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
- ☑ Streetscape
- ☐ Site Amenity
- ☐ Encroachment
- ☐ Master Plan
- ☐ Sign
- ☐ Other

Review Type

- ☐ Conceptual
- ☑ Final

Project Name: NIB - Church Hill North Model Housing Block Improvements

Project Address: T Street between 26th St. and 28th St.

Brief Project Description (this is not a replacement for the required detailed narrative) : the project will install curb & gutter, and sidewalk along south side of T St. between 26th St. and 28th St.; install new alley between S St. and T St.

Applicant Information

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

Name: Yongping Wang Email: yongping.wang@richmondgov.com

City Agency: Department of Public Works Phone: 646-2467

Address: 900 E. Broad St. Rm#603 Richmond, VA 23219

Main Contact (if different from Applicant): _____

Company: _____ Phone: _____

Email: _____

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.

CITY OF RICHMOND

DEPARTMENT OF PUBLIC WORKS

April 9, 2014

To: Urban Design Committee and City Planning Commission
Attn.: Mr. Jeff Eastman

Re.: NIB-Church Hill North Model Housing Block Improvements
FINAL UDC/CPC Approval Application
Detailed Project Narrative to accompany the UDC application form

PROJECT DESCRIPTION:

The project is funded through Neighborhood in Bloom (NIB) program. The model housing block is located in a residential area between T St. & S St., and 26th St. & 27th St. Most of the lots within the block are vacant. The project will restore the physical character of the neighborhood and complement other future project in the area. Improved streets tend to increase the value of the properties, encourage neighborhood revitalization, improve the street cleaning program, and improve the neighborhood safety.

PROJECT SCOPE:

North model block improvements project will provide curb & gutter, and sidewalks along south side of T St. from 26th St. to 28th St. A green alley will also be installed in the middle of the block from T St. to S St.

PROJECT GOALS:

Physical change:

- Provide curb & gutter, and sidewalks

Pedestrian Safety:

- Provide sidewalks, and handicapped ramps.

Environmental Benefits:

- The installation of green alley will improve the storm water runoff.

DPW proposes green alley similar to below:

CITY OF RICHMOND, VIRGINIA

DEPARTMENT OF PUBLIC WORKS

100% SUBMITTAL

PROPOSED IMPROVEMENTS IN THE CITY OF RICHMOND

T STREET GREEN ALLEY

INDEX OF SHEETS

REVISIONS

NO.	DATE	COMMENTS
1	2-27-13	ADDRESS 60% COMMENTS PER DPU
2	8-16-13	ADDRESS DPU COMMENTS
3	1-15-14	100% SUBMITTAL

LOCATION MAP

SCALE: 1"=100'

CITY OF RICHMOND

APPROVED FOR CONSTRUCTION

DATE	PROJECT MANAGER
DATE	CITY TRANSPORTATION ENGINEER
DATE	CAPITAL PROJECTS ADMINISTRATOR
DATE	CITY ENGINEER
DATE	DIRECTOR OF PUBLIC WORKS

CITY OF RICHMOND
DEPARTMENT OF PUBLIC WORKS
RICHMOND, VIRGINIA
Contact: Yongping Wang
Phone: 804-646-2467

JANUARY 2014

Kimley-Horn and Associates, Inc.
1700 Willow Lawn Drive, Suite 200
Richmond, Virginia 23230
Tel. 804-673-3882 Fax 804-673-3980
Contact: Brian Brewer,P.E.

GENERAL NOTES:

1. THIS PROJECT IS PROPOSED BY: CITY OF RICHMOND
   DEPARTMENT OF PUBLIC WORKS
   YoungPing Wang
   900 E.
   Broad St., Suite 704
   RICHMOND, VA 23219
2. NUMBER OF LOTS AFFECTED BY THIS PROJECT - 27
3. PROPERTY THROUGH WHICH PROJECT IS PROPOSED IS ZONED: R-6
4. ALL CONSTRUCTION AND MATERIALS SHALL CONFORM WITH THE LATEST CITY STANDARDS, THE LATEST STANDARDS AND SPECIFICATIONS OF THE VIRGINIA DEPARTMENT OF TRANSPORTATION (VDOT) AND THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD), EXCEPT AS NOTED ON PLANS.
5. STREET SIGNS, PARKING BOLSTERS AND PARKING LOTS SO SPECIFIED ARE TO REMAIN OR BE RESTORED TO ORIGINAL CONDITION OR BETTER.
6. THE CONTRACTOR SHALL LOCATE ALL EXISTING UTILITIES AND LATERALS PRIOR TO THE START OF CONSTRUCTION. IF ANY UTILITY DIFFERS THAN WHAT IS SHOWN ON THE PLAN THE CONTRACTOR SHALL CONTACT THE ENGINEER IMMEDIATELY
7. IF THE ELEVATIONS SHOWN ON THESE PLANS ARE FOUND TO BE DIFFERENT THAN FIELD CONDITIONS, THE CONTRACTOR SHALL CONTACT THE ENGINEER IMMEDIATELY.
8. STREET SIGNS SHALL BE REPLACED IMMEDIATELY AFTER ARE IS BACKFILLED AND NO LATE THEN CLOSE OF EACH WORK DAY, EVEN IF REPLACEMENT IS ONLY TEMPORARY.

CONSTRUCTION NOTES:

1. ALL MATERIALS FOR WATER, GAS AND SEWER SYSTEMS SHOWN SHALL BE SUPPLIED AND INSTALLED IN ACCORDANCE WITHE THE LATEST SPECIFICATIONS OF THE CITY OF RICHMOND, APPLICABLE AT THE TIME OF NOTICE TO PROCEED.
2. ALL WORK SHALL BE SUBJECT TO INSPECTION BY UTILITY DEPARTMENT OFFICIALS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFICATION OF APPROPRIATE CITY OFFICIALS 48 HOURS PRIOR TO START OF WORK.
3. THE LOCATION OF EXISTING SEWER, WATER OR GAS LINES, CONDUITS, OR OTHER STRUCTURES ACROSS, UNDERNEATH, OR OTHERWISE ALONG THE LINE OF PROPOSED WORK ARE NOT NECESSARILY SHOWN ON THESE PLANS, AND IF SHOWN ARE ONLY APPROXIMATELY CORRECT. THE CONTRACTOR SHALL BE LIABLE FOR ALL DAMAGE DONE TO ANY STRUCTURES OR PROPERTY. THE CONTRACTOR SHALL VERIFY THE LOCATION AND ELEVATION OF ALL UNDERGROUND UTILITIES SHOWN ON THE PLANS IN AREAS OF CONSTRUCTION PRIOR TO STARTING WORK. CONTACT THE PROJECT MANAGER IMMEDIATELY IF LOCATION OR ELEVATION IS DIFFERENT FROM THAT SHOWN ON THE PLANS, IF THERE APPEARS TO BE A CONFLICT, OR UPON DISCOVERY OF ANY UTILITY NO SHOWN ON THE PLANS. THE CONTRACTOR SHALL CONTACT "MISS UTILITY", PHONE NUMBER 1-800-552-7001 PRIOR TO THE START OF CONSTRUCTION.
4. ALL WATER AND GAS UTILITIES THAT NEED TO BE ADJUSTED DUE TO CONFLICTS SHALL BE DONE BY THE CITY OF RICHMOND DEPARTMENT OF PUBLIC UTILITIES. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING WITH THE DEPARTMENT OF PUBLIC UTILITIES PRIOR TO CONSTRUCTION.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING EXISTING UTILITIES AND SHALL REPLACE AT NO ADDITIONAL COST, IF DAMAGED, AS DIRECTED BY THE CITY. EXISTING UTILITIES THAT ARE IN CONFLICT AND MAY NEED TO BE REMOVED OR RELOCATED WILL BE COORDINATED BY THE CITY. RELOCATIONS OF CITY FACILITIES WILL BE ADMINISTERED BY THE CITY DEPARTMENT OF PUBLIC UTILITIES. IN CASE OF EMERGENCIES OF UTILITY BREAKAGE/CONFLICT CONTACT:

