALL BE NON-MECHANICALLY GRADED AS REQUESTED BY THE CITY OF FALLS CHURCH.
39. SEE SHEET 27 FOR 15" STORM SEWER RETROFIT MANHOLE AND CHANNEL CONSTRUCTION.
40. SEE SHEET T1 AND T2 FOR PROPOSED TRAIL ALIGNMENT TO BE INSTALLED AFTER COMPLETION OF STORM SEWER RETROFIT.
41. UPON COMPLETION OF ALL CONSTRUCTION ACTIVITIES, ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL BE REMOVED WITHIN 30 DAYS. ANY CONCENTRATED SEDIMENT ALONG THE E&S MEASURES SHALL BE RE-SPREAD AND STABILIZED WITH SEED/MULCH IN UPLAND AREAS. REMOVAL OF ANY TREE PROTECTION MEASURES, INCLUDING FENCING, MULCH ROADS, TIMBER MATS, ETC., MUST BE APPROVED IN ADVANCE BY THE CITY ARBORIST. CONTACT THE CITY ARBORIST AT 703-248-5183 TO SCHEDULE AN INSPECTION IN ADVANCE OF REMOVAL OF TREE PROTECTIONS.
42. CONTRACTOR SHALL NOTIFY ENGINEER AND/OR DESIGNER UPON COMPLETION OF CLEANUP ACTIVITIES TO ARRANGE A FINAL SITE INSPECTION AND WALKTHROUGH.
43. CONTRACTOR SHALL COORDINATE WITH ENGINEER AND/OR DESIGNER TO SCHEDULE INSTALLATION OF WOODY VEGETATION INCLUDING TREES AND SHRUBS. AS THE PLANTING WINDOW FOR THIS VEGETATION MAY NOT FALL WITHIN THE CONSTRUCTION WINDOW, THE PLANTING SHALL BE SCHEDULED AT THE EARLIEST TIME POSSIBLE AS SHOWN IN SPECIFICATION OR AS APPROVED BY ENGINEER AND/OR DESIGNER.

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EROSION & SEDIMENT CONTROL NOTES
COE BRANCH STREAM RESTORATION
CITY OF FALLS CHURCH, VIRGINIA

COMMONWEALTH OF VIRGINIA
SCOTT C. BLOSSOM
Lic. No. 40287
12/16/13
PROFESSIONAL ENGINEER

REVISIONS:

DATE:	
12/16/13	REVISIONS MADE PER REQUEST BY CITY OF FALLS CHURCH

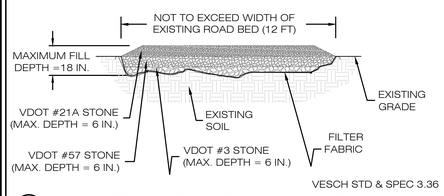
DRAWN BY: CSA/AWT
DESIGNED BY: SCB/CSA
DATE: 11/07/2013
CHECKED BY: SCB
SCALE: N/A

NOTES

CONTRACTOR TO USE MOST APPROPRIATE MEASURE BASED ON SPECIFIC SITE CONSTRAINTS UPON APPROVAL OF ENGINEER AND IN ACCORDANCE WITH THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK, 3RD EDITION 1993.

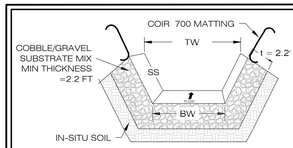
(CRS)

NOTE: GRAVEL ACCESS ROAD STABILIZATION PROPOSED ONLY WITHIN EXISTING ROAD BEDS AS SHOWN ON EROSION AND SEDIMENT CONTROL PLAN (SHEET 28-31). FILL WILL GENERALLY BE USED TO RETURN EXISTING ROADS TO ADJACENT GRADE BUT WILL NOT EXCEED A MAXIMUM FILL DEPTH OF 18 INCHES OVERALL.



VESCH STD & SPEC 3.36

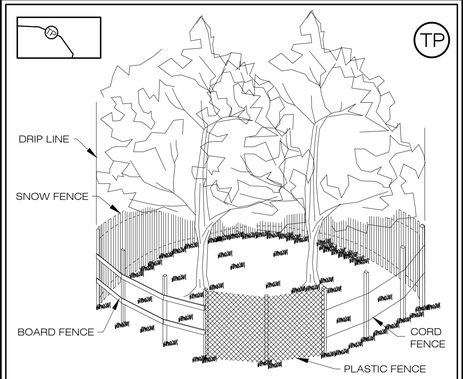
1/33 DETAIL : CONSTRUCTION ROAD STABILIZATION NTS



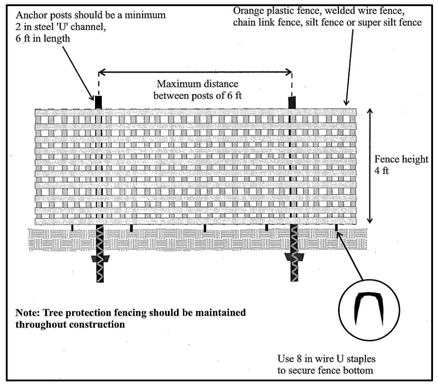
CHANNEL	TOP WIDTH (FT)	BOTTOM WIDTH (FT)	SIDE SLOPE	MINIMUM SLOPE (FT/FT)
18" REES PL CULVERT	11	5	2:1	0.0150
21" RETROFIT CULVERT	15	5	2.5:1	0.0035
CHANNEL AT CONCRETE SWALE DEMOLITION ABOVE RETROFIT	8	4	2.5:1	0.14

11/33 DETAIL: TYPICAL SWALE SECTION NTS

(TP)



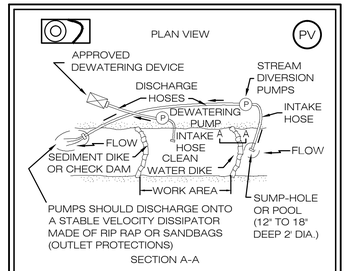
CORRECT METHODS OF TREE FENCING



Note: Tree protection fencing should be maintained throughout construction

4/33 DETAIL : TREE PROTECTION NTS

(PV)

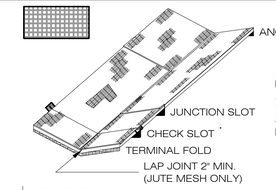


REVISED NOVEMBER 2000 PAGE 1.2 - 3

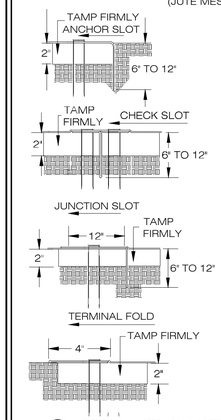
NOTES:
1. SET UP PUMP AND HOSE AS SHOWN, OR USE OTHER PRACTICAL ALTERNATIVES. PUMP SHOULD HAVE TWICE THE PUMPING CAPACITY OF ANTICIPATED FLOW.
2. ALL INTAKE HOSES WILL BE SCREENED.
3. DISMANTLE DOWNSTREAM DAM, THEN UPSTREAM DAM. KEEP PUMP RUNNING TO MAINTAIN STREAM FLOW.
4. PUMP AROUND MAY NOT BE LEFT IN PLACE FOR MORE THAN 24 HOURS.

8/33 DETAIL : PUMP AROUND PRACTICE NTS
VSRSBMPG DETAIL 5.1

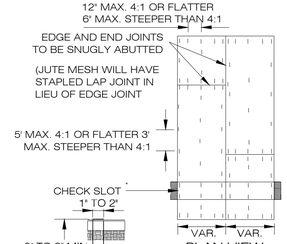
(BM)



NOTES
APPROXIMATELY 200 STAPLES REQUIRED PER 100 SQ. YDS. OF MATERIAL ROLL. ANCHOR SLOTS, JUNCTION SLOTS & CHECK SLOTS TO BE BURIED 6" TO 12".



CHECK SLOTS TO BE BURIED 6" TO 12".
12" MAX. 4:1 OR FLATTER
6" MAX. STEEPER THAN 4:1



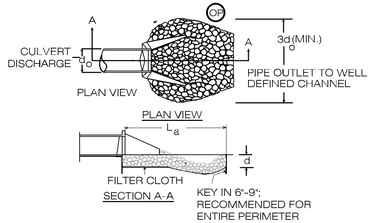
PLAN VIEW
STAPLING DIAGRAM

STAPLE FORMED FROM NO.11 STEEL WIRE. 8" STAPLE MIN. LENGTH FOR SANDY SOIL. 6" STAPLE MIN. LENGTH FOR OTHER SOIL.

* CHECK SLOTS AT MIN. 50' C-C INTERVALS; NOT REQ'D WITH ALL COMBINATION*BLANKETS

9/33 DETAIL : STRAW MATTING (EC-2) STAPLING DETAIL NTS

(OF)



NOTES:

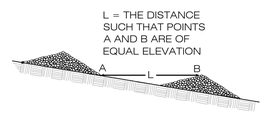
1. APRON LINING MAY BE RIPRAP, GROUTED RIPRAP, GABION BASKET, OR CONCRETE.
2. La IS THE LENGTH OF THE RIPRAP APRON AS CALCULATED USING PLATES 3.18-3 AND 3.18-4.
3. d = 1.5 TIMES THE MAXIMUM STONE DIAMETER, BUT NOT LESS THAN 6 INCHES.
4. LEVEL SPREADER TRENCH TO BE INSTALLED PARALLEL TO CONTOUR AND TO MATCH THE PROPOSED GRADE. TOP LIP ELEVATION TO BE UNIFORM TO WITHIN 1".
5. LENGTHS PROVIDED ARE A MINIMUM, APRONS SHOULD BE EXTENDED INTO THE CHANNEL TO PREVENT EROSION OF PROPOSED STREAM BANKS.
6. CLASS I TOE PROTECTION SHALL BE USED ON OUTER BENDS OF OUTFALL CHANNEL OF THE 18" RCP CULVERT AT STA 05+80 PROPOSED STREAM CHANNEL.

OUTFALL PROTECTION SUMMARY

PIPE	FULL FLOW Q (CFS)	RIPRAP SIZE	APRON LENGTH (SEE NOTE 5)	MINIMUM APRON STARTING WIDTH	MINIMUM APRON END WIDTH	RIPRAP DEPTH (d)
18" RCP AT 05+80	11.30	CLASS I	14 FT	4.50 FT	7.10	2.2 FT
15" RCP AT 07+50	6.95	CLASS I	10 FT	3.75 FT	5.25	2.2 FT
PROPOSED 21" RCP AT 11+38	12.04	CLASS I	10 FT	5.25 FT	5.75	2.2 FT

3/33 DETAIL: OUTFALL PROTECTION
VESCH STD & SPEC 3.18 NTS

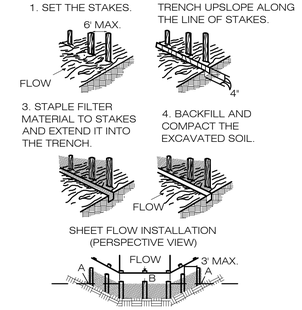
(CD)



5/33 DETAIL : CHECK DAM NTS

(SF)

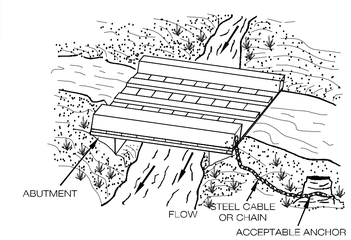
CONSTRUCTION OF A SILT FENCE (WITHOUT WIRE SUPPORT)



POINTS A SHOULD BE HIGHER THAN POINT B.
DRAINAGEWAY INSTALLATION (FRONT ELEVATION)

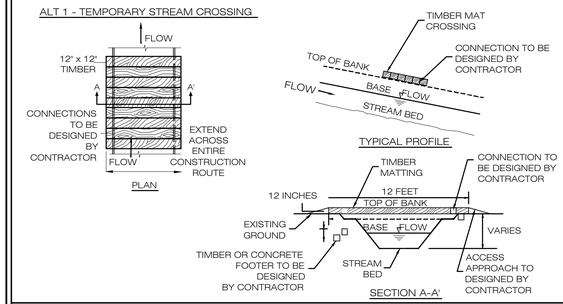
7/33 DETAIL : SILT FENCE NTS
VESCH STD & SPEC 3.05

(TSC)

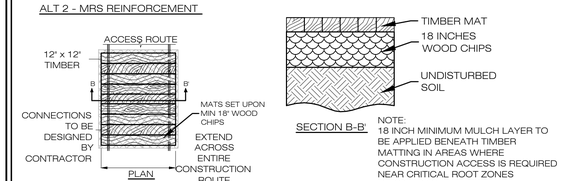


1. TIMBER MATTING SHALL BE USED WHERE CONSTRUCTION EQUIPMENT CROSSES THE BASE/LOW FLOW CHANNEL WITHIN THE STREAM CHANNEL OR ANY NON-TIDAL WETLANDS.
2. CONTRACTOR SHALL DESIGN THE TIMBER MATTING TO PROTECT THE STREAM CHANNEL BOTTOM OR WETLAND AREAS FROM VEHICLES. THE MATTING SHALL BE DESIGNED TO BE STABLE WHEN TRAVERSED BY CONSTRUCTION VEHICLES.
3. THE TIMBER MATTING WILL BE REMOVED FROM THE STREAM CHANNEL AT THE END OF EACH WORK DAY.
4. SILT FENCE SHALL BE INSTALLED ALONG BOTH BANKS ADJACENT TO THE TIMBER MATTING TO ENSURE EXCESS SEDIMENT FROM THE CROSSING DOES NOT FLOW INTO THE CHANNEL.

ALT 1 - TEMPORARY STREAM CROSSING



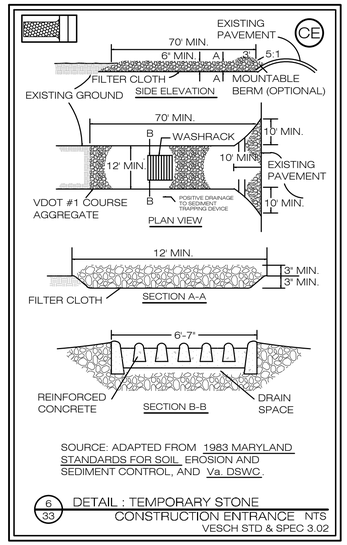
ALT 2 - MRS REINFORCEMENT



NOTE:
18 INCH MINIMUM MULCH LAYER TO BE APPLIED BENEATH TIMBER MATTING IN AREAS WHERE CONSTRUCTION ACCESS IS REQUIRED NEAR CRITICAL ROOT ZONES DEPICTED ON THE TREE PRESERVATION PLAN.

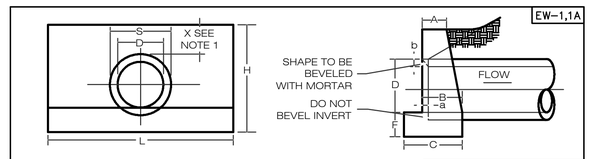
10/33 DETAIL : TEMPORARY BRIDGE CROSSING AND TEMPORARY TIMBER MAT NTS

(CE)



SOURCE: ADAPTED FROM 1983 MARYLAND STANDARDS FOR SOIL EROSION AND SEDIMENT CONTROL, AND Va. DSWC.

6/33 DETAIL : TEMPORARY STONE CONSTRUCTION ENTRANCE NTS
VESCH STD & SPEC 3.02



EW-1,1A

1. "H" MAY BE REDUCED UNTIL "X" REACHES A MINIMUM OF 4" WHERE ENDWALL WOULD PROTRUDE ABOVE SHOULDER LINE. IN NO CASE SHALL TOP OF ENDWALL PROJECT ABOVE FILL SLOPE, DITCH SLOPE, OR SHOULDER.
2. THIS ITEM MAY BE PRECAST OR CAST IN PLACE.
3. ALL CAST IN PLACE CONCRETE TO BE CLASS A3. FOR PRECAST SEE SHEET 101.02.
4. THIS STANDARD TO BE USED WITH STRAIGHT CROSSINGS AND ALL SKEWS (0TO 45^).
5. HEADWALL TO BE BEVELED IN ALL AREAS EXCEPT WHERE A CONFLICT WITH INVERT OR WINGWALLS OCCUR.
6. BEVEL EDGE IS REQUIRED ON THE HEADWALL AT THE INLET END OF THE CULVERT (WHERE THE FLOW ENTERS THE CULVERT).
7. HEADWALL AT THE OUTLET END OF THE CULVERT MAY BE EITHER SQUARE EDGE OR BEVEL EDGE.
8. ON SHALLOW FILLS, WHERE ENDWALLS ARE 1' OR LESS BELOW SHOULDER LINE, THE TOP OF THE ENDWALL SHALL BE CONSTRUCTED PARALLEL TO THE GRADE OF THE ROAD.
9. 3/4" CHAMFER MAY BE PROVIDED ON ALL EDGES AT MANUFACTURER'S OPTION.

EW-1

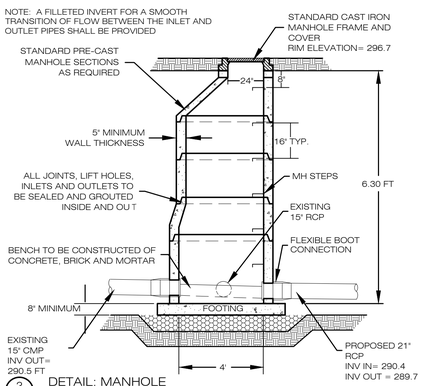
ENDWALL FOR CIRCULAR PIPE

DIAMETER OF PIPE CULVERT	21" OR 24"
A	0'-11"
B	1'-6"
C	2'-2"
D	2'-0"
F	0'-9"
H	3'-9"
L	8'-0"
a	0'-2?"
b	0'-2"

CUBIC YARDS OF CONCRETE

CONC. PIPE	1.319
C.M. PIPE	1.398

SPECIFICATION REFERENCE	STANDARD ENDWALL FOR PIPE CULVERTS 21"-24" CIRCULAR VIRGINIA DEPARTMENT OF TRANSPORTATION	101.01
105 302		



2/33 DETAIL: MANHOLE NTS

5209 Center Street
Williamsburg, Virginia 23188
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1011 Boulder Springs Drive, Suite 225
Richmond, Virginia 23225
(804) 267-3474
150 Riverside Parkway, Suite 301
Fredericksburg, Virginia 22406
(540) 759-5244
Environmental Consultants
WILLIAMSBURG ENVIRONMENTAL GROUP, INC.

EROSION & SEDIMENT CONTROL DETAILS I
COE BRANCH STREAM RESTORATION
CITY OF FALLS CHURCH, VIRGINIA

COMMONWEALTH OF VIRGINIA
SCOTT C. BLOSSOM
Lic. No. 40287
12/16/13
PROFESSIONAL ENGINEER

REVISIONS:

DATE:	REVISIONS MADE PER REQUEST BY CITY OF FALLS CHURCH
12/16/13	

DRAWN BY: CSA/AWT
DESIGNED BY: SCB/CSA
DATE: 11/07/2013
CHECKED BY: SCB
SCALE: N/A

SHEET: 33 OF 43
JOB#: 4966

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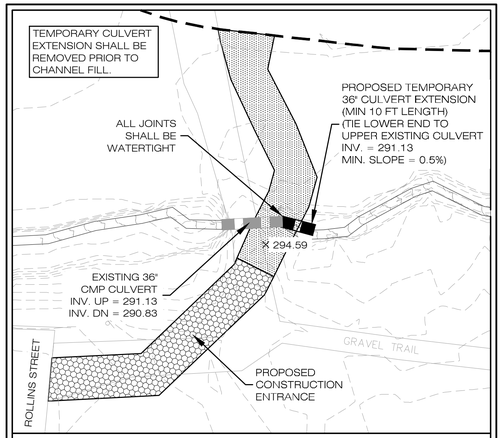
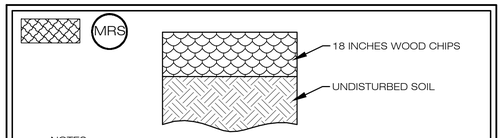


1/34 DETAIL: TEMPORARY 36" CULVERT EXTENSION

NTS



NOTES:

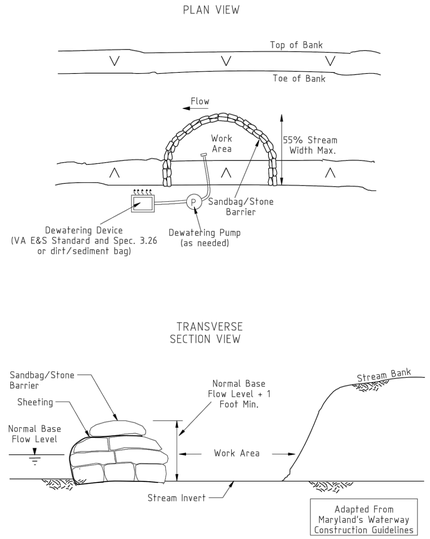
1. MULCH ROAD STABILIZATION TO BE USED WHERE EQUIPMENT MUST OPERATE WITHIN CRITICAL ROOT ZONES (SEE SHEETS 21 AND 22) IN AREAS THAT WILL REMAIN AT GRADE.
2. SPREAD 18 INCHES OF WOOD CHIPS BY HAND.
3. THE ROADBED MATERIAL SHALL BE REPLENISHED AS NECESSARY TO MAINTAIN A MINIMUM 18 INCH DEPTH.
4. CITY ARBORIST MUST APPROVE USE OF ANY TEMPORARY ROAD IN THE TREE PROTECTION AREA.
5. WHERE TEMPORARY CLEARANCE IS NEEDED FOR ACCESS, BRANCHES SHALL BE TIED BACK TO HOLD THEM OUT OF THE CLEARANCE ZONE. THE CITY ARBORIST MUST APPROVE SUCH TYING.
6. THE CITY ARBORIST MAY REQUIRE ADDITIONAL USE OF TIMBER MATTING ON TOP OF MULCH IF MINIMUM MULCH DEPTHS CANNOT BE MAINTAINED BY THE CONTRACTOR (SEE DETAIL 10, SHEET 33).

2/34 DETAIL: MULCH ROAD STABILIZATION

NTS

The Virginia Stream Restoration & Stabilization Best Management Practices Guide

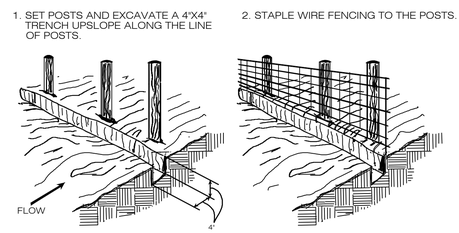
DETAIL 5.2: SANDBAG/STONE DIVERSION

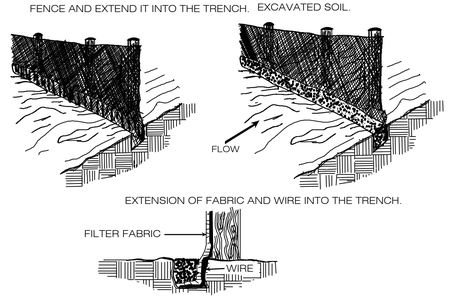


TEMPORARY INSTREAM CONSTRUCTION MEASURES	DECEMBER 2003	VIRGINIA DEPARTMENT OF CONSERVATION RECREATION

2/34 DETAIL: SANDBAG DIVERSION

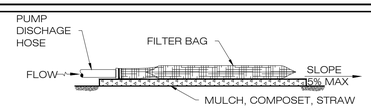
NTS





3/34 DETAIL: SUPER SILT FENCE

NTS



CONSTRUCTION SPECIFICATIONS

1. MATERIAL: NON-WOVEN GEOTEXTILE WITH A MINIMUM SURFACE AREA OF 225 SQUARE FEET PER SIDE.
2. SEAM STRENGTH: WITHSTAND 100 POUNDS/INCH USING ASTM D-4884 TEST METHOD. DOUBLE STITCH SEWN USING A DOUBLE NEEDLE MACHINE WITH HIGH STRENGTH THREAD
3. SLEEVE SIZE TO ACCOMMODATE A 4 INCH DIAMETER PUMP DISCHARGE HOSE.
4. TIGHTLY SEAL SLEEVE AROUND THE PUMP DISCHARGE HOSE WITH A STRAP OR SIMILAR DEVICE.
5. PLACE FILTER BAG UPON MULCH, COMPOST, STRAW BALES OR OTHER LOCAL AGENCY APPROVED MATERIAL LOCATED ON LEVEL OR GENTLY SLOPING (5% MAXIMUM) STABILIZED AREA.
6. CONTROL PUMPING RATE TO PREVENT EXCESSIVE PRESSURE WITHIN THE FILTERBAG. AS THE BAG FILLS WITH SEDIMENT, REDUCE PUMPING RATE
7. DEWATER, REMOVE AND DISPOSE FILTER BAG UPON COMPLETION OF PUMPING OPERATIONS OR AFTER BAG HAS REACHED CAPACITY, WHICHEVER OCCURS FIRST. SPREAD THE DEWATERED SEDIMENT FROM THE BAG IN AN APPROVED UPLAND AREA AND STABILIZED BY THE END OF THE WORK DAY. RESTORE SURFACE AREA BENEATH BAG TO ORIGINAL CONDITION UPON REMOVAL OF THE DEVICE
8. MINIMUM GEOTEXTILE REQUIREMENTS AND SPECIFICATIONS:

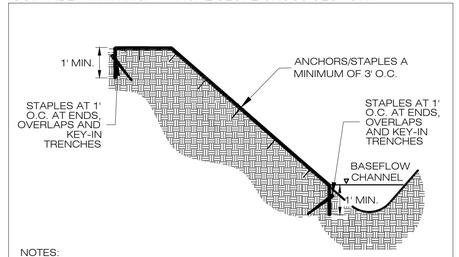
GRAB TENSILE STRENGTH	300 LB	ASTM D-4632
PUNCTURE	175 LB	ASTM D-4833
FLOW RATE	70 GAL/MIN/SF	ASTM D-4491
PERMITTIVITY	1.3 SEC-I	ASTM D-4491
UV RESISTANCE	70% STRENGHT AT 500 HOURS	ASTM D-4355
APPARENT OPENING SIZE (AOS)	0.40-0.80 MM	ASTM D-4751

4/34 DETAIL: FILTER BAG

SOURCE: MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL, DETAIL F-4

NTS

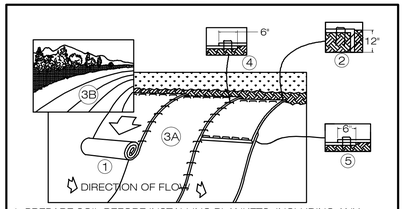
COIR FIBER MATTING - TYPICAL SLOPE CROSS SECTION



NOTES:
1. BLANKETS SHALL EXTEND DOWNSLOPE TO BASEFLOW CHANNEL.
2. SECURE BOTTOM EDGE OF BLANKET AS DONE AT TOP OF SLOPE.
3. KEY IN MATTING A MINIMUM OF 1' BELOW FINISHED GRADE AT EDGES.

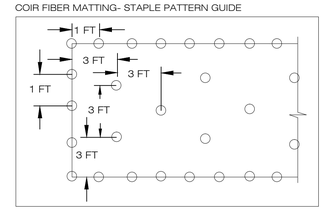
NOTE: COIR FIBER MATTING SHALL BE PLACED ALONG EACH BANK FROM TOE OF SLOPE TO TOP OF SLOPE UPON COMPLETION OF GRADING AND APPLICATION OF PERMANENT SEEDING. MATTING CAN BE INSTALLED INCREMENTALLY AS CONSTRUCTION PROGRESSES, PER THE SEQUENCE OF CONSTRUCTION.

COIR FIBER MATTING- INSTALLATION



1. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND NATIVE SEED MIX IN ACCORDANCE WITH PERMANENT SEEDING.
2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE BLANKET IN A 12" DEEP X 6" WIDE TRENCH WITH APPROXIMATELY 12" OF BLANKET EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE BLANKET WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN THE TRENCH.
3. ROLL THE BLANKETS (A.) DOWN OR (B.) HORIZONTALLY ACROSS THE SLOPE. BLANKETS WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL BLANKETS MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE.
4. THE EDGES OF PARALLEL BLANKETS MUST BE STAPLED WITH APPROXIMATELY 6" OVERLAP DEPENDING ON BLANKET TYPE. SEAMS OF ADJACENT BLANKETS MUST BE ALIGNED.
5. CONSECUTIVE BLANKETS SPLICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH AN APPROXIMATE 6" OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" APART ACROSS ENTIRE BLANKET WIDTH.

COIR FIBER MATTING- STAPLE PATTERN GUIDE

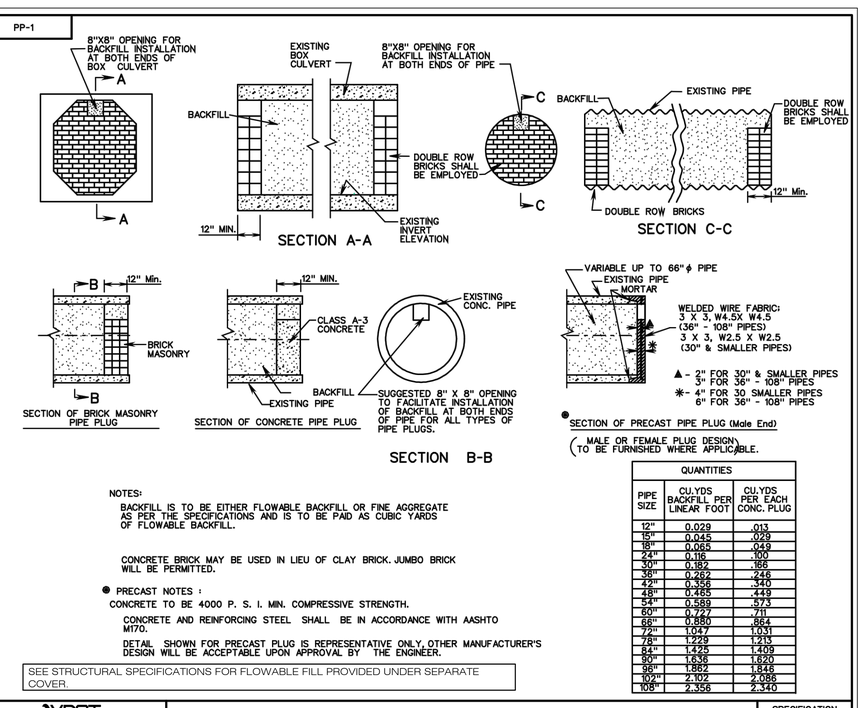


REFER TO PRODUCT MANUFACTURER INSTALLATION GUIDANCE AND THE VDOT EC-2 SPECIFICATIONS FOR ANY ITEMS NOT DISCUSSED HEREIN. DEFAULT TO THE MOST RESTRICTIVE CRITERIA IF THE MANUFACTURER SPECIFICATIONS CONFLICT WITH THOSE HEREIN.

NOTE - DETAIL MODIFIED TO BETTER CLARIFY THE REQUIREMENTS PREVIOUSLY PROVIDED IN THE TECHNICAL SPECIFICATIONS.

5/34 DETAIL : TEMPORARY MATTING

PP-1



NOTES:

BACKFILL IS TO BE EITHER FLOWABLE BACKFILL OR FINE AGGREGATE AS PER THE SPECIFICATIONS AND IS TO BE PAID AS CUBIC YARDS OF FLOWABLE BACKFILL.

CONCRETE BRICK MAY BE USED IN LIEU OF CLAY BRICK. JUMBO BRICK WILL BE PERMITTED.

● PRECAST NOTES :

CONCRETE TO BE 4000 P. S. I. MIN. COMPRESSIVE STRENGTH.

CONCRETE AND REINFORCING STEEL SHALL BE IN ACCORDANCE WITH AASHTO M170.

DETAIL SHOWN FOR PRECAST PLUG IS REPRESENTATIVE ONLY, OTHER MANUFACTURER'S DESIGN WILL BE ACCEPTABLE UPON APPROVAL BY THE ENGINEER.

SEE STRUCTURAL SPECIFICATIONS FOR FLOWABLE FILL PROVIDED UNDER SEPARATE COVER.

QUANTITIES

PIPE SIZE	CU.YDS BACKFILL PER LINEAR FOOT	CU.YDS PER EACH CONC. PLUG
12"	0.029	.013
15"	0.045	.029
18"	0.065	.049
24"	0.116	.100
30"	0.182	.166
36"	0.262	.246
42"	0.356	.340
48"	0.465	.449
54"	0.589	.573
60"	0.727	.711
66"	0.880	.864
72"	1.047	1.031
78"	1.229	1.213
84"	1.425	1.409
90"	1.636	1.620
96"	1.862	1.846
102"	2.102	2.086
108"	2.356	2.340

VDOT ROAD AND BRIDGE STANDARDS

SHEET 1 OF 1 | REVISION DATE

107.23

DETAILS FOR BACKFILLING ABANDONED CULVERTS

VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION REFERENCE

5209 Center Street
Williamsburg, Virginia 23188
(757) 220-6869
1011 Boulder Springs Drive, Suite 225
Richmond, Virginia 23225
(804) 267-3474
150 Riverside Parkway, Suite 301
Fredericksburg, Virginia 22406
(540) 763-5344
WILLIAMSBURG ENVIRONMENTAL GROUP, INC.
Environmental Consultants

EROSION & SEDIMENT CONTROL DETAILS II
COE BRANCH STREAM RESTORATION
CITY OF FALLS CHURCH, VIRGINIA

COMMONWEALTH OF VIRGINIA
SCOTT C. BLOSSOM
Lic. No. 40287
12/16/13
PROFESSIONAL ENGINEER

REVISIONS:
DATE:
12/16/13 REVISIONS MADE PER REQUEST BY CITY OF FALLS CHURCH

DRAWN BY: CSA/AWT
DESIGNED BY: SCB/CSA
DATE: 11/07/2013
CHECKED BY: SCB
SCALE: N/A

SHEET: 34 OF 43

JOB#: 4966

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LEGEND

- GENERAL STABILIZATION SEED MIX
- PROPOSED STREAMBANK STABILIZATION AND COIR MATTING

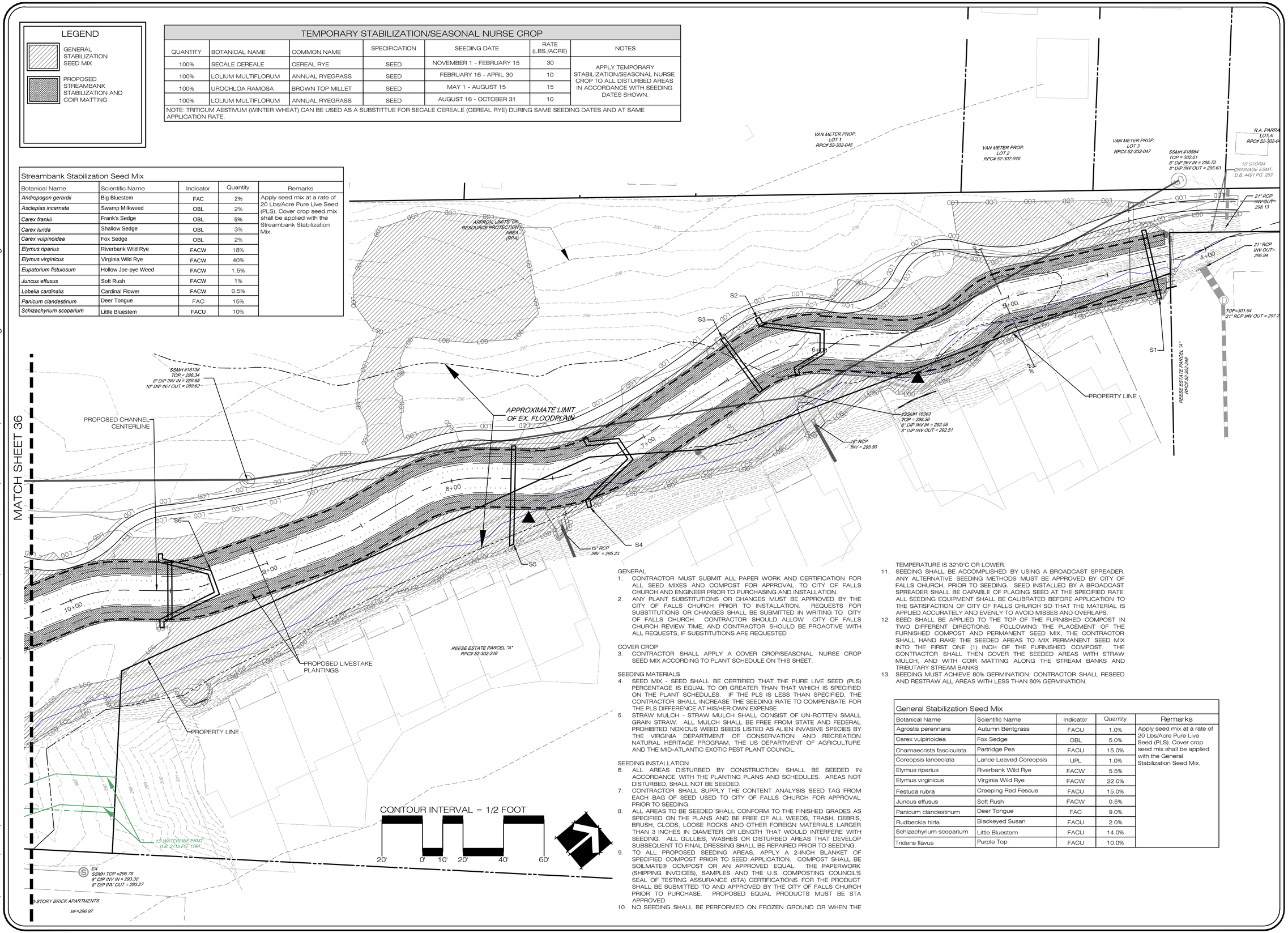
TEMPORARY STABILIZATION/SEASONAL NURSE CROP

QUANTITY	BOTANICAL NAME	COMMON NAME	SPECIFICATION	SEEDING DATE	RATE (LBS./ACRE)	NOTES
100%	SECALE CEREALE	CEREAL RYE	SEED	NOVEMBER 1 - FEBRUARY 15	30	APPLY TEMPORARY STABILIZATION/SEASONAL NURSE CROP TO ALL DISTURBED AREAS IN ACCORDANCE WITH SEEDING DATES SHOWN.
100%	LOLIUM MULTIFLORUM	ANNUAL RYEGRASS	SEED	FEBRUARY 16 - APRIL 30	10	
100%	UROCHLOA RAMOSA	BROWN TOP MILLET	SEED	MAY 1 - AUGUST 15	15	
100%	LOLIUM MULTIFLORUM	ANNUAL RYEGRASS	SEED	AUGUST 16 - OCTOBER 31	10	

NOTE: TRITICUM AESTIVUM (WINTER WHEAT) CAN BE USED AS A SUBSTITTUE FOR SECALE CEREALE (CEREAL RYE) DURING SAME SEEDING DATES AND AT SAME APPLICATION RATE.

Streambank Stabilization Seed Mix

Botanical Name	Scientific Name	Indicator	Quantity	Remarks
Andropogon gerardii	Big Bluestem	FAC	2%	Apply seed mix at a rate of 20 Lbs/Acre Pure Live Seed (PLS). Cover crop seed mix shall be applied with the Streambank Stabilization Mix.
Asclepias incarnata	Swamp Milkweed	OBL	2%	
Carex frankii	Frank's Sedge	OBL	5%	
Carex lurida	Shallow Sedge	OBL	3%	
Carex vulpinoidea	Fox Sedge	OBL	2%	
Elymus riparius	Riverbank Wild Rye	FACW	18%	
Elymus virginicus	Virginia Wild Rye	FACW	40%	
Eupatorium fistulosum	Hollow Joe-pye Weed	FACW	1.5%	
Juncus effusus	Soft Rush	FACW	1%	
Lobelia cardinalis	Cardinal Flower	FACW	0.5%	
Panicum clandestinum	Deer Tongue	FAC	15%	
Schizachyrium scoparium	Little Bluestem	FACU	10%	



GENERAL

1. CONTRACTOR MUST SUBMIT ALL PAPER WORK AND CERTIFICATION FOR ALL SEED MIXES AND COMPOST FOR APPROVAL TO CITY OF FALLS CHURCH AND ENGINEER PRIOR TO PURCHASING AND INSTALLATION.
2. ANY PLANT SUBSTITUTIONS OR CHANGES MUST BE APPROVED BY THE CITY OF FALLS CHURCH PRIOR TO INSTALLATION. REQUESTS FOR SUBSTITUTIONS OR CHANGES SHALL BE SUBMITTED IN WRITING TO CITY OF FALLS CHURCH. CONTRACTOR SHOULD ALLOW CITY OF FALLS CHURCH REVIEW TIME, AND CONTRACTOR SHOULD BE PROACTIVE WITH ALL REQUESTS, IF SUBSTITUTIONS ARE REQUESTED

COVER CROP

3. CONTRACTOR SHALL APPLY A COVER CROP/SEASONAL NURSE CROP SEED MIX ACCORDING TO PLANT SCHEDULE ON THIS SHEET.

SEEDING MATERIALS

4. SEED MIX - SEED SHALL BE CERTIFIED THAT THE PURE LIVE SEED (PLS) PERCENTAGE IS EQUAL TO OR GREATER THAN THAT WHICH IS SPECIFIED ON THE PLANT SCHEDULES. IF THE PLS IS LESS THAN SPECIFIED, THE CONTRACTOR SHALL INCREASE THE SEEDING RATE TO COMPENSATE FOR THE PLS DIFFERENCE AT HIS/HER OWN EXPENSE.
5. STRAW MULCH - STRAW MULCH SHALL CONSIST OF UN-ROTTEN SMALL GRAIN STRAW. ALL MULCH SHALL BE FREE FROM STATE AND FEDERAL PROHIBITED NOXIOUS WEED SEEDS LISTED AS ALIEN INVASIVE SPECIES BY THE VIRGINIA DEPARTMENT OF CONSERVATION AND RECREATION NATURAL HERITAGE PROGRAM, THE US DEPARTMENT OF AGRICULTURE AND THE MID-ATLANTIC EXOTIC PEST PLANT COUNCIL.

SEEDING INSTALLATION

6. ALL AREAS DISTURBED BY CONSTRUCTION SHALL BE SEEDED IN ACCORDANCE WITH THE PLANTING PLANS AND SCHEDULES. AREAS NOT DISTURBED, SHALL NOT BE SEEDED.
7. CONTRACTOR SHALL SUPPLY THE CONTENT ANALYSIS SEED TAG FROM EACH BAG OF SEED USED TO CITY OF FALLS CHURCH FOR APPROVAL PRIOR TO SEEDING.
8. ALL AREAS TO BE SEEDED SHALL CONFORM TO THE FINISHED GRADES AS SPECIFIED ON THE PLANS AND BE FREE OF ALL WEEDS, TRASH, DEBRIS, BRUSH, CLODS, LOOSE ROCKS AND OTHER FOREIGN MATERIALS LARGER THAN 3 INCHES IN DIAMETER OR LENGTH THAT WOULD INTERFERE WITH SEEDING. ALL GULLIES, WASHES OR DISTURBED AREAS THAT DEVELOP SUBSEQUENT TO FINAL DRESSING SHALL BE REPAIRED PRIOR TO SEEDING.
9. TO ALL PROPOSED SEEDING AREAS, APPLY A 2-INCH BLANKET OF SPECIFIED COMPOST PRIOR TO SEED APPLICATION. COMPOST SHALL BE SOILMATE® COMPOST OR AN APPROVED EQUAL. THE PAPERWORK (SHIPPING INVOICES), SAMPLES AND THE U.S. COMPOSTING COUNCIL'S SEAL OF TESTING ASSURANCE (STA) CERTIFICATIONS FOR THE PRODUCT SHALL BE SUBMITTED TO AND APPROVED BY THE CITY OF FALLS CHURCH PRIOR TO PURCHASE. PROPOSED EQUAL PRODUCTS MUST BE STA APPROVED.
10. NO SEEDING SHALL BE PERFORMED ON FROZEN GROUND OR WHEN THE TEMPERATURE IS 32°/0°C OR LOWER.
11. SEEDING SHALL BE ACCOMPLISHED BY USING A BROADCAST SPREADER. ANY ALTERNATIVE SEEDING METHODS MUST BE APPROVED BY CITY OF FALLS CHURCH, PRIOR TO SEEDING. SEED INSTALLED BY A BROADCAST SPREADER SHALL BE CAPABLE OF PLACING SEED AT THE SPECIFIED RATE. ALL SEEDING EQUIPMENT SHALL BE CALIBRATED BEFORE APPLICATION TO THE SATISFACTION OF CITY OF FALLS CHURCH SO THAT THE MATERIAL IS APPLIED ACCURATELY AND EVENLY TO AVOID MISSES AND OVERLAPS.
12. SEED SHALL BE APPLIED TO THE TOP OF THE FURNISHED COMPOST IN TWO DIFFERENT DIRECTIONS. FOLLOWING THE PLACEMENT OF THE FURNISHED COMPOST AND PERMANENT SEED MIX, THE CONTRACTOR SHALL HAND RAKE THE SEEDED AREAS TO MIX PERMANENT SEED MIX INTO THE FIRST ONE (1) INCH OF THE FURNISHED COMPOST. THE CONTRACTOR SHALL THEN COVER THE SEEDED AREAS WITH STRAW MULCH, AND WITH COIR MATTING ALONG THE STREAM BANKS AND TRIBUTARY STREAM BANKS.
13. SEEDING MUST ACHIEVE 80% GERMINATION. CONTRACTOR SHALL RESEED AND RESTRAW ALL AREAS WITH LESS THAN 80% GERMINATION.

