Application for URBAN DESIGN COMMITTEE Review

Department of Planning and Development Review
Planning & Preservation Division
900 E. Broad Street, Room 510
Richmond, Virginia 23219
(804) 646-6335
http://www.richmondgov.com/CommitteeUrbanDesign

Application Type

- [ ] Addition/Alteration to Existing Structure
- [ ] New Construction
- [x] Streetscape
- [ ] Site Amenity
- [ ] Encroachment
- [ ] Master Plan
- [ ] Sign
- [ ] Other

Review Type

- [ ] Conceptual
- [x] Final

Project Name: 10th Street - Jefferson Greenway

Project Address: South 10th Street (Cary Street to Main Street)

Brief Project Description (this is not a replacement for the required detailed narrative) :

Streetscape, stormwater and crosswalk enhancements. Please see narrative for detailed description of project.

Applicant Information

(on all applications other than encroachments, a City agency representative must be the applicant)

Name: Todd Hopkins Email: todd.hopkins@richmondgov.com

City Agency: Dept. of Public Utilities, Tech Services Div. Phone: 804-646-1394

Address: 730 East Broad Street, 6th Floor, Richmond, VA 23219

Main Contact (if different from Applicant): Keith Whipple

Company: Waterstreet Studio Phone: 434-906-0374

Email: kwhipple@waterstreetstudio.net

Submittal Deadlines

All applications and support materials must be filed no later than 21 days prior to the scheduled meeting of the Urban Design Committee (UDC). Please see the schedule on page 3 as actual deadlines are adjusted due to City holidays. **Late or incomplete submissions will be deferred to the next meeting.**

Filing

Applications can be mailed or delivered to the attention of "Urban Design Committee" at the address listed at the top of this page. **It is important that the applicant discuss the proposal with appropriate City agencies, Zoning Administration staff, and area civic associations and residents prior to filing the application with the UDC.**

UDC Background

The UDC is a ten member committee created by City Council in 1968 whose purpose is to advise the City Planning Commission on the design of projects on City property or right-of-way. The UDC provides advice of an aesthetic nature in connection with the performance of the duties of the Commission under Sections 17.05, 17.06 and 17.07 of the City Charter. The UDC also advises the Department of Public Works in regards to private encroachments in the public right-of-way.

March 20, 2014

Project: 10th Street – Jefferson Greenway

Submittal: City of Richmond Urban Design Commission – Project Narrative

Introduction:
In 2013, members of the Alliance for the Chesapeake Bay and Capital Trees Organizations met to discuss collaboration on a project involving improvements to the 10th Street Corridor between the Virginia State Capitol and Kanawha Canal in Richmond's Downtown District.

Having successfully designed and built stormwater planters along 9th Street as part of the 2009-2010 "Greening the Capitol Project," ACB was looking to extend its efforts to the south. Similarly, Capital Trees was exploring areas in which to expand its public-private streetscape initiative which had begun nearby on 14th Street. At the suggestion of then Deputy Stormwater Director, Michelle Virts, the two groups set out to inventory past planning efforts and conditions of the 10th Street Corridor.

Working with 3north Architects and Waterstreet Studio, the team assembled a master plan for the corridor and developed construction drawings for one block of the project - between Cary and Main Streets. Permit drawings for this block are included in and form the basis for this application package.

Conceptual plans, previously developed by the Greening the Capitol Team, were used in the project team's inventory and subsequently analyzed and compared to topographic and physical survey data provided by the City of Richmond. Inconsistencies discovered in the survey effort were noted and used to guide changes to the proposed streetscape interventions.

It is the intent of the Project Team to work with City Staff and Review Agencies to permit and construct streetscape and stormwater enhancements along this block of 10th Street between Cary and Main Streets. Properties adjacent to the planned work include: 921 East Main Street to the West (Sun Trust Building), owned by PARMENTER 919 MAIN STREET LP LLLP; and the East, 11 South 10th Street and 1001 East Main Street, owned by PARMENTER 919 MAIN STREET LP LLLP and AMERICAN HERITAGE PLACE LP, respectively.

ACB and Capital Trees have provided funding for the design and engineering drawings. ACB will work with City Representatives to Project Manage the construction and funding will be provided through third-party grants and contributions from the corporate citizenry of Richmond.

Proposed Improvements:

1. Crosswalk improvements at intersections of 10th Street with Cary and Main Street. Crosswalks are to be restriped and north/south walks treated in stamped asphalt.
2. Removal and replacement of concrete walkways within City ROW. Installation of brick accent bands at discrete locations within concrete walks.
3. Installation of pedestrian scale light poles.
4. Installation of sunken tree planters along East and West curbs in the northern half of the block. Tree planters are designed to increase potential root volume for the proposed street trees and contained mulch/groundcover beds, while providing adequate pedestrian crossing from the travelway to sidewalks.

5. Stormwater Planters are proposed along the East and West curbs in the southern half of the block. These planters are designed to detain and treat stormwater runoff from the travelways in a way that is safe, sustainable, and aesthetically pleasing. The system, similar to those approved and built along 9th and 14th Streets, links planters through a series of weir channels and underdrains, allowing for increased infiltration and treatment prior to its connection to the existing City storm sewer. Pedestrian crossings and canal stone bench seating are incorporated in the design. Planters will contain stone base, biofilter mix and a series of shrub, grass and street tree plantings.
6. A steel plate conceals the proposed weirs to allow safe crossing and presents opportunity for educational signage/etching. Currently, the team is considering content for the signage and etching. Under consideration is educational text and symbology explaining the benefits of green infrastructure as well as historical text highlighting the significance of Jefferson's vision for the connections between the State Capitol and James River.

Urban Canopy:
At present, there are 14 trees on the subject block. Twelve are Lindens ranging in caliper from 7 to 10 inches and two are Redbuds roughly 3.5 inches in caliper. Canopy coverage is calculated to be 4,196 square feet however four of the lindens are dead or dying. Assuming these trees were to be removed, post-removal canopy is calculated to be 2,880 square feet. Proposed plans call for all trees to be removed and replaced. Nineteen (19) 2.5 inch caliper shade trees are to be installed resulting in a calculated 10 year canopy coverage of 6,023 square feet.

Budget:
Estimated construction cost of the above improvements is $950,000.

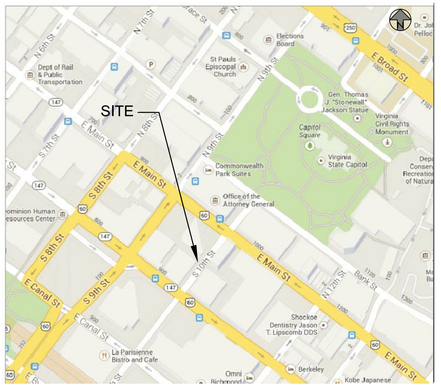
Funding Sources:
The Alliance for the Chesapeake Bay and Capital Trees have raised sufficient funds for the project through private donations, grants provided by local corporations and foundations including Altria Corp. and Chesapeake Bay Trust.

Projected Timeline:
The City of Richmond's Department of Public Utilities has agreed to sponsor the project and has organized a review by the Development Review Committee to begin upon UDC and Planning Commission Approval. ACB will solicit competitive bids for the work and anticipates that construction will start in early Fall 2014 with substantial completion reached in December, 2014.

Future Maintenance:
Based on prior experience with projects of similar scale and nature, ACB and Capital Trees will play an active role in the ongoing maintenance of this streetscape. The two groups work closely with Hands on Richmond and Back Yard Farmer, Inc. to ensure that tree installations are adequately watered until establishment and planters are kept weed free.

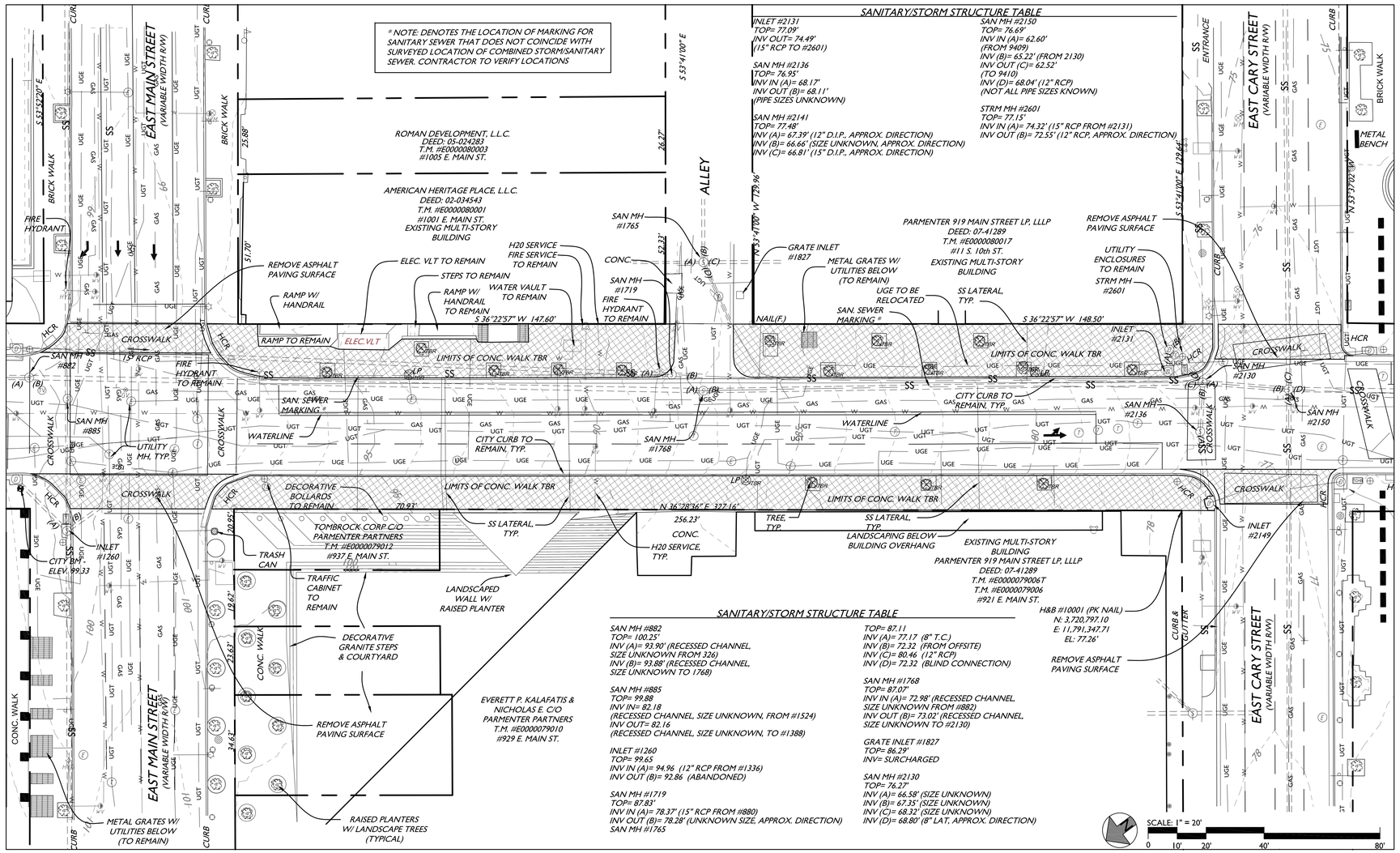
225-49-7658

VICINITY MAP: 1" = 400'



PROJECT NOTES:

1. SITE MAPPING DERIVED FROM FIELD RUN SURVEY PROVIDED BY H & B SURVEYING AND MAPPING, LLC (804) 330-3781. CONTRACTOR TO FIELD VERIFY EXISTING CRITICAL SITE DIMENSIONS.
2. CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS FOR THE PROJECT FROM THE CITY OF RICHMOND, DEPARTMENT OF CONSERVATION AND RECREATION, AND OTHERS AS APPLICABLE. ALL PERMITTING FEES SHALL BE PAID BY OWNER.
3. THE EXISTENCE AND LOCATION OF ALL UNDERGROUND UTILITIES AND STRUCTURES WITHIN THE WORK AREA ARE NOT NECESSARILY INDICATED ON THE PLANS AND IF SHOWN MAY ONLY BE APPROXIMATE. CONTRACTOR SHALL FIELD VERIFY LOCATION AND ELEVATION OF ALL EXISTING UTILITIES IN THE WORK AREA PRIOR TO STARTING WORK. CONTRACTOR SHALL CONTACT ENGINEER OR LANDSCAPE ARHCITECT IMMEDIATELY IF LOCATION OR ELEVATION DIFFER FROM THOSE SHOWN ON THE PLAN, IF THERE APPEARS TO BE A CONFLICT, OR UPON DISCOVERY OF ANY UTILITIES NOT SHOWN ON THE PLAN. FOR AREAS WITHIN THE CITY OF RICHMOND RIGHT-OF-WAY, CONTACT MISS UTILITY (800-552-7001) AT LEAST 72 HOURS PRIOR TO BEGINNING WORK TO HAVE UTILITIES LOCATED.
4. ANY DAMAGE TO UTILITIES OR PROPERTY BY THE CONTRACTOR SHALL BE RESTORED TO PRE-CONSTRUCTION CONDITIONS BY THE CONTRACTOR AT NO EXPENSE TO THE OWNER.
5. CONTRACTOR SHALL MAINTAIN A SET OF APPROVED CONSTRUCTION DOCUMENTS AT THE SITE AT ALL TIMES AND A DESIGNATED RESPONSIBLE REPRESENTATIVE SHALL BE AVAILABLE FOR CONTACT BY THE CITY OR STATE INSPECTORS.
6. ALL CONSTRUCTION ELEMENTS OF THIS PROJECT CONSIST OF LOW-IMPACT DESIGN (LID) MEASURES. THESE MEASURES ARE EXTREMELY SENSITIVE TO COMPACTION AND CONTAMINATION FROM SOILS RUNOFF AND TRACKING DURING CONSTRUCTION. CONTRACTOR SHALL TRAIN AND INFORM ALL CONSTRUCTION PERSONNEL TO ENSURE AWARENESS OF THESE CONCERNS, AND TAKE NECESSARY STEPS TO PROTECT THESE MEASURES. SPECIFIC ACTIONS INCLUDE:
   - SEALING/PROTECTING INLETS FROM ALL RUNOFF
   - MINIMIZING DURATION OF OPEN EXCAVATIONS
   - DO NOT STOCKPILE OR HANDLE SOILS UPSTREAM OF PRACTICES
   - WORK FROM UPSTREAM AREAS TOWARD DOWNSTREAM AREAS
   - COVER WORK AREAS WITH PLASTIC, TARPS, OR GEOTEXTILES UNTIL COMPLETE
7. ALL SUBGRADE IN EXCAVATED AREAS TO RECEIVE LID MEASURES SHALL BE INSPECTED AND TESTED FOR INFILTRATION BY OWNER'S REPRESENTATIVE PRIOR TO PLACEMENT OF DRAINAGE STONE.
8. EXCAVATION FOR BIORETENTION PRACTICES SHALL BE PERFORMED IN A MANNER THAT DOES NOT COMPACT THE SUBGRADE SOIS.
9. ALL UNDERDRAINS SHALL CONNECT TO EXISTING STORM SEWER SYSTEMS IN ACCORDANCE WITH CITY OF RICHMOND UTILITY STANDARDS.
10. ALL PUBLIC SEWERS IN THE PROJECT AREA ARE COMBINED STORM AND SANITARY SEWERS.
11. CONTRACTOR MAY ELECT TO INSTALL UNDERDRAIN PIPING UNDER EXISTING CONCRETE PAVING BY TUNNELLING, DIRECTION DRILLING, OR OTHER APPROVED METHOD TO MINIMIZE SURFACE DISRUPTION FROM OPEN TRENCHING.