UTILITY	TELEPHONE NUMBER
GAS	646-8300, 646-8309, 646-8310
WATER	646-8300, 646-8309, 646-8310
SEWER	646-8600, 646-8426
POWER	888-667-3000

6. CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PROTECT AND MAINTAIN UNINTERRUPTED SERVICE ANY DAMAGE TO EXISTING STRUCTURES SHALL BE REPAIRED IMMEDIATELY TO THE SATISFACTION OF THE CITY UTILITY INSPECTOR, AT THE CONTRACTORS EXPENSE.
7. CONTRACTOR SHALL PROPERLY NOTIFY ALL PROPERTY OWNERS TWO WEEKS PRIOR TO THE START OF ANY CONSTRUCTION.
8. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL REQUIRED PERMITS FOR THE WORK, AND SHALL PAY ALL APPROPRIATE FEES.
9. FINAL ACCEPTANCE BY THE CITY SHALL NOT BE MADE UNTIL ALL WORK SHOWN ON THE APPROVED PLANS IS COMPLETED.
10. WHERE UNSUITABLE MATERIAL IS ENCOUNTERED, IT SHALL BE REMOVED WHERE NECESSARY, AND REPLACED WITH SUITABLE MATERIAL TO THE SPECIFICATION OF THE CITY INSPECTOR.
11. TEMPORARY DRAINAGE DURNING CONSTRUCTION SHALL BE PROVIDED BY THE CONTRACTOR TO RELIEVE AREAS THAT MAY CAUSE DAMAGE TO ROADWAYS OR IMPEDE TRAFFIC AS DIRECTED BY THE CITY OF RICHMOND, WITHIN THE PROJECT LIMITS.
12. ALL UNDERDRAIN PIPES SHALL BE CLEANED OF DEBRIS AND ERODED MATERIAL AT ALL STAGES OF CONSTRUCTION.
13. ALL CUTS IN THE STREETS AND SIDEWALKS SHALL BE PERFORMED UNDER A PERMIT AND MONITORED BY THE PERMIT INSPECTOR. ALL STREET EXCAVATION OR RESTORATION SHALL BE IN ACCORDANCE WITH THE CITY OF RICHMOND'S RIGHT-OF-WAY EXCAVATION & RESTORATION MANUAL.
14. WORK SHALL NOT COMMENCE UNTIL THE PERMIT INSPECTOR HAS BEEN NOTIFIED, A PRE-CONSTRUCTION CONFERENCE HELD AND MISS UTILITY CLEARS.
15. CUTS SHALL BE AS CLEAN AND STRAIT AS POSSIBLE, WITH NO OUTLINE DIMENSIONS LESS THAN 3 FEET WITHOUT SPECIAL APPROVAL OF THE DEPARTMENTS INSPECTOR.
16. THE CONTRACTOR SHALL NOTIFY THE SURVEYS DIVISION OF THE CITY OF RICHMOND'S DEPARTMENT OF PUBLIC WORKS (804-646-0436 OR 804-646-5404) AT LEAST 48 HOURS PRIOR TO ANY ACTIVITIES WHICH MAY DISTURB THE LOCATION OR THE STABILITY OF ANY RIGHT-OF-WAY CORNERSTONE OR MARKER. THE CONTRACTOR WILL COORDINATE HIS WORK WITH THE SURVEYS DIVISION REPRESENTATIVE REGARDING THE PLACEMENT OR REPLACEMENT OF RIGHT-OF-WAY CORNERSTONES OR MARKERS IN ANY AREAS BEING AFFECTED BY CONSTRUCTION. ALL PLACEMENT OR REPLACEMENT OF RIGHT-OF-WAY CORNERSTONES OR MARKERS WILL BE PERFORMED BY SURVEYS DIVISION. THE CONTRACTOR WILL BE RESPONSIBLE FOR REIMBURSING THE CITY FOR ANY COSTS ASSOCIATED WITH REPLACING ANY RIGHT-OF-WAY CORNERSTONES OR MARKERS THAT ARE DISTURBED WITHOUT GIVING PROPER NOTIFICATION.

DEMOLITION / LAND DISTURBANCE NOTES

1. PRIOR TO STARTING ANY DEMOLITION CONTRACTOR IS RESPONSIBLE FOR/TO:
   A. ENSURING THAT COPIES OF ALL APPLICABLE PERMITS AND APPROVALS ARE MAINTAINED ON SITE AND AVAILABLE FOR REVIEW.

   B. INSTALLING THE REQUIRED SOIL EROSION AND SEDIMENT CONTROL AND/OR TREE PROTECTION MEASURES PRIOR TO SITE DISTURBANCE.

   C. LOCATING (VERTICALLY AND HORIZONTALLY) ALL UTILITIES AND SERVICES, INCLUDING, BUT NOT LIMITED TO GAS, WATER, ELECTRIC, SANITARY AND STORM SEWER, TELEPHONE, CABLE, FIBER OPTIC CABLE, ETC. WITHIN THE LIMITS OF DISTURBANCE. THE CONTRACTOR SHALL USE AND COMPLY WITH THE REQUIREMENTS OF THE APPLICABLE UTILITY NOTIFICATION SYSTEM TO LOCATE ALL THE UNDERGROUND UTILITIES.

   E. FAMILIARIZING THEMSELVES WITH THE APPLICABLE UTILITY SERVICE PROVIDER AND IS RESPONSIBLE FOR ALL COORDINATION REGARDING UTILITY DEMOLITION REQUIRED FOR THE PROJECT. THE CONTRACTOR SHALL PROVIDE THE OWNER WRITTEN NOTIFICATION THAT THE EXISTING UTILITIES AND SERVICES HAVE BEEN TERMINATED AND ABANDONED IN ACCORDANCE WITH JURISDICTION AND UTILITY COMPANY REQUIREMENTS.

