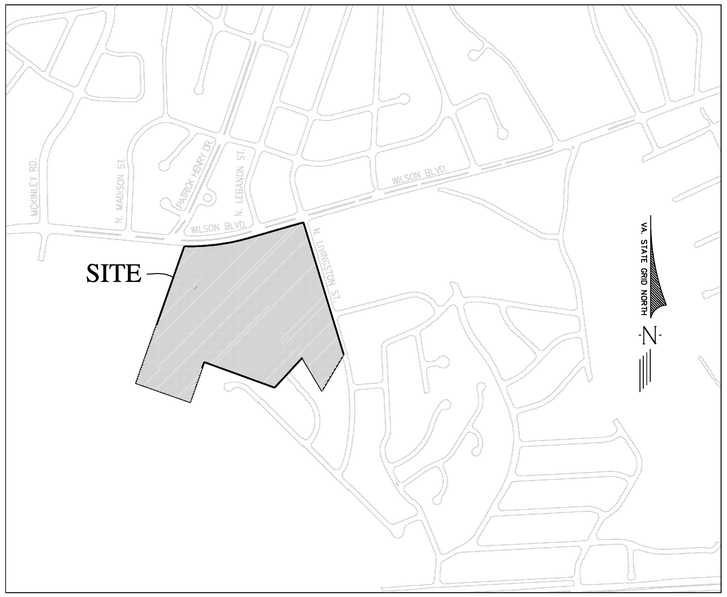
CIVIL ENGINEERING PLAN
UPTON HILL REGIONAL PARK
PARK IMPROVEMENTS
ARLINGTON COUNTY, VA
SWM PROJECT #: SWM 18-0119

GENERAL NOTES

1. THE ARLINGTON COUNTY REAL PROPERTY CODE (RPC) FOR THE SUBJECT SITE IS: RPC 12042103. THE PARCEL IS ZONED S-3A/R-6 WITH A TOTAL PROPERTY AREA OF 1,020,006 S.F./23.42 A.C. THE PROJECT IS BEING DEVELOPED PER THE S-3A/R-6 ZONING REQUIREMENTS.
2. THE ARLINGTON COUNTY ADDRESS FOR THE SITE IS 6060 WILSON BLVD, ARLINGTON, VA 22205.
3. THE PURPOSE OF THIS PLAN IS TO PROPOSE A NEW PARKING LOT AND OTHER MINOR IMPROVEMENTS TO THE PROPERTY.
4. ELEVATIONS ARE BASED ON ARLINGTON COUNTY DATUM.
5. THE SITE SHOWN HEREON IS REFERENCED TO THE VIRGINIA COORDINATE SYSTEM OF 1983 AS COMPUTED FROM A FIELD RUN BOUNDARY AND HORIZONTAL CONTROL SURVEY.
5. THE SITE SHOWN HEREON IS REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 AS COMPUTED FROM A FIELD VERTICAL CONTROL SURVEY.
6. BOUNDARY AND TOPOGRAPHY PER SURVEY BY URBAN ENGINEERING & ASSOCIATES, INC. NOVEMBER, 2017.
7. STORMWATER MANAGEMENT BEST MANAGEMENT PRACTICES (BMP) WILL BE PROVIDED ONSITE WITH THE USE OF POROUS ASPHALT AND BIO-RETENTION.
8. ALL STORM DRAINAGE FACILITIES CONSTRUCTED WITH THIS PROJECT SHALL MEET OR EXCEED ARLINGTON COUNTY STANDARDS AND SPECIFICATIONS.
9. ALL STORM DRAINAGE AREAS DEFINED HEREON AS SHEETFLOW SATISFY THE SHEETFLOW PROVISIONS OF 9VAC25-870-66 AND SHALL HAVE HAVE NO ADVERSE IMPACT TO ADJACENT PROPERTIES.
10. THERE ARE NO FLOODPLAIN AREAS PRESENT ONSITE.
11. ALL WATER SERVICE CONNECTIONS MUST HAVE A MINIMUM COVER OF 4.0' UNLESS CONSTRUCTED AT A UTILITY CROSSING.
12. ALL BASE AND SUB-BASE MATERIAL SHALL BE COMPACTED TO NINETY EIGHT PERCENT (98 THEORETICAL DENSITY WHEN TESTED IN ACCORDANCE WITH AASHTO METHOD T-99 (SEE VDOT 1994 ROAD AND BRIDGE SPECIFICATIONS, SECTION 304 AND 305).
13. THE APPROVAL OF THESE PLANS SHALL IN NO WAY RELIEVE THE DEVELOPER OR HIS AGENTS OF ANY LEGAL RESPONSIBILITY WHICH MAY BE REQUIRED BY THE CODE OF VIRGINIA OR ANY OTHER ORDINANCE ENACTED BY ARLINGTON COUNTY.
14. LIGHTING AND UNDERGROUND UTILITIES AND STRUCTURES ARE TO BE LOCATED AWAY FROM LANDSCAPING TO THE EXTENT NECESSARY TO MINIMIZE ANY IMPACT ON THE ROOT SYSTEMS OF THE PROPOSED LANDSCAPING.
15. FOR LOCATION OF EXISTING UTILITIES, DESCRIPTIONS, SEE EXISTING CONDITIONS PLAN ON SHEET C.06.
16. THE LOCATIONS OF EXISTING NON SURVEYABLE UTILITIES ON THESE DRAWINGS ARE GENERALLY APPROXIMATE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE ALL UTILITIES WITHIN THE AREA OF CONSTRUCTION PRIOR TO COMMENCING WORK. THE CONTRACTOR SHALL CONTACT MISS UTILITY AT 1-800-257-7777, UTILITY COMPANY REPRESENTATIVES, PERFORM TEST PITS, REVIEW CURRENT TEST PIT DATA, AND WHATEVER OTHER OPERATIONS AVAILABLE TO INSURE THE EXACT HORIZONTAL AND VERTICAL LOCATION OF ALL UTILITIES IN THE AREA OF CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY URBAN LTD. OF ANY POTENTIAL CONFLICTS PRIOR TO COMMENCING CONSTRUCTION.
17. 14. THE CONTRACTOR SHALL CAREFULLY EXAMINE THE SITE AND MAKE ALL INSPECTIONS NECESSARY IN ORDER TO DETERMINE THE FULL EXTENT OF THE WORK REQUIRED TO MAKE THE COMPLETED WORK CONFORM TO THE DRAWINGS AND SPECIFICATIONS. THE CONTRACTOR SHALL SATISFY HIMSELF AS TO THE NATURE AND LOCATION OF THE WORK, CONDITIONS, THE CONFORMATION AND CONDITION OF THE EXISTING GROUND SURFACE AND THE CHARACTER OF EQUIPMENT AND FACILITIES NEEDED PRIOR TO AND DURING PROSECUTION OF THE WORK. THE DEVELOPER OR THE CONTRACTOR SHALL SATISFY HIMSELF AS THE THE CHARACTER, QUALITY AND THE QUANTITY OF SURFACE AND SUBSURFACE MATERIALS OR OBSTACLES TO BE ENCOUNTERED. ANY INACCURACIES OR DISCREPANCIES BETWEEN THE DRAWINGS AND BROUGHT OT THE OWNER'S ATTENTION IN ORDER TO CLARIFY THE EXACT NATURE OF THE WORK TO BE PERFORMED PRIOR TO COMMENCEMENT OF ANY WORK.
18. ALL UNDERGROUND UTILITIES WITHIN STREET RIGHT-OF-WAY OR EASEMENTS SHALL BE INSTALLED TO ARLINGTON COUNTY STANDARDS PRIOR TO THE INSTALLATION OF ANY SUBBASE MATERIAL OR RESTORATION OF PAVEMENT.
19. NO EXISTING SANITARY SEWER, WATERMAIN, STORM DRAIN OR FIRE HYDRANT SHALL BE TAKEN OUT OF SERVICE OR MADE INACCESSIBLE WITHOUT APPROVAL BY THE DEPARTMENT OF PUBLIC WORKS.
20. ALL CURB AND GUTTER, PAVEMENT, AND SIDEWALK CONSTRUCTION WITHIN STREET RIGHT-OF-WAY OR EASEMENT LINES SHALL BE PROPERLY COORDINATED WITH THE ARLINGTON COUNTY DEPARTMENT OF PUBLIC WORKS AND SHALL BE IN CONFORMANCE WITH THESE PLANS.
21. ALL GAS LINE CONSTRUCTION TO BE BY THE WASHINGTON GAS COMPANY; THE CONTRACTOR SHALL COORDINATE HIS OPERATIONS WITH WASHINGTON GAS COMPANY.
22. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE LOCATION OF ALL EXISTING UTILITIES WITHIN THE LIMITS OF THIS PROJECT; THESE UTILITIES SHALL BE CAPPED AT THE CURB LINE AND REMOVED WITHIN THE SITE BY (OR WITH THE APPROVAL OF) EACH UTILITY COMPANY AND/OR BY ARLINGTON COUNTY.
23. THE DEVELOPER OR CONTRACTOR SHALL OBTAIN PERMITS FROM THE INSPECTION SERVICES DIVISION FOR THE CONSTRUCTION OF ALL PRIVATE SIDEWALKS, DRIVEWAYS, PARKING AREAS AND OTHER ONSITE FACILITIES.
24. THE DEVELOPER OR CONTRACTOR SHALL FURNISH EMERGENCY TELEPHONE NUMBER TO THE CONSTRUCTION MANAGEMENT SECTION, ENGINEERING DIVISION, DPW.
25. PARKING ON-SITE OR ON A SUITABLE OFF-SITE LOCATION SHALL BE PROVIDED FOR ALL CONSTRUCTION WORKERS WITHOUT CHARGE TO THE WORKERS.
26. THE SITE HAS NO EXISTING BUS STOPS.
27. CONTRACTOR/ESTIMATOR SHOULD CONSIDER FIELD CONDITIONS AND CONSTRUCTION REQUIREMENTS NECESSARY TO FULLY COMPLETE THE PROPOSED IMPROVEMENTS OF THIS SITE PLAN WHILE PLANNING/SCHEDULING/ESTIMATING.
28. ALL FINISHED GRADING, SEEDING, SODDING OR PAVING SHALL BE DONE IN SUCH A MANNER TO PRECLUDE THE PONDING OF WATER ON THE SITE.
29. ALL WALKS, CURB-CUTS, RAMPS, DRIVEWAYS, ETC. ARE TO CONFORM AND BE INSTALLED TO ADA REQUIREMENTS AND IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS. ANY VARIATION FROM THIS IS TO BE REVIEWED AD APPROVED BY THE CIVIL ENGINEER, LANDSCAPE ARCHITECT AND OWNER.
30. ANY SPEED HUMPS, ROAD PAINTING, STREET SIGNS, OR SIMILAR ITEMS THAT REQUIRE REMOVAL FOR WORK WITHIN THE RIGHT OF WAY SHALL BE REPLACED IN KIND UPON COMPLETION OF THE WORK REQUIRING THE REMOVAL OF SUCH ITEM.
31. ANY OPEN CUT IN THE ROAD WAY WILL REQUIRE A PATCH TO EXTEND AT LEAST TO THE MIDDLE OF THE ROAD PER COUNTY REQUIREMENTS.
32. FIELD VERIFIED RPA WAS PROVIDED BY TNT ENVIRONMENTAL, DATED JUNE 11TH, 2018.



VICINITY MAP
SCALE : 1"=500'

APPLICANT/ DEVELOPER
NORTHERN VIRGINIA REGIONAL PARK AUTHORITY
5400 OX RD.
FAIRFAX STATION, VA 22039
(703) 359-4921
CONTACT: BRIAN NOLAN
EMAIL: BNOLAN@NVRPA.ORG

ENGINEER
URBAN LTD.
4200D TECHNOLOGY COURT
CHANTILLY, VA 20151
(703) 642-2306
CONTACT: CLAYTON TOCK
EMAIL: CTOCK@URBAN-LTD.COM

BID SET
ISSUED: 11/26/18

Sheet List Table	
Sheet Number	Sheet Title
C.01	COVER SHEET
C.02	GENERAL NOTES & DETAILS
C.03	GENERAL NOTES & DETAILS
C.03A	GENERAL NOTES & DETAILS
C.04	OVERVIEW
C.05	AERIAL PHOTOGRAPHY
C.06	EXISTING CONDITIONS
C.07	EXISTING CONDITIONS
C.07A	DEMOLTION PLAN
C.07B	DEMOLITION PLAN
C.08	GEOMETRY PLAN
C.09	GEOMETRY PLAN
C.09A	GEOMETRY PLAN - PHASE I
C.10	GRADING PLAN
C.11	GRADING PLAN
C.11A	GRADING PLAN - PHASE I
C.11B	SAN PROFILES
C.12	STORM PROFILES & COMPUTATIONS
C.13	SWM - PRE DEVELOPMENT DIVIDES
C.14	SWM - POST DEVELOPMENT DIVIDES
C.17	SWM COMPUTATIONS & DETAILS
C.17C	WATER QUALITY IMPACT ASSESSMENT
C.17D	WATER QUALITY IMPACT ASSESSMENT
C.18	BMP - DESIGN & DETAILS
C.19	BMP - DESIGN & DETAILS
C.22	BMP - DESIGN & DETAILS
C.23	BMP - DESIGN & DETAILS
C.24	BMP DETAILS
C.24A	BMP DETAILS
C.24B	BMP DETAILS
C.25	OUTFALL ANALYSIS
C.26	OUTFALL ANALYSIS
C.27	EROSION & SEDIMENT CONTROL - PHASE I
C.28	EROSION & SEDIMENT CONTROL - PHASE I
C.29	EROSION & SEDIMENT CONTROL - PHASE II
C.30	EROSION & SEDIMENT CONTROL - PHASE II
C.31	EROSION & SEDIMENT CONTROL - DETAILS
C.32	EROSION & SEDIMENT CONTROL - DETAILS
C.33	EROSION & SEDIMENT CONTROL - DETAILS
C.34	SIGHT DISTANCE PROFILE
C.35	FIRELANE AND PAVING PLAN
C.36	FIRELANE AND PAVING PLAN
C.37	TREE PRESERVATION PLAN
C.38	TREE PRESERVATION PLAN
C.39	TREE PRESERVATION DETAILS
C.40	LANDSCAPE PLAN
C.41	LANDSCAPE PLAN
C.42	LANDSCAPE DETAILS
C.42A	LANDSCAPE DETAILS
C.43	REFORESTATION & LANDSCAPE PLAN
C.44	REFORESTATION & LANDSCAPE DETAILS
C.44A	LIGHTING PLAN
C.44B	LIGHTING NOTES & DETAILS
C.44C	GEOTECHNICAL REPORT
C.44D	GEOTECHNICAL REPORT
C.45	CORRESPONDENCE

No.	DATE	DESCRIPTION
		REVISIONS

COMMONWEALTH OF VIRGINIA
CLAYTON C. TOCK
Lic. No. 036790
11/21/2018
PROFESSIONAL ENGINEER

urban
Planners · Engineers · Landscape Architects · Land Surveyors
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ARLINGTON, VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES
COVER SHEET
UPTON HILL REGIONAL PARK
CIVIL ENGINEERING PLAN
6060 WILSON BLVD, ARLINGTON, VIRGINIA 22205

SCALE: AS NOTED	DESIGNED	CHECKED
SUBMITTED DATE 11-21-18 05-15-18 - 08-08-18 - 09-28-18 -	APPROVED DATE CHIEF TRANSPORTATION PLANNING BUREAU	APPROVED DATE CHIEF TRANSPORTATION ENGINEERING BUREAU
APPROVED DATE CHIEF WATER, SEWER & STREETS DIV.	APPROVED DATE CHIEF ENGINEERING DIVISION	APPROVED DATE DIRECTOR OF ENVIRONMENTAL SERVICES
	APPROVED DATE CPHD PLANNER	APPROVED DATE CPHD LANDSCAPE REVIEWER
	SHEET C.01 OF 62	SP-12928

Urban, Ltd. - J:\JOBS\upton hill park\sp bid set\12928-01-COVER.dwg [COVER] November 26, 2018 - 3:21pm bbrien

VDOT GENERAL NOTES

1. THESE PLANS WERE PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF (SELECT ONE):

   ☒ VDOT SUBDIVISION STREET REQUIREMENTS (SSR 24VAC-30-91 EFFECTIVE JANUARY 1, 2005 AND VDOT ROAD DESIGN MANUAL APPENDIX B)

   ☐ VDOT SECONDARY STREET ACCEPTANCE REQUIREMENTS (SSAR 24VAC-30-92 EFFECTIVE MARCH 9, 2009 AND VDOT ROAD DESIGN MANUAL APPENDIX B1), SCHEMATIC STREET LAYOUT AND COMPUTATIONS OF CONNECTIVITY INDEX ARE PROVIDED WITH THESE PLANS PER 24VAC30-92-60.

   ☐ VDOT SECONDARY STREET ACCEPTANCE REQUIREMENTS (SSAR 24VAC-30-92 EFFECTIVE DECEMBER 31, 2011 AND VDOT ROAD DESIGN MANUAL APPENDIX B1), SCHEMATIC STREET LAYOUT WITH PHASING DIAGRAM FOR STREET ACCEPTANCE ARE PROVIDED WITH THESE PLANS PER 24VAC30-92-60.

2. METHODS AND MATERIALS USED SHALL CONFORM TO CURRENT COUNTY/TOWN AND VDOT STANDARDS AND SPECIFICATIONS.
3. ALL UTILITIES, INCLUDING ALL POLES, ARE TO BE RELOCATED AT THE DEVELOPER'S EXPENSE, PRIOR TO CONSTRUCTION.
4. OPEN CUTTING OF PAVED OR SURFACE TREATED ROADS IS NOT PERMITTED. ALL UTILITIES WHICH WILL BE PLACED UNDER EXISTING STREETS ARE TO BE BORED OR JACKED. ANY EXCEPTIONS, DUE TO EXTENUATING CIRCUMSTANCES, ARE TO BE ADDRESSED AT THE PERMIT STAGE.
5. ANY TYPE OF REVERSE CURB (SPILL CURB, CG-6R, ETC.) AND TRANSITION TO THESE CURBS SHALL NOT BE USED WITH THE PUBLIC RIGHT OF WAY.
6. THE DEVELOPER IS RESPONSIBLE FOR ANY DAMAGE TO EXISTING ROADS AND UTILITIES WHICH OCCUR AS A RESULT OF PROJECT CONSTRUCTION WITHIN OR CONTIGUOUS TO EXISTING RIGHT OF WAY.
7. A SMOOTH GRADE SHALL BE MAINTAINED FROM THE CENTERLINE OF THE EXISTING ROAD TO THE PROPOSED EDGE OF PAVEMENT TO PRECLUDE THE FORMING OF FALSE GUTTERS AND/OR THE PONDING OF ANY WATER IN THE ROADWAY.
8. STANDARD GUARDRAILS AND/OR HANDRAILS SHALL BE INSTALLED AT HAZARDOUS LOCATIONS AS DESIGNATED DURING FIELD REVIEW BY THE COUNTY/TOWN INSPECTOR OR VDOT.
9. THE DEVELOPER IS RESPONSIBLE FOR ALL TRAFFIC CONTROL. THE DEVELOPER SHALL SUBMIT A SIGNING, STRIPING AND/OR SIGNALIZATION PLAN TO THE VDOT LAND DEVELOPMENT SECTION A MINIMUM OF THIRTY DAYS PRIOR TO PERMIT APPLICATION. THE DEVELOPER SHALL NOT COMMENCE CONSTRUCTION OF ANY PAVEMENT COURSE WITHOUT AN APPROVED STRIPING PLAN.
10. PAVEMENT DESIGN IS BASED ON AN ASSUMED CBR VALUE OF 10 (USE CBR VALUE OF 4 IN LOUDOUN CO), SOIL TESTS OF SUBGRADE MUST BE SUBMITTED FOR ACTUAL DETERMINATION OF REQUIRED THICKNESS OF THE PAVEMENT INCLUDING LAYERS OF ASPHALT AND SUBBASE PRIOR TO SUBBASE PLACEMENT.
11. A 4 (MIN.) LAYER OF STONE IS REQUIRED BENEATH CURB AND GUTTER (MAY BE SHOWN ON TYPICAL SECTION IN LIEU OF A NOTE).
12. ALL UNTREATED AGGREGATE USED IN BASE OR SUBBASE COURSES SHALL BE 21B, EXCEPT ON ROADS WITH ADT OF 1000 VPD OR LESS, WHERE 21A AGGREGATE MAY BE USED. WHEN 21B AGGREGATE IS USED, UD-4 UNDERDRAINS MUST BE PROVIDED
13. ADDITIONAL DITCH LININGS OR SILTATION AND EROSION CONTROL MEASURES SHALL BE PROVIDED, AT THE DEVELOPER'S EXPENSE, AS DETERMINED NECESSARY BY VDOT AND/OR THE COUNTY/TOWN DURING FIELD REVIEW. ALL COSTS SHALL BE ASSUMED BY THE DEVELOPER.
14. THE ENTIRE SURFACE OF THE ROADWAY (OLD AND NEW PORTIONS) SHALL BE OVERLAID AND RE-STRIPED AS REQUIRED BY VDOT PERSONNEL. OVERLAY OF EXISTING PAVEMENT SHALL BE MINIMUM OF 1.25 DEPTH; ANY COSTS ASSOCIATED WITH PAVEMENT OVERLAY, OR THE MILLING OF EXISTING PAVEMENT TO OBTAIN REQUIRED DEPTH, SHALL BE ASSUMED BY THE DEVELOPER.
15. DEVELOPER IS RESPONSIBLE FOR DESIGN AND CONSTRUCTION OF ANY TRAFFIC SIGNAL INSTALLATION OR MODIFICATION WHICH WILL BE NECESSARY AS A RESULT OF DEVELOPMENT OF THIS SITE.
16. ALL RIGHT OF WAY DEDICATED TO PUBLIC USE SHALL BE CLEAR AND UNENCUMBERED.
17. THE COUNTY/TOWN SHALL OBTAIN A PERMIT FOR ALL SIDEWALKS WITHIN THE RIGHT OF WAY THAT DO NOT QUALIFY FOR VDOT MAINTENANCE.
18. TRAFFIC CONTROL DEVICES OR ADVISORY SIGNS, SUCH AS MULTIWAY STOPS, SPEED LIMITS, WATCH FOR CHILDREN, PEDESTRIAN TRAFFIC ETC., SHALL NOT BE INSTALLED UNLESS SPECIFICALLY SHOWN ON THESE PLANS OR A VDOT APPROVED PLAN REVISION. SPEED STUDY CERTIFIED BY PROFESSIONAL ENGINEER SHOULD BE SUBMITTED FOR VDOT APPROVAL PRIOR TO THE STREET ACCEPTANCE FOR ANY ROAD TO BE POSTED OTHER THAN THE STATUTORY SPEED LIMIT. SHOULD UNAPPROVED SIGNS BE NOTED AT THE TIME OF VDOT INSPECTION, THE ROAD ACCEPTANCE PROCESS SHALL BE TERMINATED IMMEDIATELY AND NOT RECOMMENCED UNTIL A DETERMINATION IS MADE REGARDING THE APPROVAL OF ANY ADDITIONAL SIGNS. IMMEDIATE REMOVAL OF SUCH SIGNS SHALL NOT NEGATE THE NEED FOR THE SUBMISSION OF A REVISION.
19. LANDSCAPING AND IRRIGATION SYSTEMS SHALL NOT BE INSTALLED WITHIN THE PUBLIC RIGHT OF WAY EXCEPT AS SHOWN ON THESE PLANS OR A VDOT APPROVED REVISION.
20. BEGINNING JULY 1, 2009 ALL LAND USE PERMIT APPLICATIONS ARE REQUIRED TO PROVIDE AT LEAST ONE (1) PERSON WHO, AT MINIMUM, IS VERIFIED BY VDOT IN BASIC WORK ZONE TRAFFIC CONTROL FOR ALL PERMITTED ACTIVITIES WITHIN STATE MAINTAINED RIGHT OF WAY WHICH INVOLVES INSTALLING, MAINTAINING, OR REMOVING WORK ZONE TRAFFIC CONTROL DEVICES. THIS PERSON SHALL BE RESPONSIBLE FOR THE PLACEMENT, MAINTENANCE AND REMOVAL OF ALL WORK ZONE TRAFFIC CONTROL DEVICES.

ARLINGTON COUNTY NOTES

1. ALL CONSTRUCTION SHALL CONFORM TO THE CURRENT ARLINGTON COUNTY DES STANDARDS AND SPECIFICATIONS.
2. THE DEVELOPER OR CONTRACTOR SHALL REMOVE AND REPLACE, TO THE CURRENT ARLINGTON COUNTY DES STANDARDS AND SPECIFICATIONS, ANY EXISTING ENTRANCES, CURB AND GUTTER OR SIDEWALK ALONG THE FRONTAGE OF THIS SITE IN POOR CONDITION, OR DAMAGED DURING CONSTRUCTION.
3. THE DEVELOPER OR CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVING AND CLOSING, TO ARLINGTON COUNTY STANDARDS, ANY EXISTING ENTRANCES NOT BEING USED IN CONJUNCTION WITH THIS DEVELOPMENT.
4. THE DEVELOPER OR CONTRACTOR SHALL OBTAIN ARLINGTON COUNTY PERMITS FOR ALL WORK WITHIN THE RIGHT OF WAY ALONG THE FRONTAGE OF THIS SITE.
5. THERE MAY BE UNDERGROUND CONDUIT, CABLES AND TRAFFIC DETECTION DEVICES IN THIS AREA; THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPLACING ANY TRAFFIC CONTROLS THAT ARE DISTURBED DURING CONSTRUCTION. NOTIFY THE TRANSPORTATION ENGINEERING & OPERATIONS BUREAU AT (703)-228-3575, 24 HOURS PRIOR TO STARTING WORK.
6. THE DEVELOPER OR CONTRACTOR SHALL NOT DISTURB OR REMOVE ANY TRAFFIC CONTROL SIGNS, PARKING METERS OR ANY OTHER TRAFFIC CONTROL DEVICE WITHOUT PRIOR PERMISSION FROM THE TRANSPORTATION ENGINEERING & OPERATIONS BUREAU. CONTRACT TRANSPORTATION ENGINEERING AT (703)-228-575.
7. THE DEVELOPER OR CONTRACTOR SHALL OBTAIN A PERMIT FROM THE TRANSPORTATION ENGINEERING & OPERATIONS BUREAU, PRIOR TO PLACING ANY OBSTRUCTION WITHIN THE PUBLIC RIGHT OF WAY, OR ON SIDEWALKS ALONG THE FRONTAGE OF THIS DEVELOPMENT.
8. ALL SANITARY SEWER CLEAN-OUTS LOCATED WITHIN THE TRAVEL WAY OR PARKING LOTS OF THIS DEVELOPMENT SHALL BE CAST IRON.
9. THE CONTRACTOR SHALL CONSTRUCT ALL HANDICAP RAMPS TO THE CURRENT VDOT STANDARDS. USE 2'X2' TRUNCATED DOME PANELS.
10. THE DEVELOPER OR CONTRACTOR SHALL OBTAIN PERMITS FROM THE INSPECTION SERVICES DIVISION PRIOR TO ANY DEMOLITION, EXCAVATION OR CONSTRUCTION OF ON-SITE FACILITIES. FOR INFORMATION AND PERMIT REQUIREMENTS, CALL (703)-228-3800.
11. THE PLANTING OF STREET TREES FOR THIS DEVELOPMENT SHALL BE COORDINATED WITH AND APPROVED BY THE DEPARTMENT OF PARKS, RECREATION AND COMMUNITY RESOURCES (DPRCR). THIS COORDINATION SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR, DEVELOPER OR THEIR ENGINEER. THE DEVELOPER OR CONTRACTOR SHALL CONTACT PRCR AT (703)-288-6557, 72 HOURS IN ADVANCE TO SCHEDULE INSPECTION OF EXCAVATION, PLANT MATERIAL AND INSTALLATION. ALSO, PRIOR TO REMOVING OR DISTURBING ANY EXISTING COUNTY TREES, CONTACT PRCR FOR INFORMATION AND APPROVAL.

UTILITY MARKING REQUIREMENTS

THE DEVELOPER OR CONTRACTOR SHALL NOTIFY "MISS UTILITY" AT 1-800-257-7777 48 HOURS PRIOR TO THE START OF ANY EXCAVATION OR CONSTRUCTION FOR THE MARKINGS OF UNDERGROUND UTILITIES.

STREET LIGHTING INFORMATION

DENOTES PROPOSED ARLINGTON COUNTY STANDARD STREET LIGHT LOCATION. THE DEVELOPER OR CONTRACTOR SHALL CONTACT THE TRANSPORTATION ENGINEERING & OPERATIONS BUREAU AT (703) 228-3575 FOR LIGHTING REQUIREMENTS, SPECIFICATIONS AND COORDINATION INFORMATION. THE CAPITAL COST OF THE LIGHTING INSTALLATION SHALL BE PAID BY THE DEVELOPER OR CONTRACTOR.

DENOTES 2-INCH RIGID STEEL CONDUIT, INSTALLED 24-INCHES DEEP AND NOT MORE THAN 6-INCHES FROM THE BACK OF CURB. THIS CONDUIT SHALL BE FURNISHED BY THE DEVELOPER OR CONTRACTOR AND CONTAIN A NYLON CORD OR PULL WIRE WITH 500 LBS. MINIMUM STRESS PULL. CONTACT THE TRANSPORTATION ENGINEERING & OPERATIONS BUREAU AT (703) 228-3575 FOR CONDUIT SPECIFICATIONS, AND INSTALLATION REQUIREMENTS.

TEST PIT NOTE

IN ORDER TO DETERMINE THE EXACT HORIZONTAL AND VERTICAL LOCATION OF A GIVEN UTILITY AND TO ASSIST THE CONTRACTOR AND/OR OWNER IN DETERMINING AREAS OF SPECIAL CONCERN, URBAN ENGINEERING & ASSOC., INC. HAS INDICATED HEREON CERTAIN LOCATIONS WHERE TEST PITS SHOULD BE EXCAVATED PRIOR TO COMMENCING CONSTRUCTION. THESE INDICATIONS ARE NOT INTENDED TO BE ALL INCLUSIVE AND WILL NOT RELIEVE THE CONTRACTOR AND/OR OWNER OF THE RESPONSIBILITY OF DIGGING ADDITIONAL TEST PITS, AS MIGHT BE REQUIRED BY ACTUAL SITE CONDITIONS. ANY DISCREPANCIES FOUND BETWEEN ACTUAL AND ASSUMED CONDITIONS SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF URBAN ENGINEERING & ASSOC., INC. BY CALLING 703-642-8080.

SITE DATA

1.) SITE AREA = 1,020,006 SF (23.41 AC)

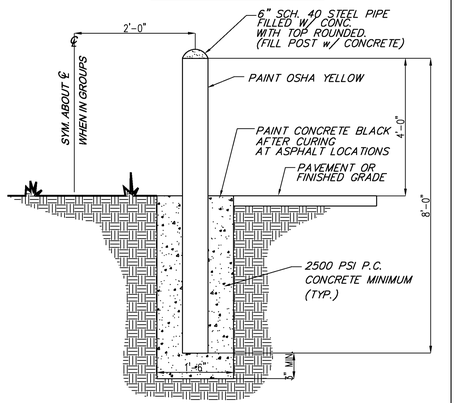
2.) USE
EXISTING USE = PARK
PROPOSED USE = PARK

3.) LOT REQUIREMENTS
MINIMUM AREA = 6,000 SF
PROPOSED LOT AREA = 1,020,006 SF (23.41 AC)

4.) PARKING
REQUIRED = N/A
PROPOSED = 218 SPACES

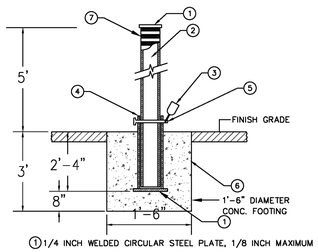
5.) HANDICAPPED PARKING
REQUIRED = N/A
PROPOSED = 11 HANDICAPPED SPACES

BOLLARD DETAIL



REMOVABLE BOLLARD DETAIL

NOT TO SCALE

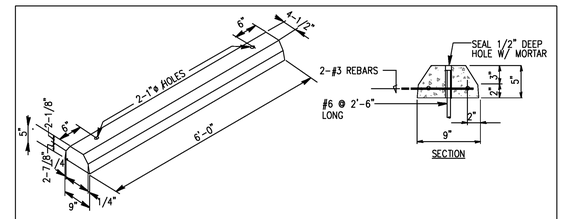


1. 1/4 INCH WELDED CIRCULAR STEEL PLATE, 1/8 INCH MAXIMUM LIP.
2. 4 INCH DIAMETER, 7'-4" LONG SCHEDULE 40 GALVANIZED PIPE.
3. PADLOCK
4. 5 INCH DIAMETER, 28 INCH LONG SCHEDULE 40 GALVANIZED PIPE.
5. 3/4 INCH STEEL PIN WITH 1/2 INCH HOLE FOR LOCK; PIN THROUGH 13/16 INCH HOLE IN 3 INCH BOLLARD AND 4 INCH SLEEVE.
6. CLASS "A" CONCRETE FOUNDATION, CENTERED ON BOLLARD.
7. 3" WIDE ORANGE/SILVER/ORANGE REFLECTIVE TAPE, 3M SERIES CW80.

NOTE:
A. BOLLARD AND SLEEVE TO BE PRIMERED AND PAINTED WITH 2 COATS OF HIGH GLOSS WHITE RUST INHIBITIVE PAINT.

LEGEND:

OHW	EXISTING OVERHEAD WIRE		EXISTING STORM DRAIN STRUCTURE
G	EXISTING GAS LINE		PROPOSED STORM DRAIN STRUCTURE
G	PROPOSED GAS LINE	00	EXISTING CONTOUR (1')
GV	EXISTING GAS VALVE	00	PROPOSED CONTOUR (1')
GV	PROPOSED GAS VALVE	00	EXISTING CONTOUR (5')
WM	EXISTING WATER METER	00	PROPOSED CONTOUR (5')
WM	PROPOSED WATER METER		EXISTING SANITARY SEWER
WV	EXISTING WATER VALVE		PROPOSED SANITARY SEWER
WV	PROPOSED WATER VALVE	W	EXISTING WATER LINE
		W	PROPOSED WATER LINE
T.B.R.	TO BE REMOVED		EXISTING TREE LINE
S, C, HC	STANDARD, COMPACT, AND HANDICAP PARKING SPACE DESIGNATOR		EXISTING PROPERTY LINE
			PROPOSED PROPERTY LINE
V	VISITOR PARKING SPACE		EXISTING PROPERTY LINE PIPES
FF	FINISHED FLOOR		PROPOSED PROPERTY LINE PIPES
PROP.	PROPOSED		EX. FIRE HYDRANT
EX.	EXISTING		PROP. FIRE HYDRANT
SF	SQUARE FEET		PROPOSED LIMITS OF CLEARING & GRADING
GSF	GROSS SQUARE FEET	C-2	EXISTING CURB & GUTTER
NSF	NET SQUARE FEET	C-2	PROPOSED CURB & GUTTER
	PROPOSED ENTRANCE/EXIT TO BUILDING	C-2R	REVERSE FLOW CURB & GUTTER
	TRAFFIC SIGN		EXISTING POWER POLE
	STREET SIGN		TEST PIT REQUIRED
+25.6	EXISTING SPOT ELEVATION		PROPOSED CSRP-1
+25.60	PROP. SPOT ELEVATION		BENCHMARK
X X X	EXISTING FENCE		EXISTING TREE
	EXISTING LIGHTING		PROPOSED TREE
	PROPOSED LIGHTING		
VPD	PROJECTED TRAFFIC COUNT (BASED ON 6TH ED. OF ITE TRIP GENERATION BOOK)		



PRECAST CONCRETE WHEEL STOP

NOT TO SCALE

No.	DATE	DESCRIPTION

REVISIONS

COMMONWEALTH OF VIRGINIA
CLAYTON C. TOCK
Lic. No. 036790
11/21/2018
PROFESSIONAL ENGINEER

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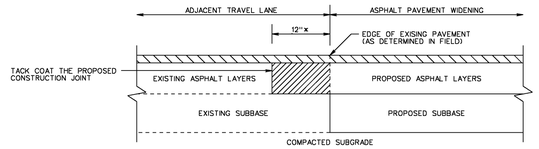
ARLINGTON, VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES

GENERAL NOTES & DETAILS
UPTON HILL REGIONAL PARK
CIVIL ENGINEERING PLAN
6060 WILSON BLVD, ARLINGTON, VIRGINIA 22205

SCALE: AS NOTED	DESIGNED	CHECKED
SUBMITTED DATE 11-21-18 05-15-18 – 08-08-18 – 09-28-18 –	APPROVED DATE CHIEF TRANSPORTATION PLANNING BUREAU	APPROVED DATE CHIEF TRANSPORTATION ENGINEERING BUREAU
APPROVED DATE CHIEF WATER, SEWER & STREETS DIV.	APPROVED DATE CHIEF ENGINEERING DIVISION	APPROVED DATE DIRECTOR OF ENVIRONMENTAL SERVICES
	APPROVED DATE CPHD PLANNER	APPROVED DATE CPHD LANDSCAPE REVIEWER
	SHEET C.02 OF 62	SP-12928

Urban, Ltd. – J:\JOBS\upton hill park\sp bid set\12928-02-GNOTES.dwg [GeneralNotes] November 26, 2018 – 12:11pm bbrien

WP-2



CONSTRUCTION JOINT DETAIL

REMOVE EXISTING ASPHALT LAYERS TO EXISTING SUBBASE AND REPLACE WITH PROPOSED ASPHALT WIDENING LAYERS

PROPOSED MINIMUM 1½ INCH THICK ASPHALT SURFACE COURSE (SEE NOTE 5)

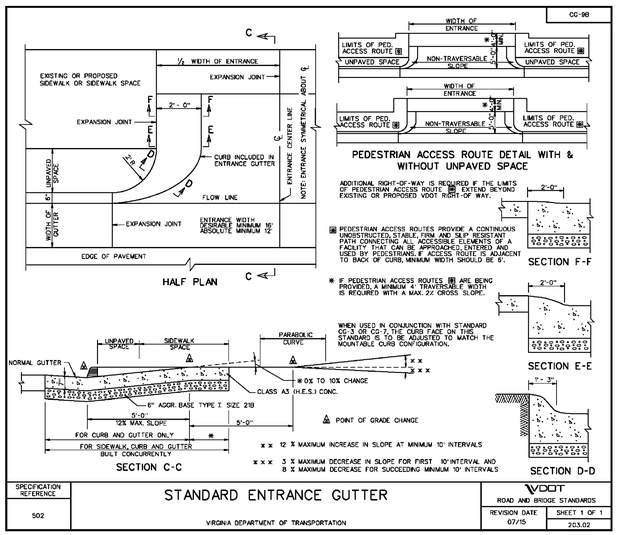
x MINIMUM 12 INCHES, OR GREATER AS NECESSARY TO ABUT THE FULL THICKNESS OF EXISTING ASPHALT LAYERS AS DETERMINED BY CORES (SEE NOTE 3)

NOTES:

1. ASPHALT PAVEMENT WIDENING SHALL HAVE A PAVEMENT DESIGN IN ACCORDANCE WITH CURRENT VDOT PROCEDURES AND BE APPROVED BY THE ENGINEER.
2. THE PAVEMENT DESIGN FOR ASPHALT PAVEMENT WIDENING SHALL MEET OR EXCEED THE DEPTHS AND TYPES OF THE LAYERS OF EXISTING PAVEMENT. SUBSURFACE DRAINAGE OF THE EXISTING AND PROPOSED PAVEMENT SHALL BE ADDRESSED IN THE PAVEMENT DESIGN.
3. A MINIMUM OF THREE CORES SHALL BE TAKEN ALONG THE CENTER OF THE ADJACENT TRAVEL LANE TO DETERMINE THE TYPE AND THICKNESS OF EXISTING PAVEMENT LAYERS. THESE CORES SHALL BE SPACED NO MORE THAN 500 FEET APART.
4. THE ADJACENT TRAVEL LANE SHALL BE MILLED A MINIMUM DEPTH OF 1½ INCHES AND REPLACED WITH AN ASPHALT SURFACE COURSE TO MATCH THE PROPOSED PAVEMENT WIDENING SURFACE COURSE, UNLESS WAIVED BY THE ENGINEER.
5. THE ENGINEER MAY REQUIRE THE MILLING DEPTH OF THE EXISTING PAVEMENT TO BE ADJUSTED TO ACHIEVE AN ACCEPTABLE PAVEMENT CROSS-SLOPE AND EFFECTIVE SURFACE DRAINAGE.
6. EXISTING PAVEMENT MARKINGS AND MARKERS WITHIN THE PROJECT LIMITS SHALL BE RESTORED SUBJECT TO THE APPROVAL OF THE ENGINEER.
7. FINAL TRANSVERSE PAVEMENT TIE-IN SHALL CONFORM TO THE REQUIREMENTS OF SECTION 315.05(c) OF THE SPECIFICATIONS EXCEPT THAT ALL JOINTS AT TIE-IN LOCATIONS SHALL BE TESTED USING A 10 FOOT STRAIGHTEDGE IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION 315.07(a) OF THE SPECIFICATIONS.

VDOT ROAD AND BRIDGE STANDARDS		ASPHALT PAVEMENT WIDENING FOR WIDENING SUBJECT TO TRAFFIC VIRGINIA DEPARTMENT OF TRANSPORTATION	SPECIFICATION REFERENCE
SHEET 1 OF 1	REVISION DATE		315
303.02			

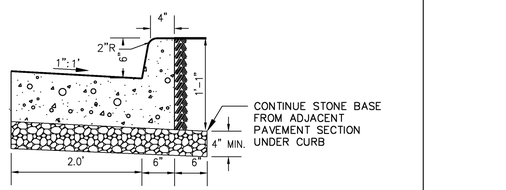
CG-9B



SPECIFICATION REFERENCE	STANDARD ENTRANCE GUTTER VIRGINIA DEPARTMENT OF TRANSPORTATION	VDOT ROAD AND BRIDGE STANDARDS	
502		REVISION DATE: 07/15	SHEET 1 OF 1: 203.02

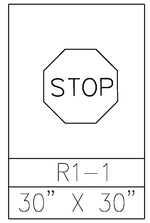
CURB & GUTTER (CG-6)

NOT TO SCALE



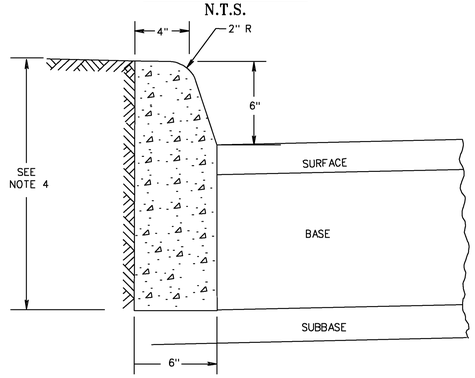
NOTES:
1. THIS ITEM MAY BE PRECASE OR CAST IN PLACE.
2. CONCRETE TO BE CLASS A3 IF CAST IN PLACE, 4000 PSI IF PRECAST
3. COMBINATION CURB AND GUTTER HAVING A RADIUS OF 300 FEET OR LESS (ALONG FACE OF CURB) SHALL BE PAID FOR AS RADIAL COMBINATION CURB AND GUTTER.
4. FOR USE WITH STABILIZED OPEN-GRADED DRAINAGE LAYER, THE BOTTOM OF THE CURB AND GUTTER SHALL BE CONSTRUCTED PARALLEL TO THE SLOPE OF ALL SUBBASE COURSES AND TO THE DEPTH OF THE PAVEMENT
5. THIS CURB MAY BE USED WHERE DESIGN SPEED IS 40MPH OR LESS ON RURAL HIGHWAYS AND 45MPH OR LESS IN DEVELOPED URBAN & SUBURBAN AREAS. IF THESE DESIGN SPEEDS ARE EXCEEDED STANDARD CG-7 IS REQUIRED.

STOP SIGN DETAIL



DETAIL TYPICAL CG-2

N.T.S.



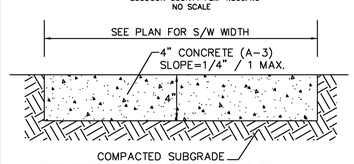
NOTES:

1. THIS ITEM MAY BE PRECAST OR CAST IN PLACE.
2. CONCRETE TO BE CLASS A3 IF CAST IN PLACE, 4000 PSI IF PRECAST.
3. CURB HAVING A RADIUS OF 300 FEET OR LESS (ALONG FACE OF CURB) WILL BE PAID FOR AS RADIAL CURB.
4. THE DEPTH OF CURB MAY BE REDUCED AS MUCH AS 3" (15" DEPTH) OR INCREASED AS MUCH AS 3" (21" DEPTH) IN ORDER THAT THE BOTTOM OF CURB WILL COINCIDE WITH THE TOP OF A COURSE OF THE PAVEMENT SUBSTRUCTURE. OTHERWISE THE DEPTH IS TO BE 18" AS SHOWN. NO ADJUSTMENT IN THE PRICE BID IS TO BE MADE FOR A DECREASE OR AN INCREASE IN DEPTH.
5. CG-2 IS TO BE USED ON ROADWAYS MEETING THE REQUIREMENTS FOR CG-6 AS SHOWN IN APPENDIX A OF THE VDOT ROAD DESIGN MANUAL.
6. THE CONTRACTOR MAY UTILIZE ROLLED ASPHALT CURB IN LIEU OF CONCRETE CURB AS APPROVED BY THE ENGINEER. THE CONTRACTOR SHALL OBTAIN WRITTEN APPROVAL FROM THE ENGINEER PRIOR TO INSTALLING ASPHALT CURB IN LIEU OF THE CONCRETE CURB.
7. ALL SPOT ELEVATIONS SHOWN IN THE VICINITY OF NEW CURB ON SHEET C.10-C.11, ARE EDGE OF PAVEMENT (EP) ELEVATIONS UNLESS OTHERWISE INDICATED.

DETAIL TYPICAL CONC. SIDEWALK

LOUDOUN COUNTY FSM 4.500.4.o

NO SCALE



COMPACTED SUBGRADE NOTE:
THE TOP 12" OF SUBGRADE TO BE COMPACTED TO 95% OF MAXIMUM DRY DENSITY PER STANDARD PROCTOR TEST WITHIN ±2% OPTIMUM MOISTURE.

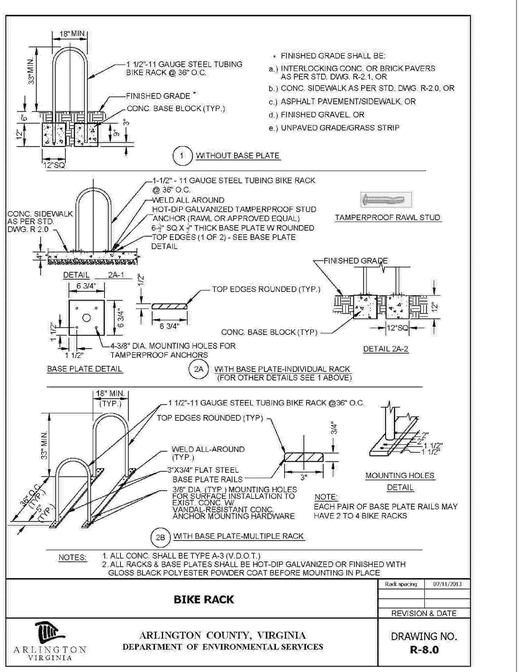
SOILS LEGEND

SCALE=1"=200'

NUMBER	NAME	SOIL GROUP	CLASS	K FACTOR
6B	GLENELG LOAM, (3-8%)	B	N/A	0.32
6D	HATBORO LOAM, (0-2%)	B	N/A	0.32
4B	URBAN LAND-SASSAFRAS-NEABSCO COMPLEX	D	N/A	N/A
10D	URBAN LAND-GLENELG COMPLEX, (15-25%)	B	N/A	N/A
12	URBAN LAND-UDORTHENTS COMPLEX, (2-15%)	D	N/A	N/A
38D	FAIRFAX LOAM(15-25%)	B	I	0.28
38E	FAIRFAX LOAM(25-45%)	B	I	0.28
95	URBAN LAND	D	IVB	N/A
101	URBAN LAND -WHEATON COMPLEX	D	IVB	0.32

SOIL LINES

SITE AREA



BIKE RACK	Rack spacing	07/31/2013
	REVISION & DATE	
ARLINGTON COUNTY, VIRGINIA DEPARTMENT OF ENVIRONMENTAL SERVICES	DRAWING NO.	R-8.0

No.	DATE	DESCRIPTION
		REVISIONS

COMMONWEALTH OF VIRGINIA
CLAYTON C. TOCK
Lic. No. 036790
09/28/2018
PROFESSIONAL ENGINEER

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GENERAL NOTES & DETAILS
UPTON HILL REGIONAL PARK
CIVIL ENGINEERING PLAN
6060 WILSON BLVD, ARLINGTON, VIRGINIA 22205

SCALE: AS NOTED	DESIGNED	CHECKED
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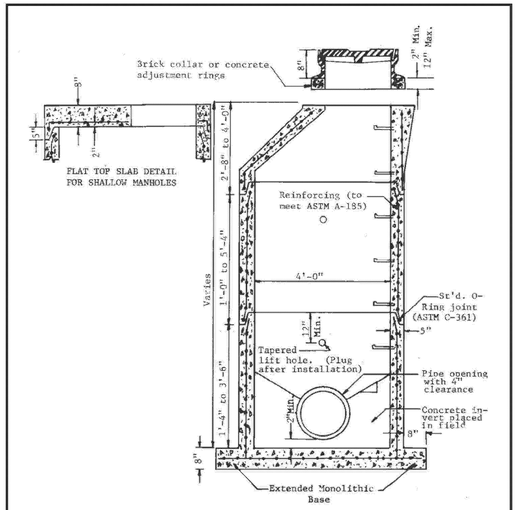
	APPROVED DATE CPHD PLANNER	APPROVED DATE CPHD LANDSCAPE REVIEWER
	SHEET C.03 OF 61	SP-12928

Urban, Ltd. – J:\JOBS\upton hill park\cp bid set\12928-02-GNOTES.dwg [C.03 GENERAL NOTES & DETAILS] November 26, 2018 – 12:11pm bbrien



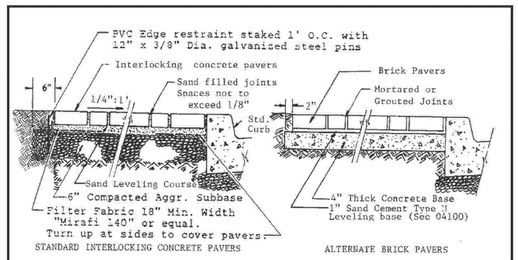
NOTES:
1. Manhole shall meet all requirement of ASTM C-478.
2. Riser and/or eccentric cone section may be replaced with alternate "Flat Top Slab" for use in shallow manholes.
3. Other combinations of riser and taper sections may be used as approved by the Engineer, to achieve required height.
4. Tongue and groove joint sealer may be used in lieu of "O-Ring joint."
5. For additional notes, see Drawing D-3.0.

STORM SEWER PRECAST MANHOLE, PH-1
FOR PIPE SIZES 15" THROUGH 36"

REVISION & DATE

ARLINGTON VIRGINIA — ARLINGTON COUNTY, VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES

DRAWING NO. **D-3.1**



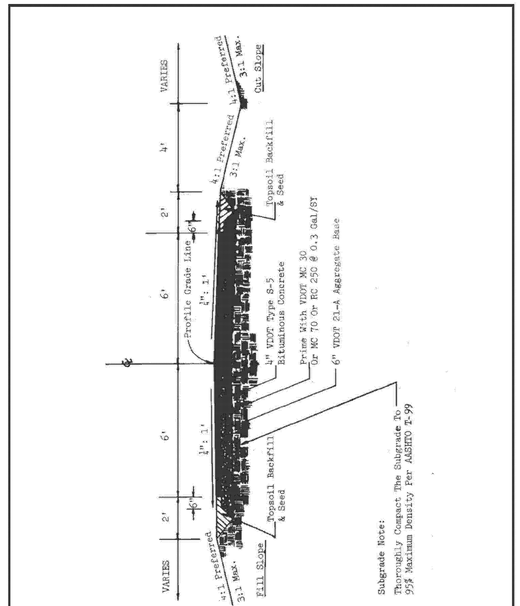
NOTES
1. Refer to Section 2611 and Section 2612 for specifications for Interlocking Concrete Pavers and Brick Pavers and other related materials shown on sidewalk applications.
2. All brick shall meet ASTM Specification C-902-78.
3. For driveway application see Drawing R-2.4 and related specs.

INTERLOCKING CONCRETE AND BRICK PAVERS
FOR SIDEWALK APPLICATION

REVISION & DATE

ARLINGTON VIRGINIA — ARLINGTON COUNTY, VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES

DRAWING NO. **R-2.1**

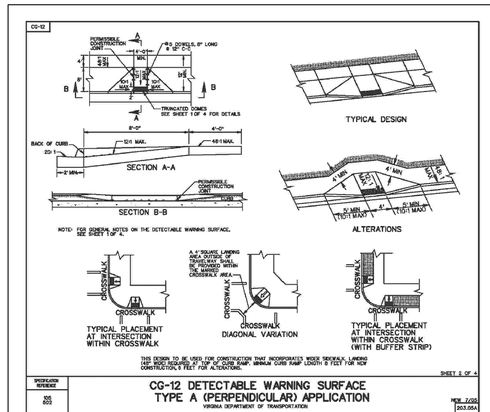


TYPICAL SECTION
HIKING - BIKING - JOGGING TRAIL

REVISION & DATE

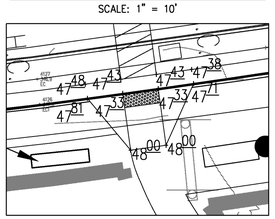
ARLINGTON VIRGINIA — ARLINGTON COUNTY, VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES

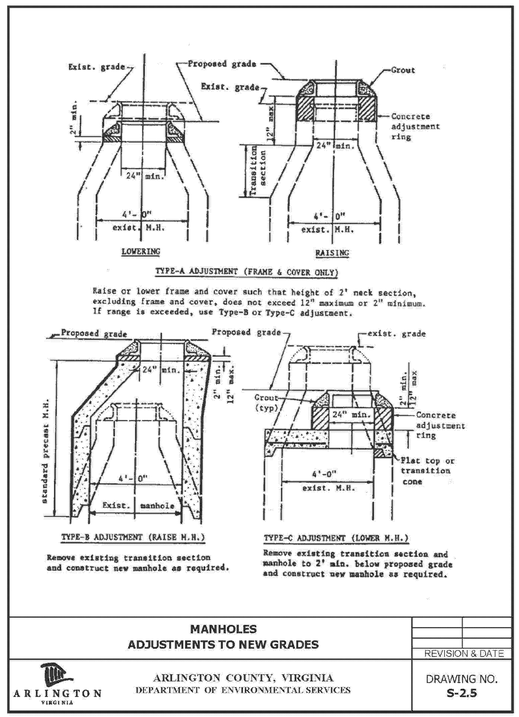
DRAWING NO. **R-6.1**



CG-12 COMPUTATIONS

SCALE: 1" = 10'





MANHOLES
ADJUSTMENTS TO NEW GRADES

REVISION & DATE

ARLINGTON VIRGINIA — ARLINGTON COUNTY, VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES

DRAWING NO. **S-2.5**

No.	DATE	DESCRIPTION

REVISIONS

COMMONWEALTH OF VIRGINIA — CLAYTON C. TOCK — Lic. No. 036790 — 11/21/2018 — PROFESSIONAL ENGINEER

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ARLINGTON, VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES
GENERAL NOTES & DETAILS
UPTON HILL REGIONAL PARK
CIVIL ENGINEERING PLAN
6060 WILSON BLVD, ARLINGTON, VIRGINIA 22205

SCALE: AS NOTED		DESIGNED	CHECKED
SUBMITTED DATE	11-21-18	APPROVED DATE	APPROVED DATE
	05-15-18 –		
	08-08-18 –		
	09-28-18 –	CHIEF TRANSPORTATION PLANNING BUREAU	CHIEF TRANSPORTATION ENGINEERING BUREAU
APPROVED DATE		APPROVED DATE	APPROVED DATE
CHIEF WATER, SEWER & STREETS DIV.		CHIEF ENGINEERING DIVISION	DIRECTOR OF ENVIRONMENTAL SERVICES
		APPROVED DATE	APPROVED DATE
		CPHD PLANNER	CPHD LANDSCAPE REVIEWER
		SHEET C.03AOF 45	SP-12928

Urban, Ltd. – J:\JOBS\upton hill park\sp bid set\12928-02-GNOTES.dwg [C.03A GENERAL NOTES & DETAILS] November 26, 2018 – 12:11pm bbrien

SHEETS C.06,C.08,C.10

SHEETS C.07,C.09,C.11

THIS SHEET IS FOR OVERVIEW PURPOSES ONLY.

No.	DATE	DESCRIPTION
		REVISIONS

CLAYTON C. TOCK
Lic. No. 036790
09/28/2018
COMMONWEALTH OF VIRGINIA
PROFESSIONAL ENGINEER

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ARLINGTON, VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES

OVERVIEW

UPTON HILL REGIONAL PARK
CIVIL ENGINEERING PLAN

6060 WILSON BLVD, ARLINGTON, VIRGINIA 22205

SCALE: 1"=60'	DESIGNED	CHECKED
SUBMITTED DATE 05-15-18 08-08-18 09-28-18	APPROVED DATE CHIEF TRANSPORTATION PLANNING BUREAU	APPROVED DATE CHIEF TRANSPORTATION ENGINEERING BUREAU
APPROVED DATE CHIEF WATER, SEWER & STREETS DIV.	APPROVED DATE CHIEF ENGINEERING DIVISION	APPROVED DATE DIRECTOR OF ENVIRONMENTAL SERVICES
	APPROVED DATE CPHD PLANNER	APPROVED DATE CPHD LANDSCAPE REVIEWER
		SHEET C.04 OF 61 — SP-12928

Urban, Ltd. – k:\JOBS\upton hill park\sp bid set\12928-03-OVERVIEW.dwg [C.04 OVERVIEW] November 28, 2018 – 12:12pm bbrien

EX. PATRICK HENRY DR.
EX. N LEBANON ST
EX. N. LIVINGSTON ST
EX. WILSON BLVD. - ROUTE 6503
VA STATE GRID NORTH
RPA
RPA
RPA

EX. PATRICK HENRY DR

VA STATE GRID NORTH

N 7003982
E 11869174

RPC: 12-018-001
AGER LUCAS &
AGER LISA

RPC: 12-018-024
DE LA VIA MARCELINO
DE LA VIA JULIETA ET AL

RPC: 12-018-023
TONAKARN EAK & ORAPAN

RPC: 12-018-022
HORNE HEATHER

RPC: 12-018-021
DE OVANDO MARIA V &
ANTONIO OVANDO

RPC: 12-018-020
FERRANDO WILLIAM ANTHONY
ET AL

URCIA ANDRES C TR
URCIA ROWENA M TR

EX. N LEBANON ST

EX. WILSON BLVD - ROUTE 6608
EX. R/W - WIDTH VARIES
POSTED SPEED: 30 MPH

N73°56'55"E 399.58'

R=1472.40'
A=453.74'

15,000 VPD

BENCHMARK
STORM INLET
TOP= 338.30

N 7003881.48
E 11869495.85

N 7003896
E 11869741

N 7003824.66
E 11869047.49

RPC: 12-042-066
COMMONWEALTH
OF VIRGINIA

RPC: 12-042-061
NORTHERN VA REGIONAL
PARK AUTHORITY

MISSPOINTE
S14°14'4" (TOTAL)
582.54'

N 7003547
E 11869046

EX. 8" SANITARY SEWER

EX. CG

EX. MEDIAN

EX. ASPHALT (T.B.R.)

EX. SIGN (T.B.R)

EX. WOOD STEPS

EX. TIMBERS (T.B.R.)

EX. SPLIT RAIL (T.B.R.)

EX. CINDER BLOCK FACILITIES OVER MAIN

EX. PLAYGROUND AREA (T.B.R.)

EX. MEMORIAL STONE

EX. WOOD CHIP TRAIL

"RED TRAIL"

EX. ASPHALT PATH

EX. SWING GATE

EX. UTILITY POLE

EX. 15" RCP

EX. 12" RCP

EX. 21" RCP

RPA

FIELD VERIFIED RPA

NORTH

MATCHLINE
SEE SHEET C.07

No.	DATE	DESCRIPTION

REVISIONS

COMMONWEALTH OF VIRGINIA
CLAYTON C. TOCK
Lic. No. 036790
09/28/2018
PROFESSIONAL ENGINEER

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ARLINGTON, VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES

EXISTING CONDITIONS

UPTON HILL REGIONAL PARK
CIVIL ENGINEERING PLAN

6060 WILSON BLVD, ARLINGTON, VIRGINIA 22205

SCALE: 1"=25'	DESIGNED	CHECKED
SUBMITTED DATE 05-15-18 – 08-08-18 – 09-28-18 –	APPROVED DATE CHIEF TRANSPORTATION PLANNING BUREAU	APPROVED DATE CHIEF TRANSPORTATION ENGINEERING BUREAU
APPROVED DATE CHIEF WATER, SEWER & STREETS DIV.	APPROVED DATE CHIEF ENGINEERING DIVISION	APPROVED DATE DIRECTOR OF ENVIRONMENTAL SERVICES
	APPROVED DATE CPHD PLANNER	APPROVED DATE CPHD LANDSCAPE REVIEWER
		SHEET C.06 OF 45 — SP-12928

Urban, Ltd. – J:\JOBS\upton hill park\cp hld set\12928-06-EX CONDITIONS.dwg [EX CONDITIONS] November 26, 2018 - 12:12pm bbrien

MATCHLINE
SEE SHEET C.06

N 7003437
E 11869559

RPC: 12-042-103
NORTHERN VA REGIONAL
PARK AUTHORITY
PARCEL B
DB. 1808 PG. 253
23.41613 ACRES

VA STATE GRID NORTH

N 7003435
E 11868824

N 7003275.08
E 11868854.31

PIN: 0513 18 E
SCA-SPE LLC
DB. 23671 PG. 1646

PIN: 0514-01-0001
NORTHERN VA REGIONAL
PARK AUTHORITY
PARCEL A
DB. 3764 PG. 55
3.11833 ACRES

RPC: 12-042-106
SAINT ALBANS HOUSING
HARTLAND BANK
DB. 3860 PG. 1232

N 7002956
E 11868810

N 7002969.14
E 11869170.69

BENCHMARK
SAN MH
ELEV= 399.63

ARLINGTON COUNTY (APPROXIMATE)
FAIRFAX COUNTY (APPROXIMATE)

N19°22'01"E 1014.14' (TOTAL)
431.59'

N45°57'40"W
440.11'

S19°22'20"W
48.64'

247.71'
296.35' (TOTAL)

175' 8" PVC @ 0.00%

EX. BATTING CAGE
EX. ASPHALT
EX. TIMBERS
EX. CHAIN LINK FENCE
EX. SHED
EX. BENCH (TYP.)
EX. 8" PVC PIPE
EX. EXERCISE AREA (T.B.R.)
CONCRETE WALK
EX. MEMORIAL STONE
EX. 8' CHAIN LINK
EX. ASPHALT PARKING AREA
EX. 4' CHAIN LINK
EX. MINI GOLF
8' METAL FENCE
EX. WATER PARK / EX. WOOD DECK
EX. BUILDING
EX. WOOD CHIP TRAIL
YELLOW TRAIL
EX. PIPE TO BE ABANDONED
EX. CONCRETE PAD
EX. GAZEBO (T.B.R.)
GRILL CONC
EX. SPLIT RAIL FENCE (T.B.R.)
CURB
CONCRETE SIDEWALK
APPROX. LOCATION 6" PVC SANITARY SEWER
EX. 8" SANITARY SEWER
#4 OLD CONC FENCE
EX. 6' CHAIN LINK WITH BARBED WIRE
OHU
EM
CP
FH
TC

No.	DATE	DESCRIPTION
		REVISIONS

CLAYTON C. TOCK
Lic. No. 036790
07/28/2018
COMMONWEALTH OF VIRGINIA
PROFESSIONAL ENGINEER

urban
Planners · Engineers · Landscape Architects · Land Surveyors
Urban, Ltd.
4200 D Technology Ct.
Chantilly Va. 20151
(703)-642-2306
(703)-378-7888
www.urban-engineering.com

ARLINGTON, VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES

EXISTING CONDITIONS
UPTON HILL REGIONAL PARK
CIVIL ENGINEERING PLAN
6060 WILSON BLVD, ARLINGTON, VIRGINIA 22205

SCALE: 1"=25'	DESIGNED	CHECKED
SUBMITTED DATE 05-15-18 – 08-08-18 – 09-28-18 –	APPROVED DATE CHIEF TRANSPORTATION PLANNING BUREAU	APPROVED DATE CHIEF TRANSPORTATION ENGINEERING BUREAU
APPROVED DATE CHIEF WATER, SEWER & STREETS DIV.	APPROVED DATE CHIEF ENGINEERING DIVISION	APPROVED DATE DIRECTOR OF ENVIRONMENTAL SERVICES
	APPROVED DATE CPHD PLANNER	APPROVED DATE CPHD LANDSCAPE REVIEWER
	SHEET C.07 OF 45	SP-12928

Urban, Ltd. – J:\JOBS\upton hill park\sp bid set\12928-05-EX CONDITIONS (2)] November 26, 2018 – 12:12pm bbrien

EX. PATRICK HENRY DR

VA STATE GRID NORTH

N 7003982

E 11869774

RPC: 12-018-001
AGER LUCAS &
AGER LISA

RPC: 12-018-024
DE LA VIA MARCELINO
DE LA VIA JULIETA ET AL

RPC: 12-018-023
TONAKARN EAK & ORAPAN

RPC: 12-018-022
HORNE HEATHER

RPC: 12-018-021
DE OVANDO MARIA V &
ANTONIO OVANDO

RPC: 12-018-020
FERRANDO WILLIAM ANTHONY
ET AL

URCIA ANDRES C TR
URCIA ROWENA M TR

EX. N LEBANON ST

EX. 8" SANITARY SEWER

EX. WILSON BLVD - ROUTE 6608
EX. R/W - WIDTH VARIES
POSTED SPEED: 30 MPH

15,000 VPD

BENCHMARK
STORM INLET
TOP= 338.20

N 7003881.48
E 11869495.85

N73°56'55"E 399.58'

N 7003896
E 11869741

N 7003824.66
E 11869047.49

RPC: 12-042-066
COMMONWEALTH
OF VIRGINIA

EX. WOOD STEPS

EX. ASPHALT (T.B.R.)