GENERAL NOTES:

1. ALL SITE WORK AND ALL IMPROVEMENTS SHOWN ON THESE PLANS ARE REQUIRED TO BE PERFORMED AND / OR INSTALLED. UNLESS SPECIFICALLY ITEMIZED AS "NOT INCLUDED IN CONTRACT" IN THE OWNER / CONTRACTOR AGREEMENT, THE CONTRACTOR IS RESPONSIBLE FOR PERFORMING AND / OR INSTALLING ALL SITE WORK AND IMPROVEMENTS SHOWN ON THESE DRAWINGS, INCLUDING ANCILLARY EFFORTS AND WORK NORMALLY ASSOCIATED WITH SPECIFIED IMPROVEMENTS.
2. CALL MISS UTILITY (1-800-552-7001) PRIOR TO ANY LAND DISTURBING ACTIVITY. UTILITIES SHOWN ON THESE PLANS ARE REPRESENTATIONS OF DATA MADE AVAILABLE TO THE ENGINEER FROM VARIOUS SOURCES AND HAVE NOT BEEN FIELD CONFIRMED. EXPLORATORY EXCAVATIONS MAY BE NECESSARY TO CONFIRM THE EXISTENCE OR NON-EXISTENCE OF CERTAIN UNDERGROUND FEATURES.
3. THE CONTRACTOR SHALL COORDINATE WITH ALL LOCAL AUTHORITIES PRIOR TO COMMENCING THE WORK AND SCHEDULE / ATTEND ALL REQUIRED PRE-CONSTRUCTION MEETINGS. THE CONTRACTOR SHALL CONFIRM THAT ALL BONDS HAVE BEEN POSTED AND PULL ALL PERMITS. THE CONTRACTOR SHALL MAINTAIN THE PERMITS AND AN APPROVED SET OF THESE WORKING DRAWINGS AND PROJECT SPECIFICATIONS ON-SITE AT ALL TIMES.
4. THE CONTRACTOR SHALL ENSURE THAT HIS / HER WORK IS PROPERLY COORDINATED WITH THAT OF THE OTHER TRADES ON-SITE.
5. UNEXPECTED SITE CONDITIONS MAY ARISE DURING CONSTRUCTION THAT REQUIRE A DEVIATION FROM THESE PLANS. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY OF ANY CONDITIONS THAT CONFLICT WITH THE PROPER EXECUTION OF THESE PLANS. THE ENGINEER SHALL DETERMINE THE NATURE AND DEGREE OF CHANGES NECESSARY, AND THE CONTRACTOR SHALL PROVIDE A COST FOR SAID CHANGES. NO CHANGES ARE TO BE MADE WITHOUT THE WRITTEN CONSENT OF THE ENGINEER.
6. THE SITE WORK IS TO BE LAID-OUT ACCORDING TO THE DIMENSIONS ON THESE PLANS. SCALING OF THE PLANS IS NOT ACCEPTABLE. CONTACT ENGINEER IF THERE ARE QUESTIONS REGARDING THE LAYOUT OF THE WORK. BECAUSE ARCHITECTURAL DESIGN MANY TIMES CONTINUES AFTER SITE PLAN APPROVAL, STRUCTURAL INFORMATION REFLECTED ON THESE DRAWINGS MAY NOT REPRESENT FINAL ARCHITECTURAL DIMENSIONS. PRIOR TO STAKEOUT OF ANY STRUCTURES, SURVEYOR AND / OR CONTRACTOR SHALL OBTAIN FINAL ARCHITECTURAL DRAWINGS AND CONSULT WITH ENGINEER REGARDING EXACT PLACEMENT OF BUILDINGS ON SITE.
7. THE CONTRACTOR SHALL VERIFY ALL EXISTING SITE CONDITIONS AND FEATURES REPRESENTED ON THESE PLANS TO THE BEST OF HIS / HER ABILITY. THE CONTRACTOR SHALL ALSO VERIFY, BY STAKEOUT, THE RELATIONSHIP OF ALL MAJOR SITE IMPROVEMENTS TO EXISTING SITE CONDITIONS AND FEATURES AND NOTIFY ENGINEER OF ANY DISCREPANCIES, ERRORS AND OMISSIONS BEFORE PROCEEDING WITH THE WORK.
8. THE CONTRACTOR SHALL BE HELD SOLELY RESPONSIBLE FOR SITE CONDITIONS, THE SAFETY OF HIS / HER WORKERS AND THOSE ASSISTING HIM / HER WITH SUPPLYING OR EXECUTING THE WORK, AND THE SECURITY OF PROPERTY HE / SHE IS STORING ON-SITE. THE CONTRACTOR IS NOT LIABLE FOR THE SAFETY OF THOSE WITHIN THE BUILDINGS OR WORKING ON THE BUILDINGS, NOR IS HE / SHE RESPONSIBLE FOR SECURING THE PROPERTY OF THE BUILDING CONTRACTOR OR THEIR ASSOCIATED TRADES. HOWEVER, CONTRACTOR IS REQUIRED TO MAINTAIN A CLEAN, ORGANIZED AND SAFE SITE, AND IS THE FINAL AUTHORITY AS TO THE LOCATION, PLACEMENT OR STORAGE OF ANY AND ALL MATERIALS, EQUIPMENT, VEHICLES AND TEMPORARY STRUCTURES USED DURING CONSTRUCTION. NEITHER THE OWNER NOR ENGINEER SHALL BE HELD RESPONSIBLE FOR THEFT, DAMAGE OR INJURY ON-SITE DURING CONSTRUCTION UNLESS IT IS DUE TO TO THE SOLE NEGLIGENCE OF THE OWNER OR ENGINEER.
9. THE CONTRACTOR SHALL DETERMINE THE LIMITS OF CONSTRUCTION AND DEMARCATE THEM CLEARLY PRIOR TO COMMENCING GRADING OF THE SITE. ALSO, THE CONTRACTOR SHALL INSTALL ALL SEDIMENT AND EROSION CONTROL MEASURES THAT CAN LOGISTICALLY BE PLACED BEFORE GRADING COMMENCES.
10. DURING THE INSTALLATION OF UTILITIES TO SUPPORT THE PROJECT, THE CONTRACTOR SHALL MAINTAIN SERVICE TO NEIGHBORING PROPERTIES. DAMAGE TO LINES OR INTERRUPTIONS OF SERVICE SHALL BE IMMEDIATELY REPORTED TO THE SERVICE PROVIDER AND ENGINEER. THE CONTRACTOR IS RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH REPAIR AND RESTORATION OF SERVICE.
11. ALL EXISTING IMPROVEMENTS ADJACENT TO THE PROPERTY, SUCH AS ROADWAYS, SHALL BE PROTECTED FROM DAMAGE DUE TO THE EXECUTION OF THE WORK. ALL REPAIR MADE NECESSARY BY THE CONTRACTOR OR THOSE ASSISTING HIM / HER IN THE EXECUTION OF THE WORK SHALL BE BORNE BY THE CONTRACTOR.
12. USE OF EXPLOSIVES IS EXPRESSLY PROHIBITED UNLESS STATED OTHERWISE. IF PERMITTED, THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS AND NOTIFY ENGINEER PRIOR TO STORING OR USING EXPLOSIVES ON-SITE. ALL OTHERS SHARING THE SITE FOR CONSTRUCTION PURPOSES SHALL ALSO BE NOTIFIED. USE OF EXPLOSIVES SHALL BE CAREFULLY COORDINATED WITH ALL OTHERS SHARING THE SITE AS WELL AS CITY OF RICHMOND AND ADJACENT OWNERS.
13. PRIOR TO ANY CONSTRUCTION WITHIN ANY EXISTING PUBLIC RIGHT-OF-WAY, INCLUDING CONNECTION TO ANY EXISTING ROAD, A GENERAL LAND USE PERMIT SHALL BE OBTAINED FROM THE CITY OF RICHMOND (CITY). THIS PLAN, AS DRAWN, MAY NOT ACCURATELY REFLECT THE REQUIREMENTS OF THE PERMIT. WHERE ANY DISCREPANCIES OCCUR, THE REQUIREMENTS OF THE PERMIT SHALL GOVERN.
14. CONTRACTOR SHALL COORDINATE TRAFFIC CONTROL MEASURES WITH CITY OF RICHMOND INSPECTORS PRIOR TO OR AS PART OF THE REQUIRED PRE-CONSTRUCTION CONFERENCE.
15. ALL UNSUITABLE SOIL MATERIAL SHALL BE STOCKPILED AND ITS DISPOSITION DETERMINED BY THE OWNER WHILE THE EARTHWORK ASPECT OF THE SITE WORK IS STILL UNDERWAY.
16. ALL SPRINGS SHALL BE CAPPED AND PIPED TO THE NEAREST DRAINAGEWAY OR DIRECTED TO A STORM SEWERAGE STRUCTURE.
17. EROSION AND SILTATION CONTROL MEASURES, IF REQUIRED, SHALL BE PROVIDED IN ACCORDANCE WITH THE APPROVED EROSION CONTROL PLAN AND INASMUCH AS IS POSSIBLE SHALL BE INSTALLED PRIOR TO ANY CLEARING, GRADING OR OTHER CONSTRUCTION. THE CONTRACTOR SHALL NOT BE RELEASED FROM RESPONSIBILITY FOR STABILIZATION OF THE PROPERTY UNTIL THE LOCAL AUTHORITY OR AGENT ISSUES FINAL APPROVAL AND AUTHORIZES DECOMMISIONING OF EROSION CONTROL MEASURES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR POSTING THE EROSION CONTROL BOND.
18. PAVED, RIP-RAP OR STABILIZATION MAT-LINED DITCHES MAY BE REQUIRED WHEN, IN THE OPINION OF THE CITY OF RICHMOND AGENT, IT IS DEEMED NECESSARY IN ORDER TO STABILIZE A DRAINAGE CHANNEL.
19. ALL PAVING AND DRAINAGE-RELATED MATERIALS AND CONSTRUCTION SHALL CONFORM TO CURRENT SPECIFICATIONS AND STANDARDS OF THE CITY OF RICHMOND UNLESS OTHERWISE NOTED. ALL MATERIALS TO BE USED IN STABILIZATION SHALL ALSO BE APPROVED BY ENGINEER.
20. ALL CONCRETE CURBING SHALL CONFORM TO CITY OF RICHMOND STANDARDS.
21. FINISH PAVEMENT AND CURBING SHALL BE CONSTRUCTED TO WITHIN ½ INCH OF REQUIRED FINISH ELEVATIONS
22. ALL STORM SEWERAGE SHALL BE INSTALLED IN ACCORDANCE WITH CITY OF RICHMOND STANDARDS AND SPECIFICATIONS. ALL REINFORCED CONCRETE PIPE SHALL BE CLASS 3 UNLESS OTHERWISE NOTED. ALL HDPE PIPE SHALL BE ADS N-12 OR EQUAL W/VDOT STANDARD PB-1 BEDDING. ALL PVC PIPE SHALL BE SCHEDULE 40 OR SDR-35.