   F. COORDINATION WITH UTILITY COMPANIES & ADJACENT LANDOWNERS/BUSINESSES REGARDING WORKING "OFF-PEAK" HOURS OR ON WEEKENDS AS MAY BE REQUIRED TO MINIMIZE THE IMPACT ON THE AFFECTED PARTIES.
2. NEITHER KIMLEY-HORN & ASSOCIATES, INC. NOR THE OWNER IS RESPONSIBLE FOR JOB SITE SAFETY OR SUPERVISION. CONTRACTOR IS TO PROCEED WITH THE DEMOLITION IN A SYSTEMATIC AND SAFE MANNER, FOLLLOWING ALL OSHA REQUIREMENTS, TO ENSURE PUBLIC AND CONTRACTOR SAFETY.
3. THE CONTRACTOR SHALL PROVIDE ALL THE "MEANS AND METHODS" NECESSARY TO PREVENT MOVEMENT, SETTLEMENT, OR COLLAPSE OF EXISTING STRUCTURES, AND ANY OTHER IMPROVEMENTS THAT ARE REMAINING ON OR OFF SITE. THE DEMOLITION CONTRACTOR IS RESPONSIBLE FOR ALL REPAIRS OF DAMAGE TO ALL ITEMS THAT ARE TO REMAIN AS A RESULT OF HIS ACTIVITIES.
4. IN THE ABSENCE OF SPECIFICATIONS, THE CONTRACTOR SHALL PERFORM EARTH MOVEMENT ACTIVITIES, DEMOLITION AND REMOVAL OF ALL FOUNDATION WALLS, FOOTINGS, AND OTHER MATERIALS WITHIN THE LIMITS OF DISTURBANCE WITH DIRECTION BY OWNER'S STRUCTURAL OR GEOTECHNICAL ENGINEER.
5. CONTRACTOR SHALL PROVIDE TRAFFIC CONTROL AND GENERALLY ACCEPTED SAFE PRACTICES IN CONFORMANCE WITH: THE "MANUAL ON UNIFORM TRAFFIC CONTROL," AS WELL AS FEDERAL, STATE, AND LOCAL REGULATIONS WHEN DEMOLITION RELATED ACTIVITIES IMPACT ROADWAYS OR ROADWAY RIGHTS - OF - WAY.
6. CONDUCT DEMOLITION ACTIVITIES IN SUCH A MANNER TO ENSURE MINIMUM INTERFERENCE WITH ROADS, STREETS, SIDEWALKS, WALKWAYS, AND OTHER ADJACENT FACILITIES. STREET CLOSURE PERMITS MUST BE RECEIVED FROM THE APPROPRIATE GOVERNMENTAL AUTHORITY.
7. USE DUST CONTROL MEASURES TO LIMIT AIRBORNE DUST AND DIRT RISING AND SCATTERING IN THE AIR IN ACCORDANCE WITH FEDERAL, STATE, AND/OR LOCAL STANDARDS. AFTER THE DEMOLITION IS COMPLETE, ADJACENT STRUCTURES AND IMPROVEMENTS SHALL BE CLEANED OF ALL DUST AND DEBRIS CAUSED BY THE DEMOLITION OPERATIONS. THE CONTRACTOR IS RESPONSIBLE FOR RETURNING ALL ADJACENT AREAS TO THEIR "PRE-DEMOLITION" CONDITION.
8. CONTRACTOR IS RESPONSIBLE TO SAFEGUARD SITE AS NECESSARY TO PERFORM THE DEMOLITION IN SUCH A MANNER AS TO PREVENT THE ENTRY OF UNAUTHORIZED PERSONS AT ANY TIME.
9. THIS DEMOLITION PLAN IS INTENDED TO IDENTIFY THOSE EXISTING ITEMS/CONDITIONS WHICH ARE TO BE REMOVED. IT IS NOT INTENDED TO PROVIDE DIRECTION OTHER THAN THAT ALL METHODS AND MEANS ARE TO BE IN ACCORDANCE WITH STATE, FEDERAL, LOCAL, AND JURISDICTIONAL REQUIREMENTS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL OSHA AND OTHER SAFETY PRECAUTIONS NECESSARY TO PROVIDE A SAFE WORK SITE.
10. DEBRIS SHALL NOT BE BURIED ON THE SUBJECT SITE. ALL DEMOLITION WASTES AND DEBRIS (SOLID WASTE) SHALL BE DISPOSED OF IN ACCORDANCE WITH ALL TOWN, COUNTY, STATE, AND FEDERAL LAWS AND APPLICABLE CODES.

DRAINAGE / STORMWATER NOTES

1. ALL STORM SEWER PIPES, MANHOLES, AND CURB INLETS SHALL BE CLEANED OF DEBRIS AND ERODED MATERIALS AT THE LAST STAGES OF CONSTRUCTION.
2. ALL STORM SEWER PIPES SHALL BE REINFORCED CONCRETE TONGUE AND GROOVE CONFORMING TO ASTM C-76. ALL STORM DRAINAGE PIPE SHALL BE CLASS III, UNLESS OTHERWISE NOTED. CONCRETE PIPE JOINTS SHALL BE SEALED WITH A RING OF MASTIC TYPE MATERIAL SUCH AS RAM-NEK, RUBRNEK, OR BUTYL-TITE, INSTALLED PER MANUFACTURER'S RECOMMENDATIONS, AND CONFORMING TO ASTM C-76. THE CONTRACTOR SHALL WRAP AND STRAP EACH PIPE JOINT WITH A THREE (3) FOOT WIDE STRIP OF NON-WOVEN GEOTEXTILE FABRIC AND NON-METALLIC STRAPS. THE INSIDE OF ALL CONCRETE PIPE JOINTS SHALL BE MORTARED TO THE SPRINGLINE OF THE PIPE. WHERE PIPES ENTER STRUCTURES, THE OUTSIDE OF THE PIPE/STRUCTURE JOINT SHALL BE FULLY MORTARED. VERTICAL CLEARANCE OF 12" BETWEEN STORM AND OTHER UTILITIES IS REQUIRED UNLESS OTHERWISE NOTED.
3. ALL EXISTING STORM SEWER PIPES, DROP INLETS, AND CURB INLETS BEING UTILIZED BY A PART OF THE DRAINAGE SYSTEM SHALL BE CLEANED OF ERODED MATERIAL AT ALL STAGES OF CONSTRUCTION, AS DIRECTED BY THE ENGINEER. THE COST INCIDENTAL TO THIS IS TO BE INCLUDED IN THE CONTRACT PRICE FOR THE OTHER DRAINAGE ITEMS.
4. STORM SEWER PIPES AS SHOWN ON THE PLANS ARE MEASURED FROM THE CENTERLINE OF EACH STRUCTURE AND INVERT ELEVATIONS ARE ESTABLISHED BASED ON THIS CENTER LINE DISTANCE. LENGTH CALL OUTS FOR PIPES WITH FLARED END SECTIONS WILL BE MEASURED TO THE JOINT. CONTRACTOR SHALL LOCATE ALL END SECTIONS TO MATCH THE BANK SLOPE AND THE PIPE SLOPE SHALL BE ADJUSTED AS NECESSARY.
5. ALL DROP INLETS AND CURB INLETS SHALL HAVE VDOT STD. IS-1 SHAPING, WHERE APPLICABLE.
6. BOOT CONNECTIONS SHALL BE PROVIDED FOR ALL PLASTIC PIPES THAT TIE INTO A CONCRETE STRUCTURE.
7. GENERAL CONTRACTOR SHALL NOTIFY ALL UTILITY COMPANIES HAVING UNDERGROUND UTILITIES ON SITE OR IN RIGHT-OF-WAY PRIOR TO EXCAVATION. CONTRACTOR SHALL CONTACT UTILITY LOCATING COMPANY AND LOCATE ALL UTILITIES PRIOR TO GRADING START. SEE EXISTING CONDITIONS SHEET FOR UTILITY CONTACT INFORMATION.
8. SITE GRADING SHALL NOT PROCEED UNTIL EROSION CONTROL MEASURES HAVE BEEN INSTALLED AND APPROVED BY APPLICABLE AUTHORITY.
9. ALL ELEVATIONS ARE IN REFERENCE TO THE BENCHMARK, AND THIS MUST BE VERIFIED AND LOCATED BY THE GENERAL CONTRACTOR PRIOR TO GROUND BREAKING.
10. CONTRACTOR SHALL INSURE POSITIVE DRAINAGE SO THAT RUNOFF WILL DRAIN BY GRAVITY FLOW ACROSS NEW PAVEMENT AREAS TO NEW OR EXISTING DRAINAGE INLETS OR SHEET OVERLAND.
11. THE CONTRACTOR SHALL ADHERE TO ALL TERMS & CONDITIONS AS OUTLINED IN THE GENERAL V.S.M.P. PERMIT FOR STORMWATER DISCHARGE ASSOCIATED WITH CONSTRUCTION ACTIVITIES.
12. ALL DRAINAGE STRUCTURES AND STORM SEWER PIPES SHALL MEET HEAVY DUTY TRAFFIC (H20) LOADING AND BE INSTALLED ACCORDINGLY.
13. IF ANY EXISTING STRUCTURES TO REMAIN ARE DAMAGED DURING CONSTRUCTION IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO REPAIR AND/OR REPLACE THE EXISTING STRUCTURE AS NECESSARY TO RETURN IT TO EXISTING CONDITIONS OR BETTER.