General Stabilization Seed Mix

Botanical Name	Scientific Name	Indicator	Quantity	Remarks
Agrostis perennans	Autumn Bentgrass	FACU	1.0%	Apply seed mix at a rate of 20 Lbs/Acre Pure Live Seed (PLS). Cover crop seed mix shall be applied with the General Stabilization Seed Mix.
Carex vulpinoidea	Fox Sedge	OBL	5.0%	
Chamaecrista fasciculata	Partridge Pea	FACU	15.0%	
Coreopsis lanceolata	Lance Leaved Coreopsis	UPL	1.0%	
Elymus riparius	Riverbank Wild Rye	FACW	5.5%	
Elymus virginicus	Virginia Wild Rye	FACW	22.0%	
Festuca rubra	Creeping Red Fescue	FACU	15.0%	
Juncus effusus	Soft Rush	FACW	0.5%	
Panicum clandestinum	Deer Tongue	FAC	9.0%	
Rudbeckia hirta	Blackeyed Susan	FACU	2.0%	
Schizachyrium scoparium	Little Bluestem	FACU	14.0%	
Tridens flavus	Purple Top	FACU	10.0%	

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(804) 267-3474
150 Riverside Parkway, Suite 301
Fredericksburg, Virginia 22406
(540) 785-5244
WILLIAMSBURG ENVIRONMENTAL GROUP, INC.
Environmental Consultants

PLANTING PLAN: SEEDING UPPER COE BRANCH STREAM RESTORATION

CITY OF FALLS CHURCH, VIRGINIA

COMMONWEALTH OF VIRGINIA
GEORGE C. RHODES III
Lic. No. 000894
12/16/13
LANDSCAPE ARCHITECT

REVISIONS:
DATE:
12/16/13 REVISED PER CITY REQUEST

DRAWN BY: CDP, RH
DESIGNED BY: CDP
DATE: 11/07/2013
CHECKED BY: SCB, GCR
SCALE: 1"=20'

SHEET: 35 OF 43
JOB#: 4966

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LAMONT TERRACE LOT 30-19A RPC# 52-302-026

LAMONT TERRACE LOT 18-A RPC# 52-302-034

5' SAN. SEW. ESMT. APPROXIMATE LOCATION

LAMONT TERRACE LOT 16 RPC# 52-302-035

LAMONT TERRACE LOT 16 RPC# 52-302-036

LAMONT TERRACE LOT 15 RPC# 52-302-037

LAMONT TERRACE LOT 14 RPC# 52-302-038

LAMONT TERRACE LOT 13 RPC# 52-302-039

S12

S11

SSMH #15435
TOP=293.40
8" DIP INV IN = 286.12 (COULD NOT FIND)
8" DIP INV OUT = 285.37

42" ELLIPTICAL RCP
INV OUT = 286.47
INV OUT = 286.63

APPROX. LIMITS OF RESOURCE PROTECTION AREA (RPA)

UNABLE TO FIND THIS STORM GRATE

STM 10" CLAY
INV IN = 288.29
INV OUT = 288.29

SSMH #15908
TOP=292.31
8" DIP INV IN =284.94
10" DIP INV IN = 285.02
10" DIP INV OUT = 284.90

LEE CREST SEC. 3 LOT 30 RPC# 52-302-017

HSE #432

FF=299.39'

FF=291.27'

EX. 10' DRAINAGE EASEMENT D.B. 1206 PG. 208

FF=298.66'

FF=290.68'

HSE #434

LEE CREST SEC. 3 LOT 48 RPC# 52-302-018

LEE CREST SEC. 3 LOT 29 RPC# 52-302-016

HSE #430

FF=291.70'

FF=299.54'

FF=290.65'

HSE #428

LEE CREST SEC. 3 LOT 28 RPC# 52-302-015

FF=294.65'

FF=298.23'

FF=298.24'

HSE #426

FF=290.03'

LEE CREST SEC. 3 LOT 27 RPC# 52-302-014

SHERROW AVENUE (50' RIGHT-OF-WAY)

IPF PINCHED

IPF

STM STRUCTURE
TOP = 291.54
42" CMP INV IN "A" = 287.34
42" CMP INV IN "B" = 287.31
42" CMP INV OUT "A" = 287.24
42" CMP INV OUT "B" = 287.19

PROPERTY LINE

S10

S9

SSMH #15575
TOP = 292.78
10" DIP INV IN = 286.02
10" DIP INV OUT = 285.96

APPROXIMATE LIMIT OF EX. FLOODPLAIN

CITY OF FALLS CHURCH LOT 13 RPC# 52-302-051

MATCH SHEET 35

PROPOSED CHANNEL CENTERLINE

S8

S7

36" CMP
INV IN = 291.13
INV OUT = 290.93

LEE CREST SEC. 3 LOT 1 RPC# 52-302-063

APPROX. LIMITS OF RESOURCE PROTECTION AREA (RPA)

CONCRETE FLUME 295.29

20' B.R.L. D.B. 2715 PG. 1264

FLOODPLAIN ESMT. D.B. 2715 PG 1264

15' WATERLINE ESMT. D.B. 2715 PG. 1264

TOP OF STORM STR
296.18
15" CMP INV IN = 288.51
42" ELLIP INV OUT = 287.21
42" ELLIP INV OUT = 287.06

SSMH #20299
TOP=297.64
8" DIP INV IN = 292.10
8" DIP INV OUT = 292.23

COLLINS STREET (50' RIGHT-OF-WAY)

SDMH
TOP=295.63
15" RCP INV IN = 291.94
15" CMP INV OUT = 291.73

LEGEND

GENERAL STABILIZATION SEED MIX

PROPOSED STREAMBANK STABILIZATION AND COIR MATTING

CONTOUR INTERVAL = 1/2 FOOT

20' 0' 10' 20' 40' 60'

5209 Center Street
Williamsburg, Virginia 23188
(757) 220-6869

1011 Boulder Springs Drive, Suite 225
Richmond, Virginia 23225
(804) 267-3474

150 Riverside Parkway, Suite 301
Fredericksburg, Virginia 22406
(540) 759-5544

WILLIAMSBURG ENVIRONMENTAL GROUP, INC.
Environmental Consultants

PLANTING PLAN: SEEDING LOWER COE BRANCH STREAM RESTORATION

CITY OF FALLS CHURCH, VIRGINIA

COMMONWEALTH OF VIRGINIA
GEORGE C. RHODES III
Lic. No. 000894
12/16/13
LANDSCAPE ARCHITECT

REVISIONS:

DATE:	
12/16/13	REVISED PER CITY REQUEST

DRAWN BY: CDP, RH

DESIGNED BY: CDP

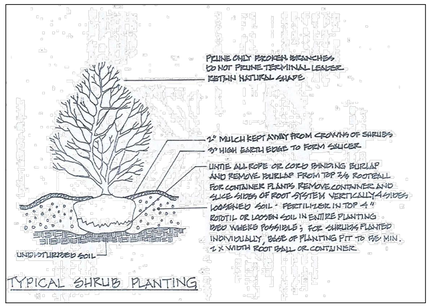
DATE: 11/07/2013

CHECKED BY: SCB, GCR

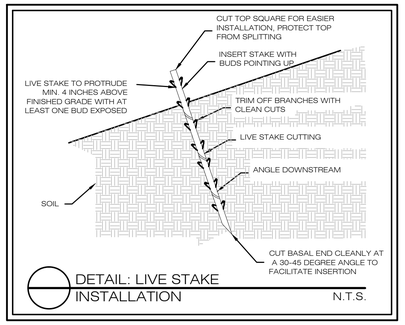
SCALE: 1"=20'

SHEET: 36 OF 43

JOB#: 4966

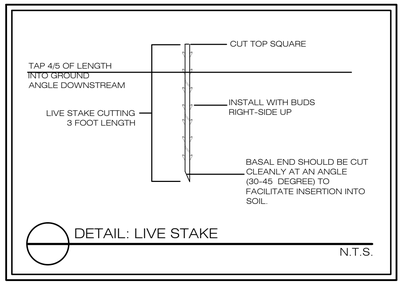


TYPICAL SHRUB PLANTING



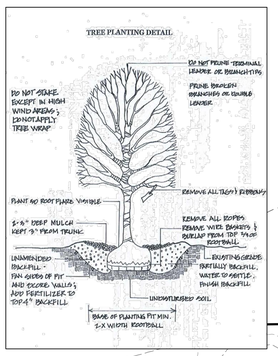
DETAIL: LIVE STAKE INSTALLATION

N.T.S.

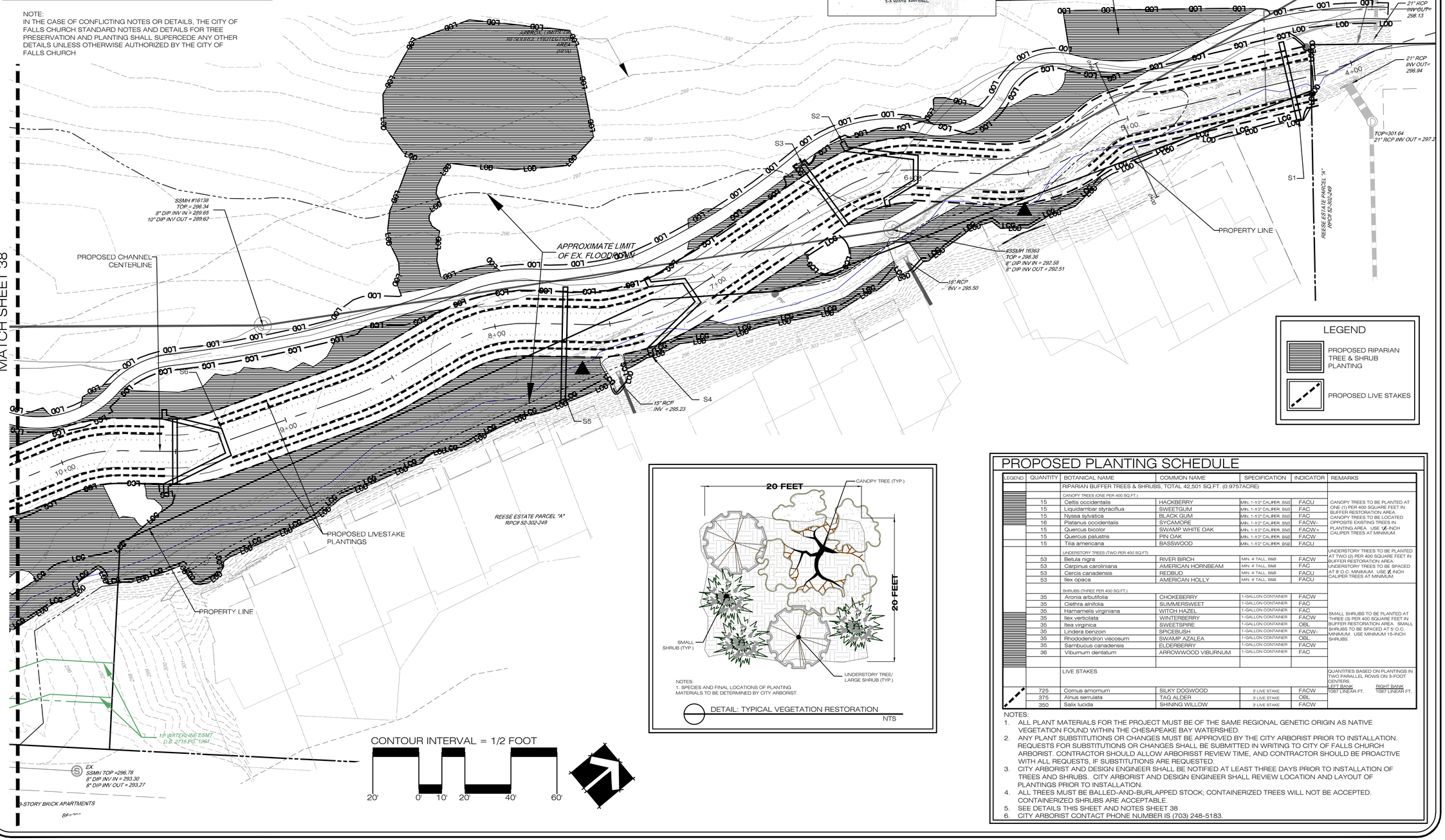


DETAIL: LIVE STAKE

N.T.S.



NOTE:
IN THE CASE OF CONFLICTING NOTES OR DETAILS, THE CITY OF FALLS CHURCH STANDARD NOTES AND DETAILS FOR TREE PRESERVATION AND PLANTING SHALL SUPERCEDE ANY OTHER DETAILS UNLESS OTHERWISE AUTHORIZED BY THE CITY OF FALLS CHURCH



NOTES:
1. SPECIES AND FINAL LOCATIONS OF PLANTING MATERIALS TO BE DETERMINED BY CITY ARBORIST.

DETAIL: TYPICAL VEGETATION RESTORATION

NTS

PROPOSED PLANTING SCHEDULE

LEGEND	QUANTITY	BOTANICAL NAME	COMMON NAME	SPECIFICATION	INDICATOR	REMARKS
		RIPARIAN BUFFER TREES & SHRUBS, TOTAL 42,501 SQ.FT. (0.9757ACRE)				
		CANOPY TREES (ONE PER 400 SQ.FT.)				
	15	Celtis occidentalis	HACKBERRY	MIN. 1-1/2" CALIPER, B&B	FACU	CANOPY TREES TO BE PLANTED AT ONE (1) PER 400 SQUARE FEET IN BUFFER RESTORATION AREA. CANOPY TREES TO BE LOCATED OPPOSITE EXISTING TREES IN PLANTING AREA. USE 1½-INCH CALIPER TREES AT MINIMUM.
	15	Liquidambar styraciflua	SWEETGUM	MIN. 1-1/2" CALIPER, B&B	FAC	
	15	Nyssa sylvatica	BLACK GUM	MIN. 1-1/2" CALIPER, B&B	FAC	
	16	Platanus occidentalis	SYCAMORE	MIN. 1-1/2" CALIPER, B&B	FACW-	
	15	Quercus bicolor	SWAMP WHITE OAK	MIN. 1-1/2" CALIPER, B&B	FACW+	
	15	Quercus palustris	PIN OAK	MIN. 1-1/2" CALIPER, B&B	FACW	
	15	Tilia americana	BASSWOOD	MIN. 1-1/2" CALIPER, B&B	FACU	
		UNDERSTORY TREES (TWO PER 400 SQ.FT)				UNDERSTORY TREES TO BE PLANTED AT TWO (2) PER 400 SQUARE FEET IN BUFFER RESTORATION AREA. UNDERSTORY TREES TO BE SPACED AT 8' O.C. MINIMUM. USE ½ INCH CALIPER TREES AT MINIMUM.
	53	Betula nigra	RIVER BIRCH	MIN. 4' TALL, B&B	FACW	
	53	Carpinus caroliniana	AMERICAN HORNBEAM	MIN. 4' TALL, B&B	FAC	
	53	Cercis canadensis	REDBUD	MIN. 4' TALL, B&B	FACU	
	53	Ilex opaca	AMERICAN HOLLY	MIN. 4' TALL, B&B	FACU	
		SHRUBS (THREE PER 400 SQ.FT.)				SMALL SHRUBS TO BE PLANTED AT THREE (3) PER 400 SQUARE FEET IN BUFFER RESTORATION AREA. SMALL SHRUBS TO BE SPACED AT 5' O.C. MINIMUM. USE MINIMUM 15-INCH SHRUBS.
	35	Aronia arbutifolia	CHOKEBERRY	1-GALLON CONTAINER	FACW	
	35	Clethra alnifolia	SUMMERSWEET	1-GALLON CONTAINER	FAC	
	35	Hamamelis virginiana	WITCH HAZEL	1-GALLON CONTAINER	FAC	
	35	Ilex verticilata	WINTERBERRY	1-GALLON CONTAINER	FACW	
	35	Itea virginica	SWEETSPIRE	1-GALLON CONTAINER	OBL	
	35	Lindera benzoin	SPICEBUSH	1-GALLON CONTAINER	FACW-	
	35	Rhododendron viscosum	SWAMP AZALEA	1-GALLON CONTAINER	OBL	
	35	Sambucus canadensis	ELDERBERRY	1-GALLON CONTAINER	FACW	
	36	Viburnum dentatum	ARROWWOOD VIBURNUM	1-GALLON CONTAINER	FAC	
		LIVE STAKES				QUANTITIES BASED ON PLANTINGS IN TWO PARALLEL ROWS ON 3-FOOT CENTERS. LEFT BANK 1087 LINEAR FT. RIGHT BANK 1087 LINEAR FT.
	725	Cornus amomium	SILKY DOGWOOD	3' LIVE STAKE	FACW	
	375	Alnus serrulata	TAG ALDER	3' LIVE STAKE	OBL	
	350	Salix lucida	SHINING WILLOW	3' LIVE STAKE	FACW	

NOTES:
1. ALL PLANT MATERIALS FOR THE PROJECT MUST BE OF THE SAME REGIONAL GENETIC ORIGIN AS NATIVE VEGETATION FOUND WITHIN THE CHESAPEAKE BAY WATERSHED.
2. ANY PLANT SUBSTITUTIONS OR CHANGES MUST BE APPROVED BY THE CITY ARBORIST PRIOR TO INSTALLATION. REQUESTS FOR SUBSTITUTIONS OR CHANGES SHALL BE SUBMITTED IN WRITING TO CITY OF FALLS CHURCH ARBORIST. CONTRACTOR SHOULD ALLOW ARBORISST REVIEW TIME, AND CONTRACTOR SHOULD BE PROACTIVE WITH ALL REQUESTS, IF SUBSTITUTIONS ARE REQUESTED.
3. CITY ARBORIST AND DESIGN ENGINEER SHALL BE NOTIFIED AT LEAST THREE DAYS PRIOR TO INSTALLATION OF TREES AND SHRUBS. CITY ARBORIST AND DESIGN ENGINEER SHALL REVIEW LOCATION AND LAYOUT OF PLANTINGS PRIOR TO INSTALLATION.
4. ALL TREES MUST BE BALLED-AND-BURLAPPED STOCK; CONTAINERIZED TREES WILL NOT BE ACCEPTED. CONTAINERIZED SHRUBS ARE ACCEPTABLE.
5. SEE DETAILS THIS SHEET AND NOTES SHEET 38
6. CITY ARBORIST CONTACT PHONE NUMBER IS (703) 248-5183.

5209 Center Street
Williamsburg, Virginia 23188
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1011 Boulder Springs Drive, Suite 225
Richmond, Virginia 23225
(804) 267-3474
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Fredericksburg, Virginia 22406
(540) 763-5244
WILLIAMSBURG ENVIRONMENTAL GROUP, INC.
Environmental Consultants

PLANTING PLAN: TREES & SHRUBS UPPER COE BRANCH STREAM RESTORATION

CITY OF FALLS CHURCH, VIRGINIA

COMMONWEALTH OF VIRGINIA
GEORGE C. RHODES III
Lic. No. 000894
12/16/13
LANDSCAPE ARCHITECT

REVISIONS:
DATE:
12/16/13 Revised per City comments.

DRAWN BY: CDP, RH
DESIGNED BY: CDP
DATE: 11/07/2013
CHECKED BY: SCB, GCR
SCALE: 1"=20'

SHEET: 37 OF 43
JOB#: 4966

W:\FREDcad\4900s\4966 - Coe Branch Stream Restoration\Stream Restoration\Construction Plan-95\CAD SHEETS\Coe Branch - Planting Plan SHEETS.dwg

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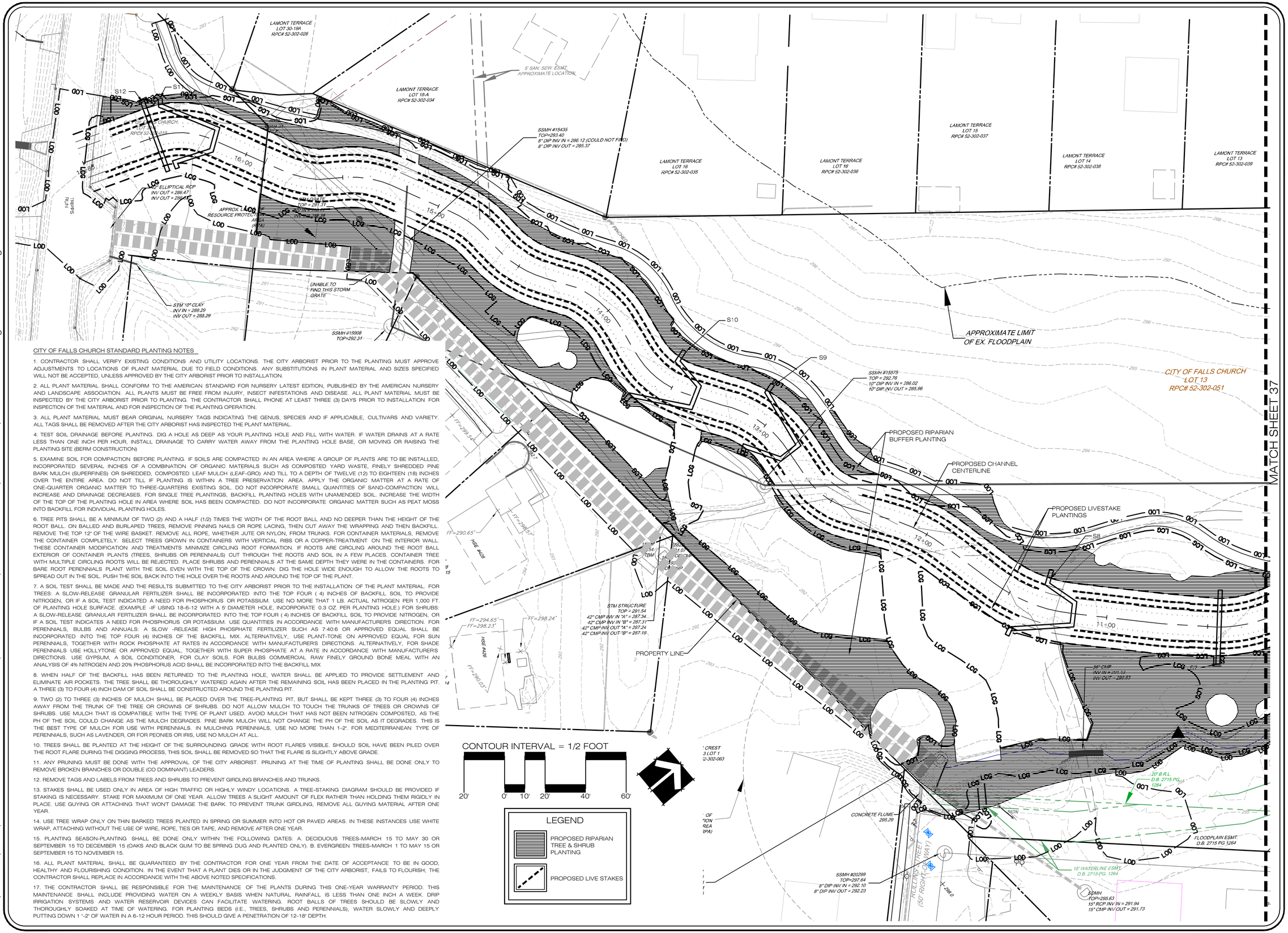

CITY OF FALLS CHURCH STANDARD PLANTING NOTES

1. CONTRACTOR SHALL VERIFY EXISTING CONDITIONS AND UTILITY LOCATIONS. THE CITY ARBORIST PRIOR TO THE PLANTING MUST APPROVE ADJUSTMENTS TO LOCATIONS OF PLANT MATERIAL DUE TO FIELD CONDITIONS. ANY SUBSTITUTIONS IN PLANT MATERIAL AND SIZES SPECIFIED WILL NOT BE ACCEPTED, UNLESS APPROVED BY THE CITY ARBORIST PRIOR TO INSTALLATION.

2. ALL PLANT MATERIAL SHALL CONFORM TO THE AMERICAN STANDARD FOR NURSERY LATEST EDITION, PUBLISHED BY THE AMERICAN NURSERY AND LANDSCAPE ASSOCIATION. ALL PLANTS MUST BE FREE FROM INJURY, INSECT INFESTATIONS AND DISEASE. ALL PLANT MATERIAL MUST BE INSPECTED BY THE CITY ARBORIST PRIOR TO PLANTING. THE CONTRACTOR SHALL PHONE AT LEAST THREE (3) DAYS PRIOR TO INSTALLATION FOR INSPECTION OF THE MATERIAL AND FOR INSPECTION OF THE PLANTING OPERATION.

3. ALL PLANT MATERIAL MUST BEAR ORIGINAL NURSERY TAGS INDICATING THE GENUS, SPECIES AND IF APPLICABLE, CULTIVARS AND VARIETY. ALL TAGS SHALL BE REMOVED AFTER THE CITY ARBORIST HAS INSPECTED THE PLANT MATERIAL.

4. TEST SOIL DRAINAGE BEFORE PLANTING. DIG A HOLE AS DEEP AS YOUR PLANTING HOLE AND FILL WITH WATER. IF WATER DRAINS AT A RATE LESS THAN ONE INCH PER HOUR, INSTALL DRAINAGE TO CARRY WATER AWAY FROM THE PLANTING HOLE BASE, OR MOVING OR RAISING THE PLANTING SITE (BERM CONSTRUCTION)

5. EXAMINE SOIL FOR COMPACTION BEFORE PLANTING. IF SOILS ARE COMPACTED IN AN AREA WHERE A GROUP OF PLANTS ARE TO BE INSTALLED, INCORPORATED SEVERAL INCHES OF A COMBINATION OF ORGANIC MATERIALS SUCH AS COMPOSTED YARD WASTE, FINELY SHREDDED PINE BARK MULCH (SUPERFINES) OR SHREDDED, COMPOSTED LEAF MULCH (LEAF-GRO) AND TILL TO A DEPTH OF TWELVE (12) TO EIGHTEEN (18) INCHES OVER THE ENTIRE AREA. DO NOT TILL IF PLANTING IS WITHIN A TREE PRESERVATION AREA. APPLY THE ORGANIC MATTER AT A RATE OF ONE-QUARTER ORGANIC MATTER TO THREE-QUARTERS EXISTING SOIL. DO NOT INCORPORATE SMALL QUANTITIES OF SAND-COMPACTION WILL INCREASE AND DRAINAGE DECREASES. FOR SINGLE TREE PLANTINGS, BACKFILL PLANTING HOLES WITH UNAMENDED SOIL. INCREASE THE WIDTH OF THE TOP OF THE PLANTING HOLE IN AREA WHERE SOIL HAS BEEN COMPACTED. DO NOT INCORPORATE ORGANIC MATTER SUCH AS PEAT MOSS INTO BACKFILL FOR INDIVIDUAL PLANTING HOLES.

6. TREE PITS SHALL BE A MINIMUM OF TWO (2) AND A HALF (1/2) TIMES THE WIDTH OF THE ROOT BALL AND NO DEEPER THAN THE HEIGHT OF THE ROOT BALL. ON BALLED AND BURLAPED TREES, REMOVE PINNING NAILS OR ROPE LACING, THEN CUT AWAY THE WRAPPING AND THEN BACKFILL. REMOVE THE TOP 12" OF THE WIRE BASKET. REMOVE ALL ROPE, WHETHER JUTE OR NYLON, FROM TRUNKS. FOR CONTAINER MATERIALS, REMOVE THE CONTAINER COMPLETELY. SELECT TREES GROWN IN CONTAINERS WITH VERTICAL RIBS OR A COPPER-TREATMENT ON THE INTERIOR WALL. THESE CONTAINER MODIFICATION AND TREATMENTS MINIMIZE CIRCLING ROOT FORMATION. IF ROOTS ARE CIRCLING AROUND THE ROOT BALL EXTERIOR OF CONTAINER PLANTS (TREES, SHRUBS OR PERENNIALS) CUT THROUGH THE ROOTS AND SOIL IN A FEW PLACES. CONTAINER TREE WITH MULTIPLE CIRCLING ROOTS WILL BE REJECTED. PLACE SHRUBS AND PERENNIALS AT THE SAME DEPTH THEY WERE IN THE CONTAINERS. FOR BARE ROOT PERENNIALS PLANT WITH THE SOIL EVEN WITH THE TOP OF THE CROWN. DIG THE HOLE WIDE ENOUGH TO ALLOW THE ROOTS TO SPREAD OUT IN THE SOIL. PUSH THE SOIL BACK INTO THE HOLE OVER THE ROOTS AND AROUND THE TOP OF THE PLANT.

7. A SOIL TEST SHALL BE MADE AND THE RESULTS SUBMITTED TO THE CITY ARBORIST PRIOR TO THE INSTALLATION OF THE PLANT MATERIAL. FOR TREES: A SLOW-RELEASE GRANULAR FERTILIZER SHALL BE INCORPORATED INTO THE TOP FOUR (4) INCHES OF BACKFILL SOIL TO PROVIDE NITROGEN, OR IF A SOIL TEST INDICATED A NEED FOR PHOSPHORUS OR POTASSIUM. USE NO MORE THAT 1 LB. ACTUAL NITROGEN PER 1,000 FT. OF PLANTING HOLE SURFACE. (EXAMPLE -IF USING 18-6-12 WITH A 5' DIAMETER HOLE, INCORPORATE 0.3 OZ. PER PLANTING HOLE.) FOR SHRUBS: A SLOW-RELEASE GRANULAR FERTILIZER SHALL BE INCORPORATED INTO THE TOP FOUR (4) INCHES OF BACKFILL SOIL TO PROVIDE NITROGEN, OR IF A SOIL TEST INDICATES A NEED FOR PHOSPHORUS OR POTASSIUM. USE QUANTITIES IN ACCORDANCE WITH MANUFACTURER'S DIRECTION. FOR PERENNIALS, BULBS AND ANNUALS: A SLOW -RELEASE HIGH PHOSPHATE FERTILIZER SUCH AS 7:40:6 OR APPROVED EQUAL SHALL BE INCORPORATED INTO THE TOP FOUR (4) INCHES OF THE BACKFILL MIX. ALTERNATIVELY, USE PLANT-TONE ON APPROVED EQUAL FOR SUN PERENNIALS, TOGETHER WITH ROCK PHOSPHATE AT RATES IN ACCORDANCE WITH MANUFACTURER'S DIRECTIONS. ALTERNATIVELY, FOR SHADE PERENNIALS USE HOLLYTONE OR APPROVED EQUAL, TOGETHER WITH SUPER PHOSPHATE AT A RATE IN ACCORDANCE WITH MANUFACTURER'S DIRECTIONS. USE GYPSUM, A SOIL CONDITIONER, FOR CLAY SOILS. FOR BULBS COMMERCIAL RAW FINELY GROUND BONE MEAL WITH AN ANALYSIS OF 4% NITROGEN AND 20% PHOSPHORUS ACID SHALL BE INCORPORATED INTO THE BACKFILL MIX

8. WHEN HALF OF THE BACKFILL HAS BEEN RETURNED TO THE PLANTING HOLE, WATER SHALL BE APPLIED TO PROVIDE SETTLEMENT AND ELIMINATE AIR POCKETS. THE TREE SHALL BE THOROUGHLY WATERED AGAIN AFTER THE REMAINING SOIL HAS BEEN PLACED IN THE PLANTING PIT. A THREE (3) TO FOUR (4) INCH DAM OF SOIL SHALL BE CONSTRUCTED AROUND THE PLANTING PIT.

9. TWO (2) TO THREE (3) INCHES OF MULCH SHALL BE PLACED OVER THE TREE-PLANTING PIT, BUT SHALL BE KEPT THREE (3) TO FOUR (4) INCHES AWAY FROM THE TRUNK OF THE TREE OR CROWNS OF SHRUBS. DO NOT ALLOW MULCH TO TOUCH THE TRUNKS OF TREES OR CROWNS OF SHRUBS. USE MULCH THAT IS COMPATIBLE WITH THE TYPE OF PLANT USED. AVOID MULCH THAT HAS NOT BEEN NITROGEN COMPOSTED, AS THE PH OF THE SOIL COULD CHANGE AS THE MULCH DEGRADES. PINE BARK MULCH WILL NOT CHANGE THE PH OF THE SOIL AS IT DEGRADES. THIS IS THE BEST TYPE OF MULCH FOR USE WITH PERENNIALS. IN MULCHING PERENNIALS, USE NO MORE THAN 1-2". FOR MEDITERRANEAN TYPE OF PERENNIALS, SUCH AS LAVENDER, OR FOR PEONIES OR IRIS, USE NO MULCH AT ALL.

10. TREES SHALL BE PLANTED AT THE HEIGHT OF THE SURROUNDING GRADE WITH ROOT FLARES VISIBLE. SHOULD SOIL HAVE BEEN PILED OVER THE ROOT FLARE DURING THE DIGGING PROCESS, THIS SOIL SHALL BE REMOVED SO THAT THE FLARE IS SLIGHTLY ABOVE GRADE.

11. ANY PRUNING MUST BE DONE WITH THE APPROVAL OF THE CITY ARBORIST. PRUNING AT THE TIME OF PLANTING SHALL BE DONE ONLY TO REMOVE BROKEN BRANCHES OR DOUBLE (CO DOMINANT) LEADERS.

12. REMOVE TAGS AND LABELS FROM TREES AND SHRUBS TO PREVENT GIRDLING BRANCHES AND TRUNKS.

13. STAKES SHALL BE USED ONLY IN AREA OF HIGH TRAFFIC OR HIGHLY WINDY LOCATIONS. A TREE-STAKING DIAGRAM SHOULD BE PROVIDED IF STAKING IS NECESSARY. STAKE FOR MAXIMUM OF ONE YEAR. ALLOW TREES A SLIGHT AMOUNT OF FLEX RATHER THAN HOLDING THEM RIGIDLY IN PLACE. USE GUYING OR ATTACHING THAT WON'T DAMAGE THE BARK. TO PREVENT TRUNK GIRDLING, REMOVE ALL GUYING MATERIAL AFTER ONE YEAR.

14. USE TREE WRAP ONLY ON THIN BARKED TREES PLANTED IN SPRING OR SUMMER INTO HOT OR PAVED AREAS. IN THESE INSTANCES USE WHITE WRAP, ATTACHING WITHOUT THE USE OF WIRE, ROPE, TIES OR TAPE, AND REMOVE AFTER ONE YEAR.

15. PLANTING SEASON-PLANTING SHALL BE DONE ONLY WITHIN THE FOLLOWING DATES: A. DECIDUOUS TREES-MARCH 15 TO MAY 30 OR SEPTEMBER 15 TO DECEMBER 15 (OAKS AND BLACK GUM TO BE SPRING DUG AND PLANTED ONLY). B. EVERGREEN TREES-MARCH 1 TO MAY 15 OR SEPTEMBER 15 TO NOVEMBER 15.

16. ALL PLANT MATERIAL SHALL BE GUARANTEED BY THE CONTRACTOR FOR ONE YEAR FROM THE DATE OF ACCEPTANCE TO BE IN GOOD, HEALTHY AND FLOURISHING CONDITION. IN THE EVENT THAT A PLANT DIES OR IN THE JUDGMENT OF THE CITY ARBORIST, FAILS TO FLOURISH; THE CONTRACTOR SHALL REPLACE IN ACCORDANCE WITH THE ABOVE NOTED SPECIFICATIONS.

17. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE MAINTENANCE OF THE PLANTS DURING THIS ONE-YEAR WARRANTY PERIOD. THIS MAINTENANCE SHALL INCLUDE PROVIDING WATER ON A WEEKLY BASIS WHEN NATURAL RAINFALL IS LESS THAN ONE INCH A WEEK. DRIP IRRIGATION SYSTEMS AND WATER RESERVOIR DEVICES CAN FACILITATE WATERING. ROOT BALLS OF TREES SHOULD BE SLOWLY AND THOROUGHLY SOAKED AT TIME OF WATERING. FOR PLANTING BEDS (I.E., TREES, SHRUBS AND PERENNIALS), WATER SLOWLY AND DEEPLY PUTTING DOWN 1 "-2" OF WATER IN A 6-12 HOUR PERIOD. THIS SHOULD GIVE A PENETRATION OF 12-18" DEPTH.

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(540) 759-5244
WILLIAMSBURG ENVIRONMENTAL GROUP, INC.
Environmental Consultants

PLANTING PLAN: TREES & SHRUBS LOWER COE BRANCH STREAM RESTORATION

CITY OF FALLS CHURCH, VIRGINIA

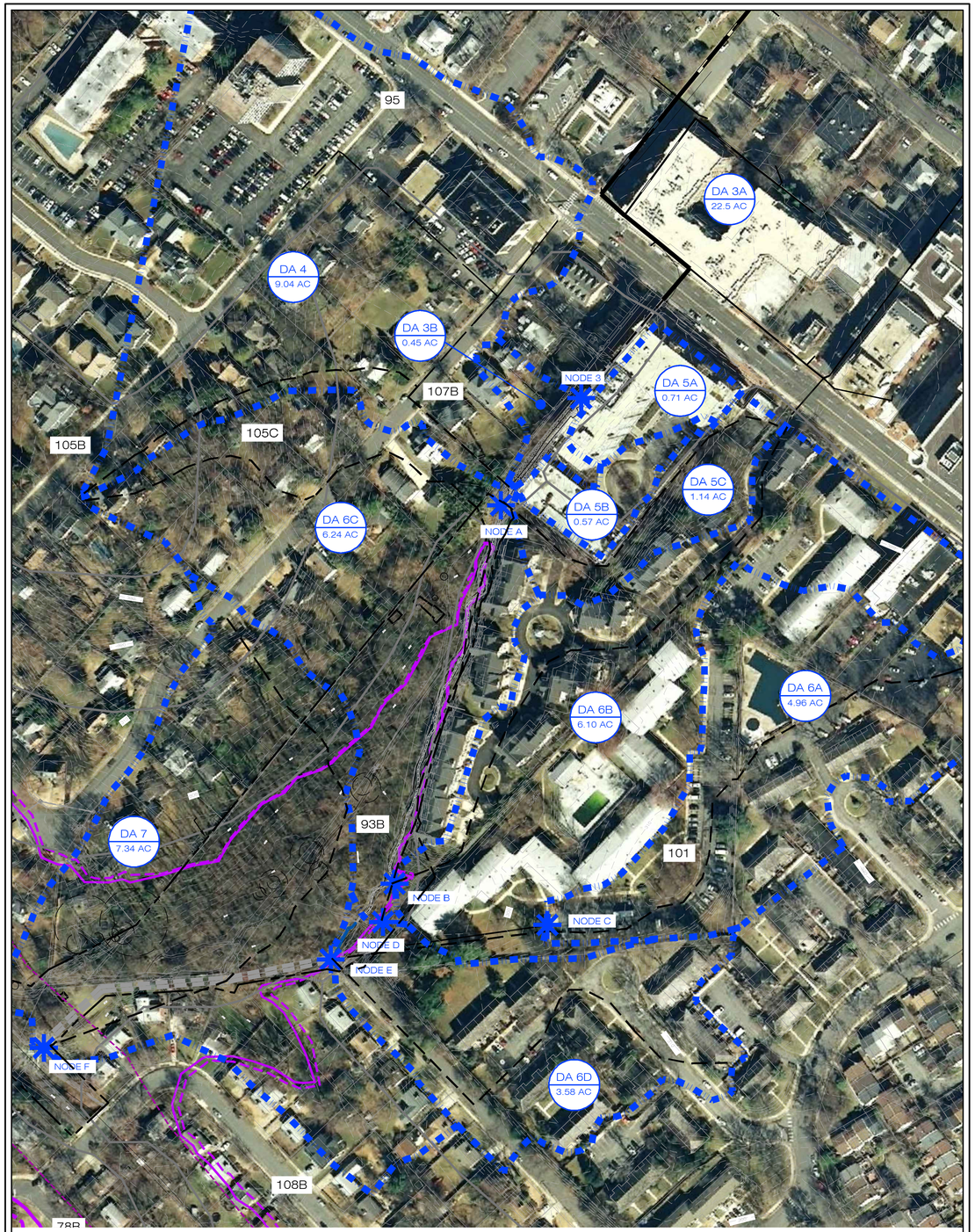
COMMONWEALTH OF VIRGINIA
GEORGE C. RHODES III
Lic. No. 000894
12/16/13
LANDSCAPE ARCHITECT

REVISIONS:

DATE	
12/16/13	REVISIONS MADE PER REQUEST BY CITY OF FALLS CHURCH

DRAWN BY: CDP, RH
DESIGNED BY: CDP
DATE: 11/07/2013
CHECKED BY: SCB, GCR
SCALE: 1"=20'

SHEET: 38 OF 43
JOB#: 4966



WATERSHED MAP

SCALE: 1 INCH = 100 FEET

CONTOUR INTERVAL = 1/2 FT (PENNONI SURVEY)
CONTOUR INTERVAL = 1 FT (FALLS CHURCH GIS)
SCALE: 1 INCH = 100 FT

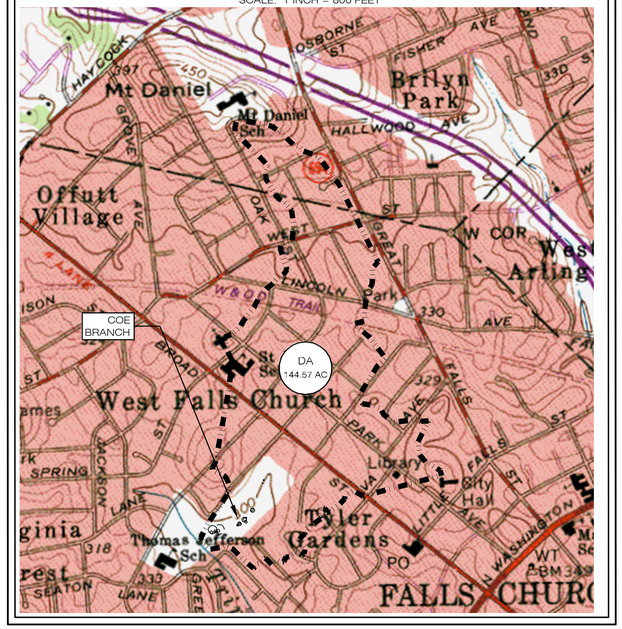
100' 0' 50' 100' 200' 300'

LEGEND

- EXISTING CONTOURS (PER CITY OF FALLS CHURCH GIS)
- EXISTING CONTOURS (PER PENNONI ASSOC. SURVEY)
- CULVERT
- SOIL BOUNDARIES & LABELS
- DRAINAGE NODES
- SUB-WATERSHED BOUNDARIES
- SUBWATERSHED LABEL
- TIME OF CONCENTRATION FLOW PATH
- APPROXIMATE WATER LIMITS
- FLOW DIRECTION
- 100 YEAR EFFECTIVE FLOODWAY (PER DFIRM 5100540001C, DATED 07/16/04)
- 100 YEAR EFFECTIVE FLOODPLAIN (PER DFIRM 5100540001C, DATED 07/16/04)
- 500 YEAR EFFECTIVE FLOODPLAIN (PER DFIRM 5100540001C, DATED 07/16/04)

OVERALL DRAINAGE AREA

SCALE: 1 INCH = 800 FEET



HYDROLOGY SUMMARY TABLES

WATERSHED SUMMARY

LABEL	AREA (AC)	CN	TC (hr)	LAG (MIN)
DA 1	17.84	81	0.32	11.34
DA 2	19.13	81	0.27	10.00
DA 3A	67.55	86	0.42	14.98
DA 3B	0.45	94	0.08	6.00
DA 4	9.04	90	0.21	7.52
DA 5A	0.71	98	0.10	6.00 *
DA 5B	0.57	98	0.10	6.00 *
DA 5C	1.14	71	0.10	6.00 *
DA 6A	4.96	90	0.36	13.00
DA 6B	6.10	90	0.25	8.82
DA 6C	6.24	78	0.32	11.38
DA 6D	3.58	90	0.19	7.00
DA 7	7.30	72	0.27	9.58
TOTAL	144.61			

* VALUES REPRESENT MODEL MINIMUMS FOR LAG TIME, ACTUAL VALUES MAY VARY

DESIGN STORM SUMMARY

STORM RECURRANCE INTERVAL (YR)	RAINFALL DEPTH (IN)
1	2.64
2	3.19
10	4.90
25	6.14
50	7.23
100	8.47
500	12.10

* DESIGN STORM DEPTHS ARE BASED ON A DURATION OF 24-HOURS. DATA GATHERED FROM NOAA PRECIPITATION DATA SERVER WHICH REPRESENTS A LOCATION BASED INTERPOLATION OF ATLAS 14 RAINFALL ESTIMATES.