EX. SIGN (T.B.R.)

EX. CONCRETE SIDEWALK (T.B.R.)

EX. ASPHALT PATH

EX. SWING SET

EX. UTILITY POLE

EX. TIMBERS (T.B.R.)

EX. PLAYGROUND AREA (T.B.R.)

EX. CINDER BLOCK BUILDING

EX. MEMORIAL STONE

"RED TRAIL"

EX. WOOD CHIP TRAIL

EX. TIMBERS (T.B.R.)

POST

FIELD VERIFIED RPA

RPC: 12-042-061
NORTHERN VA REGIONAL
PARK AUTHORITY

N10°22'01"E 104.14' (TOTAL)
582.54'

N 7003547
E 11869046

STEPS

MATCHLINE
SEE SHEET C.07

N.T.S.

LEGEND

- EX. BUILDING/PLAYGROUND T.B.R.
- EX. TIMBERS T.B.R.
- EX. ASPHALT T.B.R.
- EX. CONCRETE SIDEWALKS T.B.R.
- EX. WALL/FENCE T.B.R.
- EX. M.H. TOP OR STRUCTURE T.B.R. SEE PLAN FOR DETAIL
- EX. WET UTILITY TO BE ABANDONED
- EX. WET UTILITY T.B.R.
- EX. DRY UTILITY T.B.R.

NOTE: ALL UTILITIES TO BE CAPPED AND FILLED WITH BACKFILL ARE TO BE WATERTIGHT AS TO PRECLUDE THE PONDING OF WATER WITHIN THE PIPE OR STRUCTURE.

No.	DATE	DESCRIPTION

REVISIONS

COMMONWEALTH OF VIRGINIA
CLAYTON C. TOCK
Lic. No. 036790
11/21/2018
PROFESSIONAL ENGINEER

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ARLINGTON, VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES

DEMOLITION PLAN
UPTON HILL REGIONAL PARK
CIVIL ENGINEERING PLAN
6060 WILSON BLVD, ARLINGTON, VIRGINIA 22205

SCALE: 1"=25'	DESIGNED	CHECKED
SUBMITTED DATE 11-21-18 05-15-18 – 08-08-18 – 09-28-18 –	APPROVED DATE CHIEF TRANSPORTATION PLANNING BUREAU	APPROVED DATE CHIEF TRANSPORTATION ENGINEERING BUREAU
APPROVED DATE CHIEF WATER, SEWER & STREETS DIV.	APPROVED DATE CHIEF ENGINEERING DIVISION	APPROVED DATE DIRECTOR OF ENVIRONMENTAL SERVICES
	APPROVED DATE CPHD PLANNER	APPROVED DATE CPHD LANDSCAPE REVIEWER

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MATCHLINE
SEE SHEET C.06

N 7003437
E 11869559

VA STATE GRID NORTH
N 7003435
E 11868824

RPC: 12-042-103
NORTHERN VA REGIONAL PARK AUTHORITY
PARCEL B
DB. 1808 PG. 253
23.41613 ACRES

PIN: 0513 18 E
SCA-SPE LLC
DB. 23671 PG. 1646

PIN: 0514-01-0001
NORTHERN VA REGIONAL PARK AUTHORITY
PARCEL A
DB. 3764 PG. 55
3.11833 ACRES

RPC: 12-042-106
SAINT ALBANS HOUSING HARTLAND BANK
DB. 3860 PG. 1232

N 7002956
E 11868810

N 7003275.08
E 11868854.31

N 7002969.14
E 11869170.69

BENCHMARK
TOP MH
399.63

EX. BATTING CAGE
EX. TIMBERS
EX. ASPHALT
EX. CHAIN LINK FENCE
EX. BENCH (TYP.)
EX. 8" PVC PIPE
EX. 8" CHAIN LINK
EX. MEMORIAL STONE
EX. ASPHALT PARKING AREA
EX. MINI GOLF
EX. WATER PARK / EX. WOOD DECK
EX. BUILDING
EX. 4' CHAIN LINK
EX. EXERCISE AREA (T.B.R.)
EX. WOOD CHIP TRAIL
"YELLOW TRAIL"
EX. SPLIT RAIL (T.B.R.)
EX. 8" SANITARY SEWER
EX. 6" CHAIN LINK WITH BARBED WIRE
EX. PIPE TO BE ABANDONED
EX. 6" PVC PIPE
EX. 6" DIP
EX. 8" DIP
EX. 12" DIP
EX. 15" RCP
EX. 18" RCP
EX. 24" RCP
EX. 30" RCP
EX. 36" RCP
EX. 42" RCP
EX. 48" RCP
EX. 54" RCP
EX. 60" RCP
EX. 66" RCP
EX. 72" RCP
EX. 78" RCP
EX. 84" RCP
EX. 90" RCP
EX.

EX. PATRICK HENRY DR

VA STATE GRID NORTH

N 7003982

E 11869174

RPC: 12-018-001
AGER LUCAS &
AGER LISA

RPC: 12-018-024
DE LA VIA MARCELINO
DE LA VIA JULIETA ET AL

RPC: 12-018-023
TONAKARN EAK & ORAPAN

RPC: 12-018-022
HORNE HEATHER

RPC: 12-018-021
DE OVANDO MARIA V &
ANTONIO OVANDO

RPC: 12-018-020
FERRANDO WILLIAM ANTHONY
ET AL

URCIA ANDRES C TR
URCIA ROWENA M TR

EX. N LEBANON ST

EX. WILSON BLVD - ROUTE 6608
EX. R/W - WIDTH VARIES
POSTED SPEED: 30 MPH
POTENTIAL BIKE SHARE STATION

N73°56'55"E 399.58'

BENCHMARK
STORM INLET
TOP= 338.30

15,000 VPD

N 7003881.48
E 11869495.85

N 7003896
E 11869741

N 7003824.66
E 11869047.49

PROP. ENTRY SIGN(TYP.)

PROP. PARK SIGN

R=1472.40' (C1)
A=453.74'

RPC: 12-042-066
COMMONWEALTH
OF VIRGINIA

EX. WOOD STEPS

PROP. NATURAL SURFACE TRAIL

EX. WOOD CHIP TRAIL

EX. BUS STOP SHELTER

EX. ASPHALT (T.B.R.)

PROP. CG-12A

GAME TABLES

EX. CUY TO BE RELOCATED

EX. TRAIL T.B.R.

N.I.C.

EX. TIMBERS (T.B.R.)

EX. CINDER BLOCK UTILITIES/ SEWAGE

PROP. PICNIC PAVILION

EX. PLAYGROUND AREA (T.B.R.)

PROP. 5' SW

PROP. BIKE RACKS

EX. UTILITY POLE

EX. PLAYGROUND AREA (T.B.R.)

TW=356.00
BW=354.00
PROP. RET. WALL
(DESIGN BUILD BY CONTRACTOR)

EX. MEMORIAL STONE
TW=355.00
BW=352.00

PROP. PLAYGROUND

EX. TRAIL T.B.R. CARE SHALL BE TAKEN TO PRESERVE EXISTING TREES

EX. PLAYGROUND AREA (T.B.R.)

SHADE STRUCTURE

TIMBERS (T.B.R.)

PROP. 36" FENCE

POST

"RED TRAIL"
EX. WOOD CHIP TRAIL

TW=358.00
BW=353.00

PROP. SW PAVERS
(SEE SHEET C.03A FOR DETAIL)

TW=352.00
BW=350.20

EX. TRAIL TO CONNECT TO PROPOSED SIDEWALK

PORTION OF EX. TRAIL TO BE REPLACED WITH 5' SIDEWALK

EX. ASPHALT

EX. SWING SET

EX. ASPHALT PATH

EX. WOOD CHIP TRAIL

RPA

FIELD VERIFIED RPA

RPC: 12-042-061
NORTHERN VA REGIONAL
PARK AUTHORITY

N10°22'01"E 1014.4' (TOTAL)
582.54'

N 7003547
E 11869046

MATCHLINE
SEE SHEET C.09

NORTH

No.	DATE	DESCRIPTION
		REVISIONS

CLAYTON C. TOCK
Lic. No. 036790
11/21/2018
COMMONWEALTH OF VIRGINIA
PROFESSIONAL ENGINEER

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ARLINGTON, VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES

GEOMETRY PLAN

UPTON HILL REGIONAL PARK
CIVIL ENGINEERING PLAN

6060 WILSON BLVD, ARLINGTON, VIRGINIA 22205

SCALE: 1"=25'	DESIGNED	CHECKED
SUBMITTED DATE 11-21-18 05-15-18 – 08-08-18 – 09-28-18 –	APPROVED DATE CHIEF TRANSPORTATION PLANNING BUREAU	APPROVED DATE CHIEF TRANSPORTATION ENGINEERING BUREAU
APPROVED DATE CHIEF WATER, SEWER & STREETS DIV.	APPROVED DATE CHIEF ENGINEERING DIVISION	APPROVED DATE DIRECTOR OF ENVIRONMENTAL SERVICES
	APPROVED DATE CPHD PLANNER	APPROVED DATE CPHD LANDSCAPE REVIEWER
	SHEET C.08 OF 62	SP-12928

Urban, Ltd. – z:\JOBS\upton hill park\sp bid set\12928-08-GEOMETRY.dwg [GEOMETRY] November 26, 2018 – 12:13pm bbrien

MATCHLINE
SEE SHEET C.08

VA STATE GRID NORTH

N 7003435
E 11868824

N 7003437
E 11869559

RPC: 12-042-103
NORTHERN VA REGIONAL
PARK AUTHORITY
PARCEL B
DB. 1808 PG. 253
23.41613 ACRES

N.I.C.

EX. TIMBERS
EX. BATTING CAGE
EX. ASPHALT
EX. TIMBERS
CONTRACTOR TO NOSE DOWN CURB
35.09'
EM
STEPS
RETAINING WALL N.I.C.
PROP. RET. WALL (DESIGN BUILD BY CONTRACTOR)
EX. CHAIN LINK FENCE
TIMBERS TO BE CUT BACK
PROP. HANDRAIL (DESIGN BUILD BY CONTRACTOR)
PROP. TICKET BOOTH
PROP. WOODEN DECK
PROP. CANOPY
PROP. ROPES COURSE
PROP. 6" PERFORATED UNDERDRAIN (TYP.)
PROP. 8.0' CL A1 RIPRAP
17.5'~ 8"PVC @X.XX%
EX. EXERCISE AREA
CONTRACTOR TO STABILIZE EX. CHANNEL WITH RIP RAP OR OTHER MEANS AS DETERMINED BY THE SITE INSPECTOR
PROP. 9.5' CL A1 RIPRAP
PROP. 15" STANDPIPE
PROP. 15" RCP @0.52%
PROP. 8" PVC
PROP. REMOVABLE BOLLARD (TYP.) SEE DETAIL SHEET C.02
PROP. CLEANOUT
PROP. FLOW SPREADER PRETREATMENT (SEE SHEET C.23 FOR DETAIL)
PROP. 13'X7' FILTERRA
PROP. OBSERVATION WELL/CLEANOUT (TYP.)
PROP. BIORETENTION
EX. MEMORIAL STONE
PROP. WHEEL STOP (TYP.)
PROP. 12" OVERFLOW PIPE (TYP.)
CROSS WALK
PROP. LIGHTS (TYP.)
PROP. CROSS-WALK
EX. ASPHALT PARKING AREA
PROP. CHAMBERS
PROP. PERVIOUS PAVERS
PROP. BOLLARD
PROP. CROSS PVC @ 6"
PROP. WHEEL STOP (TYP.)
PROP. CLEANOUT
PROP. LIGHTS (Typ.)
EX. SAN TOP TO BE RAISED TO PROPOSED ELEVATION (SEE SHEET C.03A FOR DETAIL)
PROP. TRAIL RELOCATION
EX. SANITARY SEWER
EX. 6" CHAIN LINK WITH BARBED WIRE
EX. BUILDING
EX. MINI GOLF
EX. WATER PARK
EX. CONCRETE SIDEWALK
EX. 6" PVC
BENCHMARK
CSN MH
ELEV=399.63
PROP 42.8' 8" PVC
PROP. DROP OFF
AREA OF MILLING/PAVING/STRIPING CONSIDERED MAINTENANCE AND NOT DISTURBED AREA
ARLINGTON COUNTY (APPROXIMATE)
FAIRFAX COUNTY (APPROXIMATE)
EX. EDGE OF ASPHALT
EX. 4' CHAIN LINK
OHU
EP
LOC

N 7003275.08
E 11868854.31

PIN: 0513 18 E
SCA-SPE LLC
DB. 23671 PG. 1646

N19°22'01"E 1014.14' (TOTAL)
431.59'

N45°57'40"W 440.17'

S19°22'20"W 48.64'

N 7002969.14
E 11869170.69

247.71'
296.35' (TOTAL)

PIN: 0514-01-0001
NORTHERN VA REGIONAL
PARK AUTHORITY
PARCEL A
DB. 3764 PG. 55
3.11833 ACRES

RPC: 12-042-106
SAINT ALBANS HOUSING
HARTLAND BANK
DB. 3860 PG. 1232

N 7002956
E 11868810

No.	DATE	DESCRIPTION
		REVISIONS

COMMONWEALTH OF VIRGINIA
CLAYTON C. TOCK
Lic. No. 036790
11/21/2018
PROFESSIONAL ENGINEER

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ARLINGTON, VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES

GEOMETRY PLAN
UPTON HILL REGIONAL PARK
CIVIL ENGINEERING PLAN
6060 WILSON BLVD, ARLINGTON, VIRGINIA 22205

SCALE: 1"=25'	DESIGNED	CHECKED
SUBMITTED DATE 11-21-18 05-15-18 – 08-08-18 – 09-28-18 –	APPROVED DATE CHIEF TRANSPORTATION PLANNING BUREAU	APPROVED DATE CHIEF TRANSPORTATION ENGINEERING BUREAU
APPROVED DATE CHIEF WATER, SEWER & STREETS DIV.	APPROVED DATE CHIEF ENGINEERING DIVISION	APPROVED DATE DIRECTOR OF ENVIRONMENTAL SERVICES
	APPROVED DATE CPHD PLANNER	APPROVED DATE CPHD LANDSCAPE REVIEWER

Urban, Ltd. – z:\JOBS\upton hill park\sp bid set\12928-08-GEOMETRY.dwg [GEOMETRY (2)] November 26, 2018 – 12:13pm bbrien

MATCHLINE
SEE SHEET C.08

N 7003437
E 11869559

VA STATE GRID NORTH

N 7003435
E 11868824

RPC: 12-042-103
NORTHERN VA REGIONAL
PARK AUTHORITY
PARCEL B
DB. 1808 PG. 253
23.41613 ACRES

N 7003275.08
E 11868854.31

PIN: 0513 18 E
SCA-SPE LLC
DB. 23671 PG. 1646

PIN: 0514-01-0001
NORTHERN VA REGIONAL
PARK AUTHORITY
PARCEL A
DB. 3764 PG. 55
3.11833 ACRES

RPC: 12-042-106
SAINT ALBANS HOUSING
HARTLAND BANK
DB. 3860 PG. 1232

N 7002956
E 11868810

N 7002969.14
E 11869170.69

EX. TIMBERS
EX. BATTING CAGE
EX. ASPHALT
EX. CHAIN LINK FENCE
EX. MINI Ggolf
EX. WATER PARK
EX. ASPHALT PARKING AREA
EX. BUILDING
EX. EXERCISE AREA (T.B.R.)
EX. MEMORIAL STONE
EX. 6" CHAIN LINK WITH BARBED WIRE
EX. SANITARY SEWER
EX. 6" PVC
EX. 4" CHAIN LINK
EX. ASPHALT PARKING AREA
CONCRETE SIDEWALK
OHU
EP
LOC
CONTRACTOR TO NOSE DOWN CURB
TIMBERS TO BE CUT BACK
PROP. HANDRAIL (DESIGN BUILD BY CONTRACTOR)
PROP. 6.0' CL A1 RIPRAP
PROP. 6" PERFORATED UNDERDRAIN (TYP.)
PROP. FLOW SPREADER PRETREATMENT (SEE SHEET C.23 FOR DETAIL)
PROP 13'X7' FILTERRA
PROP. BIORETENTION
PROP. OBSERVATION WELL/CLEANOUT (TYP.)
PROP. 15" STANDPIPE
PROP. 15" RCP @0.52%
PROP. 18" OR 15" RCP @ 0.52%
PROP. REMOVABLE BOLLARD (TYP.) SEE DETAIL SHEET C.02
PROP. CLEANOUT
PROP. 9.5' CL A1 RIPRAP
CONTRACTOR TO STABILIZE EX. CHANNEL WITH RIP RAP OR OTHER MEANS AS DETERMINED BY THE SITE INSPECTOR
AREA OF MILLING/PAVING/STRIPING CONSIDERED MAINTENANCE AND NOT DISTURBED AREA
ARLINGTON COUNTY (APPROXIMATE)
FAIRFAX COUNTY (APPROXIMATE)
PROP. WHEEL STOP (TYP.)
PROP. LIGHTS (TYP.)
PROP. CROSS WALK
PROP. 12" OVERFLOW PIPE (TYP.)
PROP. CHAMBERS
PROP. PERVIOUS PAVERS
PROP. BOLLARD
PROP. TRAIL RELOCATION
PROP. 6" PVC
BENCHMARK
CGN MH
ELEV. 399.63
PROP. 42.8' 8" PVC @ 0.5%
EX. SAN TOP TO BE RAISED TO PROPOSED ELEVATION (SEE SHEET C.03A FOR DETAIL)
N19°22'01"E 1014.14' (TOTAL)
431.59'
N55°57'40"W 440.17'
S19°22'20"W 48.64'
247.71'
296.35' (TOTAL)

No.	DATE	DESCRIPTION
		REVISIONS

COMMONWEALTH OF VIRGINIA
CLAYTON C. TOCK
Lic. No. 036790
11/21/2018
PROFESSIONAL ENGINEER

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ARLINGTON, VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES

GEOMETRY PLAN – PHASE I

UPTON HILL REGIONAL PARK
CIVIL ENGINEERING PLAN

6060 WILSON BLVD, ARLINGTON, VIRGINIA 22205

SCALE: 1"=25'	DESIGNED	CHECKED
SUBMITTED DATE 11-21-18 05-15-18 – 08-08-18 – 09-28-18 –	APPROVED DATE	APPROVED DATE
APPROVED DATE	CHIEF TRANSPORTATION PLANNING BUREAU	CHIEF TRANSPORTATION ENGINEERING BUREAU
CHIEF WATER, SEWER & STREETS DIV.	APPROVED DATE CHIEF ENGINEERING DIVISION	APPROVED DATE DIRECTOR OF ENVIRONMENTAL SERVICES
	APPROVED DATE CPHD PLANNER	APPROVED DATE CPHD LANDSCAPE REVIEWER

SHEET C.09A OF 62 | SP-12928

Urban, Ltd. – z:\JOBS\upton hill park\sp bid set\12928-08-GEOMETRY PH 1.dwg [GEOMETRY (2)] November 26, 2018 – 12:13pm bbrien

EX. WILSON BLVD - ROUTE 6608
EX. R/W - WIDTH VARIES
POSTED SPEED - 30 MPH
POTENTIAL BIKE SHARE STATION

EX. PATRICK HENRY DR

EX. N LEBANON ST

VA STATE GRID NORTH

N 7003982
E 11869174

N 7003896
E 11869741

RPC: 12-018-001
AGER LUCAS & AGER LISA

RPC: 12-018-024
DE LA VIA MARCELINO DE LA VIA JULIETA ET AL

RPC: 12-018-023
TONAKARN EAK & ORAPAN

RPC: 12-018-022
HORNE HEATHER

RPC: 12-018-021
DE OVANDO MARIA V & ANTONIO OVANDO

RPC: 12-018-020
FERRANDO WILLIAM ANTHONY ET AL

URCIA ANDRES C TR
URCIA ROWENA M TR

RPC: 12-042-066
COMMONWEALTH OF VIRGINIA

RPC: 12-042-061
NORTHERN VA REGIONAL PARK AUTHORITY

N 7003824.66
E 11869047.49

PROP. ENTRY SIGN(TYP.)

PROP. PARK SIGN

PROP. NATURAL SURFACE TRAIL

EX. WOOD STEPS

EX. BUS STOP

EX. TIMBERS (T.B.R.)

PROP. PICNIC PAVILION

EX. PLAYGROUND AREA (T.B.R.)

EX. MEMORIAL STONE

PROP. CG-12A

EX. GUY TO BE RELOCATED

PROP. 5' SW

EX. TRAIL T.B.R.

EX. ASPHALT (T.B.R.)

GAME TABLES

PROP. BIKE RACKS

EX. UTILITY POLE

PROP. PLAYGROUND

SHADE STRUCTURE

PROP. 36" FENCE

EX. TRAIL T.B.R./ CARE SHALL BE TAKEN TO PRESERVE EXISTING TREES

EX. ASPHALT PATH

EX. SWING SET

EX. ASPHALT

EX. WOOD CHIP TRAIL

"RED TRAIL"

PROP. SW PAVERS (SEE SHEET C.03A FOR DETAIL)

EX. TRAIL TO CONNECT TO PROPOSED SIDEWALK

PORTION OF EX. TRAIL TO BE REPLACED WITH 5' SIDEWALK

TW=356.00
BW=354.00
PROP. RET. WALL (DESIGN BUILD BY CONTRACTOR)

TW=355.00
BW=352.00

TW=358.00
BW=353.00

TW=352.00
BW=350.20

R=1472.40'
A=453.74'

15,000 YPD

N 7003881.48
E 11869495.85

BENCHMARK
STORM INLET
TOP= 338.30

N73°56'55"E 399.58'

N10°20'17"E 1014.14' (1011.)
582.54'

N 7003547
E 11869046

FIELD VERIFIED RPA

NORTH

MATCHLINE
SEE SHEET C.11

No.	DATE	DESCRIPTION
		REVISIONS

COMMONWEALTH OF VIRGINIA
CLAYTON C. TOCK
Lic. No. 036790
11/21/2018
PROFESSIONAL ENGINEER

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ARLINGTON, VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES

GRADING PLAN
UPTON HILL REGIONAL PARK
CIVIL ENGINEERING PLAN
6060 WILSON BLVD, ARLINGTON, VIRGINIA 22205

SCALE: 1"=25'		DESIGNED	CHECKED
SUBMITTED DATE	11-21-18	APPROVED DATE	APPROVED DATE
05-15-18	–		
08-08-18	–		
09-28-18	–	CHIEF TRANSPORTATION PLANNING BUREAU	CHIEF TRANSPORTATION ENGINEERING BUREAU
APPROVED DATE		APPROVED DATE	APPROVED DATE
CHIEF WATER, SEWER & STREETS DIV.		CHIEF ENGINEERING DIVISION	DIRECTOR OF ENVIRONMENTAL SERVICES
		APPROVED DATE	APPROVED DATE
		CPHD PLANNER	CPHD LANDSCAPE REVIEWER

SHEET C.10 OF 62 | SP-12928

Urban, Ltd. – I:\JOBS\upton hill park\sp bid set\12928-08-GRADING.dwg [GRADING] November 26, 2018 – 12:13pm bbrien

MATCHLINE
SEE SHEET C.10

VA STATE GRID NORTH

N 7003435
E 11868824

N 7003437
E 11869559

RPC: 12-042-103
NORTHERN VA REGIONAL
PARK AUTHORITY
PARCEL B
DB. 1808 PG. 253
23.41613 ACRES

N.I.C.

EX. BATTING CAGE

RETAINING WALL N.I.C.

PROP. TICKET BOOTH

PROP. WOODEN DECK

PROP. CANOPY

PROP. ROPES COURSE

PROP. RET. WALL (DESIGN BUILD BY CONTRACTOR)

PROP. HANDRAIL (DESIGN BUILD BY CONTRACTOR)

EX. CHAIN LINK FENCE

TIMBERS TO BE CUT BACK

PROP. 6.0' Ø PERFORATED UNDERDRAIN (TYP.)

PROP. 8.0' Ø AI RIPRAP

PROP. 8" PVC

PROP. 15"X7" FILTERRA

PROP. FLOW SPREADER PRETREATMENT (SEE SHEET C.23 FOR DETAIL)

PROP. WHEEL STOP (TYP.)

EX. MULCH

PROP. BIORETENTION

PROP. OBSERVATION WELL/CLEANOUT (TYP.)

PROP. 15" RCP

PROP. STANDPIPE

PROP. 8" PVC

PROP. 12" OVERFLOW PIPE (TYP.)

PROP. H.C. RAMP

PROP. CROSS WALK

PROP. 6" PVC

PROP. REMOVABLE BOLLARD SEE DETAIL SHEET C.02

PROP. CLEANOUT

PROP. BOLLARD

PROP. CHAMBERS

PROP. PERVIOUS PAVERS

PROP. LIGHTS (TYP.)

PROP. 4' TRAIL RELOCATION

EX. SAN TOP TO BE RAISED TO PROPOSED ELEVATION (SEE SHEET C.03A FOR DETAIL)

CONTRACTOR TO NOSE DOWN CURB

CONTRACTOR TO STABILIZE EX. CHANNEL WITH RIP RAP OR OTHER MEANS AS DETERMINED BY THE SITE INSPECTOR

PROP. 9.5' Ø AI RIPRAP

EX. ASPHALT

EX. TIMBERS

EX. EDGE OF ASPHALT

EX. ASPHALT PARKING AREA

EX. MINI GOLF

EX. WATER PARK / EX. WOOD DECK

EX. CONCRETE SIDEWALK

EX. BUILDING

EX. 4' CHAIN LINK

EX. 16' CHAIN LINK WITH BARBED WIRE

EX. WOOD CHIP TRAIL

EX. YELLOW TRAIL

EX. ASPHALT

EX. WOOD CHIP TRAIL

EX. TIMBERS

EX. STEPS

EX. 6" SANITARY SEWER

OHU

EP

EM

N 7003275.08
E 11868854.31

AREA OF MILLING/PAVING/STRIPING CONSIDERED MAINTENANCE AND NOT DISTURBED AREA

PIN: 0513 18 E
SCA-SPE LLC
DB. 23671 PG. 1646

ARLINGTON COUNTY/FAIRFAX COUNTY (APPROXIMATE)

AREA OF MILLING/PAVING/STRIPING CONSIDERED MAINTENANCE AND NOT DISTURBED AREA

PROP. WHEEL STOP (TYP.)

PROP. LIGHTS (TYP.)

PROP. CROSS WALK

N45°57'40"W
440.11'

N19°22'01"E 1014.14' (TOTAL)
431.59'

BENCHMARK
SAN MH
TOP= 399.63
PROP. 42.8' 8" PVC

PROP. DROP OFF

PIN: 0514-01-0001
NORTHERN VA REGIONAL
PARK AUTHORITY
PARCEL A
DB. 3764 PG. 55
3.11833 ACRES

N 7002956
E 11868810

N 7002969.14
E 11869170.69

S19°22'20"W
48.64'

247.71'
296.35' (TOTAL)

RPC: 12-042-106
SAINT ALBANS HOUSING
HARTLAND BANK
DB. 3860 PG. 1232

No.	DATE	DESCRIPTION
		REVISIONS

CLAYTON C. TOCK
Lic. No. 036790
11/21/2018
COMMONWEALTH OF VIRGINIA
PROFESSIONAL ENGINEER

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Chantilly Va. 20151
(703)-642-2306
(703)-378-7888
www.urban-engineering.com

ARLINGTON, VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES

GRADING PLAN
UPTON HILL REGIONAL PARK
CIVIL ENGINEERING PLAN
6060 WILSON BLVD, ARLINGTON, VIRGINIA 22205

SCALE: 1"=25'	DESIGNED	CHECKED
SUBMITTED DATE 11-21-18 05-15-18 – 08-08-18 – 09-28-18 –	APPROVED DATE CHIEF TRANSPORTATION PLANNING BUREAU	APPROVED DATE CHIEF TRANSPORTATION ENGINEERING BUREAU
APPROVED DATE CHIEF WATER, SEWER & STREETS DIV.	APPROVED DATE CHIEF ENGINEERING DIVISION	APPROVED DATE DIRECTOR OF ENVIRONMENTAL SERVICES
	APPROVED DATE CPHD PLANNER	APPROVED DATE CPHD LANDSCAPE REVIEWER
	SHEET C.11 OF 62	SP-12928

Urban, Ltd. – J:\JOBS\upton hill park\sp bid set\12928-08-GRADING.dwg [GRADING (2)] November 26, 2018 – 12:13pm bbrien

MATCHLINE
SEE SHEET C.10

N 7003437
E 11869559

VA STATE GRID NORTH

N 7003435
E 11868824

RPC: 12-042-103
NORTHERN VA REGIONAL
PARK AUTHORITY
PARCEL B
DB. 1808 PG. 253
23.41613 ACRES

N 7003275.08
E 11868854.31

PIN: 0513 18 E
SCA-SPE LLC
DB. 23671 PG. 1646

PIN: 0514-01-0001
NORTHERN VA REGIONAL
PARK AUTHORITY
PARCEL A
DB. 3764 PG. 55
3.11833 ACRES

RPC: 12-042-106
SAINT ALBANS HOUSING
HARTLAND BANK
DB. 3860 PG. 1232

N 7002956
E 11868810

N 7002969.14
E 11869170.69

AREA OF MILLING/PAVING/STRIPING CONSIDERED MAINTENANCE AND NOT DISTURBED AREA

ARLINGTON COUNTY/FAIRFAX COUNTY (APPROXIMATE)

CONTRACTOR TO NOSE DOWN CURB

PROP. RET. WALL (DESIGN BUILD BY CONTRACTOR)

PROP. HANDRAIL (DESIGN BUILD BY CONTRACTOR)

EX. CHAIN LINK FENCE

EX. TIMBERS TO BE CUT BACK

EX. BATTING CAGE

EX. ASPHALT

EX. TIMBERS

EX. EXERCISE AREA (T.B.R.)

EX. ASPHALT PARKING AREA

EX. MINI GOLF

EX. WATER PARK / EX. WOOD DECK

EX. BUILDING

EX. WOOD CHIP TRAIL

EX. ASPHALT TRAIL

EX. 6' CHAIN LINK WITH BARBED WIRE

PROP. WHEEL STOP (TYP.)

PROP. FLOW SPREADER PRETREATMENT (SEE SHEET C.23 FOR DETAIL)

PROP. 13'X7' FILTERRA

PROP. 17.5" ø75 PVC @ X.X%

PROP. 6.0' CL A1 RIPRAP

PROP. 6" PERFORATED UNDERDRAIN (TYP.)

PROP. OBSERVATION WELL/CLEANOUT (TYP.)

PROP. 15" RCP @0.53%

PROP. 15" RCP @0.50%

PROP. STANDPIPE

PROP. 9.5' CL A1 RIPRAP

CONTRACTOR TO STABILIZE EX. CHANNEL WITH RIP RAP OR OTHER MEANS AS DETERMINED BY THE SITE INSPECTOR

PROP. REMOVABLE BOLLARD SEE DETAIL SHEET C.02

PROP. CLEANOUT

PROP. 6" PVC

PROP. BOLLARD

PROP. CHAMBERS

PROP. PERMEABLE PAVERS

PROP. 12" OVERFLOW PIPE (TYP.)

PROP. CROSS WALK

PROP. LIGHTS (TYP.)

PROP. DROP OFF

PROP. BENCH

PROP. TRAIL RELOCATION

EX. SAN. MH TOP=399.63 INV=342.8' 8" PVC

EX. SAN TOP TO BE RAISED TO PROPOSED ELEVATION (SEE SHEET C.03A FOR DETAIL)

BENCHMARK

N19°22'01"E 1014.14' (TOTAL)
431.59'

N45°57'40"W 440.11'

S19°22'20"W 48.64'

247.71'
296.35' (TOTAL)

No.	DATE	DESCRIPTION
		REVISIONS

COMMONWEALTH OF VIRGINIA
CLAYTON C. TOCK
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11/21/2018
PROFESSIONAL ENGINEER

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ARLINGTON, VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES

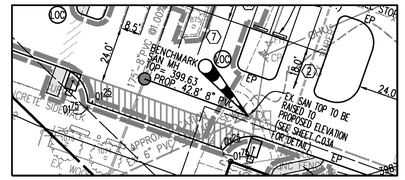
GRADING PLAN – PHASE I

UPTON HILL REGIONAL PARK
CIVIL ENGINEERING PLAN

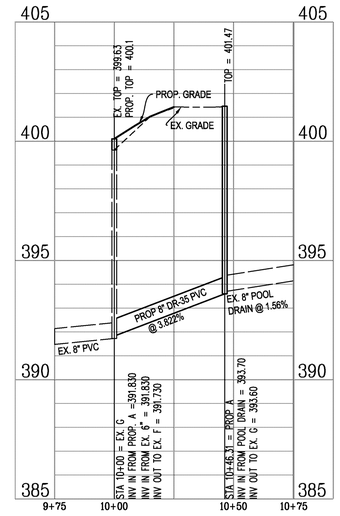
6060 WILSON BLVD, ARLINGTON, VIRGINIA 22205

SCALE: 1"=25'	DESIGNED	CHECKED
SUBMITTED DATE 11-21-18 05-15-18 – 08-08-18 – 09-28-18 –	APPROVED DATE CHIEF TRANSPORTATION PLANNING BUREAU	APPROVED DATE CHIEF TRANSPORTATION ENGINEERING BUREAU
APPROVED DATE CHIEF WATER, SEWER & STREETS DIV.	APPROVED DATE CHIEF ENGINEERING DIVISION	APPROVED DATE DIRECTOR OF ENVIRONMENTAL SERVICES
	APPROVED DATE CPHD PLANNER	APPROVED DATE CPHD LANDSCAPE REVIEWER
	SHEET C.11A OF 62	SP-12928

Urban, Ltd. – J:\JOBS\upton hill park\sp bid set\12928-08-GRADING PH 1.dwg [GRADING (2)] November 26, 2018 – 12:14pm bbrien



PROFILE PR SAN



No.	DATE	DESCRIPTION

REVISIONS

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ARLINGTON, VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES

SAN PROFILES

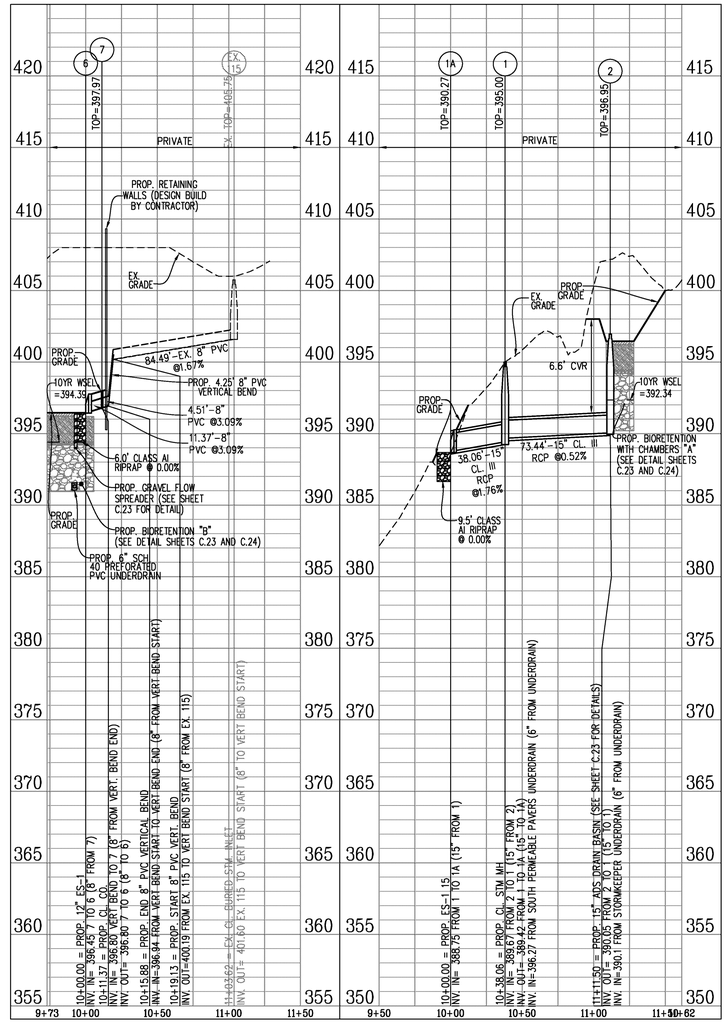
UPTON HILL REGIONAL PARK
CIVIL ENGINEERING PLAN

6060 WILSON BLVD, ARLINGTON, VIRGINIA 22205

SCALE: 1"=30' (H); 1"=3' (V)	DESIGNED	CHECKED
SUBMITTED DATE 11-21-18 05-15-18 - 08-08-18 - 09-28-18 -	APPROVED DATE CHIEF TRANSPORTATION PLANNING BUREAU	APPROVED DATE CHIEF TRANSPORTATION ENGINEERING BUREAU
APPROVED DATE CHIEF WATER, SEWER & STREETS DIV.	APPROVED DATE CHIEF ENGINEERING DIVISION	APPROVED DATE DIRECTOR OF ENVIRONMENTAL SERVICES
	APPROVED DATE CPHD PLANNER	APPROVED DATE CPHD LANDSCAPE REVIEWER
	SHEET C.11B OF 62	SP-12928

Urban, Ltd. – J:\JOBS\upton hill park\sp bid set\12928-12-SAN PROFILES.dwg [C.11B SAN PROFILES] November 26, 2018 – 12:14pm bbrien

DESIGN FOR OUTLET PROTECTION (PER VESCH PLATE 3-18.3&4)										
STRUCTURE	Q (CFS)	VEL (FPS)	OUTLET PIPE DIAMETER D0 (FT)	3D0 (FT)	LENGTH OF APRON (FT)	WIDTH (FT)	D50 (FT)	D50 MAX (FT)	DEPTH (FT)	REMARKS
STR # 1A	3.8	6.77	1.25	3.75	9.50	10.75	0.5	0.75	1.13	CLASS AI RIP-RAP
STR # 6	1.25	6.33	0.67	2.01	6.00	6.27	0.9	1.35	2.03	CLASS AI RIP-RAP



STORM SEWER DESIGN COMPUTATIONS

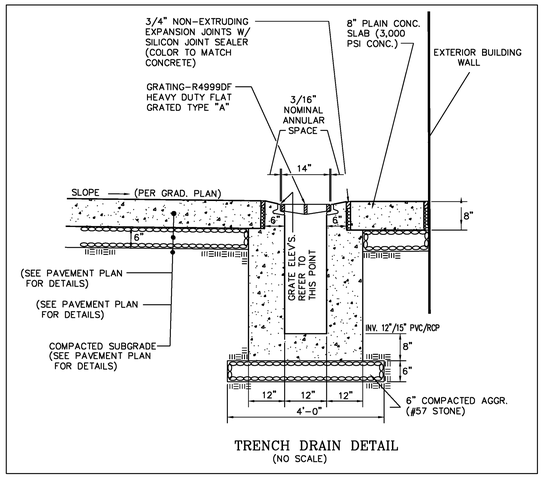
Project: Upton Hill

From Point	To Point	Drainage Area	C Factor	C x A Increment	C x A Cumm.	Inlet Time Min.	Rain Fall In/Hr	Runoff Q C.F.S.	Invert Elevation Upper End	Invert Elevation Lower End	Length FT.	Slope %	Dia. IN.	Capacity Q C.F.S.	VEL. F.P.S.	Flow Time MIN.	Remarks
*																	
EX. 115	VERT BEND	0.54	0.34	0.18	0.18	5.00	6.79	1.25	401.60	400.19	84.49	1.67%	8	1.57	4.97	0.28	
VERT BEND	7	0.00	0.00	0.00	0.18	5.00	6.79	1.25	396.94	396.80	4.51	3.09%	8	2.13	6.33	0.01	
7	6	0.00	0.00	0.00	0.18	5.00	6.79	1.25	396.80	396.45	11.37	3.09%	8	2.13	6.33	0.03	
*																	
2	1	0.00	0.00	0.00	0.00	5.00	6.79	3.45	390.05	389.67	73.44	0.52%	15	4.68	4.17	0.29	
1	1A	0.00	0.00	0.00	0.00	5.00	6.79	3.80	389.42	388.75	38.06	1.75%	15	8.57	6.77	0.09	

HYDRAULIC GRADE LINE COMPUTATIONS

Project: Upton Hill

INLET STATION (1)	UPSTREAM INLET	Outlet Water Surface Elev. (2)	Do in (3)	Qo cfs (4)	Lo ft (5)	Sfo % (6)	Hf ft (7)	JUNCTION LOSS Vo (8)	Ho (9)	Qi (10)	Vi (11)	QiVi (12)	2 Vi /2g (13)	Hi Angle (14)	Hd (15)	Ht (16)	1.3 Ht (17)	0.5 Ht (18)	FINAL H (19)	Inlet Water Surface Elev. (20)	RIM ELEV. (21)
1A																		Starting Elevation		389.50	
1		389.50	15	3.80	38.06	0.34	0.13	3.1	0.04					0.04	0.09	0.17	0.22	0.11	0.24	389.74	395.00
	2		15							3.45	2.81	9.70	0.12	90							
2		390.42	15	3.45	73.44	0.54	0.40	2.811	0.03					0.00	0.00	0.03	0.04	0.02	0.42	390.83	397.45
	0									3.45	0.00	0.00	0.00	0							
6																		Starting Elevation		396.85	
7		396.85	8	1.25	11.37	1.06	0.12	3.6	0.05					0.07	0.14	0.26	0.33	0.17	0.29	397.14	409.45
	VERT BEND		8							1.25	3.57	4.45	0.20	90							
VERT BEND		397.20	8	1.25	4.51	1.06	0.05	3.6	0.05					0.07	0.14	0.26	0.33	0.17	0.22	397.42	400.64
	EX. 115		8							1.25	3.57	4.45	0.20	90							
EX. 115		400.59	8	1.25	84.49	0.63	0.54	3.571	0.05					0.00	0.00	0.05	0.06	0.03	0.57	401.16	405.50
	0									1.25	0.00	0.00	0.00	0							



TRENCH DRAIN DETAIL
(NO SCALE)

*OR APPROVED EQUAL.

No.	DATE	DESCRIPTION

REVISIONS

COMMONWEALTH OF VIRGINIA
CLAYTON C. TOCK
Lic. No. 036790
PROFESSIONAL ENGINEER
11/21/2018

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ARLINGTON, VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES

STORM PROFILES & COMPUTATIONS

UPTON HILL REGIONAL PARK
CIVIL ENGINEERING PLAN

6060 WILSON BLVD, ARLINGTON, VIRGINIA 22205

SCALE: 1"=50'(H);1"=5'(V)	DESIGNED	CHECKED
SUBMITTED DATE 11-21-18 05-15-18 – 08-08-18 – 09-28-18 –	APPROVED DATE CHIEF TRANSPORTATION PLANNING BUREAU	APPROVED DATE CHIEF TRANSPORTATION ENGINEERING BUREAU
APPROVED DATE CHIEF WATER, SEWER & STREETS DIV.	APPROVED DATE CHIEF ENGINEERING DIVISION	APPROVED DATE DIRECTOR OF ENVIRONMENTAL SERVICES
	APPROVED DATE CPHD PLANNER	APPROVED DATE CPHD LANDSCAPE REVIEWER
	SHEET C.12 OF 62	SP-12928

Urban, Ltd. – J:\JOBS\upton hill park\cp hid set\12928-18- STORM PROFILES.dwg [C.12 STORM PROFILES & COMPUTATIONS] November 26, 2018 – 12:14pm bbrien

SITE DRAINAGE SHED PREDEVELOPMENT CALCULATION SUMMARY

Curve Number Calculations

Area (ac)	CN	Description
1.111	80	>75% Grass cover, Good, HSG D
0.025	77	Woods, Good, HSG D
0.378	98	Paved parking, HSG D
0.106	61	>75% Grass cover, Good, HSG B
0.314	55	Woods, Good, HSG B
0.302	98	Paved parking, HSG B
2.236	81	Weighted Average

Time of Concentration Calculations

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	100	0.1208	0.16		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.15"
5.6	574	0.1170	1.71		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.9	322	0.0527	6.13	248.88	Channel Flow, Area= 40.6 sf Perim= 81.4' r= 0.50' n= 0.035 Earth, dense weeds
17.0	996	Total			

ALL CALCULATIONS SHOWN AS TAKEN FROM HYDROCAD VERSION 10.00 2014 MODEL

1 Year Flow Calculations

Runoff = 2.87 cfs @ 12.10 hrs, Volume= 8,767 cf, Depth= 1.08"
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 1 yr Storm Rainfall=2.69"

2 Year Flow Calculations

Runoff = 3.84 cfs @ 12.10 hrs, Volume= 11,605 cf, Depth= 1.43"
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 yr Storm Rainfall=3.15"

10 Year Flow Calculations

Runoff = 7.67 cfs @ 12.09 hrs, Volume= 23,087 cf, Depth= 2.84"
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 yr Storm Rainfall=4.84"

OFFSITE DETAINED ROUTINGS ARE IDENTICAL TO THE POST-DEVELOPMENT CONDITION. PLEASE SEE SHEETS C.14-C.16.

1 Year Total Flow Calculations

Inflow Area = 147,712 sf, 37.66% Impervious, Inflow Depth = 1.26" for 1 yr Storm event
Inflow = 5.13 cfs @ 12.10 hrs, Volume= 15,568 cf
Primary = 5.13 cfs @ 12.10 hrs, Volume= 15,568 cf , Atten= 0% , Lag= 0.0 min
Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

2 Year Total Flow Calculations

Inflow Area = 147,712 sf, 37.66% Impervious, Inflow Depth = 1.64" for 2 yr Storm event
Inflow = 6.66 cfs @ 12.10 hrs , Volume= 20,141 cf
Primary = 6.66 cfs @ 12.10 hrs , Volume= 20,141 cf, Atten= 0%, Lag= 0.0 min
Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

10 Year Total Flow Calculations

Inflow Area = 147,712 sf, 37.66% Impervious, Inflow Depth = 3.11" for 10 yr Storm event
Inflow = 12.57 cfs @ 12.09 hrs , Volume= 38,260 cf
Primary = 12.57 cfs @ 12.09 hrs , Volume= 38,260 cf , Atten= 0% , Lag= 0.0 min
Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

EXISTING DETENTION POND STORAGE CALCULATION

Volume	Invert	Avail.Storage	Storage Description		
#1	395.80'	13,936 cf	Custom Stage Data (Prismatic)	Listed below	(Recalc)
Elevation (feet)		Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
395.80		0	0	0	
396.00		743	74	74	
398.00		3,639	4,382	4,456	
400.00		5,841	9,480	13,936	

ALL CALCULATIONS SHOWN AS TAKEN FROM HYDROCAD VERSION 10.00 2014 MODEL

LEGEND:
- ON SITE IMPERVIOUS = 0.68 AC
- ON SITE TURF = 1.22 AC
- ON SITE FOREST = 0.34 AC
- ON SITE IMPERVIOUS TO BE UNDISTURBED/RESURFACED = 0.91 AC
- SOILS
- CHANNEL FLOW
- SHALLOW CONCENTRATION FLOW
- SHEET FLOW
- DRAINAGE DIVIDE

No.	DATE	DESCRIPTION
		REVISIONS

CLAYTON C. TOCK
Lic. No. 036790
11/21/2018
COMMONWEALTH OF VIRGINIA
PROFESSIONAL ENGINEER

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ARLINGTON, VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES

SWM – PRE DEVELOPMENT DIVIDES

UPTON HILL REGIONAL PARK
CIVIL ENGINEERING PLAN

6060 WILSON BLVD, ARLINGTON, VIRGINIA 22205

SCALE: 1"=60'		DESIGNED	CHECKED
SUBMITTED DATE	11-21-18	APPROVED DATE	APPROVED DATE
	05-15-18 –		
	08-08-18 –	CHIEF TRANSPORTATION PLANNING BUREAU	CHIEF TRANSPORTATION ENGINEERING BUREAU
	09-28-18 –		
APPROVED DATE		APPROVED DATE	APPROVED DATE
CHIEF WATER, SEWER & STREETS DIV.		CHIEF ENGINEERING DIVISION	DIRECTOR OF ENVIRONMENTAL SERVICES
		APPROVED DATE	APPROVED DATE
		CPHD PLANNER	CPHD LANDSCAPE REVIEWER

SHEET C.13 OF 62 | SP-12928

Urban, Ltd. – k:\ARBS\upton hill park\sp bid set\12928-21-SWM PRE.dwg [C.14 SWM – PRE DEVELOPMENT DIVIDES] November 26, 2018 – 12:15pm bbrien

SHEET FLOW
ON-SITE UNDETAINED
TOTAL DA = 0.20 AC
TOTAL CN = 78

TO STUDY POINT "A"
ON-SITE UNDETAINED
TOTAL DA = 0.41 AC
TOTAL CN = 75
Tc =17.0 MIN

TO STUDY POINT "A"
ON-SITE DETAINED
TOTAL DA = 0.23 AC
TOTAL RCN = 92
Tc = 17.0 MIN

STUDY POINT "A"
TOTAL DA = 26.61 AC
N=67

ON-SITE DETAINED
TOTAL DA = 0.98 AC
TOTAL RCN = 90-91
Tc = 17.0 MIN

STUDY POINT "A"
OFF-SITE DETAINED
TOTAL DA = 1.16 AC
CN = 89
Tc = 17.0 MIN

SHEET FLOW
ON-SITE UNDETAINED
TOTAL DA = .11 AC
TOTAL CN = 95

N.I.C.

SHEET FLOW

SHALLOW CONCENTRATED FLOW

CHANNEL FLOW

EX. N. LYNN/GLEBE ST.

N. MADISON ST.

N. LONGFELLOW ST.

LEGEND:
- ON SITE
- SOILS
- CHANNEL FLOW
- SHALLOW CONCENTRATION FLOW
- SHEET FLOW
- DRAINAGE DIVIDE

SEE SHEETS C.18 & C.19 FOR ADDITIONAL LAND COVER INFORMATION

No.	DATE	DESCRIPTION
		REVISIONS

COMMONWEALTH OF VIRGINIA
CLAYTON C. TOCK
Lic. No. 036790
11/21/2018
PROFESSIONAL ENGINEER

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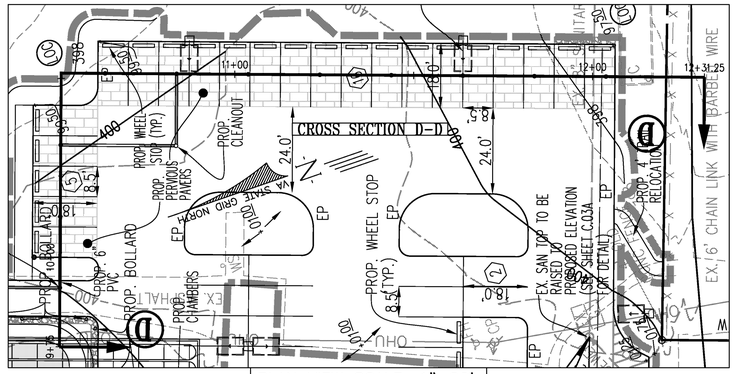
SWM – POST DEVELOPMENT DIVIDES
UPTON HILL REGIONAL PARK
CIVIL ENGINEERING PLAN
6060 WILSON BLVD, ARLINGTON, VIRGINIA 22205

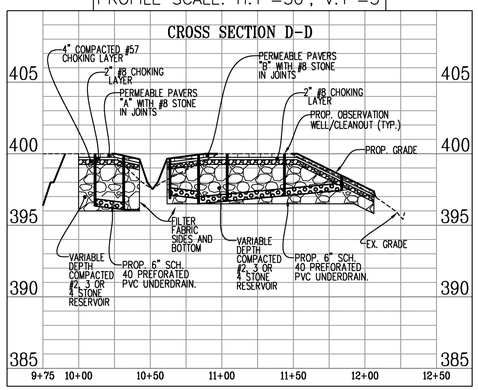
SCALE: 1"=60'		DESIGNED	CHECKED
SUBMITTED DATE	11-21-18	APPROVED DATE	APPROVED DATE
	05-15-18 –		
	08-08-18 –		
	09-28-18 –	CHIEF TRANSPORTATION PLANNING BUREAU	CHIEF TRANSPORTATION ENGINEERING BUREAU
APPROVED DATE		APPROVED DATE	APPROVED DATE
CHIEF WATER, SEWER & STREETS DIV.		CHIEF ENGINEERING DIVISION	DIRECTOR OF ENVIRONMENTAL SERVICES
		APPROVED DATE	APPROVED DATE
		CPHD PLANNER	CPHD LANDSCAPE REVIEWER
		SHEET C.14 OF 62	SP-12928

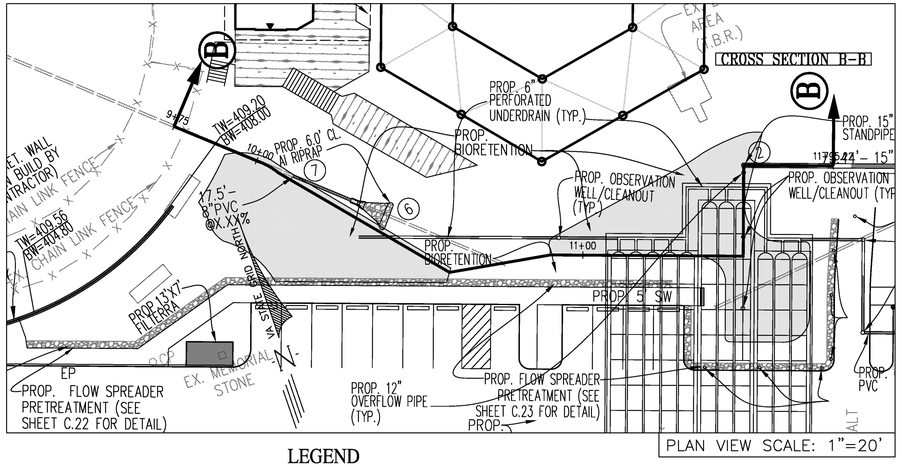
Urban, Ltd. – z:\JOBS\upton hill park\zp bid set\12928-21-SWM POST.dwg [C.16 SWM – POST DEVELOPMENT DIVIDES] November 26, 2018 – 12:15pm bbrien



PLAN VIEW SCALE: 1"=20'

PROFILE SCALE: H:1"=50'; V:1"=5'



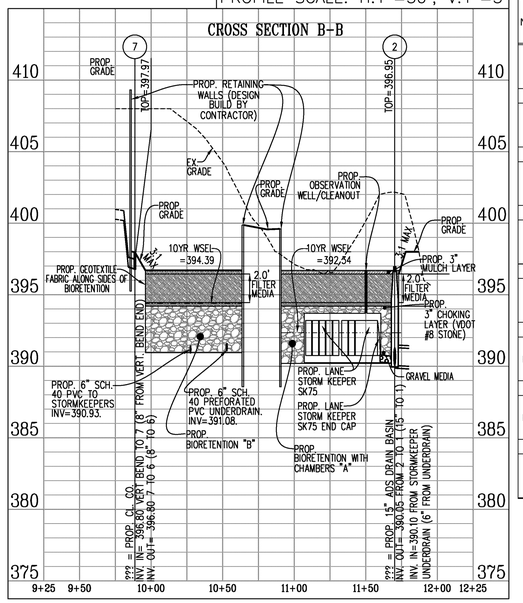


PLAN VIEW SCALE: 1"=20'

LEGEND

PROP. BIORETENTION PLANTING SURFACE

PROFILE SCALE: H:1"=50'; V:1"=5'



STORMWATER MANAGEMENT NARRATIVE

THE SUBJECT SITE IS LOCATED WITHIN THE FOUR MILE RUN WATERSHED. THE TOTAL DISTURBED AREA IS 3.09 AC THE TOTAL SITE AREA IS 26.53 AC. 0.09 AC OF THE PREVIOUSLY LISTED DISTURBED AREA IS FOR CONSTRUCTION ACCESS PURPOSES ONLY, AND SHALL BE RESTORED TO PREDEVELOPMENT CONDITIONS FOLLOWING CONSTRUCTION. THUS, IT IS NOT INCLUDED IN THE SWM ANALYSIS. A STORM WATER MANAGEMENT (SWM) ANALYSIS COMPARING THE EXISTING 1, 2, AND 10 YEAR RUNOFS TO THE PROPOSED 1, 2, AND 10 YEAR RUNOFFS HAS BEEN PERFORMED FOR THE SUBJECT SITE. THE EXISTING IMPERVIOUS AREA IS 0.68 ACRES. THE PROPOSED REDEVELOPMENT OF THE SUBJECT SITES INCREASES THE TOTAL IMPERVIOUSNESS OF THE SITE TO 1.10 ACRES.

ONE DOWNSTREAM STUDY POINT WAS ESTABLISHED AT THE SITE OUTFALL TO ENSURE OUTFALL ADEQUACY. SEE THE PRE DEVELOPMENT DIVIDES AND CALCULATIONS ON SHEET C.13 FOR THE LOCATION OF STUDY POINT "A" AND THE ASSOCIATED DRAINAGE SHEDS, SEE SHEET C.14 FOR THE POST DEVELOPMENT DIVIDES AND CALCULATIONS.

THE ALLOWABLE RUNOFFS FROM THE SITE FOR STUDY POINT "A" FOR THE 1-YR, 2-YR, AND 10-YR STORM ARE 4.20 CFS, 6.65 CFS, AND 12.56 CFS, RESPECTFULLY. THE PROPOSED RUNOFFS FROM THE SITE FOR STUDY POINT "A" FOR THE 1-YR, 2-YR, AND 10-YR STORM ARE 2.89 CFS, 3.58 CFS, AND 5.97 CFS, RESPECTFULLY.

A DETAILED OUTFALL ADEQUACY ANALYSIS HAS BEEN PROVIDED ON SHEET C.26

STUDY POINT A

FLOW SUMMARY		PRE-DEVELOPMENT			POST-DEVELOPMENT SUMMARY			Q ALLOW*	POND	
NODE ID	RETURN EVENT	Q PEAK hrs	Q PEAK cfs	Rv cu.ft.	Q PEAK hrs	Q PEAK cfs	Rv cu.ft.	CFS	MAX WSEL ft	STORAGE cu.ft.
ONSITE UNDETAINED	1	12.10	2.87	8,767	12.10	1.12	3,455			
	2	12.10	3.84	11,605	12.10	1.53	4,641			
	10	12.09	7.67	23,087	12.09	3.17	9,517			
ONSITE DETAINED	1				12.09	2.37	7,152			
	2				12.09	3.05	9,249			
	10				12.09	5.33	16,532			
OFFSITE DETAINED		12.09	2.26	6,801	12.09	2.30	7,370			
		12.09	2.82	8,536	12.09	2.82	9,065			
		12.09	4.91	15,173	12.09	4.81	15,567			
BIORETENTION A OUTFLOW	1				12.32	2.09	15,573		391.75	3,118
	2				12.34	2.44	19,365		391.98	3,958
	10				12.37	3.47	33,150		392.87	6,975
BIORETENTION B OUTFLOW	1				12.22	0.72	3,147		392.53	468
	2				12.25	0.83	4,126		392.91	683
	10				12.30	1.22	8,149		394.91	1,801
PERVIOUS PAVER A OUTFLOW	1				12.39	0.22	1,717		396.44	134
	2				12.41	0.25	2,078		396.53	163
	10				12.49	0.36	3,436		396.90	274
PERVIOUS PAVER B OUTFLOW	1				12.29	0.20	1,450		396.90	419
	2				12.30	0.24	1,761		396.99	512
	10				12.32	0.34	2,933		397.34	874
STUDY POINT A	1	12.10	5.13	15,568	12.16	2.89	19,027	4.20		
	2	12.10	6.66	20,141	12.15	3.58	24,006	N/A		
	10	12.09	12.57	38,260	12.13	5.97	42,667	12.56		

SWM Water Quantity Energy Balance Worksheet

SITE AREA (acre) 2.24

	1-year		10-year	
	PRE	POST (adjusted)	PRE	POST (adjusted)
P	2.69	2.69	4.84	4.84
CN	81	84	81	85
S=1000/CN-10	2.35	1.90	2.35	1.76
0.2S	0.47	0.38	0.47	0.35
RV=(P-0.2S)^2/(P-0.2S)+S	1.08	1.27	2.84	3.22

I.F 0.8

CHANNEL PROTECTION (2-YEAR)	
Qpre-development	6.66
QPost Development	3.58
RVPost Development (with runoff reduction)	1.27
Qallowable	4.55

FLOOD CONTROL (10-YEAR)	
Qpre-development	12.57
QPost Development	5.97
RVPost Development (with runoff reduction)	3.22
Qallowable	15.91

Qallowable/QPost Development	1.27
Vs/Vr	0.265
Vs	0.34
Storage required (cf)	2726

Qallowable/QPost Development	2.67
Vs/Vr	0.29
Vs	0.93
Storage required (cf)	7594

STUDY POINT A ENERGY BALANCE COMPUTATIONS

*THE POST DEVELOPMENT RUNOFF FOR THE 1 YEAR FROM THE ON-SITE AREA SHALL BE LESS THAN THE PRE-DEVELOPED PER THE STATE ENERGY BALANCE EQUATION STATED BELOW:

Qdev ≤ I.F. * (Qpre * RVpre)/RVdev
WHERE I.F.(IMPROVEMENT FACTOR) IS 0.8 FOR SITES MORE THAN 1.0 ACRES

THE COMPUTATIONS FOR THE 1 YEAR ALLOWABLE RATE IS PROVIDED AT RIGHT:

1 YEAR SWM RUNOFF COMPUTATIONS
Rv pre = 8,767 CU.FT
Q pre = 2.87 CFS
Rv dev = 3,455 CU.FT. + 7,152 CU.FT. = 10,607 CU.FT.

Qdev on-site ≤ I.F. * (Qpre * RVpre)/RVdev
Qdev on-site ≤ 0.8 * (2.87 * 8,767)/10,607
Qdev on-site ≤ 1.90 CFS

Qallow ≤ Qdev on-site + Qdetained off-site
Qallow ≤ 1.90 CFS + 2.30 CFS (OFFSITE DETAINED) = 4.20 CFS

SEE SHEETS C.14-##### FOR SWM POST-DEVELOPMENTS COMPUTATIONS TO SHOW FLOOD AND CHANNEL PROTECTION REQUIREMENTS HAVE BEEN MET.

POLLUTION PREVENTION

ONLY THE FOLLOWING NON-STORMWATER DISCHARGES ARE AUTHORIZED BY ARLINGTON COUNTY'S MS4 PERMIT, UNLESS THE STATE WATER CONTROL BOARD, THE VIRGINIA SOIL AND WATER CONSERVATION BOARD (BOARD), OR ARLINGTON COUNTY DETERMINES THE DISCHARGE TO BE A SIGNIFICANT SOURCE OF POLLUTANTS TO SURFACE WATERS: WATER LINE FLUSHING; LANDSCAPE IRRIGATION; DIVERTED STREAM FLOWS; RISING GROUND WATERS; UNCONTAMINATED GROUND WATER INFILTRATION (AS DEFINED AT 40 CFR 35.2005(20)); UNCONTAMINATED PUMPED GROUND WATER; DISCHARGES FROM POTABLE WATER SOURCES; FOUNDATION DRAINS; AIR CONDITIONING CONDENSATION; IRRIGATION WATER; SPRINGS; WATER FROM CRAWL SPACE PUMPS; FOOTING DRAINS; LAWN WATERING; INDIVIDUAL RESIDENTIAL CAR WASHING; FLOWS FROM RIPARIAN HABITATS AND WETLANDS; DECHLORINATED SWIMMING POOL DISCHARGES; DISCHARGES OR FLOWS FROM FIRE FIGHTING; AND, OTHER ACTIVITIES GENERATING DISCHARGES IDENTIFIED BY THE DEPARTMENT OF ENVIRONMENTAL QUALITY AS NOT REQUIRING VPDES AUTHORIZATION.

APPROPRIATE CONTROLS MUST BE IMPLEMENTED TO PREVENT ANY NON-STORMWATER DISCHARGES NOT INCLUDED ON THE ABOVE LIST (E.G., CONCRETE WASH WATER, PAINT WASH WATER, VEHICLE WASH WATER, DETERGENT WASH WATER, ETC.) FROM BEING DISCHARGED INTO ARLINGTON COUNTY'S MS4 SYSTEM, WHICH INCLUDES THE CURB AND GUTTER SYSTEM, AS WELL AS CATCH BASINS AND OTHER STORM DRAIN INLETS, OR STREAM NETWORK.

PER CHAPTER 26 OF THE ARLINGTON COUNTY CODE, IT SHALL BE UNLAWFUL FOR ANY PERSON TO DISCHARGE DIRECTLY OR INDIRECTLY INTO THE STORM SEWER SYSTEM OR STATE WATERS, ANY SUBSTANCE LIKELY, IN THE OPINION OF THE COUNTY MANAGER, TO HAVE AN ADVERSE EFFECT ON THE STORM SEWER SYSTEM OR STATE WATERS.

MAINTENANCE STATEMENT

ALL PROPOSED STORMWATER MANAGEMENT FACILITIES SHALL BE PRIVATELY OWNED AND MAINTAINED, SHALL BE DISCLOSED AS PART OF THE CHAIN OF TITLE TO ALL FUTURE OWNERS RESPONSIBLE FOR MAINTENANCE OF THE FACILITIES, AND PRIVATE MAINTENANCE RESPONSIBILITIES SHALL BE ESTABLISHED IN THE REQUIRED DEED OF DEDICATION PRIOR TO PLAN APPROVAL.

CONSTRUCTION INSPECTION

INSPECTIONS ARE NEEDED DURING CONSTRUCTION TO ENSURE THAT FACILITIES ARE BUILT IN ACCORDANCE WITH THE APPROVED PLANS AND DESIGN SPECIFICATIONS. THE DEVELOPER/OWNER SHALL PROVIDE FOR PERIODIC INSPECTIONS OF THE FACILITY DURING CONSTRUCTION. DETAILED INSPECTION CHECKLISTS SHALL BE USED THAT INCLUDE SIGN-OFFS BY A LICENSED LAND SURVEYOR OR PROFESSIONAL ENGINEER REGISTERED IN VIRGINIA AT CRITICAL STAGES OF CONSTRUCTION, TO ENSURE THAT THE CONTRACTOR'S INTERPRETATION OF THE PLAN IS CONSISTENT WITH THE DESIGNER'S INTENT. THE ACTUAL INSPECTIONS MAY BE PERFORMED BY AN INDIVIDUAL UNDER THE DIRECT SUPERVISION OF THE LICENSED PROFESSIONAL.