UTILITY NOTES

1. THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES OR UTILITIES BY OTHERS AS SHOWN ON THESE PLANS IS BASED ON RECORDS OF THE VARIOUS UTILITY COMPANIES, AND WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THE INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR MUST CALL THE APPROPRIATE UTILITY COMPANIES AT LEAST 72 HOURS BEFORE ANY EXCAVATION TO REQUEST EXACT FIELD LOCATION OF UTILITIES. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.
2. THE CONTRACTOR SHALL FAMILIARIZE THEMSELVES WITH THE APPLICABLE UTILITY SERVICE PROVIDER REQUIREMENTS AND IS RESPONSIBLE FOR ALL COORDINATION REGARDING UTILITY DEMOLITION AS IDENTIFIED OR REQUIRED FOR PROJECT. THE CONTRACTOR SHALL PROVIDE THE OWNER WRITTEN NOTIFICATION THAT THE EXISTING UTILITIES AND SERVICES HAVE BEEN TERMINATED AND ABANDONED IN ACCORDANCE WITH JURISDICTION AND UTILITY COMPANY REQUIREMENTS.
3. CONTRACTOR IS RESPONSIBLE FOR COORDINATION OF SITE PLAN DOCUMENTS AND ARCHITECTURAL DESIGN FOR EXACT BUILDING UTILITY CONNECTION LOCATIONS, DOOR ACCESS, AND EXTERIOR GRADING. THE UTILITY SERVICE SIZES ARE TO BE DETERMINED BY THE ARCHITECT. THE CONTRACTOR SHALL COORDINATE INSTALLATION OF UTILITIES/SERVICES WITH THE INDIVIDUAL COMPANIES, TO AVOID CONFLICTS AND ENSURE PROPER DEPTHS ARE ACHIEVED. THE JURISDICTION UTILITY REQUIREMENTS SHALL ALSO BE MET, AS WELL AS COORDINATING THE UTILITY TIE-INS/CONNECTIONS PRIOR TO CONNECTING TO THE EXISTING UTILITY/SERVICE. WHERE CONFLICTS EXIST WITH THESE SITE PLANS, ENGINEER IS TO BE NOTIFIED PRIOR TO CONSTRUCTION TO RESOLVE SAME.
4. THE CONTRACTOR SHALL PERFORM WHATEVER TEST EXCAVATION OR OTHER INVESTIGATION IS NECESSARY TO VERIFY TIE-IN INVERTS, LOCATIONS AND CLEARANCES, AND SHALL REPORT IMMEDIATELY ANY DISCREPANCIES TO KIMLEY-HORN AND ASSOCIATES, INC. AT (804) 673-3882.
5. THE CONTRACTOR IS RESPONSIBLE FOR THE PROTECTION OF ALL UTILITIES TO REMAIN IN PLACE.
6. MAINTAIN A MINIMUM OF 18" OF VERTICAL CLEARANCE BETWEEN STORM, SANITARY, AND ALL UTILITIES (UNLESS OTHERWISE NOTED).
7. CROSS CONNECTION CONTROL AND BACK FLOW PREVENTION SHALL BE IN ACCORDANCE WITH THE UNIFORM STATEWIDE BUILDING CODE.
8. CONTRACTOR SHALL COORDINATE WITH THE FIRE MARSHAL BEFORE INSTALLING FIRE LANE SIGNS AND MARKINGS.
9. ALL CLEANOUTS WITHIN VEHICULAR AREAS SHALL BE TRAFFIC BEARING.
10. CONTRACTOR TO PROVIDE CONDUIT TO DOUBLE DETECTOR CHECK SO THAT SUMP PUMPS MAY BE INSTALLED. CONTRACTOR TO COORDINATE WITH ARCHITECTURAL PLANS.
11. CONTRACTOR SHALL SAW CUT, REMOVE, AND REPLACE ASPHALT PAVEMENT AS NECESSARY TO INSTALL UNDERGROUND ELECTRIC, TELEPHONE, SANITARY SEWER, WATER, AND COMMUNICATION CONDUITS.
12. UNDERGROUND UTILITIES INSTALLED ON PRIVATE PROPERTY OR IN PRIVATE UTILITY EASEMENTS AND BUILDING RELATED STORM DRAINS SHALL BE DESIGNED AND INSTALLED PER THE CURRENT EDITION OF THE VIRGINIA UNIFORM STATEWIDE BUILDING CODE.
13. PROPOSED CROSSINGS WITH EXISTING UNDERGROUND UTILITIES SHALL BE FIELD VERIFIED BY TEST PIT PRIOR TO COMMENCEMENT OF CONSTRUCTION.
14. THE RIM ELEVATIONS OF EXISTING MANHOLES, INLET STRUCTURES, AND SANITARY CLEANOUT TOPS SHALL BE ADJUSTED, IF REQUIRED, TO MATCH PROPOSED GRADES IN ACCORDANCE WITH ALL APPLICABLE STANDARDS.

CONSTRUCTION SEQUENCE:

1. THIS PROJECT SHALL BE CONSTRUCTED ACCORDING TO THE SEQUENCE OF CONSTRUCTION DESCRIBED BELOW. THE CONTRACTOR CAN SUBMIT AN ALTERNATIVE SEQUENCE FOR CONSTRUCTION PRIOR THE THE START OF CONSTRUCTION FOR APPROVAL BY THE ENGINEER.
2. THE CONTRACTOR IS RESPONSIBLE FOR SCHEDULING A PRE CONSTRUCTION MEETING WITH THE CITY OF RICHMOND'S DEPARTMENT OF PUBLIC UTILITIES AT LEAST 72 HOURS PRIOR TO THE START OF WORK CONTRACTOR SHALL CALL "MISS UTILITY" AT 1-800-552-7001 48 HOURS PRIOR TO CONSTRUCTION.
3. DEVELOP A UTILITIES RELOCATION PLAN, AS NECESSARY, WITH THE CITY OF RICHMOND PUBLIC UTILITIES. SEQUENCE RELOCATION FOR THE MOST EFFICIENT CONSTRUCTION AND TO AVOID DELAYS. DECIDE IF RELOCATION SHOULD TAKE PLACE PRIOR TO OR DURING CONSTRUCTION AND PROCEED ACCORDINGLY.
4. A STAGING ARE A SHALL BE DETERMINED PRIOR TO START OF CONSTRUCTION.
5. INSTALL THE SPECIFIED EROSION AND SEDIMENT CONTROL MEASURES BEFORE COMMENCING ANY LAND DISTURBING ACTIVITIES INCLUDING DEMOLITION.
6. BEGIN CONSTRUCTION OF THE ALLEY AT THE T STREET ENTRANCE STATION 0+00 AND END CONSTRUCTION AT THE S STREET ENTRANCE STATION 4+000.
7. CONSTRUCTION WILL PROGRESS IN PHASES SO THAT SAFE PEDESTRIAN AND VEHICULAR ACCESS TO GARAGE BAYS IS MAINTAINED.
8. EXISTING MATERIAL TO BE REMOVED SHALL BE DISPOSED PROPERLY IN A LEGAL MANNER.
9. SAWCUT AND REMOVE EXISTING ASPHALT PAVEMENT AND OTHER ITEMS NOTED FOR DEMOLITION ON THE DEMOLITION PLAN.
10. EXCAVATE EXISTING BASE GRADE TO ELEVATIONS SHOWN ON PLAN.
11. INSTALL 15" STORM DRAINAGE PIPE AND STORM STRUCTURES
12. ADJUST EXISTING SANITARY CONNECTION CLEAN OUTS, UTILITY MANHOLE TOPS AND UTILITY VALVES TO BE FLUSH WITH PROPOSED SURFACE.
13. INSTALL GEOTEXTILE FABRIC.
14. INSTALL #57 STONE BASE FOR UNDERDRAIN AND CONCRETE APRON SECTIONS.
15. INSTALL 8" UNDERDRAIN WRAPPED IN GEOTEXTILE FABRIC.
16. FORM 6" HEAVY DUTY CONCRETE APRONS AND INSTALL W2 9XW2.9 WOVEN WIRE FABRIC (FLAT SHEETS) 2" DOWN FROM TOP OF CONCRETE AS SHOWN IN HEAVY CONCRETE SECTION DETAIL ON SHEET CS-502.
17. POUR CONCRETE SECTIONS A PAVEMENT JOINT SEALANT SHALL BE USED BETWEEN THE PROPOSED CONCRETE APRONS AND ALL EXISTING BUILDINGS, BUILDING ENTRANCES, WALLS, PARKING LOTS AND SIDEWALKS.
18. INSTALL PERMEABLE PAVER GRANULAR LAYER. SEE PERMEABLE PAVER SECTION DETAIL ON SHEET CS-502.

CONSTRUCTION SEQUENCE (cont):

19. INSTALL PERMEABLE PAVER SYSTEM USING 2" OF NO. 8 STONE AND PAVER SHOWN IN PERMEABLE PAVER SECTION DETAIL ON SHEET CS-502. GENERAL CONTRACTOR WILL PROTECT EACH NEW SECTION OF PERMEABLE PAVERS FROM CONSTRUCTION DEBRIS AND SEDIMENT UNTIL CONSTRUCTION IS COMPLETE.
20. INSTALL ALLEY ENTRANCE MAKING SURE TO TIE INTO EXISTING SIDEWALKS AND ROADS.
21. ALL SIGNS REMOVED FOR CONSTRUCTION WILL BE REPLACED BEFORE CONSTRUCTION IS COMPLETE.
22. REPAIR DAMAGE TO GRASSED, SEEDED OR SODDED AREAS AS WELL AS PAVEMENT AREAS OUTSIDE THE CONSTRUCTION AREA IF THEY HAVE BEEN DAMAGED.
23. MAINTAIN ALL EROSION CONTROL DEVICES DURING CONSTRUCTION AND REMOVE ONCE THE DISTURBED AREAS HAVE BEEN STABILIZED AND THE CITY INSPECTOR HAS GIVEN APPROVAL.

SURVEY NOTES:

1. INLET INVERTS SHOWN ON SURVEY 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 MAY 18, 2012. DIFFERENTIAL CORRECTIONS WERE DERIVED FROM NATIONAL GEODETIC SURVEY (NGS) CONTINUALLY OPERATING REFERENCE STATION (CORS) "LOYS". COORDINATE VALUES, IF SHOWN HEREON, ARE BASED ON VIRGINIA STATE GRID, SOUTH ZONE.
4. UNDERGROUND UTILITIES WERE DESIGNATED (PAINTED) BY ACCUMARK. 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. INTERIOR PARCEL LINES SHOWN HEREON TAKEN FROM RICHMOND CITY TAX MAPS AND GIS AND ARE FOR GRAPHICAL REPRESENTATION ONLY. 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. THIS TOPOGRAPHIC SURVEY WAS COMPLETED UNDER THE DIRECT AND RESPONSIBLE CHARGE OF, ALISON W. HANSON FROM AN ACTUAL GROUND SURVEY MADE UNDER MY SUPERVISION; THAT THE IMAGERY AND/OR ORIGINAL DATA WAS OBTAINED ON JUNE 15, 2012; AND THAT THIS PLAT, MAP, OR DIGITAL GEOSPATIAL DATA INCLUDING METADATA MEETS MINIMUM ACCURACY STANDARDS UNLESS OTHERWISE NOTED.

MAINTENANCE OF TRAFFIC NOTES:

1. TEMPORARY TRAFFIC CONTROL AND DEVICES SHALL COMPLY WITH THE MOST RECENT VERSION OF THE VIRGINIA WORK AREA PROTECTION MANUAL, THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES , SPECIAL PROVISIONS OF CONTRACT DOCUMENTS, THE CITY OF RICHMOND'S "DEPARTMENT OF PUBLIC WORKS SPECIAL PROVISIONS" AND/OR AS DIRECTED BY THE PROJECT MANAGER.
2. WORK SHALL BE PERFORMED IN ACCORDANCE WITH TTC-20.0 "LANE CLOSURE OPERATION IN INTERSECTION", TTC-23.0 "TURN LANE CLOSURE OPERATION", TTC-24.0 "SIDEWALK CLOSURE AND BYPASS SIDEWALK OPERATION" AND ANY OTHER APPLICABLE TTC APPLICATIONS.
3. CONSTRUCTION SHALL BE PROHIBITED ON STREETS BETWEEN THE HOURS OF 7 AM TO 9 AM AND 4 PM TO 6 PM MONDAY THROUGH FRIDAY.
4. THE CONTRACTOR SHALL SUBMIT A PROPOSED TRAFFIC CONTROL PLAN FOR APPROVAL BY THE CITY'S PROJECT MANAGER PRIOR TO BEGINNING CONSTRUCTION.
5. ACCESS FOR RESIDENTS, PEDESTRIANS, AND EMERGENCY ACCESS SHALL BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL TRAFFIC CONTROL AND WORK-IN-STREETS PERMITS WITHIN THE CITY.
7. THE CONTRACTOR SHALL INSTALL ROAD WORK AHEAD WARNING SIGNS TO THE APPROACHES TO THE INTERSECTION.
8. AN ADVERTISEMENT ANNOUNCING TRAFFIC DELAYS DUE TO CONSTRUCTION SHALL BE POSTED TWO WEEKS BEFORE THE START OF CONSTRUCTION.
9. THE COST OF ALL TRAFFIC CONTROL DEVICES SHALL BE PAID FOR BY THE CONTRACTOR.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING ALL EXISTING AD TEMPORARY TRAFFIC CONTROL DEVICES ARE PROPERLY MAINTAINED THROUGHOUT THE DURATION OF CONSTRUCTION. THE CITY PROJECT MANAGER WILL DETERMINE IF SIGNS ARE BEING MAINTAINED IN THE PROPER MANNER BY THE CONTRACTOR. THE CONTRACTOR WILL BE CHARGED FOR ANY COSTS INCURRED BY THE CITY OF RICHMOND AS A RESULT OF THE CONTRACTOR'S FAILURE TO PROPERLY MAINTAIN TEMPORARY TRAFFIC CONTROL DEVICES WITHIN THE PROJECT AREA.
11. THE CONTRACTOR SHALL PROVIDE THE NAMES AND PHONE NUMBERS TO THE CITY PROJECT MANAGER OF PERSONS DESIGNATED BY THE CONTRACTOR TO BE CONTACTED AFTER WORKING HOURS CONCERNING ANY PROBLEMS WHICH MAY ARISE REGARDING TEMPORARY TRAFFIC CONTROL DEVICES ON THIS PROJECT.