DRAINAGE AREA SUMMARY

DA	Q1 (CFS)	Q2 (CFS)	Q10 (CFS)	Q25 (CFS)	Q50 (CFS)	Q100 (CFS)	Q500 (CFS)
DA 1	21.6	30.6	60.8	83.6	104.0	127.1	194.6
DA 2	24.5	34.6	68.8	94.6	117.5	143.6	219.6
DA 3A	93.3	125.6	229.7	306.1	373.3	449.4	670.4
DA 3B	1.3	1.6	2.6	3.3	3.9	4.6	6.6
DA 4	20.5	26.5	45.2	58.6	70.3	83.6	122.2
DA 5A	2.1	2.6	4.1	5.2	6.1	7.2	10.4
DA 5B	1.7	2.1	3.3	4.2	4.9	5.8	8.3
DA 5C	0.9	1.4	3.5	5.1	6.6	8.3	13.6
DA 6A	9.0	11.7	20.0	25.9	31.2	37.1	54.3
DA 6B	13.1	17.0	29.0	37.6	45.1	53.6	78.3
DA 6C	6.2	9.1	19.3	27.0	34.1	42.1	65.7
DA 6D	8.4	10.8	18.4	23.9	28.6	34.0	49.7
DA 7	5.9	9.5	22.8	33.4	43.1	54.5	88.4

NODE SUMMARY

NODE	Q1 (CFS)	Q2 (CFS)	Q10 (CFS)	Q25 (CFS)	Q50 (CFS)	Q100 (CFS)	Q500 (CFS)
NODE 1	21.6	30.6	60.8	83.6	104.0	127.1	194.6
NODE 2	45.9	65.1	129.3	177.7	220.6	269.5	412.9
NODE 3	136.2	186.7	351.6	473.7	581.3	703.4	1059.5
NODE A	155.9	212.5	396.8	533.1	653.1	789.5	1186.7
NODE B	13.1	17.0	29.0	37.6	45.1	53.6	78.3
NODE C	9.0	11.7	20.0	25.9	31.2	37.1	54.3
NODE D	174.3	237.3	442.5	594.9	729.5	882.4	1327.2
NODE E	189.8	257.3	477.3	640.4	784.1	947.3	1422.0
NODE F	194.5	265.1	496.0	667.4	818.6	990.5	1490.9

SOIL SERIES SUMMARY

MAP SYMBOL	SOIL NAME	HSG	DEPTH TO WATER TABLE	DEPTH TO BEDROCK	PERMEABILITY (IN/HR)
93B	SUMERDUCK SILT LOAM, 2-7% SLOPES	C	2.5 FT	>60 IN	0.2
95	URBANLAND	-	-	>60 IN	-
101	URBANLAND - WHEATON COMPLEX	-	-	>60 IN	-
102	WHEATON	D	>6 FT	>60 IN	0.2
105B	WHEATON - GLEANELG COMPLEX 2-7% SLOPE	D/B *	>6 FT	>60 IN	0.2
105C	WHETON - GLENELG COMPLEX, 7-15% SLOPE	D/B *	>6 FT	>60 IN	0.2
107B	WHEATON - MEADOWVILLE COMPLEX, 2-7% SLOPES	D/B *	>6 FT	>60 IN	0.2
108B	WHEATON - SUMERDUCK COMPLEX, 7-15% SLOPES	D/C *	>6 FT	>60 IN	0.2

NOTE: SOIL DATA PROVIDED FOR SOILS LOCATED WITHIN THE CONTRIBUTING WATERSHED
SOURCE: U.S. DEPARTMENT OF AGRICULTURE, NATURAL RESOURCE CONSERVATION SERVICE WEB SOIL SURVEY FOR CITY OF FALLS CHURCH, VIRGINIA, ACCESSED JUNE 11, 2013.

*MODELING ASSUMES AVERAGE OF COMPLEX HYDROLOGIC SOIL GROUPS WITH RESPECT TO CURVE NUMBERS. D REPRESENTS NATURAL CONDITION OF SOIL, B OR C REPRESENTS SOIL WITH ARTIFICIAL DRAINAGE.

CURVE NUMBER ASSESSMENT SUMMARY

	DA1	DA 2	DA 3A	DA 3B	DA 4	DA 5A	DA 5B	DA 5C	DA 6A	DA 6B	DA 6C	DA 6D	DA 7
RESIDENTIAL DISTRICTS - 1/3 ACRE - SOIL B/D (ACRES)	17.84	19.13	39.30	–	2.86	–	–	–	–	–	3.09	–	1.31
CN	81	81	81	81	81	81	81	81	81	81	81	81	81
RESIDENTIAL DISTRICTS - 1/8 ACRE - SOIL B/D (ACRES)	–	–	–	–	–	–	–	–	4.96	6.10	0.75	3.58	–
CN	90	90	90	90	90	90	90	90	90	90	90	90	90
URBAN DISTRICTS - COMMERCIAL & BUSINESS - SOIL B/D (ACRES)	–	–	28.25	0.45	6.18	–	–	–	–	–	–	–	–
CN	94	94	94	94	94	94	94	94	94	94	94	94	94
IMPERVIOUS (AC)	–	–	–	–	–	0.71	0.57	0.04	–	–	–	–	–
CN	98	98	98	98	98	98	98	98	98	98	98	98	98
WOODS - FAIR - SOIL C (ACRES)	–	–	–	–	–	–	–	1.10	–	–	2.40	–	5.99
CN	70	70	70	70	70	70	70	70	70	70	70	70	70
WEIGHTED CN	81	81	86	94	90	98	98	71	90	90	78	90	72

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WILLIAMSBURG ENVIRONMENTAL GROUP, INC.
Environmental Consultants

HYDROLOGY SUMMARY
COE BRANCH STREAM RESTORATION
CITY OF FALLS CHURCH, VIRGINIA

COMMONWEALTH OF VIRGINIA
SCOTT C. BLOSSOM
Lic. No. 40287
11/2/13
PROFESSIONAL ENGINEER

REVISIONS:
DATE:

DRAWN BY: CSA/AWT
DESIGNED BY: SCB/CSA
DATE: 11/07/2013
CHECKED BY: SCB
SCALE: AS SHOWN
JOB#: 4966

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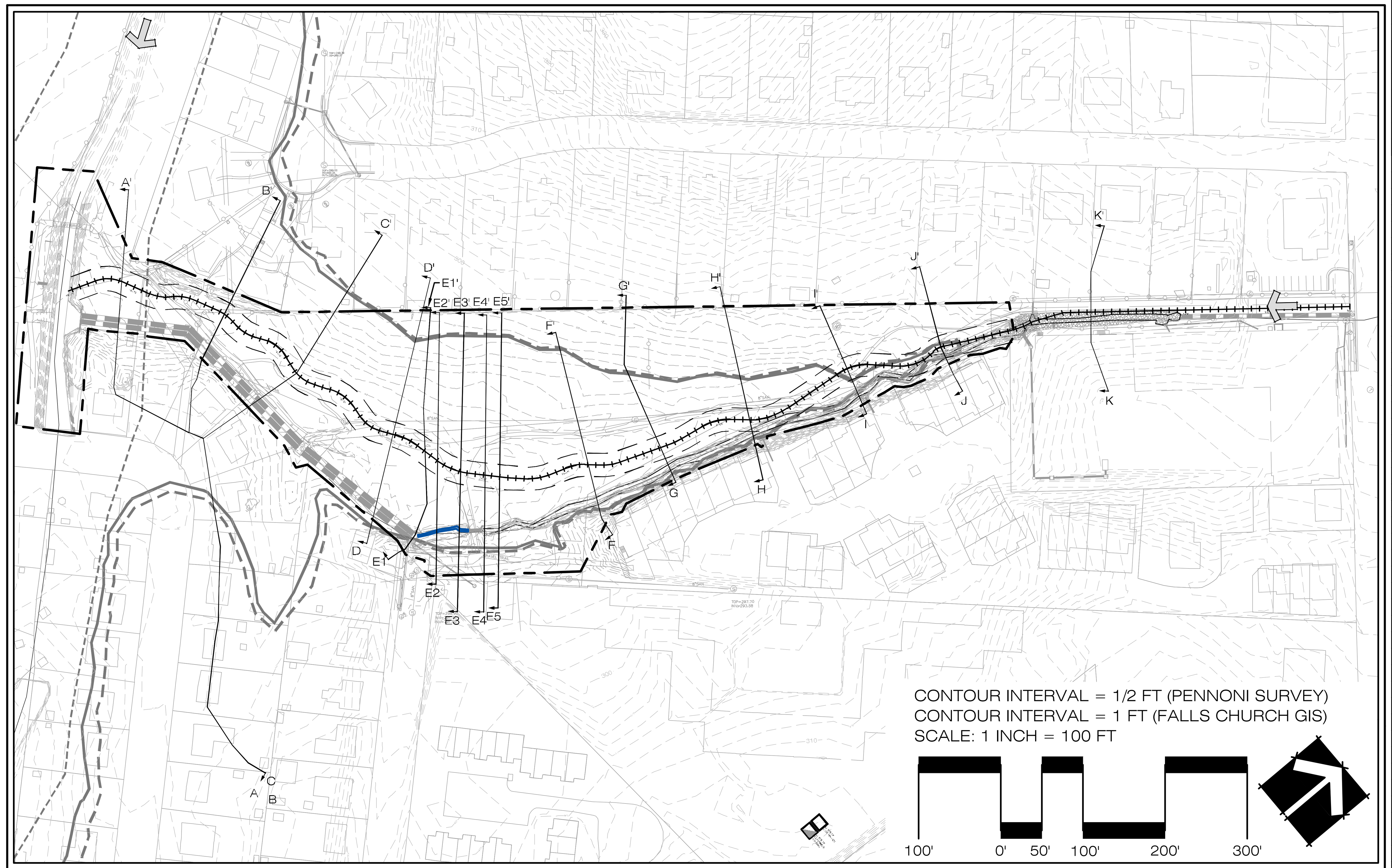

LEGEND

- PROJECT LIMITS
- EXISTING CULVERTS
- CROSS SECTIONS
- APPROXIMATE STREAM CHANNEL LIMITS
- APPROXIMATE WETLAND LIMITS
- DIRECTION OF FLOW
- EXISTING CONTOURS (PER CITY OF FALLS CHURCH GIS)
- EXISTING CONTOURS (PER PENNONI ASSOC. SURVEY)
- 100 YEAR EFFECTIVE FLOODWAY (PER DFIRM 5100540001C, DATED 07/16/04)
- 100 YEAR EFFECTIVE FLOODPLAIN (PER DFIRM 5100540001C, DATED 07/16/04)
- 500 YEAR EFFECTIVE FLOODPLAIN (PER DFIRM 5100540001C, DATED 07/16/04)

HYDRAULIC SUMMARY

A PORTION OF THE PROJECT SITE IS LOCATED WITHIN A FEMA IDENTIFIED SPECIAL FLOOD HAZARD AREA (SFHA) AS DEPICTED ON FEMA FIRM PANEL 5100540001 C EFFECTIVE JULY 16, 2004. WHILE IT APPEARS THAT THE DEPICTED SFHA REPRESENTS BACKWATER EFFECTS ASSOCIATED WITH THE FLOOD HAZARD MAPPING FOR TRIPPS RUN, THE IMPACT OF THE RESTORATION PROJECT ON THE FLOOD ELEVATIONS IN COE BRANCH ARE BEING EVALUATED. THE HYDRAULIC ANALYSIS WAS PREPARED IN ORDER TO CONDUCT AN ANALYSIS OF PRE AND POST RESTORATION CONDITIONS USING THE US ARMY CORPS HYDROLOGIC ENGINEERING CENTER'S RIVER ANALYSIS SOFTWARE (HEC-RAS) TO CALCULATE WATER SURFACE ELEVATIONS ASSOCIATED WITH A RANGE OF SYNTHETIC RAINFALL EVENTS. THE OVERALL INTENTION OF THE PROJECT DESIGN IS TO IMPROVE HYDRAULIC CONVEYANCE AND CAPACITY WITHIN THE FLOODPLAIN CORRIDOR WITHOUT HAVING ANY NEGATIVE EFFECTS ON THE EXISTING WATER SURFACE ELEVATION PROFILES NOR ADJACENT PROPERTIES. BASED ON HYDRAULIC ANALYSIS PERFORMED, CHANNEL RELOCATION WITHIN THE FLOODPLAIN VALLEY OR PROPOSED GRADING OPERATIONS WILL HAVE ANY SUBSTANTIAL EFFECT ON FLOODPLAIN ELEVATIONS WHEN COMPARING PRE- AND POST-RESTORATION SCENARIOS.

ESTIMATED PEAK DISCHARGES FROM THE HYDROLOGIC ANALYSIS WERE UTILIZED AS INPUT FLOW FILES AND USED IN WITH PRELIMINARY CHANNEL GEOMETRIES. MANNING'S ROUGHNESS COEFFICIENTS WERE APPROXIMATED USING A COMBINATION OF FIELD OBSERVATIONS AND PROJECTED POST-DEVELOPMENT CONDITIONS; THESE VALUES RANGE FROM 0.035 WITHIN THE PROPOSED AND EXISTING CHANNEL BANKS, TO 0.06 FOR THE VEGETATED OVERBANKS. PRELIMINARY CROSS SECTION GEOMETRY FILES WERE CREATED USING 0.5 FOOT DIGITAL TOPOGRAPHY, AND WILL BE UPDATED AS ADDITIONAL INFORMATION BECOMES AVAILABLE. SPECIFICALLY, PRE- AND POST-RESTORATION GEOMETRY HAVE BEEN REFINED USING FIELD SURVEY SECTIONS, AND EXISTING INFRASTRUCTURE MODELING TECHNIQUES HAVE BEEN UPDATED IN CONJUNCTION WITH DESIGN DEVELOPMENT. FOR THE PURPOSES OF THIS ANALYSIS, TWO (2) DOWNSTREAM BOUNDARY CONDITIONS WERE EVALUATED:

1.) NORMAL DEPTH AT TRIPPS RUN: FEMA STANDARD INDICATES THAT TRIBUTARY CHANNELS BE MODELED USING A NORMAL DEPTH ROUTINE. GENERALLY, CALCULATED WATER SURFACE ELEVATIONS AT THE CONFLUENCE ARE LOWER THAN WOULD BE EXPECTED WITH A COINCIDING PEAK EVENT OR UNDER CONSIDERATION OF BACKWATER EFFECTS FROM THE DOWNSTREAM MAIN STEM STREAM.

2.) DEFINED STARTING WATER SURFACE AT TRIPPS RUN: IN ORDER TO EVALUATE CONDITIONS IN WHICH TRIPP'S RUN WOULD BE AT FLOOD STAGE AT THE SAME TIME AS COE BRANCH, A MODEL "PLAN" WAS CREATED WITH DEFINED DOWNSTREAM WATER SURFACE ELEVATIONS USING THOSE INDICATED ON THE EFFECTIVE FIS PROFILES FOR TRIPPS RUN.

FOR THIS HYDRAULIC ANALYSIS, CHANNEL GEOMETRY WAS DEFINED WITH NESTED PROPOSED SECTIONS AT DESIGN ELEVATION. THE EXISTING 4X6 ELLIPTICAL STORM SEWERS ARE REMOVED IN THE FINAL PROPOSED HYDRAULIC MODEL.

EXISTING HEC-RAS SUMMARY (NORMAL DEPTH)

RAS STATION	ALIGNMENT STATION	CROSS SECTION	PROFILE	Q	W.S. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl	Shear Chan
				(cfs)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)		(lb/sq ft)
1381.82			1-YR	155.90	300.41	0.0050	2.01	77.63	42.07	0.26	0.57
1381.82			2-YR	212.50	300.81	0.0052	2.24	94.70	44.56	0.27	0.68
1381.82			10-YR	396.80	301.72	0.0061	2.87	138.12	50.33	0.31	1.02
1381.82			25-YR	533.10	302.20	0.0069	3.27	163.03	53.36	0.33	1.28
1381.82			50-YR	653.10	302.60	0.0073	3.54	184.62	55.86	0.34	1.46
1381.82			100-YR	789.50	303.00	0.0076	3.80	207.94	58.54	0.35	1.64
1381.82			500-YR	1186.70	303.98	0.0076	4.44	278.09	85.93	0.37	2.07
1181.92	505	J	1-YR	155.90	297.89	0.0205	6.82	22.85	14.09	0.94	1.86
1181.92	505	J	2-YR	212.50	298.35	0.0163	7.06	34.27	34.24	0.88	1.85
1181.92	505	J	10-YR	396.80	299.39	0.0110	7.64	88.32	82.13	0.77	1.89
1181.92	505	J	25-YR	533.10	299.83	0.0104	8.12	126.31	88.90	0.77	2.03
1181.92	505	J	50-YR	653.10	300.10	0.0107	8.68	150.70	90.48	0.79	2.27
1181.92	505	J	100-YR	789.50	300.36	0.0113	9.31	174.55	91.90	0.82	2.55
1181.92	505	J	500-YR	1186.70	300.90	0.0139	11.23	224.78	94.44	0.93	3.56
1062.21	625	I	1-YR	155.90	296.58	0.0084	5.40	28.88	15.66	0.70	0.86
1062.21	625	I	2-YR	212.50	296.94	0.0106	5.99	35.86	26.88	0.80	1.06
1062.21	625	I	10-YR	396.80	297.61	0.0116	7.75	66.49	57.92	0.88	1.60
1062.21	625	I	25-YR	533.10	298.11	0.0100	8.15	98.42	74.02	0.84	1.66
1062.21	625	I	50-YR	653.10	298.34	0.0109	8.97	117.04	86.04	0.89	1.96
1062.21	625	I	100-YR	789.50	298.83	0.0088	8.86	163.77	99.96	0.82	1.82
1062.21	625	I	500-YR	1186.70	299.54	0.0091	10.12	238.36	111.48	0.85	2.24
924.54	760	H	1-YR	155.90	295.89	0.0047	4.11	56.70	69.77	0.54	0.49
924.54	760	H	2-YR	212.50	296.13	0.0051	4.69	74.71	76.48	0.58	0.61
924.54	760	H	10-YR	396.80	296.73	0.0061	6.05	124.47	89.24	0.66	0.94
924.54	760	H	25-YR	533.10	297.07	0.0065	6.82	156.04	95.56	0.70	1.14
924.54	760	H	50-YR	653.10	297.32	0.0070	7.44	180.42	100.32	0.73	1.32
924.54	760	H	100-YR	789.50	297.56	0.0075	8.11	205.30	104.87	0.77	1.53
924.54	760	H	500-YR	1186.70	298.14	0.0089	9.75	268.45	113.89	0.85	2.11
811.49	880	G	1-YR	155.90	295.28	0.0057	4.74	76.37	103.33	0.60	0.64
811.49	880	G	2-YR	212.50	295.52	0.0059	5.22	101.43	111.40	0.62	0.75
811.49	880	G	10-YR	396.80	296.10	0.0063	6.29	172.61	131.29	0.67	1.00
811.49	880	G	25-YR	533.10	296.42	0.0067	6.99	216.28	144.44	0.70	1.19
811.49	880	G	50-YR	653.10	296.68	0.0068	7.44	254.19	153.46	0.72	1.32
811.49	880	G	100-YR	789.50	296.93	0.0070	7.88	293.63	160.39	0.73	1.44
811.49	880	G	500-YR	1186.70	297.56	0.0071	8.87	401.04	176.74	0.76	1.73
717.56	970	F	1-YR	174.30	294.62	0.0100	5.20	93.21	116.03	0.77	0.85
717.56	970	F	2-YR	237.30	294.79	0.0111	5.90	112.77	121.48	0.83	1.05
717.56	970	F	10-YR	442.50	295.40	0.0100	6.93	195.02	159.68	0.83	1.30
717.56	970	F	25-YR	594.90	295.85	0.0076	6.84	272.43	180.73	0.74	1.19
717.56	970	F	50-YR	729.50	296.17	0.0066	6.90	332.29	190.60	0.71	1.17
717.56	970	F	100-YR	882.40	296.44	0.0064	7.22	383.82	196.80	0.71	1.24
717.56	970	F	500-YR	1327.20	297.10	0.0062	8.04	518.77	212.30	0.72	1.44
600.65	1080	E5	1-YR	174.30	293.89	0.0053	3.33	134.40	157.44	0.54	0.37
600.65	1080	E5	2-YR	237.30	294.21	0.0038	3.30	187.77	171.80	0.47	0.34
600.65	1080	E5	10-YR	442.50	295.08	0.0022	3.44	365.74	235.28	0.39	0.31
600.65	1080	E5	25-YR	594.90	295.62	0.0017	3.45	502.80	263.85	0.36	0.29
600.65	1080	E5	50-YR	729.50	295.96	0.0016	3.61	594.63	276.99	0.35	0.31
600.65	1080	E5	100-YR	882.40	296.21	0.0018	3.95	665.70	291.58	0.37	0.36
600.65	1080	E5	500-YR	1327.20	296.86	0.0020	4.71	865.83	330.22	0.41	0.49
582.59	1100	E4	1-YR	174.30	293.67	0.0086	4.50	109.06	151.26	0.69	0.66
582.59	1100	E4	2-YR	237.30	294.11	0.0043	3.84	178.62	171.46	0.51	0.43
582.59	1100	E4	10-YR	442.50	295.03	0.0023	3.72	364.50	245.76	0.40	0.35
582.59	1100	E4	25-YR	594.90	295.59	0.0017	3.63	509.18	268.72	0.36	0.32
582.59	1100	E4	50-YR	729.50	295.93	0.0016	3.78	603.03	278.80	0.35	0.33
582.59	1100	E4	100-YR	882.40	296.18	0.0017	4.13	673.94	294.27	0.37	0.39
582.59	1100	E4	500-YR	1327.20	296.82	0.0020	4.92	874.44	333.08	0.41	0.52
552.97	1130	E3	1-YR	174.30	293.70	0.0017	3.05	146.32	159.29	0.34	0.24
552.97	1130	E3	2-YR	237.30	294.09	0.0014	3.10	212.54	176.77	0.32	0.24
552.97	1130	E3	10-YR	442.50	295.01	0.0012	3.39	395.52	219.34	0.30	0.26
552.97	1130	E3	25-YR	594.90	295.57	0.0010	3.48	522.49	232.44	0.29	0.26
552.97	1130	E3	50-YR	729.50	295.87	0.0011	3.80	595.49	251.99	0.31	0.31
552.97	1130	E3	100-YR	882.40	296.15	0.0012	4.15	668.27	274.08	0.33	0.36
552.97	1130	E3	500-YR	1327.20	296.77	0.0016	5.11	851.24	323.13	0.38	0.52
521.15	1160	E2	1-YR	174.30	293.66	0.0021	2.81	174.65	159.46	0.36	0.23
521.15	1160	E2	2-YR	237.30	294.06	0.0016	2.81	242.48	176.57	0.33	0.21
521.15	1160	E2	10-YR	442.50	294.99	0.0013	3.10	423.12	212.48	0.31	0.23
521.15	1160	E2	25-YR	594.90	295.55	0.0011	3.23	546.89	226.54	0.29	0.24
521.15	1160	E2	50-YR	729.50	295.85	0.0012	3.53	616.31	234.32	0.31	0.28
521.15	1160	E2	100-YR	882.40	296.13	0.0013	3.88	681.46	242.94	0.33	0.33
521.15	1160	E2	500-YR	1327.20	296.74	0.0018	4.91	842.66	295.65	0.39	0.50
501.39	1180	E1	1-YR	189.80	293.64	0.0012	2.11	213.53	171.41	0.11	0.07
501.39	1180	E1	2-YR	257.30	294.04	0.0011	2.18	286.42	187.02	0.10	0.08
501.39	1180	E1	10-YR	477.30	294.97	0.0011	2.44	475.05	215.57	0.10	0.09
501.39	1180	E1	25-YR	640.40	295.54	0.0010	2.56	600.98	230.15	0.10	0.09
501.39	1180	E1	50-YR	784.10	295.84	0.0011	2.79	671.39	238.21	0.10	0.11
501.39	1180	E1	100-YR	947.30	296.11	0.0013	3.08	737.37	247.45	0.11	0.13
501.39	1180	E1	500-YR	1422.00	296.72	0.0018	3.85	896.26	273.07	0.13	0.20
461.43	1225	D	1-YR	189.80	293.58	0.0016	2.25	187.46	155.78	0.12	0.09
461.43	1225	D	2-YR	257.30	293.99	0.0014	2.29	256.69	179.60	0.11	0.09
461.43	1225	D	10-YR	477.30	294.92	0.0013	2.53	435.66	203.91	0.10	0.10
461.43	1225	D	25-YR	640.40	295.49	0.0012	2.66	555.93	219.83	0.10	0.10
461.43	1225	D	50-YR	784.10	295.78	0.0014	2.91	621.94	228.67	0.11	0.12
461.43	1225	D	100-YR	947.30	296.05	0.0015	3.21	683.43	236.95	0.11	0.15
461.43	1225	D	500-YR	1422.00	296.63	0.0021	4.04	829.13	261.68	0.14	0.22
317.38	1370	C	1-YR	189.80	293.09	0.0038	3.62	87.12	92.11	0.24	0.22
317.38	1370	C	2-YR	257.30	293.55	0.0034	3.72	134.02	110.01	0.22	0.22
317.38	1370	C	10-YR	477.30	294.51	0.0033	4.21	254.25	147.06	0.21	0.26
317.38	1370	C	25-YR	640.40	295.05	0.0035	4.65	368.14	589.64	0.21	0.31
317.38	1370	C	50-YR	784.10	295.44	0.0026	4.22	598.02	616.72	0.17	0.25
317.38	1370	C	100-YR	947.30	295.74	0.0022	4.03	788.88	638.43	0.15	0.23
317.38	1370	C	500-YR	1422.00	296.35	0.0019	3.98	1189.20	666.79	0.12	0.21
200.34	1485	B	1-YR	194.50	292.52	0.0048	4.04	60.51	54.22	0.29	0.27
200.34	1485	B	2-YR	265.10	292.88	0.0057	4.69	85.05	79.33	0.31	0.36
200.34	1485	B	10-YR	496.00	293.72	0.0068	5.84	161.02	100.46	0.33	0.52
200.34	1485	B	25-YR	667.40	294.11	0.0082	6.78	203.86	123.61	0.36	0.68
200.34	1485	B	50-YR	818.60	294.60	0.0072	6.78	269.01	145.08	0.34	0.66
200.34	1485	B	100-YR	990.50	294.82	0.0083	7.46	301.69	152.84	0.36	0.79
200.34	1485	B	500-YR	1490.90	295.57	0.0074	7.65	689.73	653.85	0.31	0.80
65.74	1620	A	1-YR	194.50	292.08	0.0030	3.28	109.85	119.17	0.22	0.18
65.74	1620	A	2-YR	265.10	292.46	0.0030	3.51	157.19	133.15	0.21	0.20
65.74	1620	A	10-YR	496.00	293.32	0.0030	3.99	307.07	193.67	0.20	0.24
65.74	1620	A	25-YR	667.40	293.73	0.0030	4.22	404.56	279.59	0.19	0.26
65.74	1620	A	50-YR	818.60	294.22	0.0030	4.48	577.17	455.13	0.19	0.28
65.74	1620	A	100-YR	990.50	294.46	0.0030	4.60	688.81	473.95	0.18	0.30
65.74	1620	A	500-YR	1490.90	295.17	0.0030	4.96	1094.29	781.56	0.17	0.33

PROPOSED HEC-RAS SUMMARY (NORMAL DEPTH)

RAS STATION	ALIGNMENT STATION	CROSS SECTION	PROFILE	Q	W.S. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl	Shear Chan
				(cfs)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)		(lb/sq ft)
1381.82	3+05	K	1-YR	155.90	299.79	0.0160	2.96	52.67	38.15	0.44	1.36
1381.82	3+05	K	2-YR	212.50	300.09	0.0163	3.30	64.34	40.03	0.46	1.61
1381.82	3+05	K	10-YR	396.80	300.93	0.0154	3.96	100.24	45.34	0.47	2.08
1381.82	3+05	K	25-YR	533.10	301.42	0.0153	4.33	123.26	48.43	0.48	2.38
1381.82	3+05	K	50-YR	653.10	301.80	0.0153	4.60	142.04	50.82	0.48	2.60
1381.82	3+05	K	100-YR	789.50	302.16	0.0157	4.90	161.02	53.13	0.50	2.88
1381.82	3+05	K	500-YR	1186.70	303.10	0.0158	5.56	213.47	61.15	0.51	3.49
1181.92	505	J	1-YR	155.90	297.95	0.0056	3.65	42.79	35.52	0.57	0.43
1181.92	505	J	2-YR	212.50	298.20	0.0056	4.14	52.54	41.62	0.59	0.52
1181.92	505	J	10-YR	396.80	298.78	0.0064	5.50	79.59	49.60	0.67	0.82
1181.92	505	J	25-YR	533.10	299.14	0.0068	6.26	98.10	61.64	0.70	1.01
1181.92	505	J	50-YR	653.10	299.41	0.0070	6.82	117.71	82.80	0.73	1.16
1181.92	505	J	100-YR	789.50	299.69	0.0071	7.33	142.04	88.22	0.75	1.30
1181.92	505	J	500-YR	1186.70	300.30	0.0078	8.73	197.23	91.59	0.81	1.73
1062.21	625	I	1-YR	155.90	296.54	0.0168	5.75	28.20	39.49	0.97	1.12
1062.21	625	I	2-YR	212.50	296.81	0.0156	6.16	39.58	46.55	0.96	1.22
1062.21	625	I	10-YR	396.80	297.43	0.0127	7.21	76.62	64.01	0.92	1.46
1062.21	625	I	25-YR	533.10	297.77	0.0124	7.93	98.58	66.75	0.94	1.68
1062.21	625	I	50-YR	653.10	298.04	0.0121	8.45	116.88	72.25	0.94	1.84
1062.21	625	I	100-YR	789.50	298.31	0.0118	8.97	138.77	85.72	0.95	2.00
1062.21	625	I	500-YR	1186.70	299.06	0.0105	9.91	211.87	103.78	0.93	2.25
924.54	760	H	1-YR	155.90	295.43	0.0051	3.85	40.49	27.30	0.56	0.45
924.54	760	H	2-YR	212.50	295.72	0.0053	4.27	57.16	64.05	0.58	0.54
924.54	760	H	10-YR	396.80	296.37	0.0054	5.37	105.15	81.92	0.62	0.76
924.54	760	H	25-YR	533.10	296.67	0.0060	6.17	130.97	88.18	0.67	0.96
924.54	760	H	50-YR	653.10	296.89	0.0066	6.82	150.66	92.25	0.71	1.15
924.54	760	H	100-YR	789.50	297.07	0.0076	7.63	167.41	95.52	0.77	1.41
924.54	760	H	500-YR	1186.70	297.64	0.0088	9.17	224.70	106.11	0.85	1.92
811.49	880	G	1-YR	155.90	294.41	0.0118	5.08	31.42	37.69	0.82	0.85
811.49	880	G	2-YR	212.50	294.68	0.0112	5.49	42.58	42.72	0.82	0.95
811.49	880	G	10-YR	396.80	295.27	0.0108	6.73	85.01	102.83	0.85	1.27
811.49	880	G	25-YR	533.10	295.61	0.0100	7.22	122.01	114.50	0.84	1.38
811.49	880	G	50-YR	653.10	295.87	0.0096	7.59	152.67	123.04	0.84	1.48
811.49	880	G	100-YR	789.50	296.21	0.0083	7.66	196.53	135.17	0.80	1.44
811.49	880	G	500-YR	1186.70	296.80	0.0085	8.77	282.99	156.81	0.83	1.78
717.56	970	F	1-YR	174.30	293.60	0.0075	4.51	38.67	27.68	0.67	0.63
717.56	970	F	2-YR	237.30	293.89	0.0075	5.06	50.18	51.33	0.69	0.75
717.56	970	F	10-YR	442.50	294.52	0.0073	6.20	113.27	112.87	0.72	1.02
717.56	970	F	25-YR	594.90	294.82	0.0079	7.00	148.24	122.58	0.77	1.25
717.56	970	F	50-YR	729.50	295.08	0.0079	7.47	181.17	131.05	0.78	1.37
717.56	970	F	100-YR	882.40	295.33	0.0083	8.08	215.99	154.29	0.81	1.56
717.56	970	F	500-YR	1327.20	296.43	0.0047	7.47	413.93	196.64	0.64	1.21
600.65	1080	E5	1-YR	174.30	292.71	0.0077	4.56	38.24	27.59	0.68	0.65
600.65	1080	E5	2-YR	237.30	293.02	0.0074	5.04	48.72	60.05	0.69	0.75
600.65	1080	E5	10-YR	442.50	293.78	0.0061	5.89	125.00	152.59	0.67	0.90
600.65	1080	E5	25-YR	594.90	294.25	0.0049	5.93	201.93	173.22	0.61	0.86
600.65	1080	E5	50-YR	729.50	294.63	0.0042	5.96	274.22	204.98	0.58	0.84
600.65	1080	E5	100-YR	882.40	295.03	0.0035	5.91	360.59	230.62	0.54	0.79
600.65	1080	E5	500-YR	1327.20	296.35	0.0018	5.19	712.68	299.46	0.41	0.55
582.59	1100	E4	1-YR	174.30	292.44	0.0113	5.20	33.55	26.55	0.81	0.87
582.59	1100	E4	2-YR	237.30	292.77	0.0101	5.54	42.92	30.39	0.79	0.93
582.59	1100	E4	10-YR	442.50	293.59	0.0072	6.22	112.38	147.08	0.72	1.02
582.59	1100	E4	25-YR	594.90	294.16	0.0049	5.91	203.08	175.36	0.61	0.86
582.59	1100	E4	50-YR	729.50	294.57	0.0039	5.82	281.45	203.35	0.56	0.79
582.59	1100	E4	100-YR	882.40	294.98	0.0033	5.73	368.51	218.79	0.52	0.74
582.59	1100	E4	500-YR	1327.20	296.32	0.0017	5.08	731.39	302.32	0.40	0.52
552.97	1130	E3	1-YR	174.30	292.45	0.0030	3.40	52.89	35.06	0.44	0.33
552.97	1130	E3	2-YR	237.30	292.80	0.0031	3.86	66.72	64.28	0.46	0.40
552.97	1130	E3	10-YR	442.50	293.66	0.0027	4.57	172.68	157.65	0.46	0.50
552.97	1130	E3	25-YR	594.90	294.18	0.0024	4.72	260.87	181.31	0.44	0.51
552.97	1130	E3	50-YR	729.50	294.57	0.0022	4.85	335.93	201.30	0.43	0.52
552.97	1130	E3	100-YR	882.40	294.97	0.0020	4.97	419.72	217.88	0.42	0.53
552.97	1130	E3	500-YR	1327.20	296.28	0.0014	4.86	738.14	278.56	0.36	0.46
521.15	1160	E2	1-YR	174.30	292.32	0.0035	3.56	50.20	38.44	0.48	0.37
521.15	1160	E2	2-YR	237.30	292.68	0.0034	3.94	73.80	93.18	0.48	0.43
521.15	1160	E2	10-YR	442.50	293.60	0.0025	4.32	197.26	157.37	0.44	0.45
521.15	1160	E2	25-YR	594.90	294.13	0.0021	4.46	286.62	179.57	0.42	0.46
521.15	1160	E2	50-YR	729.50	294.53	0.0020	4.60	361.03	196.45	0.41	0.47
521.15	1160	E2	100-YR	882.40	294.93	0.0018	4.73	443.11	210.71	0.40	0.48
521.15	1160	E2	500-YR	1327.20	296.26	0.0012	4.60	746.91	248.85	0.34	0.41
501.39	1180	E1	1-YR	189.80	292.20	0.0044	3.94	49.14	34.62	0.53	0.45
501.39	1180	E1	2-YR	257.30	292.54	0.0043	4.41	68.33	102.60	0.54	0.53
501.39	1180	E1	10-YR	477.30	293.54	0.0026	4.47	213.55	167.71	0.45	0.48
501.39	1180	E1	25-YR	640.40	294.09	0.0022	4.54	311.65	188.97	0.42	0.47
501.39	1180	E1	50-YR	784.10	294.49	0.0020	4.66	390.70	204.45	0.41	0.48
501.39	1180	E1	100-YR	947.30	294.90	0.0018	4.78	475.70	213.92	0.40	0.49
501.39	1180	E1	500-YR	1422.00	296.24	0.0012	4.70	784.90	252.51	0.35	0.43
461.43	1225	D	1-YR	189.80	292.04	0.0041	3.85	50.95	47.59	0.51	0.43
461.43	1225	D	2-YR	257.30	292.39	0.0039	4.24	73.18	75.64	0.52	0.49
461.43	1225	D	10-YR	477.30	293.36	0.0030	4.81	172.59	137.03	0.48	0.56
461.43	1225	D	25-YR	640.40	293.90	0.0026	5.04	258.36	174.76	0.47	0.58
461.43	1225	D	50-YR	784.10	294.33	0.0023	5.11	335.61	188.65	0.45	0.57
461.43	1225	D	100-YR	947.30	294.75	0.0021	5.22	416.90	199.41	0.44	0.58
461.43	1225	D	500-YR	1422.00	296.14	0.0014	5.00	722.21	240.55	0.36	0.48
317.38	1370	C	1-YR	189.80	291.52	0.0034	3.65	53.74	35.15	0.47	0.38
317.38	1370	C	2-YR	257.30	291.89	0.0034	4.10	66.83	36.62	0.49	0.45
317.38	1370	C	10-YR	477.30	292.78	0.0036	5.28	115.45	89.81	0.53	0.67
317.38	1370	C	25-YR	640.40	293.28	0.0035	5.83	162.56	99.86	0.54	0.77
317.38	1370	C	50-YR	784.10	293.65	0.0036	6.26	201.96	113.12	0.55	0.87
317.38	1370	C	100-YR	947.30	294.03	0.0036	6.65	246.96	124.83	0.56	0.95
317.38	1370	C	500-YR	1422.00	295.03	0.0043	8.32	411.21	587.99	0.63	1.38
200.34	1485	B	1-YR	194.50	291.09	0.0038	3.74	52.28	34.21	0.50	0.41
200.34	1485	B	2-YR	265.10	291.46	0.0037	4.18	65.91	37.76	0.51	0.48
200.34	1485	B	10-YR	496.00	292.34	0.0038	5.33	117.17	76.40	0.54	0.69
200.34	1485	B	25-YR	667.40	292.80	0.0040	6.01	159.12	96.95	0.57	0.84
200.34	1485	B	50-YR	818.60	293.16	0.0040	6.45	194.88	100.93	0.58	0.93
200.34	1485	B	100-YR	990.50	293.50	0.0042	6.96	229.59	104.83	0.60	1.05
200.34	1485	B	500-YR	1490.90	294.46	0.0041	7.94	344.90	139.34	0.62	1.28
65.74	1620	A	1-YR	194.50	290.65	0.0030	3.54	57.15	35.87	0.45	0.35
65.74	1620	A	2-YR	265.10	291.03	0.0030	4.00	73.76	52.70	0.46	0.42
65.74	1620	A	10-YR	496.00	291.94	0.0030	4.98	154.42	114.24	0.49	0.59
65.74	1620	A	25-YR	667.40	292.42	0.0030	5.47	214.19	130.64	0.50	0.68
65.74	1620	A	50-YR	818.60	292.80	0.0030	5.84	271.66	175.72	0.51	0.75
65.74	1620	A	100-YR	990.50	293.16	0.0030	6.18	339.35	191.07	0.52	0.81
65.74	1620	A	500-YR	1490.90	294.16	0.0030	7.07	611.96	449.19	0.53	0.99

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HYDRAULIC SUMMARY
COE BRANCH STREAM RESTORATION
CITY OF FALLS CHURCH, VIRGINIA

COMMONWEALTH OF VIRGINIA
SCOTT C. BLOSSOM
Lic. No. 40287
11/7/13
PROFESSIONAL ENGINEER

REVISIONS:
DATE:

DRAWN BY: CSA/AWT
DESIGNED BY: SCB/CSA
DATE: 11/07/2013
CHECKED BY: SCB/CK
SCALE: 1"=50'

INVASIVE REMOVAL PLAN

COE BRANCH

COE INVASIVES:

FIELD INSPECTIONS REVEALED THAT THE MAJORITY OF THE BUFFER RESTORATION AREA CONTAINS NON-NATIVE, INVASIVE PLANT SPECIES (TABLE 1-1).

TABLE 1-1: COE BRANCH INVASIVE SPECIES

COMMON NAME	SCIENTIFIC NAME	INVASIVE LEVEL	COVERAGE
GARLIC MUSTARD	*Alliaria petiolata*	Highly	Occasional
PORCELAIN BERRY	*Ampelopsis brevipedunculata*	Highly	Occasional
ORIENTAL BITTERSWEET	*Celastrus orbiculata*	Highly	Moderate
BUSH HONEYSUCKLE	*Lonicera morrowii*	Highly	Moderate
JAPANESE STILIT GRASS	*Microstegium vimineum*	Highly	Light
ROSE	*Rosa multiflora*	Highly	Heavy
WINEBERRY	*Rubus phoenicolasius*	Highly	Light
MIMMOSA	*Albizia julibrissin*	Moderately	Occasional
WINTERCREEPER	*Euonymus fortunei*	Moderately	Heavy
GILL-OVER-THE-GROUND	*Glechoma hederacea*	Moderately	Light
ENGLISH IVY	*Hedera helix*	Moderately	Heavy
BAMBOO	*Phyllostachys aurea*	Moderately	Moderate
TRUMPET CREEPER	*Campsis radicans*	Occasionally	Light
RED MORNING-GLORY	*Ipomoea coccinea*	Occasionally	Occasional

TABLE 1-2: INVASIVE SPECIES COVERAGE DENSITY

Occasional	< 5%
Light	5>15%
Moderate	15>30%
Heavy	>30%

THESE SPECIES WILL NEED TO BE REMOVED AND/OR CONTROLLED IN ORDER TO INCREASE THE VIABILITY OF THE PROPOSED NATIVE BUFFER PLANTINGS. THE FOLLOWING IS AN ABATEMENT MAINTENANCE PLAN FOR THESE INVASIVE AND AGGRESSIVE SPECIES, DESIGNED IN ACCORDANCE WITH THE VIRGINIA NATIVE PLANT SOCIETY AND THE VIRGINIA DEPARTMENT OF CONSERVATION AND RECREATION DIVISION OF NATURAL HERITAGE.