AS-BUILT CERTIFICATION

AFTER THE FACILITY HAS BEEN CONSTRUCTED, THE DEVELOPER SHALL HAVE AN AS-BUILT CERTIFICATION CONDUCTED BY A LICENSED LAND SURVEYOR OR PROFESSIONAL ENGINEER REGISTERED IN VIRGINIA AND SUBMITTED TO THE COUNTY ALONG WITH THE AS-BUILT CHECKLIST AND AS-BUILT PLAN. THE AS-BUILT CERTIFICATION VERIFIES THAT THE FACILITY WAS INSTALLED AS DESIGNED AND APPROVED.
THE FOLLOWING COMPONENTS SHALL BE ADDRESSED IN THE AS-BUILT CERTIFICATION:

a. THE FILTER IS IN CONFORMANCE WITH THE SPECIFICATION AND IS INSTALLED TO THE CORRECT DEPTH (IF APPLICABLE).
b. ELEVATIONS (e.g., THE INVERT OF THE UNDERDRAIN, INVERTS FOR THE INFLOW AND OUTFLOW POINTS, etc.) AND THE SURFACE SLOPE ARE PER THE PLAN (IF APPLICABLE).
c. PRETREATMENT STRUCTURES (IF APPLICABLE) ARE PROPERLY INSTALLED AND WORKING EFFECTIVELY.
d. OBSERVATION WELLS ARE INSTALLED AND WORKING EFFECTIVELY (IF APPLICABLE).
e. ANY MATERIAL DELIVERY TICKETS AND CERTIFICATIONS FROM THE MATERIAL SUPPLIERS AND RESULTS OF THE TESTS AND INSPECTIONS (IF APPLICABLE).
f. INFILTRATION BASED FACILITIES SHALL BE INSPECTED AT THE OBSERVATION WELL 24 HOURS FOLLOWING A STORM EVENT IN EXCESS OF 0.5 INCHES OF RAINFALL OR ARTIFICIAL FLOODING TO DETERMINE THAT THE FACILITY IS DRAINING PROPERLY. REPORT OF FIELD PERFORMANCE TEST RESULTS AHLL BE INCLUDED ALONG WITH THE AS-BUILT SUBMISSION PACKAGE.
g. PLANTING IS INSTALLED PER PLAN (IF APPLICABLE).
h. BASED ON THE TYPE OF THE FACILITY, DIGITAL PHOTOGRAPHS DOCUMENTING CONSTRUCTION AND SHOWING THE SITE BEFORE BEGINNING CONSTRUCTION, THE EXCAVATION'S WALLS AND BOTTOM BEFORE ANY BACKFILL, PLACEMENT OF EACH MATERIAL LAYER SHOWING THE FINAL TOP SURFACE OF EACH LAYER, PLACEMENT OF THE UNDERDRAIN SYSTEM, OBSERVATION WELLS, AND, OUTLET WORKS (IF APPLICABALE).
i. GPS COORDINATES FOR EACH FACILITY.

No.	DATE	DESCRIPTION
		REVISIONS

COMMONWEALTH OF VIRGINIA
CLAYTON C. TOCK
Lic. No. 036790
11/21/2018
PROFESSIONAL ENGINEER

urban
Planners-Engineers-Landscape Architects-Land Surveyors
Urban, Ltd.
4200 D Technology Ct.
Chantilly Va. 20151
(703)-642-2306
(703)-378-7888
www.urban-engineering.com

ARLINGTON, VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES

SWM COMPUTATIONS & DETAILS
UPTON HILL REGIONAL PARK
CIVIL ENGINEERING PLAN
6060 WILSON BLVD, ARLINGTON, VIRGINIA 22205

SCALE: N/A		DESIGNED	CHECKED
SUBMITTED DATE	11-21-18	APPROVED DATE	APPROVED DATE
05-15-18	–		
08-08-18	–	CHIEF TRANSPORTATION PLANNING BUREAU	CHIEF TRANSPORTATION ENGINEERING BUREAU
09-28-18	–		
APPROVED DATE		APPROVED DATE	APPROVED DATE
CHIEF WATER, SEWER & STREETS DIV.		CHIEF ENGINEERING DIVISION	DIRECTOR OF ENVIRONMENTAL SERVICES
		APPROVED DATE	APPROVED DATE
		CPHD PLANNER	CPHD LANDSCAPE REVIEWER
		SHEET C.17 OF 62	SP-12928

Urban, Ltd. – z:\JOBS\upton hill park\sp bid set\12928-21-SWM.dwg [COMPS-DETS-PROF] November 26, 2018 – 12:16pm bbrien

N 7003982
E 11869174

RPC: 12-018-001
AGER LUCAS &
AGER LISA

RPC: 12-018-024
DE LA VIA MARCELINO
DE LA VIA JULIETA ET AL

RPC: 12-018-023
TONAKARN EAK & ORAPAN

RPC: 12-018-021
DE OVANDO MARIA V &
ANTONIO OVANDO

VA STATE GRID NORTH

EX. WILSON BLVD - ROUTE 6608
EX. R/W - WIDTH VARIES
POSTED SPEED: 30 MPH

CONTRACTOR TO PROVIDE DEDICATED WATER TRUCK OR WATERLINE WITH METER FOR THE CONSTRUCTION ENTRANCE.

N 7003881.48
E 11869495.85

N 7003896
E 11869741

PROP. WASH RACK
EX. ASPHALT PATH
EX. ASPHALT (T.B.R.)
PROP. POTENTIAL BIKE SHARE STATION
PROP. PARK SIGN
PROP. CG-12A
GAME TABLES
PROP. NATURAL SURFACE TRAIL
EX. GUY TO BE RELOCATED
PROP. 5' SW
EX. TRAIL T.B.R.
PROP. BIKE RACKS
PROP. PICNIC PAVILION
PROP. PLAYGROUND
EX. TRAIL T.B.R. CARE SHALL BE TAKEN TO PRESERVE EXISTING TREES
SHADE STRUCTURE
PROP. 36" FENCE
PROP. SW PAVERS (SEE SHEET C.03A FOR DETAIL)
EX. TRAIL TO CONNECT TO PROPOSED SIDEWALK
PORTION OF EX. TRAIL TO BE REPLACED WITH 5' SIDEWALK
EX. ASPHALT

TW=356.00
BW=354.00
PROP. RET. WALL
(DESIGN BUILD BY CONTRACTOR)

TW=355.00
BW=352.00

TW=358.00
BW=353.00

TW=352.00
BW=350.20

IP
OP
RPA
FIELD VERIFIED RPA

N 7003547
E 11869046

N 7003437
E 11

VA STATE GRID NORTH

LEGEND
RPA BUFFER ZONE = 107,513 SF
(2.47 acres)

No.	DATE	DESCRIPTION
		REVISIONS

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07/25/18
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ARLINGTON, VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES

WATER QUALITY IMPACT ASSESSMENT
UPTON HILL REGIONAL PARK
CIVIL ENGINEERING PLAN
6060 WILSON BLVD, ARLINGTON, VIRGINIA 22205

SCALE: 1"=25'	DESIGNED	CHECKED
SUBMITTED DATE 05-15-18 07-25-18	APPROVED DATE CHIEF TRANSPORTATION PLANNING BUREAU	APPROVED DATE CHIEF TRANSPORTATION ENGINEERING BUREAU
APPROVED DATE CHIEF WATER, SEWER & STREETS DIV.	APPROVED DATE CHIEF ENGINEERING DIVISION	APPROVED DATE DIRECTOR OF ENVIRONMENTAL SERVICES
	APPROVED DATE CPHD PLANNER	APPROVED DATE CPHD LANDSCAPE REVIEWER
		SHEET C.17C OF 45 — SP-12928

Urban, Ltd. - J:\JOBS\upton hill park\sp bid set\12928-24-WQIA.dwg [WQIA Proposed] November 26, 2018 - 12:16pm bbrien

Appendix C. Water Quality Impact Assessment Data Sheet

Project Address: 6060 Wilson Blvd., Arlington, VA 22205	Date: September 21st, 2018
Applicant Name/Affiliation: Northern Virginia Regional Park Authority	Applicant Contact Information (phone and email): 703-359-49212 bnolan@nvrpa.com
Owner/Client Name: Northern Virginia Regional Park Authority	Owner/Client Contact Information (phone and email): 703-359-49212 bnolan@nvrpa.com

Section 1: Type of activity proposed

Activity type (check all that apply):

- ☐ New construction (residential, commercial, public, etc.)
- (X) Alteration of non-residential structure
- ☐ Residential addition
- ☐ Detached residential structure
- ☐ Deck, patio, or retaining wall
- ☐ Landscaping (includes tree removal)
- ☐ Utility work
- ☐ Fence
- ☐ Other (please describe):

Section 2: Key details of the proposed activity

Complete all that apply		Explanation
Total area of disturbance on parcel (sf)	134,600 SF	Includes building footprint plus a 10 foot buffer. Also includes all soil disturbance, ingress/egress areas, stockpiling areas, etc.
Area of disturbance within RPA (sf)	0 SF	Includes removal of trees ≥ 3" in diameter
Area of disturbance on slopes greater than or equal to 15 percent located adjacent to landward RPA boundary (sf)	0 SF	Does not apply to RPA parcels along Chain Bridge Road (15 percent and greater slopes are included as part of RPA)

Complete all fields		Existing condition	Proposed condition	Explanation
RPA encroachment (ft)	Left third of parcel or site	330 ft	330 ft	The distance (in feet) from the existing or proposed structure to the designated RPA feature (edge of stream or open channel, wetland, etc.). Encroachments of zero (0) indicate the project will impact the stream or other RPA feature.
	Middle third of parcel or site	150 ft	150 ft	
	Right third of parcel or site	30 ft	30 ft	
Total development footprint in RPA (sf)		0 SF	0 SF	The existing footprint includes the area of any existing structures, patios, decks, walkways, etc. Proposed footprint is the anticipated post-project area of all structures, additions, decks, walkways, regraded area behind a retaining wall, etc.
Impervious footprint in RPA (sf)		0 SF	0 SF	Total area of impervious surfaces within the RPA (rooftops, pavement, etc.)

(OVER)

STAFF USE ONLY

Building/demolition/LDA/Fence permit number(s):

Major WQIA required? ☐ Yes ☐ No

Date WQIA/Exception request information complete:

Date Chesapeake Bay Preservation Ordinance and E/S ordinance (if applicable) approvals issued in Permits Plus:

Section 3: Plan and Narrative

Provide a plan showing the location of the proposed activity, along with the RPA boundary
Briefly describe the proposed project, including any potential water quality impacts and mitigation measuresproposed. The narrative must address three impact categories 1. Tree/vegetation impacts, 2. Stormwater and runoff 3. Erosion and sediment control. Please refer to the WQIA plan/narrative checklist for additional information.

- The RPA on the property is 107,513 SF or 2.47 acres. There is 0 SF of the RPA located within the job site, and there will be 0 SF of the RPA disturbed. See Existing Conditions sheet C.06 and WQIA sheet C.17C

- Root pruning will be implemented along the edge of the job site. Tree protection and super silt fence is proposed along the limits of clearing as well. These activities are outside the RPA. See Tree Preservation Plan sheet C.37

- Tree and vegetation planting are proposed on the job site, outside of the RPA. See Landscape Plan sheet C.40.

- A bioretention and pervious pavers have been proposed to detain the post development flow. See Grading Plan sheet C.10 and WQIA sheet C.17C.

-The disturbed area in the northern site upstream of the RPA is proposed to flow off of the site in the form of sheet flow. Additionally, the portion of the northern job site closest to the RPA contains no proposed improvements, it is for construction access only, and will be restored to pre-development conditions after construction.

- Erosion and sediment control is proposed through the use of silt fencing around the job site. Inlet protection is also proposed. See WQIA sheet C.17C and Erosion and Sediment Control Phase I & II sheets C.27-C.30.

Additional Water Quality Impact Assessment Information

The information supplied on this form satisfies the minimum requirements for a Minor Water Quality Impact Assessment. For projects that disturb over 2500 square feet, elements of a Major Water Quality Impact Assessment may also be required, depending on the nature and extent of the proposed RPA encroachment, as outlined in Section 61-12 of the ordinance.

No.	DATE	DESCRIPTION

REVISIONS

COMMONWEALTH OF VIRGINIA
CLAYTON C. TOCK
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01/25/18
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UPTON HILL REGIONAL PARK
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SCALE:		DESIGNED	CHECKED
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APPROVED DATE CHIEF WATER, SEWER & STREETS DIV.		APPROVED DATE CHIEF ENGINEERING DIVISION	APPROVED DATE DIRECTOR OF ENVIRONMENTAL SERVICES
		APPROVED DATE CPHD PLANNER	APPROVED DATE CPHD LANDSCAPE REVIEWER
		SHEET C.17D OF 45	SP-12928

Urban, Ltd. - s:\JOBS\upton hill park\sp bid set\12928-24-WQIA.dwg [WQIA DETAILS] November 26, 2018 - 12:16pm bbrian

EX. PATRICK HENRY DR

VA STATE GRID NORTH

N 7003982
E 11869174

RPC: 12-018-001
AGER LUCAS &
AGER LISA

RPC: 12-018-024
DE LA VIA MARCELINO
DE LA VIA JULIETA ET AL

RPC: 12-018-023
TONAKARN EAK & ORAPAN

RPC: 12-018-022
HORNE HEATHER

RPC: 12-018-021
DE OVANDO MARIA V &
ANTONIO OVANDO

RPC: 12-018-020
FERRANDO WILLIAM ANTHONY
ET AL

URCIA ANDRES C TR
URCIA ROWENA M TR

EX. N LEBANON ST

EX. WILSON BLVD - ROUTE 6608
EX. R/W - WIDTH VARIES
POSTED SPEED: 30 MPH

15,000 VPD

N 7003881.48
E 11869495.85

N73°56'55"E 399.58'

N 7003896
E 11869741

EX. 8" SANITARY SEWER
EX. CG
EX. MEDIAN
EX. ASPHALT PATH
EX. SIDEWALK
EX. ASPHALT (T.B.R.)
EX. BUS SHELTER
EX. WOOD STEPS
EX. WOOD CHIP TRAIL
EX. TRAIL T.B.R.
EX. GUY TO BE RELOCATED
EX. CINDER BLOCK FACILITIES TO REMAIN
EX. MEMORIAL STONE
EX. TREES (T.B.R.)
EX. WOOD CHIP TRAIL
EX. ASPHALT

PROP. PARK SIGN
PROP. ENTRY SIGN(TYP.)
PROP. CG-12A
PROP. NATURAL SURFACE TRAIL
PROP. PICNIC PAVILION
EX. PLAYGROUND AREA (T.B.R.)
PROP. RET. WALL (DESIGN BUILD BY CONTRACTOR)
TW=356.00
BW=354.00
TW=355.00
BW=352.00
TW=358.00
BW=353.00
TW=352.00
BW=350.20
PROP. SW PAVERS (SEE SHEET C.03A FOR DETAIL)
PROP. 5' SW
SHLT RAIL (T.B.R.)
PROP. BIKE RACKS
PROP. PLAYGROUND
PLAYGROUND AREA (T.B.R.)
SHADE STRUCTURE
PROP. 36" FENCE
POST
GAME TABLES
TRAIL TO CONNECT TO PROPOSED SIDEWALK
PORTION OF EX. TRAIL TO BE REPLACED WITH 5' SIDEWALK
EX. TRAIL T.B.R. CARE SHALL BE TAKEN TO PRESERVE EXISTING TREES

R=1472.40'
A=453.74'

RPC: 12-042-066
COMMONWEALTH OF VIRGINIA

RPC: 12-042-061
NORTHERN VA REGIONAL PARK AUTHORITY

N 7003824.66
E 11869047.49

N 7003547
E 11869046

N10°20'01"E 1014.1' (TOTAL)
582.54'

"RED TRAIL"

FIELD VERIFIED RPA

RPA

AREA FOR CONSTRUCTION ACCESS PURPOSES ONLY, AND WILL BE RESTORED TO PRE-DEVELOPMENT LAND COVER AFTER CONSTRUCTION.

LEGEND

ONSITE PROP. IMPERVIOUS AREA TO BE DISTURBED	= 1.10 AC
ONSITE PROP. MANAGED TURF AREA TO BE DISTURBED	= 1.10 AC
ONSITE IMPERVIOUS AREA TO BE UNDISTURBED/RESURFACED	= 0.91 AC
SOILS	
DRAINAGE DIVIDES	

MATCHLINE
SEE SHEET C.19

No.	DATE	DESCRIPTION

REVISIONS

COMMONWEALTH OF VIRGINIA
CLAYTON C. TOCK
Lic. No. 036790
09/28/2018
PROFESSIONAL ENGINEER

urban
Planners · Engineers · Landscape Architects · Land Surveyors
Urban, Ltd.
4200 D Technology Ct.
Chantilly Va. 20151
(703)-642-2306
(703)-378-7888
www.urban-engineering.com

ARLINGTON, VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES

BMP – DESIGN & DETAILS

UPTON HILL REGIONAL PARK
CIVIL ENGINEERING PLAN

6060 WILSON BLVD, ARLINGTON, VIRGINIA 22205

SCALE: 1"=25'	DESIGNED	CHECKED
SUBMITTED DATE 05-15-18 – 08-08-18 – 09-28-18 –	APPROVED DATE CHIEF TRANSPORTATION PLANNING BUREAU	APPROVED DATE CHIEF TRANSPORTATION ENGINEERING BUREAU
APPROVED DATE CHIEF WATER, SEWER & STREETS DIV.	APPROVED DATE CHIEF ENGINEERING DIVISION	APPROVED DATE DIRECTOR OF ENVIRONMENTAL SERVICES
	APPROVED DATE CPHD PLANNER	APPROVED DATE CPHD LANDSCAPE REVIEWER
	SHEET C.18 OF 45	SP-12928

Urban, Ltd. – k:\JOBS\upton hill park\sp bid set\12928-22-BMP.dwg [BMP PLAN] November 26, 2018 – 12:16pm bbrien

MATCHLINE
SEE SHEET C.18

STATE GRID NORTH

N 7003435
E 11868824

N 7003437
E 11869559

RPC: 12-042-103
NORTHERN VA REGIONAL
PARK AUTHORITY
PARCEL B
DB. 1808 PG. 253
23.41613 ACRES

PROPOSED LOCATION
OF FILTERRA
DA = 0.36 AC, 0.28 AC
IMPERVIOUS

PROP. BIORETENTION "A"
(LEVEL 1)
DA= 1.84 AC, 1.30 AC IMPERVIOUS

P. PERMEABLE PAVEMENT "A"
/EL 1)
= 0.03AC, 0.03AC IMPERVIOUS

P. PERMEABLE PAVEMENT "B"
/EL 1)
= 0.20AC, 0.17AC IMPERVIOUS

N 7003275.08
E 11868854.31

AREA OF MILLING/PAVING/STRIPING
CONSIDERED MAINTENANCE AND NOT
DISTURBED AREA

PIN: 0513 18 E
SCA-SPE LLC
DB. 23671 PG. 1646

PROP. TICKET BOOTH

PROP. WOODEN DECK

PROP. CANOPY

PROP. ROPES COURSE

PROP. RET WALL (DESIGN BUILD BY CONTRACTOR)

PROP. HANDRAIL (DESIGN BUILD BY CONTRACTOR)

EX. CHAIN LINK FENCE

PROP. FLOW SPREADER PRETREATMENT (SEE SHEET C.23 FOR DETAIL)

PROP. OBSERVATION WELL (TYP.)

PROP. BIORETENTION

PROP. BIORETENTION PONDING AREA (ELEV.=396.95)

PROP. CLEANOUT

PROP. CHAMBERS

PROP. PERVIOUS PAVERS

PROP. LIGHTS (TYP.)

PROP. CROSS WALK

PROP. TRAIL RELOCATION

EX. SANITARY SEWER

EX. 6" PVC

EX. 16" CHAIN LINK W/ BARBED WIRE

EX. BUILDING

EX. WOOD DECK

EX. WATER PARK

EX. MINI GOLF

EX. BATTING CAGE

EX. WOOD CHIP TRAIL

"YELLOW TRAIL"

EX. ASPHALT

EX. TIMBERS

EX. 4' CHAIN LINK

CONTRACTOR TO NOSE DOWN CURB

4B

38D

95

PIN: 0514-01-0001
NORTHERN VA REGIONAL
PARK AUTHORITY
PARCEL A
DB. 3764 PG. 55
3.11831 ACRES

RPC: 12-042-106
SAINT ALBANS HOUSING
HARTLAND BANK
DB. 3860 PG. 1232

N 7002956
E 11868810

N 7002969.14
E 11869170.69

N19°22'01"E 1014.14' (TOTAL)
431.59'

S19°22'20"W
48.64'

247.71'
296.35' (TOTAL)

LEGEND

ONSITE IMPERVIOUS AREA TO BE DISTURBED	= 1.10 AC
ONSITE MANAGED TURF AREA TO BE DISTURBED	= 1.10 AC
ONSITE IMPERVIOUS AREA TO BE UNDISTURBED/RESURFACED	= 0.91 AC
BIORETENTION PLANTING SURFACE (COMPUTED IN VRRM AS FOREST)	= 0.07 AC
SOILS	
DRAINAGE DIVIDES	

No.	DATE	DESCRIPTION
		REVISIONS

CLAYTON C. TOCK
Lic. No. 036790
09/28/2018
COMMONWEALTH OF VIRGINIA
PROFESSIONAL ENGINEER

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BMP - DESIGN & DETAILS
UPTON HILL REGIONAL PARK
CIVIL ENGINEERING PLAN
6060 WILSON BLVD, ARLINGTON, VIRGINIA 22205

SCALE: 1"=25'	DESIGNED	CHECKED
SUBMITTED DATE 05-15-18 - 08-08-18 - 09-28-18 -	APPROVED DATE CHIEF TRANSPORTATION PLANNING BUREAU	APPROVED DATE CHIEF TRANSPORTATION ENGINEERING BUREAU
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	SHEET C.19 OF 45	SP-12928

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PERMEABLE PAVER CONSTRUCTION SEQUENCE

THE FOLLOWING IS A TYPICAL CONSTRUCTION SEQUENCE TO PROPERLY INSTALL PERMEABLE PAVEMENT, WHICH MAY NEED TO BE MODIFIED TO DEPENDING ON WHETHER POROUS ASPHALT (PA), PERVIOUS CONCRETE (PC) OR INTERLOCKING PAVER (IP) DESIGNS ARE EMPLOYED.

STEP 1. CONSTRUCTION OF THE PERMEABLE PAVEMENT SHALL ONLY BEGIN AFTER THE ENTIRE CONTRIBUTING DRAINAGE AREA HAS BEEN STABILIZED. THE PROPOSED SITE SHOULD BE CHECKED FOR EXISTING UTILITIES PRIOR TO ANY EXCAVATION. DO NOT INSTALL THE SYSTEM IN RAIN OR SNOW, AND DO NOT INSTALL FROZEN AGGREGATE MATERIALS.

STEP 2. AS NOTED ABOVE, TEMPORARY EROSION AND SEDIMENT (E&S) CONTROLS ARE NEEDED DURING INSTALLATION TO DIVERT STORMWATER AWAY FROM THE PERMEABLE PAVEMENT AREA UNTIL IT IS COMPLETED. SPECIAL PROTECTION MEASURES SUCH AS EROSION CONTROL FABRICS MAY BE NEEDED TO PROTECT VULNERABLE SIDE SLOPES FROM EROSION DURING THE EXCAVATION PROCESS. THE PROPOSED PERMEABLE PAVEMENT AREA MUST BE KEPT FREE FROM SEDIMENT DURING THE ENTIRE CONSTRUCTION PROCESS. CONSTRUCTION MATERIALS THAT ARE CONTAMINATED BY SEDIMENTS MUST BE REMOVED AND REPLACED WITH CLEAN MATERIALS.

STEP 3. WHERE POSSIBLE, EXCAVATORS OR BACKHOES SHOULD WORK FROM THE SIDES TO EXCAVATE THE RESERVOIR LAYER TO ITS APPROPRIATE DESIGN DEPTH AND DIMENSIONS. FOR MICRO-SCALE AND SMALL-SCALE PAVEMENT APPLICATIONS, EXCAVATING EQUIPMENT SHOULD HAVE ARMS WITH ADEQUATE EXTENSION SO THEY DO NOT HAVE TO WORK INSIDE THE FOOTPRINT OF THE PERMEABLE PAVEMENT AREA (TO AVOID COMPACTION). CONTRACTORS CAN UTILIZE A CELL CONSTRUCTION APPROACH, WHEREBY THE PROPOSED PERMEABLE PAVEMENT AREA IS SPLIT INTO 500 TO 1000 SQ. FT. TEMPORARY CELLS WITH A 10 TO 15 FOOT EARTH BRIDGE IN BETWEEN, SO THAT CELLS CAN BE EXCAVATED FROM THE SIDE. EXCAVATED MATERIAL SHOULD BE PLACED AWAY FROM THE OPEN EXCAVATION SO AS TO NOT JEOPARDIZE THE STABILITY OF THE SIDE WALLS.

STEP 4. THE NATIVE SOILS ALONG THE BOTTOM AND SIDES OF THE PERMEABLE PAVEMENT SYSTEM SHOULD BE SCARIFIED OR TILLED TO A DEPTH OF 3 TO 4 INCHES PRIOR TO THE PLACEMENT OF THE FILTER LAYER OR FILTER FABRIC. IN LARGE SCALE PAVING APPLICATIONS WITH WEAK SOILS, THE SOIL SUBGRADE MAY NEED TO BE COMPACTED TO 95% OF THE STANDARD PROCTOR DENSITY TO ACHIEVE THE DESIRED LOAD-BEARING CAPACITY. (NOTE: THIS EFFECTIVELY ELIMINATES THE INFILTRATION FUNCTION OF THE INSTALLATION, AND IT MUST BE ADDRESSED DURING HYDROLOGIC DESIGN.)

STEP 5. THE FILTER LAYER SHOULD BE INSTALLED ON THE BOTTOM OF THE RESERVOIR LAYER, AND WHERE WARRANTED, FILTER FABRIC CAN BE PLACED ON THE SIDES.

STEP 6. PROVIDE A MINIMUM OF 2 INCHES OF AGGREGATE ABOVE AND BELOW THE UNDERDRAINS. THE UNDERDRAINS SHOULD SLOPE DOWN TOWARDS THE OUTLET AT A GRADE OF 0.5% OR STEEPER. THE UP-GRADIENT END OF UNDERDRAINS IN THE RESERVOIR LAYER SHOULD BE CAPPED. WHERE AN UNDERDRAIN PIPE IS CONNECTED TO A STRUCTURE, THERE SHALL BE NO PERFORATIONS WITHIN 1 FOOT OF THE STRUCTURE. ENSURE THAT THERE ARE NO PERFORATIONS IN CLEAN-OUTS AND OBSERVATION WELLS WITHIN 1 FOOT OF THE SURFACE.

STEP 7. SPREAD 6-INCH LIFTS OF THE APPROPRIATE CLEAN, WASHED STONE AGGREGATE. PLACE AT LEAST 4 INCHES OF ADDITIONAL AGGREGATE ABOVE THE UNDERDRAIN, AND THEN COMPACT IT USING A VIBRATORY ROLLER IN STATIC MODE UNTIL THERE IS NO VISIBLE MOVEMENT OF THE AGGREGATE. DO NOT CRUSH THE AGGREGATE WITH THE ROLLER.

STEP 8. INSTALL OVERDRAIN IF REQUIRED AND CONNECT INTO OUTLET CONVEYANCE SYSTEM.

STEP 9. INSTALL THE DESIRED DEPTH OF THE BEDDING LAYER, DEPENDING ON THE TYPE OF PAVEMENT, AS FOLLOWS:
PERVIOUS CONCRETE: NO BEDDING LAYER IS USED.
POROUS ASPHALT: THE BEDDING LAYER FOR POROUS ASPHALT PAVEMENT CONSISTS OF 1 TO 2 INCHES OF CLEAN, WASHED ASTM D 448 NO.57 STONE. THE FILTER COURSE MUST BE LEVELED AND PRESSED (CHOKED) INTO THE RESERVOIR BASE WITH AT LEAST FOUR (4) PASSES OF A 10-TON STEEL DRUM STATIC ROLLER.
INTERLOCKING PAVERS: THE BEDDING LAYER FOR OPEN-JOINTED PAVEMENT BLOCKS SHOULD CONSIST OF 2 INCHES OF WASHED ASTM D 448 NO.8 STONE.

STEP 10. PAVING MATERIALS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER OR INDUSTRY SPECIFICATIONS FOR THE PARTICULAR TYPE OF PAVEMENT.

INSTALLATION OF POROUS ASPHALT. THE FOLLOWING HAS BEEN EXCERPTED FROM VARIOUS DOCUMENTS, MOST NOTABLY JACKSON (2007).

1. INSTALL POROUS ASPHALT PAVEMENT SIMILARLY TO REGULAR ASPHALT PAVEMENT. THE PAVEMENT SHOULD BE LAID IN A SINGLE LIFT OVER THE FILTER COURSE. THE LAYING TEMPERATURE SHOULD BE BETWEEN 230OF AND 260OF, WITH A MINIMUM AIR TEMPERATURE OF 50OF, TO ENSURE THAT THE SURFACE DOES NOT STIFFEN BEFORE COMPACTION.
2. COMPLETE COMPACTION OF THE SURFACE COURSE WHEN THE SURFACE IS COOL ENOUGH TO RESIST A 10-TON ROLLER. ONE OR TWO PASSES OF THE ROLLER ARE REQUIRED FOR PROPER COMPACTION. MORE ROLLING COULD CAUSE A REDUCTION IN THE POROSITY OF THE PAVEMENT.
3. THE MIXING PLANT MUST PROVIDE CERTIFICATION OF THE AGGREGATE MIX, ABRASION LOSS FACTOR, AND ASPHALT CONTENT IN THE MIX. TEST THE ASPHALT MIX FOR ITS RESISTANCE TO STRIPPING BY WATER USING ASTM 1664. IF THE ESTIMATED COATING AREA IS NOT ABOVE 95%, ADDITIONAL ANTI-STRIPPING AGENTS MUST BE ADDED TO THE MIX.
4. TRANSPORT THE MIX TO THE SITE IN A CLEAN VEHICLE WITH SMOOTH DUMP BEDS SPRAYED WITH A NON-PETROLEUM RELEASE AGENT. THE MIX SHALL BE COVERED DURING TRANSPORTATION TO CONTROL COOLING.
5. TEST THE FULL PERMEABILITY OF THE PAVEMENT SURFACE BY APPLICATION OF CLEAN WATER AT A RATE OF AT LEAST FIVE GALLONS PER MINUTE OVER THE ENTIRE SURFACE. ALL WATER MUST INFILTRATE DIRECTLY, WITHOUT PUDDLE FORMATION OR SURFACE RUNOFF.
6. INSPECT THE FACILITY 18 TO 30 HOURS AFTER A SIGNIFICANT RAINFALL (GREATER THAN 1/2 INCH) OR ARTIFICIAL FLOODING, TO DETERMINE THAT THE FACILITY IS DRAINING PROPERLY.

MAINTENANCE AGREEMENTS

THE VIRGINIA STORMWATER MANAGEMENT REGULATIONS (4 VAC 50-60) SPECIFY THE CIRCUMSTANCES UNDER WHICH A MAINTENANCE AGREEMENT MUST BE EXECUTED BETWEEN THE OWNER AND THE VSMP AUTHORITY, AND SETS FORTH INSPECTION REQUIREMENTS, COMPLIANCE PROCEDURES IF MAINTENANCE IS NEGLECTED, NOTIFICATION OF THE LOCAL PROGRAM UPON TRANSFER OF OWNERSHIP, AND RIGHT-OF-ENTRY FOR LOCAL PROGRAM PERSONNEL.

1. ALL PERMEABLE PAVEMENT INSTALLATIONS MUST BE COVERED BY A LONG TERM MAINTENANCE AGREEMENT AND DRAINAGE EASEMENT CONSISTENT WITH THE PROVISIONS OF THE VSMP REGULATIONS TO ALLOW INSPECTION AND MAINTENANCE.
2. THE MAINTENANCE AGREEMENTS SHOULD NOTE WHICH CONVENTIONAL PARKING LOT MAINTENANCE TASKS MUST BE AVOIDED (E.G., SANDING, RE-SEALING, RE-SURFACING, POWER-WASHING). SIGNS SHOULD BE POSTED ON LARGER PARKING LOTS TO INDICATE THEIR STORMWATER FUNCTION AND SPECIAL MAINTENANCE REQUIREMENTS. WHEN MICRO-SCALE OR SMALL-SCALE PERMEABLE PAVEMENT ARE INSTALLED ON PRIVATE RESIDENTIAL LOTS, HOMEOWNERS SHOULD BE PROVIDED A SIMPLE DOCUMENT THAT EXPLAINS THE PURPOSE OF THE PERMEABLE PAVEMENT AND OUTLINES (1) THE ROUTINE MAINTENANCE NEEDS, (2) THE LONG-TERM MAINTENANCE PLAN, AND (3) THE BASIC PARAMETERS OF THE DEED RESTRICTION, DRAINAGE EASEMENT OR OTHER MECHANISM ENFORCEABLE BY THE VSMP AUTHORITY TO HELP ENSURE THAT THE PERMEABLE PAVEMENT SYSTEM IS MAINTAINED AND FUNCTIONING.
3. THE MECHANISM SHOULD, IF POSSIBLE, GRANT AUTHORITY FOR THE VSMP AUTHORITY TO ACCESS THE PROPERTY FOR INSPECTION OR CORRECTIVE ACTION.

MAINTENANCE TASKS

IT IS DIFFICULT TO PRESCRIBE THE SPECIFIC TYPES OR FREQUENCY OF MAINTENANCE TASKS THAT ARE NEEDED TO MAINTAIN THE HYDROLOGIC FUNCTION OF PERMEABLE PAVEMENT SYSTEMS OVER TIME. MOST INSTALLATIONS WORK REASONABLY WELL YEAR AFTER YEAR WITH LITTLE OR NO MAINTENANCE, WHEREAS SOME HAVE PROBLEMS RIGHT FROM THE START.

THE FOLLOWING TASKS MUST BE AVOIDED ON ALL PERMEABLE PAVEMENTS:

1. SANDING
2. RE-SEALING
3. RE-SURFACING
4. POWER WASHING
5. STORAGE OF SNOW PILES CONTAINING SAND
6. STORAGE OF MULCH OR SOIL MATERIALS
7. CONSTRUCTION STAGING ON UNPROTECTED PAVEMENT

A PREVENTATIVE MAINTENANCE TASK FOR LARGE-SCALE APPLICATIONS INVOLVES REGENERATIVE AIR VACUUM SWEEPING ON A FREQUENCY CONSISTENT WITH THE USE AND LOADINGS ENCOUNTERED IN THE PARKING LOT. MANY CONSIDER AN ANNUAL, DRY-WEATHER SWEEPING IN THE SPRING MONTHS TO BE IMPORTANT. THE CONTRACT FOR SWEEPING SHOULD SPECIFY THAT A VACUUM SWEEPER BE USED THAT DOES NOT USE WATER SPRAY, SINCE SPRAYING MAY LEAD TO SUBSURFACE CLOGGING. VACUUM SETTINGS FOR LARGE-SCALE INTERLOCKING PAVER APPLICATIONS SHOULD BE CALIBRATED SO THEY DO NOT PICK UP THE STONES BETWEEN PAVEMENT BLOCKS.

PERMEABLE PAVERS "A"

PERMEABLE PAVEMENT		Input	Critera
Level 1			
Tv = [(Rv)(A)]/12-The volume reduced by an upstream BMP	Tv =	105.9597	
Soil infiltration: less than 0.5 in/hr	rate =	0	OK
Underdrain required			Yes
CDA:	ratio =	0.75	
The permeable pavement area plus upgradient parking, as long as the ratio of external contributing area to permeable pavement does not exceed 2.5:1.	AREA (ft²)=	1341.648	OK
PHYSICAL FEASIBILITY			
External drainage area: Less than 2.5x surface area of permeable pavement			
Pavement slope (longtitudinal):			
Bottom of slope should be 0%, or 1% with underdrain or overdrain.	slope =	1.00%	OK
Hydraulic Head:			
Minimum of 2 feet of head	feet =	2	OK
Underdrain should have minum 0.5% slope	slope =	0.50%	OK
Minimum depth to water table: Vertical distance of at least 2 feet	feet =	2	OK
Setbacks:			
Horizontal distance from water supply well (at least 100 ft)	feet =	N/A	OK
Horizontal distance from septic system (at least 50 ft)	feet =	N/A	OK
Distance of down-gradient from dry/wet utility lines (at least 5 ft)	feet =	5	OK
Setbacks based on design scale			
Down-greadient from building 5	feet =	10	OK
Up-gradient from building 25	feet =	50	OK
DESIGN CRITERIA			
(Equation 7.1) $d_{stone}=[(P \times A1 \times Rv1)+(P*Ap)]/(nr \times Ap)$			
dstone = Depth of the stone reservoir layer (ft.)	feet =	**2.83**	
P = The rainfall depth (in feet) for the Treatment Volume (Level 1 = 1 inch (0.08 ft); Level 2 = 1.1 inch (0.09 ft)), or other design storm	feet =	0.08	
AI = Contributing impervious drainage area, (ft2)	ft^2 =	1341.648	
Rvl = Volumetric runoff coefficient		0.95	
AP = Area of permeable pavement (ft2)	ft^2 =	765	
ηr = Porosity of reservoir layer (0.4)	ratio =	0.4	

PERMEABLE PAVERS "B"

PERMEABLE PAVEMENT		Input	Critera
Level 1			
Tv = [(Rv)(A)]/12-The volume reduced by an upstream BMP	Tv =	622.4724	
Soil infiltration: less than 0.5 in/hr	rate =	0	OK
Underdrain required			Yes
CDA:	ratio =	2.31	
The permeable pavement area plus upgradient parking, as long as the ratio of external contributing area to permeable pavement does not exceed 2.5:1.	AREA (ft²)=	8607.456	OK
PHYSICAL FEASIBILITY			
External drainage area: Less than 2.5x surface area of permeable pavement			
Pavement slope (longtitudinal):			
Bottom of slope should be 0%, or 1% with underdrain or overdrain.	slope =	1.00%	OK
Hydraulic Head:			
Minimum of 2 feet of head	feet =	2	OK
Underdrain should have minum 0.5% slope	slope =	0.50%	OK
Minimum depth to water table: Vertical distance of at least 2 feet	feet =	2	OK
Setbacks:			
Horizontal distance from water supply well (at least 100 ft)	feet =	N/A	OK
Horizontal distance from septic system (at least 50 ft)	feet =	N/A	OK
Distance of down-gradient from dry/wet utility lines (at least 5 ft)	feet =	5	OK
Setbacks based on design scale			
Down-greadient from building 10	feet =	10	OK
Up-gradient from building 50	feet =	50	OK
DESIGN CRITERIA			
(Equation 7.1) $d_{stone}=[(P \times A1 \times Rv1)+(P*Ap)]/(nr \times Ap)$			
dstone = Depth of the stone reservoir layer (ft.)	feet =	**3.08**	
P = The rainfall depth (in feet) for the Treatment Volume (Level 1 = 1 inch (0.08 ft); Level 2 = 1.1 inch (0.09 ft)), or other design storm	feet =	0.08	
AI = Contributing impervious drainage area, (ft2)	ft^2 =	8607.456	
Rvl = Volumetric runoff coefficient		0.87	
AP = Area of permeable pavement (ft2)	ft^2 =	2601	
ηr = Porosity of reservoir layer (0.4)	ratio =	0.4	

MAINTENANCE INSPECTIONS

IT IS HIGHLY RECOMMENDED THAT A SPRING MAINTENANCE INSPECTION AND CLEANUP BE CONDUCTED AT EACH PERMEABLE PAVEMENT SITE, PARTICULARLY AT LARGE-SCALE APPLICATIONS.

MAINTENANCE OF PERMEABLE PAVEMENT IS DRIVEN BY ANNUAL INSPECTIONS THAT EVALUATE THE CONDITION AND PERFORMANCE OF THE PRACTICE. ANY PERMEABLE PAVEMENT INSTALLATION WITH EXTERNAL DRAINAGE AREA (RUN-ON) SHOULD BE INSPECTED MORE FREQUENTLY DURING THE FIRST YEAR (FOUR SEASONS) TO ENSURE THAT THERE ARE NO UNEXPECTED CONTRIBUTING LOADS OF SEDIMENT OR PAVEMENT PARTICULATES FROM THE CONTRIBUTING AREA. IF SO, EXTENSIVE INVESTIGATION SHOULD ASSESS WAYS TO LIMIT THE CONTRIBUTIONS, OR THE MAINTENANCE SCHEDULE SHOULD BE ADJUSTED TO ENSURE THE PAVEMENT DOES NOT BECOME CLOGGED.

THE FOLLOWING ARE SUGGESTED ROUTINE ANNUAL MAINTENANCE INSPECTION POINTS FOR PERMEABLE PAVEMENTS:

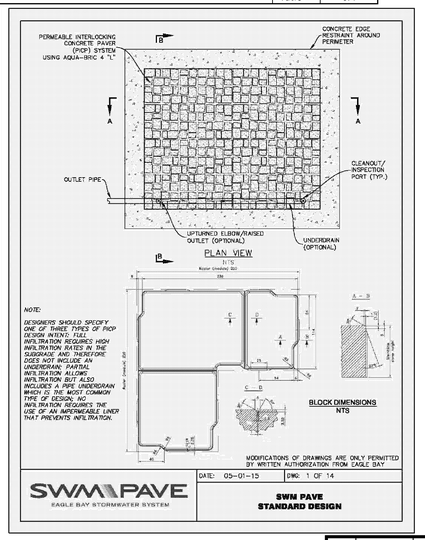
1. THE DRAWDOWN RATE SHOULD BE MEASURED AT THE OBSERVATION WELL FOR THREE (3) DAYS FOLLOWING A STORM EVENT IN EXCESS OF 1/2 INCH IN DEPTH. IF STANDING WATER IS STILL OBSERVED IN THE WELL AFTER THREE DAYS, THIS IS A CLEAR SIGN THAT CLOGGING IS A PROBLEM.
2. INSPECT THE SURFACE OF THE PERMEABLE PAVEMENT FOR EVIDENCE OF SEDIMENT DEPOSITION, ORGANIC DEBRIS, STAINING OR PONDING THAT MAY INDICATE SURFACE CLOGGING. IF ANY SIGNS OF CLOGGING ARE NOTED, SCHEDULE A VACUUM SWEEPER (NO BROOMS OR WATER SPRAY) TO REMOVE DEPOSITED MATERIAL. THEN, TEST SECTIONS BY POURING WATER FROM A FIVE GALLON BUCKET TO ENSURE THEY WORK.
3. INSPECT THE STRUCTURAL INTEGRITY OF THE PAVEMENT SURFACE, LOOKING FOR SIGNS OF SURFACE DETERIORATION, SUCH AS SLUMPING, CRACKING, SPALLING OR BROKEN PAVERS. REPLACE OR REPAIR AFFECTED AREAS, AS NECESSARY.
4. CHECK INLETS, PRETREATMENT CELLS AND ANY FLOW DIVERSION STRUCTURES FOR SEDIMENT BUILDUP AND STRUCTURAL DAMAGE. NOTE IF ANY SEDIMENT NEEDS TO BE REMOVED.
5. INSPECT THE CONDITION OF THE OBSERVATION WELL AND MAKE SURE IT IS STILL CAPPED.
6. GENERALLY INSPECT ANY CONTRIBUTING DRAINAGE AREA FOR ANY CONTROLLABLE SOURCES OF SEDIMENT OR EROSION.

AN EXAMPLE MAINTENANCE INSPECTION CHECKLIST FOR PERMEABLE PAVEMENT CAN BE ACCESSED IN APPENDIX C OF CHAPTER 9 OF THE VIRGINIA STORMWATER MANAGEMENT HANDBOOK (2010). BASED ON INSPECTION RESULTS, SPECIFIC MAINTENANCE TASKS WILL BE TRIGGERED AND SCHEDULED TO KEEP THE FACILITY IN OPERATING CONDITION.

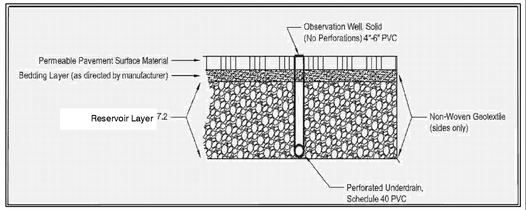
Material Specifications for Underneath the Permeable Pavements

Material	Specification	Notes
Bedding Layer	PC: None PICP: 2 in. depth of No. 8 stone above 4 inches of No. 57	ASTM D448 size No. 8 stone (e.g. 3/8 to 3/16 inch in size). ASTM D448 size No. 57 stone (e.g. 1 1/2 to 1/2 inch in size) Should be washed, clean and free of all fines.
Reservoir Layer	PC: No. 57 stone PICP: No. 2 or 3 stone	PC: ASTM D448 size No. 57 stone (e.g. 1 1/2 to 1/2 inch in size) PICP: No. 2 Stone (e.g. 3 inch to 3/4 inch in size) or No. 3 Stone. Depth is based on the pavement structural and hydraulic requirements. Should be washed, clean and free of all fines.
Underdrain	Use 4 to 6 inch diameter perforated PVC (AASHTO M 252) pipe, with 3/8-inch perforations at 6 inches on center; each underdrain installed at a minimum 0.5% slope located 20 feet or less from the next pipe (or equivalent corrugated HDPE may be used for non-vehicular applications). Perforated pipe installed for the full length of the permeable pavement cell, and non-perforated pipe, as needed, is used to connect with the storm drain system. T's and Y's installed as needed, depending on the underdrain configuration. Extend cleanout pipes to the surface with caps.	
Filter Layer	The underlying native soils should be separated from the stone reservoir by a 2 to 4 inch layer of choker stone (e.g. No. 8) covered by a 6 to 8 inch layer of coarse sand (e.g. ASTM C 33, gradation) or use an appropriate filter fabric for the particular application based on AASHTO M288-06. At a minimum the fabric shall have a Flow Rate greater than 125 gpm/sq. ft. (ASTM D4491), and an Apparent Opening Size (AOS) equivalent to a US # 70 or # 80 sieve (ASTM D4751). The geotextile AOS selection is based on the percent passing the No. 200 sieve in "A" Soil subgrade, using FHWA or AASHTO selection criteria.	
Observation Well	Use a perforated 4 to 6 inch vertical PVC pipe (AASHTO M 252) with a cap, installed flush with the surface. Applications in vehicular areas shall have a metal cap. All applications shall have an observation well installed.	

*PC: Permeable Concrete, PICP: Permeable Interlocking Concrete Pavers



LEVEL 1 PERMEABLE PAVEMENT TYPICAL CROSS SECTION



Permeable Pavement Maintenance Schedule

Maintenance Activity	Schedule
• Check observation wells 3 days after a storm event in excess of 1/2 inch in depth. Standing water observed in the well after three days is a clear indication of clogging. • Inspect the surface of the permeable pavement for evidence of sediment deposition, organic debris, staining or ponding that may indicate surface clogging. If any signs of clogging are noted, schedule a vacuum sweeper (no brooms or water spray) to remove deposited material. • Inspect the structural integrity of the pavement surface, looking for signs of surface deterioration, such as slumping, cracking, spalling or broken pavers. Replace or repair affected areas, as necessary. • Check inlets, pretreatment cells and any flow diversion structures for sediment buildup and structural damage. Note if any sediment needs to be removed. • Inspect the condition of the observation well and make sure it is still capped. • Generally inspect any contributing drainage area for any controllable sources of sediment or erosion.	Annually
• Inspected and certified by a professional licensed in the State of Virginia	Once every 5 years

ALL BMP'S SHALL BE PRIVATELY MAINTAINED

Construction Inspection Checklist: Permeable Pavement

ARLINGTON VIRGINIA

Address/ Location: _____ Building Permit #: _____
LDA Permit #: _____ SWM#: _____
Contractor Certifying Professional*: _____ Telephone: _____
Telephone: _____
Date Started: _____ Final Inspection Date: _____

*Certifying professional must be a licensed Professional Engineer (PE), Landscape Architect (LA), or Land Surveyor (LS).

The following checklist provides a basic outline of the anticipated items for the construction inspection of permeable pavement. This checklist does not necessarily differentiate between the types of pavement materials and the different construction requirements. Inspectors should review the plans carefully, and adjust these items and the timing of inspection verification as needed to ensure the intent of the design is met. The standard for design of this practice is based on Virginia Stormwater BMP Clearinghouse and Arlington County Stormwater Guidance Manual.

All items should be crossed off when completed. Items labeled "Certification of..." must be crossed off, dated and initialed by the certifying inspector.

PRE-CONSTRUCTION MEETING	DATE
☐ Walk through site with builder/contractor/subcontractor to review the SWPPP (erosion and sediment control plan, the stormwater management plan, and the Pollution Prevention plan)	
☐ Determine when permeable pavement is built in project construction sequence, before or after building construction and determine measures for protection and surface cleaning	
☐ Identify the tentative schedule for construction, verify the certification of the installer (ICPI for permeable interlocking pavers or NRMCA for pervious concrete) and requirements and schedule for interim inspections.	
☐ Storage locations for aggregate material have been identified (hard surface or on geotextile).	
☐ Pre-construction meeting with the contractor designated to install the permeable pavement, County DES inspector, and person completing this checklist has been conducted.	

SEDIMENT MANAGEMENT	DATE
☐ Access routes for delivery and construction vehicles identified.	
☐ Vehicle tire/track washing station location/maintenance (if specified in the erosion and sediment control plan/SWPPP).	
☐ Contributing drainage areas are stabilized and are not eroding.	

EXCAVATION	DATE
☐ Excavated area marked with paint and/or stakes.	
☐ Excavation size and location conforms to plan.	
☐ Runoff is diverted around the excavation area to a stabilized conveyance.	
☐ If excavation is used as a sediment trap: verify that the bottom elevation of the proposed stone reservoir is lower than the bottom elevation of the existing trap.	

Permeable Pavement | January 2017

☐ Subgrade surface is free of rocks and roots, and large voids. Any voids should be refilled with the base aggregate to create a level surface for the placement of aggregates and underdrain (if required).	
☐ For Level 2 permeable pavement, ensure the bottom of the excavation is scarified prior to placement of stone.	
☐ No groundwater seepage or standing water is present. Any standing water is dewatered to an acceptable dewatering device.	
☐ The excavation has achieved the proper elevations and grade (0% slope) as noted on the approved plans.	
☐ **Certification of Excavation Inspection:** Inspector certifies the successful completion of the excavation steps listed above. Photos required include excavated subgrade prior to covering with fabric and stone, and include measurement from subgrade to reference point (i.e., top of edge restraint, top of apron, top of garage entrance, top of flow barriers and flow barrier excavation cuts, etc.)	

FILTER LAYER, UNDERDRAIN, STONE RESERVOIR, AND BEDDING LAYER PLACEMENT	DATE
☐ All aggregates, including, as required, the filter layer (choker stone & sand or geotextile), the reservoir layer, and bedding layer conform to specifications as certified by quarry	
☐ Underdrain size and perforations meet the specifications (if applicable).	
☐ Placement of filter layer and initial layer of reservoir layer aggregates (approximately 2 inches) spread (not dumped) to avoid aggregate segregation.	
☐ Placement of underdrain, observation wells, and underdrain fittings in accordance with the approved plans.	
☐ Concrete curbs or plastic/metal edge restraints are installed.	
☐ Sides of excavation covered with geotextile, prior to placing stone reservoir aggregate; no tears or holes, or excessive wrinkles are present.	
☐ Flow barriers are properly installed (if applicable).	
☐ Stone reservoir layer and bedding layer is properly installed.	
☐ **Certification of Filter Layer, Underdrain, Stone Reservoir and Bedding Layer Inspection:** Inspector certifies the successful completion of the filter layer, underdrain, stone reservoir and bedding layer placement steps listed above. Photos and material delivery tickets for these items are attached. Photos required include: ○ Non-woven geotextile fabric installed on bottom and sides of excavated subgrade; ○ Perforated observation well prior to installation of stone; ○ Perforated underdrain (if applicable) and connection to storm sewer or dry well; ○ Depth of #2 or #3 stone installed (if applicable); ○ Edge restraints; ○ Depth of #57 stone installed; ○ Depth of #8 stone installed. Photos required of flow barrier (if applicable): ○ 12" height of berm; ○ 12" height of cut for flow barrier; ○ Impermeable liner; ○ Distance between flow barriers. Material delivery tickets required include: ○ Choker stone & sand or geotextile installed at subbase; ○ Geotextile installed along sides;	

Permeable Pavement | January 2017

○ Geotextile used as the impermeable barrier on gravel flow berms (if applicable); #2 or #3 stone (if applicable), #57 stone, #8 stone.	
PERMEABLE PAVERS OR PERVIOUS CONCRETE INSTALLATION	**DATE**
☐ Permeable paver surface is installed.	
☐ If pavers are used, the joints are full of #8 or #9 stone.	
☐ **Certification of Pavement Installation:** Contractor and/or manufacturer certifies that permeable pavement has been placed in accordance with manufacturers specifications (ICPI Tech Spec #18 for interlocking concrete pavers or ACI#522 1-13 for pervious concrete) Photos required include: ○ Overall of completed installation; ○ Observation well with proper cap installed. Material delivery tickets required for the pavers or concrete installed.	
☐ The permeable pavement is protected until the remainder of the site is stabilized.	

COMMENTS (CLARIFICATION, DEVIATIONS, ETC.)	DATE

All items checked above have been inspected by me (or by an individual under my responsible charge) and have been completed to my satisfaction and meet the approved plans (or deviations are noted here).

Signature: _____ Date: _____

Certifying Professional's License Number (or Seal): _____

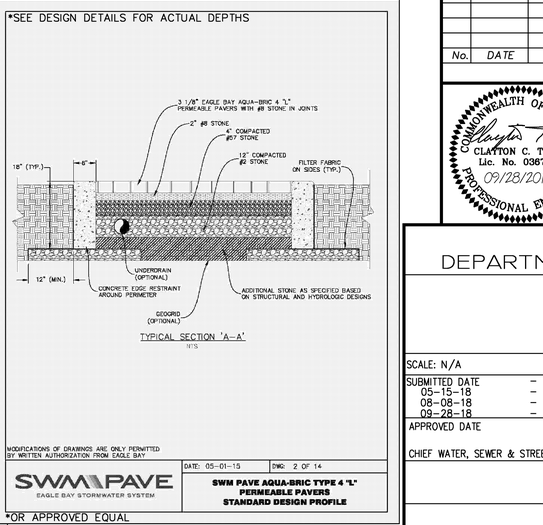
Installer / Contractor's Certification (Required)

☐ **Permeable Interlocking Pavers:** Attach copy of ICPI Certification

☐ **Pervious Concrete:** NRMCA Certification* Number: _____

*NRMCA Certification must be either Installer or Craftsman certification.

Permeable Pavement | January 2017



No.	DATE	DESCRIPTION

REVISIONS

COMMONWEALTH OF VIRGINIA — Clayton C. Tock — Lic. No. 036790 — 09/28/2018 — PROFESSIONAL ENGINEER

urban — Planners • Engineers • Landscape Architects • Land Surveyors
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ARLINGTON, VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES
BMP - DESIGN & DETAILS
UPTON HILL REGIONAL PARK
CIVIL ENGINEERING PLAN
6060 WILSON BLVD, ARLINGTON, VIRGINIA 22205

SCALE: N/A	DESIGNED	CHECKED
SUBMITTED DATE 05-15-18 – 08-08-18 – 09-28-18 –	APPROVED DATE CHIEF TRANSPORTATION PLANNING BUREAU	APPROVED DATE CHIEF TRANSPORTATION ENGINEERING BUREAU
APPROVED DATE CHIEF WATER, SEWER & STREETS DIV.	APPROVED DATE CHIEF ENGINEERING DIVISION	APPROVED DATE DIRECTOR OF ENVIRONMENTAL SERVICES
	APPROVED DATE CPHD PLANNER	APPROVED DATE CPHD LANDSCAPE REVIEWER
	SHEET C.22 OF 45	SP-12928

Urban, Ltd. – a:\JOBS\upton hill park\dgn\upton hill park\App bid set\12928-22-BMP.dwg [Prvmnt DETAILS 1] November 26, 2018 - 12:17pm bbriten

BIORETENTION - DEQ CONSTRUCTION SPECIFICATIONS PER SPECIFICATION #9, SECTION 8

8.1. CONSTRUCTION SEQUENCE

CONSTRUCTION STAGE E&S CONTROLS. MICRO-BIORETENTION AND SMALL-SCALE BIORETENTION AREAS SHOULD BE FULLY PROTECTED BY SILT FENCE OR CONSTRUCTION FENCING, PARTICULARLY IF THEY WILL RELY ON INFILTRATION (I.E., HAVE NO UNDERDRAINS). IDEALLY, BIORETENTION SHOULD REMAIN OUTSIDE THE LIMIT OF DISTURBANCE DURING CONSTRUCTION TO PREVENT SOIL COMPACTION BY HEAVY EQUIPMENT. BIORETENTION BASIN LOCATIONS MAY BE USED AS SMALL SEDIMENT TRAPS OR BASINS DURING CONSTRUCTION. HOWEVER, THESE MUST BE ACCOMPANIED BY NOTES AND GRAPHIC DETAILS ON THE ESC PLAN SPECIFYING THAT (1) THE MAXIMUM EXCAVATION DEPTH AT THE CONSTRUCTION STAGE MUST BE AT LEAST 1 FOOT ABOVE THE POST-CONSTRUCTION MAXIMUM EXCAVATION, (2) THE FACILITY MUST CONTAIN AN UNDERDRAIN, AND (3) THE PLAN MUST ALSO SHOW THE PROPER PROCEDURES FOR CONVERTING THE TEMPORARY SEDIMENT CONTROL PRACTICE TO A PERMANENT BIORETENTION FACILITY, INCLUDING DEWATERING, CLEANOUT AND STABILIZATION.

8.2 BIORETENTION INSTALLATION

THE FOLLOWING IS A TYPICAL CONSTRUCTION SEQUENCE TO PROPERLY INSTALL A BIORETENTION BASIN. THE INSTALLATION OF A BIORETENTION BASIN WILL INCLUDE INTERMEDIATE INSPECTIONS AT CRITICAL STAGES OF CONSTRUCTION WITH INSPECTOR SIGN-OFF THAT THE PARTICULAR ELEMENTS OF THE BIORETENTION ARE CONSTRUCTED ACCORDING THE APPROVED PLANS AND SPECIFICATIONS. AS AN ALTERNATIVE, IF ALLOWED BY THE VSMP AUTHORITY, THE CONTRACTOR MAY RELY ON THE ENGINEER OF RECORD OR OTHER QUALIFIED INDIVIDUAL TO CONDUCT THE INTERMEDIATE INSPECTIONS AND CERTIFICATIONS OF COMPLIANCE. THE CONSTRUCTION SEQUENCE FOR MICRO-BIORETENTION IS MORE SIMPLIFIED. THESE STEPS MAY BE MODIFIED TO REFLECT DIFFERENT BIORETENTION APPLICATIONS OR EXPECTED SITE CONDITIONS:

STEP 1. CONSTRUCTION OF THE BIORETENTION AREA MAY ONLY BEGIN AFTER THE ENTIRE CONTRIBUTING DRAINAGE AREA HAS BEEN STABILIZED WITH VEGETATION. IT MAY BE NECESSARY TO BLOCK CERTAIN CURB OR OTHER INLETS WHILE THE BIORETENTION AREA IS BEING CONSTRUCTED. THE PROPOSED SITE SHOULD BE CHECKED FOR EXISTING UTILITIES PRIOR TO ANY EXCAVATION.

STEP 2. THE DESIGNER AND THE INSTALLER SHOULD HAVE A PRECONSTRUCTION MEETING, CHECKING THE BOUNDARIES OF THE CONTRIBUTING DRAINAGE AREA AND THE ACTUAL INLET ELEVATIONS TO ENSURE THEY CONFORM TO ORIGINAL DESIGN. SINCE OTHER CONTRACTORS MAY BE RESPONSIBLE FOR CONSTRUCTING PORTIONS OF THE SITE, IT IS QUITE COMMON TO FIND SUBTLE DIFFERENCES IN SITE GRADING, DRAINAGE AND PAVING ELEVATIONS THAT CAN PRODUCE HYDRAULICALLY IMPORTANT DIFFERENCES FOR THE PROPOSED BIORETENTION AREA. THE DESIGNER SHOULD CLEARLY COMMUNICATE, IN WRITING, ANY PROJECT CHANGES DETERMINED DURING THE PRECONSTRUCTION MEETING TO THE INSTALLER AND THE PLAN REVIEW/INSPECTION AUTHORITY.

STEP 3. TEMPORARY E&S CONTROLS ARE NEEDED DURING CONSTRUCTION OF THE BIORETENTION AREA TO DIVERT STORMWATER AWAY FROM THE BIORETENTION AREA UNTIL IT IS COMPLETED. SPECIAL PROTECTION MEASURES SUCH AS EROSION CONTROL FABRICS MAY BE NEEDED TO PROTECT VULNERABLE SIDE SLOPES FROM EROSION DURING THE CONSTRUCTION PROCESS.

STEP 4. ANY PRE-TREATMENT CELLS SHOULD BE EXCAVATED FIRST AND THEN SEALED TO TRAP SEDIMENTS.

STEP 5. EXCAVATORS OR BACKHOES SHOULD WORK FROM THE SIDES TO EXCAVATE THE BIORETENTION AREA TO ITS APPROPRIATE DESIGN DEPTH AND DIMENSIONS. EXCAVATING EQUIPMENT SHOULD HAVE SCOOPS WITH ADEQUATE REACH SO THEY DO NOT HAVE TO SIT INSIDE THE FOOTPRINT OF THE BIORETENTION AREA. CONTRACTORS SHOULD USE A CELL CONSTRUCTION APPROACH IN LARGER BIORETENTION BASINS, WHEREBY THE BASIN IS SPLIT INTO 500 TO 1,000 SQ. FT. TEMPORARY CELLS WITH A 10-15 FOOT EARTH BRIDGE IN BETWEEN, SO THAT CELLS CAN BE EXCAVATED FROM THE SIDE.

STEP 6. IT MAY BE NECESSARY TO RIP THE BOTTOM SOILS TO A DEPTH OF 6 TO 12 INCHES TO PROMOTE GREATER INFILTRATION.

STEP 7. PLACE GEOTEXTILE FABRIC ON THE SIDES OF THE BIORETENTION AREA WITH A 6-INCH OVERLAP ON THE SIDES. IF A STONE STORAGE LAYER WILL BE USED, PLACE THE APPROPRIATE DEPTH OF #57 STONE ON THE BOTTOM, INSTALL THE PERFORATED UNDERDRAIN PIPE, PACK #57 STONE TO 3 INCHES ABOVE THE UNDERDRAIN PIPE, AND ADD APPROXIMATELY 3 INCHES OF CHOKER STONE/PEA GRAVEL AS A FILTER BETWEEN THE UNDERDRAIN AND THE SOIL MEDIA LAYER. IF NO STONE STORAGE LAYER IS USED, START WITH 6 INCHES OF #57 STONE ON THE BOTTOM, AND PROCEED WITH THE LAYERING AS DESCRIBED ABOVE.

STEP 8. OBTAIN SOIL THE MEDIA FROM A QUALIFIED VENDOR, AND STORE IT ON AN ADJACENT IMPERVIOUS AREA OR PLASTIC SHEETING. AFTER VERIFYING THAT THE MEDIA MEETS THE SPECIFICATIONS, APPLY THE MEDIA IN 12-INCH LIFTS UNTIL THE DESIRED TOP ELEVATION OF THE BIORETENTION AREA IS ACHIEVED. WAIT A FEW DAYS TO CHECK FOR SETTLEMENT, AND ADD ADDITIONAL MEDIA, AS NEEDED, TO ACHIEVE THE DESIGN ELEVATION.

STEP 9. PREPARE PLANTING HOLES FOR ANY TREES AND SHRUBS, INSTALL THE VEGETATION, AND WATER ACCORDINGLY. INSTALL ANY TEMPORARY IRRIGATION.

STEP 10. PLACE THE SURFACE COVER IN BOTH CELLS (MULCH, RIVER STONE OR TURF), DEPENDING ON THE DESIGN. IF COIR OR JUTE MATTING WILL BE USED IN LIEU OF MULCH, THE MATTING WILL NEED TO BE INSTALLED PRIOR TO PLANTING (STEP 9), AND HOLES OR SLITS WILL HAVE TO BE CUT IN THE MATTING TO INSTALL THE PLANTS.

STEP 11. INSTALL THE PLANT MATERIALS AS SHOWN IN THE LANDSCAPING PLAN, AND WATER THEM DURING WEEKS OF NO RAIN FOR THE FIRST TWO MONTHS.

8.3 CONSTRUCTION INSPECTION

INSPECTIONS DURING AND IMMEDIATELY AFTER CONSTRUCTION ARE NEEDED TO ENSURE THAT ALL THE ELEMENTS OF BIORETENTION BASINS ARE BUILT IN ACCORDANCE WITH THESE SPECIFICATIONS. USE A DETAILED INSPECTION CHECKLIST THAT REQUIRES SIGN-OFFS BY QUALIFIED INDIVIDUALS AT CRITICAL STAGES OF CONSTRUCTION AND TO ENSURE THAT THE CONTRACTOR'S INTERPRETATION OF THE PLAN IS CONSISTENT WITH THE DESIGNER'S INTENT. THE FOLLOWING IDENTIFIES THE CRITICAL STAGES OF CONSTRUCTION WHERE AN INTERMEDIATE INSPECTION AND SIGN-OFF BY A QUALIFIED INDIVIDUAL IS RECOMMENDED SINCE THE ITEMS CAN'T BE VERIFIED AFTER CONSTRUCTION IS COMPLETED. A CONSTRUCTION INSPECTION CHECKLIST THAT INCLUDES CERTIFICATIONS OF INSPECTION AT CRITICAL STAGES IS PROVIDED AT THE END OF THIS SPECIFICATION.