LEGEND

- H&B CONTROL
- ELECTRIC HAND HOLE
- ELECTRIC BOX
- FLAGPOLE
- GROUND LIGHT
- GAS TEE
- SHRUB
- TRAFFIC SIGNAL BOX
- IRRIGATION VALVE
- TRAFFIC CONTROL HAND HOLE
- BOLLARD
- CLEANOUT
- FIRE HYDRANT
- GAS METER
- GAS DRIP
- GAS TEST STATION
- GAS VALVE
- ELECTRIC MANHOLE
- SEWER MANHOLE
- POWER POLE
- SIAMESE CONNECTION
- SIGNAL POLE
- TURN ARROW RIGHT
- TURN ARROW LEFT
- TURN ARROW STRAIGHT
- WATER METER
- WATER VALVE
- PARKING METER
- GRATE INLET
- STORM MANHOLE
- SPRINKLER CONTROL BOX
- SIGN
- LANDSCAPE TREE
- TELEPHONE MANHOLE
- LIGHT POLE
- TRASH CAN
- ELECTRICAL OUTLET
- CABLE TV MANHOLE

SHEET INDEX:

SURVEY NOTES:

1. INLET INVERTS SHOWN HEREON ARE APPROXIMATE AND SHOULD BE VERIFIED PRIOR TO CONSTRUCTION OR DESIGN TIE IN.
2. EXISTING GROUND SURFACE LOCATION PERFORMED BY CONVENTIONAL INSTRUMENT SURVEY.
3. HORIZONTAL (NAD'83) AND VERTICAL (NAVD'88) DATUM ESTABLISHED THROUGH REAL TIME KINEMATIC (RTK) GPS OBSERVATIONS ON 12/18/2012; DIFFERENTIAL CORRECTIONS WERE DERIVED FROM NATIONAL GEODETIC SURVEY (NGS) CONTINUALLY OPERATING REFERENCE STATION (CORS) "LOY3". COORDINATE VALUES, IF SHOWN HEREON, ARE BASED ON VIRGINIA STATE GRID, SOUTH ZONE.
4. UNDERGROUND UTILITIES WERE DESIGNATED (PAINTED) BY MISS UTILITY OF VIRGINIA. H & B SURVEYING AND MAPPING, LLC SURVEYED THE PAINTED LINE AS PAINTED AND IS NOT RESPONSIBLE FOR THE ACCURACY OF THE PAINT DESIGNATION. UTILITY INFORMATION ON THIS DRAWING WILL NEED TO BE FIELD VERIFIED PRIOR TO CONSTRUCTION.
5. PROPERTY LINES SHOWN HEREON TAKEN FROM COURT HOUSE RECORDS AND EVIDENCE OF MONUMENTATION AND OCCUPATION FOUND IN THE FIELD. THIS SURVEY DOES NOT CONSTITUTE A BOUNDARY SURVEY AND WAS PREPARED WITHOUT THE BENEFIT OF A TITLE COMMITMENT; THEREFORE ALL EASEMENTS MAY OR MAY NOT BE SHOWN ON THIS SURVEY.
6. FACE OF BUILDINGS SHOWN HEREON ARE IRREGULAR IN NATURE, AND MAY NOT DEPICT ALL ARCHITECTURAL FACADE DETAILS. NOT ALL OVERHANGS SHOWN.
7. SEE SHEET 4 FOR SANITARY SEWER & STORM SEWER INFORMATION
8. SEE SHEET 5 FOR PROPERTY LINE AND OWNERSHIP INFORMATION
9. ALL ROADS ARE ASPHALT PAVED SURFACES.

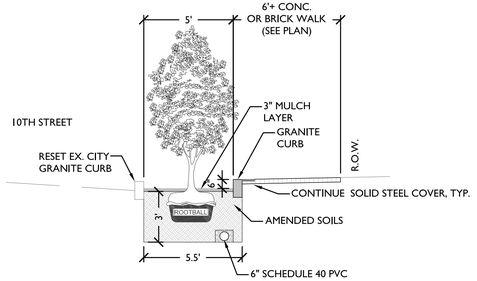
3 NORTH
waterstreetstudio
t 804 775 0117
201 WEST 7TH STREET RICHMOND VA 23224
P 804 232 8900 F 804 232 2092

DEMOLITION PLAN

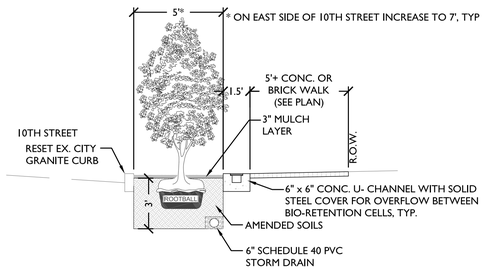
PERMIT DRAWINGS JEFFERSON GREENWAY - MAIN ST. TO CARY ST. 11.25.13

REV	DATE	DESCRIPTION

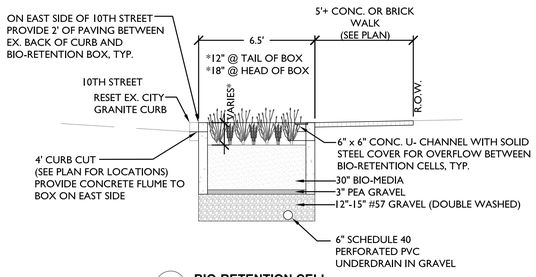
C1.0



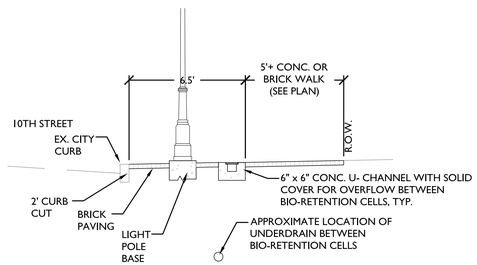
2 RECESSED TREE PLANTER
SECTION - SCALE: 1" = 4'



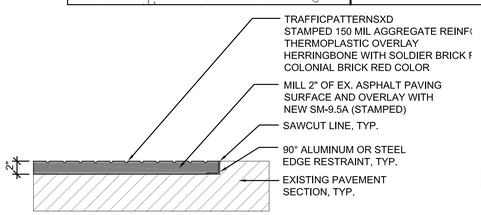
3 TREE PLANTER @ BIO-CELLS
SECTION - SCALE: 1" = 4'



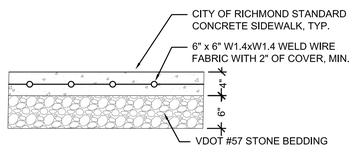
4 BIO-RETENTION CELL
SECTION - SCALE: 1" = 4'



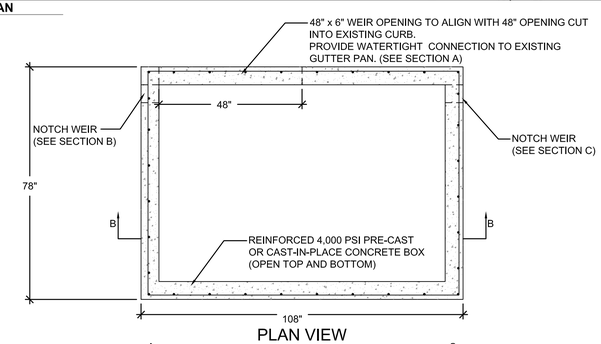
5 LIGHTPOLE @ BIO-RETENTION CELL
SECTION - SCALE: 1" = 4'



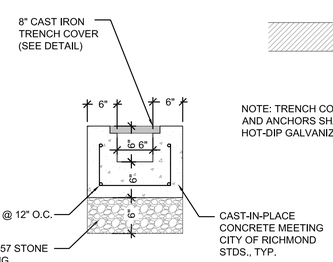
8 STAMPED ASPHALT
SECTION - SCALE: 1" = 1'



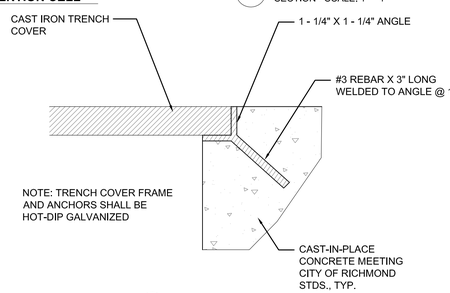
9 CONCRETE SIDEWALK
SECTION - SCALE: 1" = 1'



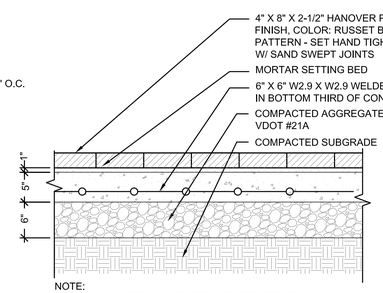
11 BIO-RETENTION CELL PLANTER BOX
DETAIL - SCALE: 1" = 2'



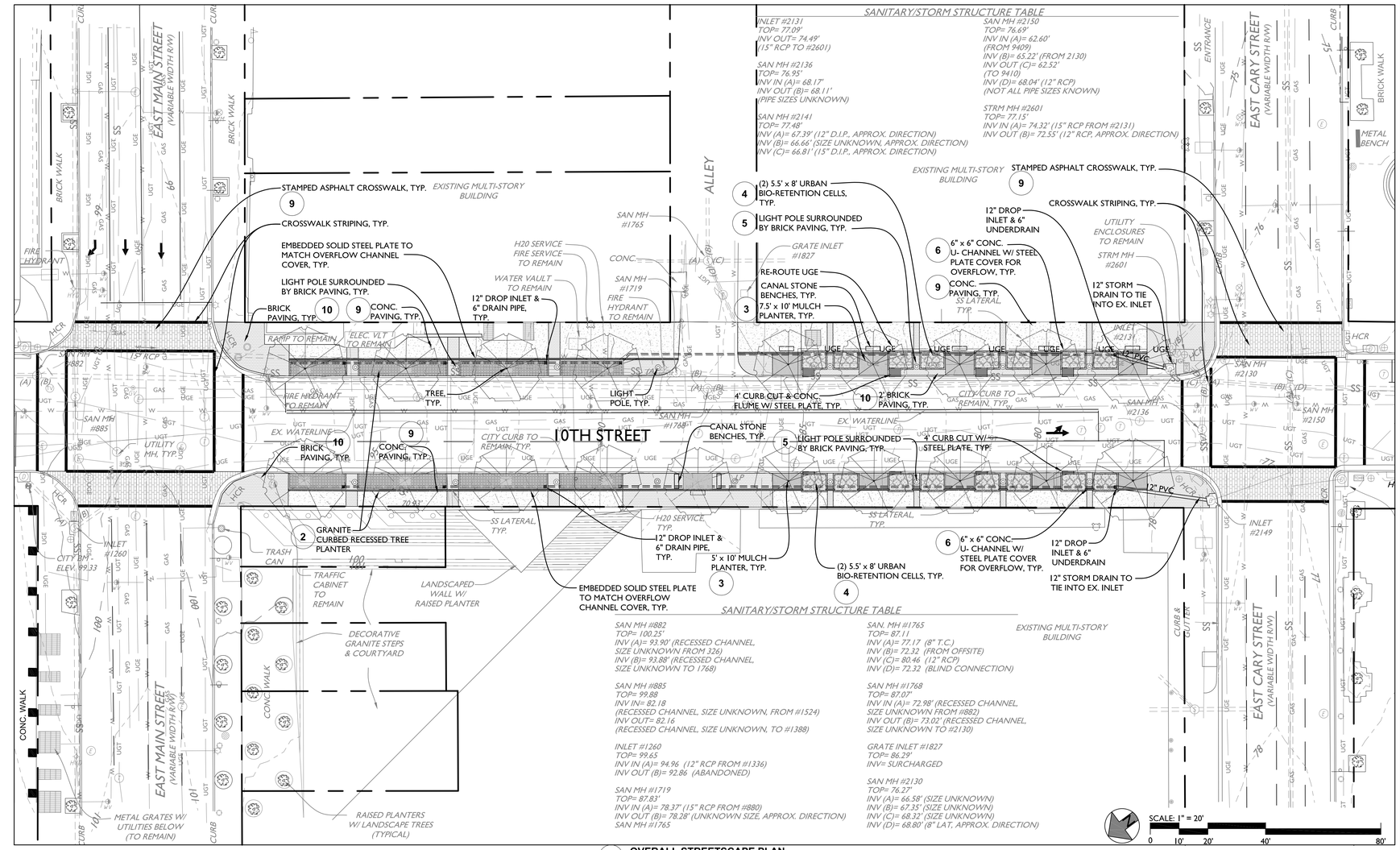
6 6"x6" CONC. U-CHANNEL W/ COVER
SECTION - SCALE: 1" = 2'



7 6"x6" CONC. U-CHANNEL W/ COVER
SECTION - SCALE: 1" = 2'



10 BRICK PAVING - PEDESTRIAN
SECTION - SCALE: 1" = 1'



1 OVERALL STREETSCAPE PLAN
PLAN VIEW - SCALE: 1" = 20'

3 NORTH
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t 434 973 6117
201 WEST 7TH STREET RICHMOND VA 23224
P 804 232 8900 F 804 232 2092

COMMONWEALTH OF VIRGINIA
Alan G. Franklin
Lic. No. 35326
12-10-13
PROFESSIONAL ENGINEER

OVERALL STREETSCAPE PLAN & DETAILS

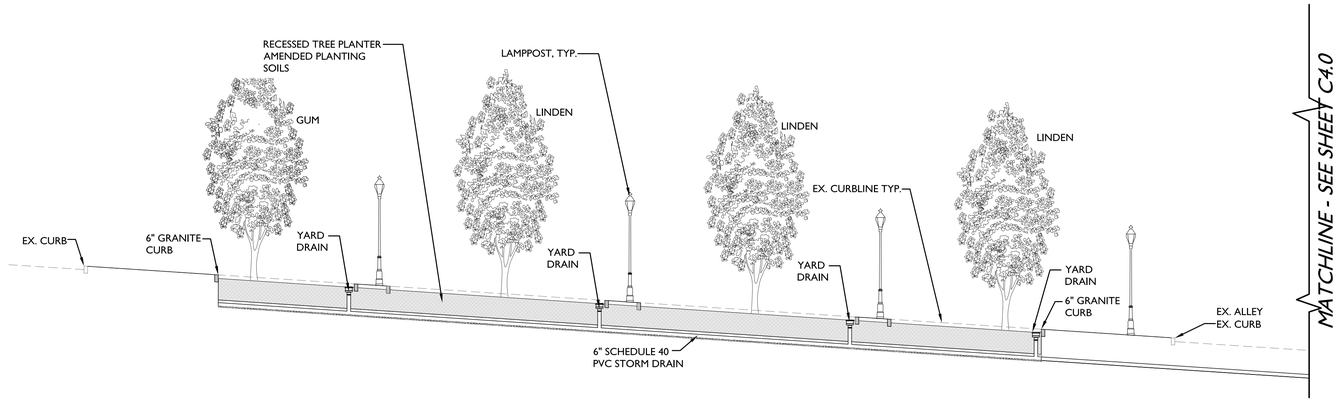
PERMIT DRAWINGS

JEFFERSON GREENWAY - MAIN ST. TO CARY ST.