DURING THE CLEARING AND GRUBBING OF THE CONSTRUCTION AREA PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL BUSH-HOG THE BUFFER AREA AND SPRAY IT WITH A 10% GLYPHOSATE/1% ISOPROPYLAMINE HERBICIDE MIX APPLIED DIRECTLY TO FRESHLY CUT INVASIVE PLANTS. THIS WILL HELP INSURE THAT THE ROOTS DIE OFF, REDUCING THE AMOUNT OF NEW GROWTH AFTER CUTTING. THE CONTRACTOR SHALL ALSO MAKE A SECOND APPLICATION OF THE SAME HERBICIDE MIX IN THE SPRING TOWARDS THE END OF CONSTRUCTION, AND BEFORE BUFFER PLANTING OCCURS. AREAS CONTAINING HONEYSUCKLE AND ENGLISH IVY SHOULD ALSO BE TREATED ONCE DURING THE FALL/WINTER WITH THE SAME HERBICIDE MIX, AS THESE SPECIES ARE EVERGREEN AND CAN BE TREATED WHEN OTHER HERBACEOUS SPECIES ARE DORMANT.

THE CONTRACTOR SHALL ALSO CUT DOWN AND MECHANICALLY REMOVE THE DENSE AREA OF BAMBOO NEAR THE UPSTREAM PORTION OF THE SITE, IN ORDER TO ELIMINATE AS MUCH OF THE ROOT MASS AS POSSIBLE. THE CONTRACTOR SHALL THEN TREAT THE AREA WITH A 10% GLYPHOSATE MIX ON ANY NEW SPROUTS IN THE SPRING, AND BEFORE BUFFER PLANTING OCCURS.

AFTER BUFFER PLANTING OCCURS, THE CITY WILL NEED TO CONTRACT SOMEONE TO PERFORM SPOT TREATMENTS OF ANY OF THE TARGET SPECIES THAT COME BACK AFTER THE FIRST TWO TREATMENTS. THESE SPOT TREATMENTS SHOULD BE PERFORMED USING THE 10% GLYPHOSATE/1% ISOPROPYLAMINE MIX. THESE TREATMENTS SHOULD OCCUR TWO TO FIVE TIMES A YEAR (DEPENDING ON DENSITY), BETWEEN APRIL AND SEPTEMBER, WITH ONE BETWEEN NOVEMBER AND FEBRUARY TO TARGET THE HONEYSUCKLE AND ENGLISH IVY (IF NECESSARY). IT MAY TAKE THREE TO FIVE GROWING SEASONS TO EFFECTIVELY CONTROL THE TARGET SPECIES.

IDENTIFICATION OF INVASIVE SPECIES SHOULD BE DONE BY QUALIFIED STAFF, AND APPLICATION OF ALL HERBICIDES SHOULD ONLY BE MADE BY AN EXPERIENCED APPLICATOR CERTIFIED IN THE STATE OF VIRGINIA. THIS IS EITHER A COMMERCIAL APPLICATOR CERTIFIED FOR 5-A - AQUATIC PEST CONTROL GENERAL, OR A REGISTERED TECHNICIAN UNDER THE SUPERVISION OF A COMMERCIAL APPLICATOR

INVASIVE REMOVAL PLAN

PEARSON BRANCH

PEARSON INVASIVES:

FIELD INSPECTIONS REVEALED THAT THE MUCH OF THE BUFFER RESTORATION AREA CONTAINS NON-NATIVE, INVASIVE PLANT SPECIES (TABLE 1-1).

TABLE 1-1: COE BRANCH INVASIVE SPECIES

COMMON NAME	SCIENTIFIC NAME	INVASIVE LEVEL	COVERAGE
GARLIC MUSTARD	*Alliaria petiolata*	Highly	Occasional
ORIENTAL BITTERSWEET	*Celastrus orbiculata*	Highly	Occasional
BUSH HONEYSUCKLE	*Lonicera morrowii*	Highly	Light
ROSE	*Rosa multiflora*	Highly	Light
MIMMOSA	*Albizia julibrissin*	Moderately	Occasional
GILL-OVER-THE-GROUND	*Glechoma hederacea*	Moderately	Light
ENGLISH IVY	*Hedera helix*	Moderately	Heavy

TABLE 1-2: INVASIVE SPECIES COVERAGE DENSITY

Occasional	< 5%
Light	5>15%
Moderate	15>30%
Heavy	>30%

THESE SPECIES WILL NEED TO BE REMOVED AND/OR CONTROLLED IN ORDER TO INCREASE THE VIABILITY OF THE PROPOSED NATIVE BUFFER PLANTINGS. THE FOLLOWING IS AN ABATEMENT MAINTENANCE PLAN FOR THESE INVASIVE AND AGGRESSIVE SPECIES, DESIGNED IN ACCORDANCE WITH THE VIRGINIA NATIVE PLANT SOCIETY AND THE VIRGINIA DEPARTMENT OF CONSERVATION AND RECREATION DIVISION OF NATURAL HERITAGE.

DURING THE CLEARING AND GRUBBING OF THE CONSTRUCTION AREA PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL BUSH-HOG THE BUFFER AREA AND SPRAY IT WITH A 10% GLYPHOSATE/1% ISOPROPYLAMINE HERBICIDE MIX APPLIED DIRECTLY TO FRESHLY CUT INVASIVE PLANTS. THIS WILL HELP INSURE THAT THE ROOTS DIE OFF, REDUCING THE AMOUNT OF NEW GROWTH AFTER CUTTING. THE CONTRACTOR SHALL ALSO MAKE A SECOND APPLICATION OF THE SAME HERBICIDE MIX IN THE SPRING TOWARDS THE END OF CONSTRUCTION, AND BEFORE BUFFER PLANTING OCCURS. AREAS CONTAINING HONEYSUCKLE AND ENGLISH IVY SHOULD ALSO BE TREATED ONCE DURING THE FALL/WINTER WITH THE SAME HERBICIDE MIX, AS THESE SPECIES ARE EVERGREEN AND CAN BE TREATED WHEN OTHER HERBACEOUS SPECIES ARE DORMANT.

AFTER BUFFER PLANTING OCCURS, THE CITY WILL NEED TO CONTRACT SOMEONE TO PERFORM SPOT TREATMENTS OF ANY OF THE TARGET SPECIES THAT COME BACK AFTER THE FIRST TWO TREATMENTS. THESE SPOT TREATMENTS SHOULD BE PERFORMED USING THE 10% GLYPHOSATE/1% ISOPROPYLAMINE MIX. THESE TREATMENTS SHOULD OCCUR TWO TO FIVE TIMES A YEAR (DEPENDING ON DENSITY), BETWEEN APRIL AND SEPTEMBER, WITH ONE BETWEEN NOVEMBER AND FEBRUARY TO TARGET THE HONEYSUCKLE AND ENGLISH IVY (IF NECESSARY). IT MAY TAKE THREE TO FIVE GROWING SEASONS TO EFFECTIVELY CONTROL THE TARGET SPECIES.

IDENTIFICATION OF INVASIVE SPECIES SHOULD BE DONE BY QUALIFIED STAFF, AND APPLICATION OF ALL HERBICIDES SHOULD ONLY BE MADE BY AN EXPERIENCED APPLICATOR CERTIFIED IN THE STATE OF VIRGINIA. THIS IS EITHER A COMMERCIAL APPLICATOR CERTIFIED FOR 5-A - AQUATIC PEST CONTROL GENERAL, OR A REGISTERED TECHNICIAN UNDER THE SUPERVISION OF A COMMERCIAL APPLICATOR.

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WILLIAMSBURG ENVIRONMENTAL GROUP, INC.
Environmental Consultants

INVASIVE REMOVAL PLAN
COE BRANCH STREAM RESTORATION
CITY OF FALLS CHURCH, VIRGINIA

COMMONWEALTH OF VIRGINIA
GEORGE C. RHODES III
Lic. No. 000894
12/16/13
LANDSCAPE ARCHITECT

REVISIONS:
DATE:

DRAWN BY: CDP, RH
DESIGNED BY: CDP
DATE: 11/07/2013
CHECKED BY: SCB, GCR
SCALE: N/A

SHEET: 41 OF 43
JOB#: 4966

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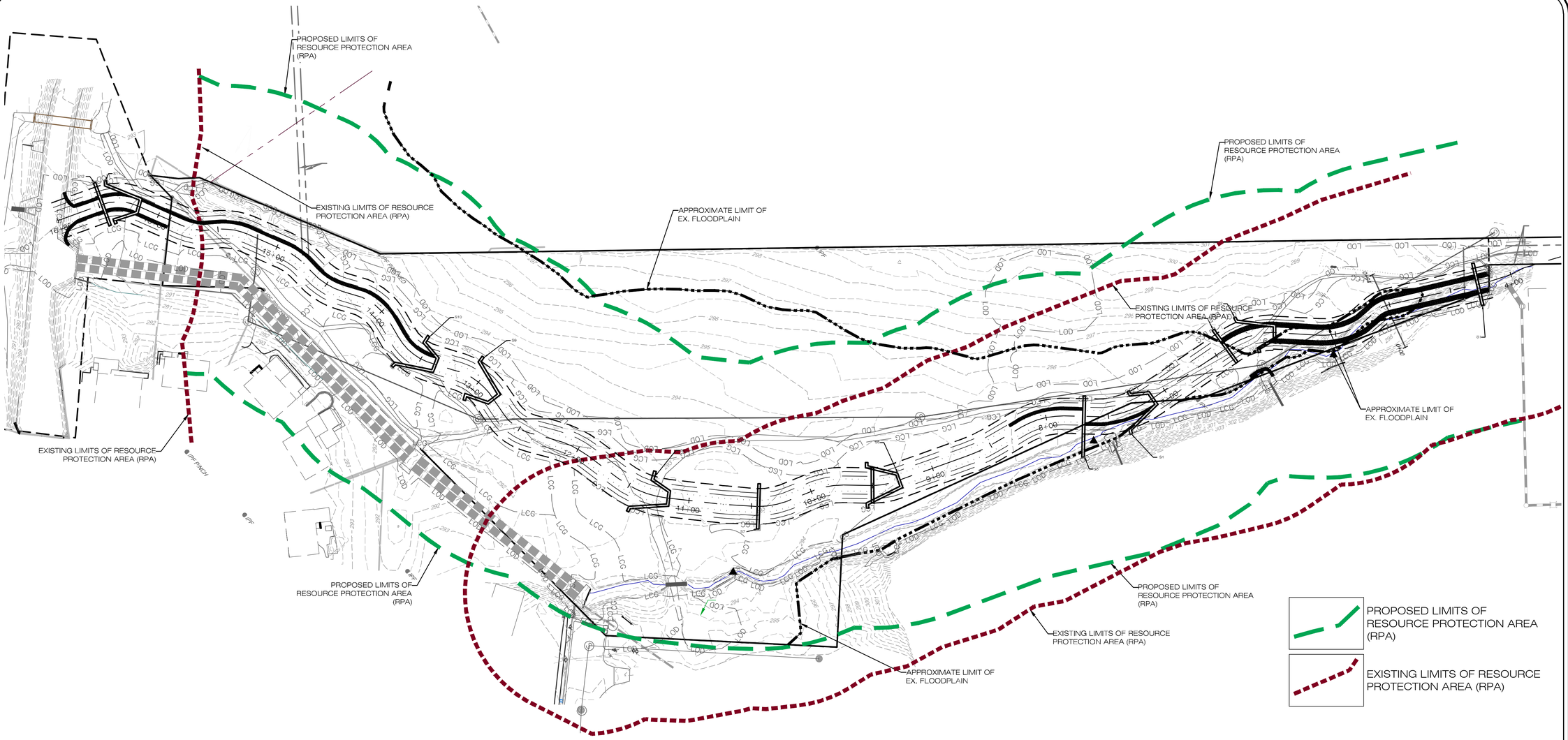

WATER QUALITY IMPACT ASSESSMENT

In accordance with Chapter 48, Article IV, Division 16 of the Code of the City of Falls Church entitled "CBPA, Chesapeake Bay Preservation Area Overlay District", the following water quality impact assessment (WQIA) for the Coe Branch stream restoration project was prepared.

Sec. 48-838 (b) (1) Identification of Impacts with Specificity

Identification of impacts are based on the existing Resource Protection Area (RPA) boundary. The perennial stream channel, Coe Branch, will be restored and daylighted after existing corrugated metal pipes are removed. By its nature, stream restoration projects are water-dependent activities.

This project is located in the Tripps Run and Coe Branch watersheds, on Coe Branch. The project begins on the City of Fall Church Howard E. Herman Stream Valley Park and ends on the City of Falls Church Lot 39A at Tripps Run. The City of Falls Church proposes to restore and stabilize approximately 1,258 linear feet of perennial stream using natural channel design practices. In addition, riparian buffer planting areas are proposed within the floodplain and RPA to increase the habitat diversity. The total limits of disturbance for this project are 2.48 acres, of which 1.88 acres is located within the existing RPA.

Restoration will involve removing existing corrugated metal pipes pipe, riprap, concrete, debris and invasive species. The stream will be restored to a more natural state with a riparian buffer. Restoration will also include daylighting new stream channel through the Park, improving floodplain connectivity, and stream sinuosity.

The project includes extensive plantings to restore and enhance the riparian community. Native seed mixes will be used along the streambanks, and within the floodplain areas. The existing riparian vegetation will be saved to the greatest extent practicable, and some invasive species will be removed.

Sec. 48-838 (b) (2) Site Drawing

RPA Components

The boundaries of the existing and proposed Resource Protection Area (RPA) are shown on the attached plans, Sheet 42. The RPA components include Coe Branch and Tripps Run, both of which are perennial streams. The 100-foot RPA buffer is measured from the top of the stream bank.

Proposed Encroachment

Natural stream design techniques will be used to restore Coe Branch. The proposed stream restoration project includes re-alignment of the stream channel, placement of in-stream stabilization structures, creation of riffles and pools, habitat structures, and plantings. The channel re-alignment will reduce shear stress and erosion along tight meander bends and protect adjacent properties and the sewer infrastructure that runs parallel to the channel. Bankfull benches and inner berms will be created along the new channel to accommodate the bankfull and smaller discharges, and to reduce bank erosion.

The in-stream structures are designed to protect meander bends from erosion and to create pools of varying depth to increase habitat diversity. The created riffles and pools have been designed to mimic other stable stream channels within the urban Piedmont watersheds. The proposed channel dimension, plan and profile are based on a reference reach and hydraulic analysis of varying storm discharges.

The project includes habitat structures, such as constructed riffles and pools to provide habitat diversity. Created riffles are built from rock that is placed to stabilize the channel and prevent down cutting.

RPA mitigation will consist of the re-establishment of approximately 42,501 square feet of native riparian buffer, and approximately 1,258 linear feet of stream bank stabilization and planting. The buffer will improve the existing wooded area by adding native understory vegetation and canopy trees. The site will be planted to the maximum extent practicable. See the attached planting plans on sheets 38 and 39.

The buffer plantings will follow the guidance from the City of Falls Church recommended trees and/or native floodplain species lists. The density of the buffer shall be as decribed in the Riparian Buffers Modification and Mitigation Guidance Manual. The required plantings are as follows: 99 Overstory Trees (based on density of 1 per 400 sq.ft), 199 Understory Trees (based on density of 2 per 400 sq.ft), and 298 Shrubs (based on density of 3 per 400 sq.ft).

All work within the stream channel shall be performed in the dry. Approved clean water diversion measures will be utilized to ensure that sediment laden water is not discharged into the stream channel. The clean water diversion will be of sufficient length to ensure that all work within the daily work zone is performed in the dry. Only an area that can be stabilized within the same work day is allowed. A stable flow channel will be operable at the end of each day so any base flow or storm flow can be safely conveyed. No work will be conducted within the channel during storm events (rain events).

No wetlands will be permanently impacted by this project. Wetlands will be temporarily impacted during restoration activities. These activities have been approved by the U.S. Army Corps of Engineers.

No impervious surfaces will be constructed.

Demonstrate the extent to which the proposed activity will comply with applicable performance criteria

The project will improve water quality by stabilizing the stream using natural channel design criteria. In addition, the in-stream structures, habitat features, such as pools, and riffles will provide habitat for fish, macroinvertebrates and amphibians. The riparian buffer restoration provide further habitat diversity for the floodplain community. Riparian plantings will enhance the floodplain, using native species (See Sheets 36 to 39), which provide a breakdown of the species and planting quantities along with the seed mixtures.

Based on the design and calculations provided in Table 1, a total of 106 overstory trees, 212 understory trees, and 316 shrubs will be installed. In addition, 1450 live stakes will be installed. The planting density requirements can be met.

Table 1: Coe Branch Stream Restoration

Project		Note
81909	Sq.Ft.	Pr. Area of Disturbance within Ex. RPA
29810	Sq.Ft.	Pr. Stream Channel within Ex. RPA
5600	Sq.Ft.	Ex Sanitary Sewer Area within Ex. RPA
5335	Sq.Ft.	Pr. Areas of Preservation within Ex. RPA
1420	Sq.Ft.	Ex. Stormdrain System within Ex. RPA
3955	Sq.Ft.	Pr. Trail within Ex. RPA
39744	Sq.Ft.	Area to be counted toward buffer requirement

CONTOUR INTERVAL = 1/2 FOOT

40' 0' 20' 40' 80' 120'

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COE BRANCH STREAM RESTORATION
CITY OF FALLS CHURCH, VIRGINIA

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12/16/13 Revised per City comments

DRAWN BY: CDP, RH
DESIGNED BY: CDP
DATE: 11/07/2013
CHECKED BY: SCB, GCR
SCALE: 1"=40'

SHEET: 42 OF 43
JOB#: 4966

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19955 Highland Vista Dr., Suite 170
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(703) 726-8030
www.geoconcepts-eng.com

October 31, 2013

Mr. George C. Rhodes, III PLA
Williamsburg Environmental Group, Inc.
150 Riverside Pkwy, Ste 301
Fredericksburg, VA 22406

Subject: **Geotechnical Engineering Report, COE Branch Restoration, City of Falls Church, Virginia (13042)**

Dear Mr. Rhodes:

GeoConcepts Engineering, Inc. (GeoConcepts) is pleased to present the following geotechnical engineering report prepared for Coe Branch Restoration, City of Falls Church, Virginia.

We appreciate the opportunity to serve as your geotechnical consultant on this project. Please do not hesitate to contact me if you have any questions or want to meet to discuss the findings and recommendations contained in the report.

Sincerely,

GEOCONCEPTS ENGINEERING, INC.

Ashley Hogan, PG
Project Geologist
ahogan@geoconcepts-eng.com

1.0 Scope of Services

This geotechnical engineering report presents the results of the field investigation, soil laboratory testing, and engineering analysis of the geotechnical data. This report specifically addresses the following:

- Completion of up to 5 hand augers to depths of 5 feet each, or prior refusal, in order to provide an evaluation of subsurface conditions within the area of the proposed stream restoration area.
- Soil laboratory testing of selected samples to aid in visual classification and to determine in place moisture contents.
- An evaluation of subsurface conditions within the area of the proposed site development.
- Recommendations regarding stream slopes.
- Earthwork recommendations, including an assessment of on-site soils to be excavated for re-use as fill.
- Rock excavation requirements for the site development.

Services not specifically identified in the contract for this project are not included in the scope of services.

2.0 Site Description and Proposed Construction

Note: Aerial Photograph From Google Earth Imagery Dated 2013.

The site is located at Falls Park in Falls Church Virginia. The stream channel trends northeast, southwest, and the flow direction of the stream appears to be southwest. The stream bisects a row of townhomes to the east and single family homes to the south and west. The site is at an approximate elevation between 290 and 300 feet and slopes downward to the southwest. A site vicinity map is presented as Figure 1 at the end of this report. Proposed plans are to realign the existing steam channel and improve the stream channel slope to mitigate erosion in the area.

3.0 Subsurface Conditions

Subsurface conditions were investigated by using a hand auger to perform a total of 5 test borings in the proposed site development area. The five locations were performed using a 3½-inch hand auger and dynamic cone penetrometer (DCP). The hand augers extended to a maximum depth of 5.0 feet below

the ground surface. DCP testing was conducted at approximately 1-foot depth increments. Test boring logs and a boring location plan are presented in Appendix A of this report.

3.1 Geology

The site lies within the Piedmont Physiographic Province of Virginia. The Piedmont is bordered to the east by the Coastal Plain Physiographic Province and to the west by the Blue Ridge Physiographic Province and contains several fault bordered basins. Bedrock in the Piedmont typically consists of highly weathered metamorphic and igneous bedrock. Surface topography in the Piedmont is the result of millions of years of erosion.

Specifically, the site is mapped in the Falls Church Intrusive Suite. This suite, which consists of tonalite, granodiorite, monzogranite, and trondhjemite, is of the Early Ordovician geologic time period. A younger alluvium deposit of the Quaternary geologic time period consists of sand, silt, gravel, and clay and crosscuts a potion of the site to the southwest.

3.2 Published Soils

According to the United States Department of Agriculture Soil Survey 2.0 website, the site is underlain by soils of the Summerduck silt loam, 2 to 7 percent slopes, Urbanland-Wheaton complex, and Wheaton-Meadowville complex, 2 to 7 percent slopes. The majority of soils mapped at the property belong to the Summerduck silt loam (93B). These soils consist of alluvium derived from schist and/or phyllite, occurring mostly in drainageways and are considered moderately well drained.

The urbanland-Wheaton complex (101) is mapped in a small area on the northeast portion of the site. These soils usually occur in interfluves and most likely are derived from mine spoils or fill material derived from phyllite. These soils are considered to be well drained.

The Wheaton-Meadowville complex (107B) is mapped along the northwestern portion of the site. These soils usually occur in interfluves, consisting of mine spoils or fill material from phyllite, and are considered to be well drained.

Soils map provided courtesy of the USDA Soil Survey 2.0 website.

3.3 Stratification

The subsurface materials encountered have been stratified for purposes of our discussions herein. These stratum designations do not imply that the materials encountered are continuous across the site. Stratum designations have been established to characterize similar subsurface conditions based on material gradations and parent geology. The subsurface materials encountered in the test borings completed at the site have been assigned to the following strata:

Stratum A (Existing Fill)	Generally soft, silt FILL, moist, brown
Stratum B1 (alluvium)	Generally medium stiff, SILT (ML), LEAN CLAY (CL) with varying amounts of sand and gravel, moist to wet, brown, black, gray, grayish brown, and brownish gray
Stratum B2 (alluvium)	Generally stiff, silty SAND (SM), moist to wet, brown and gray

The two letter designations included in the strata descriptions presented above and on the test boring logs represent the Unified Soil Classification System (USCS) group symbol and group name for the samples based on laboratory testing per ASTM D-2487 and visual classifications per ASTM D-2488. It should be noted that visual classifications per ASTM D-2488 may not match classifications determined by laboratory testing per ASTM D-2487.

3.4 Groundwater

Groundwater level observations were made in the field during hand augering, and after completion of each boring. We did not make 24-hour water level observations as boreholes were backfilled upon completion for safety concerns. Groundwater was encountered at depths of about 2.3 to 4 feet below the existing ground surface.

3.5 Soil Laboratory Test Results

Selected soil samples obtained from the field investigation were tested for grain size distribution, Atterberg limits, and natural moisture content. A summary of soil laboratory test results is presented below, and the results of natural moisture content tests are presented on the test boring logs in Appendix A.

Test Boring No.	Depth (ft)	Sample Type	Stratum	Description of Soil Specimen	Sieve Results		Atterberg Limits			Natural Moisture Content (%)
					Percent Retained #4 Sieve	Percent Passing #200 Sieve	LL	PL	PI	
HA-1	1.0-2.0	Ziploc	B1	LEAN CLAY (CL) with sand	1.3	75.0	45	23	22	22.8
HA-2	2.0-2.6	Ziploc	B1	sandy LEAN CLAY (CL)	0	59.0	30	14	16	19.9
HA-3	3.0-4.0	Ziploc	B1	sandy LEAN CLAY (CL)	0.3	50.8	32	18	14	20.1
HA-3	4.0-4.3	Ziploc	B1	sandy LEAN CLAY (CL)	2.7	52.6	44	20	24	33.3
HA-4	4.0-5.0	Ziploc	B2	silty SAND (SM)	2.6	19.5	NP	NP	NP	27.6
HA-5	0-1.0	Ziploc	B1	SILT (ML)	0	93.5	40	25	15	29.7

Notes:
1. Soil tests are in accordance with applicable ASTM standards
2. Soil classification symbols are in accordance with Unified Soil Classification System
3. Visual identification of samples is in accordance with ASTM D-2488
4. Key to abbreviations: LL = liquid limit; PL = plastic limit; PI = plasticity index; NP = nonplastic; N/T = not tested

4.0 Engineering Analysis

Recommendations regarding earthwork, rock excavation, and preliminary slope stability are presented herein.

4.1 Earthwork

Fill may be required for site grading stream restoration areas. The areas to be filled should be cleared and grubbed prior to placing fill. Unsuitable existing fill, soft or loose natural soils, organic material, and rubble should be stripped to approved subgrades as determined by the geotechnical engineer. Topsoil depths presented on the boring logs should not be considered as stripping depths, as topsoil depths may vary widely across the site, particularly in wooded or previously cultivated areas. Stripping depths will probably extend to greater depths than the topsoil depths indicated herein due to the presence of minor amounts of organics, roots, and other surficial materials that will require removal as a part of the stripping operations. In addition, seasonal soil moisture variations can affect stripping depths. In general, less stripping may occur during summer months when drier weather conditions can be expected. The depth of required stripping should be determined prior to construction by the excavation contractor using test pits, probes, or other means that the contractor wishes to employ, and this determination should be the responsibility of the excavation contractor. All subgrades should be proofrolled with a minimum 20 ton, loaded dump truck or suitable rubber tire construction equipment approved by the geotechnical engineer, prior to the placement of new fill.

There may be some areas of deeper subcutting for removal of soft wet soils, particularly along seasonal creeks or drainage channels on the site. Actual undercutting requirements may also depend on groundwater conditions in the lower elevations at the time of construction. In some cases, soil stabilization/improvement methods such as the use of geogrids/geotextiles may be an economically beneficial option to the traditional removal and replacement option.

Fill material should be placed in lifts not exceeding 8 inches loose thickness, with fill materials compacted by hand operated tampers or light compaction equipment placed in maximum 4-inch thick loose lifts. If any fill areas will provide structural support of sidewalks, roadways or other structural areas, the fill should be compacted at +/- 2% of the optimum moisture content to at least 95 percent of the maximum dry density per ASTM D-698. For fill areas that will not provide structural support, fill should be compacted 90 percent.

Fill placed along slopes steeper than 5H:1V should be benched into the existing slope. Benches should consist of minimum 5 feet wide level cut, and at least one such bench should be used for each 1 foot of vertical rise of fill placed.

Materials used for compacted fill for support of structural areas, should consist of soils classifying CL, ML, SC, SM, SP, SW, GC, GM, GP, or GW per ASTM D-2487. It is expected that the majority of soils excavated from Stratum B1 and B2 will be suitable for re-use as fill based on classification. For fill in non-structural areas, all soil classifications except for OL or OH per ASTM D-2487 may be used. However, please note that soils that classify CH or MH may be more difficult to work with and obtain compaction. In addition, drying of excavated soils by spreading and aerating may be necessary to obtain proper compaction. This may not be practical during the wet period of the year. Accordingly, earthwork operations should be planned for early Spring through late Fall, when drier weather conditions can be expected. Individual borrow areas, both from on-site and off-site sources, should be sampled and tested to verify classification of materials prior to their use as fill.

Fill materials should not be placed on frozen or frost-heaved soils, and/or soils that have been recently subjected to precipitation. All frozen or frost-heaved soils should be removed prior to continuation of fill operations. Borrow fill materials should not contain frozen materials at the time of placement.

Compaction equipment that is compatible with the soil type used for fill should be selected. Theoretically, any equipment type can be used as long as the required density is achieved; however, sheepsfoot roller equipment are best suited for fine-grained soils and vibratory smooth drum rollers are best suited for granular soils. Ideally, a smooth drum roller should be used for sealing the surface soils at the end of the day or prior to upcoming rain events. In addition, compaction equipment used adjacent to walls below grade should be selected so as to not impose undesirable surcharge on walls. All areas receiving fill should be graded to facilitate positive drainage of any water associated with precipitation and surface run-off.

For utility excavation backfill, if required, we recommend that open graded stone be used to backfill the pipe trench to the spring line of the pipe. Backfill should be compacted in lifts not exceeding 6 inches loose thickness, to at least 95 percent of the maximum dry density per ASTM D-698. Hand operated compaction equipment should be used until the backfill has reached a level 1 foot above the top of the pipe to prevent damaging the pipe. Also, backfill material within 2 feet of the top of the pipe should not contain rock fragments or gravel greater than 1-inch in diameter.

After completion of compacted fill operations in structural areas, construction should begin immediately, or the finished subgrade should be protected from exposure to inclement weather conditions. For non-structural areas, vegetation cover should be established as soon as feasible. Exposure to precipitation and freeze/thaw cycles will cause the finished subgrade to soften and become excessively disturbed. If development plans require that finished subgrades remain exposed to weather conditions after completion of fill operations, additional fill should be placed above finished grades to protect the newly placed fill. Alternatively, a budget should be established for reworking of the upper 1 to 2 feet of previously placed compacted fill.

As indicated previously, groundwater was encountered in hand auger boring HA-4 at 2.3 feet and in boring HA-2 at 4 feet. Groundwater may impact excavations to create a new stream location, and during fill operations of the existing stream. The contractor should be prepared to lower groundwater levels temporarily in these areas in order to complete earthwork operations.

4.2 Rock Excavation

Because of the planned excavations for the stream realignment, there is a concern regarding rock excavation. The hand auger borings were extended to depths of up to 5 feet below existing grades, but most encountered refusal prior to reaching the planned depths of 5 feet. However, the hand auger refusals were due to the presence of oversize gravel that could not be penetrated by hand auger equipment. Based on the soil material encountered in the hand auger borings and the depths of the hand auger borings, we do not believe bedrock will be encountered within the top 5 feet below existing grades of the project.

Project specifications should include the following as a definition of rock excavation for mass excavation: "Rock is defined as any material which cannot be dislodged by a D-8 Caterpillar tractor, or equivalent, equipped with a hydraulically operated, single-tooth power ripper without the use of hoe-ramming or blasting. This classification does not include material such as loose rock, concrete or other materials that can be removed by means other than hoe-ramming or blasting, but which for reasons of economy in excavating, the contractor chooses to remove by hoe-ramming or blasting."

For trench excavations, rock excavation should be defined in terms of a Caterpillar 330 hydraulic backhoe, or equivalent, instead of the D-8 Caterpillar tractor. Earthwork excavation should be defined as all material except rock as defined above, including material that can be ripped.

In the event that unexpected rock is encountered during earthwork operations, requirements for blasting rock should be determined by a contractor with demonstrated experience in this work. Consideration must be given to vibrations transmitted to nearby buildings in determining the size of charges that may be detonated at one time. The specifications should require the taking of seismograph readings at adjacent structures to develop a blast plan that produces an acceptable level of vibrations. Each blast should be contained or covered to minimize air blast and flyrock. A precondition survey of nearby structures should be made prior to the start of construction to document the existing conditions. Also, line drilling should be performed adjacent to existing structures to reduce spalling of bedrock adjacent to these buildings.

4.3 Preliminary Slope Stability Considerations

This site grading may include steep slopes on the banks. Based on the soil properties and the proposed plan, we recommend bank slopes up to 5 feet high to be designed to be no steeper than about 3H:1V without additional slope stability analysis. If steeper slopes are desired, a more detailed global stability slope analysis should be completed. This service is not included in the scope of services of this project, but can be completed if requested.

5.0 General Limitations

Recommendations contained in this report are based upon the data obtained from the relatively limited number of hand auger borings. This report does not reflect conditions that may occur between the points investigated, or between sampling intervals in test borings. The nature and extent of variations between hand auger borings and sampling intervals may not become evident until the course of construction. Therefore, it is essential that on-site observations of subgrade conditions be performed during the construction period to determine if re-evaluation of the recommendations in this report must be made. It is critical to the successful completion of this project that GeoConcepts be retained during construction to observe the implementation of the recommendations provided herein.

This report has been prepared to aid in the evaluation of the site and to assist your office and the design professionals in the design of this project. It is intended for use with regard to the specific project as described herein. Changes in proposed construction, grading plans, stream relocation, etc. should be brought to our attention so that we may determine any effect on the recommendations presented herein.

An allowance should be established for additional costs that may be required for earthwork construction as recommended in this report. Additional costs may be incurred for various reasons including wet fill materials, soft subgrade conditions, unexpected groundwater problems, unexpected rock excavation, etc.

This report should be made available to bidders prior to submitting their proposals to supply them with facts relative to the subsurface conditions revealed by our investigation and the results of analyses and studies that have been performed for this project. In addition, this report should be given to the successful contractor and subcontractors for their information only.

We recommend the project specifications contain the following statement: "A geotechnical engineering report has been prepared for this project by GeoConcepts Engineering, Inc. This report is for informational purposes only and should not be considered part of the contract documents. The opinions expressed in this report are those of the geotechnical engineer and represent their interpretation of the subsoil conditions, tests and results of analyses that they performed. Should the data contained in this report not be adequate for the contractor's purposes, the contractor may make their own investigations, tests and analyses prior to bidding."

This report was prepared in accordance with generally accepted geotechnical engineering practices. No warranties, expressed or implied, are made as to the professional services included in this report.

We appreciate the opportunity to be of service for this project. Please contact the undersigned if you require clarification of any aspect of this report.

Sincerely,

GEOCONCEPTS ENGINEERING, INC.

Ashley Hogan, PG
Project Geologist

Tadeusz W. Lewis, PE
Principal

COMMONWEALTH OF VIRGINIA
TADEUSZ W. LEWIS
Lic. No. 021276
PROFESSIONAL ENGINEER

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REVISIONS:
DATE:

DRAWN BY: CDP, RH
DESIGNED BY: CDP
DATE: 11/07/2013
CHECKED BY: SCB, GCR
SCALE: N/A

SHEET: 43A OF 43
JOB#: 4966

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GeoConcepts Engineering, Inc.
19955 Highland Vista Drive, #170
Ashburn, Virginia 20147
703-726-8030
703-726-8032 fax

PROJECT: Stream Restoration Engineering
LOCATION: City of Falls Church
OWNER/CLIENT: Williamsburg Environmental Group, Inc.
PROJECT NUMBER: 13042
GROUND SURFACE ELEVATION (ft): NOT SURVEYED
LOGGED BY: J. April & L. Bolten
DRILLING CONTRACTOR: GeoConcepts Engineering, Inc.
DRILLER: J. April & L. Bolton
DRILLING METHOD: Hand Augers
BORING NUMBER: HA-1
SHEET 1 OF 1
DATE STARTED: 7/15/13
DATE COMPLETED: 7/15/13

DEPTH (ft)	STRATUM	MATERIAL DESCRIPTION	MC (%)	SAMPLE TYPE	DCP BLOW COUNTS	Geoprobe Penetration (in)
	A	silt FILL, moist, brown		▼	3+3+3	
1		LEAN CLAY (CL) with sand, moist, gray	22.8	▼	11+7+10	
2	B1	sandy LEAN CLAY (CL) with gravel, moist, brown and gray	21.6	▼	16+15+34	
3		POORLY GRADED SAND (SP), moist, gray		▼	28+40+45	
4	B2	Bottom of Hand Auger at 4.0 ft				
5						
6						
7						

GROUND WATER LEVELS:
ENCOUNTERED: None
UPON COMPLETION: Dry

SAMPLE TYPES: ▼ Dynamic Cone Penetrometer

REMARKS:

THE STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARIES. THE TRANSITION MAY BE GRADUAL.

BOREHOLE/TEST PIT LOGS.GPJ GEOCONCEPTS.GDT 11/1/13

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PROJECT: Stream Restoration Engineering
LOCATION: City of Falls Church
OWNER/CLIENT: Williamsburg Environmental Group, Inc.
PROJECT NUMBER: 13042
GROUND SURFACE ELEVATION (ft): NOT SURVEYED
LOGGED BY: J. April & L. Bolten
DRILLING CONTRACTOR: GeoConcepts Engineering, Inc.
DRILLER: J. April & L. Bolton
DRILLING METHOD: Hand Augers
BORING NUMBER: HA-2
SHEET 1 OF 1
DATE STARTED: 7/15/13
DATE COMPLETED: 7/15/13

DEPTH (ft)	STRATUM	MATERIAL DESCRIPTION	MC (%)	SAMPLE TYPE	DCP BLOW COUNTS	Geoprobe Penetration (in)
		sandy LEAN CLAY (CL), moist, light brown		▼	10+10+11	
1	B1		19.4	▼	4+5+20	
2		gray below 2.0 ft.	19.9	▼	50/0	
3		Hand Auger Refusal at 2.6 ft				
4						
5						
6						
7						

GROUND WATER LEVELS:
ENCOUNTERED: None
UPON COMPLETION: Dry

SAMPLE TYPES: ▼ Dynamic Cone Penetrometer

REMARKS:

THE STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARIES. THE TRANSITION MAY BE GRADUAL.

BOREHOLE/TEST PIT LOGS.GPJ GEOCONCEPTS.GDT 11/1/13

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PROJECT: Stream Restoration Engineering
LOCATION: City of Falls Church
OWNER/CLIENT: Williamsburg Environmental Group, Inc.
PROJECT NUMBER: 13042
GROUND SURFACE ELEVATION (ft): NOT SURVEYED
LOGGED BY: J. April & L. Bolten
DRILLING CONTRACTOR: GeoConcepts Engineering, Inc.
DRILLER: J. April & L. Bolton
DRILLING METHOD: Hand Augers
BORING NUMBER: HA-3
SHEET 1 OF 1
DATE STARTED: 7/15/13
DATE COMPLETED: 7/15/13

DEPTH (ft)	STRATUM	MATERIAL DESCRIPTION	MC (%)	SAMPLE TYPE	DCP BLOW COUNTS	Geoprobe Penetration (in)
		SILT (ML), moist, grayish brown	22.7	▼	6+5+4	
1		LEAN CLAY (CL), moist, gray		▼	10+7+8	
2		sandy LEAN CLAY (CL), moist, brownish gray		▼	6+7+9	
3			20.1	▼	48+50/0	0
4		wet below 4.0 ft.	33.3			
5		Hand Auger Refusal at 4.3 ft				
6						
7						

GROUND WATER LEVELS:
ENCOUNTERED: 4.0 ft
UPON COMPLETION: Dry

SAMPLE TYPES: ▼ Dynamic Cone Penetrometer

REMARKS:

THE STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARIES. THE TRANSITION MAY BE GRADUAL.

BOREHOLE/TEST PIT LOGS.GPJ GEOCONCEPTS.GDT 11/1/13

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PROJECT: Stream Restoration Engineering
LOCATION: City of Falls Church
OWNER/CLIENT: Williamsburg Environmental Group, Inc.
PROJECT NUMBER: 13042
GROUND SURFACE ELEVATION (ft): NOT SURVEYED
LOGGED BY: J. April & L. Bolten
DRILLING CONTRACTOR: GeoConcepts Engineering, Inc.
DRILLER: J. April & L. Bolton
DRILLING METHOD: Hand Augers
BORING NUMBER: HA-4
SHEET 1 OF 1
DATE STARTED: 7/15/13
DATE COMPLETED: 7/15/13

DEPTH (ft)	STRATUM	MATERIAL DESCRIPTION	MC (%)	SAMPLE TYPE	DCP BLOW COUNTS	Geoprobe Penetration (in)
		LEAN CLAY (CL), moist, brown		▼	5+6+6	
1	B1	black below 1.0 ft.	38.5	▼	7+10+14	
2		silty SAND (SM), moist, gray		▼	5+5+8	
3		wet, brown below 3.0 ft.	10.4	▼	7+9+16	
4	B2	moist, brownish gray below 4.0 ft.	27.6	▼	18+24+26	
5		Hand Auger Refusal at 5.0 ft				
6						
7						

GROUND WATER LEVELS:
ENCOUNTERED: 2.3 ft
UPON COMPLETION: Dry

SAMPLE TYPES: ▼ Dynamic Cone Penetrometer

REMARKS:

THE STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARIES. THE TRANSITION MAY BE GRADUAL.

BOREHOLE/TEST PIT LOGS.GPJ GEOCONCEPTS.GDT 11/1/13

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PROJECT: Stream Restoration Engineering
LOCATION: City of Falls Church
OWNER/CLIENT: Williamsburg Environmental Group, Inc.
PROJECT NUMBER: 13042
GROUND SURFACE ELEVATION (ft): NOT SURVEYED
LOGGED BY: J. April & L. Bolten
DRILLING CONTRACTOR: GeoConcepts Engineering, Inc.
DRILLER: J. April & L. Bolton
DRILLING METHOD: Hand Augers
BORING NUMBER: HA-5
SHEET 1 OF 1
DATE STARTED: 7/15/13
DATE COMPLETED: 7/15/13

DEPTH (ft)	STRATUM	MATERIAL DESCRIPTION	MC (%)	SAMPLE TYPE	DCP BLOW COUNTS	Geoprobe Penetration (in)
		SILT (ML), moist, brown				
1	B1		29.7	▼	4+3+4	
2		POORLY GRADED SAND (SP), moist, black	34.2	▼	8+2+3	
3	B2	Bottom of Boring at 2.5 ft				
4						
5						
6						
7						

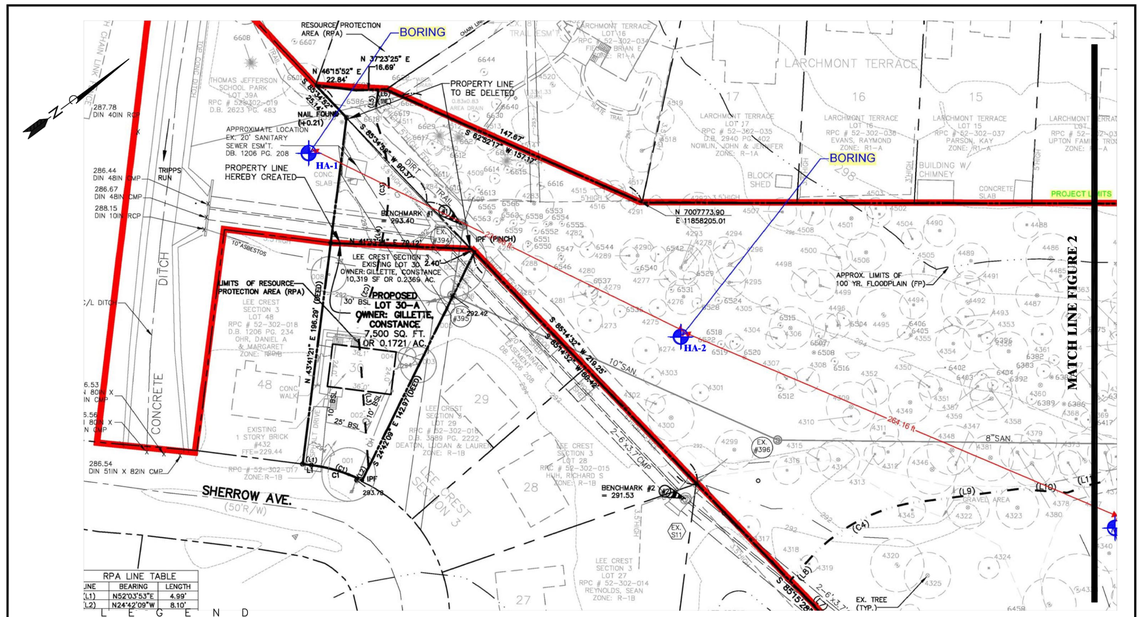
GROUND WATER LEVELS:
ENCOUNTERED: None
UPON COMPLETION: Dry

SAMPLE TYPES: ▼ Dynamic Cone Penetrometer

REMARKS:

THE STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARIES. THE TRANSITION MAY BE GRADUAL.

BOREHOLE/TEST PIT LOGS.GPJ GEOCONCEPTS.GDT 11/1/13



NOTE: BASE PLAN PROVIDED BY PATTON HARRIS RUST & ASSOCIATES DATED DECEMBER 2, 2010.