THE FOLLOWING REPRESENTS ITEMS THAT ARE FREQUENTLY OVERLOOKED DURING CONSTRUCTION INSPECTION BUT REPRESENT IMPORTANT ELEMENTS FOR ENSURING THE SUCCESS OF THE BIORETENTION FACILITY DURING THE INITIAL BREAK-IN PERIOD.

- VERIFY THE PROPER COVERAGE AND DEPTH OF MULCH, VEGETATION, OR SOIL MATTING HAS BEEN ACHIEVED FOLLOWING CONSTRUCTION, BOTH ON THE FILTER BED AND THE SIDE-SLOPES.
- INSPECT THE PRE-TREATMENT FORBAYS AND FILTER STRIPS TO VERIFY THAT THEY ARE PROPERLY INSTALLED, STABILIZED, AND WORKING EFFECTIVELY BEFORE OPENING THE FACILITY TO RUNOFF.
- CHECK THAT OUTFALL PROTECTION/ENERGY DISSIPATION MEASURES AT CONCENTRATED INFLOW AND OUTFLOW POINTS ARE STABLE.

UPON FINAL ACCEPTANCE OF THE FACILITY, LOG THE PRACTICE'S GPS COORDINATES AND SUBMIT THEM FOR ENTRY INTO THE VSMP AUTHORITY'S BMP MAINTENANCE TRACKING DATABASE.

BIORETENTION MAINTENANCE

9.1. MAINTENANCE AGREEMENTS

THE VIRGINIA STORMWATER MANAGEMENT REGULATIONS (4 VAC 50-60) SPECIFY THE CIRCUMSTANCES UNDER WHICH A MAINTENANCE AGREEMENT MUST BE EXECUTED BETWEEN THE OWNER AND THE VSMP AUTHORITY, AND SETS FORTH INSPECTION REQUIREMENTS, COMPLIANCE PROCEDURES IF MAINTENANCE IS NEGLECTED, NOTIFICATION OF THE LOCAL PROGRAM UPON TRANSFER OF OWNERSHIP, AND RIGHT-OF-ENTRY FOR LOCAL PROGRAM PERSONNEL.

- ALL BIORETENTION PRACTICES MUST INCLUDE A LONG TERM MAINTENANCE AGREEMENTS CONSISTENT WITH THE PROVISIONS OF THE VSMP REGULATIONS, AND MUST INCLUDE THE RECOMMENDED MAINTENANCE TASKS AND A COPY OF AN ANNUAL INSPECTION CHECKLIST.
- WHEN MICRO-SCALE BIORETENTION PRACTICES ARE APPLIED ON PRIVATE RESIDENTIAL LOTS, HOMEOWNERS SHOULD BE EDUCATED REGARDING THEIR ROUTINE MAINTENANCE NEEDS BY BEING PROVIDED A SIMPLE DOCUMENT THAT EXPLAINS THEIR PURPOSE AND ROUTINE MAINTENANCE NEEDS. .
- A DEED RESTRICTION, DRAINAGE EASEMENT OR OTHER MECHANISM ENFORCEABLE BY THE VSMP AUTHORITY MUST BE IN PLACE TO HELP ENSURE THAT RAIN GARDENS AND BIORETENTION FILTERS ARE MAINTAINED AND NOT CONVERTED OR DISTURBED, AS WELL AS TO PASS THE KNOWLEDGE ALONG TO ANY SUBSEQUENT OWNERS.
- THE MECHANISM SHOULD, IF POSSIBLE, GRANT AUTHORITY FOR THE VSMP AUTHORITY TO ACCESS THE PROPERTY FOR INSPECTION OR CORRECTIVE ACTION.

9.1. FIRST YEAR MAINTENANCE OPERATIONS

SUCCESSFUL ESTABLISHMENT OF BIORETENTION AREAS REQUIRES THAT THE FOLLOWING TASKS BE UNDERTAKEN IN THE FIRST YEAR FOLLOWING INSTALLATION:

- INITIAL INSPECTIONS. FOR THE FIRST 6 MONTHS FOLLOWING CONSTRUCTION, THE SITE SHOULD BE INSPECTED AT LEAST TWICE AFTER STORM EVENTS THAT EXCEED 1/2 INCH OF RAINFALL.
- SPOT RESEEDING. INSPECTORS SHOULD LOOK FOR BARE OR ERODING AREAS IN THE CONTRIBUTING DRAINAGE AREA OR AROUND THE BIORETENTION AREA, AND MAKE SURE THEY ARE IMMEDIATELY STABILIZED WITH GRASS COVER.
- FERTILIZATION. ONE-TIME, SPOT FERTILIZATION MAY BE NEEDED FOR INITIAL PLANTINGS.
- WATERING. WATERING IS NEEDED ONCE A WEEK DURING THE FIRST 2 MONTHS, AND THEN AS NEEDED DURING FIRST GROWING SEASON (APRIL-OCTOBER), DEPENDING ON RAINFALL.
- REMOVE AND REPLACE DEAD PLANTS. SINCE UP TO 10% OF THE PLANT STOCK MAY DIE OFF IN THE FIRST YEAR, CONSTRUCTION CONTRACTS SHOULD INCLUDE A CARE AND REPLACEMENT WARRANTY TO ENSURE THAT VEGETATION IS PROPERLY ESTABLISHED AND SURVIVES DURING THE FIRST GROWING SEASON FOLLOWING CONSTRUCTION. THE TYPICAL THRESHOLDS BELOW WHICH REPLACEMENT IS REQUIRED ARE 85% SURVIVAL OF PLANT MATERIAL AND 100% SURVIVAL OF TREES.

9.1. MAINTENANCE INSPECTIONS

IT IS HIGHLY RECOMMENDED THAT A SPRING MAINTENANCE INSPECTION AND CLEANUP BE CONDUCTED AT EACH BIORETENTION AREA. THE FOLLOWING IS A LIST OF SOME OF THE KEY MAINTENANCE PROBLEMS TO LOOK FOR:

- CHECK TO SEE IF 75% TO 90% COVER (MULCH PLUS VEGETATIVE COVER) HAS BEEN ACHIEVED IN THE BED, AND MEASURE THE DEPTH OF THE REMAINING MULCH.
- CHECK FOR SEDIMENT BUILDUP AT CURB CUTS, GRAVEL DIAPHRAGMS OR PAVEMENT EDGES THAT PREVENTS FLOW FROM GETTING INTO THE BED, AND CHECK FOR OTHER SIGNS OF BYPASSING.
- CHECK FOR ANY WINTER- OR SALT-KILLED VEGETATION, AND REPLACE IT WITH HARDIER SPECIES.
- NOTE PRESENCE OF ACCUMULATED SAND, SEDIMENT AND TRASH IN THE PRE-TREATMENT CELL OR FILTER BEDS, AND REMOVE IT.
- INSPECT BIORETENTION SIDE SLOPES AND GRASS FILTER STRIPS FOR EVIDENCE OF ANY RILL OR GULLY EROSION, AND REPAIR IT.
- CHECK THE BIORETENTION BED FOR EVIDENCE OF MULCH FLOTATION, EXCESSIVE PONDING, DEAD PLANTS OR CONCENTRATED FLOWS, AND TAKE APPROPRIATE REMEDIAL ACTION.
- CHECK INFLOW POINTS FOR CLOGGING, AND REMOVE ANY SEDIMENT.
- LOOK FOR ANY BARE SOIL OR SEDIMENT SOURCES IN THE CONTRIBUTING DRAINAGE AREA, AND STABILIZE THEM IMMEDIATELY.
- CHECK FOR CLOGGED OR SLOW-DRAINING SOIL MEDIA, A CRUST FORMED ON THE TOP LAYER, INAPPROPRIATE SOIL MEDIA, OR OTHER CAUSES OF INSUFFICIENT FILTERING TIME, AND RESTORE PROPER FILTRATION CHARACTERISTICS.

EXAMPLE MAINTENANCE INSPECTION CHECKLISTS FOR BIORETENTION AREAS CAN BE ACCESSED IN APPENDIX C OF CHAPTER 9 OF THE VIRGINIA STORMWATER MANAGEMENT HANDBOOK (2010).

9.1. ROUTINE AND NON-ROUTINE MAINTENANCE TASKS

MAINTENANCE OF BIORETENTION AREAS SHOULD BE INTEGRATED INTO ROUTINE LANDSCAPE MAINTENANCE TASKS. IF LANDSCAPING CONTRACTORS WILL BE EXPECTED TO PERFORM MAINTENANCE, THEIR CONTRACTS SHOULD CONTAIN SPECIFICS ON UNIQUE BIORETENTION LANDSCAPING NEEDS, SUCH AS MAINTAINING ELEVATION DIFFERENCES NEEDED FOR PONDING, PROPER MULCHING, SEDIMENT AND TRASH REMOVAL, AND LIMITED USE OF FERTILIZERS AND PESTICIDES. A CUSTOMIZED MAINTENANCE SCHEDULE MUST BE PREPARED FOR EACH BIORETENTION FACILITY, SINCE THE MAINTENANCE TASKS WILL DIFFER DEPENDING ON THE SCALE OF BIORETENTION, THE LANDSCAPING TEMPLATE CHOSEN, AND THE TYPE OF SURFACE COVER. A GENERALIZED SUMMARY OF COMMON MAINTENANCE TASKS AND THEIR FREQUENCY IS PROVIDED IN TABLE 9.8.

THE MOST COMMON NON-ROUTINE MAINTENANCE PROBLEM INVOLVES STANDING WATER. IF WATER REMAINS ON THE SURFACE FOR MORE THAN 48 HOURS AFTER A STORM, ADJUSTMENTS TO THE GRADING MAY BE NEEDED OR UNDERDRAIN REPAIRS MAY BE NEEDED. THE SURFACE OF THE FILTER BED SHOULD ALSO BE CHECKED FOR ACCUMULATED SEDIMENT OR A FINE CRUST THAT BUILDS UP AFTER THE FIRST SEVERAL STORM EVENTS. THERE ARE SEVERAL METHODS THAT CAN BE USED TO REHABILITATE THE FILTER (TRY THE EASIEST THINGS FIRST, AS LISTED BELOW):

- OPEN THE UNDERDRAIN OBSERVATION WELL OR CLEANOUT AND POUR IN WATER TO VERIFY THAT THE UNDERDRAINS ARE FUNCTIONING AND NOT CLOGGED OR OTHERWISE IN NEED OF REPAIR. THE PURPOSE OF THIS CHECK IS TO SEE IF THERE IS STANDING WATER ALL THE WAY DOWN THROUGH THE SOIL. IF THERE IS STANDING WATER ON TOP, BUT NOT IN THE UNDERDRAIN, THEN THERE IS A CLOGGED SOIL LAYER. IF THE UNDERDRAIN AND STAND PIPE INDICATES STANDING WATER, THEN THE UNDERDRAIN MUST BE CLOGGED AND WILL NEED TO BE SNAKED.
- REMOVE ACCUMULATED SEDIMENT AND TILL 2 TO 3 INCHES OF SAND INTO THE UPPER 8 TO 12 INCHES OF SOIL.
- INSTALL SAND WICKS FROM 3 INCHES BELOW THE SURFACE TO THE UNDERDRAIN LAYER. SAND WICKS CAN BE INSTALLED BY EXCAVATING OR AUGERING (USING A TREE AUGER OR SIMILAR TOOL) DOWN TO THE GRAVEL STORAGE ZONE TO CREATE VERTICAL COLUMNS WHICH ARE THEN FILLED WITH A CLEAN OPEN-GRADED COARSE SAND MATERIAL (COARSE SAND MIX SIMILAR TO THE GRADATION USED FOR THE SOIL MEDIA). A SUFFICIENT NUMBER OF WICK DRAINS OF SUFFICIENT DIMENSION SHOULD BE INSTALLED TO MEET THE DESIGN DEWATERING TIME FOR THE FACILITY.
- LAST RESORT - REMOVE AND REPLACE SOME OR ALL OF THE SOIL MEDIA.

LANE STORMKEEPER SPECIFICATIONS

1. Chambers shall be StormKeeper SK75 or approved equal.
2. Chambers shall be manufactured from virgin polypropylene resins.
3. Chambers and endcaps shall meet or exceed the requirements of ASTM F2418.
4. Chambers shall have handles installed in the base to facilitate construction of the system.
5. Chambers shall be designed in accordance with ASTM F2787, "Standard Practice for Structural Design of Thermoplastic Corrugated Wall Stormwater Collection Chambers."
6. Rows of Chambers shall be continuous, unobstructed internal space with no internal support panels.
7. The structural design of the chambers, backfill, and installation requirements shall ensure that the load factors specified in the AASHTO LRFD Bridge design specifications, section 12.12 are met.
8. Only chambers that are approved by the Engineer shall be allowed.
9. Chambers shall be produced at an ISO 9001 certified manufacturing facility.
10. All design specifications for chambers shall be in accordance with the manufacturer's latest design guidelines.
11. The installation of the chambers shall be in accordance with the manufacturer's latest installation guidelines.

BIORETENTION MAINTENANCE ACTIVITIES PER ARLINGTON COUNTY STANDARDS

Maintenance Activities for Bioretention. The following is the list of maintenance activities for bioretention. The table is to be included on plans proposing bioretention.

Bioretention Maintenance Schedule

Maintenance	Frequency
• Spot weeding, erosion repair, trash removal, and mulch raking	Twice during growing season
• Add reinforcement planting to maintain the desired vegetation density • Remove invasive plants using recommended control methods • Stabilize the contributing drainage area to prevent erosion	As needed
• Spring inspection and cleanup • Supplement mulch to maintain a 2-3 inch layer • Prune trees and shrubs	Annually
• Remove sediment in pre-treatment cells and inflow points	Once every 2 to 3 years
• Replace the mulch layer	Every 3 years
• Inspected and certified by a professional licensed in the State of Virginia	Once every 5 years

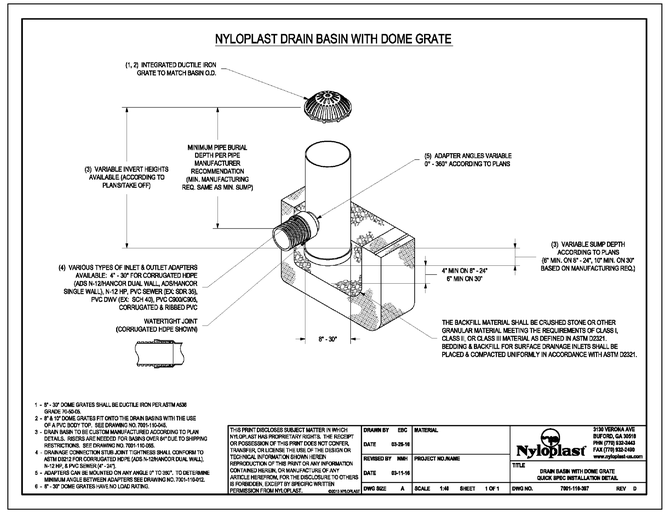


FIGURE 9.9: PRE-TREATMENT - GRAVEL FLOW SPREADER FOR CONCENTRATED FLOW

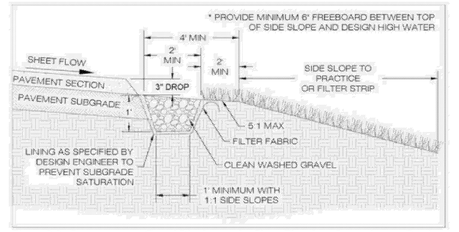
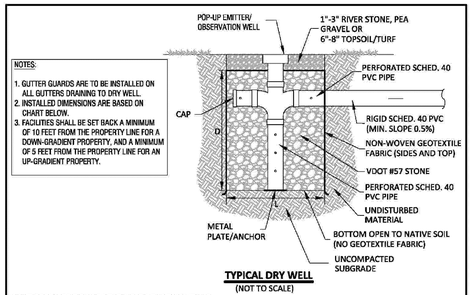


Figure 9.8 - Pretreatment – Gravel Diaphragm for Sheet Flow from Impervious or Pervious



TYPICAL DRY WELL
(NOT TO SCALE)

MATERIAL SPECIFICATIONS FOR DRY WELLS

MATERIAL	SPECIFICATION
STONE	VDOT NO. 57
OBSERVATION WELL / OVERFLOW	INSTALL A VERTICAL 4 OR 6-INCH SCHEDULE 40 PVC PERFORATED PIPE, WITH A POP-UP EMITTER AND ANCHOR PLATE. PIPE PERFORATIONS ARE 3/8 INCHES AT 6 INCHES ON CENTER.
SURFACE COVER	INSTALL A 3-INCH LAYER OF RIVER STONE OR PEA GRAVEL. TURF IS ACCEPTABLE WHEN THERE IS SUBSURFACE INFLOW (E.G. A ROOF LEADER)
FILTER FABRIC	MUST BE INSTALLED ON THE DRY WELL SIDES. WHEN TURF IS USED AS A SURFACE COVER, FABRIC SHALL BE INSTALLED ALONG THE TOP BETWEEN THE STONE LAYER AND THE SURFACE COVER. USE NON-WOVEN POLYPRENE GEOTEXTILE WITH A FLOW RATE OF > 110 GALLONS/MIN./SQ. FT. (E.G., GEOTEX 351 OR EQUIVALENT).
CLEANOUT	THREADED METAL ROD WITH PLATE AT THE END.

DRY WELL MAINTENANCE SCHEDULE

MAINTENANCE ACTIVITIES	SCHEDULE
• REPLACE PEA GRAVEL/TOPSOIL AND TOP SURFACE GEOTEXTILE FABRIC (WHEN CLOGGED).	AS NEEDED
• CHECK OBSERVATION WELLS 3 DAYS AFTER A STORM EVENT IN EXCESS OF 1/2 INCH IN DEPTH. STANDING WATER OBSERVED IN THE WELL AFTER THREE DAYS IS AN INDICATION OF CLOGGING. • CLEAN OUT ACCUMULATED SEDIMENTS FROM THE OBSERVATION WELL.	ANNUALLY
• INSPECTED AND CERTIFIED BY A PROFESSIONAL LICENSED IN THE STATE OF VIRGINIA	ONCE EVERY 5 YEARS

DRY WELL DETAIL

REVISION & DATE

ARLINGTON COUNTY, VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES
OFFICE OF SUSTAINABILITY AND ENVIRONMENTAL MANAGEMENT

DRAWING NO. SWM # 7

Construction Inspection Checklist: Bioretention

ARLINGTON VIRGINIA

Address/ Location: _____ Building Permit #: _____
LDA Permit #: _____ SWM#: _____
Contractor: _____ Telephone: _____
Certifying Professional*: _____ Telephone: _____
Date Started: _____ Final Inspection Date: _____

Certifying professional must be a licensed Professional Engineer (PE), Landscape Architect (LA), or Land Surveyor (LS).

The following checklist provides a basic outline of the anticipated items for the construction inspection of bioretention facilities. This checklist does not necessarily distinguish between all the design variations and differences in construction between the family of practices. Inspectors should review the plans carefully, and adjust these items and the timing of inspection verification as needed to ensure the intent of the design is met. **The standard for design of this practice is based on** Virginia Stormwater BMP Clearinghouse and Arlington County Stormwater Guidance Manual.

All items should be checked when completed. Items labeled "Certification of..." must be crossed off, dated and initialed by certifying inspector.

PRE-CONSTRUCTION MEETING	DATE
☐ Identify the tentative schedule for construction and verify the requirements and schedule for interim inspections.	
☐ All pervious areas of the contributing drainage areas have been adequately stabilized with a thick layer of vegetation or erosion control measures are still in place and stormwater has been diverted around the area.	
☐ Area of bioretention practice has not been impacted during construction.	
☐ Pre-construction meeting with the contractor designated to install the bioretention practice, County DES inspector, and person completing this checklist has been conducted.	

EXCAVATION	DATE
☐ Area of bioretention excavation is marked and the size and location conforms to plan.	
☐ If the excavation area has been used as a sediment trap: verify that the bottom elevation of the proposed stone reservoir is lower than the bottom elevation of the existing trap.	
☐ For Level 2 bioretention, ensure the bottom of the excavation is scarified prior to placement of stone.	
☐ Subgrade surface is free of rocks and roots, and large voids. Any voids should be refilled with the base aggregate to create a level surface for the placement of aggregates and underdrain (if required).	
☐ No groundwater seepage or standing water is present. Any standing water is dewatered to an acceptable dewatering device.	
☐ Excavation of the bioretention practice has achieved proper grades and the required geometry and elevations without compacting the bottom of the excavation. **Constructed dimensions:** _____	
☐ Sides of excavation covered with geotextile; no tears, holes, or excessive wrinkles are present.	

Bioretention | September 2017

☐ **Certification of Excavation Inspection:** Inspector certifies the successful completion of the excavation steps listed above	

Photos required include:
- Excavated area prior to installation of stone, including measurements (L x W x D).
- Non-woven geotextile fabric installed on sides of excavated subgrade only.

Material delivery ticket include:
- Geotextile installed on sides

FILTER LAYER, UNDERDRAIN, AND STONE RESERVOIR PLACEMENT	DATE
☐ All aggregates conform to specifications as certified by quarry.	
☐ Underdrain size and perforations meet the specifications (if applicable).	
☐ If the underdrain is directly tied into the public storm sewer system, the connection has been witnessed by DES inspector.	
☐ For Level 2 installations: placement of filter layer and initial lift of stone reservoir layer aggregates with underdrain or infiltration sump, spread (not dumped) to avoid aggregate segregation.	
☐ Placement of underdrain, observation wells, and underdrain fittings are in accordance with the approved plans.	
☐ Elevations of underdrain and outlet structure are in accordance with approved plans, or as adjusted to meet field conditions and denoted in Comments section.	
☐ Placement of remaining lift of stone reservoir layer as needed to achieve the required reservoir depth.	
☐ **Certification of Filter Layer and Underdrain Placement Inspection:** Inspector certifies the successful completion of the filter layer and underdrain placement steps listed above. Photos and material delivery tickets for these items are attached.	

Photos required include:
- Perforated underdrain pipe (if applicable) with a solid vertical overflow pipe:
- Depth of #57 stone;
- Depth of choker stone (pea gravel or #8);
- Underdrain connection to public storm sewer system (if applicable).

Material delivery tickets required include:
- 57 stone;
- Choker stone (pea gravel or #8).

BIORETENTION SOIL MEDIA PLACEMENT	DATE
☐ Soil media is certified by supplier or contractor as meeting the project specifications and comes from an approved soil media vendor.	
☐ Soil media is placed in 12-inch lifts to the design top elevation of the bioretention area. Elevation has been verified after settlement (2 to 4 days after initial placement).	
☐ Side slopes of ponding area are feathered back at the required slope (no steeper than 3H:1V).	
☐ **Certification of Soil Media Placement Inspection:** Inspector certifies the successful completion of the soil media steps listed above and any necessary photos are attached.	

Photo required of a measurement of the soil media installed.

Material delivery ticket required from an approved soil media vendor

Bioretention | September 2017

PRETREATMENT AND PLANT INSTALLATION	DATE
☐ Riser, overflow weir, or other outflow structure is set to the proper elevation and functional.	
☐ Placement of energy dissipaters and pretreatment practices (forebays, gravel diaphragms, etc.) are installed in accordance with the approved plans.	
☐ Appropriate number and spacing of plants are installed in accordance with the approved plans.	
☐ Ponding depth verification after plant and mulch placement.	
☐ **Certification of Pretreatment and Plant Installation:** Inspector certifies the successful completion of any pretreatment measures, plants and mulch as listed above.	

Photos required for this step include:
- Overall photos of all flowing mulch and plants installed;
- Location of inflow and appropriate energy dissipation;
- Any pretreatment measures required per the approved plans;
- Distance from the top of the mulch to the top of the overflow (either pipe or berm).

Material delivery tickets required for this step include:
- Approved plants listing number and species.
- Shredded hardwood mulch

BIORETENTION TESTING	DATE
☐ A bioretention that uses infiltration to drain (i.e., it has no underdrain) must be tested for infiltration rate upon completion and must function as

BIORETENTION "A" COMPUTATIONS

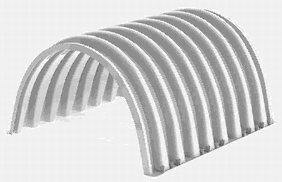
EQUATION 9.1. BIORETENTION LEVEL 1 DESIGN STORAGE DEPTH				
FILTER MEDIA DEPTH =	2	FT	η=	0.25
GRAVEL DEPTH =	1	FT	η=	0.4
MAX PONDING DEPTH =	0.75	FT	η=	1
DESIGN STORAGE DEPTH =	1.65	FT		
EQUATION 9.3 BIORETENTION LEVEL 1 DESIGN SURFACE AREA				
DRAINAGE AREA =	80415.58	SF		
Rv (COMPOSITE RUNOFF COEFFICIENT) =	0.73			
VOLUME REDUCED BY UPSTREAM BMP =	0	CF		
T_V BMP REQ. =	4910	CF		
MIN SURFACE AREA =	2976	SF		
PROPOSED SURFACE AREA =	3809	SF		
INSIDE SOIL MEDIA =	3033	SF		
OUTSIDE SOIL MEDIA =	776	SF	20.37%	OF TOTAL
TOTAL TREATMENT VOLUME PROVIDED =	5004	CF		

*NOTE: 1 FT OF GRAVEL SHOWN FOR Tv(BMP) COMPUTATIONS, DESIGN INCLUDES 4 FT OF GRAVEL FOR SWM PURPOSES.

STORMKEEPER™
STORMWATER CHAMBER

StormKeeper SK75

The StormKeeper SK75 is the highest quality and structurally sound stormwater chamber available on the market and meets the full requirements of ASTM F2418. The StormKeeper family of chambers are designed utilizing the most sophisticated and comprehensive techniques to meet the stringent AASHTO LRFD and ASTM requirements. Intended for use under traffic and nontraffic areas. StormKeeper provides a truly cost-effective and structurally superior system to provide underground stormwater storage saving valuable land and protecting the environment.



StormKeeper SK75
Nominal Dimensions

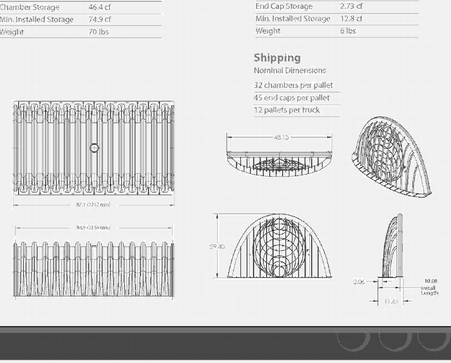
Size (L x W x H)	87.1" x 51.0" x 29.7"
Chamber Storage	46.4 cf
Min. Installed Storage	74.9 cf
Weight	70 lbs

StormKeeper SK75 End Caps
Nominal Dimensions

Size (L x W x H)	11.61" x 48.13" x 29.40"
End Cap Storage	2.79 cf
Min. Installed Storage	12.8 cf
Weight	6 lbs

Shipping
Nominal Dimensions

32 chambers per pallet
45 end caps per pallet
12 pallets per truck



StormKeeper SK75

Volume of Excavation Required Per Chamber

	Stone Foundation Depth		
	6"	12"	18"
StormKeeper SK75	5.8 cy	6.2 cy	6.8 cy

Assumes 6" of separation between chamber rows and 18" of cover.

Storage Volume Per Chamber

	Chamber Volume Only	Chamber and Stone Volume Stone Foundation Depths		
		6"	12"	18"
StormKeeper SK75	46.4 cf	75 cf	87.7 cf	96.4 cf

Assumes porosity of 40% in stone plus the chamber.

Amount of Stone Per Chamber

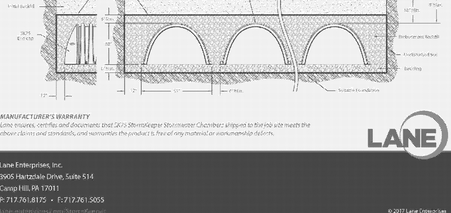
	Stone Foundation Depth		
	6"	12"	18"
StormKeeper SK75	2.6 cy	3.3 cy	3.9 cy

Assumes 6" of stone above and 6" row spacing.

Stage vs. Storage for StormKeeper SK75

Depth (in)	Chamber Volume (cf)	Installed Volume (cf)	Depth (in)	Chamber Volume (cf)	Installed Volume (cf)
0	0.00	0.00	22	32.03	43.86
1	0.09	1.12	23	33.69	45.96
2	0.00	2.24	24	35.30	48.07
3	0.00	3.36	25	36.85	50.12
4	0.09	4.48	26	38.33	52.12
5	0.00	5.60	27	39.74	54.09
6	0.00	6.72	28	41.07	56.01
7	2.23	9.19	29	42.31	57.87
8	4.43	11.62	30	43.45	59.68
9	6.60	14.04	31	44.46	61.40
10	8.75	16.45	32	45.32	63.04
11	10.87	18.84	33	45.93	64.52
12	12.97	21.22	34	46.23	65.83
13	15.03	23.58	35	46.36	67.02
14	17.06	25.92	36	46.16	68.14
15	19.07	28.25	37	46.36	69.26
16	21.04	30.55	38	46.36	70.38
17	22.97	32.83	39	46.16	71.50
18	24.87	35.09	40	46.36	72.62
19	26.72	37.32	41	46.36	73.74
20	28.54	39.53	42	46.36	74.86
21	30.31	41.71			

Assumes a void of 40% in the stone. Based on 6" of stone above and below the chambers. Add another 1.12 cubic feet of storage for each inch of additional stone in the foundation.



MANUFACTURER'S WARRANTY
Lane insures, certifies and documents that ZCG StormKeeper Stormwater Chambers shipped to the site will meet the above claims and standards, and warranties the product is free of any material or workmanship defects.

LANE

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Camp Hill, PA 17011
P: 717.761.8175 • F: 717.761.5055
lane-enterprises.com/StormKeeper

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StormKeeper SK75

Volume of Excavation Required Per Chamber

	Stone Foundation Depth		
	6"	12"	18"
StormKeeper SK75	5.8 cy	6.2 cy	6.8 cy

Assumes 6" of separation between chamber rows and 18" of cover.

Storage Volume Per Chamber

	Chamber Volume Only	Chamber and Stone Volume Stone Foundation Depths		
		6"	12"	18"
StormKeeper SK75	46.4 cf	75 cf	87.7 cf	96.4 cf

Assumes porosity of 40% in stone plus the chamber.

Amount of Stone Per Chamber

	Stone Foundation Depth		
	6"	12"	18"
StormKeeper SK75	2.6 cy	3.3 cy	3.9 cy

Assumes 6" of stone above and 6" row spacing.

Stage vs. Storage for StormKeeper SK75

Depth (in)	Chamber Volume (cf)	Installed Volume (cf)	Depth (in)	Chamber Volume (cf)	Installed Volume (cf)
0	0.00	0.00	22	32.03	43.86
1	0.09	1.12	23	33.69	45.96
2	0.00	2.24	24	35.30	48.07
3	0.00	3.36	25	36.85	50.12
4	0.09	4.48	26	38.33	52.12
5	0.00	5.60	27	39.74	54.09
6	0.00	6.72	28	41.07	56.01
7	2.23	9.19	29	42.31	57.87
8	4.43	11.62	30	43.45	59.68
9	6.60	14.04	31	44.46	61.40
10	8.75	16.45	32	45.32	63.04
11	10.87	18.84	33	45.93	64.52
12	12.97	21.22	34	46.23	65.83
13	15.03	23.58	35	46.36	67.02
14	17.06	25.92	36	46.16	68.14
15	19.07	28.25	37	46.36	69.26
16	21.04	30.55	38	46.36	70.38
17	22.97	32.83	39	46.16	71.50
18	24.87	35.09	40	46.36	72.62
19	26.72	37.32	41	46.36	73.74
20	28.54	39.53	42	46.36	74.86
21	30.31	41.71			

Assumes a void of 40% in the stone. Based on 6" of stone above and below the chambers. Add another 1.12 cubic feet of storage for each inch of additional stone in the foundation.

MANUFACTURER'S WARRANTY
Lane insures, certifies and documents that ZCG StormKeeper Stormwater Chambers shipped to the site will meet the above claims and standards, and warranties the product is free of any material or workmanship defects.

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lane-enterprises.com/StormKeeper

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Per Table 9.4 Bioretention "A" Filter and Basin Design Criteria

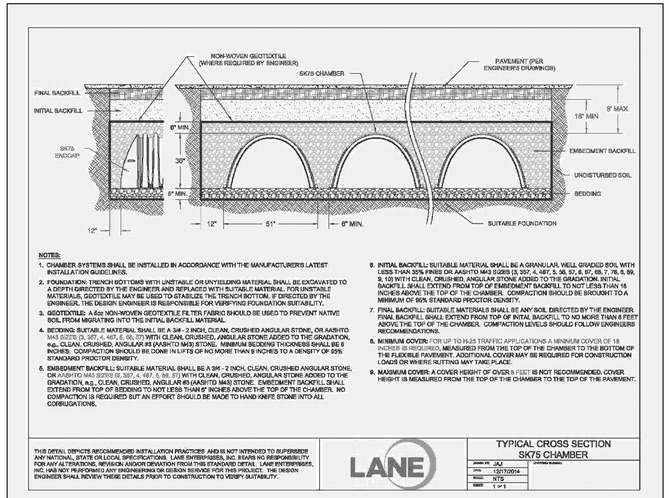
Per Table 9.4 Bioretention Filter and Basin Design Criteria	
Standards: Level 1 Design	
RR: 40 TP:25	
Sizing (Section 6.1)	
Tv_{BMP}=	[(1)(Rv)(A) / 12] + any remaining volume from upstream BMP
Surface Area (sq. ft.) =	Tv_{BMP} /Storage Depth[1]
Recommended max. contributing drainage area =	2.5 acres
Max. Ponding Depth =	6 to 12 inches[2]
Filter Media Depth min. =	24 inches
recommended max. =	48 inches
Media & Surface Cover (Section 6.6) =	supplied by vendor; tested for acceptable phosphorous index (P-index) of between 10 and 30; OR between 7 and 21 mg/kg of P in the soil media
Sub-soil Testing (Section 6.2) =	not needed if an underdrain used; Min. infiltration rate > 1/2 inch/hour in order to remove the underdrain requirement
Underdrain (Section 6.7) =	Schedule 40 PVC with clean-outs
Inflow =	sheetflow, curb cuts, trench drains, concentrated flow, or the equivalent
Geometry (Section 6.3)=	Length of shortest flow/Overall length=0.3 or greater; OR, other design methods used to prevent short-circuiting; a one-cell design (not
Pre-treatment (Section 6.4) =	a pretreatment cell, grass filter strip, gravel diaphragm, gravel flow spreader, or another approved (manufactured) pre-treatment structure
Conveyance & Overflow (Section 6.5)	
Planting Plan (Section 6.8) =	a planting template to include turf, herbaceous vegetation, shrubs, and/or trees to achieve surface area coverage of at least 75% within 2 years.
Building Setbacks[3] (Section 5) =	10 feet if down-gradient from building or level (coastal plain); 50 feet if up-gradient.
Deeded Maintenance O & M Plan (Section 8)	

[1] Storage Depth is the sum of the porosity (η) of the soil media and gravel layers multiplied by their respective depths, plus the surface ponding depth. Refer to Section 6.1.
[2] A ponding depth of 6 inches is preferred. Ponding depths greater than 6 inches will require a specific planting plan to ensure appropriate plant selection (Section 6.8).
[3] There are the recommendations for simple building foundations. If an in-ground basement or other special conditions exist, the design should be reviewed by a licensed engineer. Also, a Special footing or drainage design may be used to justify a reduction of the setbacks noted above.

Provided: Level 1 Design	
RR: 40 TP:25	
Sizing (Section 6.1)	
Surface Area (sq. ft.) =	2143.64 (sq. ft.)
Contributing drainage area =	1.42 acres
Ponding Depth =	6 inches
Filter Media Depth =	24 inches
Media & Surface Cover (Section 6.6) =	Supplied by vendor
Sub-soil Testing (Section 6.2) =	Not Applicable
Underdrain (Section 6.7) =	Schedule 40 PVC with clean-outs
Inflow =	Concentrated flow
Geometry (Section 6.3)=	Other design methods used to prevent short-circuting
Pre-treatment (Section 6.4) =	Gravel Flow Spreader
Conveyance & Overflow (Section 6.5)	
Planting Plan (Section 6.8) =	
Building Setbacks3 (Section 5) =	10 feet if down-gradient from building or level (coastal plain); 50 feet if up-gradient.
Deeded Maintenance O & M Plan (Section 8)	

BIORETENTION "A" DESIGN ELEVATIONS

TOP OF MULCH	396.45	FT
TOP OF BIORETENTION SOIL MEDIA	396.20	FT
TOP OF CHOKING LAYER	394.20	FT
TOP OF GRAVEL	393.95	FT
BOTTOM OF GRAVEL	390.20	FT
STR 2 THROAT ELEVATION	396.95	FT
STR 2 INVERT ELEVATION	390.20	FT
TOP OF EMBANKMENT	398.00	FT
1-YEAR WSE	391.23	FT
2-YEAR WSE	391.46	FT
10-YEAR WSE	392.34	FT



NOTES:
1. CHAMBER SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S LATEST INSTALLATION GUIDELINES.
2. FOUNDATION: TRENCH BOTTOMS WITH UNSTABLE OR UNYIELDING MATERIAL SHALL BE EXCAVATED TO A DEPTH DIRECTED BY THE ENGINEER AND REPLACED WITH SUITABLE MATERIAL. FOR UNSTABLE MATERIALS, GEOTEXTILE MAY BE USED TO STABILIZE THE TRENCH BOTTOM. IF DIRECTED BY THE ENGINEER, THE DESIGN ENGINEER IS RESPONSIBLE FOR VERIFYING FOUNDATION SUITABILITY.
3. GEOTEXTILE: A 6oz NON-WOVEN GEOTEXTILE FILTER FABRIC SHOULD BE USED TO PREVENT NATIVE SOIL FROM MIGRATING INTO THE INITIAL BACKFILL MATERIAL.
4. BEDDING: SUITABLE MATERIAL SHALL BE A 3/4 - 2 INCH, CLEAN, CRUSHED ANGULAR STONE, OR AASHTO M43 SIZERS (3, 357, 4, 467, 5, 56, 57) WITH CLEAN, CRUSHED, ANGULAR STONE ADDED TO THE GRADATION, e.g., CLEAN, CRUSHED, ANGULAR #8 (AASHTO M43) STONE. MINIMUM BEDDING THICKNESS SHALL BE 6 INCHES. COMPACTION SHOULD BE DONE IN LIFTS OF NO MORE THAN 8 INCHES TO A DENSITY OF 95% STANDARD PROCTOR DENSITY.
5. EMBEDMENT BACKFILL: SUITABLE MATERIAL SHALL BE A 3/4 - 2 INCH, CLEAN, CRUSHED ANGULAR STONE, OR AASHTO M43 SIZERS (3, 357, 4, 467, 5, 56, 57) WITH CLEAN, CRUSHED, ANGULAR STONE ADDED TO THE GRADATION, e.g., CLEAN, CRUSHED, ANGULAR #3 (AASHTO M43) STONE. EMBEDMENT BACKFILL SHALL EXTEND FROM TOP OF BEDDING TO NOT LESS THAN 6" INCHES ABOVE THE TOP OF THE CHAMBER. NO COMPACTION IS REQUIRED BUT AN EFFORT SHOULD BE MADE TO HAND KNIFE STONE INTO ALL CORRUGATIONS.
6. INITIAL BACKFILL: SUITABLE MATERIAL SHALL BE A GRANULAR, WELL GRADED SOIL WITH LESS THAN 35% FINES OR AASHTO M43 SIZERS (3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10) WITH CLEAN, CRUSHED, ANGULAR STONE ADDED TO THE GRADATION. INITIAL BACKFILL SHALL EXTEND FROM TOP OF EMBEDMENT BACKFILL TO NOT LESS THAN 18 INCHES ABOVE THE TOP OF THE CHAMBER. COMPACTION SHOULD BE BROUGHT TO A MINIMUM OF 90% STANDARD PROCTOR DENSITY.
7. FINAL BACKFILL: SUITABLE MATERIALS SHALL BE ANY SOIL DIRECTED BY THE ENGINEER. FINAL BACKFILL SHALL EXTEND FROM TOP OF INITIAL BACKFILL TO NO MORE THAN 8 FEET ABOVE THE TOP OF THE CHAMBER. COMPACTION LEVELS SHOULD FOLLOW ENGINEERS RECOMMENDATIONS.
8. MINIMUM COVER: FOR UP TO H-25 TRAFFIC APPLICATIONS A MINIMUM COVER OF 18 INCHES IS REQUIRED, MEASURED FROM THE TOP OF THE CHAMBER TO THE BOTTOM OF THE FLEXIBLE PAVEMENT. ADDITIONAL COVER MAY BE REQUIRED FOR CONSTRUCTION LOADS OR WHERE RUTTING MAY TAKE PLACE.
9. MAXIMUM COVER: A COVER HEIGHT OF OVER 9 FEET IS NOT RECOMMENDED. COVER HEIGHT IS MEASURED FROM THE TOP OF THE CHAMBER TO THE TOP OF THE PAVEMENT.

THIS DETAIL DEPICTS RECOMMENDED INSTALLATION PRACTICES AND IS NOT INTENDED TO SUPERSEDE ANY NATIONAL, STATE OR LOCAL SPECIFICATIONS. LANE ENTERPRISES, INC. STAND NO RESPONSIBILITY FOR ANY ALTERATIONS, REVISION AND/OR DEVIATION FROM THIS STANDARD DETAIL. LANE ENTERPRISES, INC. HAS NOT PERFORMED ANY ENGINEERING OR DESIGN SERVICES FOR THIS PROJECT. THE DESIGN ENGINEER SHALL REVIEW THESE DETAILS PRIOR TO CONSTRUCTION TO VERIFY SUITABILITY.

LANE

TYPICAL CROSS SECTION
SK75 CHAMBER

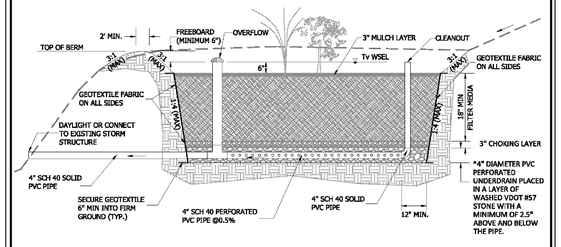
DRAWN BY:	JAJ
DATE:	12/17/2014
SCALE:	NTS
SHEET	1 OF 1

BIORETENTION BASIN MATERIAL SPECIFICATIONS

Material Specifications for Bioretention. The following is the table of material specifications for bioretention basins.

Bioretention Basin Material Specifications

Material	Specification	Notes
Filter Media Composition	Filter Media to contain: • 80%-90% sand with >75% being coarse to very coarse • 10%-20% soil fines • 3%-5% organic matter in the form of plant based compost meeting Clearinghouse Design Specification #4, Section 6.5	The volume of filter media based on 110% of the plan volume, to account for settling or compaction.
Filter Media Testing	Plant available P within Low+ (L+) to Medium (M) per DCR 2014 Nutrient Management Criteria (18-40 mg/kg P for the Mehlich III procedure) and CEC >5	The media can be procured from approved filter media vendors or mixed onsite with testing results meeting standard for both texture and nutrient composition.
Mulch Layer	Use aged, shredded hardwood bark mulch	Lay a 2 to 3 inch layer on the surface of the filter bed.
Geotextile/Liner	Use a non-woven geotextile fabric with a flow rate of > 110 gal./min./sq. ft. (e.g., Geotex 351 or equivalent)	Apply only to the vertical sides and 2' on each side of the underdrain. Do not install at the bottom or between layers.
Choking Layer	3 inch layer of pea gravel or VDOT #8 stone which is laid over the underdrain stone.	
Stone Jacket for Underdrain and/or Storage Layer	1 inch stone should be double-washed and clean and free of all fines (e.g., VDOT #57 stone).	12 inches for the underdrain; 12 to 18 inches for the stone storage layer, if needed
Underdrains, Cleanouts, and Observation Wells	Use 6 inch rigid schedule 40 PVC pipe for bioretention basins, with 3/8-inch perforations at 6 inches on center, maximum of 3 rows of perforations; position each underdrain on a 1% or 2% slope located nor more than 20 feet from the next pipe.	All bioretentions are to have an observation well, cleanout or overflow pipe. Lay the perforated pipe under the length of the bioretention cell, and install non-perforated pipe as needed to connect with the storm drain system. Install T's and Y's as needed, depending on the underdrain configuration. Extend cleanout pipes to the surface with vented caps at the Ts and Ys.
Plant Materials	Tree –minimum 1 inch caliper, 15' on-center. Shrub – minimum 30 inches high, 10' on-center. Perennials/Herbaceous - container-grown at 18-24 inches on center	A planting plan is required such that: For Level 1 designs – there is 75% surface coverage within 2 years For Level 2 designs – there is 90% surface coverage within 2 years



MICRO-BIORETENTION CONSTRUCTION DETAIL
N.T.S.

MICRO-BIORETENTION CONSTRUCTION DETAIL

ARLINGTON VIRGINIA

ARLINGTON COUNTY, VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES
OFFICE OF SUSTAINABILITY AND ENVIRONMENTAL MANAGEMENT

REVISION & DATE

DRAWING NO. SWM # 6

MAINTENANCE STATEMENT

THE PROPOSED BEST MANAGEMENT FACILITIES (BIORETENTION) WILL BE PRIVATELY OWNED AND MAINTAINED. VIRGINIA'S STORMWATER MANAGEMENT REGULATIONS REQUIRE INSPECTIONS TWICE A YEAR, AND AFTER ANY STORM THAT EXCEEDS THE CAPACITY OF THE FACILITY TO ENSURE THAT THE FACILITY REMAINS OPERATIONAL. A DETAILED INSPECTION SHALL BE PERFORMED ANNUALLY BY A QUALIFIED PROFESSIONAL TO ENSURE THAT THE FACILITY IS OPERATING AS DESIGNED, AND TO PROVIDE AN OPPORTUNITY TO SCHEDULE ANY MAINTENANCE THAT THE FACILITY MAY REQUIRE. SEE SHEET 18 FOR MAINTENANCE PROGRAM AND INSPECTION REQUIREMENTS. ADDITIONAL MAINTENANCE REQUIREMENTS CAN BE FOUND IN THE MOST RECENT VERSIONS OF THE VIRGINIA DCR STORMWATER DESIGN SPECIFICATION NO. 9.

ALL BMP'S SHALL BE PRIVATELY MAINTAINED

No.	DATE	DESCRIPTION

REVISIONS

COMMONWEALTH OF VIRGINIA
CLAYTON C. TOCK
Lic. No. 036790
09/28/2018
PROFESSIONAL ENGINEER

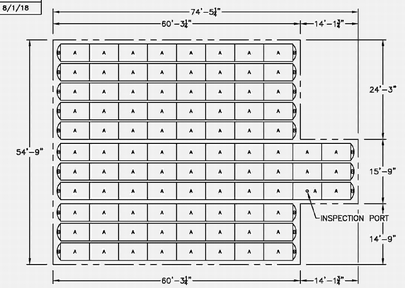
urban™
Planners • Engineers • Landscape Architects • Land Surveyors
Urban, Ltd.
4200 D Technology Ct.
Chantilly Va. 20151
(703)-642-2306
(703)-378-7888
www.urban-engineering.com

ARLINGTON, VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES
BMP DETAILS
UPTON HILL REGIONAL PARK
CIVIL ENGINEERING PLAN
6060 WILSON BLVD, ARLINGTON, VIRGINIA 22205

SCALE: N/A	DESIGNED	CHECKED
SUBMITTED DATE 05-15-18 – 08-08-18 – 09-28-18 –	APPROVED DATE CHIEF TRANSPORTATION PLANNING BUREAU	APPROVED DATE CHIEF TRANSPORTATION ENGINEERING BUREAU
APPROVED DATE CHIEF WATER, SEWER & STREETS DIV.	APPROVED DATE CHIEF ENGINEERING DIVISION	APPROVED DATE DIRECTOR OF ENVIRONMENTAL SERVICES
	APPROVED DATE CPHD PLANNER	APPROVED DATE CPHD LANDSCAPE REVIEWER
	SHEET C.24 OF 45	SP–12928

Urban, Ltd. – a:\JOBS\upton hill park\sp bid set\12928-22-BMP.dwg [bio DETAILS 2 (2)] November 26, 2018 – 12:17pm bbrien

REVISIONS		
NUMBER	REVISED BY	DATE
1	JDS	8/1/18



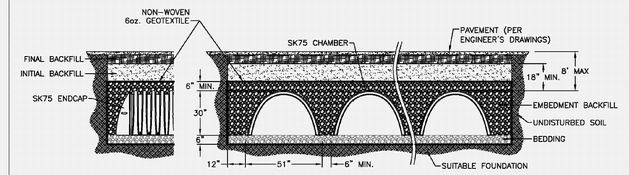
PLAN VIEW

- Chamber shall be Stormkeeper SK75 or approved equal.
- Chamber shall be manufactured from virgin polypropylene resins.
- Chamber and endcaps shall meet or exceed the requirements of ASTM F2418.
- Chambers shall have handles installed in the base to facilitate construction of the system.
- Chambers shall be designed in accordance with ASTM F2787, "Standard Practice for Structural Design of Thermoplastic Corrugated Wall Stormwater Collection Chambers."
- Rows of Chambers shall be continuous, unobstructed internal space with no internal support panels.
- The structural design of the chambers, backfill, and installation requirements shall ensure that the load factors specified in AASHTO LRFD Bridge design specifications, section 12.12 are met.
- Only chambers that are approved by the Engineer shall be allowed.
- Chambers shall be produced at an ISO 9001 certified manufacturing facility.
- All design specifications for chambers shall be in accordance with the manufacturer's latest design guidelines.
- The installation of the chambers shall be in accordance with the manufacturer's latest installation guidelines.

BILL OF MATERIALS		
MARK	DESCRIPTION	NO. REQUIRED
A	Lane SK75 Chamber	94
B	Lane SK75 End Cap	22

UPTON HILL PARK
ARLINGTON COUNTY, VA
SK75 CHAMBER SYSTEM
LANE ENTERPRISES, INC.

SCALE: 1/16" = 1'
DRAWN BY: JDS
DATE: 4/20/18
DRAWING NUMBER: B7098
PAGE: 1 OF 5



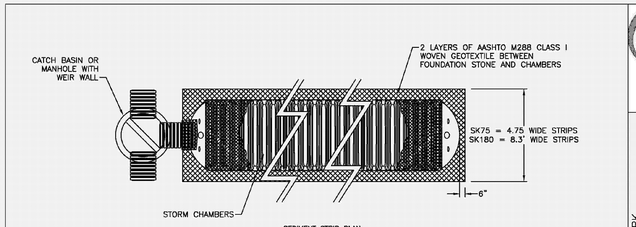
NOTES:

1. CHAMBER SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S LATEST INSTALLATION GUIDELINES.
2. FOUNDATION: TRENCH BOTTOMS WITH UNSTABLE OR UNYIELDING MATERIAL SHALL BE EXCAVATED TO A DEPTH DIRECTED BY THE ENGINEER AND REPLACED WITH SUITABLE MATERIAL. FOR UNSTABLE MATERIALS, GEOTEXTILE MAY BE USED TO STABILIZE THE TRENCH BOTTOM, IF DIRECTED BY THE ENGINEER. THE DESIGN ENGINEER IS RESPONSIBLE FOR VERIFYING FOUNDATION SUITABILITY.
3. GEOTEXTILE: A 6oz NONWOVEN GEOTEXTILE FILTER FABRIC SHOULD BE USED TO PREVENT NATIVE SOIL FROM MIGRATING INTO THE INITIAL BACKFILL MATERIAL.
4. BEDDING: SUITABLE MATERIAL SHALL BE A 3/4" – 2 INCH, CLEAN, CRUSHED ANGULAR STONE, OR AASHTO M43 SIZES (3, 357, 4, 467, 5, 56, 57) WITH CLEAN, CRUSHED, ANGULAR STONE ADDED TO THE GRADATION, e.g., CLEAN, CRUSHED, ANGULAR #3 (AASHTO M43) STONE. MINIMUM BEDDING THICKNESS SHALL BE 6 INCHES. COMPACTION SHOULD BE DONE IN LIFTS OF NO MORE THAN 9 INCHES TO A DENSITY OF 95% STANDARD PROCTOR DENSITY.
5. EMBEDMENT BACKFILL: SUITABLE MATERIAL SHALL BE A 3/4" – 2 INCH, CLEAN, CRUSHED ANGULAR STONE, OR AASHTO M43 SIZES (3, 357, 4, 467, 5, 56, 57) WITH CLEAN, CRUSHED, ANGULAR STONE ADDED TO THE GRADATION, e.g., CLEAN, CRUSHED, ANGULAR #3 (AASHTO M43) STONE. EMBEDMENT BACKFILL SHALL EXTEND FROM TOP OF BEDDING TO NOT LESS THAN 6" INCHES ABOVE THE TOP OF THE CHAMBER. NO COMPACTION IS REQUIRED BUT AN EFFORT SHOULD BE MADE TO HAND KNIFE STONE INTO ALL CORRUGATIONS.
6. INITIAL BACKFILL: SUITABLE MATERIAL SHALL BE A GRANULAR, WELL GRADED SOIL WITH LESS THAN 35% FINES OR AASHTO M43 SIZES (3, 357, 4, 467, 5, 56, 57, 5, 67, 68, 7, 78, 8, 89, 9, 10) WITH CLEAN, CRUSHED, ANGULAR STONE ADDED TO THE GRADATION. INITIAL BACKFILL SHALL EXTEND FROM TOP OF EMBEDMENT BACKFILL TO NOT LESS THAN 18 INCHES ABOVE THE TOP OF THE CHAMBER. COMPACTION SHOULD BE BROUGHT TO A MINIMUM OF 95% STANDARD PROCTOR DENSITY.
7. FINAL BACKFILL: SUITABLE MATERIALS SHALL BE ANY SOIL DIRECTED BY THE ENGINEER FINAL BACKFILL SHALL EXTEND FROM TOP OF INITAL BACKFILL TO NO MORE THAN 8 FEET ABOVE THE TOP OF THE CHAMBER. COMPACTION LEVELS SHOULD FOLLOW ENGINEERS RECOMMENDATIONS.
8. MINIMUM COVER: FOR UP TO H-25 TRAFFIC APPLICATIONS A MINIMUM COVER OF 18 INCHES IS REQUIRED, MEASURED FROM THE TOP OF THE CHAMBER TO THE BOTTOM OF THE FLEXIBLE PAVEMENT. ADDITIONAL COVER MAY BE REQUIRED FOR CONSTRUCTION LOADS OR WHERE RUTTING MAY TAKE PLACE.
9. MAXIMUM COVER: A COVER HEIGHT OF OVER 8 FEET IS NOT RECOMMENDED. COVER HEIGHT IS MEASURED FROM THE TOP OF THE CHAMBER TO THE TOP OF THE PAVEMENT.

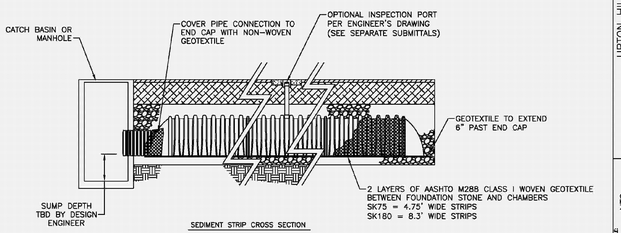
THIS DETAIL DEPICTS RECOMMENDED INSTALLATION PRACTICES AND IS NOT INTENDED TO SUPERSEDE ANY NATIONAL, STATE OR LOCAL SPECIFICATIONS. LANE ENTERPRISES, INC. BEARS NO RESPONSIBILITY FOR ANY ALTERATIONS, REVISION AND/OR DEVIATION FROM THIS STANDARD DETAIL. LANE ENTERPRISES, INC. HAS NOT PERFORMED ANY ENGINEERING OR DESIGN SERVICE FOR THIS PROJECT. THE DESIGN ENGINEER SHALL REVIEW THESE DETAILS PRIOR TO CONSTRUCTION TO VERIFY SUITABILITY.

UPTON HILL PARK
ARLINGTON COUNTY, VA
SK75 CHAMBER SYSTEM
LANE ENTERPRISES, INC.

SCALE: NTS
DRAWN BY: JDS
DATE: 4/20/18
DRAWING NUMBER: B7098
PAGE: 2 OF 5



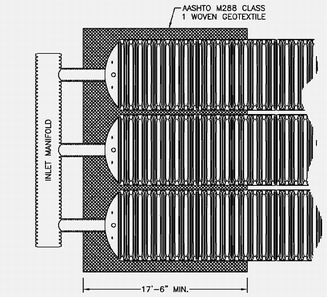
SEDIMENT STRIP PLAN



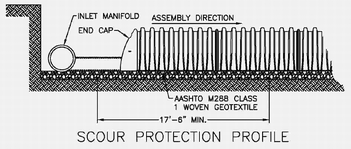
SEDIMENT STRIP CROSS SECTION

UPTON HILL PARK
ARLINGTON COUNTY, VA
SK75 CHAMBER SYSTEM
LANE ENTERPRISES, INC.

SCALE: NTS
DRAWN BY: JDS
DATE: 4/20/18
DRAWING NUMBER: B7098
PAGE: 3 OF 5



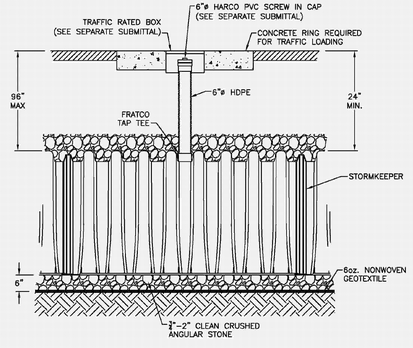
SCOUR PROTECTION



SCOUR PROTECTION PROFILE

UPTON HILL PARK
ARLINGTON COUNTY, VA
SK75 CHAMBER SYSTEM
LANE ENTERPRISES, INC.

SCALE: NTS
DRAWN BY: JDS
DATE: 4/20/18
DRAWING NUMBER: B7098
PAGE: 4 OF 5



UPTON HILL PARK
ARLINGTON COUNTY, VA
SK75 CHAMBER SYSTEM
LANE ENTERPRISES, INC.

SCALE: NTS
DRAWN BY: JDS
DATE: 4/20/18
DRAWING NUMBER: B7098
PAGE: 5 OF 5

General O&M Guide for Underground Storm Water Storage Systems

Regularly scheduled inspection and proper maintenance will help ensure underground stormwater storage systems function as designed. After the construction project is closed it is the responsibility of the owner to maintain all stormwater conveyance, storage and treatment in accordance with local, county, state or federal requirements. Moreover, it shall be the responsibility of the owner or their agent to research and implement applicable safety, hazard, and health regulations; and obtain the necessary approvals, consents or permits from applicable agencies, private land owners, or public road authorities.

This technical bulletin provides suggested guidelines for inspection and maintenance activities. The frequency of these activities is site specific and ultimately based upon documented findings over time. Factors affecting frequency include but are not limited to the following: large storm events, extended dry/wet periods, upstream conditions, groundcover establishment, site activity, and the presence of any temporary or permanent water quality treatment measures upstream of the underground storage system.

Installations require frequent inspections initially while vegetation is being re-established and soil erosion control measures remain in place. Well maintained soil erosion controls are critical in mitigating the potential for sediment infiltration. During construction it shall be the responsibility of the owner's engineer to determine acceptable sediment accumulations before cleaning procedures are required. Trash and debris shall be removed as discovered.

It should be recognized by all concerned parties that the manufacturer is not the authority on inspection and maintenance procedures, and that these guidelines represent a starting point for a more detailed and relevant plan to be developed through experience.

Perform the following tasks monthly and after major storm events while the soil erosion control permit is open, the site is under construction, or vegetation has not been completely re-established:

- Inspect and document sediment, trash and debris build-up. Remove accumulations as necessary.
- If applicable, inspect and document sediment, trash and debris build-up in pre-treatment devices. Remove accumulations as necessary.
- Ensure inlet and outlet structures are freely flowing and free of debris and sediment build-up.
- Inspect ground surface above system for depressions or sinkholes which should be immediately addressed with the contractor upon discovery.
- Note signs of pollution such as oil sheens, discolored water, unpleasant odors.
- Check for proper operation of flow control devices, control gates, valves or other mechanical devices (including pre-treatment devices)

Once site construction is complete, all disrupted areas restored, and vegetation completely re-established, the above items may serve as a baseline maintenance routine, along with any other actions that may have been incorporated into the initial protocol during the construction phase. The frequency of these operations shall be based upon experience gained during the earlier phase and increased until a desired equilibrium is attained. Documented activities noting the date, sediment accumulations, previous significant storm events, et al, will enable better discretion in this regard.

Sediment removal can be managed manually by bucketing and hoisting. However, this operation is more efficiently managed through the use of sewer cleaning equipment such as a vactor truck.

The foregoing relates inspection and maintenance efforts that help ensure underground systems used for stormwater storage continue to function as intended by identifying some regular inspection and maintenance practices and frequencies.

Lane Enterprises, Inc.
3905 Hartzdale Dr. Suite 514
Camp Hill, PA 17011
717.761.8175
www.lane-enterprises.com

ALL BMP'S SHALL BE PRIVATELY MAINTAINED

No.	DATE	DESCRIPTION

REVISIONS

COMMONWEALTH OF VIRGINIA
CLAYTON C. TOCK
Lic. No. 036790
09/28/2018
PROFESSIONAL ENGINEER

urban
Planners · Engineers · Landscape Architects · Land Surveyors
Urban, Ltd.
4200 D Technology Ct.
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(703)-642-2306
(703)-378-7888
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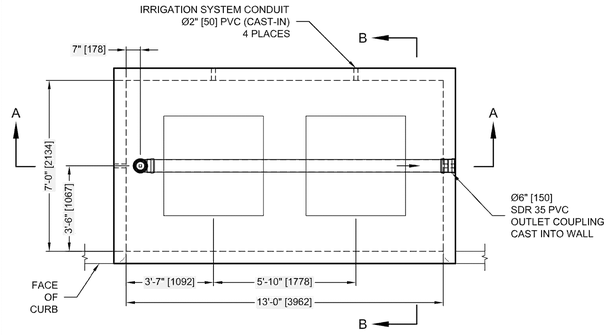
ARLINGTON, VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES
BMP DETAILS
UPTON HILL REGIONAL PARK
CIVIL ENGINEERING PLAN
6060 WILSON BLVD, ARLINGTON, VIRGINIA 22205

SCALE: N/A	DESIGNED	CHECKED
SUBMITTED DATE 05-15-18 – 08-08-18 – 09-28-18 –	APPROVED DATE CHIEF TRANSPORTATION PLANNING BUREAU	APPROVED DATE CHIEF TRANSPORTATION ENGINEERING BUREAU
APPROVED DATE CHIEF WATER, SEWER & STREETS DIV.	APPROVED DATE CHIEF ENGINEERING DIVISION	APPROVED DATE DIRECTOR OF ENVIRONMENTAL SERVICES
	APPROVED DATE CPHD PLANNER	APPROVED DATE CPHD LANDSCAPE REVIEWER
	SHEET C.24AOF 45	SP-12928

Urban, Ltd. – J:\JOBS\upton hill park\sp bid set\12928-22-BMP.dwg [bio DETAILS 2 (3)] November 26, 2018 – 12:17pm bbrien

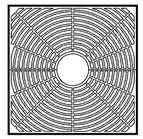


PLAN VIEW

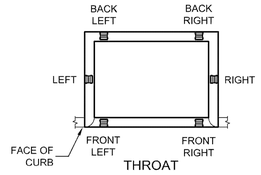
FILTERRA DESIGN NOTES

THE FILTERRA TREATMENT CAPACITY IS DETERMINED BY THE TREATMENT RATE OF THE FILTERRA MEDIA. A SEPARATE INLET STRUCTURE MUST BE INSTALLED DOWNSTREAM OF THE OFFLINE FILTERRA TO CONVEY FLOWS IN EXCESS OF THE SYSTEM DESIGN CAPACITY. SEE THE FILTERRA DESIGN, OPERATION, AND PERFORMANCE GUIDE FOR MORE INFORMATION.

Ø 7" x 8" [178 x 203]
CLEANOUT
(ACTUAL PRODUCT MAY VARY)
N.T.S.



48" x 48" [1219 x 1219]
TREE GRATE
(ACTUAL PRODUCT MAY VARY)
N.T.S.



OUTFLOW PIPE ORIENTATION OPTIONS

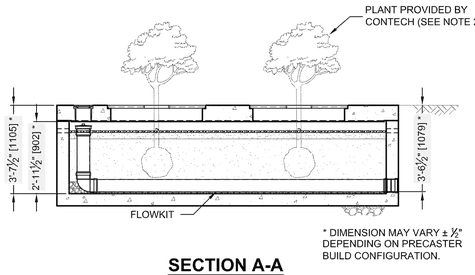
ORIENTATION REFERENCE IS INLET THROAT

SITE SPECIFIC DATA REQUIREMENTS

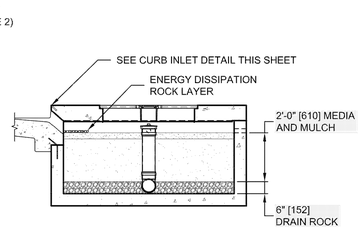
STRUCTURE ID			*
SYSTEM TREATMENT CAPACITY (CFS / l/s)			*
WATER QUALITY FLOW RATE (CFS / l/s)			*
PEAK FLOW RATE (CFS / l/s)			*
RETURN PERIOD OF PEAK FLOW (YRS)			*
REQUIRED MEDIA INFILTRATION RATE			*
PIPE DATA:	I.E.	MATERIAL	DIAMETER
OUTLET PIPE	*	SCH 40 PVC	4"
CURB OPENING ORIENTATION			*
TOP OF CURB ELEVATION			*
ANTI-FLOTATION BALLAST IF REQUIRED		WIDTH *	HEIGHT *

NOTES/SPECIAL REQUIREMENTS:

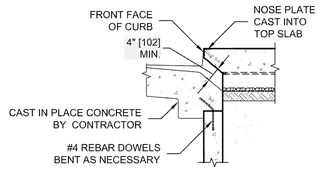
* PER ENGINEER OF RECORD



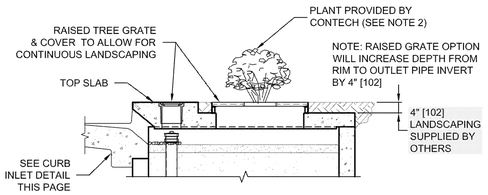
SECTION A-A



SECTION B-B



CURB INLET DETAIL



OPTIONAL RECESSED TOP SLAB DETAIL

(TYPICAL TOP SLAB DETAIL SHOWN IN SECTION B-B)

GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. PLANT, MULCH, AND DISSIPATION ROCK ARE SUPPLIED BY CONTECH AND DELIVERED AT TIME OF SYSTEM ACTIVATION. PLANT SELECTION SHALL BE DONE BY THE ENGINEER OF RECORD IN ACCORDANCE WITH THE PROJECT PLANS AND SPECIFICATIONS.
3. DIMENSIONS MARKED WITH ( ) ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
4. FOR SITE SPECIFIC DRAWINGS WITH DETAILED VAULT DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH REPRESENTATIVE. www.ContechES.com
5. FILTERRA WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
6. STRUCTURE DESIGNED FOR PEDESTRIAN LIVE LOAD WITH H5 (4,000 LBS.) WHEEL LOAD MOUNTING THE CURB AND ADJACENT HS-2 LIVE LOAD SURCHARGE ON THE WALLS ON THE STRUCTURE.
7. FILTERRA STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C-857, ASTM C-918, AND ACI-318 LOAD FACTOR DESIGN METHOD.