No.	REVISIONS	DATE	BY
1	ADDRESS DPU 60% COMMENTS	2-27-13	KHA
2	ADDRESS DPU 60% COMMENTS	8-16-13	KHA
3	100% SUBMITTAL	1-15-14	KHA

Kimley-Horn and Associates, Inc.

1700 WILLOW LAWN DR., SUITE 200, RICHMOND, VA 23230
PHONE: 804-673-3882 FAX: 804-673-3960
WWW.KIMLEY-HORN.COM

100% SUBMITTAL

KHA PROJECT 011315700
DATE 01/15/2014
SCALE AS SHOWN
DESIGNED BY RRP
DRAWN BY RRP
CHECKED BY BJB

GENERAL NOTES

T STREET GREEN ALLEY
PREPARED FOR
THE CITY OF RICHMOND
RICHMOND VIRGINIA

SHEET NUMBER
CA-101

GENERAL PERMEABLE PAVER NOTES:

REFERENCES
AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM):
C 131, C136, C 140, C 936, C979, D698, D1557, D 1883, D 2922, D4254

QUALITY ASSURANCE
1. PAVER INSTALLATION SUBCONTRACTOR QUALIFICATIONS
  1.1. INSTALLER SHALL HAV SUCCESSFULLY COMPLETED CONCRETE PAVER INSTALLATION SIMILAR IN DESIG, MATERIAL AND EXTENT INDICATED ON THIS PROJECT.
  1.2. INSTALLER SHALL HAVE A FOREMAN THAT HAS A CURRENT CERTIFICATE FORM THE INTERLOCKING CONCRETE PAVMENT INSTITUE PAVER INSTALLER CERTIFICATION PROGRAM.
2. REGULATORY REQUIREMENTS AND APPROVALS: TBD
3. REVIEW THE MANUFACTURERS' QUALITY CONTROL PLAN, PAVER INSTALLATION SUBCONTRACTOR'S METHOD STATEMENT AND QUALITY CONTROL PLAN WITH A PRE-CONSTRUCTION MEETING OF REPRESENTATIVES FROM THE MANUFACTURER, PAVER INSTALLATION SUBCONTRACTOR, GENERAL CONTRACTOR, ENGINEER AND/OR OWNER'S REPRESENTATIVE.
4. MOCK-UP-
  4.1. INSTALL A 9 FT X 9 FT PAVER AREA.
  4.2. USE THIS AREA TO DETERMINE SURCHARGE OF THE BEDDING LAYER, JOINT SIZES, AND LINES, LAYING PATTERN, COLOR AND TEXTURE OF THE JOB.
  4.3. THIS AREA WILL BE USED AS THE STANDARD BY WHICH THE WORK WILL BE JUDGED.
  4.4. SUBJECT TO ACCEPTANCE BY ENGINEER OR OWNER, MOCK-UP MAY BE RETAINED AS PART OF FINISHED WORK.
  4.5. IF MOCK-UP IS NOT RETAINED, REMOVE AND PROPERLY DISPOSE OF MOCK-UP.

DELIVERY, STORAGE, AND HANDLING
1. COMPLY WITH MANUFACTURER'S ORDERING INSTRUCTIONS AND LEAD-TIME REQUIREMENTS TO AVOID CONSTRUCTION DELAYS..
2. DELIVERY:
  2.1. COORDINATE DELIVERY AND PAVING SCHEDULE TO MINIMIZE INTERFERENCE WITH NORMAL USE OF BUILDINGS ADJACENT TO PAVING.
  2.2. DELIVER CONCRETE PAVERS TO THE SITE IN STEEL BANDED, PLASTIC BANDED OR PLASTIC WRAPPED CUBES CAPABLE OF TRANSFER BY FORKLIFT OR CLAMP LIFT.
  2.3. UNLOAD PAVERS AT JOB SITE IN SUCH A MANNER THAT NO DAMAGE OCCURS TO THE PRODUCT OR EXISTING CONSTRUCTION.
3. STORAGE AND PROTECTION:
  3.1 STORE MATERIALS IN PROTECTED AREA SUCH THAT THEY ARE KEPT FREE FROM MUD, DIRT AND OTHER FOREIGN MATERIALS.

ENVIORNMENTAL REQUIREMENTS
1. DO NOT INSTALL IN RAIN OR SNOW.
2. DO NOT INSTALL FROZEN BEDDING MATERIALS.

1. PERMEABLE INTERLOCKING CONCRETE PAVER UNITS:
  1.1. MANUFACTURER: XTERIORS PAVERS
  1.2. DISTRIBUTOR: XTERIORS PAVERS
  1.3. CONTACT: (804) 876-3339
  1.4. PAVER TYPE: OLD WORLD KOBBLE STONE
  1.5. COLOR: GREY BLEND, TUMBLED
  1.6. SIZE: STANDARD

2. CRUSHED STONE FILLER, BEDDING, BASE AND SUBBASE
  2.1 CRUSHED STONE WITH 90% FRACTURED FACES, LA ABRASION <40 PER ASTM C 131, MINIMUM cbr OF 80% PER ASTM D 1883.
  2.2 DO NOT USE ROUNDED RIVER GRAVEL FOR VEHICULAR APPLICATIONS.
  2.3 ALL STONE FILLER, BEDDING, BASE AND SUBBASE: CONFORMING TO ASTM D 448 GRADATION AS SHOWN IN TABLES 1, 2, AND 3 BELOW:

TABLE 1
ASTM NO. 8 GRADING REQUIREMENTS
BEDDING AND JOINT/OPENING FILLER

SIEVE SIZE	PERCENT PASSING
1/2 INCH (12.5 MM)	100
3/8 INCH (9.5MM)	85 TO 100
NO. 4 (4.75 MM)	10 TO 30
NO. 8 (2.36 MM)	0 TO 10
NO. 16 (1.16 MM)	0 TO 5

TABLE 2
ASTM NO. 57 BASE
GRADING REQUIREMENTS

SIEVE SIZE	PERCENT PASSING
1/2 INCH (12.5 MM)	100
3/8 INCH (9.5MM)	90 TO 100
NO. 4 (4.75 MM)	35 TO 70
NO. 8 (2.36 MM)	0 TO 15
NO. 16 (1.16 MM)	0 TO 5

TABLE 3
ASTM NO. 2 SUBBASE
GRADING REQUIREMENTS

SERVE SIZE	PERCENT PASSING
1/2 INCH (12.5 MM)	100
3/8 INCH (9.5MM)	90 TO 100
NO. 4 (4.75 MM)	35 TO 70
NO. 8 (2.36 MM)	0 TO 15
NO. 16 (1.16 MM)	0 TO 5

2.5 GRADATION CRITERIA FOR THE BEDDING AND BASE:
  2.5.1 D15 BASE STONE / D15 BEDDING STONE <5.
  2.5.2 D50 BASE STONE >2.
  NOTE: DX IS THE PARTICLE SIZE AT WHICH X PERCENT OF THE PARTICLES ARE FINER, FOR EXAMPLE, D15 IS THE PARTICLE SIZE OF THE AGGREGATE FOR WHICH 15% OF THE PARTICLES ARE SMALLER AND 85% ARE LARGER.