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HAND AUGER LOCATION PLAN

Date:	Checked By:	Scale:	Project No.:	Fig.
OCT. 2013	T.W.L.	AS SHOWN	13042	2

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DATE:

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DESIGNED BY: CDP
DATE: 11.07.2013
CHECKED BY: SCB, GCR
SCALE: N/A

SHEET: 43B OF 43
JOB#: 4966

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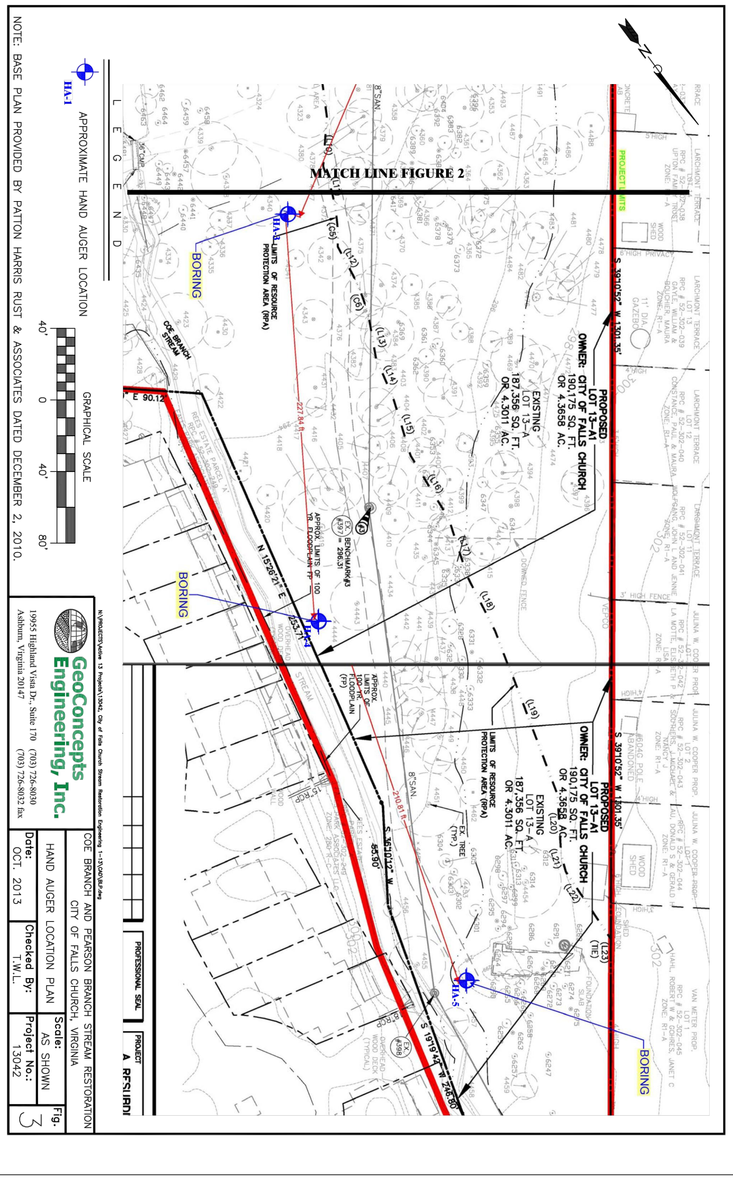

GEOTECHNICAL INFORMATION

COE BRANCH STREAM RESTORATION

CITY OF FALLS CHURCH, VIRGINIA

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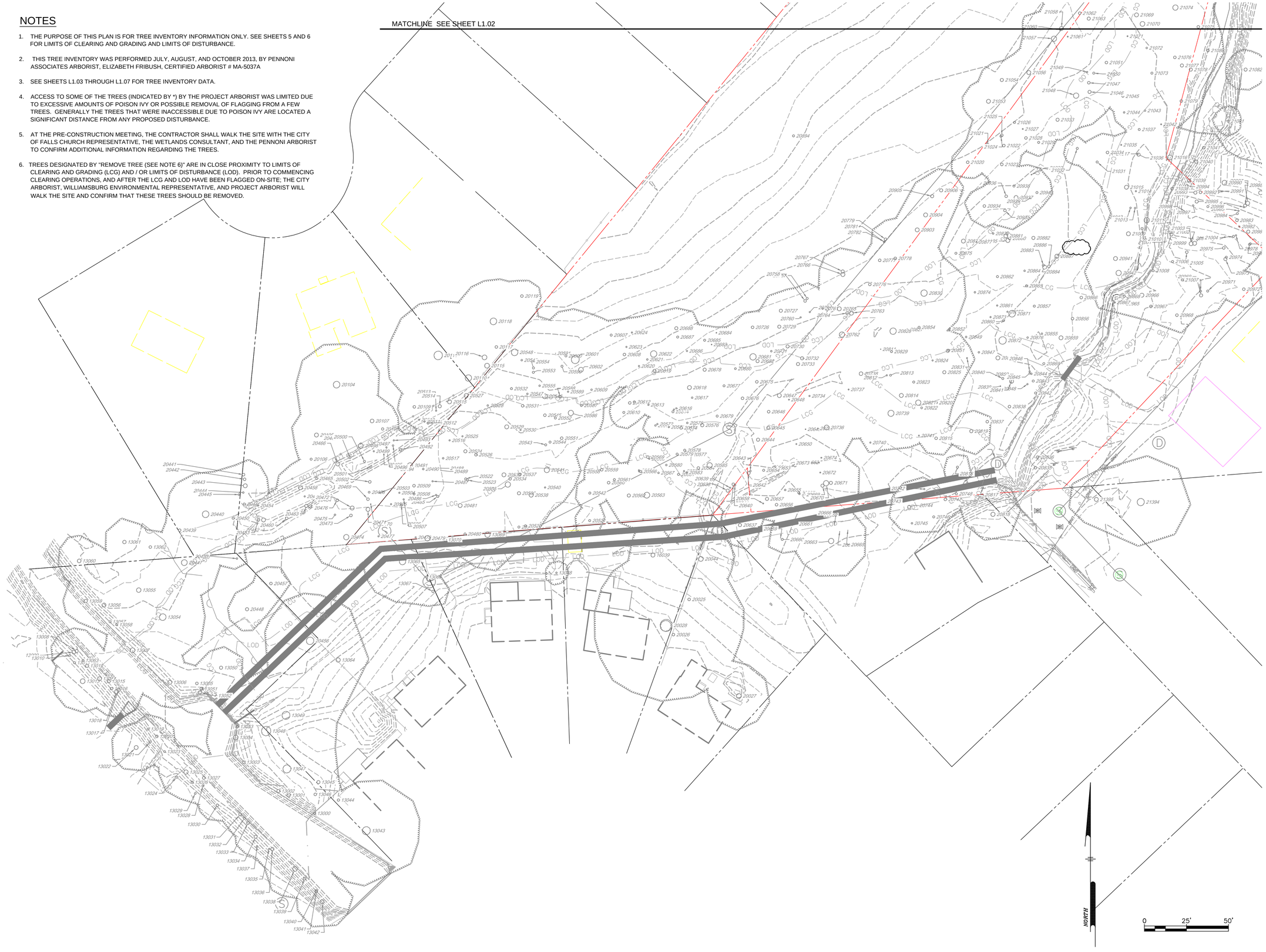
CHECKED BY: 11/07/2013
QUALITY CHECK BY: SCB, CCR
SCALE: N/A

SHEET 43C OF 43
JOB# 4966

NOTES

1. THE PURPOSE OF THIS PLAN IS FOR TREE INVENTORY INFORMATION ONLY. SEE SHEETS 5 AND 6 FOR LIMITS OF CLEARING AND GRADING AND LIMITS OF DISTURBANCE.
2. THIS TREE INVENTORY WAS PERFORMED JULY, AUGUST, AND OCTOBER 2013, BY PENNONI ASSOCIATES ARBORIST, ELIZABETH FRIBUSH, CERTIFIED ARBORIST # MA-5037A
3. SEE SHEETS L1.03 THROUGH L1.07 FOR TREE INVENTORY DATA.
4. ACCESS TO SOME OF THE TREES (INDICATED BY *) BY THE PROJECT ARBORIST WAS LIMITED DUE TO EXCESSIVE AMOUNTS OF POISON IVY OR POSSIBLE REMOVAL OF FLAGGING FROM A FEW TREES. GENERALLY THE TREES THAT WERE INACCESSIBLE DUE TO POISON IVY ARE LOCATED A SIGNIFICANT DISTANCE FROM ANY PROPOSED DISTURBANCE.
5. AT THE PRE-CONSTRUCTION MEETING, THE CONTRACTOR SHALL WALK THE SITE WITH THE CITY OF FALLS CHURCH REPRESENTATIVE, THE WETLANDS CONSULTANT, AND THE PENNONI ARBORIST TO CONFIRM ADDITIONAL INFORMATION REGARDING THE TREES.
6. TREES DESIGNATED BY "REMOVE TREE (SEE NOTE 6)" ARE IN CLOSE PROXIMITY TO LIMITS OF CLEARING AND GRADING (LCG) AND / OR LIMITS OF DISTURBANCE (LOD). PRIOR TO COMMENCING CLEARING OPERATIONS, AND AFTER THE LCG AND LOD HAVE BEEN FLAGGED ON-SITE; THE CITY ARBORIST, WILLIAMSBURG ENVIRONMENTAL REPRESENTATIVE, AND PROJECT ARBORIST WILL WALK THE SITE AND CONFIRM THAT THESE TREES SHOULD BE REMOVED.



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Engineers • Surveyors • Planners • Landscape Architects

DATE	NO.	REVISIONS	BY

ALL DIMENSIONS MUST BE VERIFIED BY CONTRACTOR AND OWNER MUST BE NOTIFIED OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK

Pennoni Associates Inc.

14532 Lee Road
Chantilly, VA 20151 - 703.449.6700

COE RUN STREAM VALLEY PARK
BROAD STREET
FALLS CHURCH, VIRGINIA
TREE INVENTORY PLAN

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NORTH

PROJECT NO. WEGI-1304
SHEET 1 OF 7

SCALE	DATE
1" = 25'	2013-11-15
DRAWN BY EFF	APPROVED DHS

DRAWING NO. L1.01

V:\PROJECTS\WEGI\WEGI-1304-COE RUN\L-101-102.DWG PLOTTED: ----, BY: ELIZABETH FRIBUSH PLOTSTYLE: PENNONI NCS.STB, PROJECT STATUS: ----

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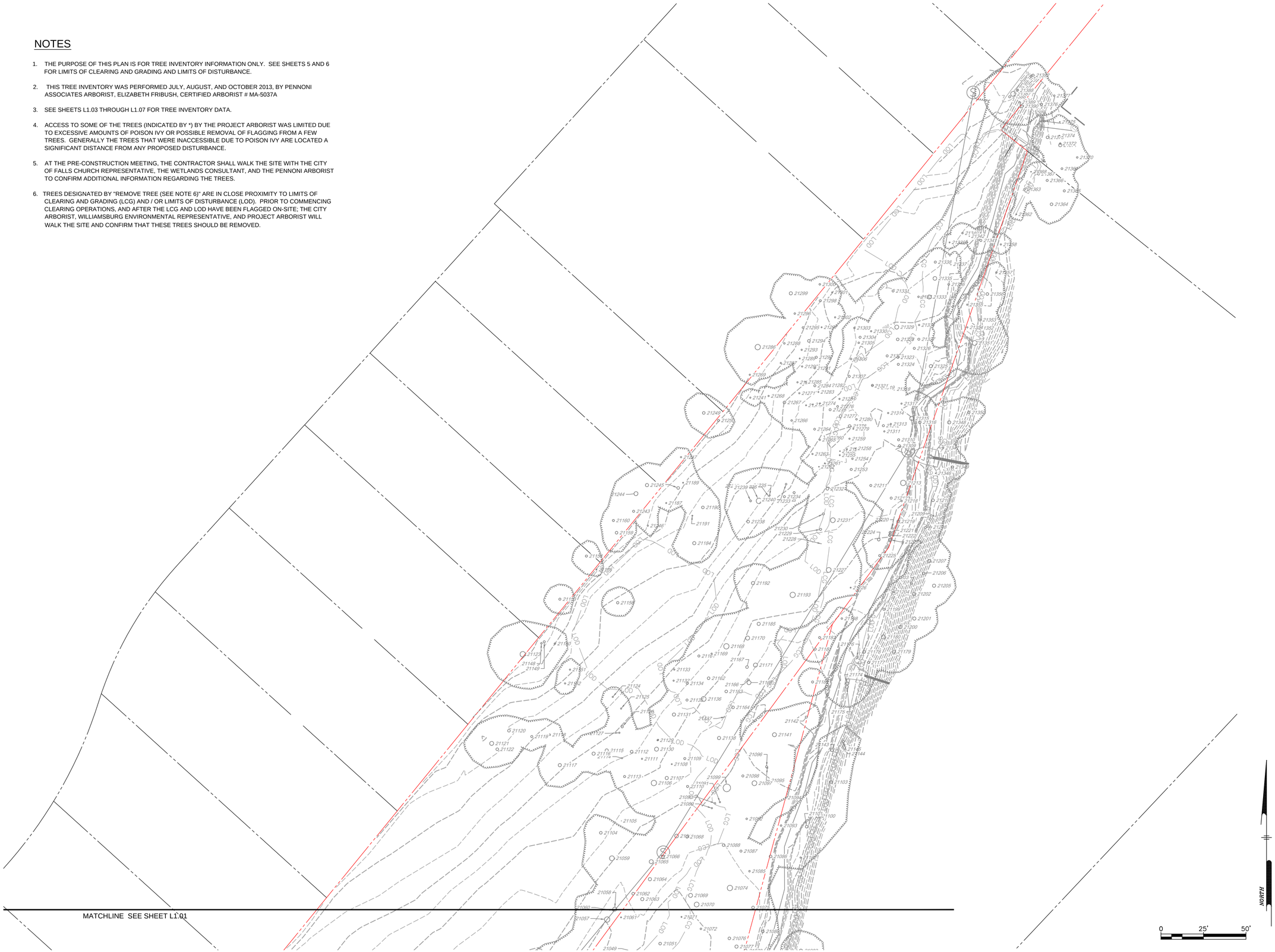
6. TREES DESIGNATED BY "REMOVE TREE (SEE NOTE 6)" ARE IN CLOSE PROXIMITY TO LIMITS OF CLEARING AND GRADING (LCG) AND / OR LIMITS OF DISTURBANCE (LOD). PRIOR TO COMMENCING CLEARING OPERATIONS, AND AFTER THE LCG AND LOD HAVE BEEN FLAGGED ON-SITE; THE CITY ARBORIST, WILLIAMSBURG ENVIRONMENTAL REPRESENTATIVE, AND PROJECT ARBORIST WILL WALK THE SITE AND CONFIRM THAT THESE TREES SHOULD BE REMOVED.



Pennoni

DATE	NO.	REVISIONS	BY

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NORTH

PROJECT NO. WEGI–1304
SHEET 2 OF 7

SCALE	DATE
1" = 25'	2013–11–15
DRAWN BY EFF	APPROVED DHS
DRAWING NO. L1.02	

V:\PROJECTS\WEGI\WEGI-1304-COE RUN\L-101-102.DWG PLOTTED: ----, BY: ELIZABETH FRIBUSH PLOTSTYLE: PENNONI NCS.STB, PROJECT STATUS: ----

TREE #	SIZE DBH (CANOPY)	SPECIES	COMMON NAME	SPECIES RATING	COMMENTS	CONDI-TION	RECOMMENDATION
13000	3", 3", 4" (9' CANOPY)	Acer ginnala	Amur Maple	80		0.6	Save
13001	2.5" (13' CANOPY)	Prunus serotina	Black Cherry	60	lean	0.5	Save
13002	5" (12' CANOPY)	Celtis occidentalis	Common Hackberry	60		0.5	Save
13003	4" (10' CANOPY)	Prunus serotina	Black Cherry	60		0.5	Save
13004	7" (18' CANOPY)	Albizia julibrissin	Mimosa	30	overgrown	0.6	Save
13005	5", 5" TWIN (10' CANOPY)	Cornus florida	Flowering Dogwood	50	poor form	0.7	REMOVE TREE FOR CONSTRUCTION
13006	6", 7" (15' CANOPY)	Celtis occidentalis	Common Hackberry	60	codominant stem	0.6	REMOVE TREE FOR CONSTRUCTION
13007	5",6",8" (18' CANOPY)	Celtis occidentalis	Common Hackberry	60		0.6	REMOVE TREE FOR CONSTRUCTION
13008	5" MULTI-STEM (12' CANOPY)	Amelanchier arborea	Shadbush	80		0.6	Save
13009	6", 3" TWIN (14' CANOPY)	Albizia julibrissin	Mimosa	40		0.5	Save
13010	4" (7' CANOPY)	Celtis occidentalis	Common Hackberry	60		0.5	Save
13011	3" TWIN (8' CANOPY)	Prunus serotina	Black Cherry	60	lean; codominant stem	0.5	Save
13012	3" CLUSTER (12' CANOPY)	Amelanchier arborea	Shadbush	80		0.7	Save
13013	12" (18' CANOPY)	Platanus occidentalis	American Sycamore	60	full crown; open grown	0.8	Save
13014	9" (15' CANOPY)	Liriodendron tulipifera	Tulip Polar	70		0.8	Save
13015	5" (12' CANOPY)	Acer ginnala	Amur Maple	80		0.7	Save
13016	5" (10' CANOPY)	Celtis occidentalis	Common Hackberry	60		0.6	Save
13017	4" (13' CANOPY)	Prunus serotina	Black Cherry	60	lean	0.5	Save
13018	4" CLUSTER (15' CANOPY)	Acer ginnala	Amur Maple	80		0.5	Save
13019	4" (8' CANOPY)	Prunus serotina	Black Cherry	60	poor form	0.5	Save
13020	5" (10' CANOPY)	Fraxinus pennsylvanica	Green Ash	30	Risk of elmerald ash borer; must treat to save ash.	0.6	Save
13021	4" (9' CANOPY)	Acer ginnala	Amur Maple	80		0.7	Save
13022	6", 3", 9" (15' CANOPY)	Betula nigra	River Birch	70	3-Stem	0.7	Save
13023	4" (7' CANOPY)	Fraxinus pennsylvanica	Green Ash	30	Risk of elmerald ash borer; must treat to save ash.	0.7	Save
13024	3" TWIN (8' CANOPY)	Celtis occidentalis	Common Hackberry	60	co-dominant stem	0.6	Save
13025	10" (16' CANOPY)	Liriodendron tulipifera	Tulip Polar	75	good form	0.8	Save
13026	2" (9' CANOPY)	Morus alba	Common Mulberry	40		0.6	Save
13027	6" (11' CANOPY)	Carya glabra	Hickory	80		0.6	Save
13028	3" (8' CANOPY)	Amelanchier spp.	Shadbush	80		0.6	Save
13029	3" CLUSTER (7' CANOPY)	Tilia americana	Linden	70		0.6	Save
13030	6" (10' CANOPY)	Tilia americana	Linden	70		0.6	Save
13031	8" (11' CANOPY)	Prunus serotina	Black Cherry	60		0.7	Save
13032	4" (8' CANOPY)	Ulmus americana	American Elm	50	Dutch Elm Disease is a threat to any Elm	0.7	Save
13033	5" (11' CANOPY)	Ulmus americana	American Elm	50	Dutch Elm Disease is a threat to any Elm	0.7	Save
13034	4" CLUSTER (12' CANOPY)	Acer ginnala	Amur Maple	80		0.6	Save
13035	2" (4' CANOPY)	Acer saccharum	Sugar Maple	70		0.8	Save
13036	7" (12' CANOPY)	Carya glabra	Hickory	80		0.6	Save
13037	4" (6' CANOPY)	Fraxinus pennsylvanica	Green Ash	30	Risk of elmerald ash borer; must treat to save ash.	0.7	Save
13038	8" TWIN (18' CANOPY)	Prunus serotina	Black Cherry	60		0.5	Save
13039	4" (11' CANOPY)	Acer ginnala	Amur Maple	80	lean	0.6	Save
13040	3" (10' CANOPY)	Acer rubrum	Red Maple	75		0.6	Save
13041	4" (10' CANOPY)	Acer rubrum	Red Maple	75		0.7	Save
13042	4", 6" (15' CANOPY)	Celtis occidentalis	Common Hackberry	60	co-dominant stem	0.6	Save
13043	21" TRIPLE (30' CANOPY)	Acer rubrum	Red Maple	75	3 stem at 8' above grade; but full crown	0.8	Save
13044	6", 7" (9' CANOPY)	Ilex x 'Nellie Stevens'	Nellie Stevens Holly	70		0.8	Save
13045	14" (12' CANOPY)	Ilex spp.	Holly	70		0.8	Save
13046	3" (10' CANOPY)	Cornus florida	Flowering Dogwood	50		0.7	Save
13047	20" (30' CANOPY)	Acer rubrum	Red Maple	75		0.8	Save
13048	45" (35' CANOPY)	Platanus occidentalis	American Sycamore	60	full crown; open grown	0.8	Save
13049	42" (30' CANOPY)	Platanus occidentalis	American Sycamore	60	full crown; open grown	0.8	Save
13050	8" (12' CANOPY)	Acer rubrum	Red Maple	75		0.8	REMOVE TREE FOR CONSTRUCTION
13051	3" TWIN (11' CANOPY)	Morus alba	Common Mulberry	40	poor form, co-dominant stem	0.5	REMOVE TREE FOR CONSTRUCTION
13052	5" (13' CANOPY)	Celtis occidentalis	Common Hackberry	60	lean	0.6	Save
13053	3" (9' CANOPY)	Acer ginnala	Amur Maple	80		0.6	Save
13054	27" (25' CANOPY)	Fraxinus pennsylvanica	Green Ash	30	Risk of elmerald ash borer; must treat to save ash.	0.8	REMOVE TREE FOR CONSTRUCTION

TREE #	SIZE DBH (CANOPY)	SPECIES	COMMON NAME	SPECIES RATING	COMMENTS	CONDI-TION	RECOMMENDATION
13055	15" (17' CANOPY)	Pinus strobus	Eastern White Pine	50		0.8	Save
13056	5" TRIPLE (15' CANOPY)	Celtis occidentalis	Common Hackberry	60	3 stem	0.6	Save
13057	3" CLUSTER (8' CANOPY)	Cornus florida	Flowering Dogwood	50		0.7	Save
13058	4" (8' CANOPY)	Liriodendron tulipifera	Tulip Polar	70		0.8	Save
13059	7" (13' CANOPY)	Cornus florida	Flowering Dogwood	50		0.7	Save
13060	7" (14' CANOPY)	Carya glabra	Hickory	80	Vines may obscure hazard	0.6	Save
13061	5" (13' CANOPY)	Carpinus caroliniana	American Hornbeam	70		0.7	Save
13062	4" (10' CANOPY)	Carpinus caroliniana	American Hornbeam	70		0.7	Save
13063	4" (7' CANOPY)	Fraxinus pennsylvanica	Green Ash	30	Risk of elmerald ash borer; must treat to save ash.	0.8	Save
13064	8" TWIN (16' CANOPY)	Quercus rubra	Red Oak	80		0.72	Save
13065	12" (24' CANOPY)	Carya glabra	Hickory	80	Dieback in crown.	0.75	Save
13066	3" TRIPLE (7' CANOPY)	Ligustrum spp.	Privet	50		0.7	Save
13067	5" (9' CANOPY)	Cornus florida	Dogwood	50		0.7	Save
13069	12" (20' CANOPY)	Quercus rubra	Red Oak	80	Co-dominant stem at 18' above grade	0.7	Save
13070	5" TWIN (10' CANOPY)	Ilex x 'Nellie Stevens'	Nellie Stevens Holly	70	open grown	0.8	Save
16039	6" TWIN (15' CANOPY)	Deciduous Tree *					Save
16040	56" (40' CANOPY)	Acer saccharinum	Silver Maple	50	Co-dominant stem with 20028	0.7	Save
20025	3" (10' CANOPY)	Morus alba	Common Mulberry	40		0.6	Save
20026	4" (10' CANOPY)	Morus alba	Common Mulberry	40			Save
20027	22" (18' CANOPY)	Deciduous Tree *					Save
20028	60" (45' CANOPY)	Acer saccharinum	Silver Maple	50	Co-dominant stem with 16040	0.7	Save
20044	10" QUAD (18' CANOPY)	Fraxinus pennsylvanica	Green Ash	30	Risk of elmerald ash borer; must treat to save ash. Multi-stem tree.	0.7	Save
20104	32" 2976 (25' CANOPY)	Liriodendron tulipifera	Tulip tree	75	Sparse stunted growth.	0.6	Save
20105	11" 60 (15' CANOPY)	Prunus serotina	Black Cherry	60	poor form	0.5	Save
20106	8" 57 (8' CANOPY)	Quercus spp.	Oak	80	Vines may obscure hazard	0.7	Save
20107	6" (14' CANOPY)	Ulmus americana	American Elm	50	Dutch Elm Disease is a threat to any Elm	0.8	Save
20108	5" (9' CANOPY)	Prunus spp.	Cherry	60		0.7	Save
20109	5" (10' CANOPY)	Ulmus americana	American Elm	50	Dutch Elm Disease is a threat to any Elm	0.8	Save
20110	36" DEAD (24' CANOPY)	Dead DeciduousTree					REMOVE THIS TREE-HAZARD
20111	22" 2973 (32' CANOPY)	Fraxinus pennsylvanica	Green Ash	30	Sparse growth. Risk of elmerald ash borer; must treat to save ash.	0.7	Save
20112	6"	Betulus spp.	Birch			0.7	Save
20115	12" (18' CANOPY)	Acer rubrum	Red Maple	75		0.8	Save
20116	10" (18' CANOPY)	Acer rubrum	Red Maple	75		0.7	Save
20117	7" (10' CANOPY)	Acer rubrum	Red Maple	75	Vines may obscure hazard.	0.7	Save
20118	21" (25' CANOPY)	Acer rubrum	Red Maple	75	sparse crown	0.6	Save
20119	9" (10' CANOPY)	Pinus strobus	Eastern White Pine	50		0.8	Save
20126	32" (23' CANOPY)	Liriodendron tulipifera	Tulip Polar	75		0.8	Save
20128	27" (27' CANOPY)	Quercus rubra *	Red Oak	80		0.7	Save
20439	14" (10' CANOPY)	Morus alba	Common Mulberry	40		0.5	Save
20440	30" (25' CANOPY)	Liriodendron tulipifera	Tulip Polar	75		0.7	Save
20441	8" (10' CANOPY)	Pinus strobus	Eastern White Pine	50	Vines may obscure hazard.	0.7	Save
20442	6" (10' CANOPY)	Pinus strobus	Eastern White Pine	50		0.7	Save
20443	12" (15' CANOPY)	Pinus strobus	Eastern White Pine	50	Vines may obscure hazard.	0.8	Save
20444	3" (6' CANOPY)	Pinus strobus	Eastern White Pine	50	Vines may obscure hazard.	0.6	Save
20445	3" (6' CANOPY)	Pinus strobus	Eastern White Pine	50		0.6	Save
20446	5" (8' CANOPY)	Pinus strobus	Eastern White Pine	50		0.8	Save
20447	20" (22' CANOPY)	Liriodendron tulipifera	Tulip Polar	75		0.8	REMOVE TREE FOR CONSTRUCTION
20448	8" (12' CANOPY)	Acer rubrum	Red Maple	75	Vines may obscure hazard.	0.7	REMOVE TREE FOR CONSTRUCTION
20450	5" (8' CANOPY)	Carya glabra	Hickory	80	Vines may obscure hazard	0.6	Save
20451	8" (10' CANOPY)	Celtis occidentalis	Common Hackberry	60		0.6	Save
20452	12" (15' CANOPY)-	Fraxinus pennsylvanica	Green Ash	30	must treat to save ash. Co-dominant at 14" AG. Vines may obscure hazard	0.5	REMOVE TREE FOR CONSTRUCTION
20453	4" (10' CANOPY)	Fraxinus pennsylvanica *	Green Ash	30	Risk of elmerald ash borer; must treat to save ash. Lean. Vines may obscure hazard	0.5	REMOVE TREE FOR CONSTRUCTION
20454	2" (5' CANOPY)	Quercus rubra	Red Oak	80		0.8	REMOVE TREE FOR CONSTRUCTION
20455	3" (6' CANOPY)	Pinus strobus	Eastern White Pine	50		0.7	REMOVE TREE FOR CONSTRUCTION
20456	30" POP (28' CANOPY)	Liriodendron tulipifera	Tulip Polar	70			Save

TREE #	SIZE DBH (CANOPY)	SPECIES	COMMON NAME	SPECIES RATING	COMMENTS	CONDI-TION	RECOMMENDATION
20457	6" LOC (10' CANOPY)	Robinia pseudoacaia	Black Locust			0.5	REMOVE TREE FOR CONSTRUCTION
20458	10" (15' CANOPY)	Juglans nigra	Black Walnut	75		0.6	REMOVE TREE FOR CONSTRUCTION
20459	12" (15' CANOPY)	Deciduous Tree *					REMOVE TREE FOR CONSTRUCTION
20460	4" (5' CANOPY)	Pinus strobus	Eastern White Pine	50		0.7	REMOVE TREE FOR CONSTRUCTION
20461	4" (10' CANOPY)	Quercus rubra	Red Oak	80		0.6	Save
20462	6" (10' CANOPY)	Carya glabra	Hickory	80		0.6	REMOVE TREE FOR CONSTRUCTION
20463	12" (12' CANOPY)	Fraxinus pennsylvanica	Green Ash	30	Vines may obscure hazard. Risk of elmerald ash borer; must treat to save ash.	0.7	REMOVE TREE FOR CONSTRUCTION
20464	10" (12' CANOPY)	Carya glabra	Hickory	80	crook	0.7	REMOVE TREE FOR CONSTRUCTION
20465	6" (8' CANOPY)						REMOVE TREE FOR CONSTRUCTION
20466	15" OAK (15' CANOPY)	Quercus rubra	Red Oak	80	Declining conditions. Vines may obscure hazard.	0.6	REMOVE TREE FOR CONSTRUCTION
20467	3" (8' CANOPY)	Fraxinus pennsylvanica	Green Ash	30	Vines may obscure hazard. Risk of elmerald ash borer; must treat to save ash.	0.7	REMOVE TREE FOR CONSTRUCTION
20468	3" (7' CANOPY)	Celtis occidentalis	Common Hackberry	60	Vines may obscure hazard.	0.6	REMOVE TREE FOR CONSTRUCTION
20469	5" (10' CANOPY)	Deciduous Tree *					REMOVE TREE FOR CONSTRUCTION
20470	2" (3' CANOPY)	Juniperus virginiana	Eastern Red Cedar	70		0.6	REMOVE TREE FOR CONSTRUCTION
20471	8" TRIPLE (15' CANOPY)	Carya glabra	Hickory	80	Dieback in crown.	6	REMOVE TREE FOR CONSTRUCTION
20472	15" (15' CANOPY)	Carya glabra	Hickory	80		0.7	REMOVE TREE FOR CONSTRUCTION
20473	10" (10' CANOPY)	Juglans nigra	Black Walnut	75	lean	0.6	REMOVE TREE FOR CONSTRUCTION
20474	18" (20' CANOPY)	Carya glabra	Hickory	80		0.6	REMOVE TREE FOR CONSTRUCTION
20475	6" DEAD (6' CANOPY)	Dead Deciduous Tree				0	REMOVE TREE FOR CONSTRUCTION
20475	10"	Juglans nigra	Black Walnut		lean/ crook	7	Save
20476	6" TWIN (10' CANOPY)	Carya glabra	Hickory	80	Vines may obscure hazard.	0.6	REMOVE TREE FOR CONSTRUCTION
20477	2" (5' CANOPY)	Ulmus americana	American Elm	50	Dutch Elm Disease is a threat to any Elm	0.6	Save
20478	3" (5' CANOPY)	Morus alba	Common Mulberry	40	lean	0.5	REMOVE TREE FOR CONSTRUCTION
20479	20" OAK (20' CANOPY)	Quercus palustris	Pin Oak	70	some dead branches in crown	0.7	Save
20480	10" PINE (8' CANOPY)	Pinus strobus	Eastern White Pine	50		0.75	Save
20481	15" MAP (15' CANOPY)	Acer rubrum	Red Maple	75	Vines may obscure hazard.	0.7	REMOVE TREE FOR CONSTRUCTION
20485	6" (8' CANOPY)	Ulmus americana	American Elm	50	Dutch Elm Disease is a threat to any Elm	0.6	REMOVE TREE FOR CONSTRUCTION
20486	4" (5' CANOPY)	Ulmus americana	American Elm	50	Dutch Elm Disease is a threat to any Elm	0.6	REMOVE TREE FOR CONSTRUCTION
20487	4" (5' CANOPY)	Ulmus americana	American Elm	50	Dutch Elm Disease is a threat to any Elm	0.6	REMOVE TREE FOR CONSTRUCTION
20488	3" (5' CANOPY)	Morus alba	Common Mulberry	40		0.6	REMOVE TREE FOR CONSTRUCTION
20489	5" (8' CANOPY)	Morus alba	Common Mulberry	40		0.6	REMOVE TREE FOR CONSTRUCTION
20490	3" IRONWOOD (6' CANOPY)	Carpinus caroliniana	American Hornbeam	70		0.6	REMOVE TREE FOR CONSTRUCTION
20491	21" (20' CANOPY)	Fraxinus pennsylvanica	Green Ash	30	Sparse growth. Risk of elmerald ash borer; must treat to save ash.	0.7	REMOVE TREE FOR CONSTRUCTION
20492	5" (10' CANOPY)	Deciduous Tree *					REMOVE TREE FOR CONSTRUCTION
20493	3" (5' CANOPY)	Ulmus americana *	American Elm	50	Dutch Elm Disease is a threat to any Elm	0.6	REMOVE TREE FOR CONSTRUCTION
20494	4" (6' CANOPY)	Ulmus americana *	American Elm	50	Dutch Elm Disease is a threat to any Elm	0.6	REMOVE TREE FOR CONSTRUCTION
20495	3" (5' CANOPY)	Ulmus americana *	American Elm	50	Dutch Elm Disease is a threat to any Elm	0.6	REMOVE TREE FOR CONSTRUCTION
20496	3" (5' CANOPY)	Carya glabra *	Hickory	80	Vines may obscure hazard.	0.6	REMOVE TREE FOR CONSTRUCTION
20497	4" HOL (8' CANOPY)	Ilex opaca	American Holly	70		0.6	REMOVE FOR CONSTRUCTION
20498	18" (18' CANOPY)	Fraxinus pennsylvanica	Green Ash	30	Vines may obscure hazard.	0.5	REMOVE TREE FOR CONSTRUCTION
20499	3" (5' CANOPY)	Evergreen Tree *					REMOVE TREE FOR CONSTRUCTION
20500	4" (8' CANOPY)	Evergreen Tree *					REMOVE TREE FOR CONSTRUCTION
20501	5" (8' CANOPY)	Carya glabra	Hickory	80	Lean. Vines may obscure hazard.	0.6	REMOVE TREE FOR CONSTRUCTION
20502	8" (10' CANOPY)	Carya glabra	Hickory	80	Vines may obscure hazard.	0.6	REMOVE TREE FOR CONSTRUCTION
20503	2" (4' CANOPY)	Juniperus virginiana	Eastern Red Cedar	70	Vines may obscure hazard.	0.6	Save
20504	3" (5' CANOPY)	Ulmus americana	American Elm	50	Dutch Elm Disease is a threat to any Elm	0.6	Save
20505	3" (5' CANOPY)	Ulmus americana	American Elm	50	Dutch Elm Disease is a threat to any Elm	0.6	REMOVE TREE FOR CONSTRUCTION

THIS SHEET IS FOR TREE INVENTORY INFORMATION PURPOSES ONLY

Pennoni

Engineers Surveyors Planners Landscape Architects

Pennoni Associates Inc.

14532 Lee Road
Chantilly, VA 20151 – 703.449.6700

DATE	NO.	REVISIONS	BY
1/20/14	1	CITY OF FALLS CHURCH	WEG

ALL DIMENSIONS MUST BE VERIFIED BY CONTRACTOR AND OWNER MUST BE NOTIFIED OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK

COE RUN STREAM VALLEY PARK

BROAD STREET
FALLS CHURCH, VIRGINIA

TREE INVENTORY PLAN

ALL DOCUMENTS PREPARED BY PENNONI ASSOCIATES ARE INSTRUMENTS OF SERVICE IN RESPECT OF THE PROJECT. THEY ARE NOT INTENDED OR REPRESENTED TO BE SUITABLE FOR REUSE BY OWNER OR OTHERS ON THE EXTENSIONS OF THE PROJECT OR ON ANY OTHER PROJECT. ANY REUSE WITHOUT WRITTEN VERIFICATION OR ADAPTATION BY PENNONI ASSOCIATES FOR THE SPECIFIC PURPOSE INTENDED WILL BE AT OWNERS SOLE RISK AND WITHOUT LIABILITY OR LEGAL EXPOSURE TO PENNONI ASSOCIATES; AND OWNER SHALL INDEMNIFY AND HOLD HARMLESS PENNONI ASSOCIATES FROM ALL CLAIMS, DAMAGES, LOSSES AND EXPENSES ARISING OUT OF OR RESULTING THEREFROM.

NORTH

PROJECT NO.	SHEET
WEGI–1304	3 OF 7

SCALE	DATE
1" = 25'	2013–11–15
DRAWN BY	APPROVED
EFF	DHS

DRAWING NO.
L1.03

W:\FREDJOBFILES\4900'S\4966 – STREAM RESTORATION ENGINEERING COE BRANCH, PEARSON\9500–PENNONI\EX TREE INFO\NOV 2013\L–103–106–TRE–CHART.DWG PLOTTED: 1/16/2014 4:17:31 PM, BY: SARAH WOODFORD PLOTSTYLE: 4000–B&W.CTB, PROJECT STATUS: ----

20507	3" (5' CANOPY)	Deciduous Tree			Access limited due to poison ivy		REMOVE FOR CONSTRUCTION
20508	4" (8' CANOPY)	Deciduous Tree			Access limited due to poison ivy		REMOVE TREE FOR CONSTRUCTION
20509	6" (10' CANOPY)	Deciduous Tree			Access limited due to poison ivy		REMOVE TREE FOR CONSTRUCTION
20510	4" (5' CANOPY)	Deciduous Tree			Access limited due to poison ivy		Save
20511	3" (5' CANOPY)	Deciduous Tree			Access limited due to poison ivy		Save
20512	4" (8' CANOPY)	Deciduous Tree			Access limited due to poison ivy		Save
20513	3" (5' CANOPY)	Deciduous Tree			Access limited due to poison ivy		Save
20514	12" (12' CANOPY)	Nyssa sylvatica	Black Gum		Vines may obscure hazard.	0.7	Save
20515	15" MAP (15' CANOPY)	Acer rubrum	Red Maple	75	Vines may obscure hazard.	0.7	Save
		Fraxinus pennsylvanica	Green Ash	30	DANGER- Large sections of deadwood could fall. Vines may obscure hazard. Risk of	0.7	Save- prune deadwood and monitor
20516	3" (5' CANOPY)	Morus alba	Common Mulberry	40		0.6	REMOVE TREE FOR CONSTRUCTION
20517	4" (6' CANOPY)	Deciduous Tree *					REMOVE TREE FOR CONSTRUCTION
20519	3" MAP (8' CANOPY)	Acer saccharinum	Silver Maple	40		0.5	Save
20520	3" MAL (8' CANOPY)	Acer ginnala	Amur Maple	80		0.7	Save
20521	5" (8' CANOPY)	Ulmus americana	American Elm	50	Dutch Elm Disease is a threat to any Elm	0.6	REMOVE TREE FOR CONSTRUCTION
20522	4" (8' CANOPY)	Deciduous Tree *					REMOVE TREE FOR CONSTRUCTION
20523	5" (8' CANOPY)	Deciduous Tree *					REMOVE TREE FOR CONSTRUCTION
20524	12" (12' CANOPY)	Fraxinus pennsylvanica	Green Ash	30	elmerald ash borer; must treat to save ash.	0.7	REMOVE TREE FOR CONSTRUCTION
20525	3" MAP (5' CANOPY)	Acer rubrum	Red Maple	75		0.7	REMOVE TREE FOR CONSTRUCTION
20526	8" MAP (10' CANOPY)	Acer rubrum	Red Maple	75		0.4	REMOVE TREE FOR CONSTRUCTION
20527	12" TWIN (15' CANOPY)	Ulmus americana	American Elm	50	Elm Disease is a threat to any Elm	0.7	Save
20528	3" (6' CANOPY)	Carya glabra	Hickory	80		0.6	REMOVE TREE FOR CONSTRUCTION
20529	14" MAP (15' CANOPY)	Acer rubrum	Red Maple	75	Vines may obscure hazard.	0.7	REMOVE TREE FOR CONSTRUCTION
20530	3" MAP (5' CANOPY)	Acer rubrum	Red Maple	75		0.7	REMOVE TREE FOR CONSTRUCTION
20531	8" (10' CANOPY)	Carya glabra	Hickory	80		0.6	REMOVE FOR CONSTRUCTION
20532	4" OAK (8' CANOPY)	Quercus rubra	Red Oak	80		0.7	REMOVE TREE (SEE L1.01-L1.02 NOTE 6)
20533	12" MAP (15' CANOPY)	Acer rubrum	Red Maple	75		0.6	REMOVE TREE FOR CONSTRUCTION
20534	8" MAP (10' CANOPY)	Acer rubrum	Red Maple	75		0.7	REMOVE TREE FOR CONSTRUCTION
20535	14" (20' CANOPY)	Fraxinus pennsylvanica	Green Ash	30	Risk of elmerald ash borer; must treat to save ash.	0.7	REMOVE TREE FOR CONSTRUCTION
20536	8" (12' CANOPY)	Ulmus americana	American Elm	50	Dutch Elm Disease is a threat to any Elm	0.6	Save
20537	10" (10' CANOPY)	Carya glabra	Hickory	80		0.6	REMOVE FOR CONSTRUCTION
20538	18" (15' CANOPY)	Fraxinus pennsylvanica	Green Ash	30	a risk of failure. Risk of elmerald ash borer; must treat to save ash.	0.5	REMOVE TREE
20540	3" (5' CANOPY)	Carya glabra	Hickory	80		0.6	Save
20541	30" OAK (20' CANOPY)	Quercus rubra	Red Oak	80	thinning crown	0.7	REMOVE TREE FOR CONSTRUCTION
20542	8" (8' CANOPY)	Ulmus americana	American Elm	50	Dutch Elm Disease is a threat to any Elm	0.6	Save
20543	5" MAP (8' CANOPY)	Acer rubrum	Red Maple	75		0.6	REMOVE TREE FOR CONSTRUCTION
20544	4" IRON (8' CANOPY)	Carpinus caroliniana	American Hornbeam	70		0.7	REMOVE TREE FOR CONSTRUCTION
20545	10" MAP (10' CANOPY)	Acer rubrum	Red Maple	75		0.7	REMOVE TREE FOR CONSTRUCTION
20546	18" POP (18' CANOPY)	Liriodendron tulipifera	Tulip tree	75	Sparse growth.	0.7	REMOVE FOR CONSTRUCTION
20547	4" (6' CANOPY)	Deciduous Tree *					Save
20548	24" (25' CANOPY)	Fraxinus pennsylvanica	Green Ash	30	Risk of elmerald ash borer; must treat to save ash. Dead branches in crown.	0.7	Save
20549	5" (6' CANOPY)	Deciduous Tree *					Save
20551	10" (10' CANOPY)	Liriodendron tulipifera	Tulip Tree	75		0.7	REMOVE TREE FOR CONSTRUCTION
20552	3" MAP (8' CANOPY)	Deciduous Tree *					REMOVE TREE FOR CONSTRUCTION
20553	4" (8' CANOPY)	Deciduous Tree *					Save
20554	5" OAK (8' CANOPY)	Deciduous Tree *					Save
20555	3" (6' CANOPY)	Deciduous Tree *					REMOVE TREE
20558	14" DEAD (0' CANOPY)	Quercus rubra	Red Oak	80		0	REMOVE TREE FOR CONSTRUCTION
20559	8" MAP (10' CANOPY)	Acer rubrum	Red Maple	75	crook	0.7	REMOVE TREE FOR CONSTRUCTION
20560	8" MAP (10' CANOPY)	Acer rubrum	Red Maple	75	Vines may obscure hazard.	0.7	Save
20561	5" MAP (8' CANOPY)	Acer rubrum	Red Maple	75		0.8	Save
20562	12" (12' CANOPY)	Ulmus americana	American Elm	50	Dutch Elm Disease is a threat to any Elm	0.7	Save
20563	24" OAK (22' CANOPY)	Quercus rubra	Red Oak	80	Vines may obscure hazard. Prune roots.	0.7	Save
20564	3" MAP (5' CANOPY)	Liquidambar styriciflua	Sweet Gum	70		0.6	Save
20565	3" MAP (5' CANOPY)	Acer rubrum	Red Maple	75		0.6	Save
20566	5" MAP (8' CANOPY)	Acer platanoides	Norway Maple	50		0.7	Save
20567	4" MAP (6' CANOPY)	Liquidambar styriciflua	Sweet Gum	70		0.6	REMOVE FOR CONSTRUCTION
20568	3" MAP (5' CANOPY)	Acer rubrum	Red Maple	75	lean, poor form	0.5	REMOVE TREE FOR CONSTRUCTION
20569	10" MAP (10' CANOPY)	Acer rubrum	Red Maple	75		0.8	REMOVE TREE FOR CONSTRUCTION
20570	5" MAP (B' CANOPY)	Acer rubrum	Red Maple	75		0.7	REMOVE TREE FOR CONSTRUCTION