INSTALLATION NOTES
A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE FILTERRA VAULT (LIFTING CLUTCHES PROVIDED). SPREADER BAR WITH SUFFICIENT CABLE IS REQUIRED FOR SAFETY AND REDUCTION OF DAMAGE TO CONCRETE STRUCTURE.
C. CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL VAULT SECTIONS AND ASSEMBLE VAULT.
D. CONTRACTOR TO PROVIDE AND INSTALL OUTLET PIPE. PVC COUPLING CAST-IN TO WALL FOR OUTLET PIPE CONNECTION.
E. CONTRACTOR TO SUPPLY AND INSTALL INLET PROTECTION BAR IF REQUIRED BY LOCAL JURISDICTION.
F. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO PROTECT FILTERRA MEDIA BAY FROM CONSTRUCTION-RELATED EROSION RUNOFF.
G. CONTECH IS RESPONSIBLE FOR ACTIVATION OF THE SYSTEM AND PLANTING OF THE PLANT THAT IS SPECIFIED. ACTIVATION ONLY OCCURS WHEN THE SITE IS FULLY STABILIZED, FINAL PAVEMENT INSTALLED AND SWEPT CLEAN OF CONSTRUCTION SEDIMENT.
H. ALL FILTERRA UNITS MUST BE WATERED BY IRRIGATION LINES OR SPRINKLER SYSTEMS ON A REGULAR BASIS. EACH FILTERRA UNIT INCLUDES IRRIGATION HOLES FOR NEW OR EXISTING IRRIGATION LINES.

filterra®
THIS PRODUCT MAY BE PROTECTED BY ONE OR MORE OF THE FOLLOWING U.S. PATENTS: 6,277,270; 6,569,321; 7,425,262; 7,470,291; 7,816,412; RELATED FOREIGN PATENTS.

CONTECH® ENGINEERED SOLUTIONS LLC
www.ContechES.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

FILTERRA 13x7 OFFLINE STANDARD
LONG SIDE INLET
MODEL: FT1307

CONTECH® ENGINEERED SOLUTIONS — WQv-Based Sizing per VADEQ Regulations

filterra

Project Name:	Upton Hill		
Site Designation:	Filterra	**Date:**	11/13/18
County or Independent City:	Arlington	**Design Engineer:**	JLW
State:	VA		

Annual Rainfall (inches)	43
Target Rainfall Event, P (inches)	1.00

Volume from Upstream Runoff Reduction Practice to BMP:

	Remaining Volume from Upstream RR Practice (cf)	Runoff Coefficient (R_v)	Effective Area (ac)
Managed Turf	0	0	0.00
Impervious Cover	0	0.95	0.00

Volume from Additional Credit Area to BMP:

	Treatment Volume from Untreated Credit Area (cf)	Runoff Coefficient (R_v)	Effective Area (ac)
Managed Turf	73	0.25	0.08
Impervious Cover	897	0.95	0.26

Total Volume to be Treated	969	cf
Total Effective Area to be Treated	0.34	ac
Composite Rv	0.79	

Filterra Sizing

Configuration Type	Standard Offline
Model Name	7x13 or 13x7

ALL BMP'S SHALL BE PRIVATELY MAINTAINED

No.	DATE	DESCRIPTION

REVISIONS

COMMONWEALTH OF VIRGINIA
CLAYTON C. TOCK
Lic. No. 036790
09/28/2018
PROFESSIONAL ENGINEER

urban™
Planners · Engineers · Landscape Architects · Land Surveyors
Urban, Ltd.
4200 D Technology Ct.
Chantilly Va. 20151
(703)-642-2306
(703)-378-7888
www.urban-engineering.com

ARLINGTON, VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES

BMP DETAILS
UPTON HILL REGIONAL PARK
CIVIL ENGINEERING PLAN
6060 WILSON BLVD, ARLINGTON, VIRGINIA 22205

SCALE: N/A	DESIGNED	CHECKED
SUBMITTED DATE – 05-15-18 – 08-08-18 – 09-28-18	APPROVED DATE CHIEF TRANSPORTATION PLANNING BUREAU	APPROVED DATE CHIEF TRANSPORTATION ENGINEERING BUREAU
APPROVED DATE CHIEF WATER, SEWER & STREETS DIV.	APPROVED DATE CHIEF ENGINEERING DIVISION	APPROVED DATE DIRECTOR OF ENVIRONMENTAL SERVICES
	APPROVED DATE CPHD PLANNER	APPROVED DATE CPHD LANDSCAPE REVIEWER
	SHEET C.24BOF 45	SP-12928

Urban, Ltd. – k:\JOBS\upton hill park\sp bid set\12928-22-BMP.dwg [FILTERRA] November 26, 2018 – 12:17pm hbrien

POINT OF CONFLUENCE
OUTFALL#1
TOTAL DA AT POINT A
=88.70 AC

ADDITIONAL OFFSITE DA
X-SECTION =2.94 AC
=80

STUDY POINT "A"
TOTAL DA = 26.61 AC
=67

CHANNEL FLOW

CHANNEL FLOW

CHANNEL FLOW

SHALLOW CONCENTRATED FLOW

SHEET FLOW

LIMIT OF ANALYSIS
(MAJOR FLOODPLAIN)

LEGEND

DRAINAGE DIVIDES

No.	DATE	DESCRIPTION
		REVISIONS

COMMONWEALTH OF VIRGINIA
CLAYTON C. TOCK
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ARLINGTON, VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES

OUTFALL ANALYSIS

UPTON HILL REGIONAL PARK
CIVIL ENGINEERING PLAN

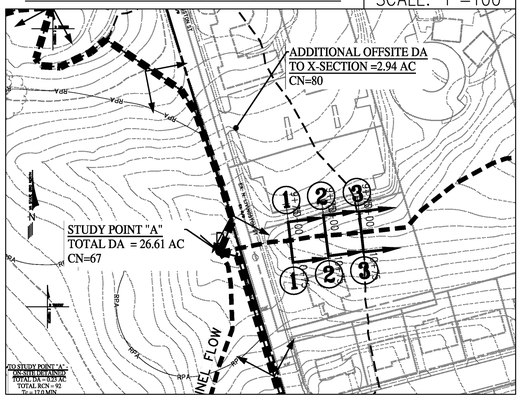
6060 WILSON BLVD, ARLINGTON, VIRGINIA 22205

SCALE: 1"=100'	DESIGNED	CHECKED
SUBMITTED DATE 11-21-18 05-15-18 – 08-08-18 – 09-28-18 –	APPROVED DATE CHIEF TRANSPORTATION PLANNING BUREAU	APPROVED DATE CHIEF TRANSPORTATION ENGINEERING BUREAU
APPROVED DATE CHIEF WATER, SEWER & STREETS DIV.	APPROVED DATE CHIEF ENGINEERING DIVISION	APPROVED DATE DIRECTOR OF ENVIRONMENTAL SERVICES
	APPROVED DATE CPHD PLANNER	APPROVED DATE CPHD LANDSCAPE REVIEWER
	SHEET C.25 OF 62	SP-12928

Urban, Ltd. – J:\JOBS\upton hill park\sp bid set\12928-23-OUTFALL.dwg [C.25 OUTFALL ANALYSIS] November 26, 2018 – 12:18pm bbrien

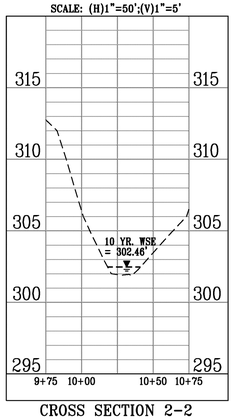
OUTFALL – STUDY POINT "A"

SCALE: 1"=100'



CROSS SECTION 1-1

SCALE: (H)1"=50';(V)1"=5'



POST DEVELOPMENT CONDITIONS:

CROSS SECTION 1-1
DA = 3.43 (ONSITE) + 26.12 (OFFSITE) = 29.55 AC.
CN = VARIES (SEE SHEET C.25)
P2 = 3.15 IN
P10 = 4.84 IN
Tc = 17.0 (SEE THIS SHEET)

Q2(TOTAL) = 16.74 CFS (SEE THIS SHEET)
Q10(TOTAL) = 48.65 CFS (SEE THIS SHEET)

CHANNEL
SLOPE = 3.91%

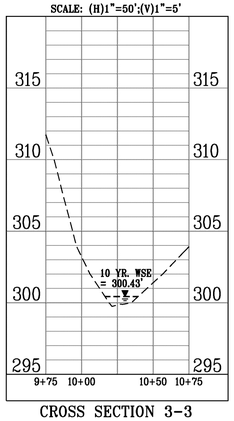
n' = 0.035 DENSE WEEDS (EARTH, WINDING AND SLUGGISH APPENDIX 7D-1 VDOT DRAINAGE MANUAL)

V2= 3.38 FPS
D10= 0.59 FT.

V2allow= 4.0 FPS (A-1-B MIXTURES PER TABLE 7D-2, VDOT DRAINAGE MANUAL)

CROSS SECTION 2-2

SCALE: (H)1"=50';(V)1"=5'



POST DEVELOPMENT CONDITIONS:

CROSS SECTION 2-2
DA = 3.43 (ONSITE) + 26.12 (OFFSITE) = 29.55 AC.
CN = VARIES (SEE SHEET C.25)
P2 = 3.15 IN
P10 = 4.84 IN
Tc = 17.0 (SEE THIS SHEET)

Q2(TOTAL) = 16.74 CFS (SEE THIS SHEET)
Q10(TOTAL) = 48.65 CFS (SEE THIS SHEET)

CHANNEL
SLOPE = 3.91%

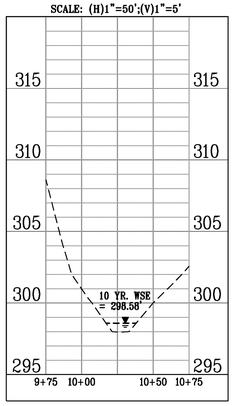
n' = 0.035 DENSE WEEDS (EARTH, WINDING AND SLUGGISH APPENDIX 7D-1 VDOT DRAINAGE MANUAL)

V2= 3.43 FPS
D10= 0.69 FT.

V2allow= 4.0 FPS (A-1-B MIXTURES PER TABLE 7D-2, VDOT DRAINAGE MANUAL)

CROSS SECTION 3-3

SCALE: (H)1"=50';(V)1"=5'



POST DEVELOPMENT CONDITIONS:

CROSS SECTION 3-3
DA = 3.43 (ONSITE) + 26.12 (OFFSITE) = 29.55 AC.
CN = VARIES (SEE SHEET C.25)
P2 = 3.15 IN
P10 = 4.84 IN
Tc = 17.0 (SEE THIS SHEET)

Q2(TOTAL) = 16.74 CFS (SEE THIS SHEET)
Q10(TOTAL) = 48.65 CFS (SEE THIS SHEET)

CHANNEL
SLOPE = 3.91%

n' = 0.035 DENSE WEEDS (EARTH, WINDING AND SLUGGISH APPENDIX 7D-1 VDOT DRAINAGE MANUAL)

V2= 3.58 FPS
D10= 0.62 FT.

V2allow= 4.0 FPS (A-1-B MIXTURES PER TABLE 7D-2, VDOT DRAINAGE MANUAL)

OVERALL OUTFALL NARRATIVE: STUDY POINT "A" (CHANNEL AND FLOOD PROTECTION)

STUDY POINT A CONSISTS OF THE TWO ONSITE AREAS WITH A TOTAL DRAINAGE AREA OF 3.43 ACRES AND AND OFFSITE AREA OF 23.18 ACRES. CURRENTLY, STUDY POINT "A" DOES NOT EXPERIENCE LOCALIZED FLOODING OR EROSION.

CROSS-SECTION 1-1, 2-2, 3-3

THE AREA TO CROSS-SECTIONS 1, 2, AND 3 CONSISTS OF 3.43 ACRES OF ONSITE AREA AND 26.12 ACRES OF OFFSITE AREA WITH A COMBINED DRAINAGE AREA OF 29.55 ACRES AND A COMBINED CURVE NUMBER OF 68. OUTFALL AREA IS COLLECTED BY AN OPEN CHANNEL SYSTEM TO EAST OF THE SUBJECT SITE, BEGINNING JUST WEST OF N. LIVINGSTON ST. AND CONTINUING IN AN EASTERLY DIRECTION TOWARD FOUR MILE RUN, DISCHARGING INTO A 100 YEAR MAPPED FLOODPLAIN.

AS SHOWN ON THIS SHEET, THE 10 YEAR STORM IS FULLY CONVEYED WITHIN EACH CHANNEL CROSS SECTION AS THE 10-YEAR FLOW HAS BEEN GREATLY REDUCED DUE TO THE EXPANDED CHAMBER SYSTEM. FURTHER, THE 2 YEAR STORM DOES NOT CAUSE ENOUGH EROSIVE VELOCITIES WHICH EXCEEDS THE ALLOWABLE PERMISSIBLE VELOCITY FOR EACH CHANNEL.

THEREFORE IT IS THE OPINION OF URBAN-LTD THAT AN ADEQUATE OUTFALL EXISTS AND NO FURTHER ANALYSIS IS REQUIRED.

Clayton Tock

URBAN LTD.
CLAYTON C. TOCK, P.E., PRINCIPAL DATE 11/21/2018

POST-DEVELOPMENT OUTFLOW SUMMARIES

SEE SHEET #### #####
FOR BIORETENTION AND PAVERS 2YR AND 10YR OUTFLOWS

2-year Cross-Section Total Summary

Inflow Area = 1,237,017 sf,16.04% Impervious, Inflow Depth = 0.73" for 2 yr Storm event
Inflow = 16.74 cfs @ 12.13 hrs , Volume= 75,395 cf
Primary = 16.74 cfs @ 12.13 hrs , Volume= 75,395 cf, Atten= 0%, Lag= 0.0 min
Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

10-year Cross-Section Total Summary

Inflow Area = 1,235,579 sf, 15.94% Impervious, Inflow Depth = 1.74" for 10 yr Storm event
Inflow = 48.65 cfs @ 12.11 hrs, Volume= 179,186 cf
Primary = 48.65 cfs @ 12.11 hrs, Volume= 179,186 cf, Atten= 0%, Lag= 0.0 min
Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

DRAINAGE SHED TO POINT "A"

Post Development OFFSITE UNDETAINED AREA Runoff Calculations - Point "A"
Curve Number Calculations

Area (ac)	CN	Description
1.330	61	>75% Grass cover, Good, HSG B
1.865	98	Paved parking, HSG B
16.230	55	Woods, Good, HSG B
0.970	80	>75% Grass cover, Good, HSG D
0.350	98	Paved parking, HSG D
1.280	77	Woods, Good, HSG D
22.025	62	Weighted Average

Time of Concentration Calculations

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	100	0.1208	0.16		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.15"
5.6	574	0.1170	1.71		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.9	322	0.0527	6.13	248.88	Channel Flow, Area= 40.6 sf Perim= 81.4' r= 0.50' n= 0.035 Earth, dense weeds
17.0	996	Total			

2 Year Flow Calculations

Runoff = 8.52 cfs @ 12.14 hrs , Volume= 36,758 cf , Depth= 0.46"
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 yr Storm Rainfall=3.15"

10 Year Flow Calculations

Runoff = 32.98 cfs @ 12.11 hrs , Volume= 107,187 cf , Depth= 1.34"
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 yr Storm Rainfall=4.84"

Post Development OFFSITE DETAINED Runoff Calculations - Point "A"

SEE SHEET #### #####

Post Development ONSITE DETAINED Runoff Calculations - Point "A"

SEE SHEET #### #####

Post Development ONSITE UNDETAINED Runoff Calculations - Point "A"

SEE SHEET #### #####

DRAINAGE SHED TO CROSS-SECTIONS

Post Development OFFSITE UNDETAINED AREA Runoff Calculations - X-S
Curve Number Calculations

Area (ac)	CN	Description
1.393	61	>75% Grass cover, Good, HSG B
0.984	98	Paved parking, HSG B
0.000	55	Woods, Good, HSG B
0.095	80	>75% Grass cover, Good, HSG D
0.472	98	Paved parking, HSG D
0.000	77	Woods, Good, HSG D
2.944	80	Weighted Average

Time of Concentration Calculations

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	100	0.1208	0.16		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.15"
5.6	574	0.1170	1.71		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.9	322	0.0527	6.13	248.88	Channel Flow, Area= 40.6 sf Perim= 81.4' r= 0.50' n= 0.035 Earth, dense weeds
17.0	996	Total			

2 Year Flow Calculations

Runoff = 4.81 cfs @ 12.10 hrs , Volume= 14,572 cf , Depth= 1.36"
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 yr Storm Rainfall=3.15"

10 Year Flow Calculations

Runoff = 9.79 cfs @ 12.09 hrs , Volume= 29,428 cf , Depth= 2.75"
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 yr Storm Rainfall=4.84"

No.	DATE	DESCRIPTION

REVISIONS

COMMONWEALTH OF VIRGINIA
CLAYTON C. TOCK
Lic. No. 036790
11/21/2018
PROFESSIONAL ENGINEER

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ARLINGTON, VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES

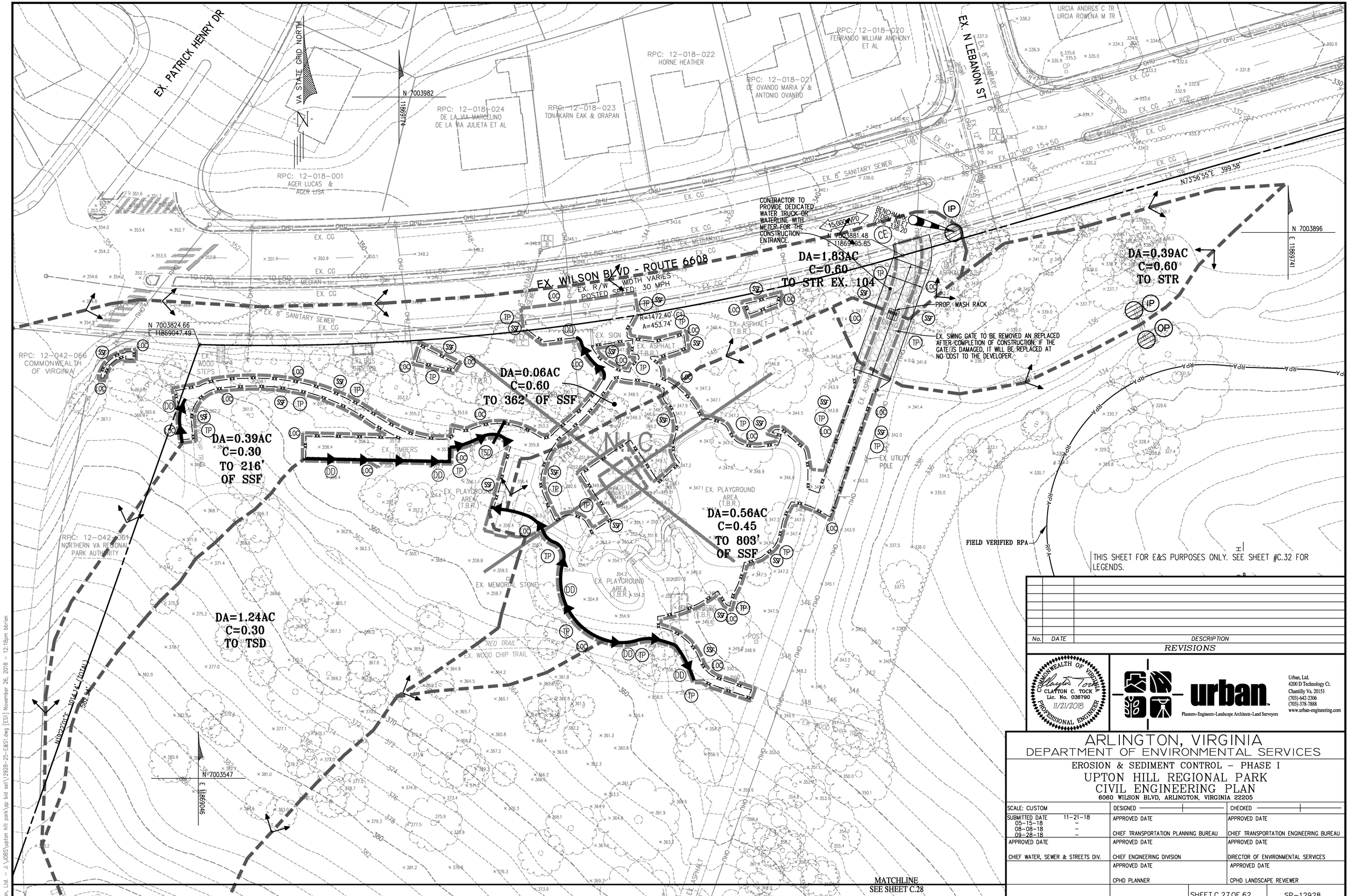
OUTFALL ANALYSIS

UPTON HILL REGIONAL PARK
CIVIL ENGINEERING PLAN

6060 WILSON BLVD, ARLINGTON, VIRGINIA 22205

SCALE: 1"=30'	DESIGNED	CHECKED
SUBMITTED DATE 11-21-18 05-15-18 – 08-08-18 – 09-28-18 –	APPROVED DATE CHIEF TRANSPORTATION PLANNING BUREAU	APPROVED DATE CHIEF TRANSPORTATION ENGINEERING BUREAU
APPROVED DATE CHIEF WATER, SEWER & STREETS DIV.	APPROVED DATE CHIEF ENGINEERING DIVISION	APPROVED DATE DIRECTOR OF ENVIRONMENTAL SERVICES
	APPROVED DATE CPHD PLANNER	APPROVED DATE CPHD LANDSCAPE REVIEWER

Urban, Ltd. – J:\JOBS\upton hill park\sp bid set\12928-23-OUTFALL.dwg [OUT ANLYS TO STUDY PT. A] November 26, 2018 – 12:18pm bbrien



No.	DATE	DESCRIPTION
		REVISIONS

COMMONWEALTH OF VIRGINIA
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ARLINGTON, VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES

EROSION & SEDIMENT CONTROL – PHASE I

UPTON HILL REGIONAL PARK
CIVIL ENGINEERING PLAN

6060 WILSON BLVD, ARLINGTON, VIRGINIA 22205

SCALE: CUSTOM	DESIGNED	CHECKED
SUBMITTED DATE 11-21-18 05-15-18 – 08-08-18 – 09-28-18 –	APPROVED DATE CHIEF TRANSPORTATION PLANNING BUREAU	APPROVED DATE CHIEF TRANSPORTATION ENGINEERING BUREAU
APPROVED DATE CHIEF WATER, SEWER & STREETS DIV.	APPROVED DATE CHIEF ENGINEERING DIVISION	APPROVED DATE DIRECTOR OF ENVIRONMENTAL SERVICES
	APPROVED DATE CPHD PLANNER	APPROVED DATE CPHD LANDSCAPE REVIEWER
	SHEET C.27 OF 62	SP-12928

Urban, Ltd. – g:\JOBS\upton hill park\sp bid set\12928-25-E&S1.dwg [ES1] November 26, 2018 – 12:18pm tbrien

MATCHLINE
SEE SHEET C.27

VA STATE GRID NORTH

N 7003435
E 11868824

N 7003437
E 11869559

RPC: 12-042-103
NORTHERN VA REGIONAL
PARK AUTHORITY
PARCEL B
DB. 1808 PG. 253
23.41613 ACRES

N.I.C.

CONTRACTOR TO PROVIDE DEDICATED WATER TRUCK OR WATERLINE WITH METER FOR THE CONSTRUCTION ENTRANCE.

PROP. WASH RACK

EX. BATTING CAGE

DA=0.06AC
C=0.60
TO 93' OF SSF

DA=0.25AC
C=0.60
TO 493'
OF SSF

DA=2.40AC
C=0.60
TO EX. POND

DA=0.09AC
C=0.60
TO 72'
OF SSF

DA=0.08AC
C=0.60
TO 137'
OF SSF

DA=0.20AC
C=0.60
TO 82' OF SSF

N 7003275.08
E 11868854.31

PIN: 0513 18 E
SCA-SPE LLC
DB. 23671 PG. 1646

ARLINGTON COUNTY (APPROXIMATE)
FAIRFAX COUNTY (APPROXIMATE)

N19°22'01"E 1014.14' (TOTAL)
431.59'

N45°57'40"W
440.11'

S19°22'20"W
48.64'

N 7002969.14
E 11869170.69

247.71'
296.35' (TOTAL)

PIN: 0514-01-0001
NORTHERN VA REGIONAL
PARK AUTHORITY
PARCEL A
DB. 3764 PG. 55
3.11833 ACRES

RPC: 12-042-106
SAINT ALBANS HOUSING
HARTLAND BANK
DB. 3860 PG. 1232

N 7002956
E 11868810

THIS SHEET FOR E&S PURPOSES ONLY. SEE SHEET #C.32 FOR LEGENDS.

No.	DATE	DESCRIPTION
		REVISIONS

CLAYTON C. TOCK
Lic. No. 036790
11/21/2018
COMMONWEALTH OF VIRGINIA
PROFESSIONAL ENGINEER

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ARLINGTON, VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES

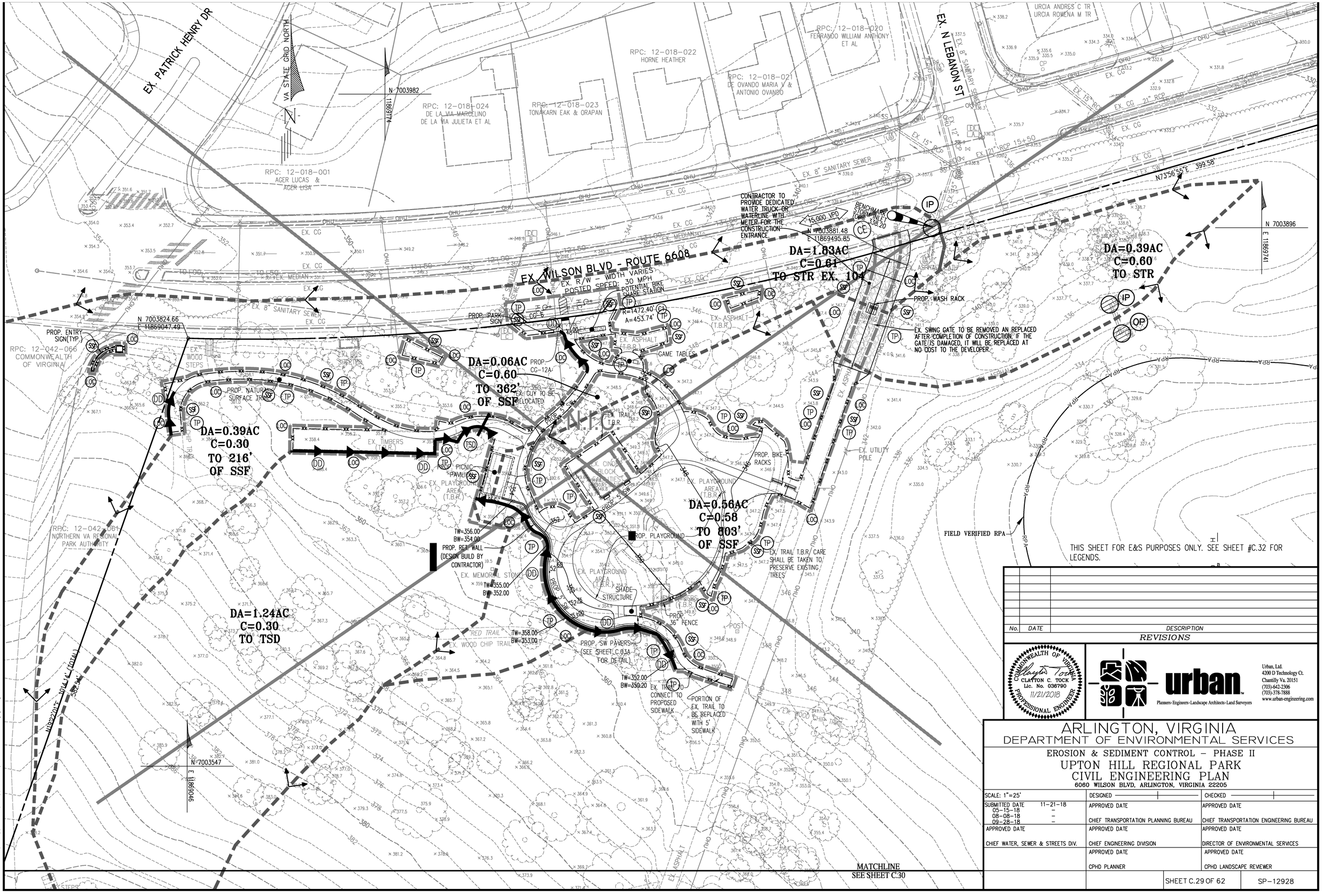
EROSION & SEDIMENT CONTROL – PHASE I

UPTON HILL REGIONAL PARK
CIVIL ENGINEERING PLAN

6060 WILSON BLVD, ARLINGTON, VIRGINIA 22205

SCALE: Custom	DESIGNED	CHECKED
SUBMITTED DATE 11-21-18 05-15-18 – 08-08-18 – 09-28-18 –	APPROVED DATE CHIEF TRANSPORTATION PLANNING BUREAU	APPROVED DATE CHIEF TRANSPORTATION ENGINEERING BUREAU
APPROVED DATE CHIEF WATER, SEWER & STREETS DIV.	APPROVED DATE CHIEF ENGINEERING DIVISION	APPROVED DATE DIRECTOR OF ENVIRONMENTAL SERVICES
	APPROVED DATE CPHD PLANNER	APPROVED DATE CPHD LANDSCAPE REVIEWER
	SHEET C.28 OF 62	SP-12928

Urban, Ltd. – J:\JOBS\upton hill park\sp bid set\12928-25-E&SI.dwg [ESI (2)] November 26, 2018 – 3:25pm bbrien



THIS SHEET FOR E&S PURPOSES ONLY. SEE SHEET #C.32 FOR LEGENDS.

No.	DATE	DESCRIPTION

REVISIONS

COMMONWEALTH OF VIRGINIA
CLAYTON C. TOCK
Lic. No. 036790
11/21/2018
PROFESSIONAL ENGINEER

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ARLINGTON, VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES

EROSION & SEDIMENT CONTROL – PHASE II

UPTON HILL REGIONAL PARK
CIVIL ENGINEERING PLAN

6060 WILSON BLVD, ARLINGTON, VIRGINIA 22205

SCALE: 1"=25'	DESIGNED	CHECKED
SUBMITTED DATE 11-21-18 05-15-18 – 08-08-18 – 09-28-18 –	APPROVED DATE CHIEF TRANSPORTATION PLANNING BUREAU	APPROVED DATE CHIEF TRANSPORTATION ENGINEERING BUREAU
APPROVED DATE CHIEF WATER, SEWER & STREETS DIV.	APPROVED DATE CHIEF ENGINEERING DIVISION	APPROVED DATE DIRECTOR OF ENVIRONMENTAL SERVICES
	APPROVED DATE CPHD PLANNER	APPROVED DATE CPHD LANDSCAPE REVIEWER
	SHEET C.29 OF 62	SP-12928

Urban, Ltd. – I:\JOBS\upton hill park\sp bid set\12928-27-E&S2.dwg [ES 2] November 26, 2018 – 12:19pm bbrien

VA STATE GRID NORTH

N 7003435
E 11868824

N 7003437
E 11868559
MATCHLINE
SEE SHEET C.29

RPC: 12-042-103
NORTHERN VA REGIONAL
PARK AUTHORITY
PARCEL B
DB. 1808 PG. 253
23.41613 ACRES

N.I.C.

DA=0.59AC
C=0.90
TO EX STR

DA=0.21AC
C=0.38
TO 607'
OF SSF

DA=1.59AC
C=0.72
TO BIORETENTION

DA=0.43AC
C=0.80
TO 237'
OF SSF

DA=0.23AC
C=0.81
TO
PREVIOUS
PAVERS

CONTRACTOR TO PROVIDE IRRIGATED WATER TRUCK OR HOSE DOWN FROM WATERLINE WITH METER FOR THE CONSTRUCTION ENTRANCE.

PROP. WASH RACK

PROP. TICKET BOOTH

PROP. WOODEN DECK

PROP. RET. WALL (DESIGN BUILD BY CONTRACTOR)

PROP. HANDRAIL (DESIGN BUILD BY CONTRACTOR)

PROP. ROPE COURSE OF SSF

PROP. PERFORATED UNDERDRAIN (TYP.)

CONTRACTOR TO STABILIZE EX. CHANNEL WITH RIP RAP OR OTHER MEANS AS DETERMINED BY THE SITE INSPECTOR

PROP. 9.5' RIP RAP

N 7003275.08
E 11868854.31

TO BE CUT BACK

AREA OF MILLING/PAVING/STRIPING CONSIDERED MAINTENANCE AND NOT DISTURBED AREA

PIN: 0513 18 E
SCA-SPE LLC
DB. 23671 PG. 1646

PROP. FLOW SPREADER PRETREATMENT (SEE SHEET C.23 FOR DETAIL)

PROP. 13'X7' FILTERRA

PROP. WHEEL STOP (TYP.)

PROP. 12" OVERFLOW PIPE (TYP.)

PROP. OBSERVATION WELL/CLEANOUT (TYP.)

PROP. 15" STANDPIPE

PROP. 8" PVC

REMOVE AND RELOCATE EX. BOLLARD SEE DETAIL SHEET C.02

PROP. BOLLARD

PROP. CLEANOUT

PROP. CHAMBERS

PROP. PERVIOUS PAVERS

PROP. LIGHTS (TYP.)

PROP. CROSS WALK

EX. PIPE TO BE ABANDONED

PROP. DROP OFF

EX. 6" WATER LINE TO BE RAISED TO PROPOSED ELEVATION (SEE SHEET C.03A FOR DETAIL)

PROP. 4' TRAIL RELOCATION

EX. 6' CHAIN LINK WITH BARBED WIRE

EX. BUILDING

EX. MINI GOLF

EX. WATER PARK / EX. WOOD DECK

EX. ASPHALT PARKING AREA

EX. BATTING CAGE

EX. CHAIN LINK FENCE

EX. TIMBERS

EX. WOOD CHIP TRAIL

"YELLOW TRAIL"

OHU

N19°22'01"E 1014.14' (TOTAL)
431.59'

N45°17'40"W
440.11'

S19°22'20"W
48.64'

247.71'
296.35' (TOTAL)

BENCHMARK
CAN MH
TOP=399.63
PROP. 42.6' 8" PVC

PIN: 0514-01-0001
NORTHERN VA REGIONAL
PARK AUTHORITY
PARCEL A
DB. 3764 PG. 55
3.11833 ACRES

N 7002956
E 11868810

N 7002969.14
E 11869170.69

RPC: 12-042-106
SAINT ALBANS HOUSING
HARTLAND BANK
DB. 3860 PG. 1232

THIS SHEET FOR E&S PURPOSES ONLY. SEE SHEET #C.32 FOR LEGENDS.

No.	DATE	DESCRIPTION
		REVISIONS

COMMONWEALTH OF VIRGINIA
CLAYTON C. TOCK
Lic. No. 036790
11/21/2018
PROFESSIONAL ENGINEER

urban
Planners-Engineers-Landscape Architects-Land Surveyors
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ARLINGTON, VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES

EROSION & SEDIMENT CONTROL – PHASE II

UPTON HILL REGIONAL PARK
CIVIL ENGINEERING PLAN

6060 WILSON BLVD, ARLINGTON, VIRGINIA 22205

SCALE: 1"=25'	DESIGNED	CHECKED
SUBMITTED DATE 11-21-18 05-15-18 – 08-08-18 – 09-28-18 –	APPROVED DATE CHIEF TRANSPORTATION PLANNING BUREAU	APPROVED DATE CHIEF TRANSPORTATION ENGINEERING BUREAU
APPROVED DATE CHIEF WATER, SEWER & STREETS DIV.	APPROVED DATE CHIEF ENGINEERING DIVISION	APPROVED DATE DIRECTOR OF ENVIRONMENTAL SERVICES
	APPROVED DATE CPHD PLANNER	APPROVED DATE CPHD LANDSCAPE REVIEWER
	SHEET C.30 OF 62	SP-12928

Urban, Ltd. – J:\JOBS\upton hill park\sp bid set\12928-27-E&S2.dwg [ES 2 (2)] November 26, 2018 – 3:24pm bbrien

VIRGINIA EROSION AND SEDIMENT CONTROL MINIMUM STANDARDS

4VAC50-30-40. MINIMUM STANDARDS

AN EROSION AND SEDIMENT CONTROL PROGRAM ADOPTED BY A DISTRICT OR LOCALITY MUST BE CONSISTENT WITH THE FOLLOWING CRITERIA, TECHINQUES AND METHODS.

1. PERMANENT OR TEMPORARY SOIL STABILIZATION SHALL BE APPLIED TO DENUDED AREAS WITHIN SEVEN DAYS AFTER FINAL GRADE IS REACHED ON ANY PORTION OF THE SITE. TEMPORARY SOIL STABILIZATION SHALL BE APPLIED WITHIN SEVEN DAYS TO DENUDED AREAS THAT MAY NOT BE AT FINAL GRADE BUT WILL REMAIN DORMANT FOR LONGER THAN 30 DAYS. PERMANENT STABILIZATION SHALL BE APPLIED TO AREAS THAT ARE TO BE LEFT DORMANT FOR MORE THAN ONE YEAR.

2. DURING CONSTRUCTION OF THE PROJECT, SOIL STOCKPILES AND BORROW AREAS SHALL BE STABILIZED OR PROTECTED WITH SEDIMENT TRAPPING MEASURES. THE APPLICANT IS RESPONSIBLE FOR THE TEMPORARY PROTECTION AND PERMANENT STABILIZATION OF ALL SOIL STOCKPILES ON SITE AS WELL AS BORROW AREAS AND SOIL INTENTIONALLY TRANSPORTED FROM THE PROJECT SITE.

3. A PERMANENT VEGETATIVE COVER SHALL BE ESTABLISHED ON DENUDED AREAS NOT OTHERWISE PERMANENTLY STABILIZED. PERMANENT VEGETATION SHALL NOT BE CONSIDERED ESTABLISHED UNTIL A GROUND COVER IS ACHIEVED THAT IS UNIFORM, MATURE ENOUGH TO SURVIVE AND WILL INHIBIT EROSION.

4. SEDIMENT BASINS AND TRAPS, PERIMETER DIKES, SEDIMENT BARRIERS AND OTHER MEASURES INTENDED TO TRAP SEDIMENT SHALL BE CONSTRUCTED AS A FIRST STEP IN ANY LAND-DISTURBING ACTIVITY AND SHALL BE MADE FUNCTIONAL BEFORE UPSTREAM LAND DISTURBANCE TAKES PLACE.

5. STABILIZATION MEASURES SHALL BE APPLIED TO EARTHEN STRUCTURES SUCH AS DAMS, DIKES AND DIVERSIONS IMMEDIATELY AFTER INSTALLATION.

6. SEDIMENT TRAPS AND SEDIMENT BASINS SHALL BE DESIGNED AND CONSTRUCTED BASED UPON THE TOTAL DRAINAGE AREA TO BE SERVED BY THE TRAP OR BASIN.

A. THE MINIMUM STORAGE CAPACITY OF A SEDIMENT TRAP SHALL BE 134 CUBIC YARDS PER ACRE OF DRAINAGE AREA AND THE TRAP SHALL ONLY CONTROL DRAINAGE AREAS LESS THAN THREE ACRES.
B. SURFACE RUNOFF FROM DISTURBED AREAS THAT IS COMPRISED OF FLOW FROM DRAINAGE AREAS GREATER THAN OR EQUAL TO THREE ACRES SHALL BE CONTROLLED BY A SEDIMENT BASIN. THE MINIMUM STORAGE CAPACITY OF A SEDIMENT BASIN SHALL BE 134 CUBIC YARDS PER ACRE OF DRAINAGE AREA. THE OUTFALL SYSTEM SHALL, AT A MINIMUM, MAINTAIN THE STRUCTURAL INTEGRITY OF THE BASIN DURING A TWENTY-FIVE YEAR STORM OF 24-HOUR DURATION. RUNOFF COEFFICIENTS USED IN RUNOFF CALCULATIONS SHALL CORRESPOND TO A BARE EARTH CONDITION OR THOSE CONDITIONS EXPECTED TO EXIST WHILE THE SEDIMENT BASIN IS UTILIZED.

7. CUT AND FILL SLOPES SHALL BE DESIGNED AND CONSTRUCTED IN A MANNER THAT WILL MINIMIZE EROSION. SLOPES THAT ARE FOUND TO BE ERODING EXCESSIVELY WITHIN ONE YEAR OF PERMANENT STABILIZATION SHALL BE PROVIDED WITH ADDITIONAL SLOPES STABILIZING MEASURES UNTIL THE PROBLEM IS CORRECTED.

8. CONCENTRATED RUNOFF SHALL NOT FLOW DOWN CURT OR FILL SLOPES UNLESS CONTAINED WITHIN AN ADEQUATE TEMPORARY OR PERMANENT CHANNEL, FLUME OR SLOPE DRAIN STRUCTURE.

9. WHENEVER WATER SEEPS FROM A SLOPE FACE, ADEQUATE DRAINAGE OR OTHER PROTECTION SHALL BE PROVIDED.

10. ALL STORM SEWER INLETS THAT ARE MADE OPERABLE DURING CONSTRUCTION SHALL BE PROTECTED SO THAT SEDIMENT-LADEN WATER CANNOT ENTER THE CONVEYANCE SYSTEM WITHOUT FIRST BEING FILTERED OR OTHERWISE TREATED TO REMOVE SEDIMENT.

11. BEFORE NEWLY CONSTRUCTED STORMWATER CONVEYANCE CHANNELS OR PIPES ARE MADE OPERATIONS., ADEQUATE OUTLET PROTECTION AND ANY REQUIRED TEMPORARY OR PERMANENT CHANNEL LINING SHALL BE INSTALLED IN BOTH THE CONVEYANCE CHANNEL AND RECEIVING CHANNEL.

12. WHEN WORK IN A LIVE WATERCOURSE IS PERFORMED, PRECAUTIONS SHALL BE TAKEN TO MINIMIZE ENCROACHMENT, CONTROL SEDIMENT TRANSPORT AND STABILIZE THE WORK AREA TO THE GREATEST EXTENT POSSIBLE DURING CONSTRUCTION. NONERODIBLE MATERIAL SHALL BE USED FOR THE CONSTRUCTION OF CAUSEWAYS AND COFFERDAMS. EARTHEN FILL MAY BE USED FOR THESE STRUCTURES IF ARMORED BY NONERODIBLE COVER MATERIALS.

11. WHEN A LIVE WATERCOURSE MUST BE CROSSED BY CONSTRUCTION VEHICLES MORE THAN TWICE IN ANY SIX-MONTH PERIOD, A TEMPORARY VEHICULAR STREAM CROSSING CONSTRUCTED OF NONERODIBLE MATERIAL SHALL BE PROVIDED.

14. ALL APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS PERTAINING TO WORKING IN OR CROSSING LIVE WATERCOURSES SHALL BE MET.

15. THE BED AND BANKS OF A WATER COURSE SHALL BE STABILIZED IMMEDIATELY AFTER WORK IN THE WATERCOURSE IS COMPLETED.

16. UNDERGROUND UTILITY LINES SHALL BE INSTALLED IN ACCORDANCE WITH THE FOLLOWING STANDARDS IN ADDITION TO OTHER APPLICABLE CRITERIA:

A. NO MORE THAN 500 LINEAR FEET OF TRENCH MAY BE OPENED AT ONE TIME.
B. EXCAVATED MATERIAL SHALL BE PLACED ON THE UPHILL SIDE OF TRENCHES.
C. EFFLUENT FROM DEWATERING OPERATIONS SHALL BE FILTERED OR PASSED THROUGH AN APPROVED SEDIMENT TRAPPING DEVICE, OR BOTH, AND DISCHARGED IN A MANNER THAT DOES NOT ADVERSELY AFFECT FLOWING STREAMS OR OFF-SITE PROPERTY.
D. MATERIAL USED FOR BACKFILLING TRENCHES SHALL BE PROPERLY COMPACTED IN ORDER TO MINIMIZE EROSION AND PROMOTE STABILIZATION.
E. RESTABILIZATION SHALL BE ACCOMPLISHED IN ACCORDANCE WITH THESE REGULATIONS.
F. APPLICABLE SAFETY REGULATIONS SHALL BE COMPLIED WITH.

17. WHERE CONSTRUCTION VEHICLE ACCESS ROUTES INTERSECT PAVED OR PUBLIC ROADS, PROVISIONS SHALL BE MADE TO MINIMIZE THE TRANSPORT OF SEDIMENT BY VEHICULAR TRACKING ONTO THE PAVED SURFACE. WHERE SEDIMENT IS TRANSPORTED ONTO A PAVED OR PUBLIC ROAD SURFACE, THE ROAD SURFACE SHALL BE CLEANED THOROUGHLY AT THE END OF EACH DAY. SEDIMENT SHALL BE REMOVED FROM THE ROADS BY SHOVELING OR SWEEPING AND TRANSPORTED TO A SEDIMENT CONTROL DISPOSAL AREA. STREET WASHING SHALL BE ALLOWED ONLY AFTER SEDIMENT IS REMOVED IN THIS MANNER. THIS PROVISION SHALL APPLY TO INDIVIDUAL DEVELOPMENT LOTS AS WELL AS TO LARGERLAND-DISTURBING ACTIVITIES.

18. ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL BE REMOVED WITHIN 30 DAYS AFTER FINAL SITE STABILIZATION OR AFTER THE TEMPORARY MEASURES ARE NO LONGER NEEDED, UNLESS OTHERWISE AUTHORIZED BY THE LOCAL PROGRAM AUTHORITY. TRAPPED SEDIMENT AND THE DISTURBED SOIL AREAS RESULTING FROM THE DISPOSITION OF TEMPORARY MEASURES SHALL BE PERMANENTLY STABILIZED TO PREVENT FURTHER EROSION AND SEDIMENTATION.

19. PROPERTIES AND WATERWAYS DOWNSTREAM FROM DEVELOPMENT SITES SHALL BE PROTECTED FROM SEDIMENT DEPOSITION, EROSION AND DAMAGE DUE TO INCREASES IN VOLUME, VELOCITY AND PEAK FLOW RATE OF STORMWATER RUNOFF FOR THE STATED FREQUENCY STORM OF 24-HOUR DURATION IN ACCORDANCE WITH THE FOLLOWING STANDARDS AND CRITERIA:

A. CONCENTRATED STORMWATER RUNOFF LEAVING A DEVELOPMENT SITES SHALL BE DISCHARGED DIRECTLY INTO AN ADEQUATE NATURAL OR MAN-MADE RECEIVING CHANNEL, PIPE OR STORM SEWER SYSTEMS. FOR THOSE SITES WHERE RUNOFF IS DISCHARGED INTO A PIPE OR SYSTEM, DOWNSTREAM STABILITY ANALYSIS AT THE OUTFALL OF THE PIPE OR PIPE SYSTEM SHALL BE PERFORMED.
B. ADEQUACY OF ALL CHANNELS AND PIPES SHALL BE VERIFIED IN THE FOLLOWING MANNER:
(1). THE APPLICANT SHALL DEMONSTRATE THAT THE TOTAL DRAINAGE AREA TO THE POINT OF ANALYSIS WITHIN THE CHANNEL IS ONE HUNDRED TIMES GREATER THAN THE CONTRIBUTING DRAINAGE AREA OF THE PROJECT IN QUESTION: OR
(2). (A) NATURAL CHANNELS SHALL BE ANALYZED BY THE USE OF A TWO-YEAR STORM TO VERIFY THAT STORMWATER WILL NOT OVERTOP CHANNEL BANKS NOR CAUSE EROSION OF CHANNEL BED OR BANKS; AND
(A) ALL PREVIOUSLY CONSTRUCTED MAN-MADE CHANNELS SHALL BE ANALYZED BY THE USE OF A TEN-YEAR STORM TO VERIFY THAT STORMWATER WILL NOT OVERTOP ITS BANKS AND BY THE USE OF A TWO-YEAR STORM TO DEMONSTRATE THAT STROMWATER WILL NOT CAUSE EROSION OF CHANNEL BED OR BANKS; AND
(B)PIPES AND STORM SYSTEMS SHALL BE ANALYZED BY THE USE OF A TEN-YEAR STORM TO VERIFY THAT STORMWATER WILL BE CONTAINED WITHIN THE PIPE OR SYSTEM.
C. IF EXISTING NATURAL RECEIVING CHANNELS OR PREVIOUSLY CONSTRUCTED MAN-MADE CHANNELS OR PIPES ARE NOT ADEQUATE, THE APPLICANT SHALL:
(1) IMPROVE THE CHANNEL TO A CONDITION WHERE A TEN-YEAR STORM WILL NOT OVERTOP THE BANKS AND A TWO-YEAR STORM WILL NOT CAUSE EROSION TO THE CHANNEL BED OR BANKS; OR
(2) IMPROVE THE PIPE OR PIPE SYSTEM TO A CONDITION WHERE THE TEN-YEAR STORM IS CONTAINED WITHIN THE APPURTENANCES; OR
(3) DEVELOP A SITE DESIGN THAT WILL NOT CAUSE THE PRE-DEVELOPMENT PEAK RUNOFF RATE FROM A TWO-YEAR STORM TO INCREASE WHEN RUNOFF OUTFALLS INTO A NATURAL CHANNEL OR WILL NOT CAUSE THE PRE-DEVELOPMENT PEAK RUNOFF RATE FROM A TEN-YEAR STORM TO INCREASE WHEN RUNOFF OUTFALLS INTO A MAN-MADE CHANNEL;
(4) PROVIDE A COMBINATION OF CHANNEL IMPROVEMENT, STORMWATER DETENTION OR OTHER MEASURES WHICH IS SATISFACTORY TO THE PLAN-APPROVING AUTHORITY TO PREVENT DOWNSTREAM EROSION.
D. THE APPLICANT SHALL PROVIDE EVIDENCE OF PERMISSION TO MAKE THE IMPROVEMENTS.
E. ALL HYDROLOGIC ANALYSIS SHALL BE BASED ON THE EXISTING WATERSHED CHARACTERISTICS AND THE ULTIMATE DEVELOPMENT OF THE SUBJECT PROJECT.
F. IF THE APPLICANT CHOOSES AN OPTION THAT INCLUDES STORMWATER DETENTION HE SHALL OBTAIN APPROVAL FROM THE LOCALITY OF A PLAN FOR MAINTENANCE OF THE DETENTION FACILITIES. THE PLAN SHALL SET FORTH THE MAINTENANCE REQUIREMENTS OF THE FACILITY AND THE PERSON RESPONSIBLE FOR PERFORMING THE MAINTENANCE.
G. OUTFALL FROM A DETENTION FACILITY SHALL BE DISCHARGED TO A RECEIVING CHANNEL, AND ENERGY DISSIPATERS SHALL BE PLACED AT THE OUTFALL OF ALL DETENTION FACILITIES AS NECESSARY TO PROVIDE A STABILIZED TRANSITION FROM THE FACILITY TO THE RECEIVING CHANNEL.
H. ALL ON-SITE CHANNELS MUST BE VERIFIED TO BE ADEQUATE.
I. INCREASED VOLUMES OF SHEET FLOWS THAT MAY CAUSE EROSION OR SEDIMENTATION ON ADJACENT PROPERTY SHALL BE DIVERTED TO A STABLE OUTLET, ADEQUATE CHANNEL, PIPE OR PIPE SYSTEM, OR TO A DETENTION FACILITY.
J. IN APPLYING THESE STORMWATER RUNOFF CRITERIA, INDIVIDUAL LOTS OR PARCELS IN A RESIDENTIAL, COMMERCIAL OR INDUSTRIAL DEVELOPMENT SHALL NOT BE CONSIDERED TO BE SEPARATE DEVELOPMENT PROJECTS. INSTEAD, THE DEVELOPMENT, AS A WHOLE, SHALL BE CONSIDERED TO BE A SINGLE DEVELOPMENT PROJECT. HYDROLOGIC PARAMETERS THAT REFLECT THE ULTIMATE DEVELOPMENT CONDITIONS SHALL BE USED IN ALL ENGINEERING CALCULATIONS.
K. ALL MEASURES USED TO PROTECT PROPERTIES AND WATERWAYS SHALL BE EMPLOYED IN A MANNER WHICH MINIMIZES IMPACTS ON THE PHYSICAL, CHEMICAL AND BIOLOGICAL INTEGRITY OF RIVERS, STREAMS AND OTHER WATERS OF THE STATE.

EROSION AND SILTATION CONTROL NARRATIVE:

PROJECT DESCRIPTION:
THE SUBJECT SITE IS LOCATED AT 6060 WILSON BLVD IN ARLINGTON, VA 20190. THE PROJECT CONSISTS OF THE ADDITION OF A PARKING LOT AND MINOR IMPROVEMENTS. THE TOTAL DISTURBED AREA WILL BE 3.09 ACRES.

EXISTING SITE CONDITIONS:
THE SITE IS A PUBLIC PARK AND PARKING LOTS. THE AREA WITHIN THE PROPOSED DEVELOPMENT IS WOODLAND. THERE ARE NO EXISTING WETLANDS ON SITE. THE EXISTING SLOPE OF THE SITE DOES NOT EXCEED 3:1.

ADJACENT AREAS:
TO THE NORTH OF THE SITE IS WILSON BLVD. TO THE WEST THERE ARE EXISTING RESIDENTIAL APARTMENTS. TO THE SOUTH OF THE SITE IS OCEAN DUNES WATERPARK. TO THE EAST OF THE SITE THERE ARE EXISTING SINGLE FAMILY HOMES.

OFFSITE AREAS:
NO OFF-SITE LAND DISTURBING ACTIVITIES ARE EXPECTED TO OCCUR. ANY OFFSITE BORROW, WASTE OR SURPLUS AREAS WILL REQUIRE A SEPARATE PLAN AND PERMIT APPROVED BY THE RELEVANT LOCAL, STATE AND FEDERAL BODIES.

SOILS:
REFER TO SHEET C.03 FOR MAPPING AND LISTING OF SOIL TYPES ON THE SITE.

CRITICAL AREAS:
NO CRITICAL SLOPES (GREATER THAN 3:1) EXIST ON THIS SITE.

PROPOSED TREE SAVE AREA:
ANY TREE OUTSIDE THE LIMITS OF CLEARING AND GRADING SHALL REMAIN UNDISTURBED UNLESS DIRECTLY INSTRUCTED BY THE COUNTY INSPECTOR.

EROSION CONTROL/GENERAL LAND CONSERVATION NOTES:
NO DISTURBED AREA THAT IS NOT ACTIVELY BEING WORKED SHALL REMAIN DENUDED FOR MORE THAN 7 CALENDAR DAYS. TEMPORARY COVER BY SEEDING OR MULCHING SHALL BE PROVIDED ON ANY AREAS THAT WILL BE EXPOSED FOR A PERIOD GREATER THAN 7 DAYS BEFORE PERMANENT STABILIZATION CAN BE ACHIEVED. PERMANENT COVER SHOULD BE PROVIDED, BY MEANS OF PLACEMENT OF NEW CONCRETE OR ASPHALT SURFACE, AS SOON AS POSSIBLE IN THE AREA SUBJECT TO DISTURBANCE.

SEDIMENT CONTROL:
MINIMIZATION AND CONTROL OF SEDIMENT SHALL BE ACCOMPLISHED THROUGH RAPID STABILIZATION OF THE DISTURBED AREA AND THE INSTALLATION OF MECHANICAL DEVICES, INCLUDING INLET PROTECTION, AND A TEMPORARY AREA FOR THE WASHING OF CONSTRUCTION VEHICLES PRIOR TO THEIR LEAVING THE SITE, IF NECESSARY. BECAUSE OF THE NATURE OF THE PROPOSED CONSTRUCTION, OCCURRENCES OF CONTSTRUCTION VEHICLES WORKING WITHIN OR PASSING THROUGH DENUDED SOIL AREAS SHOULD BE EXTREMELY LIMITED, SINCE COMPLETION OF MUCH OF THE CONSTRUCTION SHOULD BE POSSIBLE WITH THE VEHICLES BEING SITUATED ON THE EXISTING ADJOINING PAVED AREAS OR ON NEWLY PLACED GRAVEL BASE MATERIAL.

PHASE 1:
1. INSTALL INLET PROTECTION FOR ALL EXISTING INLETS AS SHOWN ON THE PHASE I DRAWINGS.
2. CLEAR AND GRUB ALONG THE PERIMETER OF LIMITS OF CLEARING AND GRADING. INSTALL PERIMETER CONTROLS IN THE FORM OF SILT FENCE DIRECTLY AFTER PAVEMENT DEMOLITION IS COMPLETE. ADDITIONAL SILT FENCE HAS BEEN PROPOSED ALONG THE PERIMETER OF THE SITE TO ENSURE THAT NO SEDIMENT LEAVES THE SITE AND TO MINIMIZE PEDESTRIAN TRAFFIC THROUGH THE SITE. THIS SILT FENCE MAY BE MODIFIED AT THE DIRECTION OF THE INSPECTOR AS CONSTRUCTION PROGRESSES.
3. ONCE THE ABOVE STEPS HAVE BEEN COMPLETED, THE COUNTY PROJECT E&S INSPECTOR MUST BE CONTACTED TO INSPECT THE SITE. NO FURTHER CONSTRUCTION ACTIVITY SHALL COMMENCE UNTIL THE COUNTY INSPECTOR HAS PERFORMED THE SITE INSPECTION.

PHASE 2:
1. ONCE ALL E&S CONTROLS HAVE BEEN INSTALLED AND APPROVED BY THE COUNTY INSPECTOR, THE CONTRACTOR SHALL PROCEED TO CLEAR AND GRADE THE REMAINDER OF THE SITE.
2. ALL SILT FENCES AND SUPER SILT FENCES WILL REMAIN WHERE SHOWN ON THE PHASE II PLAN.
3. AS THE PROJECT PROGRESSES, THE CONTRACTOR SHALL TRANSITION THE VARIOUS SECTORS OF THE SITE TO PHASE 2 OF THE EROSION AND SEDIMENT CONTROL PROGRAM. ANY TIME A PORTION OF THE E&S PROGRAM IS PLANNED TO BE REMOVED, THE CONTRACTOR MUST CONTACT THE COUNTY E&S INSPECTOR PRIOR TO REMOVAL.
4. THE CONTRACTOR SHALL MAKE EVERY EFFORT TO MINIMIZE DISTURBANCE OF TRAFFIC AND PEDESTRIAN TRAVEL NEAR THE SITE.
5. AFTER CONSTRUCTION OPERATIONS HAVE ENDED AND ALL DISTURBED AREAS HAVE BEEN STABILIZED WITH VEGETATION, THE EROSION AND SEDIMENT CONTROL MEASURES MAY BE REMOVED UPON THE APPROVAL OF THE COUNTY E&S INSPECTOR.

MAINTENANCE OF CONTROLS:
ALL MEASURES INSTALLED FOR THE CONTROL OF EROSION AND SEDIMENTATION ARE TO BE INSPECTED DAILY BY THE SUPERINTENDENT, AND ANY DAMAGED STRUCTURAL MEASURES ARE TO BE REPAIRED BY THE END OF THE DAY.

VEGETATIVE PRACTICES:

1. TOPSOILING (STOCKPILING) – 3.30
TOPSOIL WILL BE STRIPPED FROM AREAS TO BE GRADED AND STOCKPILED FOR LATER USE, AS NECESSARY, WITH EXCESS TOPSOIL TO BE REMOVED FROM THE SITE. TEMPORARY STOCKPILE LOCATIONS SHALL BE LOCATED ON SITE AND ARE TO BE STABILIZED WITH TEMPORARY VEGETATION.

2. TEMPORARY SEEDING – 3.31
ALL DENUDED AREAS WHICH WILL BE LEFT DORMANT FOR MORE THAN SEVEN DAYS WILL BE SEEDED WITH FAST-GERMINATING TEMPORARY VEGETATION IMMEDIATELY FOLLOWING GRADING. SELECTION OF THE SEED MIXTURE WILL DEPEND ON THE TIME OF YEAR IT IS APPLIED.

PERMANENT STABILIZATION
ALL AREAS DISTURBED BY CONSTRUCTION WILL BE STABILIZED WITH PERMANENT SEEDING IMMEDIATELY FOLLOWING FINISHED GRADING. SEEDING SHALL BE DONE WITH KENTUCKY 31 TALL FESCUE ACCORDING TO STD. & SPEC. 3.32, PERMANENT SEEDING, OF THE HANDBOOK. EROSION CONTROL BLANKETS WILL BE INSTALLED OVER FILL SLOPES WHICH HAVE BEEN BROUGHT TO FINAL GRADE AND HAVE BEEN SEEDED TO PROTECT THE SLOPES FROM RILL AND GULLY EROSION AND TO ALLOW SEED TO GERMINATE PROPERLY. MULCH (STRAW OR FIBER) WILL BE USED ON RELATIVELY FLAT AREAS. IN ALL SEEDING OPERATIONS, SEED, FERTILIZER, AND LIME WILL BE APPLIED PRIOR TO MULCHING. SLOPES THAT ARE FOUND TO BE ERODING EXCESSIVELY WITHIN ONE YEAR OF PERMANENT STABILIZATION SHALL BE MODIFIED WITH ADDITIONAL SLOPE STABILIZING MEASURES UNTIL THE PROBLEM IS CORRECTED.

STRUCTURAL PRACTICES:
1. SILT FENCE – 3.05
SILT FENCE SEDIMENT BARRIERS WILL BE INSTALLED DOWNSLOPE OF AREAS WITH MINIMAL GRADES TO FILTER SEDIMENT-LADEN RUNOFF.

2. INLET PROTECTION – 3.07
ALL STORM INLETS WITH THE POTENTIAL OF RECEIVING SEDIMENT LADEN RUNOFF SHALL RECEIVE INLET PROTECTION AS SHOWN ON THIS PLAN.

3. TREE PRESERVATION AND PROTECTION – 3.38
PROTECTING EXISTING TREES FROM MECHANICAL AND OTHER INJURY DURING LAND-DISTRIBUTING AND CONSTRUCTION ACTIVITY TO ENSURE THE SURVIVAL OF DESIRABLE TREES WHERE THEY WILL BE EFFECTIVE FOR EROSION AND SEDIMENT CONTROL AND PROVIDE OTHER ENVIRONMENTAL AND AESTHETIC BENEFITS.

4. SAFETY FENCE – 3.01
A PROTECTIVE BARRIER INSTALLED TO PREVENT ACCESS TO AN EROSION CONTROL MEASURE.

GENERAL NOTES:

TEMPORARY SEEDING:
1. SELECTION OF PLANTS SHOULD BE BASED ON THE SPECIFIC SITE AND SEASON AND PER VESCH TABLES 3.31-B&C.
2. LIMING REQUIREMENTS SHOULD BE BASED ON TABLE 3.31-A OF THE VESCH.
3. FERTILIZERS SHALL BE APPLIED AS 600 LBS PER ACRE. FERTILIZER SHALL BE INCORPORATED INTO TOP 2-4" OF SOIL.
4. SEED SHALL BE EVENLY APPLIED AND SMALL GRAINS SHALL BE PLANTED NOT MORE THAN 1½" DEEP.
5. SEEDING MADE IN FALL FOR WINTER COVER AND DURING HOT SUMMER SHALL BE APPLIED IN ACCORDANCE WITH STD. 3.30 OF THE VESCH.

PERMANENT SEEDING (IF REQUIRED):
1. PERMANENT VEGETATION COVER MUST MEET THE REQUIREMENTS OF MINIMUM STANDARDS #3 (MS#3) PER VESCH 3.32.
2. PLANT MATERIAL SELECTION SHOULD BE BASED ON TABLES 3.32-A&B DEPENDING ON CLIMATE, TOPOGRAPHY, SOILS AND SITE CONDITIONS.
3. THE PLANTING SOIL MUST HAVE ENOUGH FINE GRAINED SOIL, SUFFICIENT PORE SPACE, SUFFICIENT DEPTH AND FREE FROM TOXIC OR EXCESSIVE QUANTITIES OF ROOTS AND SHALL BE APPILED IN ACCORDANCE WITH STD. 3.30 OF THE VESCH.

DUST CONTROL:
1. PROVISIONS FOR DUST CONTROL SHALL BE MADE IN ACCORDANCE WITH STD. AND SPEC. 3.39 OF THE VESCH.

UTILITY NOTES:
A. NO MORE THAN 500 LINEAR FEET OF TRENCH MAY BE OPENED AT ONE TIME.
B. EXCAVATED MATERIAL SHALL BE PLACED ON THE UPHILL SIDE OF TRENCHES.
C. EFFLUENT FFROM DEWATERING OPERATIONS SHALL BE FILTERED OR PASSED THROUGH AN APPROVED SEDIEMTN TRAPPING DEVICE, OR BOTH, AND DISCHARGED IN A MANNER THAT DOES NOT ADVERSELY AFFECT FLOWING STREAMS OR OFF-SITE PROPERTY.
D. MATERIAL USED FOR BACKFILLING TRENCHES SHALL BE PROPERLY COMPACTED IN ORDER TO MINIMIZE EROSION AND PROMOTE STABILIZATION.
E. RESTABILIZATION SHALL BE ACCOMPLISHED IN ACCORDANCE WITH THESE REGULATIONS.
F. APPLICABLE SAFETY REGULATIONS SHALL BE COMPLIED WITH.