EXAMINATION
1. ACCEPTANCE OF SITE VERIFICATION OF CONDITIONS
  1.1 GENERAL CONTRACTOR SHALL INSPECT, ACCEPT AND CERTIFY IN WRITING TO THE PAVER INSTALLATION SUBCONTRACTOR THAT SITE CONDITIONS MEET SPECIFICATIONS FOR THE FOLLOWING ITEMS PRIOR TO INSTALLATION OF INTERLOCKING CONCRETE PAVERS.
  1.1.1 VERIFY THAT SUBGRADE PREPARATION, COMPACTED DENSITY AND ELEVATIONS CONFORM TO SPECIFIED REQUIREMENTS.
  1.1.2 PROVIDE WRITTEN DENSITY TEST RESULTS FOR SOIL SUBGRADE TO THE OWNER, GENERAL CONTRACTOR AND PAVER INSTALLATION SUBCONTRACTOR.
  1.1.3 VERIFY LOCATION, TYPE, AND ELEVATIONS OF EDGE RESTRAINTS, (CONCRETE COLLARS AROUND) UTILITY STRUCTRES, AND DRAINAGE PIPES AND INLETS.

2. DO NOT PROCEED WITH INSTALLATION OF BEDDING AND INTERLOCKING CONCRETE PAVERS UNTIL SUBGRADE SOIL CONDITIONS ARE CORRECTED BY THE GENERAL CONTRACTOR OR DESIGNATED SUBCONTRACTOR.

NOTE: COMPACTION OF THE SOIL SUBGRADE IS OPTIONAL AND SHOULD BE DETERMINED BY THE PROJECT ENGINEER IF THE SOIL SUBGRADE REQUIRES COMPACTION, COMPACT TO A MINIMUM OF 95% STANDARD PROCTOR DENSITY PER ASTM C 698 COMPACTED SOIL DENSITY AND MOISTURE SHOULD BE CHECKED IN THE FIELD WITH A NUCLEAR DENSITY GAUGE OR OTHER TEST METHODS FOR COMPLIANCE TO SPECIFICATIONS. STABILIZATION OF THE SOIL AND/OR BASE MATERIAL MAY BE NECESSARY WITH WEAK OR CONTINUALLY SATURATED SOILS, OR WHEN SUBJECT TO HIGH WHEEL LOADS. COMPACTION WILL REDUCE THE PERMEABILITY OR SOILS. IF SOIL COMPACTION IS NECESSARY, REDUCED INFIL TRATION MAY REQUIRE DRAIN PIPES REQUIREMENTS.

PREPARATION
1. VERIFY THAT THE SOIL SUBGRADE IS FREE FROM STANDING WATER.
2. STOCKPILE JOINT/OPENING FILLER, BASE AND SUBBASE MATERIALS SUCH THAT THEY ARE FREE FROM STANDING WATER UNIFORMLY GRADED FREE OF ANY ORGANIC MATERIAL OR SEDIMENT, DEBRIS, AND READY FOR PLACEMENT.

INSTALL EDGE RESTRAINTS PER THE DRAWINGS AT THE INDICATED ELEVATIONS

PERMEABLE PAVER NOTES (CONT.):

INSTALLATION.
NOTE: THE MINIMUM SLOPE OF THE SOIL SUBGRADE IS TYPICALLY 0.5%. ACTUAL SLOPE OF SOIL SUBGRADE WILL DEPEND ON THE DRAIINAGE DESIGN AND EXFILTRATION TYPE. ALL DRAIN PIPES, OBSERVATION WELLS, OVERFLOW PIPES, AND (IF APPLICABLE) GEOTEXTILES, BERMS, BAFFLES AND IMPERMEABLE LINER SHOULD BE IN PLACE PER THE DRAWINGS PIRIOR TO OR DURING PLACEMENT OF THE DUBBASE AND MASE, DEPENDING ON THEIR LOCATION. CARE MUST BE TAKEN NOT TO DABMAGE DRAINPIPES DURING COMPACTION AND PAVING. NO MUD OR SEDIMENT CAN BE LEFT ON THE BASE OR BEDDING AGGERGATES. IF THEY ARE CONTAMINATED, THEY MUST BE REMOVED AND REPLACED WITH CLEAN MATERIALS.

1. GENERAL
  1.1. ANY EXCESS THICKNESS OF SLIL APLIED OVER THE EXCAVATED SOIL SUBGRADE TO TRAP SEDIMENT FROM ADJACENT CONSTRUCTION ACTIVIES SHALL BE REMOVED BEFORE APPLICATION OF THE GEOTEXTILE AND SUBBASE MATERIALS.
  1.2. KEEP AREA WHERE PAVEMENT IS TO BE CONSTRUCTED FREE FROM SEDIMENT DURING ENTIRE JOB. [GEOTEXTILES] BASE AND BEDDING MATERIALS CONTAMINATED WITH SEDIMENT SHALL BE REMOVED AND REPLACED WITH CLEAN MATERIALS.
  1.3. DO NOT DAMAGE DRAINPIPES, OVERFLOW PIPES, OBSERVATION WELLS, OR ANY INLETS AND OTHER DRAINAGE APPURTENANCES DURING INSTALATION. REPORT ANY DAMAGE IMMEDIATELY TO THE PROJECT ENGINEER.

2. GEOTEXTILES
  2.1. PLACE ON [BOTTOM AND] BOTH SIDES OF SOIL SUBGRADE. SECURE IN PLACE TO PREVENT WRINKLING FROM VEHICLE TIRE AND TRACKS.
  2.2. OVERLAP A MINIMUM OF [0.3 M (12 IN)] [0.6 M (24 IN)] IN THE DIRECTION OF DRAINAGE.

3. OPEN-GRADED SUBBASE AND BASE
  3.1. MOISTEN, SPREAD AND COMPACT THE NO.2 SUBBASE IN 4 TO 6 IN. (100 TO 150 MM) LIFTS [WITHOUT WRINKLING OR FOLDING THE GEOTEXTILE PLACE SUBBASE TO PROTECT GEOTEXTILE FROM WRINKLING UNDER EQUIPMENT TIRES AND TRACKS.]
  3.2. FOR EACH LIFT, MAKE AT LEAST TWO PASSES IN THE VIBRATORY MODE THEN AT LEAST TWO IN THE STATIC MODE WITH A MINIMUM 10 T (10 T) VIBRATORY ROLLER UNTIL THERE IS NO VISIBLE MOVEMENT OF THE NO.2 STONE. DO NOT CRUSH AGGREGATE WITH THE ROLLER.
  3.3. THE SURFACE TOLERANCE OF THE COMPACTED NO. 2 SUBBASE SHALL BE ±2 1/2 IN. (±65 MM) OVER A 10 FT (3M) STRAIGHTEDGE.
  3.4. MOISTEN, SPREAD AND COMPACT THE NO.57 BASE LAYER IN ONE 4 IN. (100 MM) THICK LIFT.
  3.5. ON THIS LAYER, MAKE AT LEAST TWO PASSES IN THE VIBRATORY MODE THEN AT LEAST TWO IN THE STATIC MODE WITH A MINIMUM 10 T (10 T) VIBRATORY ROLLER UNTIL THERE IS NO VISIBLE MOVEMENT OF THE NO. 2 STONE. DO NOT CRUSH AGGREGATE WITH THE ROLLER.
  3.6. THE SURFACE TOLERANCE THE COMPACTED NO. 57 BASE SHOULD NOT DEVIATE MORE THAN ±1 IN. (25 MM) OVER A 10 FT (3 M) STRAIGHTEDGE.