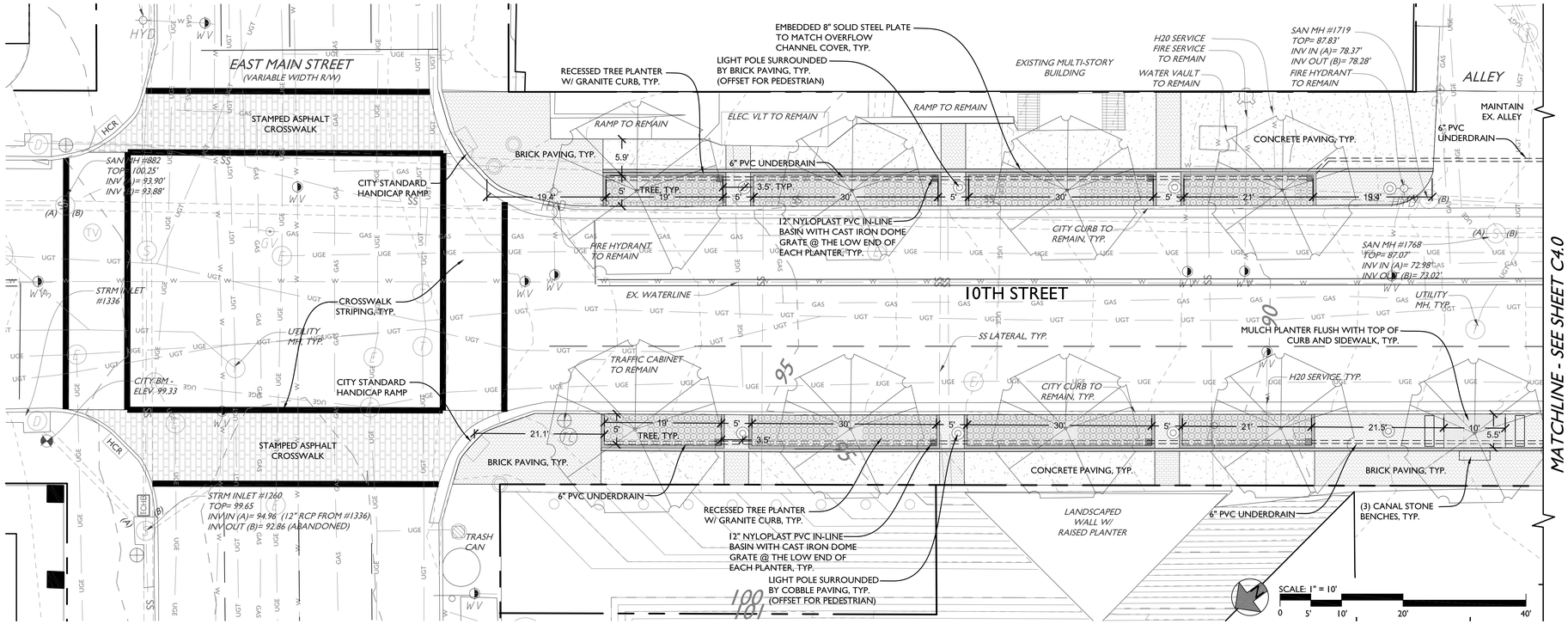
REV	DATE	DESCRIPTION

11.25.13

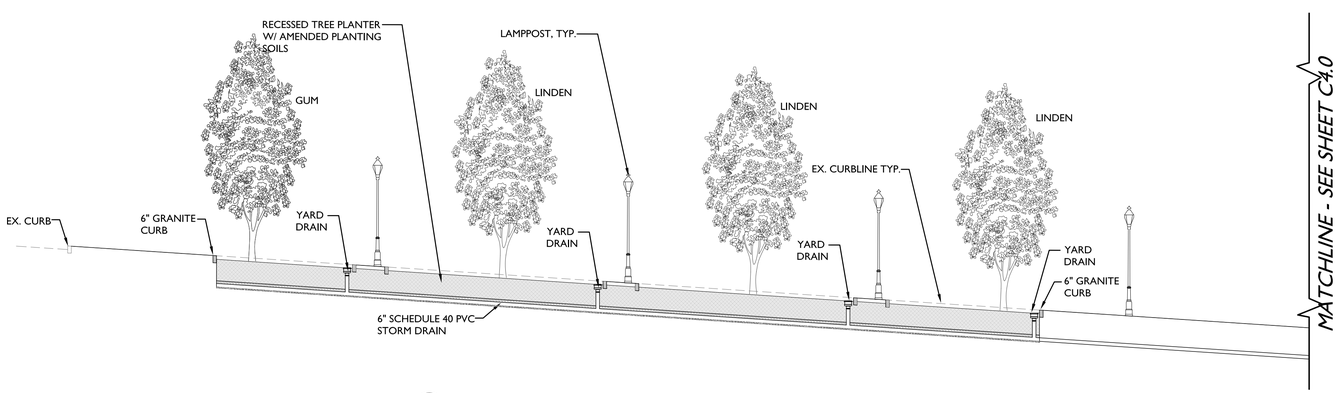
C2.0



1 **EASTERN STREETSCAPE PROFILE**
SECTION - SCALE: 1" = 10'



2 **STREETSCAPE PLAN**
ENLARGEMENT - SCALE: 1" = 10'



3 **WESTERN SIDE PROFILE**
SECTION - SCALE: 1" = 10'

3 NORTH
201 WEST 7TH STREET RICHMOND VA 23224
P 804 232 8900 F 804 232 2092

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t a k i n g i t i n

COMMONWEALTH OF VIRGINIA
Alan G. Franklin
Lic. No. 35326
12-10-13
PROFESSIONAL ENGINEER

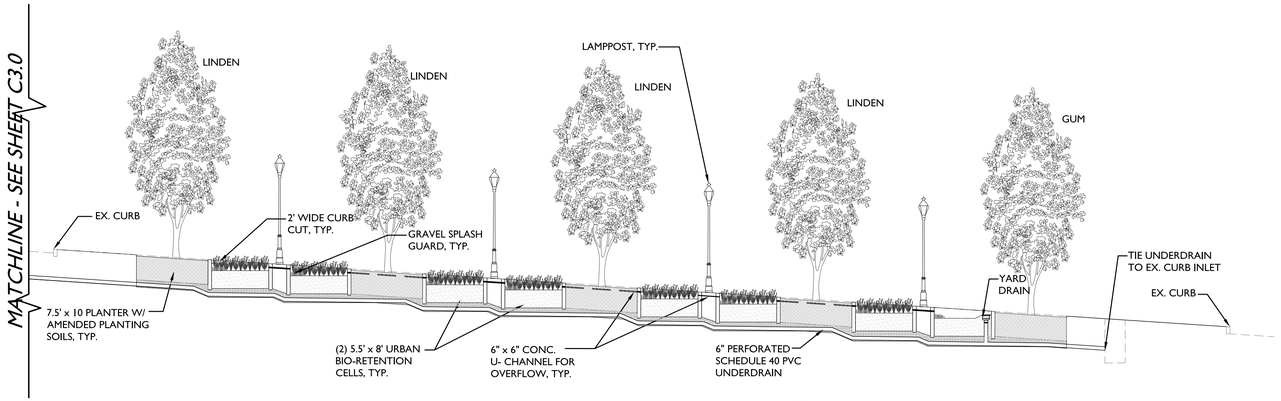
STREETSCAPE PLAN & PROFILE - I

PERMIT DRAWINGS

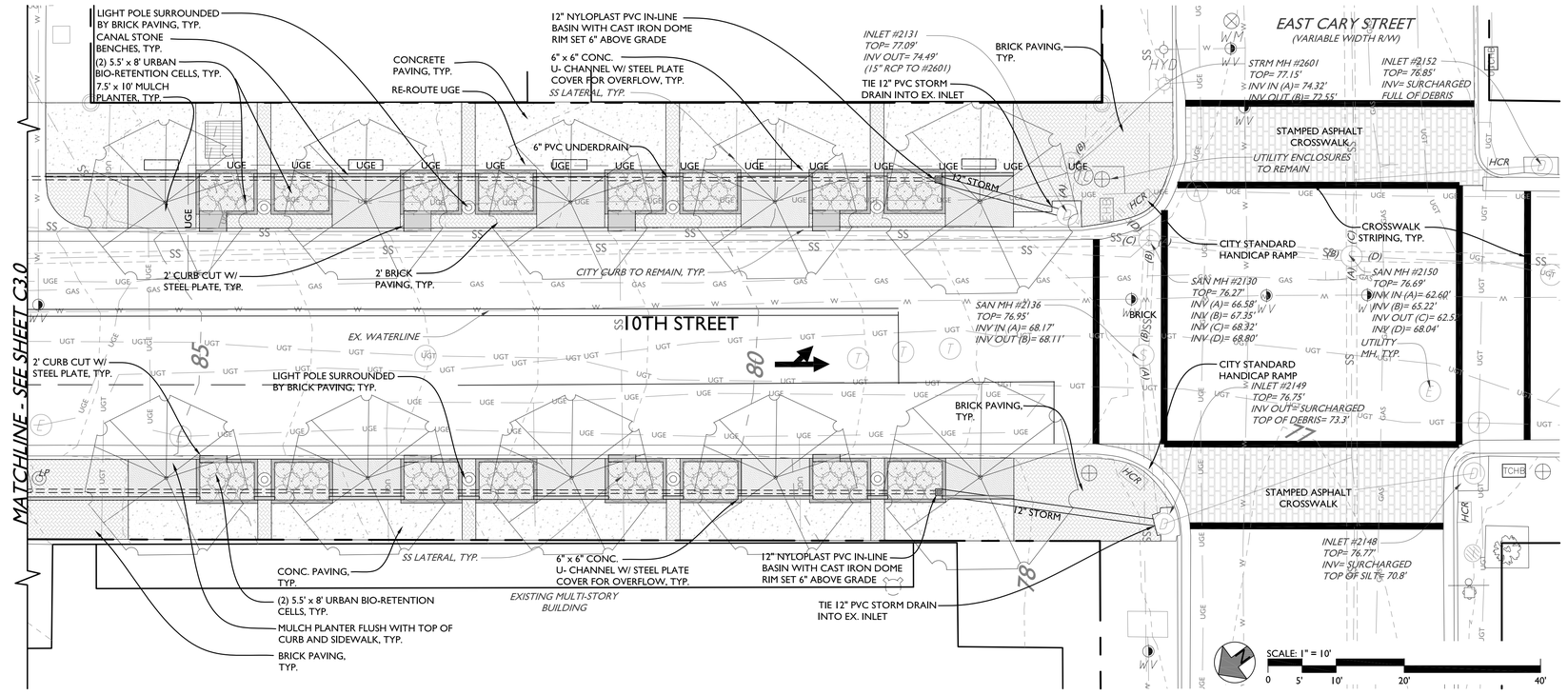
JEFFERSON GREENWAY - MAIN ST. TO CARY ST. 11.25.13

REV	DATE	DESCRIPTION

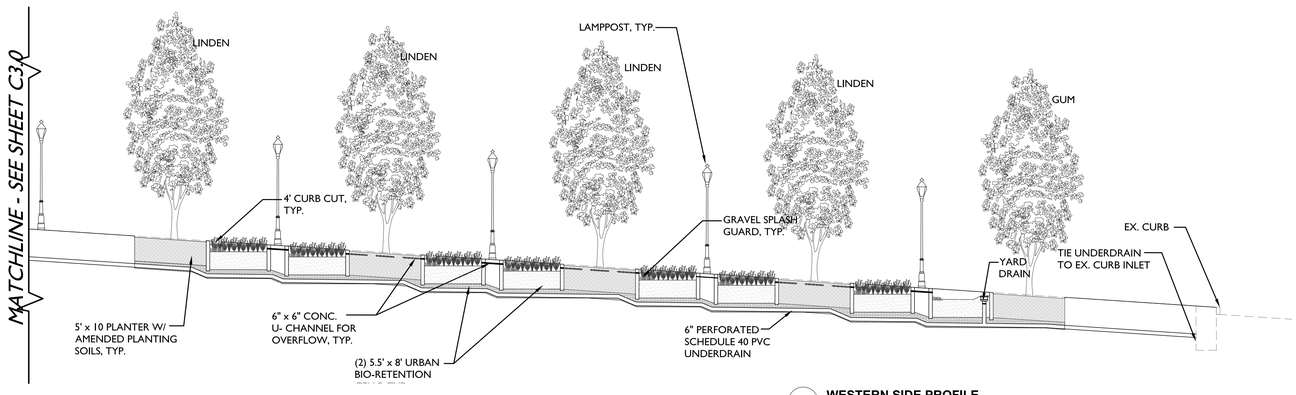
C3.0



1 **EASTERN STREETSCAPE PROFILE**
SECTION - SCALE: 1" = 10'



2 **STREETSCAPE PLAN**
ENLARGEMENT - SCALE: 1" = 10'



3 **WESTERN SIDE PROFILE**
SECTION - SCALE: 1" = 10'

3 NORTH
waterstreetstudio
201 WEST 7TH STREET RICHMOND VA 23224
P 804 232 8900 F 804 232 2092

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STREETSCAPE PLAN & PROFILE - 2

PERMIT DRAWINGS — JEFFERSON GREENWAY - MAIN ST. TO CARY ST. — 11.25.13

REV	DATE	DESCRIPTION

C4.0

NOTES: MINIMUM STANDARD FOR SOIL PREPARATION

TOPSOIL:

1) TOPSOIL SHALL BE NATURALLY OCCURING, FERTILE, GRANULAR, FRIABLE LOAM, FREE OF STONES OR OTHER DEBRIS LARGER THAN 2" IN DIAMETER AND NOXIOUS WEEDS OR WEED SEEDS. PREFERENCE SHALL BE GIVEN TO SOILS NATIVE TO THE SITE. LOAM SOILS SHALL HAVE A CLAY CONTENT BETWEEN 15 AND 27% AND SHALL HAVE A TEXTURE OF LOAM, SANDY LOAM, OR SILT LOAM, ACCORDING TO THE USDA SOIL CLASSIFICATION SYSTEM. SOIL pH SHALL RANGE BETWEEN 6 AND 7. TOPOSOIL SHALL CONTAIN NOT LESS THAN 3% ORGANIC MATTER. SUBMIT SOIL SAMPLE AND COMPLETE SOIL ANALYSIS REPORT TO THE LANDSCAPE ARCHITECT FOR APPROVAL PRIOR TO INSTALLATION.