STOCKPILING
THE GRADING/EXCAVATION CONTRACTOR FOR THE SUBJECT SITE IS REQUIRED TO NOTIFY, IN WRITING, THE ASSIGNED SITE INSPECTOR REGARDING ANY EXCESS MATERIAL PROPOSED TO BE HAULED OFFSITE PRIOR TO HAULING. THE NOTIFICATION MUST INDICATE THE QUANTITY OF MATERIAL TO BE MOVED OFFSITE, IDENTIFICATION OF THE RECEIVING SITE WHERE THE EXCESS WILL BE TAKEN, AND ALL INFORMATION NECESSARY TO SHOW THAT SUCH RECEIVING SITE HAS BEEN PROPERLY PERMITTED AND HAS E&S CONTROLS INSTALLED

GENERAL LAND CONSERVATION NOTES:

1. NO DISTURBED AREA WHICH IS NOT ACTIVELY BEING WORKED SHALL REMAIN DENUDED FOR MORE THAN 7 CALENDAR DAYS UNLESS OTHERWISE AUTHORIZED BY THE DIRECTOR.
2. ALL E&S CONTROL MEASURES APPROVED WITH THE PHASE 1 E&S CONTROL PLAN SHALL BE PLACED AS THE FIRST STEP IN GRADING.
3. ALL STORM AND SANITARY SEWER LINES NOT IN STREETS SHALL BE SEEDED AND MULCHED WITHIN 7 DAYS AFTER BACKFILL. NO MORE THAN 500 FEET SHALL BE OPEN AT ANY ONE TIME.
4. ELECTRIC POWER, TELEPHONE AND GAS SUPPLY TRENCHES SHALL BE COMPACTED, SEEDED AND MULCHED WITHIN 7 DAYS AFTER BACKFILL.
5. ALL TEMPORARY EARTH BERMS, DIVERSIONS AND SEDIMENT CONTROL DAMS SHALL BE SESEDED AND MULCHED FOR TEMPORARY VEGETATIVE COVER IMMEDIATELY (AS SOON AS POSSIBLE BUT NO LATER THAN 48 HOURS) AFTER COMPLETION OF GRADING. STRAW OR HAY MULCH IS REQUIRED. ALL SOIL STOCKPILES SHALL BE SEEDED AND MULCHED WITHIN 7 DAYS AFTER GRADING.
6. DURING CONSTRUCTION, ALL STORM SEWER INLETS SHALL BE PROTECTED BY SEDIMENT TRAPS, MAINTAINED AND MODIFIED DURING CONSTRUCTION PROGRESS AS REQUIRED.
7. ANY DISTURBED AREA NOT COVERED BY ITEM NUMBER 1 ABOVE AND NOT PAVED, SODDED OR BUILT UPON BY NOVEMBER 1, OR DISTURBED AFTER THAT DATE, SHALL BE MULCHED IMMEDIATELY WITH HAY OR STRAW MULCH AT THE RATE OF 2 TONS/ACRE AND OVER-SEEDED BY APRIL 15.
8. AT THE COMPLETION OF ANY PROJECT CONSTRUCTION AND PRIOR TO BOND RELEASE, ALL TEMPORARY SEDIMENT CONTROLS SHALL BE REMOVED AND ALL DENUDED AREAS SHALL BE STABILIZED.
9. SLOPES THAT ARE FOUND TO BE ERODING EXCESSIVELY WITHIN ONE YEAR OF PERMANENT STABILIZATION SHALL BE MODIFIED WITH ADDITIONAL SLOPE STABILIZING MEASURES UNTIL THE PROBELM IS CORRECTED.

No.	DATE	DESCRIPTION

REVISIONS

COMMONWEALTH OF VIRGINIA
CLAYTON C. TOCK
No. 036790
07/25/18
PROFESSIONAL ENGINEER

urban
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ARLINGTON, VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES

EROSION & SEDIMENT CONTROL – DETAILS
UPTON HILL REGIONAL PARK
CIVIL ENGINEERING PLAN
6060 WILSON BLVD, ARLINGTON, VIRGINIA 22205

SCALE: N/A	DESIGNED	CHECKED
SUBMITTED DATE 05-15-18 – 07-25-18 – – –	APPROVED DATE CHIEF TRANSPORTATION PLANNING BUREAU	APPROVED DATE CHIEF TRANSPORTATION ENGINEERING BUREAU
APPROVED DATE CHIEF WATER, SEWER & STREETS DIV.	APPROVED DATE CHIEF ENGINEERING DIVISION	APPROVED DATE DIRECTOR OF ENVIRONMENTAL SERVICES
	APPROVED DATE CPHD PLANNER	APPROVED DATE CPHD LANDSCAPE REVIEWER
	SHEET C.31 OF 45	SP-12928

Urban, Ltd. – k:\JOBS\upton hill park\sp bid set\12928-28-E&S Details.dwg [E&S DETAILS] November 26, 2018 – 12:19pm bbriten

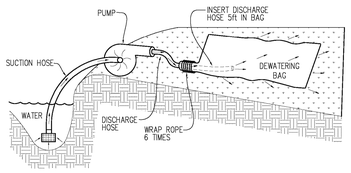
Dewatering Bag Standard Drawing

The purpose of a Dewatering Bag is to collect sediment contained in the discharged water, to prevent the scour and erosion from water exiting a pipe at high velocity, to defuse the water over a wider area to minimize erosion as the water drains away, and to retain all contained within effluent.

A SedCatch® dewatering bag or approved equal should be used anytime water is pumped on the site.

SedCatch® Dewatering Bag *

www.SedCatch.com



Installation and Use:

1. Place SedCatch® Dewatering Bag on the ground or on a trailer over a relatively level, stabilized area.
2. Insert discharge pipe a minimum of 5ft. inside SedCatch® dewatering bag and secure with a rope (included) wrapped 6 times around the snout over a 6 inch width of the bag.
3. Replace SedCatch® Dewatering Bag when half full of sediment or when the sediment has reduced the flow rate of the pump discharge to an impractical amount.

Maintenance and Disposal:

1. Remove and dispose of accumulated sediment away from waterways or environmentally sensitive areas. Slit open Sediment Bag and remove accumulated sediment. Dispose of bag at an appropriate recycling or solid waste facility, OR; as directed by engineer or inspector.

* OR APPROVED EQUAL

CONSTRUCTION OF A SILT FENCE (WITH WIRE SUPPORT)

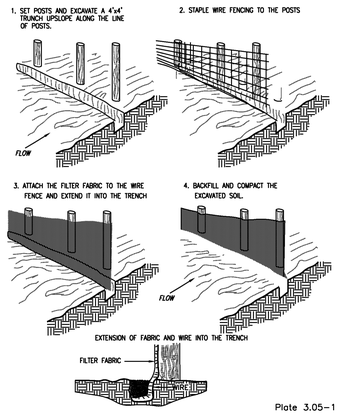
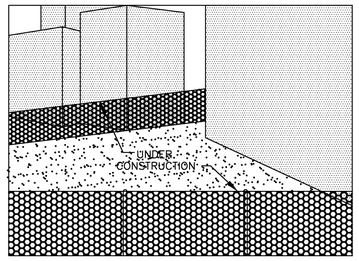


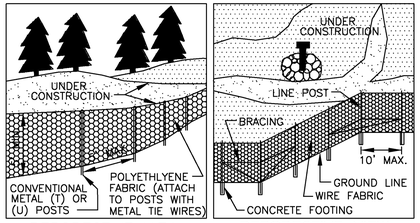
Plate 3.05-1

SAFETY FENCE 3.01-1

SAF



PERSPECTIVE VIEW



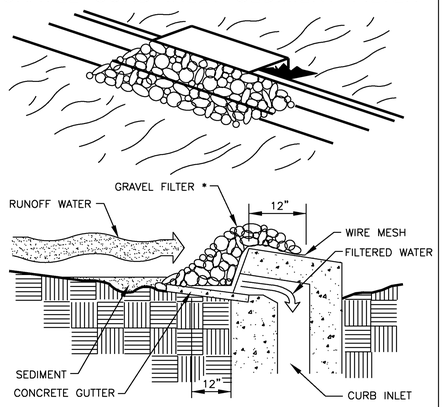
PERSPECTIVE VIEW PLASTIC FENCE

PERSPECTIVE VIEW METAL FENCE

STORM DRAIN INLET PROTECTION 3.07-6

IP

GRAVEL CURB INLET SEDIMENT FILTER



SPECIFIC APPLICATION

THIS METHOD OF INLET PROTECTION IS APPLICABLE AT CURB INLETS WHERE PONDING IN FRONT OF THE STRUCTURE IS NOT LIKELY TO CAUSE INCONVENIENCE OR DAMAGE TO ADJACENT STRUCTURES AND UNPROTECTED AREAS.

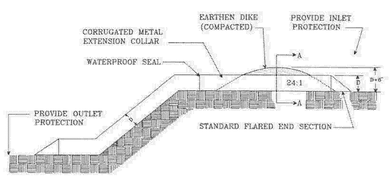
* GRAVEL SHALL BE VDOT #3, #357 OR #5 COARSE AGGREGATE.

EROSION AND SEDIMENT CONTROL LEGEND

3.01	SAFETY FENCE	SAF	
3.02	TEMPORARY STONE CONSTRUCTION ENTRANCE	CE	
3.05	SILT FENCE	SF	X X X X
3.07	STORM DRAIN INLET PROTECTION	IP	
3.09	TEMPORARY DIVERSION DIKE	DD	DD
	SUPER SILT FENCE	SSF	XX XX XX XX
3.38	TREE PROTECTION	TP	TP TP
3.18	STORM DRAIN OUTLET PROTECTION	OP	
3.20	CHECK DAM	CD	

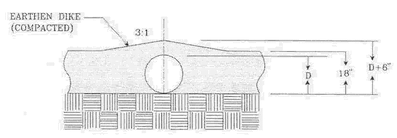
1992 3.15

TEMPORARY SLOPE DRAIN



SECTION VIEW

NOTE: SEDIMENT MAY BE CONTROLLED AT OUTLET IF UPLAND PONDING WILL CREATE PROBLEMS



SECTION A – A

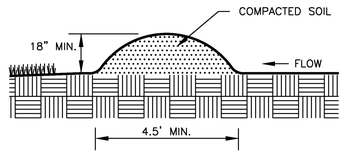
Source: Va. DSWC

Plate 3.15-1

III - 120

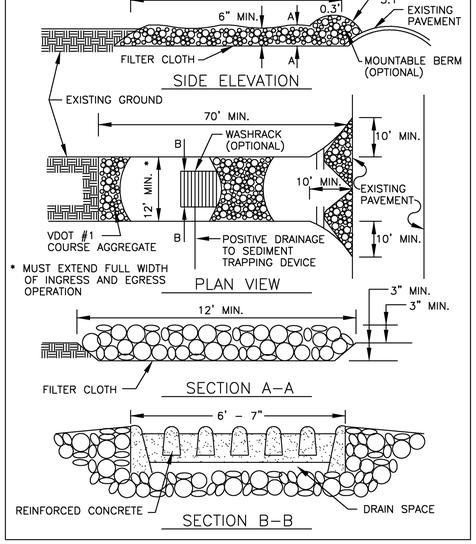
TEMPORARY DIVERSION DIKE 3.09-1

DD



TEMPORARY STONE CONSTRUCTION ENTRANCE 3.02-1

CE

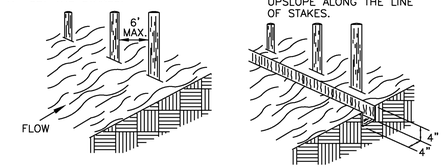


* MUST EXTEND FULL WIDTH OF INGRESS AND EGRESS OPERATION

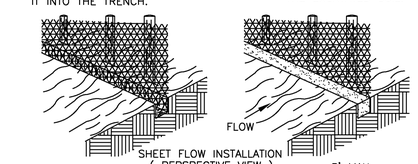
SILT FENCE (WITHOUT WIRE SUPPORT) 3.05-2

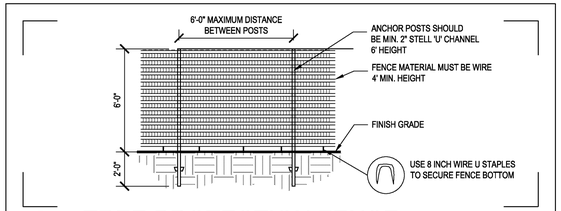
SF X X X X

1. SET THE STAKES.
2. EXCAVATE A 4" X 4" TRENCH UPSLOPE ALONG THE LINE OF STAKES.



3. STAPLE FILTER MATERIAL TO STAKES AND EXTEND IT INTO THE TRENCH.
4. BACKFILL AND COMPACT THE EXCAVATED SOIL.





8 TREE PROTECTION FENCE

Scale: NTS.

No.	DATE	DESCRIPTION
		REVISIONS

COMMONWEALTH OF VIRGINIA
CLAYTON C. TOCK
No. 036790
07/25/18
PROFESSIONAL ENGINEER

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Planners-Engineers-Landscape Architects-Land Surveyors

Urban, Ltd.
4200 D Technology Ct.
Chantilly Va. 20151
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(703)-378-7888
www.urban-engineering.com

ARLINGTON, VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES

EROSION & SEDIMENT CONTROL – DETAILS

UPTON HILL REGIONAL PARK

CIVIL ENGINEERING PLAN

6060 WILSON BLVD, ARLINGTON, VIRGINIA 22205

SCALE: N/A	DESIGNED	CHECKED
SUBMITTED DATE 05-15-18 – 07-25-18 – – –	APPROVED DATE CHIEF TRANSPORTATION PLANNING BUREAU	APPROVED DATE CHIEF TRANSPORTATION ENGINEERING BUREAU
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	SHEET C.32 OF 45	SP-12928

Urban, Ltd. – J:\JOBS\upton hill park\cp kid set\12928-28-E&S Details.dwg [E&S DETAILS 2] November 26, 2018 – 12:19pm bbrien

7/16/18
date

Qianqian Li, P.E.
ESC Program Administrator
Department of Environmental Sevices
2100 Clarendon Boulevard, Suite 813
Arlington, Virginia 22201

Re: Erosion and Sediment Control Permit Application for:
6060 Wilson Blvd, Arlington, VA 222
street address
12-042-103
lot, block, section subdivision
permit number

Dear Mrs. Li:

I hereby certify that I accept the responsibilities of Responsible Land Disturber for the above referenced project. I understand that these responsibilities include:

1. Reviewing the erosion and sedimentation (E&S) plan for the project.
2. Walking the site prior to construction to identify critical areas.
3. Conducting a pre-construction briefing with earth moving and site contractors to present the E&S plan and highlight the presence of critical areas, the limits of clearing and the required E&S controls and tree protection measures to be installed. Call 703-228-0760 to schedule pre-construction meeting.
4. Regularly inspecting the site during construction to ensure that all E&S controls are functioning and are adequate to address erosion and sedimentation. Inspect the site 48 hours after a runoff-generating storm, and provide a copy of the inspection findings to the county.
5. Reporting to the owner the presence inadequate or non functioning E&S controls when they are observed.
6. Ensuring that temporary soil stabilization is applied within 7 days to areas denuded that will remain undisturbed for longer than 14 days. Permanent stabilization shall be applied to areas that are to be left dormant for more than one year.
7. Calling (703) 228-0760 at least 80 hours before demolishing any structure.

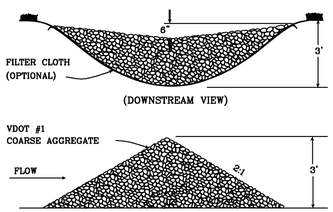
I may be reached at 703-359-4621 with questions about this plan or my execution of the duties of
telephone number
Responsible Land Disturber.

Sincerely,

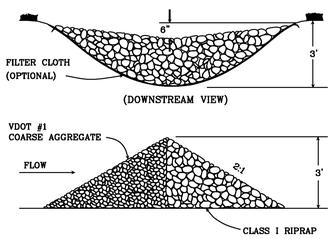
signed
Brian Nolan
name printed
LA# 0406001437
professional registration (type and number)

ROCK CHECK DAM

2 ACRES OR LESS OF DRAINAGE AREA:

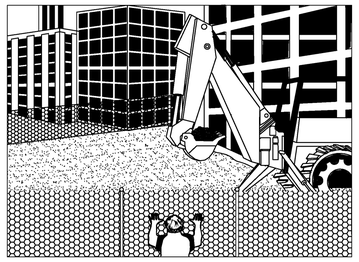


2-10 ACRES OF DRAINAGE AREA:

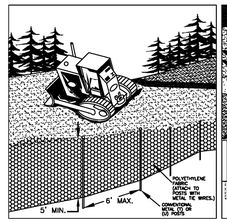


SOURCE: VA. DSWC PLATE. 3.20-1

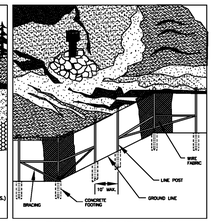
SAFETY FENCE



PERSPECTIVE VIEW



PERSPECTIVE VIEW
PLASTIC FENCE



PERSPECTIVE VIEW
METAL FENCE

SOURCE: CONWED PLASTICS
VDOT ROAD AND BRIDGE STANDARDS
VA. DSWC

PLATE. 3.1-1

SEEDING SPECIFICATION AS SPECIFIED IN DEQ TECHNICIAL BULLETIN NO. 4

1992 3.32

TABLE 3.32-D

SITE SPECIFIC SEEDING MIXTURES FOR COASTAL PLAIN AREA

	Total Lbs. Per Acre
Minimum Care Lawn	
- Commercial or Residential	
- Kentucky 31 or Turf-Type Tall Fescue	175-200 lbs.
or	
- Common Bermudagrass **	75 lbs.
High-Maintenance Lawn	
- Kentucky 31 or Turf-Type Tall Fescue	200-250 lbs.
or	
- Hybrid Bermudagrass (seed) **	40 lbs. (unhulled) 30 lbs. (hulled)
or	
- Hybrid Bermudagrass (by other vegetative establishment method, see Std. & Spec. 3.34)	
General Slope (3:1 or less)	
- Kentucky 31 Fescue	128 lbs.
- Red Top Grass	2 lbs.
- Seasonal Nurse Crop *	20 lbs.
	150 lbs.
Low Maintenance Slope (Steeper than 3:1)	
- Kentucky 31 Tall Fescue	93-108 lbs.
- Common Bermudagrass **	0-15 lbs.
- Red Top Grass	2 lbs.
- Seasonal Nurse Crop *	20 lbs.
- Sericea Lespedeza **	20 lbs.
	150 lbs.

* Use seasonal nurse crop in accordance with seeding dates as stated below:
February, March through April ..... Annual Rye
May 1st through August ..... Foxtail Millet
September, October through November 15th ..... Annual Rye
November 16th through January ..... Winter Rye

** May through October, use hulled seed. All other seeding periods, use unhulled seed. Weeping Lovegrass may be added to any slope or low-maintenance mix during warmer seeding periods; add 10-20 lbs./acre in mixes.

Areas which fail to establish vegetative cover adequate to prevent rill erosion will be re-seeded as soon as such areas are identified.

TABLE 3.31-B

ACCEPTABLE TEMPORARY SEEDING PLANT MATERIALS

"QUICK REFERENCE FOR ALL REGIONS"

Planting Dates	Species	Rate (lbs./acre)
Sept. 1 - Feb. 15	50/50 Mix of Annual Ryegrass (Lolium multi-florum) & Cereal (Winter) Rye (Secale cereale)	50 - 100
Feb. 16 - Apr. 30	Annual Ryegrass (Lolium multi-florum)	60 - 100
May 1 - Aug 31	German Millet (Setaria italica)	50

Source: Va. DSWC

12" STANDARD SIGN DIMENSION

18" STANDARD SIGN DIMENSION

NO
ENTRY
TREE
PRESERVATION
AREA
CALL: xxx-xxx-xxx
TO REPORT VIOLATIONS

PROHIBIDO ENTRAR
ZONA DE PROTECTION DEL ARBOL
LLAMAR AL TEL. xxx-xxx-xxxx
PARA REPORTAR INFRACCIONES

TYPICAL SIGNAGE FOR TREE PRESERVATION AREA

TREE PRESERVATION SIGNAGE NOTE:
SIGNS SHALL BE POSTED AT THE LIMITS OF CLEARING AT A MINIMUM OF 50-FOOT INTERVALS ALONG THE TREE PROTECTION FENCING. ALTERNATE SIGNAGE MAY BE USED ONLY AT THE APPROVAL OF THE DIRECTOR.

1992

TABLE 6-1

GENERAL EROSION AND SEDIMENT CONTROL NOTES

ES-1: 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.

ES-2: The plan approving authority must be notified one week prior to the pre-construction conference, one week prior to the commencement of land disturbing activity, and one week prior to the final inspection.

ES-3: All erosion and sediment control measures are to be placed prior to or as the first step in clearing.

ES-4: A copy of the approved erosion and sediment control plan shall be maintained on the site at all times.

ES-5: 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.

ES-6: 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.

ES-7: 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.

ES-8: During dewatering operations, water will be pumped into an approved filtering device.

ES-9: 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.

VI - 15

Pre-Storm Erosion and Sediment Control Checklist

Per Erosion and Sediment Control General Note 6, the Contractor is responsible for the installation and maintenance of any additional erosion and sediment control (ESC) measures necessary to prevent erosion and sedimentation as determined by the County. These supplementary practices are in addition to those shown in an ESC plan. ESC practices shall be modified as needed to ensure only clear water is discharged from the site.

The following actions shall be taken prior to storm events with predicted heavy and/or large volume rainfall to prevent sediment discharges from a construction site. A typical summer thunderstorm is an example of a storm event with predicted heavy and/or large volume rainfall.

Perimeter controls

- ☒ Silt fence shall be checked for undermining, holes, or deterioration of the fabric. Fencing shall be replaced immediately if the fabric is damaged or worn. Silt fence must be trenched into the ground per state specifications (Std & Spec 3.09).
- ☒ Wooden stakes or steel posts shall be properly secured upright into the ground. Damaged posts or stakes must be replaced.
- ☒ Sediment that has accumulated against the silt fence should be removed. Accumulated sediment must be removed when the level reaches one-half the height of the fencing.
- ☒ Hay bales or a stone berm should be placed across the construction entrance to prevent sediment from leaving the construction site.

Exposed slopes and soil

- ☒ Exposed slopes not at the final stabilization phase shall be covered with tarps, plastic sheeting, or erosion control matting. Covering material shall be properly secured/anchored.
- ☒ Controls shall be installed to prevent concentrated flow down an exposed slope. Berms or diversion dikes shall be installed at the top of cut / exposed slopes to direct storm flow around the disturbed area.
- ☒ Exposed slopes at the final stabilization phase shall be stabilized using slope stabilization practices such as soil stabilization blankets or matting as specified in the Virginia Erosion and Sediment Control Handbook (VESCH) Std & Spec 3.36. Blankets or mats must be properly secured and anchored to the slope using staples, pins, or stakes.
- ☒ Seeded areas shall be checked and reseeded as necessary to cover exposed soil. Recently seeded areas shall be protected by straw or soil stabilization blankets to prevent seeding from being washed away.

Stockpiles

- ☒ Stockpiled soil and other loose materials that can be washed away shall be covered with a tarp, plastic sheeting, or other stabilization matting. The cover must be properly secured / anchored down to prevent it from being blown off and exposing materials to rain. Controls such as hay bales or booms should be placed along the perimeter of the stock pile (downhill side).

Inlet protection

- ☒ Inlet protection controls shall be inspected to ensure they are functioning properly and flooding will not occur. Clogged or damaged controls must be replaced immediately. Ensure controls allow for overflow / bypass of stormwater runoff during significant storm events.

In addition to these pre-storm actions, all erosion and sediment control (ESC) measures must be checked daily and after each significant rainfall.

No.	DATE	DESCRIPTION

REVISIONS

COMMONWEALTH OF VIRGINIA
CLAYTON C. TOCK
No. 036790
07/25/18
PROFESSIONAL ENGINEER

urban
Planners · Engineers · Landscape Architects · Land Surveyors
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ARLINGTON, VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES
EROSION & SEDIMENT CONTROL - DETAILS
UPTON HILL REGIONAL PARK
CIVIL ENGINEERING PLAN
6060 WILSON BLVD, ARLINGTON, VIRGINIA 22205

SCALE: N/A	DESIGNED	CHECKED
SUBMITTED DATE 05-15-18 07-25-18	APPROVED DATE CHIEF TRANSPORTATION PLANNING BUREAU	APPROVED DATE CHIEF TRANSPORTATION ENGINEERING BUREAU
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	APPROVED DATE CPHD PLANNER	APPROVED DATE CPHD LANDSCAPE REVIEWER
	SHEET C.33 OF 45	SP-12928

Urban, Ltd - k:\JOBS\upton hill park\sp bid set\12928-28-E&S Details.dwg [E&S DETAILS 3] November 26, 2018 - 12:19pm bbrien

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No.	DATE	DESCRIPTION

REVISIONS

COMMONWEALTH OF VIRGINIA
CLAYTON C. TOCK
Lic. No. 036790
08/08/18
PROFESSIONAL ENGINEER

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Chantilly Va. 20151
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www.urban-engineering.com

ARLINGTON, VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES

SIGHT DISTANCE PROFILE

UPTON HILL REGIONAL PARK
CIVIL ENGINEERING PLAN

6060 WILSON BLVD, ARLINGTON, VIRGINIA 22205

SCALE: AS SHOWN	DESIGNED	CHECKED
SUBMITTED DATE 05-15-18 – 08-08-18 – – –	APPROVED DATE CHIEF TRANSPORTATION PLANNING BUREAU	APPROVED DATE CHIEF TRANSPORTATION ENGINEERING BUREAU
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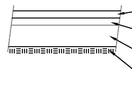
	SHEET C.34 OF 45	SP-12928

Urban, Ltd. – z:\JOBS\upton hill park\sp bid set\12928-31-SIGHT D.dwg [Layout1] November 28, 2018 – 12:19pm bbrien

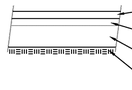
PAVEMENT DETAILS
N.T.S.

LIGHT DUTY PAVING PARKING LOTS



1 1/2" BITUM. CONC. SURFACE (VDOT SPEC. SM-9.5A)
3" BITUM. CONC. BASE (VDOT SPEC. BM-25.0)
6" COMPACTED AGGR. SUBBASE (VDOT SPEC. 209, 21-A GRAD.)
* COMPACTED SUBGRADE (SEE NOTE THIS SHEET)

HEAVY DUTY PAVING



2" BITUM. CONC. SURFACE (VDOT SPEC. SM-9.5A)
3" BITUM. CONC. BASE (VDOT SPEC. BM-25.0)
8" COMPACTED AGGR. SUBBASE (VDOT SPEC. 209, 21-A GRAD.)
* COMPACTED SUBGRADE (SEE NOTE THIS SHEET)

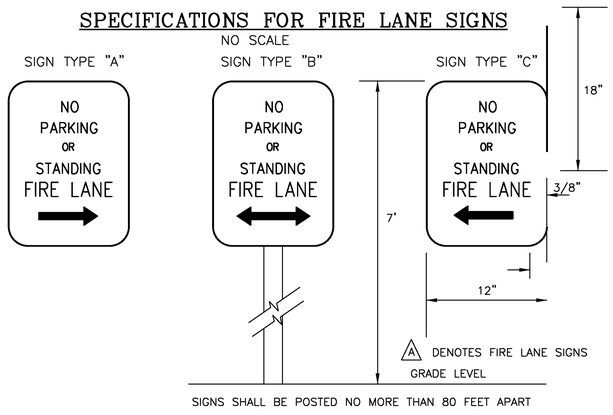
MILL AND OVERLAY AREA
SEE WP-2 DETAIL ON SHEET C.03

PERMEABLE PAVERS
SEE DESIGN & DETAILS ON SHEET C.22

NOTE:

PAVEMENT SECTION IS BASED ON AN ASSUMED CBR VALUE OF 10. ACTUAL CBR VALUES SHALL BE FORWARDED TO URBAN ENGINEERING TO VERIFY THE PROPOSED PAVEMENT SECTION.

SPECIFICATIONS FOR FIRE LANE SIGNS
NO SCALE



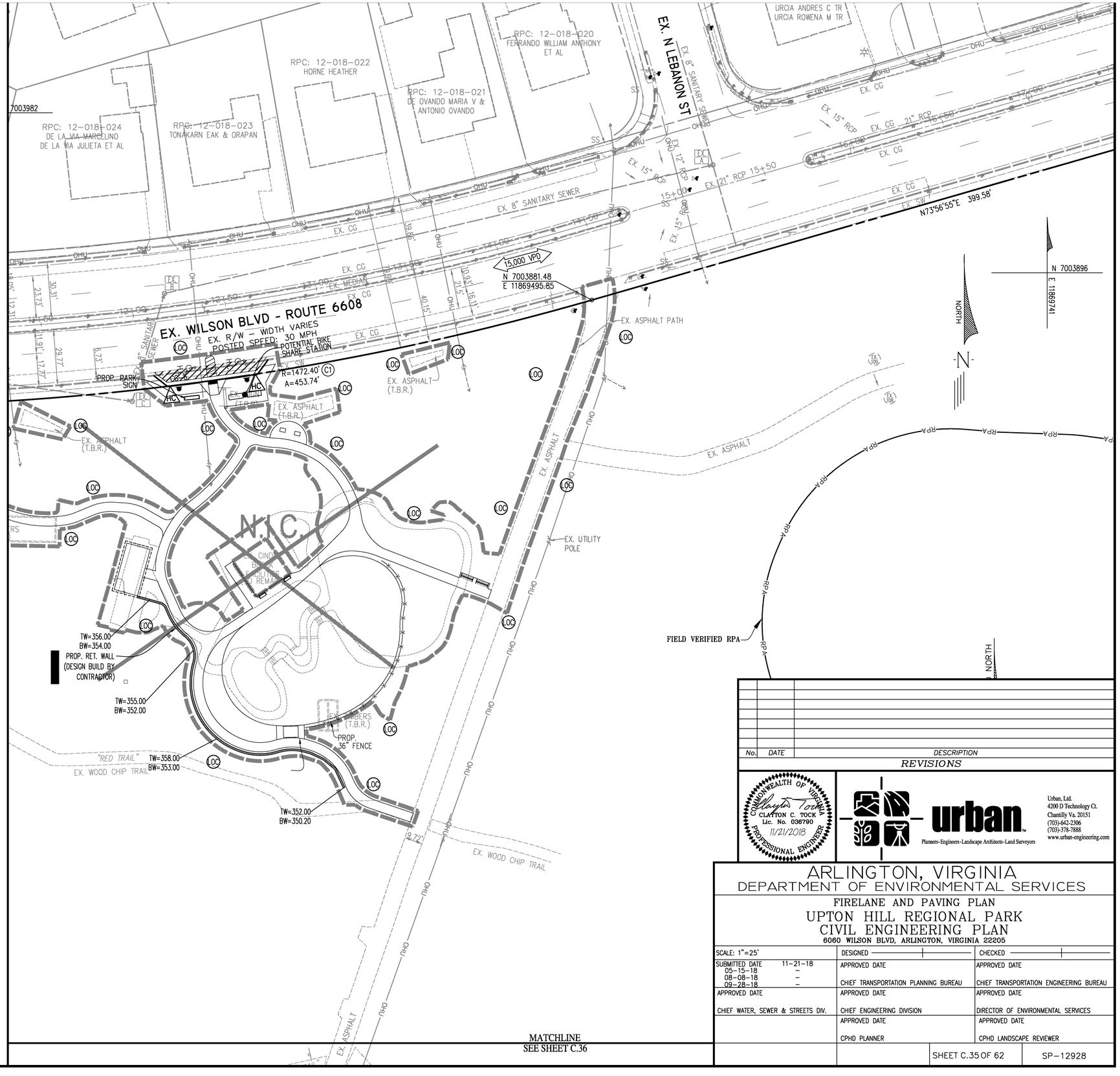
NOTES:

SIGN DIMENSIONS – 12" x 18"
3/8" RED TRIM NEAR OUTSIDE BORDER
LETTERING : RED ON WHITE BACKGROUND
"NO PARKING", "STANDING" – 2"HIGH

"FIRE LANE" – 2 1/2" HIGH
ARROWS – 1" HIGH SOLID LINE
POST (IF USED) – WOOD (4"x4"TREATED)
OR METAL CONSTRUCTION

LEGEND

- FIRE LANE DESIGNATION SIGN (DETAILS THIS SHEET)
- CONCRETE PAD
- HEAVY DUTY ASPHALT PAVEMENT
- LIGHT DUTY ASPHALT PAVEMENT
- MILL AND OVERLAY AREA



No.	DATE	DESCRIPTION

REVISIONS

COMMONWEALTH OF VIRGINIA
CLAYTON C. TOCK
Lic. No. 036790
11/21/2018
PROFESSIONAL ENGINEER

urban
Planners · Engineers · Landscape Architects · Land Surveyors
Urban, Ltd.
4200 D Technology Ct.
Chantilly Va. 20151
(703)-642-2306
(703)-378-7888
www.urban-engineering.com

ARLINGTON, VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES

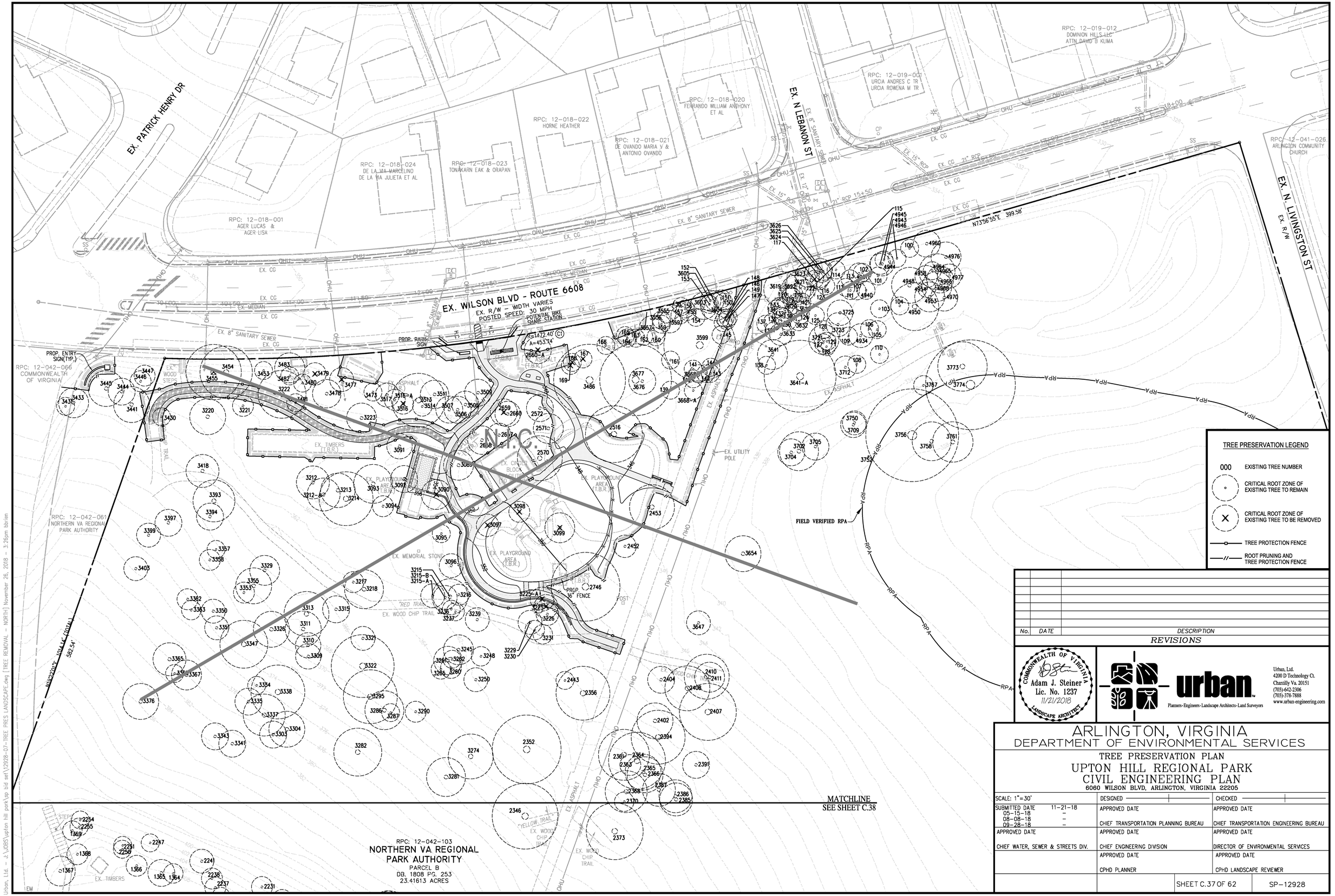
FIRELANE AND PAVING PLAN

UPTON HILL REGIONAL PARK
CIVIL ENGINEERING PLAN

6060 WILSON BLVD, ARLINGTON, VIRGINIA 22205

SCALE: 1"=25'		DESIGNED	CHECKED
SUBMITTED DATE	11-21-18	APPROVED DATE	APPROVED DATE
05-15-18	–		
08-08-18	–	CHIEF TRANSPORTATION PLANNING BUREAU	CHIEF TRANSPORTATION ENGINEERING BUREAU
09-28-18	–		
APPROVED DATE		APPROVED DATE	APPROVED DATE
CHIEF WATER, SEWER & STREETS DIV.		CHIEF ENGINEERING DIVISION	DIRECTOR OF ENVIRONMENTAL SERVICES
		APPROVED DATE	APPROVED DATE
		CPHD PLANNER	CPHD LANDSCAPE REVIEWER

Urban, Ltd. – k:\JOBS\upton hill park\sp bid set\12928-SP-FIREPAVE.dwg [FIREPAVE] November 26, 2018 – 12:20pm bbrien


EX. PATRICK HENRY DR
EX. N LEBANON ST
EX. N. LIVINGSTON ST
EX. WILSON BLVD - ROUTE 6608
EX. R/W - WIDTH VARIES
POSTED SPEED: 30 MPH
POTENTIAL BIKE SHARE STATION
RPC: 12-018-001 AGER LUCAS & AGER LISA
RPC: 12-018-022 HORNE HEATHER
RPC: 12-018-021 DE OVANDO MARIA V & ANTONIO OVANDO
RPC: 12-018-020 FERRANDO WILLIAM ANTHONY ET AL
RPC: 12-018-024 DE LA VIA MARCELINO DE LA VIA JULIETA ET AL
RPC: 12-018-023 TONAKARN EAK & ORAPAN
RPC: 12-019-012 DOMINION HILLS LLC ATTN DAVID B KLIMA
RPC: 12-019-001 URCIA ANDRES C TR URCIA ROWENA M TR
RPC: 12-041-026 ARLINGTON COMMUNITY CHURCH
RPC: 12-042-066 COMMONWEALTH OF VIRGINIA
RPC: 12-042-061 NORTHERN VA REGIONAL PARK AUTHORITY
RPC: 12-042-103 NORTHERN VA REGIONAL PARK AUTHORITY PARCEL B DB. 1808 PG. 253 23.41613 ACRES
N73°56'55"E 399.58'
N10°20'00"E 592.54' (TOTAL)
FIELD VERIFIED RPA
PROP. ENTRY SIGN(TYP.)
PROP. PARK SIGN
EX. WOOD STEPS
EX. TIMBERS (T.B.R.)
EX. PLAYGROUND AREA (T.B.R.)
EX. CINDER BLOCK (TO BE REMOVED)
EX. MEMORIAL STONE
PROP 36" FENCE
EX. WOOD CHIP TRAIL
"RED TRAIL"
"YELLOW TRAIL"
EX. ASPHALT TRAIL
EX. UTILITY POLE
EX. 8" SANITARY SEWER
EX. 15" RCP
EX. 21" RCP
EX. CG
EX. MEDIAN
EX. OHU
EX. SS
EX. 12" W
EX. 8" W
EX. 6" W
EX. 4" W
EX. 2" W
EX. 1" W
EX. 3/4" W
EX. 1 1/2" W
EX. 2" GAS
EX. 4" GAS
EX. 6" GAS
EX. 8" GAS
EX. 12" GAS
EX. 16" GAS
EX. 20" GAS
EX. 24" GAS
EX. 30" GAS
EX. 36" GAS
EX. 42" GAS
EX. 48" GAS
EX. 54" GAS
EX. 60" GAS
EX. 66" GAS
EX. 72" GAS
EX. 78" GAS
EX. 84" GAS
EX. 90" GAS
EX. 96" GAS
EX.

EX. PATRICK HENRY DR

EX. N LEBANON ST

EX. N. LIVINGSTON ST
EX. R/W

EX. WILSON BLVD - ROUTE 6608
EX. R/W – WIDTH VARIES
EX. R/W – WIDTH VARIES
POSTED SPEED: 30 MPH
POTENTIAL BIKE SHARE STATION

RPC: 12-018-001
AGER LUCAS &
AGER LISA

RPC: 12-018-022
HORNE HEATHER

RPC: 12-018-020
FERRANDO WILLIAM ANTHONY ET AL

RPC: 12-018-021
DE OVANDO MARIA V & ANTONIO OVANDO

RPC: 12-018-024
DE LA VIA MARCELINO
DE LA VIA JULIETA ET AL

RPC: 12-018-023
TONAKARN EAK & ORAPAN

RPC: 12-019-012
DOMINION HILLS LLC
ATTN DAVID B KLIMA

RPC: 12-019-001
URCIA ANDRES C TR
URCIA ROWENA M TR

RPC: 12-041-026
ARLINGTON COMMUNITY CHURCH

RPC: 12-042-066
COMMONWEALTH OF VIRGINIA

RPC: 12-042-061
NORTHERN VA REGIONAL PARK AUTHORITY

RPC: 12-042-103
NORTHERN VA REGIONAL PARK AUTHORITY
PARCEL B
DB. 1808 PG. 253
23.41613 ACRES

N73°56'55"E 399.58'

FIELD VERIFIED RPA

PROP. ENTRY SIGN(TYP.)

PROP. PARK SIGN

EX. WOOD STEPS

EX. TIMBERS (T.B.R.)

EX. ASPHALT TRAIL

EX. PLAYGROUND AREA (T.B.R.)

EX. CINDER BLOCK RETAINING WALL

EX. MEMORIAL STONE

EX. UTILITY POLE

PROP. 36" FENCE

"RED TRAIL"
EX. WOOD CHIP TRAIL

"YELLOW TRAIL"
EX. WOOD CHIP TRAIL

EX. WOOD CHIP TRAIL

EX. 8" SANITARY SEWER

EX. 12" SANITARY SEWER

EX. 15" RCP

EX. 21" RCP

EX. CG

EX. MEDIAN

OHU

OHO

SS

CP

EM

MATCHLINE
SEE SHEET C.38

No.	DATE	DESCRIPTION
		REVISIONS

COMMONWEALTH OF VIRGINIA
Adam J. Steiner
Lic. No. 1237
11/21/2018
LANDSCAPE ARCHITECT

urban
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ARLINGTON, VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES

TREE PRESERVATION PLAN
UPTON HILL REGIONAL PARK
CIVIL ENGINEERING PLAN
6060 WILSON BLVD, ARLINGTON, VIRGINIA 22205

SCALE: 1"=30'	DESIGNED	CHECKED
SUBMITTED DATE 11-21-18 05-15-18 – 08-08-18 – 09-28-18 –	APPROVED DATE CHIEF TRANSPORTATION PLANNING BUREAU	APPROVED DATE CHIEF TRANSPORTATION ENGINEERING BUREAU
APPROVED DATE CHIEF WATER, SEWER & STREETS DIV.	APPROVED DATE CHIEF ENGINEERING DIVISION	APPROVED DATE DIRECTOR OF ENVIRONMENTAL SERVICES
	APPROVED DATE CPHD PLANNER	APPROVED DATE CPHD LANDSCAPE REVIEWER
		SHEET C.37 OF 62 — SP-12928

Urban, Ltd. – J:\JOBS\upton hill park\cp bid set\12928-07-TREE PRES LANDSCAPE.dwg [TREE REMOVAL – NORTH] November 26, 2018 – 12:34pm bbrien

RPC: 12-042-103
NORTHERN VA REGIONAL
PARK AUTHORITY
PARCEL B
DB. 1808 PG. 253
23.41613 ACRES

MATCHLINE
SEE SHEET C.37

N.I.C.

EX. BATTING CAGE

EX. ASPHALT

EX. TIMBERS

EX. CHAIN LINK FENCE

PROP. HANDRAIL (DESIGN BUILD BY CONTRACTOR)

PROP. WOODEN DECK

PROP. WOODEN RAMP

PROP. ROPES COURSE

PROP. EXERCISE EQUIPMENT

PROP. PICNIC BOOTH

EX. BENCH (TYP.)

PROP. LIGHT (TYP.)

EX. MEMORIAL STONE

CONCRETE WALK

EX. 6' CHAIN LINK

EX. ASPHALT PARKING AREA

PROP. LIGHTS (TYP.)

EX. MINI GOLF

EX. WATER PARK

EX. WOOD DECK

EX. BUILDING

EX. CONCRETE PAD

EX. GRILL

EX. SPRINKLER

EX. PVC PIPE

EX. 8" SANITARY SEWER

EX. 6" CHAIN LINK WITH BARBED WIRE

PROP. 42.6" RCP

EX. SAN. TOP TO BE RAISED TO PROPOSED ELEVATION (SEE SHEET C.42A FOR DETAIL)

EX. WOOD CHIP TRAIL "YELLOW TRAIL"

EX. ASPHALT

OHU

EM

CONC

AREA OF MILLING/PAVING/STRIPING CONSIDERED MAINTENANCE AND NOT DISTURBED AREA

PIN: 0513 18 E
SCA-SPE LLC
DB. 23671 PG. 1646

ARLINGTON COUNTY (APPROXIMATE)
FAIRFAX COUNTY (APPROXIMATE)

N19°22'01"E 1014.14' (TOTAL)
431.59'

N45°57'40"W
140.71'

S19°22'20"W
48.64'

S19°22'20"W 247.71'
298.35' (TOTAL)

N70°03'10"W 523.62'

PIN: 0514-01-0001
NORTHERN VA REGIONAL
PARK AUTHORITY
PARCEL A
DB. 3764 PG. 55
3.11833 ACRES

RPC: 12-042-106
SAINT ALBANS HOUSING
HARTLAND BANK
DB. 3860 PG. 1232

PIN: 0514 01 0333B
SAINT ALBANS HOUSING CORP,
DB. 17445 PG. 0778

N MADISON ST.

000

No.	DATE	DESCRIPTION
		REVISIONS

COMMONWEALTH OF VIRGINIA
Adam J. Steiner
Lic. No. 1237
09/28/2018
LANDSCAPE ARCHITECT

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ARLINGTON, VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES

TREE PRESERVATION PLAN
UPTON HILL REGIONAL PARK
CIVIL ENGINEERING PLAN
6060 WILSON BLVD, ARLINGTON, VIRGINIA 22205

SCALE: 1"=30'	DESIGNED	CHECKED
SUBMITTED DATE 11-21-18 05-15-18 – 08-08-18 – 09-28-18 –	APPROVED DATE CHIEF TRANSPORTATION PLANNING BUREAU	APPROVED DATE CHIEF TRANSPORTATION ENGINEERING BUREAU
APPROVED DATE CHIEF WATER, SEWER & STREETS DIV.	APPROVED DATE CHIEF ENGINEERING DIVISION	APPROVED DATE DIRECTOR OF ENVIRONMENTAL SERVICES
	APPROVED DATE CPHD PLANNER	APPROVED DATE CPHD LANDSCAPE REVIEWER
	SHEET C.38 OF 62	SP-12928

Urban, Ltd. – z:\JOBS\upton hill park\sp bid set\12928-07-TREE PRES LANDSCAPE.dwg [TREE REMOVAL - SOUTH] November 26, 2018 - 12:34pm bbrien

TREE INVENTORY & REPLACEMENT NOTES

1. TREE REPLACEMENT SCORE FORMULA (PER ARLINGTON COUNTY LANDSCAPE STANDARDS PART 4, "REPLACEMENT GUIDELINES", SECTION 5) MULTIPLIES TREE SIZE (DBH), CONDITION RATING, AND SPECIES RATING.

2. CONDITION RATINGS ASSIGNED THROUGH ON-SITE EVALUATION BY URBAN, LTD.'S ISA CERTIFIED ARBORIST, IN ACCORDANCE WITH ISA CONDITION RATING GUIDELINES.

3. SPECIES RATINGS ADAPTED FROM THE "MID-ATLANTIC TREE SPECIES RATING GUIDE" BY MID-ATLANTIC CHAPTER OF INTERNATIONAL SOCIETY OF ARBORICULTURE, 2007 EDITION.

4. REPLACEMENT TREE MINIMUM CALIPER SIZE TO BE TWO (2) INCHES. REPLACEMENT TREES TO BE PLANTED ON PROJECT SITE OR ON OTHER PARKS, OPEN SPACES, AND/OR PUBLIC PROPERTIES PER ARLINGTON COUNTY LANDSCAPE STANDARDS PART 4, "REPLACEMENT GUIDELINES", SECTION 3.

TREE REMOVAL INVENTORY & REPLACEMENT CALCULATIONS

TREE NO.	BOTANICAL NAME	COMMON NAME	SIZE	COMMENTS	CONDITION RATING	SPECIES RATING	REPLACEMENT SCORE	QTY. OF TREE REPLACEMENTS
			DBH (in)		(Decimal)	(Decimal)		
117	*Robinia pseudoacacia*	Black Locust	7"	dead	0.0000			0
167	*Robinia pseudoacacia*	Black Locust	7"	dead	0.0000			0
168	*Robinia pseudoacacia*	Black Locust	6"	dead	0.0000			0
169	*Robinia pseudoacacia*	Black Locust	6"	dead	0.0000			0
215	*Cuppressus x leylandii*	Leyland Cypress	5"					1
216	*Cuppressus x leylandii*	Leyland Cypress	6"					1
217	*Cuppressus x leylandii*	Leyland Cypress	5"					1
218	*Cuppressus x leylandii*	Leyland Cypress	6"					1
219	*Cuppressus x leylandii*	Leyland Cypress	5"					1
220	*Cuppressus x leylandii*	Leyland Cypress	6"					1
221	*Cuppressus x leylandii*	Leyland Cypress	7"					1
222	*Cuppressus x leylandii*	Leyland Cypress	6"					1
223	*Cuppressus x leylandii*	Leyland Cypress	6"					1
224	*Cuppressus x leylandii*	Leyland Cypress	7"					1
225	*Cuppressus x leylandii*	Leyland Cypress	8"					1
226	*Cuppressus x leylandii*	Leyland Cypress	7"					1
227	*Cuppressus x leylandii*	Leyland Cypress	6"					1
228	*Cuppressus x leylandii*	Leyland Cypress	7"					1
229	*Cuppressus x leylandii*	Leyland Cypress	8"	overhead electric line				1
230	*Cuppressus x leylandii*	Leyland Cypress	7"	overhead electric line				1
231	*Cuppressus x leylandii*	Leyland Cypress	9"	overhead electric line				1
232	*Cuppressus x leylandii*	Leyland Cypress	8"	overhead electric line				1
233	*Cuppressus x leylandii*	Leyland Cypress	8"	overhead electric line				1
441	*Quercus rubra*	N. Red Oak	7"					1
442	*Quercus rubra*	N. Red Oak	6"					1
443	*Quercus rubra*	N. Red Oak	15"		0.5313	0.7500	5.9771	2
444	*Quercus rubra*	N. Red Oak	13"	co-dominant trunk	0.5938	0.7500	5.7896	2
445	*Quercus rubra*	N. Red Oak	11"		0.5625	0.7500	4.6406	1
446	*Quercus rubra*	N. Red Oak	12"		0.5938	0.7500	5.3442	2
447	*Quercus rubra*	N. Red Oak	14"		0.8250	0.7500	6.5625	2
448	*Taxodium distichum*	Bald Cypress	7"					1
449	*Taxodium distichum*	Bald Cypress	12"	co-dominant trunk	0.8250	0.8250	6.1875	2
450	*Taxodium distichum*	Bald Cypress	14"		0.7188	0.8250	8.3021	2
451	*Taxodium distichum*	Bald Cypress	6"					1
875	*Taxodium distichum*	Bald Cypress	10"					1
1286	*Quercus rubra*	N. Red Oak	12"	co-dominant trunk	0.5818	0.7500	5.2362	2
1287	*Quercus rubra*	N. Red Oak	13"	co-dominant trunk	0.4688	0.7500	4.5708	1
1446	*Acer rubrum*	Red Maple	10"					1
1446-A	*Acer rubrum*	Red Maple	12"	root girdling	0.6250	0.7000	5.2500	2
1446-B	*Acer rubrum*	Red Maple	10"	co-dominant trunk				1
1620	*Pyrus calleryana*	Callery Pear	49"	multistem	0.5818	0.5000	14.2541	3
1710	*Robinia pseudoacacia*	Black Locust	14"		0.5000	0.5500	3.8500	1
1711	*Robinia pseudoacacia*	Black Locust	13"		0.5625	0.5500	4.0219	1
1711-A	*Robinia pseudoacacia*	Black Locust	17"	decay, in decline	0.3438	0.5500	3.2145	1
1725	*Ulmus pumila*	Siberian Elm	13"	co-dominant trunk	0.6563	0.3500	2.9862	1
1726	*Ulmus pumila*	Siberian Elm	14"	co-dominant trunk	0.6250	0.3500	3.0625	1
1788	*Robinia pseudoacacia*	Black Locust	25"		0.4688	0.5500	6.4460	2
1789	*Robinia pseudoacacia*	Black Locust	12"	co-dominant trunk	0.4375	0.5500	2.8875	1
1790	*Robinia pseudoacacia*	Black Locust	17"		0.4688	0.5500	4.3833	1
1791	*Robinia pseudoacacia*	Black Locust	14"		0.5313	0.5500	4.0910	1
2217	*Robinia pseudoacacia*	Black Locust	15"	exposed roots, co-dominant trunk split	0.4063	0.5500	3.3520	1
2660-A	*Gleditsia triacanthos*	Honey Locust	26"	in decline	0.4063	0.5500	5.8101	2
2659	*Ulmus pumila*	Siberian Elm	15"	dead	0.0000			0
3090	*Tilia cordata*	Littleleaf Linden	15"		0.8250	0.7250	6.7969	2
3097	*Acer rubrum*	Red Maple	13"		0.5938	0.7000	5.4036	2
3098	*Acer saccharum*	Sugar Maple	16"		0.6563	0.7500	7.8756	2
3099	*Acer rubrum*	Red Maple	24"		0.7188	0.7000	12.0758	3
3225	*Robinia pseudoacacia*	Black Locust	13"	heavy ivy, in decline	0.3750	0.5500	2.6813	1
3225-A	*Magnolia grandiflora*	Southern Magnolia	7"					1
3455	*Quercus rubra*	N. Red Oak	26"	dead, co-dominant trunk	0.0000			0
3477	*Robinia pseudoacacia*	Black Locust	13"	dead	0.0000			0
3479	*Robinia pseudoacacia*	Black Locust	15"	dead	0.0000			0
3516	*Robinia pseudoacacia*	Black Locust	18"	trunk broken off	0.0000			0
						TOTAL QTY. OF REQUIRED TREE REPLACEMENTS		71

TREE PRESERVATION INVENTORY

TREE NO.	BOTANICAL NAME	COMMON NAME	SIZE	COMMENTS
			DBH (in)	
100	*Robinia pseudoacacia*	Black Locust	10"	trunk broken off
101	*Quercus rubra*	N. Red Oak	4"	
102	*Robinia pseudoacacia*	Black Locust	8"	in decline
103	*Prunus serotina*	Black Cherry	7"	dead
104	*Robinia pseudoacacia*	Black Locust	7"	dead
105	*Robinia pseudoacacia*	Black Locust	9"	
106	*Liriodendron tulipifera*	Tulip Poplar	6"	
107	*Quercus alba*	White Oak	8"	
108	*Acer rubrum*	Red Maple	4"	
109	*Robinia pseudoacacia*	Black Locust	9"	dead
110	*Liriodendron tulipifera*	Tulip Poplar	10"	crooked trunk
111	*Robinia pseudoacacia*	Black Locust	8"	dead
112	*Quercus rubra*	N. Red Oak	8"	crooked trunk
113	*Quercus rubra*	N. Red Oak	5"	
114	*Robinia pseudoacacia*	Black Locust	11"	in decline, leaning
115	*Acer rubrum*	Red Maple	10"	co-dominant trunk
116	*Robinia pseudoacacia*	Black Locust	8"	dead
118	*Robinia pseudoacacia*	Black Locust	7"	in decline, crooked trunk
119	*Carya glabra*	Pignut Hickory	6"	
120	*Robinia pseudoacacia*	Black Locust	8"	decay
121	*Robinia pseudoacacia*	Black Locust	11"	dead, co-dominant trunk
122	*Robinia pseudoacacia*	Black Locust	7"	leaning, dead
123	*Robinia pseudoacacia*	Black Locust	7"	dead
124	*Robinia pseudoacacia*	Black Cherry	6"	witches broom
125	*Robinia pseudoacacia*	Black Locust	7"	dead, leaning
126	*Quercus rubra*	N. Red Oak	10"	
127	*Liriodendron tulipifera*	Tulip Poplar	11"	trunk intertwined w/ 3721
128	*Robinia pseudoacacia*	Black Locust	7"	leaning on 3721, dead
129	*Quercus alba*	White Oak	10"	
130	*Prunus serotina*	Black Cherry	9"	crooked trunk
131	*Carya sp.*	Hickory	10"	trunk broken off
132	*Robinia pseudoacacia*	Black Locust	6"	leaning, dead
133	*unknown*	unknown	6"	in decline
134	*Robinia pseudoacacia*	Black Locust	8"	dead
135	*Acer rubrum*	Red Maple	7"	trunk broken off
136	*Robinia pseudoacacia*	Black Locust	4"	dead
137	*Prunus serotina*	Black cherry	8"	crooked trunk, excessively limbed
138	*Robinia pseudoacacia*	Black Locust	8"	dead
139	*Quercus alba*	White Oak	11"	co-dominant trunk
140	*Quercus montana*	Chestnut Oak	5"	
141	*Quercus montana*	Chestnut Oak	6"	
142	*Quercus montana*	Chestnut Oak	3"	
143	*Sassafras albidum*	Sassafrass	6"	
144	*Robinia pseudoacacia*	Black Locust	7"	dead
145	*Acer rubrum*	Red Maple	5"	
146	*Robinia pseudoacacia*	Black Locust	15"	twin trunk, dead
147	*unknown*	unknown	5"	
148	*Robinia pseudoacacia*	Black Locust	10"	twin trunk, dead
149	*Robinia pseudoacacia*	Black Locust	7"	dead
150	*Acer rubrum*	Red Maple	9"	one sided
151	*Robinia pseudoacacia*	Black Locust	9"	leaning, dead
152	*Prunus serotina*	Black Cherry	6"	leaning
153	*Prunus serotina*	Black Cherry	10"	
154	*Carya glabra*	Pignut Hickory	5"	
155	*Robinia pseudoacacia*	Black Locust	10"	leaning, in decline
156	*Robinia pseudoacacia*	Black Locust	12"	leaning, in decline
157	*Robinia pseudoacacia*	Black Locust	7"	dead
158	*Prunus serotina*	Black Cherry	9"	leaning
159	*Robinia pseudoacacia*	Black Locust	10"	dead
160	*Robinia pseudoacacia*	Black Locust	9"	in decline, decay
161	*Quercus alba*	White Oak	7"	
162	*Quercus alba*	White Oak	4"	
163	*Quercus alba*	White Oak	7"	
164	*Robinia pseudoacacia*	Black Locust	8"	dead
165	*Robinia pseudoacacia*	Black Locust	8"	dead
166	*Robinia pseudoacacia*	Black Locust	7"	dead
170	*Cuppressus x leylandii*	Leyland Cypress	7"	
171	*Cuppressus x leylandii*	Leyland Cypress	8"	
172	*Cuppressus x leylandii*	Leyland Cypress	7"	
173	*Cuppressus x leylandii*	Leyland Cypress	9"	
174	*Cuppressus x leylandii*	Leyland Cypress	8"	
175	*Cuppressus x leylandii*	Leyland Cypress	6"	
176	*Cuppressus x leylandii*	Leyland Cypress	7"	
177	*Cuppressus x leylandii*	Leyland Cypress	6"	
178	*Cuppressus x leylandii*	Leyland Cypress	5"	
179	*Cuppressus x leylandii*	Leyland Cypress	4"	
180	*Cuppressus x leylandii*	Leyland Cypress	6"	
181	*Cuppressus x leylandii*	Leyland Cypress	6"	
182	*Cuppressus x leylandii*	Leyland Cypress	4"	
183	*Cuppressus x leylandii*	Leyland Cypress	6"	
184	*Cuppressus x leylandii*	Leyland Cypress	6"	
185	*Cuppressus x leylandii*	Leyland Cypress	4"	
186	*Cuppressus x leylandii*	Leyland Cypress	6"	
187	*Cuppressus x leylandii*	Leyland Cypress	6"	
188	*Cuppressus x leylandii*	Leyland Cypress	6"	
189	*Cuppressus x leylandii*	Leyland Cypress	6"	
190	*Cuppressus x leylandii*	Leyland Cypress	6"	
191	*Cuppressus x leylandii*	Leyland Cypress	6"	
192	*Cuppressus x leylandii*	Leyland Cypress	6"	
193	*Cuppressus x leylandii*	Leyland Cypress	6"	
194	*Cuppressus x leylandii*	Leyland Cypress	6"	
195	*Cuppressus x leylandii*	Leyland Cypress	4"	
196	*Cuppressus x leylandii*	Leyland Cypress	5"	
197	*Cuppressus x leylandii*	Leyland Cypress	6"	
198	*Cuppressus x leylandii*	Leyland Cypress	6"	
199	*Cuppressus x leylandii*	Leyland Cypress	6"	
200	*Cuppressus x leylandii*	Leyland Cypress	6"	
201	*Cuppressus x leylandii*	Leyland Cypress	5"	
202	*Cuppressus x leylandii*	Leyland Cypress	4"	
203	*Cuppressus x leylandii*	Leyland Cypress	5"	
204	*Cuppressus x leylandii*	Leyland Cypress	7"	
205	*Cuppressus x leylandii*	Leyland Cypress	6"	
206	*Cuppressus x leylandii*	Leyland Cypress	6"	
207	*Cuppressus x leylandii*	Leyland Cypress	6"	
208	*Cuppressus x leylandii*	Leyland Cypress	8"	
209	*Cuppressus x leylandii*	Leyland Cypress	6"	
210	*Cuppressus x leylandii*	Leyland Cypress	7"	
211	*Cuppressus x leylandii*	Leyland Cypress	6"	
212	*Cuppressus x leylandii*	Leyland Cypress	6"	
213	*Cuppressus x leylandii*	Leyland Cypress	4"	
214	*Cuppressus x leylandii*	Leyland Cypress	5"	
439	*Quercus rubra*	N. Red Oak	9"	
440	*Quercus rubra*	N. Red Oak	6"	
1074	*Magnolia grandiflora*	Southern Magnolia	18"	co-dominant trunk
1075	*Magnolia grandiflora*	Southern Magnolia	18"	