20571	3" (6' CANOPY)	Ulmus americana	American Elm	50	Dutch Elm Disease is a threat to any Elm	0.5	REMOVE TREE FOR CONSTRUCTION
20572	3" MAP (5' CANOPY)	Acer pensylvanicum	Striped Maple	60		0.7	REMOVE TREE FOR CONSTRUCTION
20573	3" GUM (5' CANOPY)	Acer rubrum	Red Maple	75		0.6	REMOVE TREE FOR CONSTRUCTION
20574	10" MAP (10' CANOPY)	Acer rubrum	Red Maple	75	co-dominant stem at base	0.6	REMOVE TREE FOR CONSTRUCTION
20575	4" MAP (6' CANOPY)	Acer rubrum	Red Maple	75		0.6	Save
20576	12" (12' CANOPY)	Fraxinus pennsylvanica	Green Ash	30	Risk of elmerald ash borer; must treat to save ash.	0.5	REMOVE TREE FOR CONSTRUCTION
20577	4" MAP (8' CANOPY)	Acer rubrum	Red Maple	75		0.7	Save
20578	4" IRON (8' CANOPY)	Carpinus caroliniana	American Hornbeam	70		0.7	Save
20579	4" MAP (8' CANOPY)	Acer rubrum	Red Maple			0.7	Save
20580	3" (6' CANOPY)	Acer platanoides	Norway Maple	50		0.7	REMOVE TREE FOR CONSTRUCTION
20581	6" (8' CANOPY)	Fraxinus pennsylvanica	Green Ash	30	Risk of elmerald ash borer; must treat to save ash.	0.6	REMOVE FOR CONSTRUCTION
20582	3" (5' CANOPY)	Ulmus americana	American Elm	50	Slight lean. Dutch Elm Disease is a threat to any Elm	0.6	Save
20583	3" MAP (6' CANOPY)	Acer rubrum	Red Maple	75	slight lean	0.6	Save
20584	6" LOC (10' CANOPY)	Robinia pseudoacacia	Black Locust	50		0.6	Save
20585	21" GUM (20' CANOPY)	Liquidambar styriciflua	Tulip Tree		Vines may obscure hazard. Prune roots.	0.7	Save
20586	21" NO (20' CANOPY)	Deciduous Tree *			Limited Access.		REMOVE TREE FOR CONSTRUCTION
20587	6" MAP (8' CANOPY)	Acer rubrum	Red Maple	75			REMOVE TREE FOR CONSTRUCTION
20588	9" (10' CANOPY)	Deciduous Tree *			Limited Access.		Save
20589	3" OAK (5' CANOPY)	Quercus rubra	Red Oak	80		0.7	Save
20590	5" MAP (8' CANOPY)	Acer rubrum	Acer rubrum	75		0.7	Save
20591	15" DEAD (0' CANOPY)	Liriodendron tulipifera	Tulip Tree	75	Dead tree		Save
20593	15" (15' CANOPY)	Fraxinus pennsylvanica	Green Ash	30	Risk of elmerald ash borer; must treat to save ash. Vines. Sweep.	0.6	Save
20594	4" MAP (6' CANOPY)	Acer rubrum	Red Maple	75		0.6	Save
20595	3" MAP (5' CANOPY)	Acer rubrum	Red Maple	75	lean	0.6	Save
20597	18" 2963 (18' CANOPY)	Fraxinus pennsylvanica	Green Ash	30	Risk of elmerald ash borer. Excessive lean poses risk.	0.4	REMOVE THIS TREE-HAZARD
20600	3" (8' CANOPY)	Ulmus americana	American Elm	50	Dutch Elm Disease is a threat to any Elm	0.6	Save
20601	27" 2757 (30' CANOPY)	Liriodendron tulipifera	Tulip Tree	75	sparse growth	0.7	Save
20602	18" 2765 (18' CANOPY)	Liriodendron tulipifera	Tulip Tree	75	sparse growth	0.7	Save
20607	8" (8' CANOPY)	Deciduous Tree *			Limited Access.		Save
20608	8" 2764 (10' CANOPY)	Fraxinus pennsylvanica	Green Ash	30	Risk of elmerald ash borer. Vines may obscure hazard.	0.4	Save
20609	5" 11 (6' CANOPY)	Deciduous Tree *			Limited Access.		Save
20610	5" 10 (8' CANOPY)	Acer rubrum	Red Maple	75	trunk damage; poor form	0.5	REMOVE TREE FOR CONSTRUCTION
20611	10" 7 (10' CANOPY)	Liquidambar styriciflua	Sweet Gum	70		0.6	REMOVE TREE FOR CONSTRUCTION
20612	8" 8 (8' CANOPY)	Acer rubrum	Red Maple	75		0.7	REMOVE TREE FOR CONSTRUCTION
20613	3" 9 (5' CANOPY)	Acer rubrum	Red Maple	75	poor form	0.5	REMOVE TREE FOR CONSTRUCTION
20614	5" (8' CANOPY)	Deciduous Tree *			Limited Access.		REMOVE TREE FOR CONSTRUCTION
20615	2" (5' CANOPY)	Deciduous Tree *			Limited Access.		REMOVE TREE FOR CONSTRUCTION
20616	4" (5' CANOPY)	Deciduous Tree *			Limited Access.		REMOVE TREE FOR CONSTRUCTION
20617	4" 4 (6' CANOPY)	Deciduous Tree *			Limited Access.		REMOVE TREE FOR CONSTRUCTION
20618	15" 2766 (15' CANOPY)	Deciduous Tree *			Limited Access.		REMOVE TREE FOR CONSTRUCTION
20619	12" 2763 (12' CANOPY)	Acer rubrum	Red Maple	75	Vines may obscure hazard.	0.8	REMOVE TREE FOR CONSTRUCTION
20620	3" (5' CANOPY)	Fraxinus pennsylvanica	Green Ash	30	Risk of elmerald ash borer. Vines may obscure hazard.	0.7	Save
20621	4" 5 (6' CANOPY)	Fraxinus pennsylvanica	Green Ash	30	Risk of elmerald ash borer. Vines may obscure hazard. Danger of dead wood falling	0.6	Save
20622	24" 2765 (24' CANOPY)	Fraxinus pennsylvanica	Green Ash	30	Risk of elmerald ash borer. Vines may obscure hazard. Danger of dead wood falling	0.6	REMOVE TREE FOR CONSTRUCTION
20623	3" NO (5' CANOPY)	Deciduous Tree *			Limited Access.		Save
20624	3" (5' CANOPY)	Deciduous Tree *			Limited Access.		Save
20625	15" 2954 (15' CANOPY)	Deciduous Tree *			Limited Access.		Save
20626	21" 2955 (21' CANOPY)	Deciduous Tree *			Limited Access.		REMOVE TREE (SEE L1.01-L1.02 NOTE 6)
20629	3" (5' CANOPY)	Acer rubrum	Red Maple	75		0.6	Save
20630	5" (8' CANOPY)	Acer rubrum	Red Maple	75		0.6	Save
20631	12" 2964 (12' CANOPY)	Fraxinus pennsylvanica	Green Ash	30	Risk of elmerald ash borer; must treat to save ash.	0.7	Save; treat for ash borer.
20637	6" (12' CANOPY)	Deciduous Tree *					Save
20638	10" (12' CANOPY)	Ulmus americana	American Elm	50	Dutch Elm Disease is a threat to any Elm	0.6	Save
20639	2" (5' CANOPY)	Ulmus americana	American Elm	50	Dutch Elm Disease is a threat to any Elm	0.6	Save
20640	3" (7' CANOPY)	Acer rubrum	Red Maple	75	crook	0.6	Save
20641	6" (10' CANOPY)	Ulmus americana	American Elm	50	Dutch Elm Disease is a threat to any Elm	0.6	Save
20642	6" (12' CANOPY)	Carya glabra	Hickory	80		0.6	Save
20643	4" (6' CANOPY)	Carya glabra	Hickory	80		0.6	Save

TREE #	SIZE DBH (CANOPY)	SPECIES	COMMON NAME	SPECIES RATING	COMMENTS	CONDI-TION	RECOMMENDATION
21100	10" (15' CANOPY)	Morus alba	Common Mulberry	40		0.6	Save
21101	10" (10' CANOPY)	Betula nigra	River Birch	70		0.6	REMOVE TREE FOR CONSTRUCTION
21102	2" (5' CANOPY)	Deciduous Tree*			Limited Access		REMOVE TREE FOR CONSTRUCTION
21103	10" (10' CANOPY)	Catalpa speciosa	Northern Catalpa	50		0.6	Save
21104	18" 2857 (10' CANOPY)	Liriodendron tulipifera	Tulip Tree	75		0.7	Save
21105	18" DEAD (0' CANOPY)	DEAD Liriodendron tulipifera			Hazard. Remove this tree, or save for wildlife habitat	0	Save
21106	33" 2891 (20' CANOPY)	Liriodendron tulipifera	Tulip Tree	75		0.7	Save
21107	8" TWIN (12' CANOPY)	Acer rubrum	Red Maple	75		0.7	Save
21108	4" (4' CANOPY)	Dying Deciduous Tree			Consider removing this tree.	0.2	Save
21109	7" (8' CANOPY)	Ulmus americana	American Elm	50	Dutch Elm Disease is a threat to any Elm	0.7	Save
21110	18" TWIN (8' CANOPY)	Liriodendron tulipifera	Tulip Tree	75		0.7	Save
21111	3" 820 (5' CANOPY)	Ulmus americana	American Elm	50	Lean. Dutch Elm Disease is a threat to any Elm	0.5	Save
21112	4" 821 (10' CANOPY)	Acer saccharum	Sugar Maple	75		0.6	Save
21113	18" 2870 (8' CANOPY)	Liriodendron tulipifera	Tulip Tree	75	Dead branches in crown presents risk.	0.7	Monitor tree
21114	3" 822 (5' CANOPY)	Acer saccharum	Sugar Maple	75		0.6	Save
21115	12" 2872 (12' CANOPY)	Liriodendron tulipifera	Tulip Tree	75		0.8	Save
21116	21" 2871 (12' CANOPY)	Liriodendron tulipifera	Tulip Tree	75	significant risk of failure. Consider removing.	0.5	Save
21117	24" 2855 (12' CANOPY)	Liriodendron tulipifera	Tulip Tree	75	Vines may obscure hazard	0.7	Save
21118	6" (6' CANOPY)	Liriodendron tulipifera	Tulip Tree	75		0.7	Save
21119	6" (8' CANOPY)	Robinia pseudoacacia	Black Locust	50	Vines may obscure hazard	0.5	Save
21120	8" (10' CANOPY)	Liriodendron tulipifera	Tulip Tree	75		0.7	Save
21121	18" 2853 (15' CANOPY)	Liriodendron tulipifera	Tulip Tree	75	Vines may obscure hazard	0.7	Save
21122	10" 2854 (10' CANOPY)	Liriodendron tulipifera	Tulip Tree	75	Vines may obscure hazard	0.7	Save
21123	36" (20' CANOPY)	Liriodendron tulipifera	Tulip Tree	75	Declining condition. Vines may obscure hazard	0.5	Save
21124	3" (5' CANOPY)	Deciduous Tree*			Limited Access		Save
21125	3" (5' CANOPY)	Acer spp. *	Maple		Limited Access		Save
21126	3" (8' CANOPY)	Acer spp. *	Maple		Limited Access		Save
21127	3" (5' CANOPY)	Acer saccharum	Sugar Maple	75		0.6	Save
21128	2" (5' CANOPY)	Acer saccharum	Sugar Maple	75		0.6	Save
21129	3" (5' CANOPY)	Acer saccharum	Sugar Maple	75		0.6	Save
21130	24" 2892 (15' CANOPY)	Liriodendron tulipifera	Tulip Tree	75	Vines may obscure hazard	0.7	Save
21131	12" 814 (12' CANOPY)	Acer rubrum	Red Maple	75		0.7	REMOVE TREE FOR CONSTRUCTION
21132	3" 817 (5' CANOPY)	Acer rubrum	Red Maple	75		0.6	Save
21133	4" 818 (5' CANOPY)	Ulmus americana	American Elm	50	Dutch Elm Disease is a threat to any Elm. Consider remove.	0.2	Save
21134	4" 816 (8' CANOPY)	Acer rubrum	Red Maple	75		0.6	Save
21135	4" 815 (8' CANOPY)	Deciduous Tree*			Limited Access		Save
21136	18" 2893 (18' CANOPY)	Liriodendron tulipifera	Tulip Tree	75	Vines may obscure hazard.	0.7	Save
21137	18" DEAD (0' CANOPY)	Dead Deciduous Tree					Save
21138	18" TWIN (12' CANOPY)	Liriodendron tulipifera	Tulip Tree	75	Vines may obscure hazard. Co-dominant stems at 5' above grade with included bark.	0.6	REMOVE TREE FOR CONSTRUCTION
21141	10" (15' CANOPY)	Celtis occidentalis	Common Hackberry	60		0.8	REMOVE TREE FOR CONSTRUCTION
21142	6" (8' CANOPY)	Quercus phellos	Willow Oak	80		0.7	REMOVE TREE FOR CONSTRUCTION
21143	10" (10' CANOPY)	Fraxinus pennsylvanica	Green Ash	30	Co-dominant stem at 20' above grade. Risk of elmerald ash borer; must treat to save ash	0.7	REMOVE TREE FOR CONSTRUCTION
21144	8" (8' CANOPY)	Fraxinus pennsylvanica	Green Ash	30	Risk of elmerald ash borer; must treat to save ash	0.8	Save
21145	8" (8' CANOPY)	Fraxinus pennsylvanica	Green Ash	30	Risk of elmerald ash borer; must treat to save ash	0.8	Save
21148	6" (6' CANOPY)	Declining Deciduous Tree				0.5	Save
21149	8" (8' CANOPY)	Declining Deciduous Tree				0.5	Save
21150	6" TWIN (6' CANOPY)	Celtis occidentalis	Common Hackberry	60	Decling condition.	0.5	Save
21151	5" (5' CANOPY)	Deciduous Tree*			Limited Access		Save
21152	3" (5' CANOPY)	Morus alba	Common Mulberry	40	Dying tree. Vines	0.2	Save
21153	6" TWIN (8' CANOPY)	Deciduous Tree*			Limited Access		Save
21154	6" (8' CANOPY)	Deciduous Tree*			Limited Access		Save
21155	4" TWIN (4' CANOPY)	Dying Deciduous Tree				0.2	Save
21156	9" (9' CANOPY)	Morus alba	Common Mulberry	40	Poor form	0.5	REMOVE TREE FOR CONSTRUCTION
21159	10" (10' CANOPY)	Deciduous Tree*			Limited Access		Save
21160	10" (8' CANOPY)	Deciduous Tree*			Limited Access		Save
21161	4" 819 (8' CANOPY)	Deciduous Tree*			Limited Access		Save
21162	12" 2894 (10' CANOPY)	Acer rubrum	Red Maple	75	Vines may obscure hazard.	0.7	Save
21163	27" 2895 (10' CANOPY)	Catalpa speciosa	Northern Catalpa	50	Vines may obscure hazard.	0.6	Save
21164	15" (10' CANOPY)	Acer rubrum	Red Maple	75	Poor form.	0.5	REMOVE TREE FOR CONSTRUCTION
21165	21" 2901 (15' CANOPY)	Acer rubrum	Red Maple	75	Vines may obscure hazard.	0.7	REMOVE TREE FOR CONSTRUCTION
21166	6" (6' CANOPY)	Acer rubrum	Red Maple	75	Vines may obscure hazard.	0.7	REMOVE TREE FOR CONSTRUCTION

THIS SHEET IS FOR TREE INVENTORY INFORMATION PURPOSES ONLY

Pennoni Associates Inc.
Engineers Surveyors Planners Landscape Architects
14532 Lee Road
Chantilly, VA 20151 – 703.449.6700
Pennoni

1/20/14	1	CITY OF FALLS CHURCH	WEG
DATE	NO.	REVISIONS	BY

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FALLS CHURCH, VIRGINIA

TREE INVENTORY PLAN

ALL DOCUMENTS PREPARED BY PENNONI ASSOCIATES ARE INSTRUMENTS OF SERVICE IN RESPECT OF THE PROJECT. THEY ARE NOT INTENDED OR REPRESENTED TO BE SUITABLE FOR REUSE BY OWNER OR OTHERS ON THE EXTENSIONS OF THE PROJECT OR ON ANY OTHER PROJECT. ANY REUSE WITHOUT WRITTEN VERIFICATION OR ADAPTATION BY PENNONI ASSOCIATES FOR THE SPECIFIC PURPOSE INTENDED WILL BE AT OWNERS SOLE RISK AND WITHOUT LIABILITY OR LEGAL EXPOSURE TO PENNONI ASSOCIATES; AND OWNER SHALL INDEMNIFY AND HOLD HARMLESS PENNONI ASSOCIATES FROM ALL CLAIMS, DAMAGES, LOSSES AND EXPENSES ARISING OUT OF OR RESULTING THEREFROM.

NORTH

PROJECT NO.	WEGI–1304
SHEET	4 OF 7
SCALE	1" = 25'
DATE	2013–11–15
DRAWN BY	EFF
APPROVED	DHS
DRAWING NO.	L1.04

W:\FREDJOBFILES\4900'S\4966 – STREAM RESTORATION ENGINEERING COE BRANCH, PEARSON\9500–PENNONI\EX TREE INFO\NOV 2013\L–103–106–TRE–CHART.DWG PLOTTED: 1/20/2014 4:00:59 PM, BY: SARAH WOODFORD PLOTSTYLE: 4000–B&W.CTB, PROJECT STATUS: ----

TREE #	SIZE DBH (CANOPY)	SPECIES	COMMON NAME	SPECIES RATING	COMMENTS	CONDI-TION	RECOMMENDATION
20744	4" (12' CANOPY)	Liriodendron tulipifera	Tulip Tree	75	Poor form	0.6	Save
20746	8" (8' CANOPY)	Ilex x 'Nellie Stevens'	Nellie Stevens Holly	70	Lean	0.6	Save
20747	5" (10' CANOPY)	Liriodendron tulipifera	Tulip Tree	75	Poor form, crook, but vigorous	0.5	Save
20748	8" (8' CANOPY)	Liriodendron tulipifera	Tulip Tree	75	Vines may obscure hazard	0.5	Save. Remove vines.
20757	5" (8' CANOPY)	Acer rubrum *	Red Maple	75		0.6	Save
20758	7" (10' CANOPY)	DEAD- Acer rubrum *	Red Maple	75	Consider removing this tree, or save for wildlife habitat	0	Save
20759	3" (5' CANOPY)	Ulmus americana	American Elm	50		0.6	Save
20760	3" (5' CANOPY)	Ulmus americana	American Elm	50		0.6	Save
20761	2" (6' CANOPY)	Ulmus americana	American Elm	50		0.6	Save
20762	24" (20' CANOPY)	Liquidambar styriciflua	Sweet Gum	70	Vines may obscure hazard	0.8	REMOVE TREE FOR CONSTRUCTION
20763	10" 2803 (15' CANOPY)	Acer rubrum	Red Maple	75		0.7	REMOVE TREE FOR CONSTRUCTION
20764	7" (10' CANOPY)	Acer rubrum	Red Maple	75		0.7	REMOVE TREE FOR CONSTRUCTION
20765	24" 2804 (15' CANOPY)	Liriodendron tulipifera	Tulip Tree	75	Vines may obscure hazard	0.7	REMOVE TREE FOR CONSTRUCTION
20766	15" (15' CANOPY)	Acer rubrum	Red Maple	75		0.7	Save
20767	7" (12' CANOPY)	Acer rubrum	Red Maple	75		0.7	Save
20768	8" (15' CANOPY)	Acer rubrum	Red Maple	75		0.7	Save
20776	21" 2838 (10' CANOPY)	Acer rubrum	Red Maple	75		0.6	REMOVE TREE (SEE L1.01-L1.02 NOTE 6)
20777	15" 2837 (10' CANOPY)	Morus alba	Common Mulberry	40		0.6	Save
20778	21" 2835 (10' CANOPY)	Carya glabra	Hickory	80		0.7	Save
20779	15" 2836 (10' CANOPY)	Liriodendron tulipifera	Tulip Tree	75	Vines may obscure hazard	0.7	Save
20781	2" (5' CANOPY)	Morus alba	Common Mulberry	40		0.6	Save
20782	3" (6' CANOPY)	Morus alba	Common Mulberry	40		0.6	Save
20811	3" (2' CANOPY)	Ulmus americana	American Elm	50	Dutch Elm Disease is a threat to any Elm	0.6	REMOVE TREE FOR CONSTRUCTION
20812	4" (5' CANOPY)	Ulmus americana	American Elm	50	Dutch Elm Disease is a threat to any Elm	0.6	Save
20813	4" (7' CANOPY)	Ulmus americana	American Elm	50	Dutch Elm Disease is a threat to any Elm	0.6	Save
20814	12" (15' CANOPY)	Celtis occidentalis	Common Hackberry	60	crook	0.6	Save
20815	10" 2784 (10' CANOPY)	Acer rubrum	Red Maple	75		0.6	REMOVE TREE FOR CONSTRUCTION
20816	12" 2785 (8' CANOPY)	Liriodendron tulipifera	Tulip Tree	75	Prune roots.	0.7	Save
20817	3" TWIN (5' CANOPY)	Robinia pseudoacacia	Black Locust	50	Vines may obscure hazard	0.6	Save
20818	16" (16' CANOPY)	Acer rubrum	Red Maple	75		0.6	Save
20819	12" (12' CANOPY)	Liriodendron tulipifera	Tulip Tree	75	Vines may obscure hazard	0.6	REMOVE TREE FOR CONSTRUCTION
20820	10" (8' CANOPY)	Morus alba	Common Mulberry	40	lean	0.5	REMOVE TREE FOR CONSTRUCTION
20821	24" (20' CANOPY)	Fraxinus pennsylvanica	Green Ash	30	Crown dieback but good form. Risk of elmerald ash borer; must treat to save ash.	0.6	REMOVE TREE FOR CONSTRUCTION
20822	3" (7' CANOPY)	Carya glabra	Hickory	80	Vines may obscure hazard	0.6	REMOVE TREE FOR CONSTRUCTION
20823	8" (8' CANOPY)	Morus alba	Common Mulberry	40		0.6	Save
20824	8" (5' CANOPY)	Morus alba	Common Mulberry	40			REMOVE TREE FOR CONSTRUCTION
20825	6" (12' CANOPY)	Deciduous Tree *			Limited Access.		Save
20826	10" 2782 (12' CANOPY)	Acer negundo	Boxelder	40		0.7	REMOVE TREE FOR CONSTRUCTION
20827	6" (6' CANOPY)	Acer rubrum	Red Maple	75		0.6	REMOVE TREE FOR CONSTRUCTION
20828	24" 2780 (24' CANOPY)	Fraxinus pennsylvanica	Green Ash	30	Risk of elmerald ash borer; must treat to save ash. Sparse.	0.6	REMOVE TREE FOR CONSTRUCTION
20829	4" (8' CANOPY)	Ulmus americana	American Elm	50	Dutch Elm Disease is a threat to any Elm	0.6	REMOVE TREE FOR CONSTRUCTION
20830	21" (24' CANOPY)	Acer rubrum	Red Maple	75	full crown; but poor form, included bark, declining	0.6	REMOVE TREE FOR CONSTRUCTION
20831	4" (4' CANOPY)	Fraxinus pennsylvanica	Green Ash	30	Risk of elmerald ash borer; must treat to save ash. Lean.	0.6	Save
20834	30" (18' CANOPY)	Fraxinus pennsylvanica	Green Ash	30	Risk of elmerald ash borer; must treat to save ash	0.7	Save; treat for ash borer.
20835	12" 2786 (10' CANOPY)	Liriodendron tulipifera	Tulip Tree	75	Vines may obscure hazard. Evidence of included bark.	0.7	REMOVE TREE FOR CONSTRUCTION
20836	10" 2787 (10' CANOPY)	Liriodendron tulipifera	Tulip Tree	75	included bark. Vines may obscure hazard.	0.5	REMOVE TREE FOR CONSTRUCTION
20837	10" (10' CANOPY)	Acer negundo	Boxelder	40	lean	0.5	REMOVE TREE FOR CONSTRUCTION
20838	8" 2991 (10' CANOPY)	Fraxinus pennsylvanica	Green Ash	30	must treat to save ash. Severe vines.	0.6	REMOVE TREE (SEE L1.01-L1.02 NOTE 6)
20839	2" (3' CANOPY)	Robinia pseudoacacia	Black Locust	50			REMOVE TREE FOR CONSTRUCTION
20840	4" (8' CANOPY)	Liriodendron tulipifera	Tulip Tree	75	Lean	0.5	REMOVE TREE FOR CONSTRUCTION
20841	8" 2990 (15' CANOPY)	Robinia pseudoacacia	Black Locust	50		0.5	REMOVE TREE FOR CONSTRUCTION
20842	3" (8' CANOPY)	Deciduous Tree *					REMOVE TREE FOR CONSTRUCTION
20843	5" (8' CANOPY)	Robinia pseudoacacia	Black Locust	50		0.6	REMOVE TREE FOR CONSTRUCTION
20844	4" (6' CANOPY)	Robinia pseudoacacia	Black Locust	50		0.6	REMOVE TREE FOR CONSTRUCTION
20845	3" (6' CANOPY)	Robinia pseudoacacia	Black Locust	50		0.6	Save
20846	3" (5' CANOPY)	Robinia pseudoacacia	Black Locust	50		0.6	REMOVE FOR CONSTRUCTION
20847	4" 2989 (6' CANOPY)	Deciduous Tree *			Limited Access.		Save
20848	3" (5' CANOPY)	Morus alba	Common Mulberry	40	mulit-stem. Poor form.	0.5	Remove Tree.
20849	4" (6' CANOPY)	Carya glabra	Hickory	80	severe lean	0.4	Monitor
20850	3" (5' CANOPY)	Deciduous Tree *			Limited Access.		Save
20851	5" 2986 (8' CANOPY)	Deciduous Tree *			Limited Access.		Save

TREE #	SIZE DBH (CANOPY)	SPECIES	COMMON NAME	SPECIES RATING	COMMENTS	CONDI-TION	RECOMMENDATION
20852	2" (6' CANOPY)	Carya glabra	Hickory	80	severe lean	0.5	Save
20853	3" (5' CANOPY)	Ulmus americana	American Elm	50	Broken leader. Dutch Elm Disease is a threat to any Elm	0.4	Save
20854	6" (8' CANOPY)	Morus alba	Common Mulberry	40	Lean	0.5	Save
20855	4" TWIN (6' CANOPY)	Deciduous Tree *			Limited Access.		REMOVE TREE FOR CONSTRUCTION
20856	18" (15' CANOPY)	Liriodendron tulipifera	Tulip Tree	75	Vines may obscure hazard	0.7	REMOVE TREE FOR CONSTRUCTION
20857	4" 2982 (8' CANOPY)	Deciduous Tree *			severe lean	0.4	REMOVE TREE FOR CONSTRUCTION
20858	3" (5' CANOPY)	Robinia pseudoacacia	Black Locust	50		0.7	REMOVE TREE FOR CONSTRUCTION
20859	6" 2980 (10' CANOPY)	Deciduous Tree *			Limited Access.		REMOVE FOR CONSTRUCTION
20860	4" 2983 (8' CANOPY)	Acer saccharinum	Silver Maple	40		0.6	REMOVE FOR CONSTRUCTION
20861	3" 2979 (5' CANOPY)	Carya glabra	Hickory	80		0.6	REMOVE TREE FOR CONSTRUCTION
20862	4" 857 (8' CANOPY)	Fraxinus americana	Green Ash	30	Risk of elmerald ash borer; must treat to save ash	0.7	REMOVE TREE FOR CONSTRUCTION
20863	6" (10' CANOPY)	Carya glabra	Hickory	80		0.7	Save
20864	3" (6' CANOPY)	Acer rubrum	Red Maple	75		0.6	REMOVE TREE FOR CONSTRUCTION
20865	3" (8' CANOPY)	Acer rubrum	Red Maple	75		0.6	REMOVE TREE FOR CONSTRUCTION
20866	6" (10' CANOPY)	Deciduous Tree *			Limited Access. Lean		REMOVE TREE FOR CONSTRUCTION
20867	2" TWIN (5' CANOPY)	Deciduous Tree *			Limited Access.		REMOVE TREE FOR CONSTRUCTION
20868	4" 854 (8' CANOPY)	Betulus spp.	Birch		Lean	0.5	Save
20869	5" (8' CANOPY)	Carya glabra *	Hickory	80		0.7	Save
20871	36" (25' CANOPY)	Quercus rubra	Red Oak	80	Mature and risk of deadwood in crown falling; but high landscape value.	0.8	REMOVE TREE FOR CONSTRUCTION
20872	30" (28' CANOPY)	Acer rubrum	Red Maple	75	deadwood, weak scaffold branches	0.6	Save.
20873	2" (5' CANOPY)	Ulmus americana	American Elm	50	Dutch Elm Disease is a threat to any Elm	0.8	REMOVE TREE FOR CONSTRUCTION
20874	4" (6' CANOPY)	Fraxinus pennsylvanica	Green Ash	30	Risk of elmerald ash borer; must treat to save ash	0.7	REMOVE TREE FOR CONSTRUCTION
20875	3" (8' CANOPY)	Morus alba	Common Mulberry	40		0.7	Save
20876	2" (6' CANOPY)	Fraxinus pennsylvanica	Green Ash	30	Risk of elmerald ash borer; must treat to save ash	0.7	REMOVE TREE FOR CONSTRUCTION
20877	2" (4' CANOPY)	Acer rubrum	Red Maple	75	lean	0.6	REMOVE TREE FOR CONSTRUCTION
20878	10" (15' CANOPY)	Acer rubrum	Red Maple	75	slight lean	0.7	Save
20879	4" (6' CANOPY)	Celtis occidentalis	Common Hackberry	60		0.5	REMOVE TREE FOR CONSTRUCTION
20880	5" (10' CANOPY)	Celtis occidentalis	Common Hackberry	60		0.5	REMOVE TREE FOR CONSTRUCTION
20881	18" (15' CANOPY)	Acer rubrum	Red Maple	75	deadwood, some lean	0.7	REMOVE TREE FOR CONSTRUCTION
20882	6" (12' CANOPY)	Morus alba	Common Mulberry	0	lean, poor form	0.5	REMOVE TREE FOR CONSTRUCTION
20883	4" (8' CANOPY)	Morus alba	Common Mulberry	40		0.7	REMOVE TREE FOR CONSTRUCTION
20884	10" (15' CANOPY)	Fraxinus pennsylvanica	Green Ash	30		0.6	REMOVE TREE FOR CONSTRUCTION
20885	12" (15' CANOPY)	Celtis occidentalis	Common Hackberry	60		0.7	REMOVE FOR CONSTRUCTION
20886	10" (10' CANOPY)	Carya glabra	Hickory	80		0.7	REMOVE TREE FOR CONSTRUCTION
20887	10" 2792 (15' CANOPY)	Juglans nigra	Black Walnut	75		0.7	REMOVE TREE FOR CONSTRUCTION
20903	12" 2834 (15' CANOPY)	Acer rubrum	Red Maple	75	crook	0.7	Save
20904	24" (15' CANOPY)	Liriodendron tulipifera	Tulip Tree	75		0.8	Save
20905	18" 2828 (12' CANOPY)	Liriodendron tulipifera	Tulip Tree	75		0.8	Save
20906	12" 2827 (12' CANOPY)	Liriodendron tulipifera	Tulip Tree	75		0.8	Save
20934	5" (10' CANOPY)	Morus alba	Common Mulberry	40	Vines may obscure hazard	0.6	Save
20935	4" (10' CANOPY)	Dead Deciduous Tree					Save
20936	6" (10' CANOPY)	Acer rubrum	Red Maple	75		0.8	Save
20937	9" 2798 (15' CANOPY)	Celtis occidentalis	Common Hackberry	60		0.6	REMOVE TREE FOR CONSTRUCTION
20938	4" (8' CANOPY)	Fraxinus pennsylvanica	Green Ash	30	Risk of elmerald ash borer; must treat to save ash	0.6	Save
20939	3" (3' CANOPY)	Ulmus americana	American Elm	50	Poor form. Dutch Elm Disease is a threat to any Elm	0.3	REMOVE TREE FOR CONSTRUCTION
20940	3" (8' CANOPY)	Fraxinus pennsylvanica	Green Ash	30	Risk of elmerald ash borer; must treat to save ash	0.6	REMOVE TREE FOR CONSTRUCTION
20941	5" (15' CANOPY)	Ulmus americana	American Elm	50	Crook	0.6	Save
20942	24" 2791 (20' CANOPY)	Acer saccharinum	Silver Maple	50	Vines may obscure hazard	0.7	REMOVE TREE FOR CONSTRUCTION
20965	2" (5' CANOPY)	Deciduous Tree *			Limited Access.		Save
20966	15" (15' CANOPY)	Acer saccharinum	Silver Maple	50	Vines may obscure hazard	0.7	Save
20967	4" (10' CANOPY)	Deciduous Tree *			Limited Access.		Save
20968	6" (10' CANOPY)	Deciduous Tree *			Limited Access.		Save
20969	12" (12' CANOPY)	Fraxinus pennsylvanica	Green Ash	30	Risk of elmerald ash borer; must treat to save ash. Vines may obscure hazard	0.7	Save
20970	4" (8' CANOPY)	Fraxinus pennsylvanica	Green Ash	31	Risk of elmerald ash borer; must treat to save ash.	0.7	Save
20971	6" (8' CANOPY)	Fraxinus pennsylvanica	Green Ash	31	Risk of elmerald ash borer; must treat to save ash. Vines may obscure hazard	0.7	Save
20972	5" TWIN (10' CANOPY)	Deciduous Tree *			Access limited due to poison ivy		Save
20973	8" (12' CANOPY)	Deciduous Tree *			Access limited due to poison ivy		Save
20974	3" (8' CANOPY)	Deciduous Tree *			Access limited due to poison ivy		Save
20975	5" (10' CANOPY)	Deciduous Tree *			Access limited due to poison ivy		Save

TREE #	SIZE DBH (CANOPY)	SPECIES	COMMON NAME	SPECIES RATING	COMMENTS	CONDI-TION	RECOMMENDATION
20976	4" (4' CANOPY)	Deciduous Tree *			Access limited due to poison ivy		Save
20977	4" (8' CANOPY)	Deciduous Tree *			Access limited due to poison ivy		Save
20978	2" (5' CANOPY)	Deciduous Tree *			Access limited due to poison ivy		Save
20979	6" (8' CANOPY)	Deciduous Tree *			Access limited due to poison ivy		Save
20980	4" (8' CANOPY)	Deciduous Tree *			Access limited due to poison ivy		Save
20981	8" (12' CANOPY)	Deciduous Tree *			Access limited due to poison ivy		Save
20982	3" (5' CANOPY)	Deciduous Tree *			Access limited due to poison ivy		Save
20983	7" (10' CANOPY)	Deciduous Tree *			Access limited due to poison ivy		Save
20984	4" (8' CANOPY)	Deciduous Tree *			Access limited due to poison ivy		Save
20985	3" (5' CANOPY)	Deciduous Tree *			Access limited due to poison ivy		Save
20986	3" (5' CANOPY)	Robinia pseudoacacia	Black Locust	50		0.6	Save
20987	8" (12' CANOPY)	Robinia pseudoacacia	Black Locust	50		0.6	Save
20988	15" (15' CANOPY)	Robinia pseudoacacia	Black Locust	50		0.6	Save
20989	10" (15' CANOPY)	Deciduous Tree			Access limited due to poison ivy		Save
20990	15" (18' CANOPY)	Ulmus americana	American Elm	50	Declining condition. Dutch Elm Disease is a threat to any Elm.	0.7	Save
20991	3" (8' CANOPY)	Amelanchier spp.	Shadbush	80		0.6	Save
20992	6" (10' CANOPY)	Dead Deciduous Tree				0	Save
20993	12" 2886 (12' CANOPY)	Robinia pseudoacacia	Black Locust	50		0.6	Save
20994	5" (10' CANOPY)	Morus alba	Common Mulberry	40	Dying, lean	0.3	Save
20995	10" (12' CANOPY)	Ulmus americana	American Elm	50	Dutch Elm Disease is a threat to any Elm.	0.7	Save
20996	6" (8' CANOPY)	Amelanchier spp.	Shadbush	80	Vines, crook, poor condition.	0.5	Save
20997	2" (6' CANOPY)	Morus alba	Common Mulberry	40	Vines	0.7	Save
20998	8" DEAD (0' CANOPY)	DEAD Deciduous Tree					Save
20999	10" 2881 (12' CANOPY)	Ulmus americana	American Elm	50	Dutch Elm Disease is a threat to any Elm.	0.7	Save
21000	7" (12' CANOPY)	Deciduous Tree*			Limited Access due to poison ivy.		Save
21001	2" (5' CANOPY)	Catalpa speciosa	Northern Catalpa	50		0.7	Save
21002	3" (5' CANOPY)	Acer saccharinum	Silver Maple	40		0.6	Save
21003	15" 2882 (15' CANOPY)	Ulmus americana	American Elm	50	Severe Vines. Dutch Elm Disease is a threat to any Elm.	0.7	Save
21004	15" 2883 (15' CANOPY)	Robinia pseudoacacia	Black Locust	50	Save if possible. Excessive Lean.	0.6	Save
21005	3" TWIN (10' CANOPY)	Acer saccharinum	Silver Maple	40	Trunk damage. Co-dominant stems	0.5	Save
21006	4" (8' CANOPY)	Ulmus americana	American Elm	50	Severe Vines. Dutch Elm Disease is a threat to any Elm.	0.6	Save
21007	4" TWIN (8' CANOPY)	Morus alba	Common Mulberry	40	Vines	0.7	Save
21008	4" (8' CANOPY)	Deciduous Tree*			Limited Access due to poison ivy.		Save
21009	10" (15' CANOPY)	Ulmus americana	American Elm	50	Dutch Elm Disease is a threat to any Elm.	0.6	REMOVE TREE (SEE L1.01-L1.02 NOTE 6)
21010	4" (8' CANOPY)	Morus alba *	Common Mulberry	40	Limited Access due to poison ivy. Excessive lean	0.6	Save
21011	27" 2880 (20' CANOPY)	Fraxinus pennsylvanica	Green Ash	30	Decay at base of tree presents severe hazard. Evidence of storm damage. Risk of elmerald ash borer.	0.4	Save
21012	4" (6' CANOPY)	Morus alba	Common Mulberry	40	Excessive lean	0.2	REMOVE TREE FOR CONSTRUCTION
21013	4" (6' CANOPY)	Morus alba	Common Mulberry	40	Excessive lean	0.2	REMOVE TREE FOR CONSTRUCTION
21014	2" (5' CANOPY)	Acer rubrum	Red Maple	75		0.7	REMOVE TREE FOR CONSTRUCTION
21015	15" 2887 (15' CANOPY)	Acer negundo	Boxelder	40	Evidence of storm damage. This is a pistillate (female) tree. Female Box Elder trees harbor boxelder bugs, a nuisance pest.	0.6	REMOVE TREE FOR CONSTRUCTION
21016	18" 2879 (18' CANOPY)	Acer saccharinum	Silver Maple	40		0.7	REMOVE TREE FOR CONSTRUCTION
21017	4" (6' CANOPY)	Deciduous Tree *					REMOVE TREE (SEE L1.01-L1.02 NOTE 6)
21020	5" (10' CANOPY)	Ulmus americana	American Elm	50	Dutch Elm Disease is a threat to any Elm.	0.5	Save
21021	6" (12' CANOPY)	Fraxinus pennsylvanica	Green Ash	30	Risk of elmerald ash borer; must treat to save ash	0.8	Save
21022	3" (10' CANOPY)	Acer saccharum	Sugar Maple	75		0.7	Save
21023	3" (10' CANOPY)	Carya glabra	Hickory	80		0.8	Save
21024	3" (8' CANOPY)	Carya glabra	Hickory	80		0.7	Save
21025	3" (10' CANOPY)	Carya glabra	Hickory	80		0.7	Save
21026	3" (8' CANOPY)	Carya glabra	Hickory	80		0.7	Save
21027	2" (4' CANOPY)	Carya glabra	Hickory	80		0.7	Save
21028	18" 2800 (10' CANOPY)	Acer rubrum	Red Maple	75	crown dieback	0.4	Save
21029	4" (8' CANOPY)	Deciduous Tree*			Limited Access due to poison ivy.		Save
21030	2" (3' CANOPY)	Deciduous Tree*			Limited Access due to poison ivy.		Save
21031	3" (8' CANOPY)	Catalpa speciosa	Northern Catalpa	50		0.7	REMOVE FOR CONSTRUCTION
21032	4" (8' CANOPY)	Deciduous Tree*			Limited Access due to poison ivy.		REMOVE TREE FOR CONSTRUCTION
21033	6" (12' CANOPY)	Deciduous Tree*			Limited Access due to poison ivy.		Save
21034	6" (10' CANOPY)	Dying Deciduous Tree				0.2	REMOVE TREE FOR CONSTRUCTION
21035	4" (4' CANOPY)	Acer rubrum	Red Maple	75	Very poor condition. Tree consists of sprouts from stump.	0.2	REMOVE TREE FOR CONSTRUCTION
21036	6" (12' CANOPY)	Acer rubrum	Red Maple	75		0.7	REMOVE TREE (SEE L1.01-L1.02 NOTE 6)

THIS SHEET IS FOR TREE INVENTORY INFORMATION PURPOSES ONLY

Pennoni Associates Inc.
Engineers Surveyors Planners Landscape Architects
Pennoni
14532 Lee Road
Chantilly, VA 20151 – 703.449.6700

DATE	NO.	REVISIONS	BY
1/20/14	1	CITY OF FALLS CHURCH	WEG

ALL DIMENSIONS MUST BE VERIFIED BY CONTRACTOR AND OWNER MUST BE NOTIFIED OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK

COE RUN STREAM VALLEY PARK

BROAD STREET
FALLS CHURCH, VIRGINIA

TREE INVENTORY PLAN

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NORTH

PROJECT NO. WEGI–1304
SHEET 5 OF 7
SCALE 1" = 25'
DATE 2013–11–15
DRAWN BY EFF
APPROVED DHS
DRAWING NO. L1.05

W:\FREDJOBFILES\4900'S\4966 – STREAM RESTORATION ENGINEERING COE BRANCH, PEARSON\9500–PENNONI\EX TREE INFO\NOV 2013\L–103–106–TRE–CHART.DWG PLOTTED: 1/16/2014 4:19:01 PM, BY: SARAH WOODFORD PLOTSTYLE: 4000–B&W.CTB, PROJECT STATUS: ––––