2) TOPSOIL SHALL BE INSTALLED IN FRIABLE CONDITION IN ALL LANDSCAPED AREAS TO A MINIMUM DEPTH OF 6". SOILS SHALL NOT BE WORKED WHEN WET. VERIFY REQUIRED TOPSOIL DEPTHS WITH THE LANDSCAPE ARCHITECT.

PLANTING SOIL:

3) THE LANDSCAPE CONTRACTOR SHALL FURNISH ALL TOPSOIL AND PLANTING SOIL MIX. MATERIAL MUST BE APPROVED BY THE LANDSCAPE ARCHITECT PRIOR TO INSTALLATION. (REFER TO SPECIFICATION SECTION _____ AND NOTE (1) ABOVE PLUS NOTE (4) TO UNDER THIS HEADING FOR TOPSOIL AND AMENDMENT REQUIREMENTS).

4) THE TYPICAL PLANTING SOIL MIX FOR ON-GRADE PLANTINGS IN CONTIGUOUS PLANTING BED (NOT INDIVIDUAL PLANTING HOLES) SHALL CONSIST OF THE FOLLOWING UNLESS OTHERWISE INDICATED ON THE DRAWINGS:

BY VOLUME:

80% TOPSOIL AS SPECIFIED IN NOTE (1)

20% FULLY COMPOSTED ORGANIC MATTER FREE OF VIABLE WEED SEED, HEAVY METALS, AND EXCESSIVE LEVELS OF NUTRIENTS OR SALTS

\+ SLOW RELEASE COMMERCIAL FERTILIZER(S) AND MINERALS AS RECOMMENDED IN THE SOIL ANALYSIS REPORT
1 LB. ACUTAL NITROGEN IN SLOW RELEASE FORMULATION PER 1,000 SQUARE FEET
LIME AS RECOMMENDED IN SOIL ANALYSIS REPORT

SITE PREPARATION:

5) IN AREAS SCHEDULED FOR LANDSCAPE INSTALLATION WHERE CLEARING AND GRUBBING HAS NOT BEEN COMPLETED, OR WHERE VEGETATION HAS REESTABLISHED, THE CONTRACTOR SHALL CLEAR AND GRUB ALL WEEDS, DEAD PLANT MATERIAL, STUMPS, AND ALL OTHER MATERIAL NOT NOTED TO BE SAVED.

6) VERIFY MATERIAL TO BE REMOVED WITH THE LANDSCAPE ARCHITECT PRIOR TO ANY CLEARING AND GRUBBING.

SOIL PREPARATION- ALL PLANTING BEDS:

WHERE SOILS ARE SUFFICIENT TO MEET THE DEFINITION OF TOPSOIL ESTABLISHED IN NOTE (1)--

7) CREATE A V-DITCH BED EDGE TO A DEPTH OF 3" FOR ALL BEDS, UNLESS OTHERWISE NOTED.

8) ROTOTILL BED AREAS TO A MINIMUM DEPTH OF 8". REMOVE DEBRIS GREATER THAN 2" IN DIAMETER. DO NOT ROTOTILL WHEN SOILS ARE WET. DO NOT ROTOTILL WITHIN THE DRIP LINE OF ANY TREE.

9) SPREAD 2" FULLY COMPOSTED ORGANIC MATTER (AS DEFINED NOTE (4)) THOUGHOUT THE PLANTING BED. EVENLY APPLY SOIL AMENDMENTS AS INDICATED IN NOTE (4). INCORPORATE AMENDMENTS INTO TOP 6" OF SOIL BY ROTOTILLING AGAIN.

10) RAKE BED SMOOTH AT SPECIFIED GRADIENT(S), ASSURING POSITIVE DRAINAGE TO THE PERIMETER. AFTER PLANTING APPLY 2-3"AGED, DOUBLE-SHREDDED HARDWOOD MULCH FREE OF DYES, UNLESS OTHERWISE SPECIFIED.

WHERE SUBSOILS ARE PRESENT OR WHERE SOILS ARE NOT SUFFICIENT TO MEET THE DEFINITION OF TOPSOIL ESTABLISHED IN NOTE (1) IN AREAS TO BE PLANTED--

11) WHERE SOILS TO BE PLANTED DO NOT MEET THE DEFINITION OF TOPSOIL OR ARE DETERMINED TO BE INADEQUATE FOR PLANT GROWTH BY THE LANDSCAPE ARCHITECT DUE TO COMPACTION, HIGH CLAY CONTENT, CONTAMINATION, TEXTURE, PH, OR POOR DRAINAGE, THE CONTRACTOR SHALL EXCAVATE AREAS TO BE PLANTED TO A MINIMUM DEPTH OF 8" BELOW FINISH GRADE OF SOIL. WHERE COMPACTED SOILS ARE SUSPECTED, COMPLY WITH NOTE (15). AFTER EXCAVATION, ROTOTILL REMAINING SOIL TO A MIN. DEPTH OF 8". RAKE SMOOTH AND SLOPE TOWARD BED PERIMETER.

12) ADD 3" SOIL MIX (AS SPECIFIED IN NOTE (4)) AND INCORPORATE INTO TOP 4" OF CULTIVATED EXISTING SOIL BY ROTOTILLING. LIGHTLY COMPACT SOIL. ADD ADDITIONAL SOIL MIX TO ACHIEVE FINISH GRADE. RAKE TO ACHIEVE SPECIFIED GRADIENT(S).

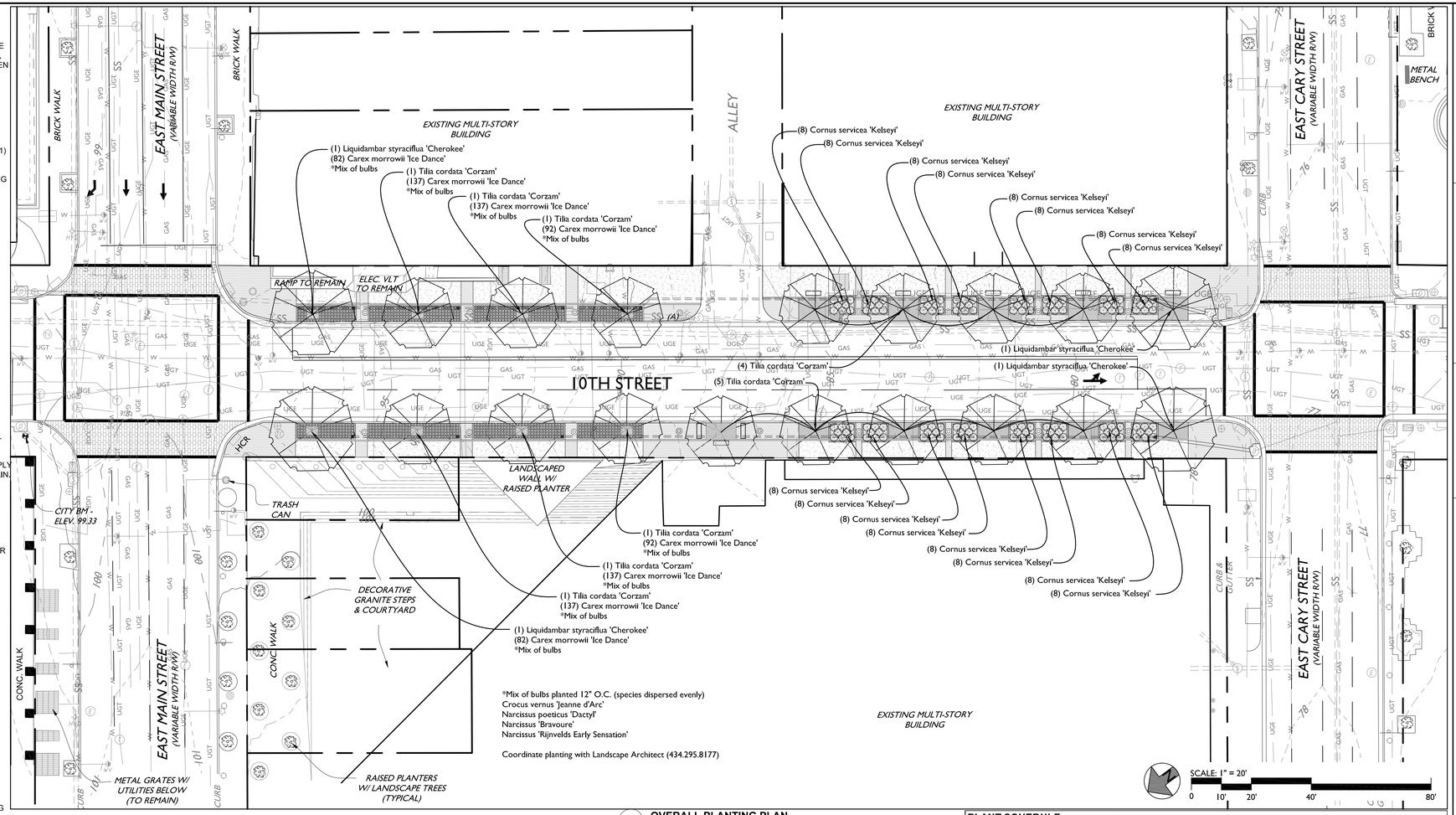
13) CREATE A V-DITCH BED EDGE TO A DEPTH OF 3"

14) RAKE BED SMOOTH AT SPECIFIED GRADIENT(S), ASSURING POSITIVE DRAINAGE TO THE PERIMETER. AFTER PLANTING APPLY 2-3"AGED, DOUBLE-SHREDDED HARDWOOD MULCH FREE OF DYES, UNLESS OTHERWISE SPECIFIED.

REMEDIATION OF COMPACTED SUBSOILS:

15) WHERE SUBSOILS ARE COMPACTED TO A LEVEL THAT WILL INHIBIT ROOT GROWTH OR INFILTRATION OF WATER THROUGH THE SOIL PROFILE, AS DETERMINED BY THE LANDSCAPE ARCHITECT AND DEFINED IN NOTE (16), THE CONTRACTOR SHALL FRACTURE THE SOILS BY SPREADING FULLY COMPOSTED ORGANIC MATTER (SEE NOTE 4) TO A DEPTH OF 4" UNIFORMLY ACROSS THE PORTION OF THE SITE TO BE REMEDIATED THEN DIGGING AND TURNING SOILS IN PLACE WITH A BACKHOE TO A DEPTH OF 24". LIGHTLY WORK AND FIRM TURNED SOIL WITH THE BACKHOE BUCKET. ADDITIONALLY, WHERE ACCESS IS LIMITED, SUBSOIL REMEDIATION MY BE ACCOMPLISHED BY AUGERING 6" DIA. HOLES TO A MINIMUM DEPTH OF 18" AT 18" O.C AND BACKFILLING WITH UNAMMENDED TOPSOIL. DO NOT CONDUCT REMEDIATION OPERATIONS WHEN SOIL IS WET. ALL SOIL REMEDIATION CONSULTATION AND OPERATIONS SHALL BE CONDUCTED AT THE NO ADDITIONAL EXPENSE TO THE CLIENT.

16) LEVELS OF COMPACTION SHALL BE DETERMINED BY FIELD INSPECTION, OR WHERE REQUIRED, BY A QUALIFIED SOILS CONSULTANT. ROOT LIMITING COMPACTION WILL BE DETERMINED BY MEASURING SOIL BULK DENSITY AND COMPARING TO SOIL BULK DENSITIES GENERALLY ACCEPTED TO BE ROOT LIMITING SPECIFIC TO THE SOIL'S TEXTURE AS REFERENCED IN TREES IN THE URBAN LANDSCAPE, TROWBRIDGE AND BASSUK, 2004.