TREE PRESERVATION INVENTORY

TREE NO.	BOTANICAL NAME	COMMON NAME	SIZE	COMMENTS
			DBH (in)	
1076	*Magnolia grandiflora*	Southern Magnolia	17"	
1077	*Magnolia grandiflora*	Southern Magnolia	27"	co-dominant trunk
1167	*Pinus strobus*	White Pine	8"	
1178	*Quercus rubra*	N. Red Oak	30"	nearly dead
1230	*Quercus rubra*	N. Red Oak	14"	
1231	*Quercus rubra*	N. Red Oak	17"	
1285	*Quercus rubra*	N. Red Oak	19"	root girdling
1578	*Pinus strobus*	White Pine	17"	
1579	*Pinus strobus*	White Pine	12"	
1580	*Pinus strobus*	White Pine	8"	
1580-A	*Pinus strobus*	White Pine	6"	
1581	*Pinus strobus*	White Pine	14"	
1617	*Pinus strobus*	White Pine	11"	
1725-A	*Acer sp.*	Maple	7"	
1726-A	*Quercus montana*	Chestnut Oak	5"	
1792	*Robinia pseudoacacia*	Black Locust	19"	
1793	*Robinia pseudoacacia*	Black Locust	12"	
1793-A	*Quercus alba*	White Oak	8"	
1793-B	*Quercus alba*	White Oak	5"	
1794	*Robinia pseudoacacia*	Black Locust	13"	
1794-A	*Carya cordiformis*	Bitternut Hickory	6"	
1795	*Robinia pseudoacacia*	Black Locust	11"	
1796	*Quercus rubra*	N. Red oak	10"	
1796-A	*Robinia pseudoacacia*	Black Locust	9"	
1819	*Liriodendron tulipifera*	Tulip Poplar	24"	roots/truck growing into 1820-A
1819-A	*Robinia pseudoacacia*	Black Locust	9"	uprooted
1820	*Prunus serotina*	Black Cherry	14"	
1820-A	*Prunus serotina*	Black Cherry	13"	roots/trunk growing into 1819
1821	*Tsuga canadensis*	Eastern Hemlock	47"	multistem
1881	*Nyssa sylvatica*	Black Gum	18"	one-sided
1882	*Nyssa sylvatica*	Black Gum	17"	one-sided
1959	*Carya cordiformis*	Bitternut Hickory	19"	trunk split, trunk decay
2066	*Fraxinus sp.*	Ash	17"	leaning
2069	*Quercus montana*	Chestnut Oak	16"	trunk broken off
2070	*Quercus montana*	Chestnut Oak	14"	dead
2071	*Ulmus americana*	American Elm	11"	twisted trunk, roots growing into 2071-A
2071-A	*Quercus montana*	Chestnut Oak	11"	roots growing into 2074, leaning
2072	*Ulmus americana*	American Elm	15"	co-dominant trunk
2075	*Robinia pseudoacacia*	Black Locust	12"	major decay
2075-A	*Prunus serotina*	Black Cherry	12"	
2164	*Carya cordiformis*	Bitternut Hickory	19"	
2165	*Carya glabra*	Pignut Hickory	19"	decay, cavity in trunk
2166	*Carya glabra*	Pignut Hickory	34"	co-dominant trunk
2167	*Carya glabra*	Pignut Hickory	37"	
2168	*Acer saccharum*	Sugar Maple	23"	trunk broken off
2169	*Acer saccharum*	Sugar Maple	28"	large decay cavities
2192	*Quercus montana*	Chestnut Oak	26"	co-dominant trunk, included bark
2193	*Catalpa speciosa*	Northern Catalpa	19"	dead
2193-A	*Catalpa speciosa*	Northern Catalpa	20"	nearly dead
2208	*Acer rubrum*	Red Maple	14"	scaffold branch damage
2214	*Pinus strobus*	White Pine	11"	
2215	*Robinia pseudoacacia*	Black Locust	12"	
2216	*Robinia pseudoacacia*	Black Locust	11"	exposed roots
2219	*Robinia pseudoacacia*	Black Locust	28"	multistem
2223	*Robinia pseudoacacia*	Black Locust	12"	
2225	*Pinus strobus*	White Pine	13"	
2227	*Robinia pseudoacacia*	Black Locust	12"	
2229	*Pinus strobus*	White Pine	11"	
2231	*Pinus strobus*	White Pine	7"	
2452	*Ulmus parvifolia*	Chinese Elm	23"	co-dominant trunk
2453	*Quercus phellos*	Willow Oak	27"	
2516	*Quercus phellos*	Willow Oak	29"	
2570	*Quercus phellos*	Willow Oak	24"	
2571	*Quercus phellos*	Willow Oak	14"	
2572	*Ulmus pumila*	Siberian Elm	16"	
2657	*Ulmus pumila*	Siberian Elm	15"	co-dominant trunk
2658	*Acer saccharum*	Sugar Maple	17"	co-dominant trunk
2660	*Ulmus pumila*	Siberian Elm	14"	
2746	*Quercus alba*	White Oak	36"	
3089	*Acer saccharum*	Sugar Maple	20"	
3091	*Quercus rubra*	N. Red Oak	14"	
3092	*Quercus rubra*	N. Red Oak	15"	
3093	*Quercus montana*	Chestnut Oak	26"	
3094	*Quercus rubra*	N. Red Oak	13"	
3095	*Quercus rubra*	N. Red Oak	14"	
3096	*Liriodendron tulipifera*	Tulip Poplar	13"	
3212	*Carya glabra*	Pignut Hickory	22"	
3212-A	*Sassafras albidum*	Sassafrass	10"	
3213	*Quercus montana*	Chestnut Oak	22"	
3214	*Quercus montana*	Chestnut Oak	29"	
3215	*Quercus montana*	Chestnut Oak	20"	
3215-A	*Robinia pseudoacacia*	Black Locust	17"	co-dominant trunk, dead
3215-B	*unknown*	unknown	12"	leaning, dead
3216	*Robinia pseudoacacia*	Black Locust	14"	decay
3220	*Quercus rubra*	N. Red Oak	23"	
3221	*Quercus alba*	White Oak	13"	
3222	*Quercus rubra*	N. Red Oak	26"	
3223	*Ulmus pumila*	Siberian Elm	25"	
3226	*Ulmus americana*	American Elm	19"	co-dominant trunk, ivy
3229	*Robinia pseudoacacia*	Black Locust	15"	dead
3230	*Ulmus americana*	American Elm	15"	co-dominant trunk, ivy, in decline
3231	*Quercus montana*	Chestnut Oak	12"	
3236	*Robinia pseudoacacia*	Black Locust	10"	
3237	*Robinia pseudoacacia*	Black Locust	10"	
3239	*Robinia pseudoacacia*	Black Locust	14"	

TREE PRESERVATION INVENTORY

TREE NO.	BOTANICAL NAME	COMMON NAME	SIZE	COMMENTS
			DBH (in)	
3418	*Acer rubrum*	Red Maple	20"	co-dominant trunk
3430	*unknown*	unknown	10"	
3454	*Quercus rubra*	N. Red Oak	29"	co-dominant trunk
3456	*Robinia pseudoacacia*	Black Locust	12"	in decline
3473	*Carya cordiformis*	Bitternut Hickory	12"	
3478	*Carya cordiformis*	Bitternut Hickory	15"	catalpa sprouts out of trunk
3480	*Quercus rubra*	N. Red Oak	11"	
3481	*Robinia pseudoacacia*	Black Locust	12"	leaning
3482	*Robinia pseudoacacia*	Black Locust	19"	co-dominant trunk
3483	*Quercus rubra*	N. Red Oak	18"	
3486	*Quercus alba*	White Oak	36"	
3505	*Robinia pseudoacacia*	Black Locust	14"	
3506	*Robinia pseudoacacia*	Black Locust	13"	leaning
3507	*Robinia pseudoacacia*	Black Locust	13"	
3509	*Robinia pseudoacacia*	Black Locust	35"	multistem
3511	*Acer saccharum*	Sugar Maple	25"	
3513	*Acer rubrum*	Red Maple	31"	multistem
3514	*Robinia pseudoacacia*	Black Locust	14"	
3516-A	*Robinia pseudoacacia*	Black Locust	15"	
3517	*Robinia pseudoacacia*	Black Locust	14"	
3555	*Acer rubrum*	Red Maple	11"	
3556	*Robinia pseudoacacia*	Black Locust	13"	dead
3557	*Quercus rubra*	N. Red Oak	13"	
3597	*Robinia pseudoacacia*	Black Locust	14"	
3599	*Quercus montana*	Chestnut Oak	40"	
3603	*Robinia pseudoacacia*	Black Locust	17"	multistem
3604	*Robinia pseudoacacia*	Black Locust	21"	co-dominant trunk
3605	*Robinia pseudoacacia*	Black Locust	13"	
3619	*Robinia pseudoacacia*	Black Locust	25"	
3621	*Robinia pseudoacacia*	Black Locust	16"	
3622	*Robinia pseudoacacia*	Black Locust	15"	
3623	*Robinia pseudoacacia*	Black Locust	24"	co-dominant trunk, in decline
3624	*Robinia pseudoacacia*	Black Locust	16"	
3625	*Robinia pseudoacacia*	Black Locust	12"	trunk broken off
3626	*Acer rubrum*	Red Maple	10"	one sided, in between guy wires
3628	*Quercus rubra*	N. Red Oak	11"	
3629	*Quercus alba*	White Oak	12"	
3632	*Quercus rubra*	N. Red Oak	11"	
3633	*Robinia pseudoacacia*	Black Locust	10"	in decline
3641	*Robinia pseudoacacia*	Black Locust	12"	in decline
3641-A	*Liriodendron tulipifera*	Tulip Poplar	41"	
3647	*Liriodendron tulipifera*	Tulip Poplar	13"	
3654	*Liriodendron tulipifera*	Tulip Poplar	19"	
3668	*Prunus serotina*	Black Cherry	10"	
3668-A	*Robinia pseudoacacia*	Black Locust	22"	trunk topped off, twin trunk
3676	*Robinia pseudoacacia*	Black Locust	14"	
3703	*Robinia pseudoacacia*	Black Locust	14"	ivy
3704	*Robinia pseudoacacia*	Black Locust	12"	ivy
3705	*Liriodendron tulipifera*	Tulip Poplar	14"	ivy
3709	*Acer saccharinum*	Silver Maple	11"	
3712	*Liriodendron tulipifera*	Tulip Poplar	13"	
3721	*Robinia pseudoacacia*	Black Locust	13"	
3723	*Quercus montana*	Chestnut Oak	12"	
3725	*Prunus serotina*	Black Cherry	13"	trunk broken off
3750	*Liriodendron tulipifera*	Tulip Poplar	16"	
4931	*Robinia pseudoacacia*	Black Locust	13"	
4934	*Liriodendron tulipifera*	Tulip Poplar	14"	
4940	*Robinia pseudoacacia*	Black Locust	11"	dead
4943	*Robinia pseudoacacia*	Black Locust	13"	
4944	*Liriodendron tulipifera*	Tulip Poplar	13"	
4945	*Prunus serotina*	Black Cherry	14"	leaning, decay
4946	*Robinia pseudoacacia*	Black Locust	11"	
4948	*Liriodendron tulipifera*	Tulip Poplar	16"	
4950	*Liriodendron tulipifera*	Tulip Poplar	26"	
4953	*Liriodendron tulipifera*	Tulip Poplar	14"	
4954	*Liriodendron tulipifera*	Tulip Poplar	10"	
4958	*Liriodendron tulipifera*	Tulip Poplar	11"	
4960	*Robinia pseudoacacia*	Black Locust	14"	
4964	*Liriodendron tulipifera*	Tulip Poplar	11"	
4965	*Liriodendron tulipifera*	Tulip Poplar	18"	
4968	*Liriodendron tulipifera*	Tulip Poplar	18"	
4970	*Liriodendron tulipifera*	Tulip Poplar	13"	
4976	*Liriodendron tulipifera*	Tulip Poplar	15"	

No.	DATE	DESCRIPTION

REVISIONS

COMMONWEALTH OF VIRGINIA
Adam J. Steiner
Lic. No. 1237
11/21/2018
LANDSCAPE ARCHITECT

urban™
Planners • Engineers • Landscape Architects • Land Surveyors
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ARLINGTON, VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES
TREE PRESERVATION DETAILS
UPTON HILL REGIONAL PARK
CIVIL ENGINEERING PLAN
6060 WILSON BLVD, ARLINGTON, VIRGINIA 22205

SCALE: AS NOTED	DESIGNED	CHECKED
SUBMITTED DATE 11-21-18 05-15-18 – 08-08-18 – 09-28-18 –	APPROVED DATE CHIEF TRANSPORTATION PLANNING BUREAU	APPROVED DATE CHIEF TRANSPORTATION ENGINEERING BUREAU
APPROVED DATE CHIEF WATER, SEWER & STREETS DIV.	APPROVED DATE CHIEF ENGINEERING DIVISION	APPROVED DATE DIRECTOR OF ENVIRONMENTAL SERVICES
	APPROVED DATE CPHD PLANNER	APPROVED DATE CPHD LANDSCAPE REVIEWER
	SHEET C.39 OF 62	SP-12928

Urban, Ltd. – z:\JOBS\upton hill park\sp bid set\12928-07-TREE PRES_LANDSCAPE.dwg [TREE REMOVAL DETS] November 26, 2018 – 12:34pm kbrien

EX. PATRICK HENRY DR

RPC: 12-018-001
AGER LUCAS &
AGER LISA

RPC: 12-018-024
DE LA VIA MARCELINO
DE LA VIA JULIETA ET AL

RPC: 12-018-023
TONAKARN EAK & ORAPAN

RPC: 12-018-022
HORNE HEATHER

RPC: 12-018-021
DE OVANDO MARIA V &
ANTONIO OVANDO

RPC: 12-018-020
FERRANDO WILLIAM ANTHONY
ET AL

EX. N LEBANON ST

RPC: 12-019-021
URCIA ANDRES C TR
URCIA ROWENA M TR

RPC: 12-019-012
DOMINION HILLS LLC
ATTN DAVID B KLIMA

RPC: 12-041-026
ARLINGTON COMMUNITY
CHURCH

EX. N LIVINGSTON ST
EX. R/W

N73°56'55"E 399.58'

EX. WILSON BLVD - ROUTE 6608
EX. R/W - WIDTH VARIES
POSTED SPEED: 30 MPH
POTENTIAL BIKE
SHARE STATION

R=1472.40' (C1)
A=453.74'

PROP. PARK SIGN

EX. 8" SANITARY SEWER

EX. 8" SANITARY SEWER

EX. MEDIAN

EX. CG

EX. 15" RCP

EX. 21" RCP

EX. 12" RCP

EX. 18" RCP

EX. 24" RCP

EX. 30" RCP

EX. 36" RCP

EX. 42" RCP

EX. 48" RCP

EX. 54" RCP

EX. 60" RCP

EX. 66" RCP

EX. 72" RCP

EX. 78" RCP

EX. 84" RCP

EX.

RPC: 12-042-066
COMMONWEALTH OF VIRGINIA

RPC: 12-042-063
PATRICK HENRY 110 LLC

MATCHLINE
SEE SHEET C.40

RPC: 12-042-103
NORTHERN VA REGIONAL
PARK AUTHORITY
PARCEL B
DB. 1808 PG. 253
23.41613 ACRES

N.I.C.

"YELLOW TRAIL"
EX. WOOD CHIP TRAIL

EX. WOOD CHIP TRAIL

STEPS

EX. TIMBERS

EM

OHU

PROP. TICKET BOOTH

PROP. WOODEN DECK

PROP. CANOPY

PROP. ROPES COURSE

EX. CHAIN LINK FENCE

PROP. HANDRAIL (DESIGN BUILD BY CONTRACTOR)

PROP. 15'X7' FILTERRA

AREA OF MILLING/PAVING/STRIPING CONSIDERED MAINTENANCE AND NOT DISTURBED AREA

PIN: 0513 18 E
SCA-SPE LLC
DB. 23671 PG. 1646

ARLINGTON COUNTY (APPROXIMATE)
FAIRFAX COUNTY (APPROXIMATE)

PROP. LIGHTS (TYP.)

EX. 8" PVC PIPE

EX. 8" SANITARY SEWER

N19°22'01"E 1044.14' (TOTAL)
431.59'

N45°54'40"W
410.11'

TREE PLANTING NOTE

TREE PRESERVATION MEASURES SHALL BE IMPLEMENTED AROUND EXISTING TREES 443, 444 AND 447. NO CREDIT FOR PRESERVATION HAS BEEN TAKEN FOR THESE TREES AND REPLACEMENT TREES ARE PROPOSED WITH THIS APPLICATION. IN THE EVENT THAT THE THREE (3) EXISTING TREES ARE PRESERVED, THE SIX (6) PROPOSED REPLACEMENT TREES SHALL NOT BE REQUIRED.

PIN: 0514-01-0001
NORTHERN VA REGIONAL
PARK AUTHORITY
PARCEL A
DB. 3764 PG. 55
3.11833 ACRES

PROP 42" 8" PVC

EX. SAN. TOP TO BE RAISED TO PROPOSED ELEVATION (SEE SHEET C.03A FOR DETAIL)

EX. WOOD DECK

EX. CONCRETE SIDEWALK

EX. BUILDING

EX. 6" CHAIN LINK WITH BARBED WIRE

S19°22'20"W 468.64'

S19°22'20"W 296.35' (TOTAL)
241.71'

N70°03'10"W 523.62'

RPC: 12-042-106
SAINT ALBANS HOUSING
HARTLAND BANK
DB. 3860 PG. 1232

PIN: 0514 01 0333B
SAINT ALBANS HOUSING CORP,
DB. 17445 PG. 0778

No.	DATE	DESCRIPTION
		REVISIONS

COMMONWEALTH OF VIRGINIA
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09/28/2018
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ARLINGTON, VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES

LANDSCAPE PLAN
UPTON HILL REGIONAL PARK
CIVIL ENGINEERING PLAN
6060 WILSON BLVD, ARLINGTON, VIRGINIA 22205

SCALE: 1"=30'	DESIGNED	CHECKED
SUBMITTED DATE 11-21-18 05-15-18 – 08-08-18 – 09-28-18 –	APPROVED DATE CHIEF TRANSPORTATION PLANNING BUREAU	APPROVED DATE CHIEF TRANSPORTATION ENGINEERING BUREAU
APPROVED DATE CHIEF WATER, SEWER & STREETS DIV.	APPROVED DATE CHIEF ENGINEERING DIVISION	APPROVED DATE DIRECTOR OF ENVIRONMENTAL SERVICES
	APPROVED DATE CPHD PLANNER	APPROVED DATE CPHD LANDSCAPE REVIEWER
	SHEET C.41 OF 62	SP-12928

Urban, Ltd – k:\JOBS\upton hill park\sp bid set\12928-07-TREE PRES LANDSCAPE.dwg [LANDSCAPE PLAN – SOUTH] November 26, 2018 – 12:35pm bbrien

PLANTING SPECIFICATIONS

I. SCOPE OF WORK
- A. THIS WORK SHALL CONSIST OF CLEARING AND SOIL PRERPERATION, FINISH GRADING, PLANTING AND DRAINAGE, INCLUDING ALL LABOR, MATERIALS, TOOLS, EQUIPMENT AND ANY OTHER APPURTENANCES NECESSARY FOR THE COMPLETION OF THIS PROJECT.

II. MATERIALS
- A. GENERALLY
  ALL MATERIALS SHALL BE BEST OF ITS KIND AVAILABLE. SOIL AND PLANTING SHALL NOT BEGIN UNTIL ALL IRRIGATION WORK AROUND PLANTING AREAS IS COMPLETE AND APPROVED.
- B. PLANTS
  ALL PLANTS SHALL BE HEALTHY, OF NORMAL GROWTH, WELL-ROOTED, AND FREE FROM DISEASE AND INSECTS.
- C. TOPSOIL
  ORGANIC TOPSOIL SHALL BE FREE OF DEBRIS, ROCKS LARGER THAN 2", WOOD, ROOTS, VEGITABLE MATTER AND CLAY CLODS.
- D. MULCH
  MULCH SHALL BE DOUBLE-SHREDDED HARDWOOD BARK.

III. FERTILIZER AND CONDITIONERS
- A. ORGANIC FERTILIZER SHALL BE PROCESSED SEWER SLUDGE WITH MINIMUM CONTENT OF 1% NITROGEN AND 2% PHOSPHORIC ACID, EQUIL TO "NITROHUMUS".
- B. ORGANIC FERTILIZER AND SOIL CONDITIONERS SHALL BE "GROW-POWER" OR EQUAL AND ORGANIC BASE MATERIALS COMPRISED OF DECOMPOSED ANIMAL AND VEGETABLE MATTER AND COMPOSTED TO SURPPORT BACTERIAL CULTURES CONTAINING NO POULTRY, ANIMAL OR HUMAN WASTE. GUARANTEED ANALYSIS (5-3-1); NITROGEN 5%, PHOSOHATE 3%, POTASH 1%, 50% HUMIC ACIDS.

IV. GENERAL WORK
- A. LANDSCAPE WORK SHALL BE ACCORDING TO THE WORKMANLIKE STANDARDS ESTABLISHED FOR LANDSCAPE CONSTRUCTION AND PLANTINGS.

V. WEEDING
- A. BEFORE AND DURING PRELIMINARY GRADING AND FINISH GRADING, ALL WEEDS AND GRASSES SHALL BE DUG OUT BT THE ROOTS AND DISPOSED OF AT THE CONTRACTOR'S EXPENSE.

VI. TOPSOIL
- A. CONTRACTOR SHALL PROVIDE 4" MINIMUM THICK TOPSOIL LAYER IN ALL PLANTING AREAS. TOPSOIL SHALL BE SPREAD OVER A PREPARED SURFACE AS A UNIFORM LAYER TO PRODUCE A 4" COMPACTED THICKNESS. TOPSOIL PRESENT AT THE SITE, IF ANY, MAY BE USED TO SUPPLEMENT TOTAL AMOUNT REQUIRED.

VII. SOIL CONDITIONING
- A. CULTIVATE ALL AREAS SHALL BE PLANTED TO DEPTH OF 6". ALL DEBRIS EXPOSED FROM EXCEVATION AND CULTIVATION SHALL BE DISPOSED OF AT THE CONTRACTOR'S EXPENSE. CONDITIONER SHALL BE SPREAD EVENLY IN ALL PLANTING AREAS AND TILLED IN TWO DIRECTIONS INTO THE TOP 4", WITH THE FOLLOWING PER 1,000 SQUARE FEET.
  150 POUNDS "GRO-POWER" OR EQUAL
  100 POUNDS AKGRICULTURAL GYPSUM
  20 POUNDS NITROFORM (COURSE) 3-O-O BLUE CHIP

VIII. PLANTING
POSITION TREES AND SHRUBS AT THEIR INTENDED LOCATIONS AS PER THE PLANS AND SECURE THE APPROVAL OF THE LANDSCAPE ARCHITECT OR HIS REPRESENTATIVE BEFORE EXCAVATING THE PITS, MAKING NECESSARY ADJUSTMENTS AS DIRECTED.
- A. PLANTING PITS SHALL BE DUG WITH LEVEL BOTTOMS, TWICE THE WIDTH OF THE DIAMETER OF THE ROOT BALL AND DEPTH MATCHING ARLINGTON COUNTY DETAILS R7.2 AND R7.6. EACH PLANT PIT SHALL BE BACKEDFILLED WITH THE FOLLOWING PREPARED SOIL, MIXED THOROUGHLY:
  1 PART LEAF MOULD OR COMPOST
  1 PART COW MANURE BY VOLUME
  3 PARTS TOPSOIL BY VOLUME
  21 GRAMS "AGRIFORM" PLANTING TABLETS OR EQUAL
  2 TABLETS PER 1 GAL. PLANT
  3 TABLETS PER 5 GAL. PLANT
  4 TABLETS PER 15 GAL. PLANT
  FOR LARGER PLANTS, 2 TABLETS PER ½" DIAMETER OF TRUNK CALIPER
- B. PREPARED SOIL SHALL BE TAMPED FIRMLY AT BOTTOM OF PIT. FILL PREPARED SOIL AROUND BALL OF PLANT HALFWAY, INSERT PLANT TABLETS, COMPLETE BACKFILL AND WATER THOROUGHLY.
- C. ALL PLANTS SHALL BE SET SO THAT THEY BEAR THE SAME RELATION TO THE REQUIRED GRADE AS THEY BORE TO THE NATURAL GRADE BEFORE BEING TRANSPLANTED.
- D. IMMEDIATELY AFTER PLANTING, STAKE ALL TREES TO PREVEMT DAMAGE FROM WIND. FEASTEN TREES TO UPPER END OF STATE IN AT LEAST TWO PLACES USING HOSE TYPE TIES.
- E. PREPARE RAISED EARTH BASINS AS WIDE AS PLANTING HOLE OF EACH TREE.
- F. WATER IMMEDATELY AFTER PLANTING. WATER SHALL BE APPLIED TO EACH TREE AND SHRUB IN SUCH A MANNER AS NOT TO DISTURB BACKFILL AND TO THE EXTENT THAT ALL MATERIALS IN THE PLANTING HOLE ARE THOUGHLY SATURATED.
- G. PRUNE ALL PROPOSED TREES DIRECTLY ADJCENT TO WALKWAYS TO A MINIMUM OF 7'-0" BRANCHING HEIGHT.

IX. GROUND COVER
- A. ALL GROUND COVER AREAS SHALL RECEIVE A ½" LAYER OF HUMUS HAKED INTO THE TOP 1" OF PREPARED SOIL PRIOR TO PLANTING GROUNG COVER.
- B. SPACING AND VERIETY OF GROUND COVER SHALL BE AS SHOWN ON APPROVED DRAWINGS.
- C. IMMEDIATELY AFTER PLANTING GROUND COVER, CONTRACTOR SHALL THOUGHLY WATER THE GROUND COVER.
- D. ALL GROUND COVER AREAS SHALL BE TREATED WITH A PRE-EMERGENT BEFORE FINAL LANDSCAPE INSPECTION. GROUND COVER AREAS SHALL BE WEEDED PRIOR TO APPLYING PRE-EMERGENT. PRE-EMERGENT SHALL BE APPLIED PER MANUFACTUR'S RECOMMENDATION.

X. FINISH GRADING
- A. ALL AREAS WILL BE RECEIVED BY THE CONTRACTOR AT SUBSTANTIALLY PLUS/MINUS 0.1 FOOT OF FINISH GRADE.
- B. ALL LAWN AND PLANTING AREAS SHALL BE GRADED TO A SMOOTH, EVEN AND UNIFORM PLANE WITH NO ABRUPT CHANGE OF SURFACE, UNLESS OTHERWISE DIRECTED BY LANDSCAPE ARCHITECT OR HIS REPRESENTATIVE. SOIL AREAS ADJCENT TO BUILDINGS SHALL SLOPE AWAY FROM BUILDING.
- C. ALL PLANTING AREAS SHALL BE GRADED AND MAINTAINED TO ALLOW FREE FLOW OF SURFACE WATER.

XI. GUARANTEE
- A. CONTRACTOR SHALL GAURANTEE ALL PLANTS FOR A PERIOD OF TWO YEARS FROM ACCEPTANCE OF JOB.

XII. CLEAN UP
- A. UPON THE COMPLETION OF ALL PLANTING WORK AND BEFORE FINAL ACCEPTANCE, THE CONTRACTOR SHALL REMOVE ALL MATERIAL, EQUIPMENT AND DEBRIS RESULTING FROM HIS WORK. ALL PAVED AREAS SHALL BE BROOM CLEANED AND THE SITE LEFT IN A NEAT AND ACCEPTABLE CONDITION AS APPROVED BY THE OWNER'S AUTHORIZED REPRESENTATIVE.
- B. ALL TREES, SHRUBS OTHER PLANTS AND PLANT BEDS SHALL BE MAINTAINED BY PRUNNING, CULTIVATING AND WEEDING AS REQUIRED FOR HEALTHY GROWTH. THIS WORK SHALL INCLUDE RESTORING PLANTING SAUCERS; TIGHTENING AND REPAIRING STAKES AND GUY SUPPORTS; RSETTING TREES AND SHRUBS TO PROPER GRADES OR VERTICAL POSITION AS REQUIRED; RESTORING OR REPLACING DAMAGED WRAPPINGS; AND SPRAYING WITH HERBICIDE AS REQUIRED TO KEEP TREES AND SHRUBS FREE OF INSECTS AND DISEASE.
- C. LAWNS SHALL ME MAINTAINED BY WEATHERING, FERTILIZING, WEEDING, MOWING, TRIMMING AND OTHER OPERATIONS SUCH AS ROLLING, REGRADING, AND REPLANTING AS REQUIRED TO ESTABLISH A SMOOTH, ACCEPTABLE LAWN FREE OF ERODED OR BARE AREAS.

XIII. MAINTENANCE (ALTERNATE BID)
COST PER MONTH AFTER INITIAL 90-DAY MAINTENANCE PERIOD.

XIV. PLANTING MATERIAL GUARANTEE
- A. PLANTING MATERIAL SHALL BE OF GOOD NURSERY STOCK AND A NURSERY GUARANTEE SHALL BE PROVIDED BY THE GENERAL CONTRACTOR THROUGH THE DEVELOPER FOR TWO YEARS, INCLUDING THE REPLACEMENT AND MAINTENANCE (TO INCLUDE BUT NOT LIMITED TO PRUNING, FEEDING, SPRAYING, MULCHING, WEEDING AND WATERING) OF ALL LANDSCAPE MATERIALS FOLLOWING THE ISSUANCE OF THE MASTER CERTIFICATE OF OCCUPANCY.

XV. URBAN FORESTER NOTIFICATION
- A. THE DEVELOPER AGREES TO NOTIFY THE ARLINGTON COUNTY OF PARKS, RECREATION AND CULTURAL AFFAIRS URBAN FORESTER AT 703-228-6557 AT LEAST 72 HOURS IN ADVANCE OF THE SCHEDULED PLANTING OF ANY TREES IN THE PUBLIC RIGHT OF WAY AND TO BE AVAILABLE AT THE TIME OF PLANTING TO MEET WITH THE STAFF OF THE DPRCR TO INSPECT THE PLANT MATERIAL, TREE PIT, AND THE TECHINIQUE OF PLANTING. SOIL USED IN THE TREE PIT MUST MEET THE SPECIFICATIONS FOR STREET TREE PLANTING "STANDARDS FOR PLANTING AND PRESERVATION OF TREES ON SITE PLAN PROJECTS" AVAILABLE FROM THE URBAN FORESTER.

PLANTING NOTES

1. PLANT MATERIAL SHALL BE FURNISHED AND INSTALLED AS INDICATED, INCLUDING ALL LABOR, MATERIALS, PLANTS, EQUIPMENT, INCIDENTALS, AND CLEAN-UP.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PLANTING AT CORRECT GRADES AND ALIGNMENT. LAYOUT TO BE APPROVED BY OWNERS' REPRESENTATIVE PRIOR TO INSTALLATION.
3. PLANTS SHALL BE TYPICAL OF THEIR SPECIES AND VARIETY; HAVE NORMAL GROWTH HABITS, WELL-DEVELOPED DENSELY FOLIATED BRANCHES, AND VIGOROUS ROOT SYSTEMS; AND BE FREE FROM DEFECTS AND INJURIES.
4. CONTRACTORS SHALL REPORT ANY SOIL OR DRAINAGE CONDITIONS COSIDERED DETRIMENTIAL TO GROWTH OF PLANT MATERIAL.
5. ALL PLANT MATREIAL SHALL BE GURANTEED BY THE CONTRACTOR TO BE IN GOOD VIGOROUS GROWING CONDITION. PROVISION SHALL BE MADE FOR A GROWTH GUARANTEE OF AT LEAST ONE YEAR FROM THE DATE OF ACCEPTANCE FOR TREES AND SHRUBS. REPLACEMENTS SHALL BE MADE AT THE BEGINNING OF THE FIRST SUCEEDING PLANTING SEASON. ALL REPLACEMENTS SHALL HAVE A GUARENTEE EQUAL TO THAT STATED ABOVE.
6. PLANT MATERIAL SHALL BE PLANTED ON THE DAY OF DELIVERY IF/WHEN PRACTICAL. IN THE EVENT THAT THIS IS NOT POSSIBLE, THE CONTRACTOR SHALL PROTECT STOCK NOT PLANTED. PLANTS SHALL NOT REMAIN UNPLANTED FOR LONGER THAN A THREE-DAY PERIOD AFTER DELIVERY. ANY PLANTS NOT INSTALLED DURING THIS PERIOD SHALL BE REJECTED, UNLESS OWNER AND CONTRACTOR PROVIDE OTHERWISE BY WRITTEN AGREEMENT.
7. QUALITY AND SIZE OF PLANTS, SPREAD OF ROOTS, AND SIZE OF ROOTBALL SHALL BE IN ACCORDANCE WITH THE MOST RECENT VERISION OF ANSI Z60 "AMERICAN STANDARD FOR NURSERY STOCK" PUBLISHED BY THE AMERICAN ASSOCATION OF NURSERYMEN, INC.
8. ALL PLANTS SHALL BE PLANTED IN AMENDED TOP SOIL THAT IS THROUGHLY WATERED AND TAMPED AS BACK-FILLING PROGRESSES. PLANTING MIX TO BE AS SHOWN ON PLANTING DETAILS. LARGE PLANTING AREAS TO INCORPRRATE FERTILIZER AND SOIL CONDITIONERS AS TESTED IN PLANTING SPECIFICATIONS.
9. PLANTS SHALL NOT BE BOUND WITH WIRE OR ROPE AT ANY TIME SO AS TO DAMAGE THE BARK OR BREAK BRANCHES. PLANTS SHALL BE HANDLED FROM THE BOTTOM OF THE BALL ONLY.
10. PLANTING OPERATIONS SHALL BE PERFORMED DURING PERIODS WITHIN THE PLANTING SEASON WHEN WEATHER AND SOIL CONDITIONS ARE SUITABLE AND IN ACCORDANCE WITH ACCEPTED LOCAL PRACTICE. PLANTS SHALL NOT BE INSTALLED IN TOP SOIL THAT IS IN AMUDDY OR FROZEN CONDITION. ALL PLANT MATERIAL SHALL BE SPRAYED WITH "WILT-PRUF" OR EQUAL AS PER MANUFACTURERS INSTRUCTIONS.
11. NO PLANT, EXCEPT GROUNDCOVERS, SHALL BE PLANTED LESS THAN TWO FEET FROM EXISTING STRUCTURES AND SIDEWALKS.
12. SET ALL PLANTS PLUMB AND STRAIGHT. SET AT SUCH LEVEL THAT A NORMAL OR NATURAL RELATIONSHIP TO THE GROUND IF THE PLANT WITH THE GROUND SURFACE WILL BE ESTBLISHED. LOCATE THE PLANT IN THE CENTER OF THE PIT.
13. ALL INJURED ROOTS SHALL BE PRUNED TO MAKE CLEAN ENDSBEFORE PLANTING UTILIZING CLEAN, SHARP TOOLS. IT IS ADVISABLE TO PRUNE APPROXIMATELY 1/3 OF THE GROWTH OF LARGER TREES (2" CALIPER AND GREATER) BY THE REMOVAL OF SURPERFLUOUS BRANCHES, THOSE WHICH CROSS, THOSE WHICH RUN PARALLEL, ETC. MAIN LEADER OF TRESS SHALL NOT BE CUT BACK. LONG SIDES BRANCHES SHALL BE SHORTEND.
14. EACH TREE SHRUB SHALL BE PRUNED IN ACCORDANCE WITH STANDARD HORTICULTURAL PRACTICE TO PRESERVE THE NATURAL CHARACTER OF PLANT. PRUNING SHALL BE DONE WITH CLEAN, SHARP TOOLS.
15. TREES SHALL BE SUPPORTED IMMEDIATELY AFTER PLANTING. ALL TREES 6" AND GREATER IN CALIPER SHALL BE GUYDED. SMALLER TREES SHALL BE STAKED. GUYING WIRES AND STAKES SHALL BE INSTALLED AS INDICATED. THE LANDSCAPE CONTRACTOR SHALL REMOVE STAKING, GUYING AND TREE WRAP AT THE END OF ONE YEAR MAINTENANCE AND GUARANTEE PERIOD.
16. ALL PLANTING BEDS SHALL BE MULCHED WITH 3" LAYER OF DOUBLE SHREDDED HARDWOOD BARK MULCH.
17. NEW PLANTING AREAS AND SOD SHALL BE ADEQUATELY IRRIGATED OR WEATHERED TO ESTABLISH THE PROPOSED PLANTS AND LAWN.
18. ALL PLANTS SHOWN ON THE APPROVED LANDSCAPE PLAN SHALL BE INSTALLED, INSPECTED AND APPROVED BT THE LANDSCAPE ARCHITECT OR HIS REPRESENTATIVE. THE LANDSCAPE ARCHITECT SHALL TAKE INTO ACCOUNT SEASONAL COSIDERATIONS IN THIS REGARD. TREES, SHRUBS, VINES AND GROUNDCOVER AS REQUIRED BY OR ASSOCIATED WITH A SUBDIVISION OR SITE PLAN APPROVED BY THE PLANNING AUTHORITIES SHALL BE INSTALLED DURING THE FOLLOWING PLANTING SEASONS:

TYPE	DATES
PLANTS	03/15 TO 12/15
LAWNS	03/15 TO 06/15
	09/15/ TO 12/01

THE FOLLOWING TRE VARITIES SHALL NOT BE PLANTED DURING THE FALL PLANTING SEASON DUE TO THE HAZARDS ASSOCIATED WITH PLANTING THESE TREES IN THIS SEASON:

ACER RUBRUM	POPULUS SPP.
BETULA SPP.	PRUNUS SPP.
CARPINUS SPP.	PYRUS SPP.
CRATECUS SPP.	QUERCUS SPP.

KOELREUTERIA PANICULATA SALIX SPP.
LIQUIDAMBAR STYRACIFLUA TILIA TOMENTOSA
LIRIODENDRON TULIPIFERA ZELKOVA
PLANTANUS ACERIFOLIA

ANY PLANTING INSTALLED IN CONFLICT WITH THIS REQUIREMENT MUST RECEIVE WRITTEN APPROVAL OF THE LANDSCAPE ARCHITECT PRIOR TO PLANTING. FAILURE TO COMPLY WITH THESE REQUIREMENTS WILL REQUIRE REMOVAL OF THE PLANTING IN QUESTION. THIS REQUIREMENT DOES NOT APPLY TO SEEDING OR SODDING OR PLANTINGS SPECIFICALLY FOR SOIL STABILIZATION PURPOSES. PLANTINGS ASSOCIATED WITH ANY LOT GIVEN A CERTIFICATE OF OCCUPANCY OUTSIDE THESE PERIODS SHALL BE PROVIDED DURING THE PREVIOUS OR NEXT APPROPREATE SEASON.

19. ALL DISTURBED AREAS SHALL BE TREATED WITH 4" TOP SOIL AND SEEDED IN ACCORDANCE WITH PERMANENT STABILIZATION METHODS INDICATED ON SOIL EROSION AND SEDIMENT CONTROL SHEET.

LANDSCAPE MAINTENANCE MANAGEMENT PROGRAM

I. GENERAL
- A. ALL PLANTING AREAS, INCLUDING LAWNS, BUFFERS, AND PARKING LOTS, SHALL BE PERIODICALLY INSPECTED A MINIMUM OF ONCE PER MONTH, EVERY TWO (2) WEEKS DURING THE GROWING SEASON, OR AFTER EACH MOWING SESSION. A FALL CLEAN-UP SHALL BE PERFORMED EACH YEAR.
- B. REMOVE ALL LITTER, DEBRIS AND WEEDS.
- C. MAINTAIN A MINIMUM OF A 2-INCH DEPTH OF ORGANIC HARDWOOD MULCH OR EQUAL IN ALL PLANTING BEDS.

II. IRRIGATION (IF APPLICABLE)
- A. AUTOMATIC SPRINKLERS SHALL BE CLEANED OUT AND TURNED OFF IN THE FALL PRIOR TO THE FIRST FROST, AND TESTED WHEN TURNED ON IN THE SPRING
- B. EVALUATE SUCCESS OF IRRAGATION SYSTEM AND MODIFY AS NECESSARY.
  WATER REQUIREMENTS:
  NEW TRUF: KEEP MOIST UNTIL ALL SEED GERMINARES AMD BECOMES AN ESTABLISHED STAND OF TURF.
  EXISTING TURF: DURING DRY PERIODS, WATER TWICE A WEEK FOR 20 MINUTES AT A TIME, OR SET IRRIGATION FOR COVERAGE OF 1-2 INCHES OF WATER PER WEEK.

III. SEASONAL FLOWERS
- A. ANNUAL FLOWER BEDS SHALL BE PERIODICALLY MULCHED AND THE SOIL AMENDED ANNUALLY. NEW PLANTINGS SHALL BE PROVIDED IN MAY OF EACH YEAR. DURING THE GROWING SEASON, ALL BEDS SHALL RECEIVE PERIODIC INSPECTIONS PER NOTE 1, IRRIGATION AND WEEDING TO MAINTAIN A NEAT APPERANCE.

IV. TURF
- A. LAWN AREAS SHALL NOT EXCEED A HEIGHT OF 4" INCHES. APPROXIMATELY 12-15 MOWINGS PER YEAR WILL BE REQUIRED.
- B. FERTILIZER AND SOIL AMENDMENTS SHOULD BE ADDED A NECESSARY AND/OR ON A SEASONAL BASIS. FERTILIZER IS OPTIMALLY APPLIED TO LAWN AND TURF AREAS THREE TUNES PER SEASON. TIMING, FREQUENCY AND RATE OF APPLICATION SHALL BE ADJUSTED ACCORDING TO WEATHER AND TO HORTICULTURAL AND SOIL TEST CONDITIONS FOR EACH SPECIFIC SITE. FERTILIZER SHALL BE APPLIED BY ACCEPTED METHODS ONLY. SAFTY SHALL BE OF PRIME CONSIDERATION. CARE SHALL BE TAKEN NOT TO APPLY FERTILIZER WHEN THE GROUND IS WET.
- C. SOIL AMENDMENTS SUCH AS LIME, GYPSUM OR PEAT MOSS MAY BE ADDED TO THE SOILS OF LAWNS, TURF OR PLANTING AREAS PERIODICALLY. THE NEED FOR SUCH SOIL AMENDMENTS SHALL BE ANALYZED DURING THE PERIODIC INSPECTIONS AND IN CONJUNCTION WITH SOIL TESTS.
- D. SOIL AMENDMENTS SHALL BE APPLIED IN ACCORDANCE WITH MANUFACTURERS' SPECIFICATIONS OR BASED UPON SOIL TEST RESULTS.
  APPLY A 3-1-2 (21-7-14, 10-4-6, OR 24-4-8) 50% ORGANIC FERTILIZER TWICE A REAR BETWEEN MARCH 15 TO APRIL 15 AND SEPTEMBER 1 TO OCTOBER 1. IF NECESARRY, TWO ADDITIONAL APPLICATIONS MAY BE MADE IN MAY AND NOVEMBER.
  DO NOT APPLY FERTILIZER OR SOIL AMENDMENTS WHILE TURF IS EITHER WET OR UNDER EXTREME STREES, IN WINDY CONDITIONS, OR WHEN CHILDERN ARE PRESENT.

V. PRUNING
- A. REMOVAL OF DEAD, DISEASED, INSECT INFECTED OR WEAK WOOD SHALL TAKE PLACE IN THE DORMANT SEASON OR AFTER FLOWERING. EXCESSIVE SHOOTS AND SUCKERS SHALL BE REMOVED.
- B. SHRUB MATERIAL USED AS A SCREEN SHALL BE PRUNED AS A MASS TO ENCANCE THEIR NATURAL FORM. HEDGES
- C. ROOT PRUNING OF TREES ADJACENT TO CURBS OR SIDEWALKS SHALL OCCURE DURING PERIODIC INSPECTIONS WITH KNOWLEDGE OF MOST RECENT PRUNING. NO MORE THAN 1/3 OF ROOT SYSTEM SHALL BE PRUNDED DURING A YEAR

VI. INSECT AND DISEAES CONTROL
- A. THE CONTROL OF INSECTS AND DISEASE ASSOCIATED WITH ALL PLANTING AREAS SHALL ALWAYS BE A MAINTENANCE PRIORITY. ALL PLANTINGS, INCLUDING EXISITING MATURE TREES, SHALL BE PERIODICALLY INSPECTEDFOR INSECTS OR DISEASE INFESTATION. METHODS UTILIZED TO CONTROL INSECTS OR DISEASE MAY RANGE FROM SPRAYING AND PRUNING TO PLANT REMOVAL. WHATEVER METHOD IS UTILIZED, SAFETY AND CONTROL SHALL BE OF PRIME CONCERN.

VII. RENOVATION
- A. RENOVATION INCLUDES THE RESEEDING OR REPLANTING OF LANDSCAPE AREAS DAMAGED, DESTROYED OR FAILING DUE TO INSECTS, DISEASE, WEATHER OR PHYSICAL DAMAGE.
- B. LAWN-ALL AREAS WHERE SOIL HAS BEEN EXPOSED SHALL BE RENOVATED DURING THE NEXT PLANNING SEASON. PROPER HORTICULTURAL AND SOIL EROSION PREVENTION METHODS SHALL BE UTILIZED. IF SOIL EROSION HAS OCCURRED, THE AREA SHALL BE REPAIRED WITH A SEED MIXTURE COMPATIBLE TO EXISTING PLANTINGS SHALL BE UTILIZED.
- C. PLANTINGS- ALL PLANTINGS WHICH ARE DAMAGED OR DESTROYED SHALL BE REPLACED DURING THE NEXT GROWING SEASON. A FAILING, DAMAGED OR DESTROYED LANDSCAPE SCREEN OR BURREFER MUST BE RENOVATED OR REPLACED WITHIN A REASONABLE PREIOD OF TIME, BUT NOT TO EXCEED THE SUBSEQUENT GROWING SEASON.

VIII. SITE AMENITIES
- A. BENCHES, PATHS, BICYCLE RACKS, TRASH RECEPTACLES AND SIGNS SHALL BE INSPECTED AT LEASTTWICE A YEAR, ONCE IN MARCH AND ONCE IN AUGUST, TO DETERMINE THEIR CONDITION. ANY DAMAGED, WORN OR UNSAFE CONDITIONS SHALL BE RECTIFIED IMMEDIATELY.

IX. PAVED SURFACES
- A. ALL PAVED SURFACES, CONCRETE SIDEWALKS, ASPHALT PAVEMENT AND DECORAVTIE PAVEMENT SHALL BE INSPECTED ON A REGULAR BASIS. ALL SUCH SURFACES SHALL BE INSPECTED AT LEAST ONCE PER MONTH.
- B. TRASH, STAINS AND/OR OBSTRUCTIONS SHALL BE REMOVED IMMEADIATELY. PAVEMENT SHALL BE INSPECTED FOR DAMAGE, CRACKS, AND/OR HOLES, AND RETURNED TO THEIR ORIGINAL CONDITIONS.
- C. SNOW SHALL BE REMOVED DURING AND FOLLOWING EVERY STORM. SIDEWALKS AND PARKING AREAS SHALL BE KEPT CLEAR OF ICE AND SNOW DURING BUSINESS HOURS.

PLANT SCHEDULE

Key	Qty.	Botanical Name	Common Name	Native Species	Size	Type	Remarks
		Shade Trees					
CL	20	Celtis laevgata	Sugar Hackberry	X	2" Cal.	B & B	Uniform branching pattern, No girdling roots
QP	6	Quercus phellos	Willow Oak	X	2" Cal.	B & B	Uniform branching pattern, No girdling roots
UA	3	Ulmus americana 'Valley Forge'	Valley Forge American Elm	X	2" Cal.	B & B	Uniform branching pattern, No girdling roots
	29	**Total Proposed Shade Trees**					

TREE REPLACEMENT COMPUTATIONS

Total Required Tree Replacements	71
Provided Tree Replacements:	
Shade Trees	29
Overstory Trees within Reforestation Area	40
Understory Trees within Reforestation Area (32 Proposed Trees @ 3:1 Ratio)	10
Total Provided Tree Replacements	79

No.	DATE	DESCRIPTION

REVISIONS

COMMONWEALTH OF VIRGINIA
Adam J. Steiner
Lic. No. 1237
11/21/2018
LANDSCAPE ARCHITECT

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ARLINGTON, VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES

LANDSCAPE DETAILS
UPTON HILL REGIONAL PARK
CIVIL ENGINEERING PLAN
6060 WILSON BLVD, ARLINGTON, VIRGINIA 22205

SCALE: N/A	DESIGNED	CHECKED
SUBMITTED DATE 11-21-18 05-15-18 – 08-08-18 – 09-28-18 –	APPROVED DATE CHIEF TRANSPORTATION PLANNING BUREAU	APPROVED DATE CHIEF TRANSPORTATION ENGINEERING BUREAU
APPROVED DATE CHIEF WATER, SEWER & STREETS DIV.	APPROVED DATE CHIEF ENGINEERING DIVISION	APPROVED DATE DIRECTOR OF ENVIRONMENTAL SERVICES
	APPROVED DATE CPHD PLANNER	APPROVED DATE CPHD LANDSCAPE REVIEWER
	SHEET C.42 OF 62	SP-12928

Urban, Ltd. – J:\JOBS\upton hill park\cp bid set\12928-07-TREE PRES LANDSCAPE.dwg [LANDSCAPE PLAN DETS] November 26, 2018 – 12:35pm bbrien

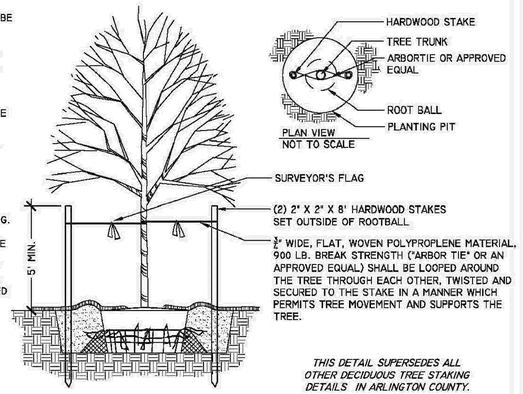
NOTES

1. STAKING AND GUYING MAY ONLY BE IMPLEMENTED WHERE SITE CONDITIONS WARRANT THEIR USE. PLANTED TREES WILL BE ASSESSED INDIVIDUALLY BY PROJECT OFFICER. STAKING AND GUYING WILL BE INSTALLED ONLY IF REQUIRED BY PROJECT OFFICER. CONDITIONS WHERE STAKING AND GUYING MAY BE NECESSARY TO ENSURE STABILITY INCLUDE: WINDY LOCATIONS, STEEP SLOPES, OR WHERE VANDALISM MAY BE A CONCERN.

2. STAKES OR GUYS WILL BE INSTALLED USING ACCEPTED ARBORICULTURE PRACTICES. TREES SHALL STAND PLUMB AFTER STAKING.

3. INSTALLATION WILL INCLUDE THE REMOVAL OF ALL STAKING AND GUYING MATERIAL ONE YEAR AFTER INSTALLATION. ANY HOLES LEFT BY REMOVING STAKING SHALL BE FILLED WITH APPROVED TOPSOIL/BACKFILL MIXTURE.

4. REFER TO DETAILS FOR TREE PLANTING INFORMATION.



THIS DETAIL SUPERSEDES ALL OTHER DECIDUOUS TREE STAKING DETAILS IN ARLINGTON COUNTY.

DECIDUOUS TREE STAKING

NOT TO SCALE

ELEVATION
02930.6 (2013)

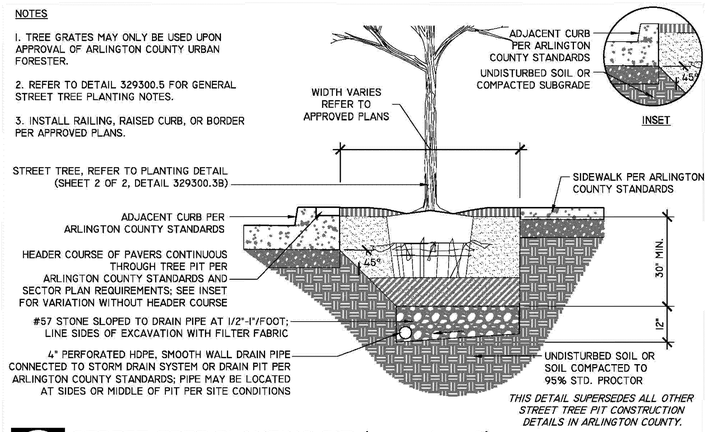
ARLINGTON VIRGINIA DPR

NOTES

1. TREE GRATES MAY ONLY BE USED UPON APPROVAL OF ARLINGTON COUNTY URBAN FORESTER.

2. REFER TO DETAIL 329300.5 FOR GENERAL STREET TREE PLANTING NOTES.

3. INSTALL RAILING, RAISED CURB, OR BORDER PER APPROVED PLANS.



THIS DETAIL SUPERSEDES ALL OTHER STREET TREE PIT CONSTRUCTION DETAILS IN ARLINGTON COUNTY.

STREET TREE PLANTING PIT (SHEET 1 OF 2)

1/2" - 1'-0"

FOR TREE PLANTING PITS IN RIGHT-OF-WAY & ADJACENT TO PAVING
329300.3A (2016) (02930.3A)

ARLINGTON VIRGINIA DPR

NOTES

1. AT PLANTING PRUNE ONLY CROSSING LIMBS, BROKEN OR DEAD BRANCHES, AND ANY BRANCHES THAT POSE A HAZARD TO PEDESTRIANS. DO NOT PRUNE INTO OLD WOOD ON EVERGREENS.

2. CONTRACTOR SHALL MAXIMIZE EXCAVATED AREA FOR TREE PIT WITHOUT ADVERSELY IMPACTING ADJACENT SITE FEATURES.

3. UNLESS OTHERWISE DIRECTED BY PROJECT OFFICER, BACKFILL SOIL MIXTURE WILL BE 3/4 EXISTING SOIL CLEANED OF DEBRIS (GRAVEL, ROCKS, STICKS, TRASH, ETC.) AND MIXED WITH 1/4 ORGANIC MATERIAL(COMPOSTED BARK, LEAF MOLD, OR OTHER PLANT DEBRIS PROCESSED TO A POINT OF DECAY AND APPROVED BY THE PROJECT OFFICER; PEAT MOSS MAY NOT BE USED).

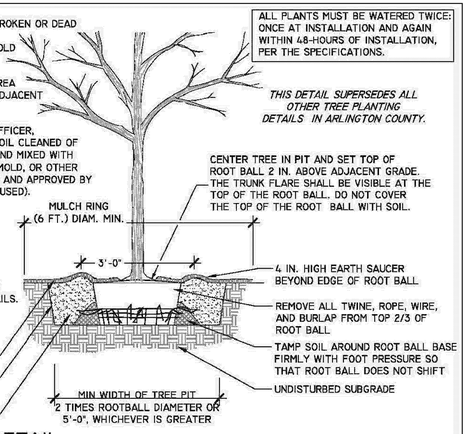
4. CONTRACTOR SHALL REMOVE EXCESS SOIL & DEBRIS FROM SITE.

5. TREES PLANTED WITHOUT THE TRUNK FLARE VISIBLE WILL BE REJECTED.

6. TREES MAY ONLY BE STAKED IF REQUIRED BY THE PROJECT OFFICER. REFER TO STAKING DETAILS.

ALL PLANTS MUST BE WATERED TWICE: ONCE AT INSTALLATION AND AGAIN WITHIN 48-HOURS OF INSTALLATION, PER THE SPECIFICATIONS.

THIS DETAIL SUPERSEDES ALL OTHER TREE PLANTING DETAILS IN ARLINGTON COUNTY.



TREE PLANTING DETAIL

NOT TO SCALE

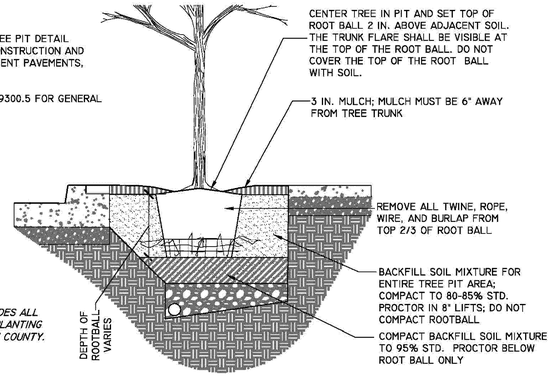
FOR OPEN PLANTING AREAS FREE OF PAVING OR GRATES
02930.1 (2013)

ARLINGTON DPR

NOTES

1. REFER TO STREET TREE PIT DETAIL (329300.3A) FOR PIT CONSTRUCTION AND INFORMATION ON ADJACENT PAVEMENTS, CURB, AND DRAINAGE.

2. REFER TO DETAIL 329300.5 FOR GENERAL TREE PLANTING NOTES.



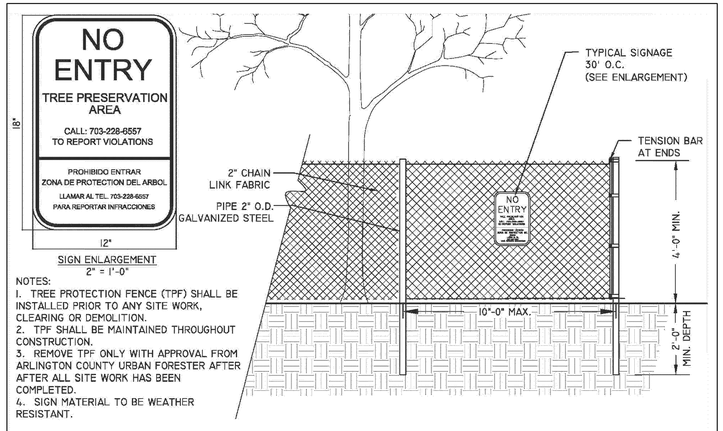
THIS DETAIL SUPERSEDES ALL OTHER STREET TREE PLANTING DETAILS IN ARLINGTON COUNTY.

STREET TREE PLANTING PIT (SHEET 2 OF 2)

1/2" = 1'-0"

FOR TREE PLANTING PITS IN RIGHT-OF-WAY & ADJACENT TO PAVING
329300.3B (2016) (02930.3B)

ARLINGTON VIRGINIA DPR



NOTES:
1. TREE PROTECTION FENCE (TPF) SHALL BE INSTALLED PRIOR TO ANY SITE WORK, CLEARING OR DEMOLITION.
2. TPF SHALL BE MAINTAINED THROUGHOUT CONSTRUCTION.
3. REMOVE TPF ONLY WITH APPROVAL FROM ARLINGTON COUNTY URBAN FORESTER AFTER AFTER ALL SITE WORK HAS BEEN COMPLETED.
4. SIGN MATERIAL TO BE WEATHER RESISTANT.

4' CHAIN LINK TREE PROTECTION FENCE

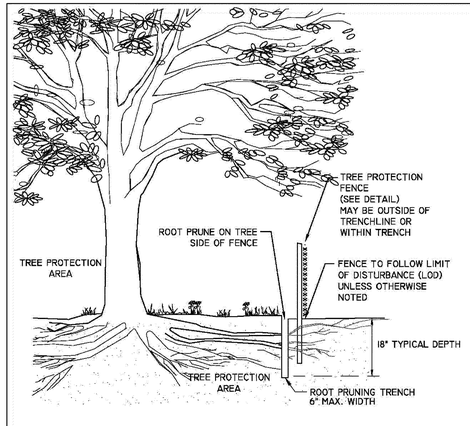
02231.2

ELEVATION

1/2" = 1'-0"

ARLINGTON COUNTY, VIRGINIA
DEPARTMENT OF PARKS & RECREATION

ARLINGTON VIRGINIA



NOTES

1. ROOT PRUNING SHALL BE DONE WITH A TRENCHER OR VIBRATORY PLOW TO A DEPTH OF 18". ROOTS OVER 1.5" IN DIAMETER SHALL HAVE A CLEAN CUT MADE BY A CLEAN SAW ON THE SURFACE OF THE ROOT, WHICH IS STILL ATTACHED TO THE TREE. DO NOT PAINT THE CUT ROOT END. IF EXCAVATION IS FOR INSTALLATION OF UNDERGROUND UTILITIES, LEAVE THE ROOT INTACT AND THREAD THE LINES UNDERNEATH.

2. ROOT PRUNING SHALL TAKE PLACE PRIOR TO ANY CLEARING AND GRADING. EXACT LOCATION OF TREE PROTECTION AREAS SHALL BE STAKED OR FLAGGED PRIOR TO TRENCHING.

3. ROOT PRUNING SHALL BE CONDUCTED WITH THE SUPERVISION OF A CERTIFIED ARBORIST.

4. BACKFILL THE ROOT-PRUNING TRENCH WITH EXCAVATED SOIL AND MULCH AND MARK LOCATION FOR FUTURE REFERENCE. SILT FENCE MAY BE INSTALLED IN TRENCH PRIOR TO BACKFILLING AS LONG AS THE TRENCH IS NOT OPEN FOR LONGER THAN 48 HOURS WITHOUT WATERING.

5. ROOT PRUNING WORK WILL NOT BE DONE WHEN MORE THAN THE TOP 1 INCH OF SOIL IS FROZEN. ROOT PRUNING WILL NOT BE UNDERTAKEN WHEN THE SOIL IS WET AND CONDITIONS ARE MUDDY.

6. THE ARLINGTON COUNTY URBAN FORESTER SHALL BE NOTIFIED WHEN ALL ROOT PRUNING AND TREE PROTECTION FENCE INSTALLATION IS COMPLETE.

ROOT PRUNING

02231.5

SECTION

NOT TO SCALE

ARLINGTON COUNTY, VIRGINIA
DEPARTMENT OF PARKS & RECREATION

ARLINGTON VIRGINIA

No.	DATE	DESCRIPTION

REVISIONS

COMMONWEALTH OF VIRGINIA
Adam J. Steiner
Lic. No. 1237
11/21/2018
LANDSCAPE ARCHITECT

urban
Planners · Engineers · Landscape Architects · Land Surveyors
Urban, Ltd.
4200 D Technology Ct.
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(703)-378-7888
www.urban-engineering.com

ARLINGTON, VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES

LANDSCAPE DETAILS
UPTON HILL REGIONAL PARK
CIVIL ENGINEERING PLAN
6060 WILSON BLVD, ARLINGTON, VIRGINIA 22205

SCALE: N/A	DESIGNED	CHECKED
SUBMITTED DATE 11-21-18 05-15-18 – 08-08-18 – 09-28-18 –	APPROVED DATE CHIEF TRANSPORTATION PLANNING BUREAU	APPROVED DATE CHIEF TRANSPORTATION ENGINEERING BUREAU
APPROVED DATE CHIEF WATER, SEWER & STREETS DIV.	APPROVED DATE CHIEF ENGINEERING DIVISION	APPROVED DATE DIRECTOR OF ENVIRONMENTAL SERVICES
	APPROVED DATE CPHD PLANNER	APPROVED DATE CPHD LANDSCAPE REVIEWER
	SHEET C.42 AOF 62	SP-12928

Urban, Ltd. – Z:\JOBS\upton hill park\go bid set\12928-07-TREE PRES LANDSCAPE.dwg [LANDSCAPE PLAN DETS (2)] November 26, 2018 – 12:35pm bbrien

PROP. ROPES COURSE

EX. EXERCISE AREA

EX. BENCH (TYP.)

EX. MEMORIAL STONE

PROP. STANDPIPE

PROP. 8.0' CL I RIPRAP @5.00%

PROP. OBSERVATION MSH. (TYP.)

EX. 8" PVC PIPE

PROP. BIORETENTION

PROP. CHAMBERS

PROP. GRAVEL FLOW SPREADER PRETREATMENT (SEE SHEET C.22 FOR DETAIL)

PROP. DIAPHRAGM PRETREATMENT (SEE SHEET C.22 FOR DETAIL)

PROP. CROSS WALK

EX. ASPHALT

EX. CONCRETE PAD

EX. GAZEBO (T.B.R.)

EX. SPLIT RAIL FENCE (T.B.R.)

PROP. BUS DROP OFF

CURB

CONCRETE SIDEWALK

EX. BENCH (TO REMAIN)

EX. 6" PVC

EX. SAN TOP TO BE RAISED TO PROPOSED ELEVATION (SEE SHEET C.43A FOR DETAIL)

EX. 8" SANITARY SEWER

EX. WOOD DECK

EX. BUILDING

EX. 6' CHAIN LINK WITH BARBED WIRE

48.64' S19°22'20"W

247.71' S19°22'20"W 296.35' (TOTAL)

RPC: 12-042-106
SAINT ALBANS HOUSING
HARTLAND BANK
DB. 3860 PG. 1232

PIN: 0514 01 0333B
SAINT ALBANS HOUSING CORP,
DB. 17445 PG. 0778

N70°03'10"W 523.62'

N.I.C.

N.I.C.