21037	6" (8' CANOPY)	Quercus phellos	Willow Oak	80		0.6	Save
21038	5" (10' CANOPY)	Deciduous Tree*			Limited Access due to poison ivy.		Save
21039	16" (12' CANOPY)	Carya glabra	Hickory	80	Vines may obscure hazard.	0.7	Save
21040	12" (12' CANOPY)	Fraxinus pennsylvanica	Green Ash	30	Risk of elmerald ash borer; must treat to save ash	0.7	Save
21041	10" (10' CANOPY)	Betula nigra	River Birch	70	Lean. Sparse crown	0.6	Save
21042	4" (4' CANOPY)	Deciduous Tree*			Limited Access due to poison ivy.		Save
21043	4" (6' CANOPY)	Betulus spp.	Birch	70		0.7	REMOVE TREE FOR CONSTRUCTION
21044	4" (6' CANOPY)	Fraxinus pennsylvanica	Green Ash	30	Risk of elmerald ash borer; must treat to save ash	0.7	REMOVE TREE FOR CONSTRUCTION
21045	4" (8' CANOPY)	Betulus spp.	Birch	70		0.6	REMOVE TREE FOR CONSTRUCTION
21046	8" (12' CANOPY)	Acer rubrum	Red Maple	75	Poor form	0.5	REMOVE TREE FOR CONSTRUCTION
21047	10" 2889 (10' CANOPY)	Acer rubrum	Red Maple	75	Vines may obscure hazard	0.7	REMOVE TREE FOR CONSTRUCTION
21048	24" 2888 (20' CANOPY)	Acer rubrum	Red Maple	75		0.6	REMOVE TREE FOR CONSTRUCTION
21049	2" (5' CANOPY)	Fraxinus pennsylvanica	Green Ash	30	Risk of elmerald ash borer; must treat to save ash	0.7	Save
21050	3" (8' CANOPY)	Fraxinus pennsylvanica	Green Ash	30	Risk of elmerald ash borer; must treat to save ash	0.6	REMOVE TREE FOR CONSTRUCTION
21051	6" (10' CANOPY)	Fraxinus pennsylvanica	Green Ash	30	Risk of elmerald ash borer; must treat to save ash	0.7	REMOVE TREE FOR CONSTRUCTION
21052	24" 2831 (15' CANOPY)	Liriodendron tulipifera	Tulip Tree	75	Vines may obscure hazard	0.7	Save
21053	20" 2832 (15' CANOPY)	Liriodendron tulipifera	Tulip Tree	75	Vines may obscure hazard	0.7	Save
21054	18" 2840 (12' CANOPY)	Acer rubrum	Red Maple	75	Vines may obscure hazard	0.7	Save
21055	26" 2841 (18' CANOPY)	Celtis occidentalis	Common Hackberry	60	Sparse crown. Vines may obsscure hazard.	0.5	Save
21056	18" 2839 (15' CANOPY)	Acer rubrum	Red Maple	75		0.6	Save
21057	24" 2860 (20' CANOPY)	Acer rubrum	Red Maple	75	Vines may obscure hazard	0.7	Save
21058	18" 2861 (15' CANOPY)	Acer rubrum	Red Maple	75	Vines may obsscure hazard	0.6	Save
21059	20" 2858 (18' CANOPY)	Liriodendron tulipifera	Tulip Tree	75	Danger of large pieces of wood falling. Vines on trunk may obscure hazard	0.6	Save
21060	3" (5' CANOPY)	Acer rubrum	Red Maple	75		0.6	Save
21061	2" (4' CANOPY)	Ulmus americana	American Elm	50	Dutch Elm Disease is a threat to any Elm	0.6	Save
21062	10" 2863 (10' CANOPY)	Acer rubrum	Red Maple	75		0.7	Save
21063	16" 2862 (12' CANOPY)	Acer rubrum	Red Maple	75	declining condition.	0.5	Save
21064	12" 2864 (12' CANOPY)	Acer rubrum	Red Maple	75	Broken limbs	0.6	Save
21065	20" 2865 (15' CANOPY)	Acer rubrum	Red Maple	75	Dying	0.2	Save
21066	12" 2866 (12' CANOPY)	Acer rubrum	Red Maple	75		0.7	Save
21067	14" 2867 (14' CANOPY)	Acer rubrum	Red Maple	75		0.7	Save
21068	10" (10' CANOPY)	DEAD- correct #?				0	REMOVE TREE
21069	22" 2873 (15' CANOPY)	Quercus rubra	Red Oak	80	poor form	0.6	REMOVE TREE FOR CONSTRUCTION
21070	20" 2874 (18' CANOPY)	Quercus rubra	Red Oak	80	slight crook	0.7	REMOVE TREE FOR CONSTRUCTION
21071	3" (4' CANOPY)	Carya glabra	Hickory	80		0.8	REMOVE TREE FOR CONSTRUCTION
21072	4" (6' CANOPY)	Fraxinus pennsylvanica	Green Ash	30	Risk of elmerald ash borer; must treat to save ash	0.7	REMOVE TREE FOR CONSTRUCTION
21073	4" (8' CANOPY)	Deciduous Tree*			Limited Access		REMOVE TREE FOR CONSTRUCTION
21074	38" (20' CANOPY)	Acer saccharinum	Silver Maple	40		0.7	REMOVE TREE FOR CONSTRUCTION
21075	8" (10' CANOPY)	Morus alba	Common Mulberry	40		0.7	REMOVE TREE FOR CONSTRUCTION
21076	3" (10' CANOPY)	Acer rubrum	Red Maple	75		0.6	REMOVE TREE FOR CONSTRUCTION
21077	16" (12' CANOPY)	Ulmus americana	American Elm	50	Dutch Elm Disease is a threat to any Elm	0.7	REMOVE TREE FOR CONSTRUCTION
21078	9" (12' CANOPY)	Ulmus americana	American Elm	50	Dutch Elm Disease is a threat to any Elm	0.6	REMOVE TREE FOR CONSTRUCTION
21079	15" 2878 (10' CANOPY)	Morus alba	Common Mulberry	40		0.7	REMOVE TREE FOR CONSTRUCTION
21080	9" (10' CANOPY)	Betula nigra	River Birch	70	Lean	0.6	REMOVE TREE FOR CONSTRUCTION
21081	3" (8' CANOPY)	Deciduous Tree*			Limited Access		Save
21082	8" (12' CANOPY)	Fraxinus pennsylvanica	Green Ash	30	Risk of elmerald ash borer; must treat to save ash	0.7	Save
21085	6" (6' CANOPY)	Morus alba	Common Mulberry	40		0.6	REMOVE TREE FOR CONSTRUCTION
21086	8" TWIN (10' CANOPY)	Betula nigra	River Birch	70	lean, hazard to adjacent townhouses	0.5	REMOVE TREE FOR CONSTRUCTION
21087	5" TWIN (8' CANOPY)	Carya glabra	Hickory	80		0.6	REMOVE TREE FOR CONSTRUCTION
21088	8" (10' CANOPY)	Celtis occidentalis	Common Hackberry	60		0.6	REMOVE TREE FOR CONSTRUCTION
21089	3" (5' CANOPY)	Carya glabra	Hickory	80		0.7	REMOVE TREE FOR CONSTRUCTION
21090	3" (6' CANOPY)	Carya glabra	Hickory	80		0.7	REMOVE TREE FOR CONSTRUCTION
21091	2" (5' CANOPY)	Carya glabra	Hickory	80		0.7	REMOVE TREE FOR CONSTRUCTION
21092	3" (6' CANOPY)	Fraxinus pennsylvanica	Green Ash	30	Risk of elmerald ash borer; must treat to save ash	0.6	REMOVE TREE FOR CONSTRUCTION
21093	3" (6' CANOPY)	Morus alba	Common Mulberry	40		0.5	REMOVE TREE FOR CONSTRUCTION
21094	2" (3' CANOPY)	Deciduous Tree*			Limited Access		REMOVE TREE FOR CONSTRUCTION
21095	3" (5' CANOPY)	Ulmus americana	American Elm	50	Dutch Elm Disease is a threat to any Elm	0.6	REMOVE TREE FOR CONSTRUCTION
21096	8" (8' CANOPY)	Ulmus americana	American Elm	50	Dutch Elm Disease is a threat to any Elm	0.7	REMOVE TREE FOR CONSTRUCTION
21097	18" 2900 (18' CANOPY)	Acer rubrum	Red Maple	75	dominant stems at 8' above grade.	0.7	REMOVE TREE FOR CONSTRUCTION
21098	3" (8' CANOPY)	Deciduous Tree*			Limited Access		REMOVE TREE FOR CONSTRUCTION
21099	30" 2899 (28' CANOPY)	Quercus rubra	Red Oak	80	3 Stem at 20' above grade. Declining condition.	0.6	REMOVE TREE FOR CONSTRUCTION

21100	10" (15' CANOPY)	Morus alba	Common Mulberry	40		0.6	Save
21101	10" (10' CANOPY)	Betula nigra	River Birch	70		0.6	REMOVE TREE FOR CONSTRUCTION
21102	2" (5' CANOPY)	Deciduous Tree*			Limited Access		REMOVE TREE FOR CONSTRUCTION
21103	10" (10' CANOPY)	Catalpa speciosa	Northern Catalpa	50		0.6	Save
21104	18" 2857 (10' CANOPY)	Liriodendron tulipifera	Tulip Tree	75		0.7	Save
21105	18" DEAD (0' CANOPY)	DEAD Liriodendron tulipifera			Hazard. Remove this tree, or save for wildlife habitat	0	Save
21106	33" 2891 (20' CANOPY)	Liriodendron tulipifera	Tulip Tree	75		0.7	Save
21107	8" TWIN (12' CANOPY)	Acer rubrum	Red Maple	75		0.7	Save
21108	4" (4' CANOPY)	Dying Deciduous Tree			Consider removing this tree.	0.2	Save
21109	7" (8' CANOPY)	Ulmus americana	American Elm	50	Dutch Elm Disease is a threat to any Elm	0.7	Save
21110	18" TWIN (8' CANOPY)	Liriodendron tulipifera	Tulip Tree	75		0.7	Save
21111	3" 820 (5' CANOPY)	Ulmus americana	American Elm	50	Lean. Dutch Elm Disease is a threat to any Elm	0.5	Save
21112	4" 821 (10' CANOPY)	Acer saccharum	Sugar Maple	75		0.6	Save
21113	18" 2870 (8' CANOPY)	Liriodendron tulipifera	Tulip Tree	75	Dead branches in crown presents risk.	0.7	Monitor tree
21114	3" 822 (5' CANOPY)	Acer saccharum	Sugar Maple	75		0.6	Save
21115	12" 2872 (12' CANOPY)	Liriodendron tulipifera	Tulip Tree	75		0.8	Save
21116	21" 2871 (12' CANOPY)	Liriodendron tulipifera	Tulip Tree	75	significant risk of failure. Consider removing.	0.5	Save
21117	24" 2855 (12' CANOPY)	Liriodendron tulipifera	Tulip Tree	75	Vines may obscure hazard	0.7	Save
21118	6" (6' CANOPY)	Liriodendron tulipifera	Tulip Tree	75		0.7	Save
21119	6" (8' CANOPY)	Robinia pseudoacacia	Black Locust	50	Vines may obscure hazard	0.5	Save
21120	8" (10' CANOPY)	Liriodendron tulipifera	Tulip Tree	75		0.7	Save
21121	18" 2853 (15' CANOPY)	Liriodendron tulipifera	Tulip Tree	75	Vines may obscure hazard	0.7	Save
21122	10" 2854 (10' CANOPY)	Liriodendron tulipifera	Tulip Tree	75	Vines may obscure hazard	0.7	Save
21123	36" (20' CANOPY)	Liriodendron tulipifera	Tulip Tree	75	Declining condition. Vines may obscure hazard	0.5	Save
21124	3" (5' CANOPY)	Deciduous Tree*			Limited Access		Save
21125	3" (5' CANOPY)	Acer spp. *	Maple		Limited Access		Save
21126	3" (8' CANOPY)	Acer spp. *	Maple		Limited Access		Save
21127	3" (5' CANOPY)	Acer saccharum	Sugar Maple	75		0.6	Save
21128	2" (5' CANOPY)	Acer saccharum	Sugar Maple	75		0.6	Save
21129	3" (5' CANOPY)	Acer saccharum	Sugar Maple	75		0.6	Save
21130	24" 2892 (15' CANOPY)	Liriodendron tulipifera	Tulip Tree	75	Vines may obscure hazard	0.7	Save
21131	12" 814 (12' CANOPY)	Acer rubrum	Red Maple	75		0.7	REMOVE TREE FOR CONSTRUCTION
21132	3" 817 (5' CANOPY)	Acer rubrum	Red Maple	75		0.6	Save
21133	4" 818 (5' CANOPY)	Ulmus americana	American Elm	50	Dutch Elm Disease is a threat to any Elm. Consider remove.	0.2	Save
21134	4" 816 (8' CANOPY)	Acer rubrum	Red Maple	75		0.6	Save
21135	4" 815 (8' CANOPY)	Deciduous Tree*			Limited Access		Save
21136	18" 2893 (18' CANOPY)	Liriodendron tulipifera	Tulip Tree	75	Vines may obscure hazard.	0.7	Save
21137	18" DEAD (0' CANOPY)	Dead Deciduous Tree					Save
21138	18" TWIN (12' CANOPY)	Liriodendron tulipifera	Tulip Tree	75	Vines may obscure hazard. Co-dominant stems at 5' above grade with included bark.	0.6	REMOVE TREE FOR CONSTRUCTION
21141	10" (15' CANOPY)	Celtis occidentalis	Common Hackberry	60		0.8	REMOVE TREE FOR CONSTRUCTION
21142	6" (8' CANOPY)	Quercus phellos	Willow Oak	80		0.7	REMOVE TREE FOR CONSTRUCTION
21143	10" (10' CANOPY)	Fraxinus pennsylvanica	Green Ash	30	Co-dominant stem at 20' above grade. Risk of elmerald ash borer; must treat to save ash	0.7	REMOVE TREE FOR CONSTRUCTION
21144	8" (8' CANOPY)	Fraxinus pennsylvanica	Green Ash	30	Risk of elmerald ash borer; must treat to save ash	0.8	Save
21145	8" (8' CANOPY)	Fraxinus pennsylvanica	Green Ash	30	Risk of elmerald ash borer; must treat to save ash	0.8	Save
21148	6" (6' CANOPY)	Declining Deciduous Tree				0.5	Save
21149	8" (8' CANOPY)	Declining Deciduous Tree				0.5	Save
21150	6" TWIN (6' CANOPY)	Celtis occidentalis	Common Hackberry	60	Decling condition.	0.5	Save
21151	5" (5' CANOPY)	Deciduous Tree*			Limited Access		Save
21152	3" (5' CANOPY)	Morus alba	Common Mulberry	40	Dying tree. Vines	0.2	Save
21153	6" TWIN (8' CANOPY)	Deciduous Tree*			Limited Access		Save
21154	6" (8' CANOPY)	Deciduous Tree*			Limited Access		Save
21155	4" TWIN (4' CANOPY)	Dying Deciduous Tree				0.2	Save
21156	9" (9' CANOPY)	Morus alba	Common Mulberry	40	Poor form	0.5	REMOVE TREE FOR CONSTRUCTION
21159	10" (10' CANOPY)	Deciduous Tree*			Limited Access		Save
21160	10" (8' CANOPY)	Deciduous Tree*			Limited Access		Save
21161	4" 819 (8' CANOPY)	Deciduous Tree*			Limited Access		Save
21162	12" 2894 (10' CANOPY)	Acer rubrum	Red Maple	75	Vines may obscure hazard.	0.7	Save
21163	27" 2895 (10' CANOPY)	Catalpa speciosa	Northern Catalpa	50	Vines may obscure hazard.	0.6	Save
21164	15" (10' CANOPY)	Acer rubrum	Red Maple	75	Poor form.	0.5	REMOVE TREE FOR CONSTRUCTION
21165	21" 2901 (15' CANOPY)	Acer rubrum	Red Maple	75	Vines may obscure hazard.	0.7	REMOVE TREE FOR CONSTRUCTION
21166	6" (6' CANOPY)	Acer rubrum	Red Maple	75	Vines may obscure hazard.	0.7	REMOVE TREE FOR CONSTRUCTION

21167	21" 2903 (10' CANOPY)	Liriodendron tulipifera	Tulip Tree	75	Vines may obscure hazard.	0.6	Save
21168	30" TRIPLE (20' CANOPY)	Acer saccharinum	Silver Maple	50	Vines may obscure hazard. Decay in trunk presents severe hazard. Evidence of storm damage	0.5	Save
21169	2" (5' CANOPY)	Deciduous Tree*			Limited Access		Save
21170	30" 2905 (15' CANOPY)	Deciduous Tree*			Limited Access		Save
21171	12" (15' CANOPY)	Acer rubrum	Red Maple	75		0.6	Save
21174	12" (12' CANOPY)	Celtis occidentalis	Common Hackberry	60		0.6	REMOVE TREE FOR CONSTRUCTION
21175	12" (12' CANOPY)	Robinia pseudoacacia	Black Locust	50		0.6	REMOVE TREE FOR CONSTRUCTION
21176	4" (8' CANOPY)	Morus alba	Common Mulberry	40		0.6	REMOVE TREE FOR CONSTRUCTION
21177	4" TWIN (8' CANOPY)	Deciduous Tree*			Limited Access		Save
21178	4" (10' CANOPY)	Platanus occidentalis	American Sycamore	60		0.7	REMOVE FOR CONSTRUCTION
21179	12" (12' CANOPY)	Robinia pseudoacacia	Black Locust	50		0.7	Save
21180	18" (15' CANOPY)	Liriodendron tulipifera	Tulip Tree	75		0.8	Save
21181	2" CLUSTER (8' CANOPY)	Morus alba	Common Mulberry	40		0.6	REMOVE TREE FOR CONSTRUCTION
21182	2" CLUSTER (8' CANOPY)	Morus alba	Common Mulberry	40		0.6	REMOVE TREE FOR CONSTRUCTION
21183	2" CLUSTER (8' CANOPY)	Morus alba	Common Mulberry	40		0.6	REMOVE TREE FOR CONSTRUCTION
21184	12" (12' CANOPY)	Morus alba	Common Mulberry	40		0.6	Save
21185	18" 2906 (12' CANOPY)	Liriodendron tulipifera	Tulip Tree	75	Excessive lean. Vines may obscure hazard	0.7	Save
21187	6" (4' CANOPY)	Ulmus americana	American Elm	50	Lean. Dutch Elm Disease is a threat to any Elm	0.6	Save
21188	6" (10' CANOPY)	Catalpa speciosa	Northern Catalpa	50	Vines may obscure hazard	0.6	Save
21189	3" (4' CANOPY)	Ulmus americana *	American Elm	50	Dutch Elm Disease is a threat to any Elm	0.6	Save
21190	8" (10' CANOPY)	Ulmus americana	American Elm	50	Dutch Elm Disease is a threat to any Elm	0.6	Save
21191	3" (4' CANOPY)	Ulmus americana	American Elm	50	Dutch Elm Disease is a threat to any Elm	0.6	Save
21192	18" 2918 (12' CANOPY)	Acer negundo	Box Elder		Excessive lean. Vines may obscure hazard	0.7	Save
21193	28" 2907 (20' CANOPY)	Acer rubrum	Red Maple	75	Vines may obscure hazard. Evidence of included bark.	0.7	Save
21198	4" (6' CANOPY)	Quercus phellos	Willow Oak	80		0.8	REMOVE TREE FOR CONSTRUCTION
21199	6" (8' CANOPY)	Deciduous Tree*			Limited Access		Save
21200	18" (12' CANOPY)	Liriodendron tulipifera	Tulip Tree	75	Vines may obscure hazard	0.7	Save
21201	18" (12' CANOPY)	Platanus occidentalis	American Sycamore	60		0.6	Save
21202	16" (12' CANOPY)	Liriodendron tulipifera	Tulip Tree	75		0.8	Save
21203	4" (8' CANOPY)	Quercus phellos	Willow Oak	80		0.8	Save
21204	3" (6' CANOPY)	Deciduous Tree*					Save
21205	12" (12' CANOPY)	Juglans nigra	Black Walnut	80		0.7	Save
21206	8" (10' CANOPY)	Acer saccharum	Sugar Maple	75		0.8	Save
21207	6" (12' CANOPY)	Robinia pseudoacacia	Black Locust	50		0.6	Save
21208	6" (8' CANOPY)	Deciduous Tree*					Save
21209	3" (4' CANOPY)	Ilex opaca	American Holly	70		0.6	Save
21210	6" (10' CANOPY)	Liquidambar styriciflua	Sweet Gum	70		0.8	Save
21211	5" (8' CANOPY)	Morus alba	Common Mulberry	40		0.6	REMOVE TREE FOR CONSTRUCTION
21212	6" (8' CANOPY)	Liquidambar styriciflua	Sweet Gum	70		0.7	REMOVE TREE FOR CONSTRUCTION
21213	36" 2911 (20' CANOPY)	Liriodendron tulipifera	Tulip Tree	75	Severe Vines. Potential danger of for large pieces of wood falling	0.7	REMOVE TREE FOR CONSTRUCTION
21218	3" (6' CANOPY)	Prunus serotina	Black Cherry	60		0.6	REMOVE TREE FOR CONSTRUCTION
21219	8" (10' CANOPY)	Betulus spp.				0.6	REMOVE TREE FOR CONSTRUCTION
21220	3" (6' CANOPY)	Deciduous Tree*					REMOVE TREE FOR CONSTRUCTION
21221	4" (8' CANOPY)	Catalpa speciosa	Northern Catalpa	50		0.6	REMOVE TREE FOR CONSTRUCTION
21222	5" (8' CANOPY)	Catalpa speciosa	Northern Catalpa	50		0.6	REMOVE TREE FOR CONSTRUCTION
21223	9" 2912 (12' CANOPY)	Juglans nigra	Black Walnut	70	Excessive lean. Roots undercut by erosion.	0.6	REMOVE TREE FOR CONSTRUCTION
21224	10" (10' CANOPY)	Juglans nigra	Black Walnut	70	Lean	0.6	REMOVE TREE FOR CONSTRUCTION
21225	8" (8' CANOPY)	Catalpa speciosa	Northern Catalpa	50	Roots undercut	0.7	REMOVE TREE FOR CONSTRUCTION
21226	3" (4' CANOPY)	Ilex opaca	American Holly	70	Top damage	0.6	REMOVE TREE FOR CONSTRUCTION
21227	12" 2908 (18' CANOPY)	Acer rubrum	Red Maple	75	Decling condition. Sever Vines. Evidence of included bark.	0.6	REMOVE TREE FOR CONSTRUCTION
21228	8" DEAD (0' CANOPY)	Dead Deciduous Tree				0	REMOVE TREE FOR CONSTRUCTION
21229	4" 807 (8' CANOPY)	Ulmus americana	American Elm	50	Dutch Elm Disease is a threat to any Elm	0.7	REMOVE TREE FOR CONSTRUCTION
21230	8" 806 (8' CANOPY)	Celtis occidentalis	Common Hackberry	60		0.6	REMOVE TREE FOR CONSTRUCTION
21231	12" (18' CANOPY)	Acer rubrum	Red Maple	75	Vines may obscure hazard.	0.7	REMOVE TREE FOR CONSTRUCTION
21232	7" (10' CANOPY)	Celtis occidentalis *	Common Hackberry	60		0.6	REMOVE TREE FOR CONSTRUCTION
21233	3" 802 (8' CANOPY)	Celtis occidentalis *	Common Hackberry	60			Save
21234	6" 803 (8' CANOPY)	Deciduous Tree*			Limited Access		Save
21235	5" 812 (5' CANOPY)	Deciduous Tree*			Limited Access		Save
21236	4" 813 (6' CANOPY)	Deciduous Tree*			Limited Access		Save

THIS SHEET IS FOR TREE INVENTORY INFORMATION PURPOSES ONLY

Landscape Architects Planners Surveyors Engineers

Pennoni

Pennoni Associates Inc.

14532 Lee Road
Chantilly, VA 20151 – 703.449.6700

DATE	NO.	REVISIONS	BY
1/20/14	1	CITY OF FALLS CHURCH	WEG

ALL DIMENSIONS MUST BE VERIFIED BY CONTRACTOR AND OWNER MUST BE NOTIFIED OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK

COE RUN STREAM VALLEY PARK

BROAD STREET
FALLS CHURCH, VIRGINIA

TREE INVENTORY PLAN

ALL DOCUMENTS PREPARED BY PENNONI ASSOCIATES ARE INSTRUMENTS OF SERVICE IN RESPECT OF THE PROJECT. THEY ARE NOT INTENDED OR REPRESENTED TO BE SUITABLE FOR REUSE BY OWNER OR OTHERS ON THE EXTENSIONS OF THE PROJECT OR ON ANY OTHER PROJECT. ANY REUSE WITHOUT WRITTEN VERIFICATION OR ADAPTATION BY PENNONI ASSOCIATES FOR THE SPECIFIC PURPOSE INTENDED WILL BE AT OWNERS SOLE RISK AND WITHOUT LIABILITY OR LEGAL EXPOSURE TO PENNONI ASSOCIATES; AND OWNER SHALL INDEMNIFY AND HOLD HARMLESS PENNONI ASSOCIATES FROM ALL CLAIMS, DAMAGES, LOSSES AND EXPENSES ARISING OUT OF OR RESULTING THEREFROM.

NORTH

PROJECT NO. WEGI–1304

SHEET 6 OF 7

SCALE 1" = 25'

DATE 2013–11–15

DRAWN BY EFF

APPROVED DHS

DRAWING NO. L1.06

W:\FREDJOBFILES\4900'S\4966 – STREAM RESTORATION ENGINEERING COE BRANCH, PEARSON\9500–PENNONI\EX TREE INFO\NOV 2013\L–103–106–TRE–CHART.DWG PLOTTED: 1/16/2014 4:23:21 PM, BY: SARAH WOODFORD PLOTSTYLE: 4000–B&W.CTB, PROJECT STATUS: ––––

21237	7" 811 (7' CANOPY)	Deciduous Tree*			Limited Access		Save
21239	33" 2910 (20' CANOPY)	Carya illinoensis	Pecan		A Falls Church Specimen Tree. Vines may obscure hazard.	0.7	Save
21240	4" 804 (6' CANOPY)	Deciduous Tree*			Limited Access		Save
21241	3" (5' CANOPY)	Deciduous Tree*			Limited Access		Save
21243	8" (8' CANOPY)	Deciduous Tree*			Limited Access		Save
21244	15" (15' CANOPY)	Deciduous Tree*			Limited Access		Save
21245	12" (12' CANOPY)	Deciduous Tree*			Limited Access		Save
21246	3" (5' CANOPY)	Deciduous Tree*			Limited Access		Save
21247	3" (5' CANOPY)	Deciduous Tree*			Limited Access		Save
21248	(' CANOPY)	Deciduous Tree*			Limited Access		Save
21249	10" (10' CANOPY)	Deciduous Tree*			Limited Access		Save
21250	4" (8' CANOPY)	Deciduous Tree*			Limited Access		Save
21253	5" (8' CANOPY)	Liriodendron tulipifera	Tulip Tree	75	Vines may obscure hazard	0.6	REMOVE TREE FOR CONSTRUCTION
21254	4" (6' CANOPY)	Liriodendron tulipifera	Tulip Tree	75		0.7	REMOVE TREE FOR CONSTRUCTION
21255	3" (4' CANOPY)	Liriodendron tulipifera	Tulip Tree	75		0.7	REMOVE TREE FOR CONSTRUCTION
21256	2" (3' CANOPY)	Liriodendron tulipifera *	Tulip Tree	75			REMOVE FOR CONSTRUCTION
21257	3" (4' CANOPY)	Liriodendron tulipifera *	Tulip Tree	75			REMOVE TREE FOR CONSTRUCTION
21258	3" (4' CANOPY)	Liriodendron tulipifera	Tulip Tree	75		0.6	REMOVE TREE FOR CONSTRUCTION
21259	5" (5' CANOPY)	Liriodendron tulipifera *	Tulip Tree	75			REMOVE TREE FOR CONSTRUCTION
21260	5" 383 (5' CANOPY)	Liriodendron tulipifera	Tulip Tree	75		0.7	REMOVE TREE FOR CONSTRUCTION
21261	4" 400 (4' CANOPY)	Liriodendron tulipifera *	Tulip Tree	75			Save
21262	3" (3' CANOPY)	Liriodendron tulipifera *	Tulip Tree	75			Save
21263	3" 399 (5' CANOPY)	Liriodendron tulipifera *	Tulip Tree	75			Save
21264	7" (7' CANOPY)	Liriodendron tulipifera *	Tulip Tree	75			Save
21265	2" (5' CANOPY)	Fraxinus pennsylvanica	Green Ash	30	Risk of elmerald ash borer; must treat to save ash	0.7	Save
21266	4" 398 (6' CANOPY)	Liriodendron tulipifera *	Tulip Tree	75			Save
21267	10" 395 (10' CANOPY)	Liriodendron tulipifera *	Tulip Tree	75			Save
21268	2" (5' CANOPY)	Deciduous Tree*					Save
21269	4" QUIN (5' CANOPY)	Deciduous Tree*					Save
21270	4" (5' CANOPY)	Liriodendron tulipifera	Tulip Tree	75		0.7	Save
21271	5" 390 (5' CANOPY)	Deciduous Tree*					Save
21272	4" 389 (4' CANOPY)	Deciduous Tree*					Save
21273	3" 388 (4' CANOPY)	Deciduous Tree*					Save
21274	3" 387 (4' CANOPY)	Deciduous Tree*					Save
21275	8" 386 (8' CANOPY)	Liriodendron tulipifera	Tulip Tree	75		0.7	Save
21276	7" 385 (7' CANOPY)	Deciduous Tree*					Save
21277	10" 384 (10' CANOPY)	Deciduous Tree*					REMOVE TREE FOR CONSTRUCTION
21278	7" (10' CANOPY)	Liriodendron tulipifera *	Tulip Tree	75		0.7	REMOVE TREE FOR CONSTRUCTION
21279	2" (4' CANOPY)	Liriodendron tulipifera *	Tulip Tree	75		0.7	REMOVE TREE FOR CONSTRUCTION
21280	3" (6' CANOPY)	Liriodendron tulipifera	Tulip Tree	75		0.7	REMOVE TREE FOR CONSTRUCTION
21281	5" 381 (5' CANOPY)	Liriodendron tulipifera	Tulip Tree	75		0.7	Save
21282	3" (4' CANOPY)	Liriodendron tulipifera	Tulip Tree	75		0.7	Save
21283	3" 391 (4' CANOPY)	Liriodendron tulipifera	Tulip Tree	75		0.7	Save
21284	5" 392 (8' CANOPY)	Liriodendron tulipifera	Tulip Tree	75		0.7	Save
21285	4" 393 (4' CANOPY)	Liriodendron tulipifera	Tulip Tree	75		0.7	Save
21286	14" (20' CANOPY)	Fraxinus pennsylvanica	Green Ash	30	Risk of elmerald ash borer; must treat to save ash	0.7	Save
21288	3" (6' CANOPY)	Prunus serotina	Black Cherry	60		0.6	Save
21289	4" (4' CANOPY)	Prunus serotina *	Black Cherry	60		0.6	Save
21290	5" (5' CANOPY)	Liriodendron tulipifera	Tulip Tree	75		0.7	Save
21291	2" (5' CANOPY)	Deciduous Tree*					Save
21292	5" (8' CANOPY)	Deciduous Tree*					Save
21293	3" (5' CANOPY)	Prunus serotina	Black Cherry	60		0.7	Save
21294	8" (10' CANOPY)	Acer saccharinum	Silver Maple	40		0.6	Save
21295	7" (7' CANOPY)	Liriodendron tulipifera	Tulip Tree	75		0.7	Save
21296	6" (6' CANOPY)	Deciduous Tree*					Save
21297	3" (4' CANOPY)	Deciduous Tree*					Save
21298	6" (8' CANOPY)	Liriodendron tulipifera	Tulip Tree	75		0.7	Save
21299	12" (12' CANOPY)	Deciduous Tree*					Save
21300	6" (6' CANOPY)	Deciduous Tree*					Save
21301	4" (4' CANOPY)	Acer saccharum	Sugar Maple	75		0.6	Save
21302	3" (5' CANOPY)	Acer saccharinum	Silver Maple	40		0.6	Save

TREE #	SIZE DBH (CANOPY)	SPECIES	COMMON NAME	SPECIES RATING	COMMENTS	CONDI-TION	RECOMMENDATION
21303	4" (6' CANOPY)	Acer saccharinum	Silver Maple	40		0.8	Save
21304	6" (8' CANOPY)	Acer saccharinum	Silver Maple	40		0.7	Save
21305	3" (6' CANOPY)	Quercus rubra	Red Oak	80		0.8	Save
21306	3" (6' CANOPY)	Morus alba	Common Mulberry	40		0.7	Save
21307	5" 379 (8' CANOPY)	Betula nigra	River Birch	70		0.8	Save
21309	5" (8' CANOPY)	Ulmus americana	American Elm	50	Dutch Elm Disease is a threat to any Elm	0.8	REMOVE TREE FOR CONSTRUCTION
21310	4" (8' CANOPY)	Ulmus americana	American Elm	50	Dutch Elm Disease is a threat to any Elm	0.7	REMOVE TREE FOR CONSTRUCTION
21311	3" (5' CANOPY)	Liriodendron tulipifera	Tulip Tree	75		0.7	REMOVE FOR CONSTRUCTION
21312	4" (8' CANOPY)	Liriodendron tulipifera	Tulip Tree	75		0.7	REMOVE TREE FOR CONSTRUCTION
21313	3" (5' CANOPY)	Dead Deciduous Tree				0	Save
21314	3" (5' CANOPY)	Liriodendron tulipifera *	Tulip Tree	75		0.7	REMOVE TREE FOR CONSTRUCTION
21315	15" 2913 (15' CANOPY)	Juglans nigra	Black Walnut	70		0.7	REMOVE TREE FOR CONSTRUCTION
21316	7" (10' CANOPY)	Juglans nigra	Black Walnut	70		0.7	REMOVE TREE FOR CONSTRUCTION
21317	2" (5' CANOPY)	Liriodendron tulipifera *	Tulip Tree	75		0.7	REMOVE TREE FOR CONSTRUCTION
21318	7" (7' CANOPY)	Acer saccharinum	Silver Maple	40		0.6	REMOVE TREE FOR CONSTRUCTION
21319	4" (8' CANOPY)	Liriodendron tulipifera	Tulip Tree	75		0.8	REMOVE TREE FOR CONSTRUCTION
21320	8" (8' CANOPY)	Liriodendron tulipifera	Tulip Tree	75		0.7	REMOVE TREE FOR CONSTRUCTION
21321	4" 382 (5' CANOPY)	Carya glabra	Hickory	80		0.7	REMOVE TREE FOR CONSTRUCTION
21322	4" 378 (8' CANOPY)	Dead Deciduous Tree				0	REMOVE TREE FOR CONSTRUCTION
21323	4" (8' CANOPY)	Acer saccharinum	Silver Maple	40		0.6	REMOVE TREE FOR CONSTRUCTION
21324	4" (8' CANOPY)	Acer saccharinum	Silver Maple	40		0.6	REMOVE TREE FOR CONSTRUCTION
21325	7" TWIN (12' CANOPY)	Magnolia soulangiana	Saucer Magnolia	50	Some decay in trunk of tree.	0.7	REMOVE TREE FOR CONSTRUCTION
21326	4" (8' CANOPY)	Acer spp. *			Maple	0.7	REMOVE TREE FOR CONSTRUCTION
21327	6" (8' CANOPY)	Acer saccharinum	Silver Maple	40		0.6	REMOVE TREE FOR CONSTRUCTION
21328	9" (10' CANOPY)	Carya glabra	Hickory	80		0.7	REMOVE TREE FOR CONSTRUCTION
21329	15" (15' CANOPY)	Juglans nigra	Black Walnut	80	Save for wildlife habitat. Vines may obscure hazard.	0.7	REMOVE FOR CONSTRUCTION
21330	3" (5' CANOPY)	Quercus rubra	Red Oak	80		0.7	Save
21331	6" 376 (8' CANOPY)	Quercus rubra	Red Oak	80		0.8	Save
21332	4" (6' CANOPY)	Liquidambar styriciflua	Sweet Gum	70		0.8	REMOVE TREE FOR CONSTRUCTION
21333	14" (15' CANOPY)	Liriodendron tulipifera	Tulip Tree	75	Excessive lean. Vines may obscure hazard	0.7	REMOVE TREE FOR CONSTRUCTION
21334	4" (5' CANOPY)	Dead Deciduous Tree					REMOVE TREE FOR CONSTRUCTION
21335	14" 2917 (14' CANOPY)	Prunus serotina	Black Cherry	60	danger of for large pieces of wood falling	0.5	REMOVE TREE FOR CONSTRUCTION
21336	7" (7' CANOPY)	Quercus phellos	Willow Oak	80		0.7	REMOVE TREE FOR CONSTRUCTION
21337	10" (5' CANOPY)	Celtis occidentalis	Common Hackberry	60		0.6	REMOVE TREE FOR CONSTRUCTION
21338	6" 375 (8' CANOPY)	Celtis occidentalis	Common Hackberry	60	vines may obscure hazard.	0.5	REMOVE TREE FOR CONSTRUCTION
21339	2" (4' CANOPY)	Ilex opaca	American Holly	70	Top damage	0.5	REMOVE TREE FOR CONSTRUCTION
21340	5" (6' CANOPY)	Morus alba	Common Mulberry	40		0.6	REMOVE TREE FOR CONSTRUCTION
21341	8" (8' CANOPY)	Juglans nigra	Black Walnut	70		0.6	REMOVE TREE FOR CONSTRUCTION
21342	2" (2' CANOPY)	Ilex opaca	American Holly	70	Top damage	0.5	REMOVE TREE FOR CONSTRUCTION
21346	2" (3' CANOPY)	Deciduous Tree*					Save
21347	2" TRIP (5' CANOPY)	Betula nigra	River Birch	70		0.8	Save
21348	12" (12' CANOPY)	Juglans nigra	Black Walnut	70		0.7	Save
21349	8" (8' CANOPY)	Deciduous Tree*					Save
21350	3" QUAD (8' CANOPY)	Lagerstroema indica	Crapemyrtle	80		0.7	Save
21351	17" (18' CANOPY)	Ulmus americana	American Elm	50	Potential for deadwood falling near townhousesDutch Elm Disease is a threat to any Elm	0.7	Save
21352	6" (8' CANOPY)	Prunus spp.	Cherry	60		0.7	REMOVE TREE FOR CONSTRUCTION
21353	6" (8' CANOPY)	Prunus spp.	Cherry	60		0.7	REMOVE TREE FOR CONSTRUCTION
21354	3" (5' CANOPY)	Deciduous Tree*					REMOVE TREE FOR CONSTRUCTION
21355	3" (5' CANOPY)	Ilex opaca	American Holly	70	Top damage	0.7	REMOVE TREE FOR CONSTRUCTION
21356	10" (10' CANOPY)	Quercus phellos	Willow Oak	80		0.7	Save
21357	9" (6' CANOPY)	Thuja occidentalis	Arborvitae	60		0.6	Save
21358	4" TWIN (5' CANOPY)	Deciduous Tree*					Save
21362	2" (4' CANOPY)	Picea abies	Norway Spruce	60		0.9	Save
21363	7" (7' CANOPY)	Liquidambar styriciflua	Sweet Gum	70		0.8	REMOVE TREE FOR CONSTRUCTION
21364	10" (10' CANOPY)	Quercus phellos	Willow Oak	80		0.8	Save
21365	6" (8' CANOPY)	Deciduous Tree*					Save
21366	6" (8' CANOPY)	Pinus strobus	Eastern White Pine	50		0.8	Save
21367	6" (8' CANOPY)	Pinus strobus	Eastern White Pine	50		0.7	REMOVE TREE FOR CONSTRUCTION
21368	2" (3' CANOPY)	Ilex opaca	American Holly	70	Top damage	0.6	REMOVE TREE FOR CONSTRUCTION
21369	3" (7' CANOPY)	Cornus florida	White Flowering Dogwood	50		0.6	Save

TREE #	SIZE DBH (CANOPY)	SPECIES	COMMON NAME	SPECIES RATING	COMMENTS	CONDI-TION	RECOMMENDATION
21370	4" (6' CANOPY)	Amelanchier spp.	Serviceberry	80		0.7	Save
21371	10" (12' CANOPY)	Liriodendron tulipifera	Tulip Tree	75		0.7	Save
21372	6" (6' CANOPY)	Robinia pseudoacacia	Black Locust	50	Impacting Tree 21371, recommend owner removes	0.5	Save
21373	9" (10' CANOPY)	Catalpa speciosa	Northern Catalpa	50	crook	0.5	Save
21374	2" (3' CANOPY)	Ilex opaca	American Holly	70		0.6	Save
21375	2" (3' CANOPY)	Ilex opaca	American Holly	70		0.6	Save
21376	5" (8' CANOPY)	Ulmus americana	American Elm	50	Dutch Elm Disease is a threat to any Elm	0.8	Save
21377	3" (6' CANOPY)	Acer rubrum	Red Maple	75		0.8	Save
21386	8" (8' CANOPY)	Robinia pseudoacacia	Black Locust	50		0.7	Save
21387	18" 2919 (18' CANOPY)	Robinia pseudoacacia	Black Locust	50	Dutch Elm Disease is a threat to any Elm	0.7	REMOVE FOR CONSTRUCTION
21388	5" (8' CANOPY)	Ulmus americana	American Elm	50		0.7	Save
21389	4" (6' CANOPY)	Fraxinus pennsylvanica	Green Ash	30	Risk of elmerald ash borer; must treat to save ash	0.7	Save
21390	10" TWIN (12' CANOPY)	Ulmus americana	American Elm	50	Dutch Elm Disease is a threat to any Elm	0.7	Save
21391	7" (7' CANOPY)	Catalpa speciosa	Northern Catalpa	50	crook	0.6	Save
21392	8" (8' CANOPY)	Acer saccharinum	Silver Maple	40		0.7	Save
21394	27" (27' CANOPY)	Juglans nigra	Black Walnut	70		0.7	Save
21395	24" (15' CANOPY)	Nyssa sylvatica	Black Gum	80		0.7	Save

THIS SHEET IS FOR TREE INVENTORY INFORMATION PURPOSES ONLY

Pennoni Associates Inc.
Engineers Surveyors Planners Landscape Architects
14532 Lee Road
Chantilly, VA 20151 – 703.449.6700

Pennoni

DATE	NO.	REVISIONS	BY
1/20/14	1	CITY OF FALLS CHURCH	WEG

ALL DIMENSIONS MUST BE VERIFIED BY CONTRACTOR AND OWNER MUST BE NOTIFIED OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK

COE RUN STREAM VALLEY PARK
BROAD STREET
FALLS CHURCH, VIRGINIA

TREE INVENTORY PLAN

ALL DOCUMENTS PREPARED BY PENNONI ASSOCIATES ARE INSTRUMENTS OF SERVICE IN RESPECT OF THE PROJECT. THEY ARE NOT INTENDED OR REPRESENTED TO BE SUITABLE FOR REUSE BY OWNER OR OTHERS ON THE EXTENSIONS OF THE PROJECT OR ON ANY OTHER PROJECT. ANY REUSE WITHOUT WRITTEN VERIFICATION OR ADAPTATION BY PENNONI ASSOCIATES FOR THE SPECIFIC PURPOSE INTENDED WILL BE AT OWNERS SOLE RISK AND WITHOUT LIABILITY OR LEGAL EXPOSURE TO PENNONI ASSOCIATES; AND OWNER SHALL INDEMNIFY AND HOLD HARMLESS PENNONI ASSOCIATES FROM ALL CLAIMS, DAMAGES, LOSSES AND EXPENSES ARISING OUT OF OR RESULTING THEREFROM.