*Mix of bulbs planted 12" O.C. (species dispersed evenly)
Crocus vernus 'Jeanne d'Arc'
Narcissus poeticus 'Dactyl'
Narcissus 'Bravoure'
Narcissus 'Rijnvelds Early Sensation'

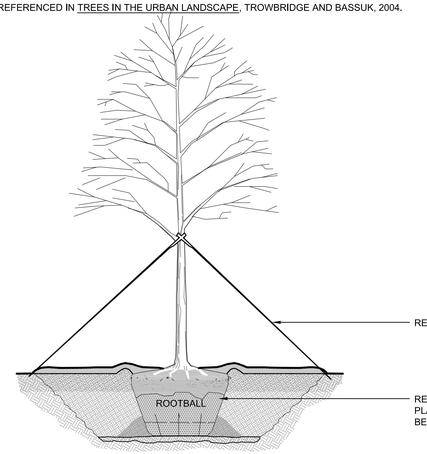
Coordinate planting with Landscape Architect (434.295.8177)

1 **OVERALL PLANTING PLAN**
PLAN VIEW - SCALE: 1" = 20'

PLANT SCHEDULE

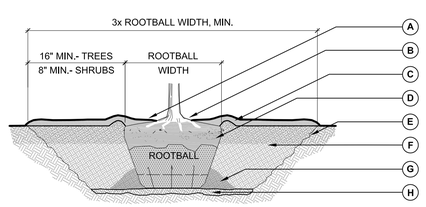
SCIENTIFIC NAME	COMMON NAME	QTY.	SIZE	ROOT	O.C.	COMMENTS
TREES						
Liquidambar styraciflua 'Cherokee'	Sweet Gum	4	2.5" cal	B&B		Single stem
Tilia cordata 'Corzam'	Littleleaf Linden	15	2.5" cal	"		Single stem
SHRUBS						
Cornus servicea 'Kelseyi'	Dwarf Red Osier Dogwood	128	36" ht	cont.	36"	
GROUNDCOVERS AND GRASSES						
Carex morrowii 'Ice Dance'	Sedge	896	12"x12"	cont.	12"	
BULBS						
Crocus vernus 'Jeanne d'Arc'	Spring Crocus	240	n/a	bulb	12"	
Narcissus poeticus 'Dactyl'	Poet's Daffodil	240	n/a	bulb	12"	
Narcissus 'Bravoure'	Trumpet Daffodil	240	n/a	bulb	12"	
Narcissus 'Rijnvelds Early Sensation'	Trumpet Daffodil	240	n/a	bulb	12"	

2 **PLANT SCHEDULE**



GENERAL TREE OR SHRUB PLANTING NOTES:
1) SET PLANT PLUMB.
2) ALL PRUNING SHALL BE RESTRICTED TO THE REMOVAL OF DEAD OR BROKEN BRANCHES AND SHALL BE PERFORMED ONLY UNDER THE SUPERVISION OF THE LANDSCAPE ARCHITECT OR PROJECT ARBORIST.
3) ALL PLANTS SHALL CONFORM TO MINIMUM STANDARDS SET FORTH IN THE MOST CURRENT ADDITION OF THE AMERICAN STANDARD FOR NURSERY STOCK. ADDITIONALLY, PLANTS SHALL BE IN GOOD, VIGOROUS GROWING CONDITION, FREE OF UNECCESSARY INJURY. ROOT COLLARS SHALL BE VISIBLE ABOVE THE SOIL LINE OF THE ROOTBALL. TREES SHALL NOT EXHIBIT CODOMINANT LEADERS, WITH THE EXCEPTION OF MULTI-STEM SPECIMENS AND CERTAIN DECURRENT SPECIES-- SUBJECT TO APPROVAL OF THE LANDSCAPE ARCHITECT. CONTAINER GROWN PLANTS SHALL NOT BE ROOT-BOUND. SUB-STANDARD PLANTS SHALL BE REJECTED.
4) WRAP TREES ONLY AS DIRECTED BY THE LANDSCAPE ARCHITECT.
5) FOR SMOOTH BARK SPECIES, MARK THE NORTH SIDE IN THE NURSERY AND ALIGN THAT SIDE TO NORTH IN THE FIELD.
6) ROOTBALLS WRAPPED IN SYNTHETIC BURLAP OR OTHER NON-BIODEGRADABLE MATERIAL SHALL BE REJECTED.
7) WHERE B&B PLANTS ARE SPECIFIED, CONTAINER GROWN PLANTS SHALL NOT BE SUBSTITUTED WITHOUT APPROVAL OF THE LANDSCAPE ARCHITECT.

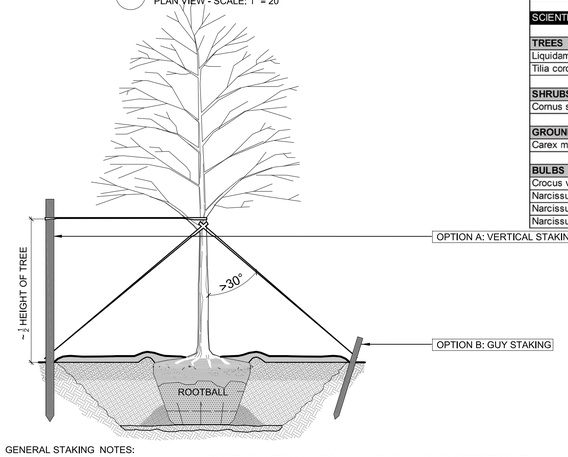
TREE OR SHRUB PLANTING, TYP.
SECTION N.T.S.



GENERAL PLANTING PIT NOTES:
A) ADD MULCH ON TOP OF THE ROOTBALL AND PLANTING PIT, BEGINNING AT NO MORE THAN 1" DEPTH NEARTRUNK AND TAPERING TO A DEPTH OF 3" AT PLANTING PIT LIMITS, THEN TAPER TO PROPOSED FINISHED GRADE. KEEP MULCH CLEAR OF ROOT COLLAR.
B) ROOT COLLAR SHALL BE EXPOSED AND FREE OF SOIL. SET TOP OF ROOTBALL SLIGHTLY ABOVE THE SURROUNDING GRADE.
C) CREATE A SLIGHT MOUND TO DIRECT WATER TO THE ROOTBALL. BACKFILL PIT TO LEVEL OF FINISH GRADE. EXCESS BACK FILL SHALL BE REMOVED OR, WHERE APPROVED BY THE LANDSCAPE ARCHITECT, SPREAD TO SURROUNDING AREA.
D) AFTER FINAL PLACEMENT, CUT AWAY WIRE BASKET TO A MIN. OF ⅓ THE DEPTH OF THE ROOTBALL. CUT ANY REMAINING WIRE GRIDS AS INDICATED. CUT AWAY AND REMOVE BURLAP, STRING, OR OTHER PACKAGING MATERIALS TO A MIN. OF ⅓ THE DEPTH OF THE ROOTBALL. SCARIFY CONTAINER GROWN PLANTS TO LOOSEN ROOTS.
E) TAPER SIDES OF PIT. SCARIFY THOROUGHLY TO LOOSEN SOIL.
F) BACKFILL WITH ORIGINAL SOIL FROM THE PIT EXCAVATION CULTIVATED TO CLUMPS NOT EXCEEDING 3" DIA. COMPACT BACKFILL LIGHTLY IN 6" LIFTS TO REMOVE VOIDS LARGER THAN 1". INCORPORATE 1" EVENLY DISTRIBUTED, APPROVED COMPOST INTO THE TOP 6" OF BACKFILL DURING THE FINAL LIFT.
G) TAMP SOIL FIRMLY AT THE BASE OF THE ROOTBALL TO STABILIZE.
H) SET ROOTBALL ON UNDISTURBED SOIL. WHERE HARDPAN IS PRESENT, NOTIFY THE LANDSCAPE ARCHITECT PRIOR TO PLANTING AND SCARIFY THE BOTTOM OF THE PLANTING PIT SUFFICIENT TO BREAK THROUGH AND LOOSEN ALL HARDPAN MATERIAL AS DIRECTED. IN ANY INSTANCE WHERE TREES ARE TO BE PLANTED ON DISTURBED SOILS, BACKFILL WITH CULTIVATED ORIGINAL SOIL OR APPROVED MATERIAL AS DIRECTED AND COMPACT TO A LEVEL SUFFICIENT TO SUPPORT THE WEIGHT OF THE ROOTBALL WHEN THE BACKFILL SOIL IS AT FIELD CAPACITY.

SUPPLEMENTAL TREE OR SHRUB PLANTING NOTES:
1) PRIOR TO PLANTING, THE CONTRACTOR SHALL NOTIFY THE LANDSCAPE ARCHITECT IF FIELD CONDITIONS AND/OR SOIL CHARACTERISTICS ARE NOT COMPATIBLE WITH THESE PLANTING CRITERIA OR WHERE CONDITIONS RAISE CONCERNS REGARDING PLANT SURVIVABILITY OR WARRANTY.
2) THE CONTRACTOR SHALL NOTIFY THE LANDSCAPE ARCHITECT OF ANY PLANT DAMAGE INCURRED DURING SHIPPING OR THE PLANTING PROCESS.
3) WATER THOROUGHLY IMMEDIATE AFTER PLANTING SUFFICIENT TO SETTLE PLANTING PIT BACKFILL.
4) PLANTING SHALL BE SUBJECT TO INSPECTION AND APPROVAL BY THE LANDSCAPE ARCHITECT. THE CONTRACTOR SHALL NOTIFY THE LANDSCAPE ARCHITECT NOT LESS THAN 24 HOURS PRIOR TO INSTALLATION. **PLANT INSTALLATIONS THAT DEVIATE FROM THESE CRITERIA SHALL BE REJECTED AND REPLACED AT THE CONTRACTOR'S EXPENSE, UNLESS PRIOR APPROVAL IS GRANTED BY THE LANDSCAPE ARCHITECT.**

INDIVIDUAL TREE OR SHRUB PLANTING PIT
SECTION N.T.S.



GENERAL STAKING NOTES:
1) TREES SHALL BE STAKED ONLY WHEN INDICATED BY SITE CONDITIONS AND/OR PLANT CHARACTERISTICS. THE THE CONTRACTOR SHALL NOTIFY THE LANDSCAPE ARCHITECT OF CONDITIONS THAT NECESSITATE STAKING OR THAT COMPROMISE PLANT STABILITY, SURVIVABILITY, AND/OR CONTRACTOR'S WARRANTY. UPON APPROVAL OF THE LANDSCAPE ARCHITECT, NECESSARY STAKING SHALL BE INSTALLED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE CLIENT.

TREE STAKING OPTIONS:
UPON APPROVAL OF THE LANDSCAPE ARCHITECT, STAKING SHALL BE INSTALLED AS FOLLOWS:
OPTION A: VERTICAL STAKING-- VERTICAL OAK STAKES TO BE DRIVEN IN OUTSIDE THE LIMITS OF THE TREE PIT. (2) STAKES AND GUYS PER TREE. SET STAKES AT 180° AROUND TREE PIT. GUY WITH 'ARBORTIE' OR EQUIVALENT WOVEN STRAPPING DESIGN FOR TREE STAKING. ATTACH GUY MATERIAL IN A SLACK LOOP AT THE TRUNK AND PULL SLIGHTLY TAUT TO THE STAKE TO SECURE.
OPTION B: GUY STAKING-- (3) 18" OAK STAKES AND GUYS PER TREE. SET STAKES AT AN ANGLE IN UNDISTURBED SOIL AT 120° AROUND THE TREE PIT. ATTACH ARBORTIE OR EQUIVALENT GUY MATERIAL IN A SLACK LOOP AT THE TRUNK AND PULL SLIGHTLY TAUT TO THE STAKE TO SECURE.

TREE STAKING
SECTION N.T.S.

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PLANTING PLAN AND PLANTING DETAILS

PERMIT DRAWINGS JEFFERSON GREENWAY - MAIN ST. TO CARY ST. 11.25.13

REV	DATE	DESCRIPTION

C5.0

SWM NARRATIVE:

PROJECT DESCRIPTION

THE PURPOSE OF THIS PROJECT IS TO CONSTRUCT LOW-IMPACT STORMWATER BEST MANAGEMENT PRACTICES (BMPs) WITHIN THE CITY R.O.W. FOR 10TH STREET BETWEEN EAST MAIN STREET AND EAST CARY STREET IN THE CITY OF RICHMOND. THE PROJECT WILL INCLUDE REMOVAL OF SECTIONS OF SIDEWALK ALONG THE EAST AND WEST SIDE OF 10TH STREET AND REPLACEMENT WITH RECESSED, MULCHED TREE PLANTER WELLS, URBAN CURBSIDE BIO-RETENTION CELLS, AND FLUSH, MULCHED TREE PLANTER WELLS ALONG THE EAST AND WEST SIDE OF 10TH STREET. THE RECESSED TREE PLANTERS WILL BE CONSTRUCTED ON BOTH SIDES OF 10TH STREET ON THE HALF OF BLOCK CLOSEST TO EAST MAIN STREET. THESE RECESSED PLANTERS WILL CONSIST OF CORNELL UNIVERSITY SPECIALITY SOILS WHICH ABSORB WATER, YARD DRAINS, UNDER DRAINS, AND TREES. ALL OF THE REMAINING SIDEWALK STORM RUNOFF WILL BE DIRECTED TO THESE RECESSED PLANTERS. THE URBAN BIO-RETENTION CELLS WILL BE CONSTRUCTED ON BOTH SIDES OF 10TH STREET ADJACENT TO THE CURB LINE ON THE HALF OF BLOCK CLOSEST TO EAST CARY STREET. STORM RUNOFF FROM 10TH STREET WILL FLOW INTO THE PLANTERS VIA CURB CUTS IN THE EXISTING CURB LINE. THE EXISTING STREET GRADE IS MODERATELY STEEP (~6.75% GRADE) AND SURFACE GRADES WITHIN THE BIO-RETENTION CELLS IS REQUIRED TO BE FLAT, THE CELLS ARE "STEPPED" TO PROVIDE THE GRADE TRANSITION. WEIRS/OVERFLOW CHANNELS ARE UTILIZED TO PASS RUNOFF OVERFLOW FROM ONE CELL TO THE NEXT CREATING A DAISY CHAIN OF STORM WATER QUALITY TREATMENT. EXCESS RUNOFF WILL BYPASS THE CURB CUTS FOR THE BIO-RETENTION CELLS AND CONTINUE ONTO EXISTING CITY DRAIN INLETS AND EXCESS RUNOFF IN THE BIO-RETENTION CELLS WILL OVERFLOW TO A YARD DRAIN IN THE LAST CELL AND BE PIPED TO THE EXISTING CITY CURB INLETS.

THIS PROJECT WILL RESULT IN A REDUCTION OF 2,600 SQUARE FEET OF IMPERVIOUS AREA WITHIN THE CITY RIGHT OF WAY. ADDITIONALLY, THE PROPOSED BIO-RETETENTION CELLS PROVIDE WATER QUALITY TREATMENT FOR A 34,413 SQUARE FOOT DRAINAGE AREA WITHIN THE CITY RIGHT OF WAY. ACCORDING THE CALCULATIONS SHOWN ON THIS SHEET, THE CURB CUTS AND THE BIO-RETENTION CELLS ARE SIZED TO CAPTURE AND TREAT THE FIRST 0.25" OF RUNOFF FROM THE CONTRIBUTING DRAINAGE AREA. PER THE VIRGINIA STORMWATER MANAGEMENT HANDBOOK, THE BIO-RETENTION CELLS COULD PROVIDE 50% REMOVAL RATE (RR) OF PHOSPHORUS FOR THE FIRST 0.50" OF RUNOFF. SINCE THE CURB CUTS AND BIO-RETENTION CELLS CAN ONLY CAPTURE AND TREAT THE FIRST 0.25", OR HALF OF THE TYPICAL "FIRST FLUSH" RUNOFF, A REMOVAL RATE (RR) OF 25% WAS USED TO DETERMINE THAT THE PROPOSED LOW-IMPACT STORMWATER BMP'S WILL REMOVE 0.44 LBS OF PHOSPHORUS PER YEAR (SEE PERFORMANCE BASE WATER QUALITY CALCULATIONS WORKSHEETS 1 & 3 SUBMITTED SEPARATELY).