VIAC (3)
CAPU (3)
HAVI (3)
LIBE (3)
10' (TYP)
DO NOT PLANT WITHIN SEWER LINE OFFSET

NORTH

SCALE: 1"=20'

PLANTING LEGEND

- PROPOSED OVERSTORY PLANTING
- PROPOSED SUBSTORY/UNDERSTORY PLANTING
- PROPOSED SHRUB PLANTING
- PROPOSED OVERSEEDING AREA TOTAL: 26,080 SF (0.60 ACRE) (SEE SEEDING SCHEDULE FOR SEED MIX COMPOSITION)

No.	DATE	DESCRIPTION

REVISIONS

COMMONWEALTH OF VIRGINIA
CLAYTON C. TOCK
Lic. No. 036790
11/21/2018
PROFESSIONAL ENGINEER

urban
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ARLINGTON, VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES

REFORESTATION & LANDSCAPE PLAN
UPTON HILL REGIONAL PARK
CIVIL ENGINEERING PLAN
6060 WILSON BLVD, ARLINGTON, VIRGINIA 22205

SCALE: 1"=20'	DESIGNED	CHECKED
SUBMITTED DATE 11-21-18 05-15-18 – 08-08-18 – 09-28-18 –	APPROVED DATE CHIEF TRANSPORTATION PLANNING BUREAU	APPROVED DATE CHIEF TRANSPORTATION ENGINEERING BUREAU
APPROVED DATE CHIEF WATER, SEWER & STREETS DIV.	APPROVED DATE CHIEF ENGINEERING DIVISION	APPROVED DATE DIRECTOR OF ENVIRONMENTAL SERVICES
	APPROVED DATE CPHD PLANNER	APPROVED DATE CPHD LANDSCAPE REVIEWER
	SHEET C.43 OF 62	SP-12928

Urban, Ltd. – a:\JOBS\upton hill park\sp bid set\12928-37-REFORESTATION PLAN.dwg [Layout1] November 26, 2018 – 12:35pm bbrien

REFORESTATION AREA VEGETATION SCHEDULE

PLANTING SCHEDULE

SPECIES GROUP	SYMBOL	SPECIES	QUANTITY	PLANT SIZE	PLANT SPACING
OVERSTORY LAYER	CATO	CARYA TOMENTOSA (MOCKERNUT HICKORY)	5	2" CALIPER	PER PLAN
	LITU	LIRIODENDRON TULIPIFERA (TULIP POPLAR)	5	2" CALIPER	PER PLAN
	NYSY	NYSSA SYLVATICA (BLACK GUM)	5	2" CALIPER	PER PLAN
	PRSE	PRUNUS SEROTINA (BLACK CHERRY)	5	2" CALIPER	PER PLAN
	QUAL	QUERCUS ALBA (WHITE OAK)	5	2" CALIPER	PER PLAN
	QUCO	QUERCUS COCCINEA (SCARLET OAK)	5	2" CALIPER	PER PLAN
	QUMO	QUERCUS MONTANA (CHESTNUT OAK)	5	2" CALIPER	PER PLAN
	QUVE	QUERCUS VELUTINA (BLACK OAK)	5	2" CALIPER	PER PLAN
		OVERSTORY SUBTOTAL	**40**		
SUBCANOPY/ UNDERSTORY LAYER	ACRU	ACER RUBRUM (RED MAPLE)	8	3 GALLON	PER PLAN
	CECA	CERCIS CANADENSIS (EASTERN REDBUD)	8	3 GALLON	PER PLAN
	ILOP	ILEX OPACA (AMERICAN HOLLY)	8	3 GALLON	PER PLAN
	VIPR	VIBURNUM PRUNIFOLIUM (BLACK-HAW)	8	3 GALLON	PER PLAN
		SUBCANOPY/UNDERSTORY SUBTOTAL	**32**		
SHRUB LAYER	CAPU	CASTANEA PUMILA (AMERICAN CHINQUAPIN)	15	1 GALLON	PER PLAN
	HAVI	HAMAMELIS VIRGINIANA (WITCH HAZEL)	15	1 GALLON	PER PLAN
	LIBE	LINDERA BENZOIN (NORTHERN SPICEBUSH)	15	1 GALLON	PER PLAN
	VIAC	VIBURNUM ACERIFOLIUM (MAPLE-LEAF VIBURNUM)	15	1 GALLON	PER PLAN
		SHRUB SUBTOTAL	**60**		
		REFORESTATION AREA QUANTITY TOTAL	**132**		

REFORESTATION AREA SEEDING SCHEDULE

SEEDING SCHEDULE

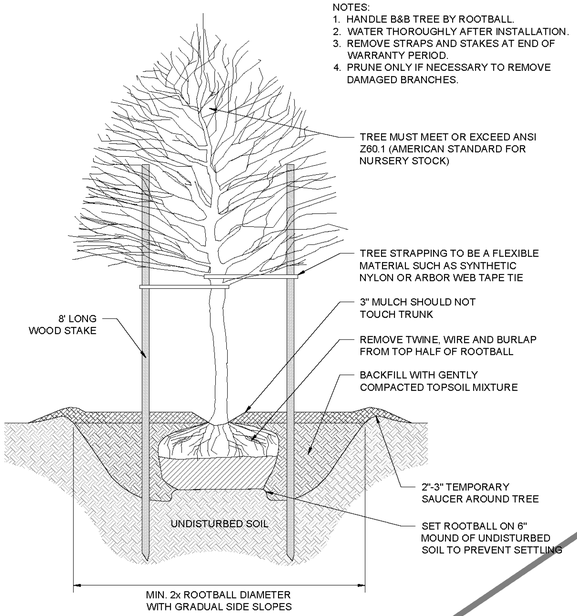
SEEDING ZONE	SPECIES GROUP	SPECIES	SEEDING RATE (LBS/AC)	SEEDING AREA (AC)	QUANTITY (LBS)
REFORESTATION AREA SEED MIX	1	LOLIUM MULTIFLORUM (ANNUAL RYEGRASS)	10.00	0.60	6.00
		SETARIA ITALICA (ITALIAN BRISTLE GRASS)	10.00	0.60	6.00
	2	COREOPSIS LANCEOLATA (LANCE-LEAVED COREOPSIS)	8.00	0.60	4.80
		DICHANTHELIUM CLANDESTINUM (DEER TONGUE GRASS)	8.00	0.60	4.80
		PANICUM VIRGATUM (SWITCHGRASS)	8.00	0.60	4.80
		SORGHASTRUM NUTANS (INDIANGRASS)	8.00	0.60	4.80
		TRIDENS FLAVUS (PURPLETOP)	8.00	0.60	4.80
	3	ASCLEPIAS TUBEROSA (BUTTERFLY MILKWEED)	0.10	0.60	0.06
		APOCYNUM CANNABINUM (INDIANHEMP)	0.10	0.60	0.06
		EUPATORIUM PERFOLIATUM (BONESET)	0.10	0.60	0.06
		EUTHAMIA CAROLINIANA (SLENDER GOLDENTOP)	0.10	0.60	0.06
		ANDROPOGON VIRGINICUS (BROOMSEDGE BLUESTEM)	0.10	0.60	0.06
	4	ASCLEPIAS SYRIACA (COMMON MILKWEED)	0.20	0.60	0.12
		JUNCUS TENUIS (PATH RUSH)	0.20	0.60	0.12
		PENSTEMON DIGITALIS (PENSTEMON)	0.20	0.60	0.12
		VERBESINA ALTERNIFOLIA (WINGSTEM)	0.20	0.60	0.12
	5	HELIOPSIS HELIANTHOIDES (OXEYE SUNFLOWER)	0.20	0.60	0.12
		RUDBECKIA HIRTA (BLACK EYED SUSAN)	0.20	0.60	0.12
		SENNA HEBECARPA (WILD SENNA)	0.20	0.60	0.12
	6	AMELANCHIER CANADENSIS (CANADIAN SERVICEBERRY)	0.50	0.60	0.30
		HAMAMELIS VIRGINIANA (WITCH HAZEL)	0.50	0.60	0.30
		VIBURNUM DENTATUM (SOUTHERN ARROW WOOD)	0.50	0.60	0.30
		VIBURNUM PRUNIFOLIUM (BLACK-HAW)	0.50	0.60	0.30
	7	ACER RUBRUM (RED MAPLE)	0.50	0.60	0.30
		CARPINUS CAROLINIANA (MUSCLEWOOD)	0.50	0.60	0.30
		CERCIS CANADENSIS (EASTERN REDBUD)	0.50	0.60	0.30
		CORNUS FLORIDA (FLOWERING DOGWOOD)	0.50	0.60	0.30
		NYSSA SYLVATICA (BLACK GUM)	0.50	0.60	0.30
		PLATANUS OCCIDENTALIS (AMERICAN SYCAMORE)	0.50	0.60	0.30
		SEEDING TOTALS	66.90	0.60	**40.14**

SEEDING SCHEDULE NOTES:

1. It is expected and preferred that all species in each of the Species Groups are planted. The tolerances listed in this note are intended to incorporate flexibility according to species availability. At a minimum, Contractor to provide at least:
   a) all of Group 1,
   b) 4 of the 5 species in Group 2,
   c) 4 of the 5 species in Group 3,
   d) 3 of the 4 species in Group 4,
   e) 2 of the 3 species in Group 5,
   f) 3 of the 4 species in Group 6,
   g) 5 of the 6 species in Group 6,
2. The planted trees and shrubs shall be randomly spaced and species mixed throughout the planting areas.
3. All seeding rates are expressed in pounds of pure live seed (PLS).

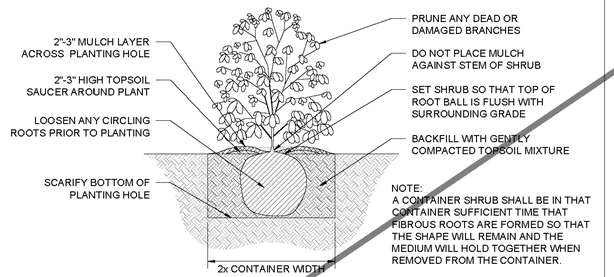
B&B TREE PLANTING DETAIL

NOT TO SCALE



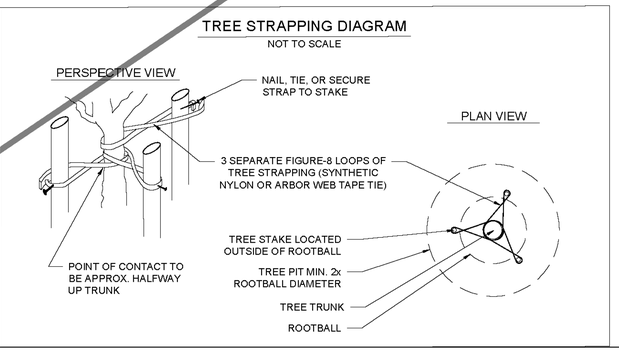
CONTAINER TREE/SHRUB PLANTING DETAIL

NOT TO SCALE



TREE STRAPPING DIAGRAM

NOT TO SCALE



PLANTING SPECIFICATIONS

1. ANY NURSERY SUPPLYING THE STOCK SHALL PROVIDE A CURRENT NURSERY INSPECTION CERTIFICATE FROM THE STATE DEPARTMENT OF AGRICULTURE, OR PROVIDE AT LEAST THIRTY DAYS ADVANCE NOTICE FOR OWNER TO INSPECT THE PLANT SOURCE AREAS AT OWNER'S DISCRETION. ANY SUCH INSPECTION IS NOT DEEMED APPROVAL OF THE PLANT MATERIALS.
2. ALL PLANTS SHALL BE SET STRAIGHT, OR PLUMB.
3. PLANTING HOLES FOR CONTAINER GROWN PLANTS SHALL BE ONE FOOT (1') DEEP PLUS THE CONTAINER DEPTH IN WHICH THE PLANT HAS BEEN GROWN AND TWO FEET (2') WIDER THAN CONTAINER.
4. BACKFILL THE PLANTING HOLES WITH THE IN-SITU SOIL MATERIALS REMOVED FOR PLANTING AFTER REMOVING ALL STONES, ROOTS, AND OTHER DEBRIS GREATER THAN 1-1/2" IN DIAMETER.
5. FOLLOWING THE BACKFILLING, WATER TO THE POINT OF SOIL SATURATION AND TAMP TO COMPACT THE BACKFILL MIXTURE. ADD EXISTING SOIL TO BRING THE FINAL GRADE IN THE PLANTING HOLE TO THE SURROUNDING SOIL SURFACE. RAKE THE UNUSED EXISTING SOIL OUTSIDE THE PLANTING HOLES, TAKING CARE NOT TO MOUND THE SOIL OR TO SIGNIFICANTLY ALTER THE EXISTING GRADES AND THEN PLACE MULCH (MIN. 2" THICK) ATOP ENTIRE PLANTING HOLE. THE PLANTING HOLE AREAS MUST NOT BE DEPRESSED BELOW THE SURROUNDING SOIL SURFACE ELEVATIONS. SAID AREAS SHALL BE SLIGHTLY RAISED (2-3"), RELATIVE TO THE SOIL SURFACE.
6. THE SHRUBS THAT ARE SPECIFIED AS CONTAINER GROWN SPECIMENS SHALL BE BETWEEN 15" AND 18" IN HEIGHT. THEY SHALL BE HEALTHY, VIGOROUS, WELL ROOTED AND ESTABLISHED IN THE PLANTING CONTAINER IN WHICH THEY ARE GROWING. A CONTAINER SHRUB SHALL BE IN THAT CONTAINER A SUFFICIENT TIME SUCH THAT FIBROUS ROOTS ARE FORMED SO THE SHAPE WILL REMAIN AND THE MEDIUM WILL HOLD TOGETHER WHEN REMOVED FROM THE CONTAINER (REFER TO AMERICAN STANDARD FOR NURSERY STOCK).
7. DO NOT REMOVE PLANTS FROM CONTAINERS UNTIL IMMEDIATELY BEFORE PLANTING. EXAMINE THE ROOTS TO SEE IF THEY ARE POT BOUND. CAREFULLY SEPARATE ANY POT BOUND OR CRAMPED ROOTS AND SPREAD THEM OUT WHEN PLACING THE PLANT SO THAT THE ROOTS CAN GROW WITHOUT FURTHER CONSTRICTION OF THE ROOT BALL.
8. FERTILIZE EACH PLANT WITH A 20 GRAM TABLET OF FERTILIZER. GENERALLY, FOR EACH 12 TO 18 INCHES OF PLANT HEIGHT OR FOR EACH 1/2" OF TREE DIAMETER AT THE BASE, USE 20 GRAMS FOR SLOW GROWING PLANTS OR 40 GRAMS FOR FAST GROWING PLANTS OR POOR SOIL SITUATIONS. SAID FERTILIZER TABLETS SHALL BE AGRIFORM 20-10-5 OR APPROVED EQUIVALENT, APPLIED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
9. THE CONTRACTOR IS RESPONSIBLE FOR REPLACING NON- SURVIVING TREES AND SHRUBS DURING THE CARE AND REPLACEMENT PERIOD (12 MONTHS, UNLESS OTHERWISE SPECIFIED IN CONTRACT DOCUMENTS) OR UNTIL FINAL ACCEPTANCE, WHICHEVER IS THE SHORTEST, AS REQUIRED BY THE TERMS OF THE SURVIVAL WARRANTY SPECIFIED HEREIN AND/OR IN CONTRACT DOCUMENTS. THE SPECIFICATIONS FOR THE REPLACED PLANTS SHALL BE THOSE PROVIDED IN THE PLANT LIST.
10. REFER TO APPLICABLE DETAILS WITHIN THIS PLAN SET FOR ADDITIONAL GUIDANCE ON PLANTING REQUIREMENTS.

PLANTING SURVIVAL WARRANTY

1. LANDSCAPE CONTRACTOR SHALL GUARANTEE A MINIMUM SURVIVAL RATE OF EACH VEGETATION SPECIES AFTER 12 MONTHS OF 85% FOR B&B AND CONTAINER GROWN STOCK.
2. IF SURVIVAL RATES ARE LESS THAN THE ABOVE WARRANTY RATES, THEN LANDSCAPE CONTRACTOR SHALL REPLACE THE QUANTITY OF DEAD PLANTS WITHIN THE NEXT PLANTING WINDOW FOLLOWING THE END OF THE APPLICABLE WARRANTY PERIOD.

SEEDING SPECIFICATIONS

1. SEED SHALL HAVE BEEN COLLECTED THE SAME YEAR OF SEEDING. A SEED GERMINATION AND PURITY RATE OF 75% IS REQUIRED. EVIDENCE OF SUCH SHALL BE PROVIDED TO OWNER PRIOR TO PLANTING.
2. THE LANDSCAPE CONTRACTOR SHALL INSPECT THE AREAS AND CONDITIONS UNDER WHICH THE SEEDING WORK IS TO BE PERFORMED PRIOR TO COMMENCING WORK. IF CONDITIONS ARE DETRIMENTAL TO THE PROPER AND TIMELY COMPLETION OF THE WORK, HE/SHE SHALL NOTIFY THE OWNER VERBALLY AND IN WRITING AND POSTPONE COMMENCING WORK UNTIL THE UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED.
3. CARE SHOULD BE EXERCISED TO INSURE UNIFORM SEED COVERAGE IS OBTAINED. SEED SHALL BE APPLIED AT THE RATE SPECIFIED ON THE PLANTING SCHEDULE.
4. THE SPECIFIED SEED SHALL BE OVERSEEDED IN THE DESIGNATED AREA AS SHOWN ON THE PLANTING PLAN.

PRODUCT HANDLING, STORAGE, AND DELIVERY

1. HANDLE PLANTS AT ALL TIMES SO THAT ROOTS OR BALLS ARE ADEQUATELY PROTECTED FROM BREAKAGE OF BALLS, FROM SUN AND DRYING WINDS. PLANTS WITH DRIED OUT TOPS OR ROOTS SHALL BE REJECTED.
2. ALL PLANT MATERIALS SHALL BE STORED AND DELIVERED IN SUCH A FASHION AND FOR TIME INTERVALS CONSISTENT WITH SOUND SILVICULTURAL PRACTICES.
3. PLANT MATERIAL WILL BE TRANSPORTED FROM THE NURSERY TO THE PLANTING AREAS BY SUCH MEANS AS TO AVOID WIND DAMAGE, OVER-CROWDING, OR OTHER MECHANISMS BY WHICH PHYSICAL DAMAGE MAY RESULT TO THE PLANTS.
4. PLANT MATERIAL MAY BE RANDOMLY INSPECTED BY THE OWNER UPON ARRIVAL AT EACH PLANTING AREA AND DURING PLANTING ACTIVITIES. MATERIAL FOUND TO BE UNACCEPTABLE WILL BE REJECTED AND THE CONTRACTOR WILL BE REQUIRED TO SUPPLY REPLACEMENT MATERIAL WITHIN A REASONABLE TIME FRAME (I.E. 1-WEEK). UNACCEPTABLE MATERIAL IS TO BE DEFINED AS THE FOLLOWING:
   (A) PLANTS WITH BENT TRUNKS OR MULTIPLE LEADERS, UNLESS CHARACTERISTIC FOR THE SPECIES;
   (B) PLANTS WITH DISEASED TRUNKS, STEMS, OR LEAVES;
   (C) PLANTS WITH PEST-INFESTED TRUNKS, STEMS, OR LEAVES;
   (D) PLANTS OF INSUFFICIENT SIZE (LESS THAN A SPECIFIED HEIGHT OR CALIPER);
   (E) PLANTS OF THE WRONG SPECIES/SUB-SPECIES;
   (F) PLANTS HAVING ROOT GIRDLING IN THE CONTAINER;
   UNLESS OTHERWISE APPROVED BY THE OWNER. JUSTIFICATION FOR USE OF TENTATIVELY REJECTED MATERIAL MAY BE PRESENTED TO THE OWNER.

No.	DATE	DESCRIPTION

REVISIONS

COMMONWEALTH OF VIRGINIA
CLAYTON C. TOCK
Lic. No. 036790
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DEPARTMENT OF ENVIRONMENTAL SERVICES

REFORESTATION & LANDSCAPE DETAILS
UPTON HILL REGIONAL PARK
CIVIL ENGINEERING PLAN
6060 WILSON BLVD, ARLINGTON, VIRGINIA 22205

SCALE: N/A	DESIGNED	CHECKED
SUBMITTED DATE 11-21-18 05-15-18 – 08-08-18 – 09-28-18 –	APPROVED DATE CHIEF TRANSPORTATION PLANNING BUREAU	APPROVED DATE CHIEF TRANSPORTATION ENGINEERING BUREAU
APPROVED DATE CHIEF WATER, SEWER & STREETS DIV.	APPROVED DATE CHIEF ENGINEERING DIVISION	APPROVED DATE DIRECTOR OF ENVIRONMENTAL SERVICES
	APPROVED DATE CPHD PLANNER	APPROVED DATE CPHD LANDSCAPE REVIEWER
	SHEET C.44 OF 62	SP-12928

Urban, Ltd. – g:\JOBS\upton hill park\sp bid set\12928-37-REFORESTATION PLAN.dwg [Layout2] November 26, 2018 – 12:35pm bbrien

Luminaire Schedule						
Symbol	Qty	Label	Arrangement	Total Lamp Lumens	LLF	Description
	4	S2	D180	N.A.	0.900	LSI 2/XGBM-5-LED-SS-NW, RTPB5-S11G-18-D180-F-20SRTBC, 20' AFG
	4	SA	SINGLE	N.A.	0.900	LSI 1/XGBM-3-LED-SS-NW-HSS, RTPB5-S11G-18-S-F-20SRTBC, 20' AFG
	5	S	SINGLE	N.A.	0.900	LSI 1/XGBM-FT-LED-SS-NW-HSS, RTPB5-S11G-18-S-F-20SRTBC, 20' AFG

Calculation Summary							
Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
PAVEMENT	Illuminance	Fc	2.46	8.2	0.5	4.92	16.40

VA STATE GRID NORTH

N 7003435
E 11868824

N 7003437
E 11869559

N 7003275.08
E 11868854.31

N 7002956
E 11868810

N 7002969.14
E 11869170.69

RPC: 12-042-105
NORTHERN VA REGIONAL PARK AUTHORITY
PARCEL B
DB. 1808 PG. 253
23.41613 ACRES

PIN: 0513 18 E
SCA-SPE LLC
DB. 23671 PG. 1646

PIN: 0514-01-0001
NORTHERN VA REGIONAL PARK AUTHORITY
PARCEL A
DB. 3764 PG. 55
3.11833 ACRES

RPC: 12-042-106
SAINT ALBANS HOUSING HARTLAND BANK
DB. 3860 PG. 1232

N.I.C.

STEPS
EX. TIMBERS
35.09'
EM
EX. BATTING CAGE
CONTRACTOR TO NOSE DOWN CURB
EX. ASPHALT
EX. CHAIN LINK FENCE
PROP. TICKET BOOTH
PROP. WOODEN DECK
PROP. CANOPY
PROP. ROPES COURSE
EX. EXERCISE AREA (I.B.)
PROP. HANDRAIL (DESIGN BUILD BY CONTRACTOR)
EX. EDGE OF ASPHALT
ARLINGTON COUNTY (APPROXIMATE)
FAIRFAX COUNTY (APPROXIMATE)
AREA OF MILLING/PAVING/STRIPING CONSIDERED DISTURBED AREA AND NOT
EX. ASPHALT PARKING AREA
PROP. LIGHT (TYP.)
PROP. WHEEL STOP (TYP.)
EX. MEMORIAL STONE
EX. 4' CHAIN LINK
EX. MINI GOLF
EX. WATER PARK
EX. BENCH (TYP.)
CONCRETE SIDEWALK
EX. 6' CHAIN LINK WITH BARBED WIRE
PROP. REMOVABLE BOLLARD (TYP.) SEE DETAIL SHEET C.02
PROP. BOLLARD
OHU
EP
TC
S1
S2
SA
S

N19°22'01"E 1014.14' (TOTAL)
431.59'
N45°37'40"W 440.11'
S19°22'20"W 48.64'
247.71'
296.35' (TOTAL)

No.	DATE	DESCRIPTION
		REVISIONS

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www.urban-engineering.com

ARLINGTON, VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES

LIGHTING PLAN

UPTON HILL REGIONAL PARK
CIVIL ENGINEERING PLAN

6060 WILSON BLVD, ARLINGTON, VIRGINIA 22205

SCALE: 1"=25'	DESIGNED	CHECKED
SUBMITTED DATE 11-21-18 05-15-18 – 08-08-18 – 09-28-18 –	APPROVED DATE CHIEF TRANSPORTATION PLANNING BUREAU	APPROVED DATE CHIEF TRANSPORTATION ENGINEERING BUREAU
APPROVED DATE CHIEF WATER, SEWER & STREETS DIV.	APPROVED DATE CHIEF ENGINEERING DIVISION	APPROVED DATE DIRECTOR OF ENVIRONMENTAL SERVICES
	APPROVED DATE CPHD PLANNER	APPROVED DATE CPHD LANDSCAPE REVIEWER
	SHEET C.44AOF 62	SP-12928

Urban, Ltd. – k:\JOBS\upton hill park\sp bid set\12928-40-LIGHTING PLAN.dwg [LIGHTING PLAN 02] November 26, 2018 – 12:29pm tbrien

AirLink™
enabled by Synapse®

Wireless Lighting Controller

The AirLink integrated controller is a California Title 24 compliant lighting controller that provides real-time light monitoring and control with utility-grade power monitoring. It includes a 24V sensor input and power supply to connect up to two (2) sensors into the outdoor AirLink wireless lighting system.

The wireless integrated controller and twist lock controller are compatible with this fixture.

Features

- 2% Utility Grade Power Monitoring
- Up to 80% Savings through smart dimming
- True On/Off functionality via switched relay
- Seamlessly integrates into the outdoor AirLink wireless lighting control solution & Self-healing Mesh Networking
- Relay closes on power loss
- Supports a wide range of LED drivers and fixtures
- Class 1 / Class 2 0-10V Dimming Control
- Direct Connect up to two (2) 24V Occupancy Sensors and Photocells (consult sales for compatible list)
- Secure, over-the-air upgrades to support future enhancements
- Excellent RF Range — 1,000ft LoS between controllers
- Available in a metal cased version with quick connect terminal blocks
- Lights default to on for safety

Specifications

Regulatory Approvals

- FCC, IC, CE certified
- cULus Listed
- California Title 24 compliant

Power and Performance

- Operating environmental: -40°F to 131°F (-40°C to 55°C)
- Input power: 100–277 VAC +/- 10% (Max 305V)47/64 Hz
- Switched output: Default ON; Zero Cross Switching
- Load rating: 5A @ 100V to 277V (+/- 10%)
- Dimming: 0–10V control; Output: Class 1/2 - 20mA Source Max / 50mA Sink Max
- Power monitoring; Utility grade - 2% accuracy
- Sensors inputs: 0–10V (photocell sensors), 0–24V (all other sensors); Sensor power supply: 24VDC @ 50mA

Other

- Dimensions: 8.2" L x 2.3" W x 1.3" H (209mm L x 59mm W x 33mm H) without antennas
- Radio: SNAP 2.4 GHz; 802.15.4; +20 dBm Transmit Power; -105 dBm Receive Sensitivity
- Warranty: 5 years

Contact LSI Controls

Sales
controls.sales@lsi-industries.com

Support
controls.support@lsi-industries.com
1 (800) 436-7800 (support, option 8)

More information
For more information on AirLink, visit our website at www.lsi-airlink.com/airlink

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LED AREA LIGHTS - (XGBM)

BUG LISTING

XGBM - Type 3

Drive Current	Color Temp. *	Lumens	Watts	LER	BUG Rating
HO	CW	26,754	300	89	B3-U0-G3
	CW-HSS	17,316	288	60	B2-U0-G2
	NW	22,240	289	77	B3-U0-G2
	NW-HSS	13,941	288	48	B2-U0-G2
LW	CW	14,082	140	100	B2-U0-G2
	CW-HSS	9205	137	67	B1-U0-G2
	NW	11,451	137	84	B2-U0-G2
	NW-HSS	7513	136	55	B1-U0-G2
SS	CW	20181	187	108	B3-U0-G2
	CW-HSS	13,034	187	70	B2-U0-G2
	NW	16,384	189	87	B3-U0-G2
	NW-HSS	10,384	189	55	B2-U0-G2

XGBM - Type 5

Drive Current	Color Temp. *	Lumens	Watts	LER	BUG Rating
HO	CW	25,464	300	85	B4-U0-G2
	NW	20,549	288	71	B4-U0-G2
LW	CW	13,842	140	99	B3-U0-G2
	NW	11,291	136	83	B3-U0-G2
SS	CW	18,044	186	97	B4-U0-G2
	NW	15,173	189	80	B4-U0-G2

XGBM - Type FTA

Drive Current	Color Temp. *	Lumens	Watts	LER	BUG Rating
HO	CW	31,808	301	106	B4-U0-G4
	CW-HSS	20,838	288	72	B3-U0-G3
	NW	25,407	289	88	B3-U0-G3
	NW-HSS	16,855	289	58	B3-U0-G3
LW	CW	16,560	140	118	B3-U0-G2
	CW-HSS	11,440	137	84	B2-U0-G2
	NW	13,473	136	99	B3-U0-G2
	NW-HSS	9277	136	68	B2-U0-G2
SS	CW	23,033	187	123	B3-U0-G3
	CW-HSS	15,213	187	81	B3-U0-G2
	NW	18,752	189	99	B3-U0-G3
	NW-HSS	12,516	189	66	B2-U0-G3

XGBM - Type FT

Drive Current	Color Temp. *	Lumens	Watts	LER	BUG Rating
HO	CW	29,070	301	97	B2-U0-G4
	CW-HSS	20,964	288	73	B1-U0-G4
	NW	23,512	289	81	B2-U0-G4
	NW-HSS	17,191	289	60	B1-U0-G3
LW	CW	15,019	141	107	B1-U0-G3
	CW-HSS	11,519	137	84	B1-U0-G3
	NW	12,217	136	90	B1-U0-G3
	NW-HSS	9365	136	69	B1-U0-G3
SS	CW	20,700	187	111	B2-U0-G3
	CW-HSS	15,273	187	82	B1-U0-G3
	NW	17,230	189	91	B1-U0-G3
	NW-HSS	12,597	189	67	B1-U0-G3

* Color Temperature: NW-4000K, CW-5000K

LED AREA LIGHTS - (XGBM)

LUMINAIRE ORDERING INFORMATION

TYPICAL ORDER EXAMPLE: **XGBM 5 LED HO CW UE WHT PCM**

Prefix	Distribution	Light Source	Drive Current	Color Temperature	Input Voltage	Finish	Optional Controls	Optional Sensor/Options
XGBM* - LED Greenbar	FT – Forward Throw FTA – Forward Throw Automotive 3 – Type III 5 – Type V	LED	LW – Low Watt. SS – Super Saver HO – High Output	CW – Cool White (5000K) NW – Neutral White (4000K)	UE – Universal Voltage (120-277) 347-480	BLK – Black BRZ – Bronze GPT – Graphite MSV – Metallic Silver PLP – Platinum Plus SVG – Satin Verde Green WHT – White **Optional Color Decal** 4S – Light Gold 29 – Charcoal Metallic 5S – Black 94 – Blue Metallic 59 – Dark Green 51 – Dark Red 21 – Tomato Red 50 – White 70Z – Aztec Silver Metallic	**Wireless Control System[2,3]** (blank) - None PCN - Pattern Control System PCNT - HostSite® Pattern Control System GCM - Gold Control System GCMT - HostSite® Gold Control System SWI - 0-10 wall dimming (required for substrite fixtures) ALSC - AirLink Syngage Control System ALSCH - AirLink Syngage Control System - HostSite® **Stand-Alone Control** (blank) - None DIM - 0-10 volt dimming[4] (from external signal) BLS – Bi-level Switching[5] (from external signal - required 120-277V controls system voltage)	**Sensor** IMS - Integral Motion Sensor[6] PC1230 - 120V Button-Type Photocell PC1208 - 208V Button-Type Photocell PC1240 - 240V Button-Type Photocell PC277 - 277V Button-Type Photocell PC347 - 347V Button-Type Photocell **Options** BRK – 8" Bracket (S and D180 only) TB - Terminal Block

LUMINAIRE EPA CHART[1] - XGBM

	8" Bracket	12" Bracket
Single	2.3	2.4
D180°	4.7	4.8
D90°	12" Bracket Required	4.7
T90°		7.2
TN120°		7.3
Q90°		8.8

Note: House Side Shield adds to fixture EPA. Consult Factory.

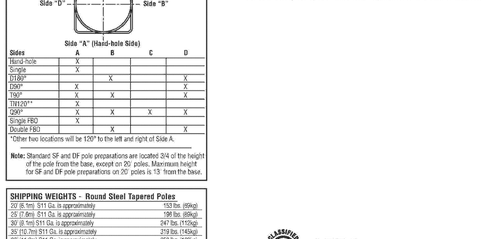
ACCESSORY ORDERING INFORMATION[2] (Accessories are field installed)

Description	Order Number	Description	Order Number
XGBM-HSS House Side Shield (Black only)	482002 BLK	DPA208_240 Double Fusing (208V, 240V)	DPA208_240
RPPP – Round Pole Plate	1489148LK	DPA480 Double Fusing (480V)	DPA480
BKS-BD-WM-*-CLR - Wall Mount Plate	1231110LR	PCMT Simple Fusing (347V)	PCMT*
BKA-BD-RA-6-CLR - Radius Arm	1680102LR	PMOS120 - 120V Pole-Mount Occupancy Sensor	518039CLR[7]
BKU-BD-S-19-CLR - Upsweep Bracket for round or square poles	1441810LR	PMOS208/240 - 208, 240V Pole-Mount Occupancy Sensor	534239CLR[7]
PA120 Simple Fusing (120V)	PA120*	PMOS208/240 - 208, 240V Occupancy Sensor	534239CLR[8]
PA277 Simple Fusing (277V)	PA277*	PMOS277 - 277V Occupancy Sensor	518039CLR[8]
		PMOS480 - 480V Pole-Mount Occupancy Sensor	534240CLR[7]

FOOTNOTES:

1- Use with 3" traditional drilling pattern.
2- For wireless controls information and accessories, see Controls section.
3- Requires a SiteManager and override switch. Not compatible with BLS or IMS option.
4- Not compatible with IMS or BLS option.
5- Not compatible with wireless controls system, DIM or IMS option.
6- Not compatible with wireless controls system, DIM or BLS option.
7- House Side Shields add to fixture EPA. Consult factory.
8- Fusing must be located in the hand hole of pole.
9- To be used with any of the PCM/GCM wireless controls systems in the fixture. Consult factory.
10- Photocell must be ordered separately. // pin standard. See Accessories.

DIMENSIONS



LED AREA LIGHTS - (XGBM)

Shown with optional decal striping

DOE LIGHTING FACTS

Department of Energy has verified representative product test data and results in accordance with its Lighting Facts Program. Visit www.lightingfacts.com for specific catalog strings.

LIGHT OUTPUT - XGBM

		Lumens (Nominal)				Watts (Nominal)
		Type 3	Type 5	Type FT	Type FTA	
Cool White	LW	14080	13840	15009	16560	140
	SS	20180	18040	20700	23030	187
	HO	26750	25460	29070	31810	300
Neutral White	LW	11450	11290	12220	13470	136
	SS	16390	15170	17230	18750	188
	HO	22240	20550	23510	25410	288

LED Chips are frequently updated therefore values may increase.

US patent D574994 & 7,826,456 and MX patent 29631 and US & Int'l. patents pending

SMARTTEC™ THERMAL CONTROL - LSI drivers feature integral sensor which reduces drive current when ambient temperatures exceed rated temperature.

OCCUPANCY SENSING (IMS) – Optional integral passive infrared motion sensor activates switching of luminaire light levels. High level light is activated and increased to full bright in 1-2 seconds upon detection of motion. Low light level (30% maximum drive current) is activated when target zone is absent of motion activity for ~2 minutes and ramps down (10-15 seconds) to low level to allow eyes time to adjust. Sensor is located on the front of optical assembly and rotates with the optic. Sensor optic has a detection cone of approximately 45°. Examples of detection – occurs 30' out from a 30' mounting height pole; occurs 20' out from a 20' mounting height pole.

ENERGY SAVING CONTROL OPTIONS – DIM – 0-10 volt dimming enabled with controls by others. BLS – Bi-level switching responds to external line voltage signal from separate 120-277V controller or sensor (by others), with low light level decreased to 30% maximum drive current.

LEDS - Select high-brightness LEDs in Cool White (5000K) or Neutral White (4000K) color temperature, 70 CRI.

DISTRIBUTION/PERFORMANCE - Types 3, 5, FT and FTA available - field rotatable reflectors.

HOUSING - Square, die-formed aluminum. Fully enclosed weather-tight housing contains factory prewired drivers and field connections.

TOP-ACCESS COVER - Gasketed, tethered top-access cover provides ease of installation and allows for easy driver access. Four captive stainless-steel fasteners secure the top-access cover to the housing.

OPTICAL UNIT - Clear tempered optical grade flat glass lens sealed to aluminum housing creates an IP67 rated, sealed optical unit (includes pressure stabilizing breather). Optical unit can be easily field rotated in 90o increments. Directional arrow on optics allows alignment without the unit being energized.

MOUNTING - 2-1/2" x 5-3/8" x 12" extruded aluminum arm mounting bracket shipped standard. Use with 5" traditional drilling pattern. Round Pole Plate (RPP2) required for mounting to 3"– 5" round poles. (See Accessory Ordering Information chart.)

ELECTRICAL - Two-stage surge protection (including separate surge protection built into electronic driver) meets IEEE C62.41.2-2002, Location Category C. Available with universal voltage power supply 120-277VAC (UE - 50/60Hz input), and 347-480VAC.

DRIVERS - Available in Low Watt (LW), Super Saver (SS) and High Output (HO) drive currents (Drive currents are factory programmed). Components are fully encased in potting material for moisture resistance. Driver complies with FCC 47 CFR part 15 RFI/EMI standard.

OPERATING TEMPERATURE - -40°C to +50°C (-40°F to +122°F).

FINISH - Fixtures are finished with LSI's DuraGrip® polyester powder coat finishing process. The DuraGrip finish withstands extreme weather changes without cracking or peeling.

DECAL STRIPING - LSI offers optional color-coordinated decals in 9 standard colors to accent the fixture. Decals are guaranteed for five years against peeling, cracking, or fading.

WARRANTY - LSI LED fixtures carry a limited 5-year warranty.

PHOTOMETRICS - Please visit our web site at www.lsi-industries.com for detailed photometric data.

SHIPPING WEIGHT (IN CARTON) - Fixture - 44.5 lbs (20 kg) Arm - 5 lbs. (2kg) arm

LISTING - UL listed to U.S. and Canadian safety standards. Suitable for wet locations. For a list of the specific products in this series that are DLC listed, please consult the LED Lighting section of our website or the Design Lights website at www.designlights.org.

This product, or selected versions of this product, meet the standards listed below. Please consult factory for your specific requirements.

RoHS COMPLIANT · FC · CE · cULus wet location · ARRA Funding Compliant · IP67 · DLC

Fixtures comply with ANSI C136.31-2010 American National Standard for Roadway Lighting Equipment - Luminaire Vibration 3G requirements.

STEEL ROUND TAPERED POLES

Use ONLY with "Wind Speed Map for ASCE7-05

STEEL ROUND TAPERED POLES - ASCE7-05

POLE	90 MPH	100 MPH	110 MPH	120 MPH	130 MPH	140 MPH	150 MPH	Bolt Circle
20' 11GA	42.2	33.3	26.7	21.7	17.8	14.7	12.2	N
25' 11GA	40.3	31.5	24.9	19.9	16.1	13.0	10.5	N
30' 11GA	38.9	30.7	24.0	18.8	14.8	11.6	9.1	N
35' 11GA	40.9	31.0	23.8	18.3	14.0	10.6	7.8	Q
39' 11GA	34.3	25.3	18.8	13.8	9.9	6.9	4.4	Q
39' 7GA	49.0	34.1	26.0	19.9	15.1	11.3	8.3	S
45' 7GA	50.8	39.8	32.1	26.0	21.4	17.7	14.7	T
50' 7GA	37.0	28.9	22.8	18.1	14.5	11.5	9.3	T

All LSI Industries' poles are guaranteed to meet the EPA requirements listed. LSI Industries is not responsible if a pole order has a lower EPA rating than the indicated wind-loading zone where the pole will be located.
CAUTION: This guarantee does not apply if the pole/bracket/fixture combination is used to support any other items such as flags, pennants, or signs, which would add stress to the pole. LSI Industries cannot accept responsibility for harm or damage caused in these situations.

Use ONLY with "Wind Speed Map for ASCE7-10

STEEL ROUND TAPERED POLES - ASCE7-10

POLE	110 MPH	115 MPH	120 MPH	130 MPH	140 MPH	150 MPH	160 MPH	170 MPH	180 MPH	Bolt Circle
20' 11GA	17.0	15.3	13.9	11.4	9.4	7.9	6.6	5.5	4.6	N
25' 11GA	16.3	14.6	13.0	10.6	8.6	7.0	5.6	4.5	3.6	N
30' 11GA	16.0	14.1	12.5	9.9	7.8	6.2	4.8	3.6	2.6	N
35' 11GA	16.1	14.1	12.3	9.5	7.2	5.4	3.9	2.7	1.6	Q
39' 11GA	13.1	11.7	9.9	7.2	5.0	3.3	1.9	0.7	0.0	Q
39' 7GA	17.5	14.9	13.3	10.2	7.5	5.5	3.8	2.3	1.3	S
45' 7GA	19.9	18.1	16.3	13.4	11.0	9.2	7.6	6.4	5.3	T
50' 7GA	15.1	13.5	12.0	9.5	7.7	6.2	4.9	3.9	3.0	T

All LSI Industries' poles are guaranteed to meet the EPA requirements listed. LSI Industries is not responsible if a pole order has a lower EPA rating than the indicated wind-loading zone where the pole will be located.
CAUTION: This guarantee does not apply if the pole/bracket/fixture combination is used to support any other items such as flags, pennants, or signs, which would add stress to the pole. LSI Industries cannot accept responsibility for harm or damage caused in these situations.

STEEL ROUND TAPERED POLES

POLE ORDERING INFORMATION

TYPICAL ORDER EXAMPLE: **RTPB5 S11G 35 S PLP DGP**

Pole Series	Material	Height [1]	Mounting Configuration	Pole Finish	Options
Round Tapered Pole for Bolt-On Mount 2-Bolt Pattern RTPB5 - 5" Traditional drilling pattern	S11G – 11 Ga. Steel S07G – 07 Ga. Steel	20' 25' 30' 35' 39' 45' 50'	S – Single/Parallel D180° – Double D90° – Double D90°– Double T90°– Triple TN120°– Triple Q90°– Quad	BRZ – Bronze BLK – Black PLP – Platinum Plus WHT – White SVG – Satin Verde Green GPT - Graphite MSV - Metallic Silver	GA – Galvanized Anchor Bolts SF – Single Flood [2] DF – Double Flood [2] DGP – DuraGrip® Plus LAB – Less Anchor Bolts OSKX - Pole preparation for PMOS Occupancy Sensor [3]
Round Tapered Pole for Tenon Mount RTPN	Consult Pole Selection Chart on opposite page	N – Tenon Mount (Standard tenon size is 2-3/8" O.D.)		Standard SF and DF pole preparations are located 3/4 of the height of the pole from the base, except on 20' poles. Maximum height for SF and DF pole preparations on 20' poles is 13' from the base.	

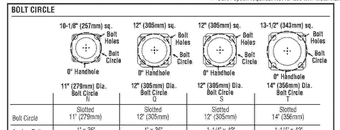
ACCESSORY ORDERING INFORMATION (Accessories are field installed)

Description	Order Number	Description	Order Number
20 SRTBC Square Base Cover	1583880LR	ER2 – Weatherproof RTP Duplex Receptacle	1225680LR
25 SRTBC Square Base Cover	1583902LR	GFI – Ground Fault RTP Circuit Interrupter	1225660LR
30 SRTBC Square Base Cover	1583920LR	MHD – Mounting Hole Weatherproof Decal	340120
35 SRTBC Square Base Cover	1584540LR	PMOS120 - 120V Occupancy Sensor	518039CLR[4]
39 SRTBC Square Base Cover	1558870LR	PMOS208/240 - 208, 240V Occupancy Sensor	534239CLR[4]
45 SRTBC Square Base Cover	1585710LR	PMOS277 - 277V Occupancy Sensor	518039CLR[4]
50 SRTBC Square Base Cover	1585780LR	PMOS480 - 480V Occupancy Sensor	534240CLR[4]

FOOTNOTES:

1- Pole heights will have +/- 1/2" tolerance.
2- See Flood Lighting Brackets Section for choice of FBO brackets.
3 - Order PMOS separately. Change "XX" to indicate height and side of pole location for pole preparation. EX: 0518A indicates preparation is to be 18ft. up from pole base on side A. Optimal distance from ground to sensor is 20ft.
4 – OSXX option required. Not for use with Metal Halide fixtures.

BOLT CIRCLE

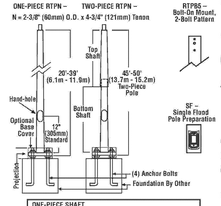


	11" (279mm) Dia. Bolt Circle	12" (305mm) Dia. Bolt Circle	12" (305mm) Dia. Bolt Circle	14" (356mm) Dia. Bolt Circle
	Q	Q	S	T
Bolt Circle	Slotted 11" (279mm)	Slotted 12" (305mm)	Slotted 12" (305mm)	Slotted 14" (356mm)
Anchor Bolt Size	1" x 36" (25mm x 914mm)	1" x 36" (25mm x 914mm)	1-1/4" x 42" (32mm x 1067mm)	1-1/4" x 42" (32mm x 1067mm)
Anchor Bolt Projection	4" (102mm)	4" (102mm)	5" (127mm)	5" (127mm)
Base Plate Dimensions	10-1/8" sq. x 1" thk. (257mm x 25mm)	12" sq. x 1" thk. (305mm x 25mm)	12" sq. x 1-1/4" thk. (305mm x 32mm)	13-1/2" sq. x 1-1/4" thk. (343mm x 32mm)

Note: Base plate illustrations may change without notice. Do not use for setting anchor bolts. Consult factory for the base plate templates.

STEEL ROUND TAPERED POLES

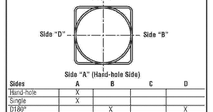
DIMENSIONS



ONE-PIECE SHAFT Height	Pole Bottom	Pole Top
20' (6.1m)	5.80" (147mm)O.D.	3.0" (76mm)O.D.
25' (7.1m)	6.60" (168mm)O.D.	3.12" (79mm)O.D.
30' (9.1m)	7.50" (191mm)O.D.	3.30" (84mm)O.D.
35' (10.7m)	8.50" (216mm)O.D.	3.60" (91mm)O.D.
39' (11.9m)	9.00" (229mm)O.D.	3.54" (90mm)O.D.

TWO-PIECE SHAFT Height	Top	Top Shaft Bottom	Length	Bottom Shaft Top	Bottom	Length
45' (13.7m)	3.95" O.D. (100mm)	8.89" O.D. (170mm)	21'-0" (6.4m)	6.43" O.D. (163mm)	10.00" O.D. (254mm)	25'-6" (7.8m)
50' (15.2m)	3.25" O.D. (83mm)	6.89" O.D. (175mm)	25'-6" (7.9m)	6.43" O.D. (163mm)	10.00" O.D. (254mm)	25'-6" (7.8m)

DRILLING LOCATIONS



Sides	A	B	C	D
Hand-hole	X			
Single	X			
D180°		X		X
D90°	X			X
T90°	X	X		X
TN120°*	X			
Q90°	X	X	X	X
Single FBO	X			
Double FBO		X		X

*Other two locations will be 120° to the left and right of Side A.

Note: Standard SF and DF pole preparations are located 3/4 of the height of the pole from the base, except on 20' poles. Maximum height for SF and DF pole preparations on 20' poles is 13' from the base.

SHIPPING WEIGHTS - Round Steel Tapered Poles

20' (6.1m) S11 Ga. is approximately	153 lbs. (69kg)
25' (7.6m) S11 Ga. is approximately	196 lbs. (89kg)
30' (9.1m) S11 Ga. is approximately	247 lbs. (112kg)
35' (10.7m) S11 Ga. is approximately	219 lbs. (145kg)
39' (11.9m) S11 Ga. is approximately	358 lbs. (162kg)
39' (11.9m) S07 Ga. is approximately	529 lbs. (240kg)
45' (13.7m) S07 Ga. is approximately	622 lbs. (282kg)
50' (15.2m) S07 Ga. is approximately	648 lbs. (293kg)
Anchor Bolts (1" x 36")(25mm x 914mm)	33 lbs. (14kg)/set
Anchor Bolts (1-1/4" x 42")(32mm x 1089mm)	63 lbs. (29kg)/set

POLE SHAFT - Pole shaft is electro-welded ASTM-A595 Grade A steel tubing with a minimum yield strength of 55,000 psi. On Tenon Mount steel poles, tenon is 2-3/8" O.D. high-strength pipe. Tenon is 4-3/4" in length.

HAND-HOLE - Standard hand-hole location is 12" above pole base. Hand-hole size is 4" x 6" and reinforced.

BASE - Pole base is ASTM-A36 hot-rolled steel plate with a minimum yield strength of 36,000 psi. Two-piece square base cover is optional.

ANCHOR BOLTS - Steel Round Tapered poles of 11 gauge material are furnished with anchor bolts featuring zinc-plated double nuts and washers. Galvanized anchor bolts are optional. Poles of 7 gauge material are furnished with galvanized anchor bolts as a standard. Anchor bolts conform to ASTM F 1554-07a Grade 55 with a minimum yield strength of 55,000 psi.

GROUND LUG - Ground lug is standard.

DUPLEX RECEPTACLE - Weatherproof duplex receptacle is optional.

GROUND FAULT CIRCUIT INTERRUPTER - Self-testing ground fault circuit interrupter is optional.

FINISHES - Each pole is finished with DuraGrip®. LSI's baked-on polyester-powder finishing process which electrostatically applies and fuses a polyester powder to the pole. Provides an extremely smooth and uniform finish to withstand extreme weather changes without cracking or peeling, and features a five-year limited warranty. Optional DuraGrip® Plus features the added protection of a 3.0 to 5.0 mil thickness of polyester-powder finish plus an inner coating, as well as a seven-year limited warranty.

DETERMINING THE LUMINAIRE/POLE COMBINATION FOR YOUR APPLICATION:

- Select luminaire from luminaire ordering information
- Select bracket configuration if required
- Determine EPA value from luminaire/bracket EPA chart
- Select pole height
- Determine MPH to match wind speed in the application area (See windspeed maps).
- Confirm pole EPA equal to or exceeding value from note above
- Consult factory for special wind load requirements and banner brackets

ARRA Funding Compliant

No.	DATE	DESCRIPTION
		REVISIONS

COMMONWEALTH OF VIRGINIA · CLAYTON C. TOCK · Lic. No. 036790 · 11/21/2018 · PROFESSIONAL ENGINEER

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ARLINGTON, VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES

LIGHTING NOTES & DETAILS
UPTON HILL REGIONAL PARK
CIVIL ENGINEERING PLAN
6060 WILSON BLVD, ARLINGTON, VIRGINIA 22205

SCALE: N/A	DESIGNED	CHECKED
SUBMITTED DATE 11-21-18 05-15-18 – 08-08-18 – 09-28-18 –	APPROVED DATE CHIEF TRANSPORTATION PLANNING BUREAU	APPROVED DATE CHIEF TRANSPORTATION ENGINEERING BUREAU
APPROVED DATE CHIEF WATER, SEWER & STREETS DIV.	APPROVED DATE CHIEF ENGINEERING DIVISION	APPROVED DATE DIRECTOR OF ENVIRONMENTAL SERVICES
	APPROVED DATE CPHD PLANNER	APPROVED DATE CPHD LANDSCAPE REVIEWER
	SHEET C.44 OF 62	SP-12928

Urban, Ltd. – K:\JOBS\upton hill park\sp bid set\12928-40-LIGHTING PLAN.dwg [NOTES & DETAILS] November 26, 2018 – 12:29pm bbrien

GDE GeoDesign & Engineering, Inc.
KNOWLEDGE IS OUR FOUNDATION

August 1, 2018

Northern Virginia Regional Park Authority
5400 Ox Road
Fairfax Station, Virginia 22039

Attention: Mr. Brian Nolan, Special Projects Manager

Reference: Subsurface Exploration and Groundwater Observations
Upton Hill Regional Park
6060 Wilson Boulevard
Arlington, Virginia
GDE Project No.: 18023-P

Dear Mr. Nolan:

Geo Design & Engineering, Inc. (GDE) has completed the subsurface exploration and groundwater observations at the above referenced project. Our work was performed in accordance with GDE Proposal No. 18023-P, dated July 19, 2018. Below is a brief report of our findings

I. Subsurface Exploration

As stated in GDE proposal, GDE performed five (5) test borings with hand augers to minimum depths that are at least 2 feet below the bottom of the proposal facilities, as identified by the project Civil Engineer, Urban, LTD (Urban). The borings were performed for planned bio-retention facilities and porous pavers areas at Upton Hill Regional Park. The boring locations were identified on grading plans provided by Urban, and the elevations at the test boring locations were also provided by Urban.

Based on the above, the borings were supposed to be augered to the following depths:

Boring B-1: 7 feet below existing surface grade
Boring B-2: 18 feet below existing surface grade
Boring B-3: 11 feet below existing surface grade
Boring B-4: 6 feet below existing surface grade
Boring B-5: 5 feet below existing surface grade

All the borings were augered to the planned depths with the exception of Boring B-2. This boring was supposed to be augered to 18 feet below the existing surface grades. However, it was extremely hard and GDE staff engineers encountered auger refusal at 8.5 feet. Upon further discussions with the project Civil Engineer, Mr. Josh Reynolds with Urban, Mr. Reynolds informed GDE to abandon any further exploration at boring location B-2 and said it would be abandoned.

II. Subsurface Conditions

GDE engineers observed approximately 2 feet to 2.75 feet of man-made fill at four (4) of the five (5) test boring locations, and 6 inches of topsoil at the fifth boring (B-3). The man-made fill and topsoil were underlain by naturally occurring terrace deposits of primarily of gravel & sand with silt and clay.

The man-made fill was described and classified as brown, dark brown & red brown sandy lean clay, clayey sand, and sandy silt with various percentages of gravel (USCS Classification: CL, SC, & ML). The fill was generally moist

The naturally occurring soils were described and classified as brown, light brown, orange brown, yellowish brown & red brown sandy lean clay, clayey sand, silty sand, clayey to silty sand, all with various percentages of gravel, and sandy gravel (USCS Classification: CL, SC, SM, SC-SM, and GP). The soils were generally moist.

The "Test Boring Location Plan" and boring logs are attached.

III. Groundwater Observations

All the borings were found dry during and at completion of the field operations. In addition, no signs of the presence of groundwater or perched water were observed within the depths explored

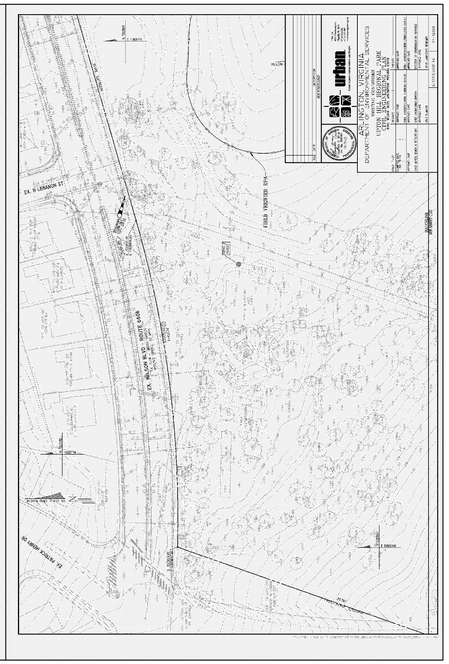
Should you have questions concerning this proposal, do not hesitate to contact us. We appreciate the opportunity to provide our services to you.

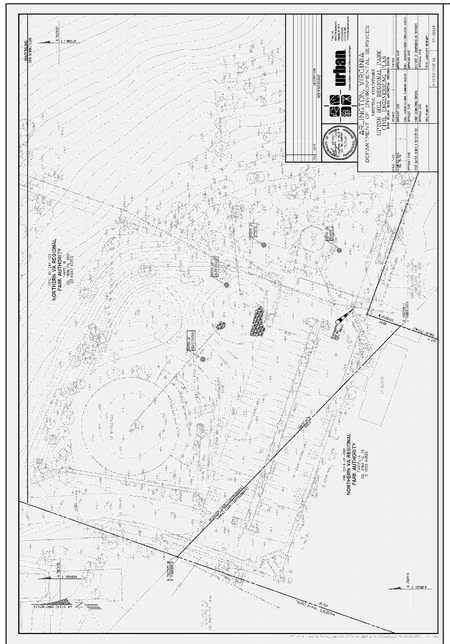
Very truly yours,
Geo Design & Engineering, Inc.

COMMONWEALTH OF VIRGINIA
MOHAMAD ABU-KASSEM
PROFESSIONAL ENGINEER

Mohamad-Abu-Kassem, P.E., Principal

Attachments: Boring Location Plans
Boring Logs





HAND AUGER LOG
HAND AUGER NO.: B-1

PROJECT: Upton Hill Regional Park - Northern Virginia Regional Authority	PROJECT NO.: E18052
CLIENT: Brian Nolan	DATE: 7-28-18
LOCATION: See Test Boring Location Plan	ELEV.: 346.02
EXCAVATION METHOD: Hand Augers	LOGGED BY: A. Estacio
DEPTH TO WATER: Dry	

Elevation/ DEPTH	SOIL SYMBOLS AND SAMPLERS: GRAPHIC	BULK	USCS	DESCRIPTION	DCP Blow Count per 3" penetration	MOISTURE %
346 — 0			ML	Man-made Fill Dark brown & brown micaceous sandy silt (ML) - moist -Top 4 inches classified as topsoil		
344 — 2						
			SM	Natural Brown silty sand (SM) with gravel and trace of mica -moist		
342 — 4						
			ML	Brown & yellow brown sandy silt (ML) with gravel and trace of mica -moist		
340 — 6						
			CL	Red brown & brown sandy lean clay (CL) with mica -moist		
338 — 8				Boring terminated at 7 feet and backfilled.		
336 — 10						

Notes:

Geo Design & Engineering, Inc.

No.	DATE	DESCRIPTION

REVISIONS

COMMONWEALTH OF VIRGINIA
CLAYTON C. TOCK
No. 036790
07/25/18
PROFESSIONAL ENGINEER

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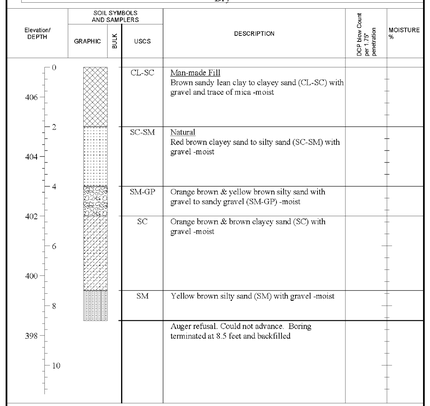
ARLINGTON, VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES
EROSION & SEDIMENT CONTROL – DETAILS
UPTON HILL REGIONAL PARK
CIVIL ENGINEERING PLAN
6060 WILSON BLVD, ARLINGTON, VIRGINIA 22205

SCALE: N/A	DESIGNED	CHECKED
SUBMITTED DATE 05-15-18 07-25-18	APPROVED DATE CHIEF TRANSPORTATION PLANNING BUREAU	APPROVED DATE CHIEF TRANSPORTATION ENGINEERING BUREAU
APPROVED DATE CHIEF WATER, SEWER & STREETS DIV.	APPROVED DATE CHIEF ENGINEERING DIVISION	APPROVED DATE DIRECTOR OF ENVIRONMENTAL SERVICES
	APPROVED DATE CPHD PLANNER	APPROVED DATE CPHD LANDSCAPE REVIEWER
	SHEET C.44 OF 45	SP-12928

Urban, Ltd. – s:\JOBS\upton hill park\sp bid set\12928-35-Geotech.dwg [Geo 1] November 26, 2018 – 12:29pm kbriten

HAND AUGER LOG
HAND AUGER NO.: B-2

PROJECT	PROJECT NO.
Upton Hill Regional Park - Northern Virginia Regional Authority	E18052
CLIENT	DATE
Brian Nolan	7-21-18
LOCATION	ELEV.
See Test Boring Location Plan	407
EXCAVATION METHOD	LOGGED BY
Hand Augers	A. Estacio
DEPTH TO WATER	
Dry	



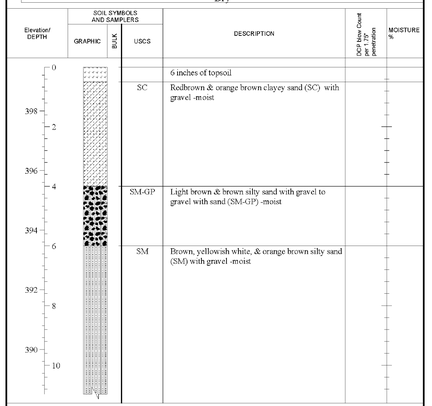
Elevation/ DEPTH	SOIL SYMBOLS AND SAMPLERS: GRAPHIC	BULK	USCS	DESCRIPTION	DCP Blow Count per 1.0" penetration	MOISTURE %
406 / 0			CL-SC	Man-made Fill Brown sandy lean clay to clayey sand (CL-SC) with gravel -moist		
404 / 2			SC-SM	Natural Red brown clayey sand to silty sand (SC-SM) with gravel -moist		
402 / 4			SM-GP	Orange brown & yellow brown silty sand with gravel to sandy gravel (SM-GP) -moist		
400 / 6			SC	Orange brown & brown clayey sand (SC) with gravel -moist		
398 / 8			SM	Yellow brown silty sand (SM) with gravel -moist		
10				Auger refusal. Could not advance. Boring terminated at 8.5 feet and backfilled		

Notes:

Geo Design & Engineering, Inc.

HAND AUGER LOG
HAND AUGER NO.: B-3

PROJECT	PROJECT NO.
Upton Hill Regional Park - Northern Virginia Regional Authority	E18052
CLIENT	DATE
Brian Nolan	7-21-18
LOCATION	ELEV.
See Test Boring Location Plan	399.47
EXCAVATION METHOD	LOGGED BY
Hand Augers	A. Estacio
DEPTH TO WATER	
Dry	



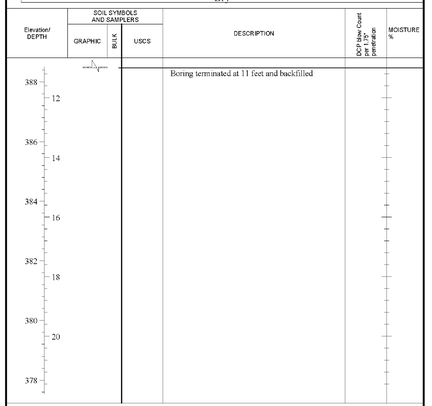
Elevation/ DEPTH	SOIL SYMBOLS AND SAMPLERS: GRAPHIC	BULK	USCS	DESCRIPTION	DCP Blow Count per 1.0" penetration	MOISTURE %
398 / 0				6 inches of topsoil		
396 / 2			SC	Redbrown & orange brown clayey sand (SC) with gravel -moist		
394 / 4			SM-GP	Light brown & brown silty sand with gravel to gravel with sand (SM-GP) -moist		
392 / 6			SM	Brown, yellowish white, & orange brown silty sand (SM) with gravel -moist		
390 / 8						
10						

Notes:

Geo Design & Engineering, Inc.

HAND AUGER LOG
HAND AUGER NO.: B-3

PROJECT	PROJECT NO.
Upton Hill Regional Park - Northern Virginia Regional Authority	E18052
CLIENT	DATE
Brian Nolan	7-21-18
LOCATION	ELEV.
See Test Boring Location Plan	399.47
EXCAVATION METHOD	LOGGED BY
Hand Augers	A. Estacio
DEPTH TO WATER	
Dry	



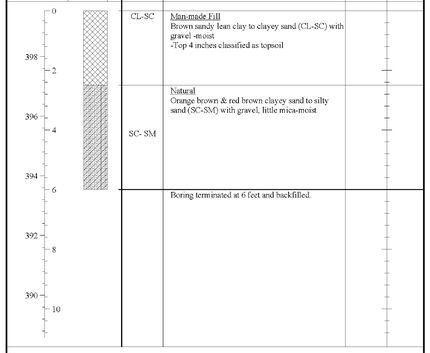
Elevation/ DEPTH	SOIL SYMBOLS AND SAMPLERS: GRAPHIC	BULK	USCS	DESCRIPTION	DCP Blow Count per 1.0" penetration	MOISTURE %
388 / 12				Boring terminated at 11 feet and backfilled		
386 / 14						
384 / 16						
382 / 18						
380 / 20						
378						

Notes:

Geo Design & Engineering, Inc.

HAND AUGER LOG
HAND AUGER NO.: B-4

PROJECT	PROJECT NO.
Upton Hill Regional Park - Northern Virginia Regional Authority	E18052
CLIENT	DATE
Brian Nolan	7-21-18
LOCATION	ELEV.
See Test Boring Location Plan	399.54
EXCAVATION METHOD	LOGGED BY
Hand Augers	A. Estacio
DEPTH TO WATER	
Dry	



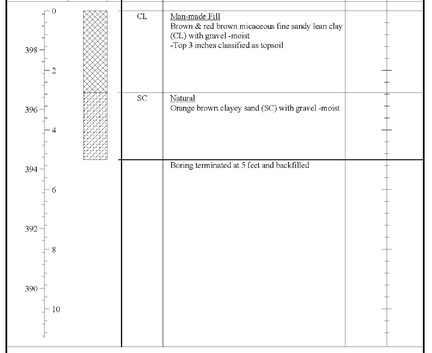
Elevation/ DEPTH	SOIL SYMBOLS AND SAMPLERS: GRAPHIC	BULK	USCS	DESCRIPTION	DCP Blow Count per 1.0" penetration	MOISTURE %
398 / 0			CL-SC	Man-made Fill Brown sandy lean clay to clayey sand (CL-SC) with gravel -moist -Top 4 inches classified as topsoil		
396 / 2			SC- SM	Natural Orange brown & red brown clayey sand to silty sand (SC-SM) with gravel, little mica-moist		
394 / 4				Boring terminated at 6 feet and backfilled.		
392 / 6						
390 / 8						
10						

Notes:

Geo Design & Engineering, Inc.

HAND AUGER LOG
HAND AUGER NO.: B-5

PROJECT	PROJECT NO.
Upton Hill Regional Park - Northern Virginia Regional Authority	E18052
CLIENT	DATE
Brian Nolan	7-28-18
LOCATION	ELEV.
See Test Boring Location Plan	399.31
EXCAVATION METHOD	LOGGED BY
Hand Augers	A. Estacio
DEPTH TO WATER	
Dry	



Elevation/ DEPTH	SOIL SYMBOLS AND SAMPLERS: GRAPHIC	BULK	USCS	DESCRIPTION	DCP Blow Count per 1.0" penetration	MOISTURE %
398 / 0			CL	Man-made Fill Brown & red brown micaceous fine sandy lean clay (CL) with gravel -moist -Top 3 inches classified as topsoil		
396 / 2			SC	Natural Orange brown clayey sand (SC) with gravel -moist		
394 / 4				Boring terminated at 5 feet and backfilled		
392 / 6						
390 / 8						
10						

Notes:

Geo Design & Engineering, Inc.

No.	DATE	DESCRIPTION

REVISIONS

COMMONWEALTH OF VIRGINIA
CLAYTON C. TOCK
No. 036790
07/25/18
PROFESSIONAL ENGINEER

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ARLINGTON, VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES

GEOTECHNICAL REPORT

UPTON HILL REGIONAL PARK
CIVIL ENGINEERING PLAN
6060 WILSON BLVD, ARLINGTON, VIRGINIA 22205

SCALE: N/A	DESIGNED	CHECKED
SUBMITTED DATE 05-15-18 – 07-25-18 – – –	APPROVED DATE CHIEF TRANSPORTATION PLANNING BUREAU	APPROVED DATE CHIEF TRANSPORTATION ENGINEERING BUREAU
APPROVED DATE CHIEF WATER, SEWER & STREETS DIV.	APPROVED DATE CHIEF ENGINEERING DIVISION	APPROVED DATE DIRECTOR OF ENVIRONMENTAL SERVICES
	APPROVED DATE CPHD PLANNER	APPROVED DATE CPHD LANDSCAPE REVIEWER

Urban, Ltd. – K:\JOBS\upton hill park\sp bid set\12928-35-Geotech.dwg [Geo 2] November 26, 2018 – 12:29pm bbrien

COMMONWEALTH of VIRGINIA

DEPARTMENT OF TRANSPORTATION

CHARLES A. KILPATRICK, P.E.
COMMISSIONER

4975 Alliance Drive
Fairfax, VA 22030

March 6, 2018

Mr. Clayton C. Tock, P.E.
Urban, Ltd.
4200 D Technology Court
Chantilly, Virginia 20151

Re: Upton Hill Park
Site Plan #: 12928
Arlington County

Dear Mr. Tock:

VDOT has reviewed the subject site plan received February 2, 2018 and concluded that Wilson Blvd. is not a VDOT maintained roadway in the County of Arlington. Therefore, there are no further objections to the approval of the Upon Hill Park Site Plan. For any question/concerns, please contact me at (703) 691-6733 or David.Jordan@vdot.virginia.gov

Sincerely,

David Jordan
Land Use Engineer

cc: NOVA Fairfax Permits

We Keep Virginia Moving

No.	DATE	DESCRIPTION

REVISIONS

COMMONWEALTH OF VIRGINIA
CLAYTON C. TOCK
Lic. No. 036790
07/25/18
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ARLINGTON, VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES

CORRESPONDENCE

UPTON HILL REGIONAL PARK
CIVIL ENGINEERING PLAN

6060 WILSON BLVD, ARLINGTON, VIRGINIA 22205

SCALE: N/A	DESIGNED	CHECKED
SUBMITTED DATE 05-15-18 07-25-18	APPROVED DATE CHIEF TRANSPORTATION PLANNING BUREAU	APPROVED DATE CHIEF TRANSPORTATION ENGINEERING BUREAU
APPROVED DATE CHIEF WATER, SEWER & STREETS DIV.	APPROVED DATE CHIEF ENGINEERING DIVISION	APPROVED DATE DIRECTOR OF ENVIRONMENTAL SERVICES
	APPROVED DATE CPHD PLANNER	APPROVED DATE CPHD LANDSCAPE REVIEWER
	SHEET C.45 OF 45	SP-12928

Urban, Ltd - F:\JOBS\upton hill park\sp bid set\12928-36-CORRESPONDENCE.dwg [CORRESPONDENCE] November 26, 2018 - 12:29pm kbrien