NORTH

PROJECT NO.	WEGI–1304
SHEET	7 OF 7
SCALE	1" = 25'
DATE	2013–11–15
DRAWN BY	EFF
APPROVED	DHS
DRAWING NO.	L1.07

W:\FREDJOBFILES\4900'S\4966 – STREAM RESTORATION ENGINEERING COE BRANCH, PEARSON\9500–PENNONI\EX TREE INFO\NOV 2013\L–103–106–TRE–CHART.DWG PLOTTED: 1/20/2014 3:59:25 PM, BY: SARAH WOODFORD PLOTSTYLE: 4000–B&W.CTB, PROJECT STATUS: ––––

Memorandum

To: Jason Widstrom, P.E., City of Falls Church

CC: George Rhodes III, PLA, Williamsburg Environmental Group, Inc. (WEG)

David Wang, Ph. D, P.E., Sabra, Wang & Associates, Inc. (SWA)

From: Dustin Schilpp, P. E., Sabra, Wang & Associates, Inc.

Subject: Coe Branch Culvert Inspection

File No.: 13-30.01

Date: October 23, 2013

Description

In accordance with WEG's request, as part of the Coe Branch Stream Restoration project, a structural inspection team from Sabra, Wang & Associates, Inc. (SWA) performed an inspection of a twin cell corrugated metal pipe arch (CMPA) culvert on July 8th and July 9th, 2013. The inspection team was led by Dustin Schilpp, P.E. with assistant inspectors Thomas Schilpp and Paul Mitchell. The CMPA culvert starts upstream at a drop inlet structure just north of Rollins Street and outfalls into Tripps Run just north of Sherrow Avenue. The purpose of the inspection was to identify the structural condition of the culvert, inlet structures, headwall/wingwalls, and identify any lateral connections to the culvert.

From the drawings, the structure was supposed to be a 48" diameter corrugated metal pipe (CMP) at the downstream end and changed section to a 6'-0" wide x 3'-8" high CMPA approximately 250' into the structure. Upon inspection, it was observed that the entire length of the culvert is the 6'-0" wide x 3'-8" high CMPA (see Photograph No. 1).

Summary of Findings

The upstream concrete inlet structure was comprised of a concrete slab (not subject to vehicular traffic) with concrete walls. The concrete slab was supported by a transverse I-beam. The west end of the beam was supported on the concrete headwall while the east end of the beam was originally supported by a 4" diameter steel tube. The 4" diameter steel tube was severed due to corrosion and a 2 ½" diameter steel tube was installed adjacent (see Photograph No. 2). The underside of the concrete slab exhibited several spalled and delaminated areas. The spalled areas were typically less than ½" deep with exposed welded wire fabric reinforcing. There was a concrete drainage flume, from Rollins Street, that discharged into the concrete inlet structure at the southwest corner. The south embankment was moderately eroded and the drainage flume was slightly undermined. No settlement of the drainage flume was observed. There was a grating comprised of reinforcing bars installed just upstream of the inlet structure. There was debris and sediment buildup on the grating

restricting the flow of the channel (see Photograph No. 3). The 15" CMP, shown on the drawings, discharged into the inlet structure through the east wall and was in good condition with no notable defects observed (see Photograph Nos. 4 and 5).

The CMPA culvert was in satisfactory condition. The bituminous coating was missing from approximately 25% of the pipes exposing minor surface rust, typically near the spring lines (see Photograph No. 6). The joints between pipe sections were typically open 1" horizontally x ½" vertically exposing the steel collar.

North Cell between Upstream Inlet and Inlet 1 (10 each, 30' long pipe sections):

This portion of the CMPA had minor deformation of the pipe crown with a minimum vertical clearance of 30". Joint 1 was open 2" horizontally x 1 ½" vertically exposing the steel collar. At Joint 2, the north wall of the 2nd pipe section is bent inward 4" over a 1'-6" height exposing fill (see Photograph No. 7). Joint 3 was open 1 ½" horizontally x 1 ¼" vertically exposing fill. Joint 5 was open 2 ½" horizontally x 1 ½" vertically with exposed fill. Joint 8 was open 2" horizontally x 1 ½" vertically exposing the steel collar.

South Cell between Upstream Inlet and Inlet 1:

There was a 1'-0" wide x 8" high x 3" deep bulge in the south wall approximately 3' from the upstream end (see Photograph No. 8). There was a 4" diameter x 1" deep bulge in the crown approximately 35' from the upstream end. There was a 8" wide x 4" high x 1 ½" deep bulge in the south wall at Joint 2 and the joint was open up to 1 ½" horizontally exposing the steel collar. Joint 5 was open up to 2" horizontally exposing the steel collar. Joint 7 was open up to 2" horizontally at the north wall exposing the steel collar, but tapered closed at the crown. Joint 9 was open 2" horizontally x 1 ½" vertically with exposed fill (see Photograph No. 9).

Inlet 1 was comprised of a concrete slab (not subject to vehicular traffic) with concrete walls. Concrete flumes discharged into the north and south walls of the inlet. There was a 1 ½" wide vertical gap between the flumes and the concrete walls of the inlet (see Photograph No. 10). The flumes were partially clogged with heavy debris (see Photograph No. 10). There were three minor spalls in the underside of the concrete slab up to 1'-4" wide x 9" long x ½" deep with exposed welded wire fabric reinforcing (see Photograph No. 11). There was a full length transverse hairline crack in the underside of the concrete slab stemming from the manhole lid. There were a few vertical hairline cracks in each wall of the inlet. The embankment on the east side of Inlet 1 was eroded the full width of the inlet x 2'-0" long x up to 1'-4" deep (see Photograph No. 12). The tops of both pipes were exposed. Just west of Inlet 1 the pipes ran underneath residential property making portions inaccessible for inspection.

North Cell between Inlet 1 and Inlet 2 (10 each, 30' long pipe sections):

Joint 1 was open 2 ½" horizontally x 2" vertically exposing the steel collar. Joint 2 was open 2" vertically with flood debris caught in the joint. Joint 3 was open 2 ½" horizontally x 3" vertically with exposed fill (see Photograph No. 13). Joint 5 was open 3" horizontally x 1 ½" vertically with exposed fill at the south wall. Joint 7 was open 2" horizontally x 1 ½" vertically with flood debris caught in the joint. Joint 8 was open up to 2 ½" horizontally with a 1'-0" long x 1" deep bent down section on the north wall. Joint 9 was open 2 ½" horizontally exposing the steel collar. Adjacent to Joint 9, there was a 1" diameter corrosion hole in the north wall (see Photograph No. 14). The area around the hole tapers back to full section within 4".

South Cell between Inlet 1 and Inlet 2:

There was a 9" high x 4" deep bulge in the north wall at Joint 2 and the joint was open 1 ½" horizontally x 2" vertically (see Photograph No. 15). Joint 4 was open 2 ½" horizontally x 3" vertically with exposed fill. It appears bricks were placed in the open joint (see Photograph No. 16). There was a 9" long x 2 ½" deep bulge in the south wall at Joint 7 and the joint was open up to 2" horizontally exposing the steel collar. Joint 8 was open up to 2" vertically with exposed fill.

Inlet 2 was comprised of a concrete slab (not subject to vehicular traffic) with concrete walls. A drainage grate in the top slab was the only point of entry for water infiltration. Dense vegetation covered the top of the inlet making it unable to be located for inspection (see Photograph No. 17).

North Cell between Inlet 2 and Downstream End (7 each, 30' long pipe sections):

Joints 2 and 3 were open 2" horizontally x 1 ½" vertically exposing the steel collar. Joint 4 was open 2 ½" horizontally exposing the steel collar.

South Cell between Inlet 2 and Downstream End:

There was up to 1'-0" deep sediment buildup intermittently throughout the invert (see Photograph No. 18). Between Joints 2 and 3, there was an 8" diameter x 1" deep bulge in the crown. Between Joint 6 and the downstream end, there was a 2'-6" wide x 2'-8" long x 8" deep bulge in the crown (see Photograph No. 19).

The downstream headwall was comprised of stone masonry and was in good condition (see Photograph No. 1). There was a 1'-6" long x 10" wide x 7" deep erosion hole behind the headwall between the pipes (see Photograph No. 20). There was a 2'-3" long x 1'-6" wide x 9" deep erosion hole 20' east of the downstream headwall (see Photograph No. 21).

The 10" diameter reinforced concrete pipe (RCP) at the downstream headwall was measured to be 14'-3" long and was in good condition. The joint between pipe sections, at approximately 5' from the downstream end, was misaligned with exposed fill (see Photograph No. 22). There was minor spalling/delamination around the misaligned joint.

Recommendation

From discussions with WEG, it was determined that after the new channel is constructed this CMPA culvert is no longer required and should be decommissioned. SWA recommends that the inlet structures be partially demolished and the pipes be filled with flowable fill (see attached specification).

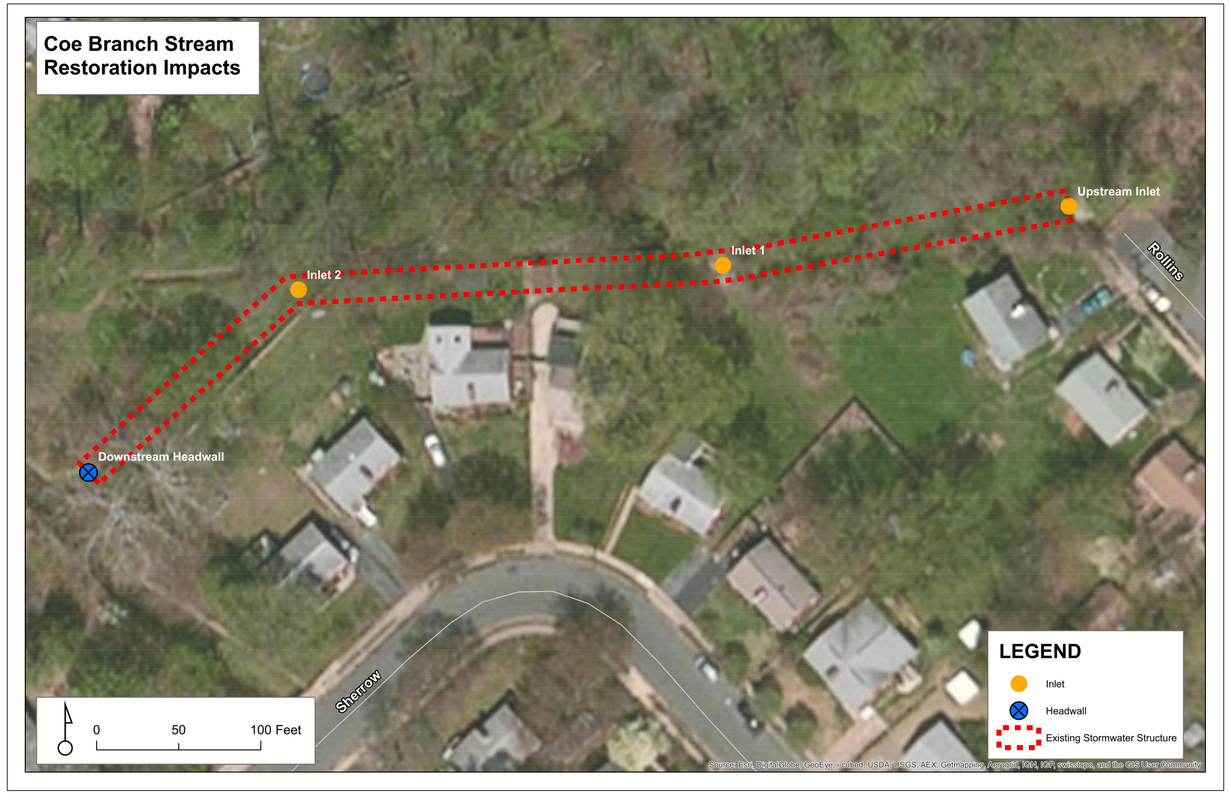
The entire length of the CMPA's should be completely filled with flowable fill with no voids. The contractor should submit means and methods for filling the CMPA's for the engineer's approval.

The top slab, steel beam, and steel columns of the upstream inlet structure should be removed. All of the walls of the inlet structure should be demolished to the top of the CMPA's. Flowable fill should be placed in the remaining portion of the inlet structure to the top of the CMPA's. Backfill, topsoil and sod should be used to bring the ground surface back up to finished grade. The 15" CMP and concrete drainage flume currently discharging to the inlet structure should be relocated as per the contract drawings.

The top slabs and any concrete aprons leading to Inlets 1 and 2 should be removed. All of the walls of the inlet structures should be demolished to the top of the CMPA's. Flowable fill should be placed in the remaining portion of the inlet structures to the top of the CMPA's. Backfill, topsoil and sod should be used to bring the ground surface back up to finished grade.

The downstream end of the CMPA's, at the confluence with Tripps Run, should be closed using stone similar to the headwall material as a bulkhead to retain the flowable fill. The 10" RCP that discharges through the downstream headwall should remain in service and undisturbed.

The contractor should perform all work related to the culvert decommission with no disturbance to the trees and minimal disturbance to the stream, land, and residence.



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Environmental Consultants

STRUCTURAL INFORMATION
COE BRANCH STREAM RESTORATION
CITY OF FALLS CHURCH, VIRGINIA

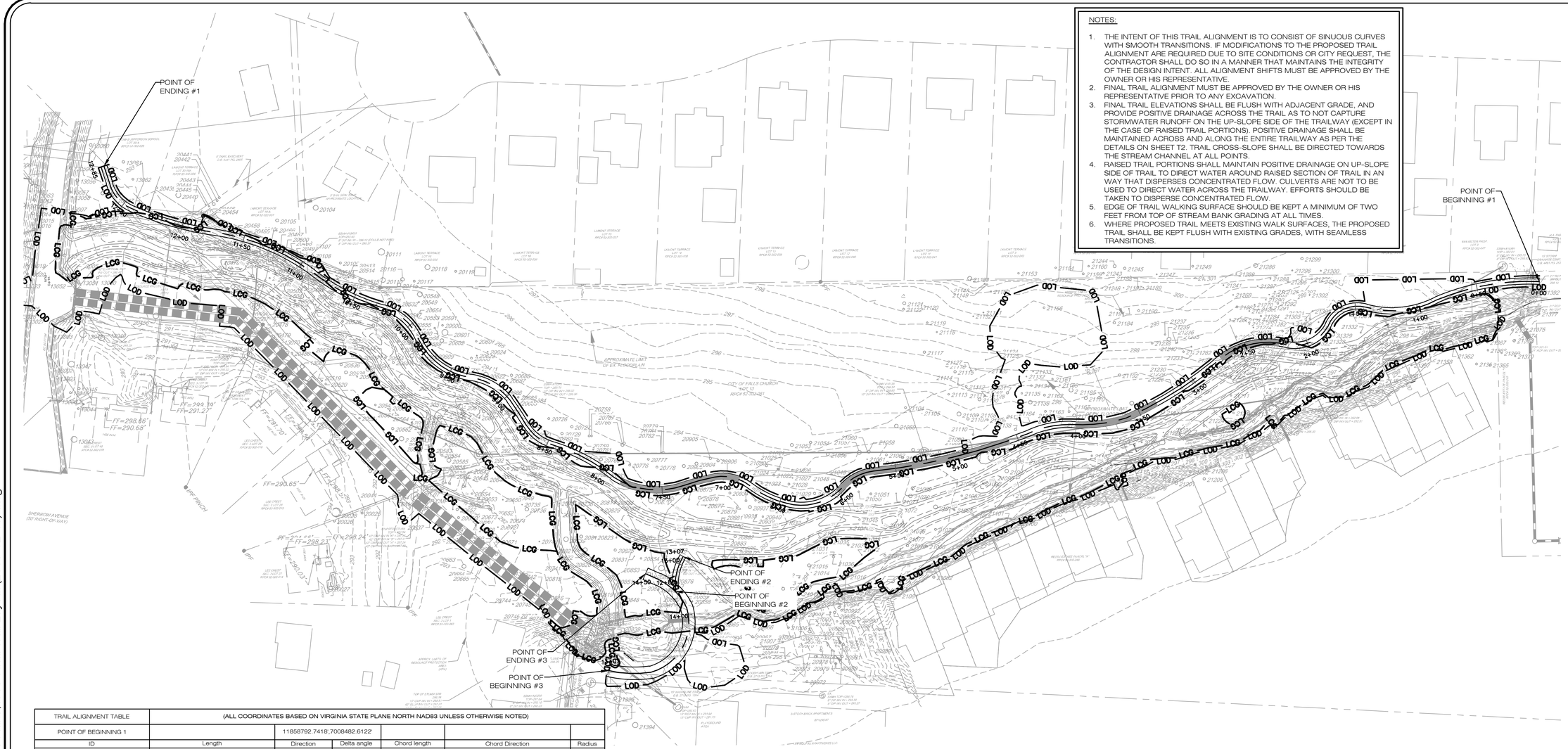
COMMONWEALTH OF VIRGINIA
SCOTT C. BLOSSOM
Lic. No. 40287
11/7/13
PROFESSIONAL ENGINEER

REVISIONS:
DATE:

DRAWN BY: CDP, RH
DESIGNED BY: CDP
DATE: 11/07/2013
CHECKED BY: SCB, GCR
SCALE: N/A

SHEET: S1 OF 43
JOB#: 4966

\\lan.wegnet.com\WEG\FREDcad\4900s\4966 - Coe Branch Stream Restoration\Stream Restoration\Construction Plan-95\CAD SHEETS\Coe Branch - Structural INFO SHEET.dwg



NOTES:

1. THE INTENT OF THIS TRAIL ALIGNMENT IS TO CONSIST OF SINUOUS CURVES WITH SMOOTH TRANSITIONS. IF MODIFICATIONS TO THE PROPOSED TRAIL ALIGNMENT ARE REQUIRED DUE TO SITE CONDITIONS OR CITY REQUEST, THE CONTRACTOR SHALL DO SO IN A MANNER THAT MAINTAINS THE INTEGRITY OF THE DESIGN INTENT. ALL ALIGNMENT SHIFTS MUST BE APPROVED BY THE OWNER OR HIS REPRESENTATIVE.
2. FINAL TRAIL ALIGNMENT MUST BE APPROVED BY THE OWNER OR HIS REPRESENTATIVE PRIOR TO ANY EXCAVATION.
3. FINAL TRAIL ELEVATIONS SHALL BE FLUSH WITH ADJACENT GRADE, AND PROVIDE POSITIVE DRAINAGE ACROSS THE TRAIL AS TO NOT CAPTURE STORMWATER RUNOFF ON THE UP-SLOPE SIDE OF THE TRAILWAY (EXCEPT IN THE CASE OF RAISED TRAIL PORTIONS). POSITIVE DRAINAGE SHALL BE MAINTAINED ACROSS AND ALONG THE ENTIRE TRAILWAY AS PER THE DETAILS ON SHEET T2. TRAIL CROSS-SLOPE SHALL BE DIRECTED TOWARDS THE STREAM CHANNEL AT ALL POINTS.
4. RAISED TRAIL PORTIONS SHALL MAINTAIN POSITIVE DRAINAGE ON UP-SLOPE SIDE OF TRAIL TO DIRECT WATER AROUND RAISED SECTION OF TRAIL IN AN WAY THAT DISPERSES CONCENTRATED FLOW. CULVERTS ARE NOT TO BE USED TO DIRECT WATER ACROSS THE TRAILWAY. EFFORTS SHOULD BE TAKEN TO DISPERSE CONCENTRATED FLOW.
5. EDGE OF TRAIL WALKING SURFACE SHOULD BE KEPT A MINIMUM OF TWO FEET FROM TOP OF STREAM BANK GRADING AT ALL TIMES.
6. WHERE PROPOSED TRAIL MEETS EXISTING WALK SURFACES, THE PROPOSED TRAIL SHALL BE KEPT FLUSH WITH EXISTING GRADES, WITH SEAMLESS TRANSITIONS.

TRAIL ALIGNMENT TABLE	(ALL COORDINATES BASED ON VIRGINIA STATE PLANE NORTH NAD83 UNLESS OTHERWISE NOTED)					
POINT OF BEGINNING 1		11858792.7418',7008482.6122'				
ID	Length	Direction	Delta angle	Chord length	Chord Direction	Radius
1	83.56'		25.2602 (d)	82.88'	S29° 43' 43"W	189.53'
2	34.88'		26.2890 (d)	34.57'	S25° 40' 06"W	76.01'
3	22.70'		15.8355 (d)	22.62'	S47° 16' 36"W	82.12'
4	37.14'		83.8558 (d)	33.91'	S13° 43' 39"W	25.38'
5	38.52'		73.0695 (d)	35.96'	S15° 49' 35"W	30.20'
6	60.08'		56.2316 (d)	57.70'	S26° 03' 35"W	61.22'
7	84.39'		15.8050 (d)	84.12'	S8° 06' 19"W	305.93'
8	43.96'		20.8570 (d)	43.71'	S33° 14' 12"W	120.75'
9	36.03'		27.4214 (d)	35.69'	S28° 12' 31"W	75.28'
10	126.44'		14.9953 (d)	126.08'	S26° 21' 55"W	483.11'
11	27.27'		39.3000 (d)	26.74'	S13° 17' 45"W	39.76'
12	49.55'		64.6427 (d)	46.97'	S23° 09' 27"W	43.92'
13	32.54'		23.6425 (d)	32.30'	S65° 19' 31"W	78.85'
14	30.00'		47.2323 (d)	29.15'	S54° 05' 50"W	36.39'
15	25.19'		8.2912 (d)	25.16'	S24° 42' 03"W	174.04'
16	57.49'		51.4597 (d)	55.58'	S46° 17' 06"W	64.01'
17	56.59'		23.2028 (d)	56.21'	S67° 53' 36"W	139.75'
18	26.54'		42.9554 (d)	25.92'	S77° 46' 10"W	35.40'
19	23.55'		5.3230 (d)	23.54'	N83° 24' 51"W	253.44'
20	35.35'		43.0967 (d)	34.52'	S70° 45' 36"W	47.00'
21	53.33'		56.4598 (d)	51.20'	S74° 41' 03"W	54.12'
22	40.45'		54.4574 (d)	38.94'	S82° 33' 03"W	42.56'
23	64.48'		22.6497 (d)	64.06'	S67° 01' 29"W	163.12'
24	87.37'		28.5813 (d)	86.46'	S61° 23' 12"W	175.14'
25	65.87'		15.1296 (d)	65.68'	S56° 28' 03"W	249.46'
26	27.50'		52.2257 (d)	26.56'	S89° 50' 09"W	30.17'
27	13.97'	N68° 10' 25"W				
POINT OF ENDING 1		11857989.3442',7007667.9708'				
POINT OF BEGINNING 2		11858534.9704',7007802.8079'				
ID	Length		Delta angle	Chord length	Chord Direction	Radius
28	21.99'		28.9531 (d)	21.75'	N33° 36' 33"W	43.51'
POINT OF ENDING 2		11858522.9289',7007820.9256'				
POINT OF BEGINNING 3		11858554.3624',7007717.3555'				
ID	Length	Direction	Delta angle	Chord length	Chord Direction	Radius
29	33.84'		20.9124 (d)	33.65'	N42° 27' 46"E	92.71'
30	26.89'		35.8118 (d)	26.45'	N6° 00' 51"E	43.02'
31	38.28'		52.6373 (d)	36.95'	N39° 37' 01"W	41.67'
32	32.64'		40.6105 (d)	31.96'	S85° 08' 31"W	46.06'
33	11.26'	S64° 01' 23"W				
POINT OF ENDING 3		11858514.3167',7007789.3133'				

CONTOUR INTERVAL = 1/2 FOOT

40' 0' 20' 40' 80' 120'

LEGEND

- EXISTING TREE
- PROPERTY LINE
- EXISTING CONTOURS
- PROPOSED CONTOURS
- PROPOSED LIMITS OF DISTURBANCE
- PROPOSED RAISED TRAIL
- PROPOSED LIMITS OF GRADING
- PROPOSED TRAIL ALIGNMENT

5209 Center Street
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WILLIAMSBURG ENVIRONMENTAL GROUP, INC.
Environmental Consultants

TRAIL ALIGNMENT
COE BRANCH STREAM RESTORATION
CITY OF FALLS CHURCH, VIRGINIA

COMMONWEALTH OF VIRGINIA
GEORGE C. RHODES III
Lic. No. 000894
12/16/13
LANDSCAPE ARCHITECT

REVISIONS:
DATE:

DRAWN BY: TL/CH
DESIGNED BY: CDP,DLM
DATE: 12/16/13
CHECKED BY: SCB,GCR,DLM
SCALE: 1"=40'

SHEET: T1 OF 43
JOB#: 4966

W:\WMBGcad\4900s\4966-Coe Branch - Stream Restoration\Landscape Plans\4966-Final Trail Layout (2013-12-13).dwg

TRAIL NOTES:

1. REMOVE ALL STUMPS WITHIN THE TRAILBED. REMOVE STUMPS LOCATED BETWEEN THE EDGE OF THE TRAILBED AND THE EDGE OF THE TRAILWAY THAT CANNOT BE CUT FLUSH WITH THE FINISHED SLOPE OR THAT ARE NOT TIGHTLY ROOTED. REMOVE ALL DUFF AND DEBRIS FROM WITHIN TRAILWAY LIMITS AND SPREAD IN DESIGNATED STOCKPILE LIMITS. DO NOT OBSTRUCT DRAINAGE OR CREATE PILES, BERMS, OR WINDROWS OF DEBRIS.
2. REMOVE LOOSE AGGREGATE, SOIL, OR OTHER DELETERIOUS MATERIALS FROM THE PROPOSED TRAIL SURFACE. PREPARE BASE OR TRAILBED BY SHAPING, WATERING, AND COMPACTING BEFORE PLACING COMPACTED FILL MATERIAL. EDGES OF EXCAVATION SHALL BE PRODUCED WITH VERTICAL SIDEWALLS
3. WHERE SHOWN ON THE DRAWINGS, PLACE GEOSYNTHETICS FLAT AND PARALLEL TO CENTERLINE OF THE TRAIL BEFORE PLACING EMBANKMENT. OVERLAP GEOSYNTHETICS A MINIMUM OF TWO FEET. INSTALL ANCHORS OR FASTENERS AS RECOMMENDED BY THE GEOSYNTHETIC MANUFACTURER.
4. WITH THE EXCEPTION OF RAISED TRAIL SEGMENTS, DO NOT OBSTRUCT DRAINAGE. WHERE TRAIL IS RAISED, CONTRACTOR SHALL MAKE AN EFFORT TO DIVERT WATER IN A WAY THAT MINIMIZES CONCENTRATED FLOW OVER TRAILWAY TO THE MAXIMUM EXTENT PRACTICAL.
5. STOCKPILE, REMOVE, TRANSPORT, AND SPREAD AGGREGATES IN A MANNER THAT WILL PRESERVE SPECIFIED GRADATION AND AVOID CONTAMINATION. DO NOT INTERMINGLE STOCKPILES OF AGGREGATE HAVING DIFFERENT GRADATIONS.
6. SUBMIT TEST RESULTS AND A CERTIFICATE OF COMPLIANCE VERIFYING THAT AGGREGATE GRADATION MEETS PLAN SPECIFICATIONS.
7. USE AGGREGATE THAT IS UNIFORMLY MIXED AT OPTIMUM MOISTURE CONTENT AND SPREAD AND COMPACT IN LAYERS TO THE FINAL THICKNESS AND WIDTH SHOWN ON THE DRAWINGS. THE MAXIMUM THICKNESS OF ANY ONE LAYER SHALL BE THREE INCHES. OBTAIN COMPACTION OF AGGREGATE BASE BY ONE OF THE FOLLOWING METHODS:

   (A) BY MECHANICAL VIBRATORY COMPACTORS (AGGREGATE BASE ONLY) OVER THE FULL AREA OF EACH LAYER UNTIL VISUAL DISPLACEMENT CEASES, BUT NOT FEWER THAN THREE COMPLETE PASSES;

   (B) BY USING A ROLLER OR MECHANICAL HAND TAMPER UNTIL THE DENSITY IS AT LEAST 95 PERCENT OF THE MAXIMUM DENSITY, AS DETERMINED BY AASHTO T 99, METHOD C OR D.
8. DO NOT INSTALL CRUSHED STONE DUST AGGREGATE PAVING DURING RAINY CONDITIONS OR BELOW 40 DEGREES FAHRENHEIT AND FALLING.
9. DO NOT VARY THE TOTAL COMPACTED THICKNESS OF THE AGGREGATE BY MORE OR LESS THAN ONE INCH FROM THE SPECIFIED THICKNESS OR PLACE IT CONSISTENTLY BELOW OR ABOVE THE SPECIFIED DEPTH. DO NOT VARY THE AGGREGATE WIDTH BY MORE THAN THREE INCHES FROM THE SPECIFIED WIDTH OR PLACE IT CONSISTENTLY NARROWER OR WIDER THAN THE SPECIFIED WIDTH.
10. FINISHED SURFACE OF PATHWAY SHALL BE SMOOTH, UNIFORM AND SOLID. THERE SHALL BE NO EVIDENCE OF CHIPPING OR CRACKING. CURED AND COMPACTED PATHWAY SHALL BE FIRM THROUGHOUT PROFILE WITH NO SPONGY AREAS. ANY SIGNIFICANT IRREGULARITIES IN PATH SURFACE SHALL BE REPAIRED TO THE UNIFORMITY OF ENTIRE INSTALLATION.
11. BLOCK ABANDONED TRAILWAY ENTRANCES TO TRAFFIC. PLACE ROCKS, LOGS, BRANCHES, AND DUFF TO BLOCK AND CONCEAL THE ABANDONED TRAILWAY AND DISCOURAGE FUTURE USE. USE ROCKS AND OTHER MATERIALS THAT ARE AVAILABLE IN THE AREAS TO BE OBLITERATED.

TRAIL CONSTRUCTION SEQUENCE:

1. CONTRACTOR SHALL STAKE PROPOSED TRAIL LAYOUT AND NOTIFY THE CITY PRIOR TO BEGINNING ANY EXCAVATION OR CLEARING PERTAINING TO TRAIL CONSTRUCTION.
2. CONTRACTOR SHALL MAKE ANY CHANGES TO THE PROPOSED TRAIL LAYOUT AS REQUESTED BY THE CITY.
3. UPON APPROVAL OF FINAL LAYOUT, THE CONTRACTOR SHALL PREPARE TRAILBED AS REQUIRED PER PLAN DETAILS. OBTAIN WRITTEN APPROVAL OF THE CO BEFORE PLACING AGGREGATE.
4. COMPACT SUBSOIL BASE TO DENSITY AS REQUIRED IN PLAN DETAILS.
5. PLACE AGGREGATE BASE OVER FILTER FABRIC AND COMPACT IN LIFTS TO ACHIEVE REQUIRED DENSITY.
6. BLEND 12 TO 16-LBS (CALL MANUFACTURER FOR EXACT BLEND) OF STABILIZER PER 1-TON OF CRUSHED AGGREGATE. IT IS CRITICAL THAT STABILIZER BE THOROUGHLY AND UNIFORMLY MIXED THROUGHOUT CRUSHED AGGREGATE SCREENINGS. BUCKET BLENDING IS NOT ACCEPTABLE. BLENDING WITH A RAKE AND OR SHOVEL IS NOT ACCEPTABLE. BLEND MATERIAL DRY AS WATER WILL MAKE THE MATERIAL HARD.
7. AFTER PRE-BLENDING, PLACE THE STABILIZED CRUSHED AGGREGATE (STONE DUST) SCREENINGS ON PREPARED SUB-GRADE. LEVEL TO DESIRED GRADE.
8. UPON THOROUGH MOISTURE PENETRATION, COMPACT AGGREGATE SCREENINGS TO 85% RELATIVE COMPACTION BY EQUIPMENT SUCH AS; A 2 TO 4-TON DOUBLE DRUM ROLLER OR A 1,000-LB. SINGLE DRUM ROLLER. DO NOT USE A VIBRATORY PLATE COMPACTOR OR VIBRATION FUNCTION ON ROLLER AS VIBRATION SEPARATES LARGE AGGREGATE PARTICLES. DO NOT BEGIN COMPACTION FOR 6 HOURS AFTER PLACEMENT AND UP TO 48 HOURS. IF SURFACE AGGREGATE DRIES SIGNIFICANTLY QUICKER THAN SUBSURFACE MATERIAL, LIGHTLY MIST SURFACE BEFORE COMPACTION.
9. IMMEDIATELY FOLLOWING FINAL SPREADING, SMOOTHING, AND COMPACTING OF FINAL SURFACE, CORRECT ANY IRREGULARITIES OR DEPRESSIONS THAT DEVELOP BY ADDING OR REMOVING MATERIAL UNTIL THE SURFACE IS SMOOTH, UNIFORM, AND COMPACTED.
10. LEAVE THE FINISHED SIDE SLOPES IN A SMOOTH, UNIFORM, AND SCARIFIED CONDITION TO ACCEPT STABILIZATION SEED MIX.
11. BLOCK ABANDONED TRAILWAY ENTRANCES.

MATERIALS:

ROCK

USE SOUND, DURABLE ROCK FREE OF RIFTS, SEAMS, LAMINATIONS, AND MINERALS THAT COULD DETERIORATE AS A RESULT OF WEATHERING. DRESS ROCK TO REMOVE THIN OR WEAK PORTIONS BEFORE USE. FURNISH ROCK OF THE SIZE, SHAPE, WEIGHT, AND FACE AREA NECESSARY TO PRODUCE THE GENERAL CHARACTERISTICS AND APPEARANCE SHOWN ON THE DRAWINGS.

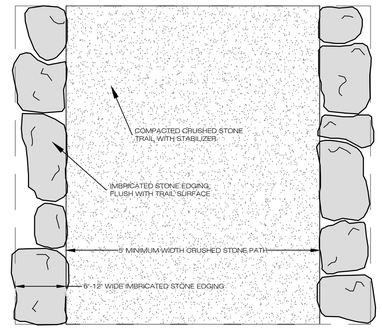
STABILIZER

STABILIZER FOR CRUSHED AGGREGATE SURFACES PROVIDED BY THE FOLLOWING MANUFACTURER (OR EQUIVALENT): STABILIZER SOLUTIONS, INC. 33 SOUTH 28TH ST., PHOENIX, AZ 85034; PHONE (602) 225-5900, (800) 336-2468; FAX (602) 225-5902; WEBSITE: STABILIZERSOLUTIONS.COM; EMAIL INFO@STABILIZERSOLUTIONS.COM
STABILIZER SHALL BE PATENTED, NON-TOXIC, ORGANIC BINDER THAT IS A COLORLESS AND ODORLESS CONCENTRATED POWDER THAT BINDS DECOMPOSED GRANITE OR CRUSHED 3/8" OR 1/4" MINUS AGGREGATE.

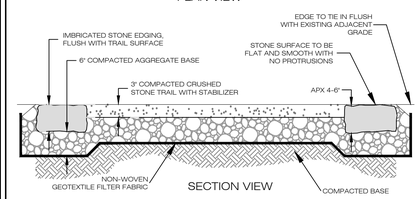
GEOTEXTILES

(A) USE GEOTEXTILES, ALONE OR IN COMBINATION WITH OTHER GEOSYNTHETICS, THAT MEET THE FOLLOWING CLASS B REQUIREMENTS FOR SUBSURFACE DRAINAGE AS SPECIFIED IN AASHTO M288.
(1) GRAB STRENGTH AT 50 PERCENT ELONGATION,
ASTM D4632-91 ..... 0.355 KN MIN.
(2) SEAM STRENGTH,
ASTM D 4632 ..... 0.310 KN MIN.
(3) PUNCTURE STRENGTH,
ASTM D4833-88 ..... 0.110 KN MIN.
(4) MULLEN BURST,
ASTM D 3786-87..... 900 KPA MIN.
(5) TRAP TEAR STRENGTH,
ASTM D4533-91 ..... 0.110 KN MIN.
(B) USE GEOTEXTILE MEETING THE FOLLOWING CRITICAL PHYSICAL PROPERTIES, UNLESS OTHERWISE SHOWN ON THE DRAWINGS.
(1) MATERIAL STRUCTURE ..... NONWOVEN (ALL PURPOSES) OR SLIT FILM (FOR REINFORCEMENT OR SEPARATION)
(2) POLYMER COMPOSITION ..... POLYPROPYLENE
(3) APPARENT OPENING,
ASTM D 4751-87 ..... 0.297 MM MAX.
(4) PERMITTIVITY, ASTM
D4491-92 ..... 4060 LITERS/MINUTE/

DURING SHIPMENT AND STORAGE, WRAP ALL GEOSYNTHETICS TO PROTECT THEM FROM SUNLIGHT. WHEN STORING GEOSYNTHETICS, PROTECT THEM FROM MUD, SOIL, DUST, AND DEBRIS. IF MATERIALS ARE NOT INSTALLED IMMEDIATELY AFTER DELIVERY TO SITE, DO NOT STORE THEM IN DIRECT SUNLIGHT.



PLAN VIEW



SECTION VIEW

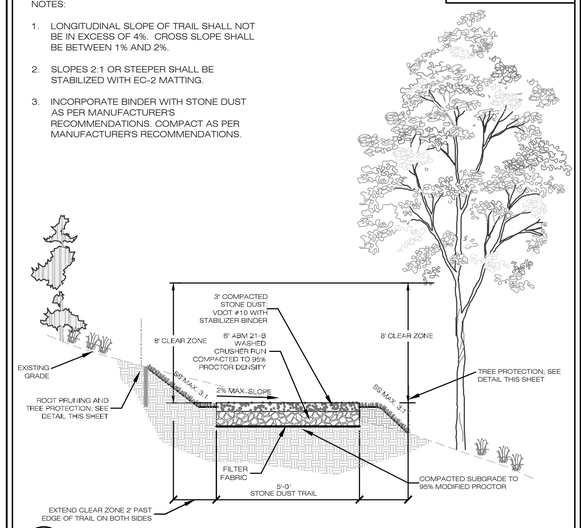
DETAIL: STONE TRAIL EDGE (BID ALTERNATE)

NTS

TRAIL: TYPE 1

NOTES:

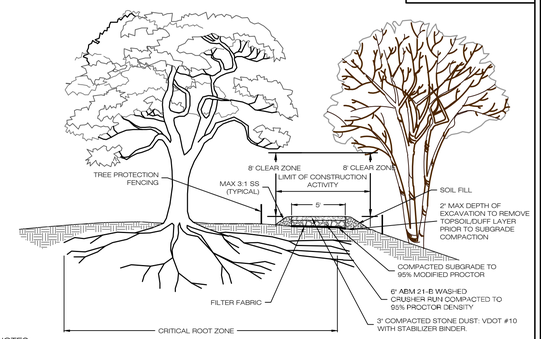
1. LONGITUDINAL SLOPE OF TRAIL SHALL NOT BE IN EXCESS OF 4%. CROSS SLOPE SHALL BE BETWEEN 1% AND 2%.
2. SLOPES 2:1 OR STEEPER SHALL BE STABILIZED WITH EC-2 MATTING.
3. INCORPORATE BINDER WITH STONE DUST AS PER MANUFACTURER'S RECOMMENDATIONS. COMPACT AS PER MANUFACTURER'S RECOMMENDATIONS.



DETAIL: TYPICAL PEDESTRIAN TRAIL CROSS-SECTION

NTS

TRAIL: TYPE 2



NOTES:

1. TRAILBED PREPARATION SHOULD NOT EXCEED 2 INCHES IN DEPTH.
2. EXTREME CARE OF EXISTING TREES AROUND ROOTS MUST BE USED DURING CONSTRUCTION. MEASURES SHALL INCLUDE TREE PROTECTION FENCING, TREE TRUNK PROTECTION AND PLASTIC MAT SYSTEM SUCH AS ALTURNAMAT AS DETERMINED NECESSARY BY THE ENGINEER. CONSTRUCTION WORK SHALL BE ACCOMPLISHED USING LIGHT WEIGHT EQUIPMENT SUCH AS A BOBCAT FOR GRADING AND BASE PLACEMENT. STONE PLACEMENT SHALL BE ACCOMPLISHED BY HAND AND LIGHTEST ROLLER THAT WILL ACHIEVE REQUIRED COMPACTION. COMPACTED AREAS WITHIN THE DRIPLINE OF TREES SHALL RECEIVE VERTICAL MULCHING, CONSISTING OF 12-18' VERTICAL HOLES ON 3' CENTERS. THE HOLES SHALL BE BACKFILLED WITH A MIX OF LEAFGRO AND SOLITE.
3. LONGITUDINAL SLOPE OF TRAIL SHALL NOT BE IN EXCESS OF 4%. CROSS SLOPE SHALL BE BETWEEN 1% AND 2%.
4. CRUSHER RUN AND STONE DUST SHALL BE FREE OF ORGANICS, SOLUBLE SALTS, DEBRIS, AND OTHER CONTAMINANTS.
5. INCORPORATE BINDER WITH STONE DUST AS PER MANUFACTURER'S RECOMMENDATIONS. COMPACT AS PER MANUFACTURER'S RECOMMENDATIONS.

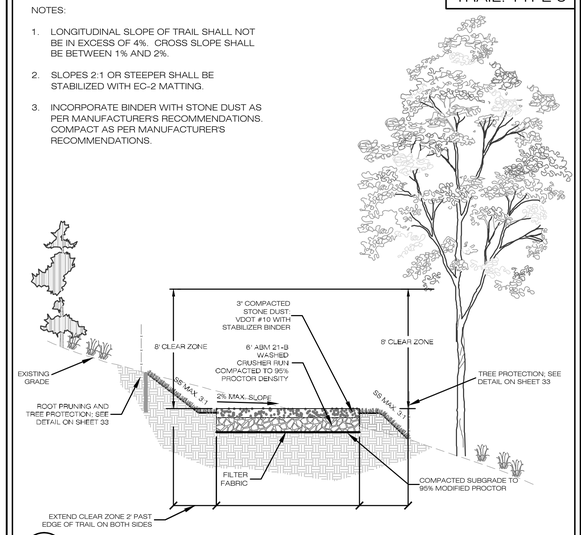
DETAIL: RAISED TRAIL (WHERE TRAIL IS LOCATED ADJACENT TO CRITICAL ROOT ZONES)

NTS

TRAIL: TYPE 3

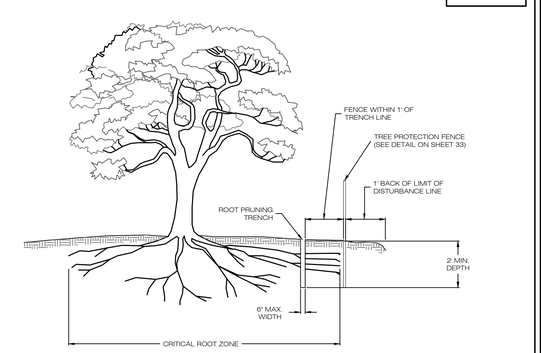
NOTES:

1. LONGITUDINAL SLOPE OF TRAIL SHALL NOT BE IN EXCESS OF 4%. CROSS SLOPE SHALL BE BETWEEN 1% AND 2%.
2. SLOPES 2:1 OR STEEPER SHALL BE STABILIZED WITH EC-2 MATTING.
3. INCORPORATE BINDER WITH STONE DUST AS PER MANUFACTURER'S RECOMMENDATIONS. COMPACT AS PER MANUFACTURER'S RECOMMENDATIONS.



DETAIL: TYPICAL MAINTENANCE TRAIL CROSS-SECTION

NTS



NOTES:

1. EXACT LOCATION OF TRENCH SHOULD BE IDENTIFIED IN THE FIELD PRIOR TO ROOT PRUNING.
2. TRENCH SHOULD BE IMMEDIATELY BACKFILLED WITH SOIL REMOVED OR OTHER HIGH ORGANIC SOIL.
3. ROOTS SHOULD BE CLEANLY CUT USING VIBRATORY KNIFE OR OTHER ACCEPTABLE EQUIPMENT.

DETAIL: ROOT PRUNING

NTS

5209 Center Street
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WILLIAMSBURG ENVIRONMENTAL GROUP, INC.
Environmental Consultants

TRAIL NOTES AND DETAILS
COE BRANCH STREAM RESTORATION
CITY OF FALLS CHURCH, VIRGINIA

COMMONWEALTH OF VIRGINIA
GEORGE C. HIMONAS III
Lic. No. 000894
12/16/13
LANDSCAPE ARCHITECT

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