STORMWATER BMP MAINTENANCE

IN GENERAL, MAINTAIN STORMWATER BMPs SUCH THAT THEY PROVIDE AN ACCEPTABLE LEVEL OF STORMWATER TREATMENT AND FLOW REDUCTION. SPECIFIC MAINTENANCE TASKS INCLUDE:

TWO YEAR ESTABLISHMENT PERIOD (TO BEGIN AT THE END OF CONTRACT ESTABLISHMENT)

POST-INSTALLATION ESTABLISHMENT OF PLANT MATERIAL TO ENSURE THE LONG TERM HEALTH AND APPEARANCE OF RAIN GARDEN PLANTINGS IS TO BE PERFORMED BY THE CITY OF RICHMOND DEPARTMENT OF PUBLIC UTILITIES - STORMWATER UTILITIES DIVISION. RAIN GARDEN PLANT MATERIAL WILL REQUIRE CLOSE OBSERVATION AND ATTENTION FOR THE FIRST TWO YEARS FOLLOWING THE END OF THE THREE MONTH "ESTABLISHMENT AND MAINTENANCE" CONTRACT PERIOD AS REQUIRED BY THE INSTALLATION CONTRACTOR. DURING THE TWO YEAR ESTABLISHMENT PERIOD, CITY STAFF SHALL BE RESPONSIBLE FOR THE SURVIVAL AND HEALTH OF ALL TREES, SHRUBS, AND GROUND COVERS WITHIN THE RAIN GARDENS. INSPECTIONS SHALL BE MADE ONCE A WEEK FOR THE FIRST YEAR AND ONCE A MONTH FOR THE SECOND YEAR UNLESS OTHERWISE SPECIFIED BELOW.

WATERING: REGULAR WATERING WILL BE REQUIRED DURING PERIODS OF LOW RAINFALL TO OBTAIN PROPER PLANT ESTABLISHMENT. WATER A MINIMUM OF ONCE PER WEEK DURING 'ESTABLISHMENT AND MAINTENANCE' CONTRACT PERIOD AS REQUIRED BY THE INSTALLATION CONTRACTOR. DURING THE TWO YEAR ESTABLISHMENT PERIOD, CITY STAFF SHALL BE RESPONSIBLE FOR THE SURVIVAL AND HEALTH OF ALL TREES, SHRUBS, AND GROUND COVERS WITH THE RAIN GARDENS.

MULCHING: REPLENISH MULCH TO A 2-3" LAYER IN ALL PLANTING AREAS ANNUALLY IN THE SPRING. MULCH IS TO BE SHREDDED HARDWOOD OR HARDWOOD BARK, SEASONED FOR A MINIMUM OF SIX MONTHS. MULCH TO BE FREE OF TRASH OR DEBRIS AND NOT TO CONTAIN PIECES LARGER THAN 4" LENGTH, FINE, FULLY COMPOSTED LEAF MATERIAL MAY BE MIXED WITH MULCH FOR ADDED ORGANIC CONTENT.

WEEDING: ALL RAIN GARDEN PLANTINGS SHALL BE KEPT FREE OF WEEDS DURING THE 'ESTABLISHMENT PERIOD'. AS PLANTINGS MATURE AND GROW TOGETHER, LESS WEEDING WILL BE REQUIRED. HAND WEED ONCE A MONTH.

REPLACEMENTS: AFTER THE INSTALLATION CONTRACT WARRANTY PERIOD OF ONE YEAR, REPLACEMENT OF DEAD PLANTS MAY BE REQUIRED. REFER TO PLANT SCHEDULE ON FILE TO OBTAIN ORIGINALLY SPECIFIED PLANT VARIETIES. IF A PARTICULAR PLANT SPECIES PROVES TO BE PERFORMING POORLY IN THE CURRENT LOCATION, CONTACT THE LANDSCAPE ARCHITECT TO COORDINATE AN ALTERNATIVE SELECTION. INSPECT ONCE A MONTH.

REGULAR INSPECTIONS: THE LANDSCAPE ARCHITECT WILL PERFORM REGULAR INSPECTIONS OF PLANT MATERIAL TO EVALUATE PLANT HEALTH AND VIGOR AT LEAST ONCE PER MONTH DURING THE ESTABLISHMENT PERIOD. A REPORT WILL BE SUBMITTED BY THE LANDSCAPE ARCHITECT TO THE CITY AS NEEDED TO OUTLINE POSSIBLE CORRECTIVE ACTIONS.

REGULAR MAINTENANCE (LONG TERM - AFTER 2 YEAR ESTABLISHMENT PERIOD)

REGULAR MAINTENANCE TO ENSURE THE LONG TERM HEALTH AND APPEARANCE OF RAIN GARDEN PLANTINGS IS TO BE PERFORMED BY THE CITY OF RICHMOND DEPARTMENT OF PUBLIC UTILITIES DIVISION . INSPECT AND APPLY MAINTENANCE TWICE A YEAR UNLESS OTHERWISE SPECIFIED BELOW.

SEDIMENT AND TRASH REMOVAL: INSPECT RAIN GARDENS AFTER LARGE STORM EVENTS AND ON A REGULAR BASIS FOR SEDIMENT BUILD-UP AND TRASH/DEBRIS THAT MAY HAVE ACCUMULATED ON THE SPLASH BLOCKS AT EACH CURB INLET. HAND SHOVEL SEDIMENT AND DISPOSE OF OFF-SITE. COLLECT AND DISPOSE OF TRASH AND DEBRIS.

WATERING: HAND WATER PLANTINGS DURING PERIODS OF DROUGHT WHERE RAINFALL AVERAGES LESS THAN ¼" PER WEEK FOR TWO OR MORE CONSECUTIVE WEEKS. HAND WATER BY CONNECTING TO A NEARBY HYDRANT OR BY USING A WATER TRUCK. OPENING OF UP-STREAM HYDRANTS THAT FLOW INTO THE STREET ALONG THE CURBLINE INTO THE RAIN GARDENS TO ALLOW ADEQUATE WATERING TO ALL PLANTS IS AN ALTERNATIVE TO HAND WATERING. PERMANENT IRRIGATION SYSTEMS SHOULD NOT BE INSTALLED IN RAIN GARDENS.

MULCHING: REPLENISH MULCH TO A 2-3" LAYER IN ALL PLANTING AREAS ANNUALLY IN THE SPRING. MULCH IS TO BE SHREDDED HARDWOOD OR HARDWOOD BARK, SEASONED FOR A MINIMUM OF SIX MONTHS. MULCH TO BE FREE OF TRASH OR DEBRIS AND NOT TO CONTAIN PIECES LARGER THAN 4" LENGTH, FINE, FULLY COMPOSTED LEAF MATERIAL MAY BE MIXED WITH MULCH FOR ADDED ORGANIC CONTENT.

WEEDING: ALL RAIN GARDEN PLANTINGS SHALL BE KEPT FREE OF WEEDS DURING THE 'ESTABLISHMENT PERIOD'. AS PLANTINGS MATURE AND GROW TOGETHER, LESS WEEDING WILL BE REQUIRED. HAND WEED AS NEEDED OR TWICE A YEAR.

PRUNING AND CUTTING BACK: REGULAR PRUNING OF PLANTINGS IS NOT REQUIRED. PLANT VARIETIES HAVE BEEN SELECTED THAT MAINTAIN APPROPRIATE SIZE FOR THE PLANTING SPACE AT MATURITY. PRUNE SHRUBS OR CUT-BACK GRASSES/PERENNIALS ONLY AS NEEDED FOR GROWTH BEYOND PLANTER BOUNDARY.

REPLACEMENTS: INSPECT PLANTINGS TWICE A YEAR AND REPLACE DEAD PLANTS AS NEEDED TO MAINTAIN PROPER PLANTING DENSITY AND BIO-RETENTION FUNCTIONALITY. REFER TO THE PLANT SCHEDULE ON FILE TO OBTAIN ORIGINALLY SPECIFIED PLANT VARIETIES. IF A PARTICULAR PLANT SPECIES PROVES TO BE PERFORMING POORLY IN THE CURRENT LOCATION, CONTACT THE LANDSCAPE ARCHITECT TO COORDINATE AN ALTERNATIVE SELECTION.

BIO-MEDIA SPECIFICATIONS

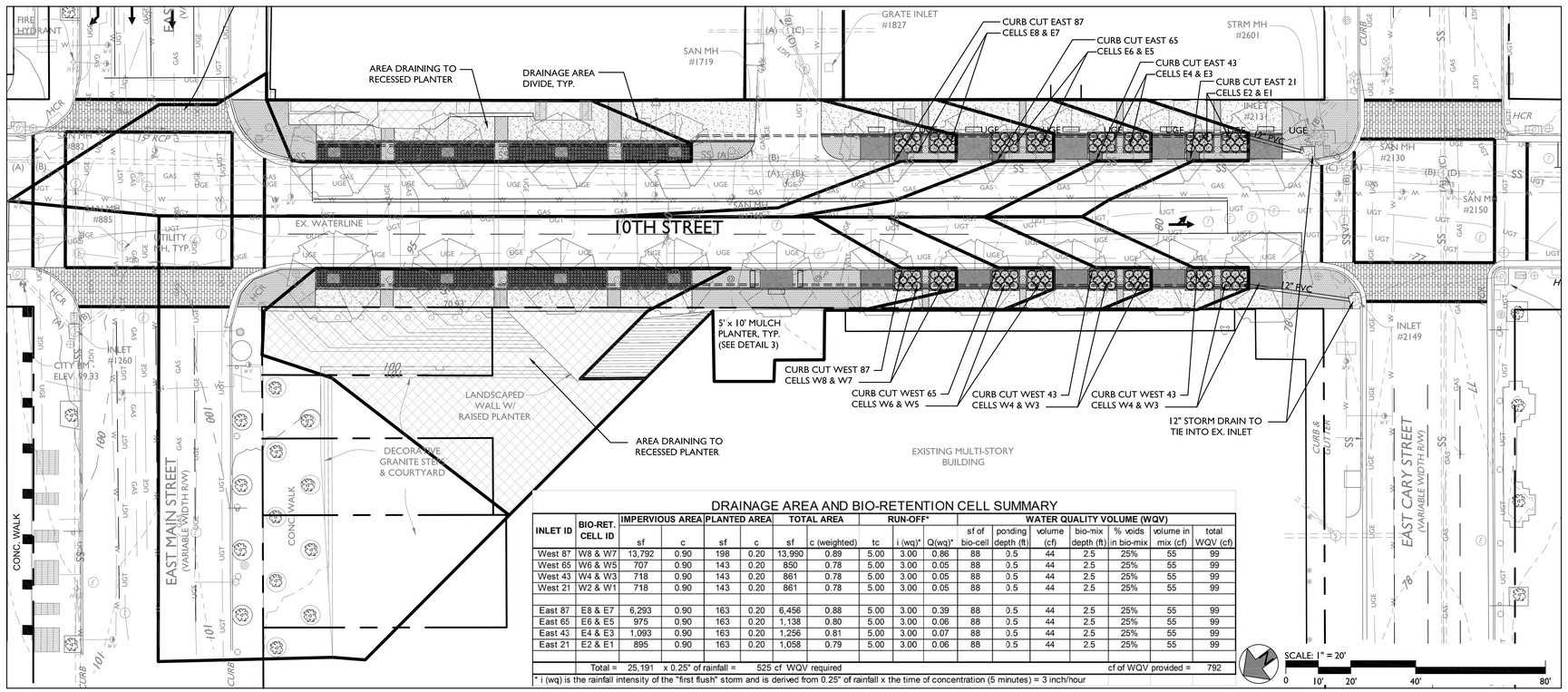
MATERIAL	SPECIFICATION	NOTES
BIO-MEDIA COMPOSITION	FILTER MEDIA TO CONTAIN: 85% - 88% SAND 8% - 12% SOIL FINES AND ONE OF THE FOLLOWING: HIGH ORGANIC CONTENT MIX: 3%-5% ORGANIC MATTER IN THE FORM OF LEAF COMPOST SOURCE OF ALL SOIL MATERIALS EXCEPT FOR PEAT (EXTRACTION AND PROCESSING) TO BE WITHIN 50 MILES OF PROJECT SITE. pH 5.5 - 6.5	THE VOLUME OF FILTER MEDIA TO BE BASED ON 110% OF THE PLAN VOLUME TO ACCOUNT FOR SETTLING IF BLENDED MEDIA DOES NOT CONFORM TO THESE SPECIFICATIONS AS TO GRADATION, ORGANIC CONTECT, AND pH, IT SHALL BE AMENDED USING APPROPRIATE MATERIALS TO FALL WITHIN THE SPECIFIICATIONS.
FILTER MEDIA TESTING	P-INDEX RANGE = 10-30, OR BETWEEN 7 AND 21 MG/KG OF P IN THE SOIL MEDIA. CEC'S GREATER THAN 10.	THE MEDIA MUST BE PROCURED FROM APPROVED FILTER MEDIA VENDORS.
MULCH LAYER	USE AGED, SHREDDED HARDWOOD BARK MULCH SOURCE OF ALL SOIL MATERIALS (EXTRACTION AND PROCESSING) TO BE WITHIN 50 MILES OF PROJECT SITE.	LAY A 2 TO 3 INCH LAYER ON THE SURFACE OF THE FILTER BED.

1. AVOID MECHANICAL COMPACTION OF SOIL MEDIA UPON INSTALLATION. AFTER INSTALLATION OF MEDIA, WET THOROUGHLY TO ALLOW PROPER SOIL SETTLING (HAND WATER TO THE POINT OF SATURATION). REPEAT WETTING TO EQUAL SATURATION AGAIN IN 24 HOURS. DONOT INSTALL PLANT MATERIAL UNTIL PROPER SETTLING HAS BEEN ACHIEVED.
2. WHERE NEW TREE PLANTINGS ARE PROPOSED WITHIN BIO-RETENTION CELLS, CREATE A STABLE PLATFORM BELOW THE ROOTBALL BY MOUNDING A MIXTURE OF 40% BIO-MEDIA AND 60% #57 GRAVEL.

INLETS ON GRADE, DESIGN (CURB SPREAD AND INLET CAPTURE)

Intensity 3.00 (Intensity is 3 in/hr)
Mannings Coefficient, n is 0.015

			Hydrology						Curb and Gutter						Inlet						
Plan Label	IDOT DI type	T - throat length (ft)	A, Drainage area (acres)	C - rational coeff.	CA	Q - flow incr. (cfs)	Qb, carry-over (cfs)	Qt, total flow	sl, gutter longitudinal slope (ft/ft)	Sx, lane cross slope (ft/ft)	W, gutter width (ft)	Sw, gutter cross-slope (ft/ft)	Sw/Sx	T - spread at curb (ft)	Eo, frontal flow ratio in gutter W	eq = 1/2W(Sw-Sx)+ local depr. (in)	Sw = sl*(12W)	Se = Sx+E(Sw-Sx)	Ei, inlet efficiency	Qi, flow intercepted	Qb, carry-over	carry-over to inlet	Remarks
West 87	CURB CUT	4.0	0.32	0.89	0.285	0.85	0.00	0.85	0.0675	0.0300	1.0	0.0830	2.7667	3.60	0.58	1.6360	0.1363	0.1091	0.45	0.38	0.47	West 3	
West 65	CURB CUT	4.0	0.02	0.78	0.016	0.05	0.47	0.52	0.0675	0.0300	1.0	0.0830	2.7667	2.99	0.66	1.6360	0.1363	0.1200	0.55	0.28	0.23	West 2	carryover from West 87
West 43	CURB CUT	4.0	0.02	0.78	0.016	0.05	0.23	0.28	0.0675	0.0300	1.0	0.0830	2.7667	2.34	0.78	1.6360	0.1363	0.1363	0.72	0.20	0.08	West 1	carryover from West 65
West 21	CURB CUT	4.0	0.02	0.78	0.016	0.05	0.08	0.13	0.0675	0.0300	1.0	0.0830	2.7667	1.72	0.90	1.6360	0.1363	0.1528	1.00	0.13	0.00	n/a	carryover from West 43
East 87	CURB CUT	4.0	0.15	0.88	0.132	0.40	0.00	0.40	0.0675	0.0300	1.0	0.0830	2.7667	2.70	0.71	1.6360	0.1363	0.1268	0.63	0.25	0.15	West 3	
East 65	CURB CUT	4.0	0.03	0.80	0.024	0.07	0.15	0.22	0.0675	0.0300	1.0	0.0830	2.7667	2.13	0.82	1.6360	0.1363	0.1418	0.79	0.17	0.05	West 2	carryover from East 87
East 43	CURB CUT	4.0	0.03	0.81	0.024	0.07	0.05	0.12	0.0675	0.0300	1.0	0.0830	2.7667	1.72	0.90	1.6360	0.1363	0.1527	0.92	0.11	0.01	West 1	carryover from East 65
East 21	CURB CUT	4.0	0.03	0.79	0.024	0.07	0.01	0.08	0.0675	0.0300	1.0	0.0830	2.7667	1.50	0.95	1.6360	0.1363	0.1595	1.00	0.08	0.00	n/a	carryover from East 43



DRAINAGE AREA AND BIO-RETENTION CELL SUMMARY

INLET ID	BIO-RET. CELL ID	IMPERVIOUS AREA sf	IMPERVIOUS AREA c	PLANTED AREA sf	PLANTED AREA c	TOTAL AREA sf	TOTAL AREA c (weighted)	RUN-OFF* tc	RUN-OFF* i (wq)*	RUN-OFF* Q(wq)*	WATER QUALITY VOLUME (WQV) sf of bio-cell	ponding depth (ft)	volume (cf)	bio-mix depth (ft)	% voids in bio-mix	volume in mix (cf)	total WQV (cf)
West 87	W8 & W7	13,792	0.90	198	0.20	13,990	0.89	5.00	3.00	0.86	88	0.5	44	2.5	25%	55	99
West 65	W6 & W5	707	0.90	143	0.20	850	0.78	5.00	3.00	0.05	88	0.5	44	2.5	25%	55	99
West 43	W4 & W3	718	0.90	143	0.20	861	0.78	5.00	3.00	0.05	88	0.5	44	2.5	25%	55	99
West 21	W2 & W1	718	0.90	143	0.20	861	0.78	5.00	3.00	0.05	88	0.5	44	2.5	25%	55	99
East 87	E8 & E7	6,293	0.90	163	0.20	6,456	0.88	5.00	3.00	0.39	88	0.5	44	2.5	25%	55	99
East 65	E6 & E5	975	0.90	163	0.20	1,138	0.80	5.00	3.00	0.06	88	0.5	44	2.5	25%	55	99
East 43	E4 & E3	1,093	0.90	163	0.20	1,256	0.81	5.00	3.00	0.07	88	0.5	44	2.5	25%	55	99
East 21	E2 & E1	895	0.90	163	0.20	1,058	0.79	5.00	3.00	0.06	88	0.5	44	2.5	25%	55	99
	Total =	25,191	x 0.25" of rainfall =	525	cf WQV required											cf of WQV provided =	792

* i (wq) is the rainfall intensity of the "first flush" storm and is derived from 0.25" of rainfall x the time of concentration (5 minutes) = 3 inch/hour

3 NORTH
201 WEST 7TH STREET RICHMOND VA 23224
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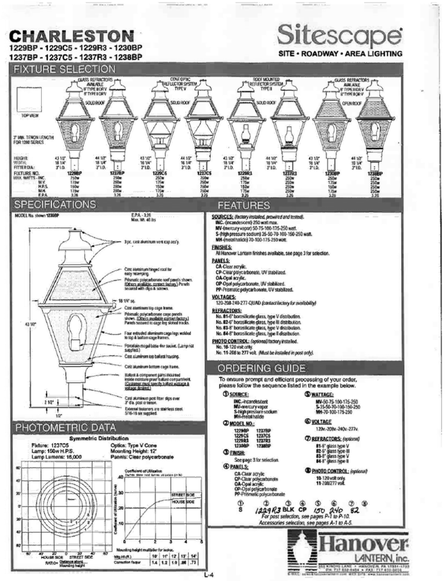
T 434 973 6117
COMMONWEALTH OF VIRGINIA
Alan G. Franklin
Lic. No. 35326
12-10-13
PROFESSIONAL ENGINEER

STORMWATER RUNOFF NARRATIVE AND CALCS.

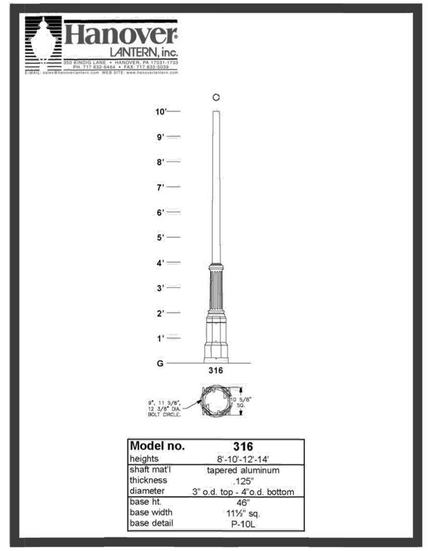
PERMIT DRAWINGS JEFFERSON GREENWAY - MAIN ST. TO CARY ST. 11.25.13

REV	DATE	DESCRIPTION

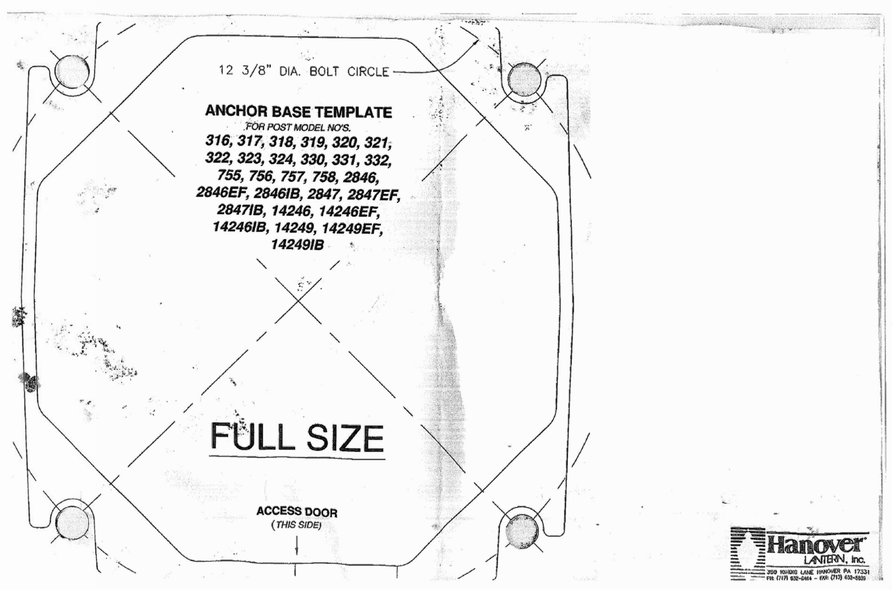
C6.0



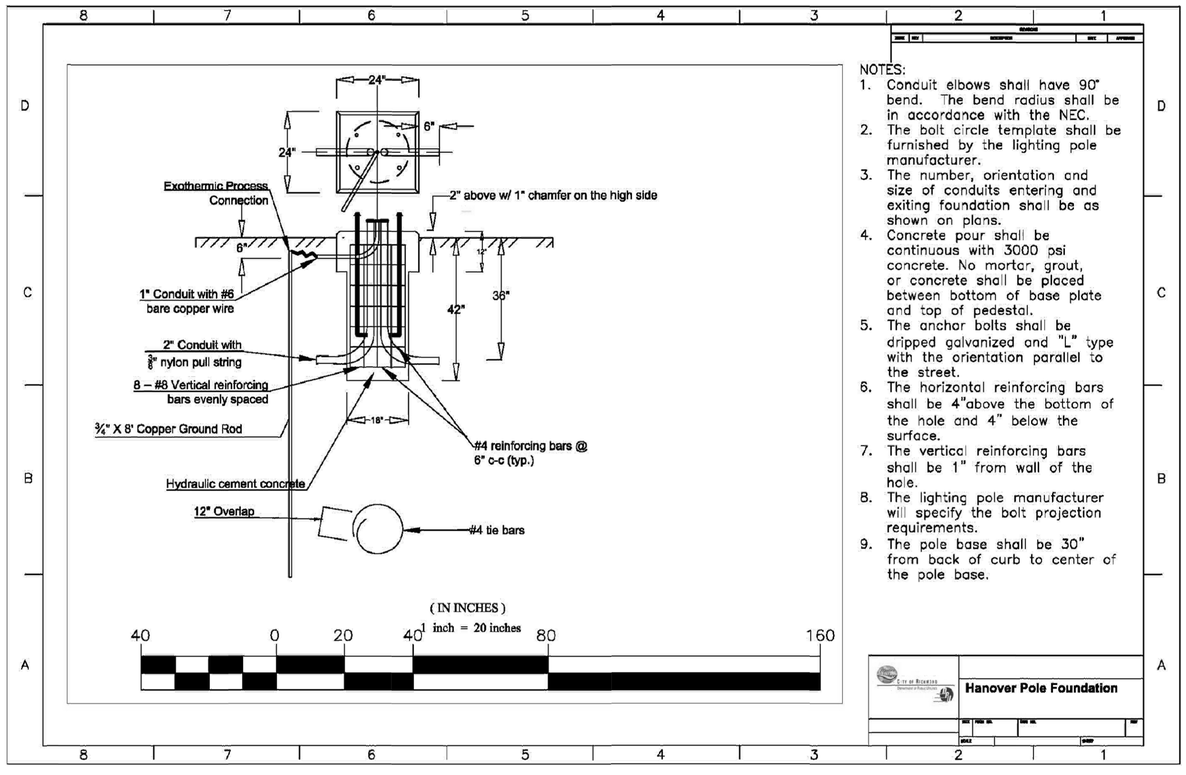
1 **STREETLIGHT FIXTURE**
DETAIL



1 **STREETLIGHT POLE**
DETAIL



3 **STREETLIGHT ANCHOR BASE TEMPLATE**
DETAIL



4 **STREETLIGHT POLE BASE FOUNDATION**
DETAIL

3 NORTH
201 WEST 7TH STREET RICHMOND VA 23224
P. 804 232 8800 F. 804 232 2692

waterstreetstudio
landscape architecture

LIGHTING DETAILS

PERMIT DRAWINGS
JEFFERSON GREENWAY - MAIN ST. TO CARY ST.

REV	DATE	DESCRIPTION

11.25.13

C7.0

01 STAMPED ASPHALT CROSSWALKS

02 STREET TREES

03 EXISTING GREEN ROOF

04 CONCRETE SIDEWALKS WITH BRICK BANDING

05 MODIFIED TREE PITS

06 BIORETENTION PLANTERS

07 EXISTING PLANTERS TO REMAIN

08 MAJOR PEDESTRIAN ENTRANCE

Cherokee Sweet Gum

Corinthian Littleleaf Linden

Sedge

Crocus

Red Osier Dogwood (Summer and Winter)

Daffodils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