4. BEDDING LAYER
  4.1. MOISTEN, SPREAD AND SCREED THE NO. 8 STONE BEDDING MATERIAL
  4.2. FILL VOIDS LEFT BY REMOVED SCREED RAILS WITH NO. 8 STONE.
  4.3. THE SURFACE TOLERANCE OF THE SCREEDED NO. 8 BEDDING LAYER SHALL BE ±3/8 IN (10 MM) OVER A 10 FT (3 M) STRAIGHTEDGE.

5. PERMEABLE INTERLOCKING CONCRETE PAVERS AND JOINT/OPENING FILL MATERIAL
  5.1. LAY THE PAVING UNITS IN THE PATTERN(S) AND JOINT WIDTHS SHOWN ON THE DRAWINGS. MAINTAIN STRAIGHT PATTERN LINES.
  5.2. FILL GAPS AT THE EDGES OF THE PAVED AREA WITH CUT UNITS. CUT PAVERS SUBJECT TO TIRE TRAFFIC SHALL BE NO SMALLER THAN 1/3 OF A WHOLE UNIT.
  5.3. CUT PAVERS AND PLACE ALONG THE EDGES WITH A [DOUBLE-BLADED SPLITTER OR] MASONRY SAW.
  5.4. FILL THE OPENING AND JOINTS WITH [NO. 8] STONE.
    NOTE: SOME PAVER JOINT WIDTHS MAY BE NARROW AND NOT ACCEPT MOST OF THE NO. 8 STONE USE JOINT MATERIAL THAT WILL FILL JOINTS SUCH AS A WASHED ASTM NO. 9 OR NO.10 STONE
  5.5 REMOVE EXCESS AGGREGATE ON THE SURFACE BY SWEEPING PAVERS CLEAN.
  5.6 COMPACT AND SEAT THE PAVERS INTO THE BEDDING MATERIAL USING A LOW-AMPLITUDE, 75-90 HZ PLATE COMPACTOR CAPABLE OF AT LEAST 5,000 LBF (22 KN) CENTRIFUGAL COMPACTION FORCE. THIS WILL REQUIRE AT LEAST TWO PASSES WITH THE PLATE COMPACTOR.
  5.7 DO NOT COMPACT WITHIN 6 FT (2 M) OF THE UNRESTRAINED EDGES OF THE PAVING UNITS.
  5.8 APPLY ADDITIONAL AGGREGATE TO THE OPENINGS AND JOINTS IF NEEDED, FILLING THEM COMPLETELY. REMOVE EXCESS AGGREGATE BY SWEEPING AND THEN COMPACT THE PAVERS. THIS WILL REQUIRE AT LEAST TWO PASS WITH THE PLATE COMPACTOR.
  5.9 ALL PAVERS WITHIN WITHIN 6 FT (2 M) OF THE LAYING FACE MUST BE LEFT FULLY COMPACTED AT THE COMPLETION OF EACH DAY.
  5.10 THE FINAL SURFACE TOLERANCE OF COMPACTED PAVERS SHALL NOT DEVIATE MORE THAN ±3/8 (10 MM) UNDER A 10 FT (3M) LONG STRAIGHTEDGE.
  5.11 THE SURFACE ELEVATION OF PAVERS SHALL BE 1/8 TO 1/4 IN. (3 TO 6 MM) ABOVE ADJACENT DRAINAGE INLETS, CONCRETE COLLARS OR CHANNELS.

6. FIELD QUALITY CONTROL
  6.1. AFTER SWEEPING THE SURFACE CLEAN FINAL ELEVATIONS FOR CONFORMANCE TO THE DRAWING.
  6.2. LIPPAGE: NO GREATER THAN 1/8 IN. (3 MM) DIFFERENCE IN HEIGHT BETWEEN ADJACENT PAVERS.
  6.3. THE SURFACE ELEVATION OF PAVERS SHALL BE 1/8 TO 1/4 IN. (3 TO 6 MM) ABOVE THE ADJACENT DRAINAGE INLETS, CONCRETE COLLARS OR CHANNELS.
  6.4. BOND LINES FOR PAVER COURSES: ±1/2 IN. (±15 MM) OVER A 50 FT (15 M) STRING LINE.

7. PROTECTION
  7.1. AFTER WORK IN THIS SECTION IS COMPLETE, THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING WORK FROM SEDIMENT DEPOSITION AND DAMAGE DUE TO SUBSEQUENT CONSTRUCTION ACTIVITY ON THE SITE.

LANDSCAPING NOTES:

THE CONTRACTOR SHALL PROVIDE ALL LABOR, MATERIALS, ETC. NECESSARY TO COMPLETE ALL PLANTING AS SHOWN ON THE PLANTING PLANS, AS SPECIFIED HEREIN OR IN SUPPLEMENTAL SPECIFICATIONS, AND/OR AS REQUIRED BY JOB CONDITIONS. THE WORK IN GENERAL INCLUDES, BUT IS NOT LIMITED TO THE FOLLOWING:

(1) SOIL PREPARATION;
(2) PROVIDING TOPSOIL AND ALL SOIL AMENDMENTS;
(3) EXCAVATION OF PLANT PITS;
(4) PROVIDING ALL PLANT MATERIAL AND MULCH AS INDICATED ON PLANS;
(5) FERTILIZING;
(6) STAKING;
(7) CHEMICAL APPLICATION;
(8) MAINTENANCE AND GUARANTEE;
(9) ALL OTHER ITEMS NECESSARY TO MAKE WORK COMPLETE.

THE PLANTING CONTRACTOR IS RESPONSIBLE FOR COORDINATING WORK WITH THE OTHER CONTRACTORS. THIS PLAN DOES NOT GUARANTEE THE EXISTENCE OR NON-EXISTENCE OF ANY UTILITIES. PRIOR TO ANY CONSTRUCTION, EXCAVATION, OR ROTO-TILLING THE CONTRACTOR SHALL ASSUME THE RESPONSIBILITY OF VERIFYING THE LOCATIONS OF ALL UTILITIES, ABOVE AND/OR BELOW GROUND, PUBLIC AND/OR PRIVATE THAT MAY EXIST AND CROSS THROUGH THE AREAS OF CONSTRUCTION.

(1) SOIL PREPARATION

(1.1) BECAUSE OF SOIL COMPACTION DURING CONSTRUCTION, ALL PLANTING AREAS SHALL BE ROTOTILLED TO A DEPTH AS SHOWN IN DETAILS OR AS SPECIFIED IN WRITTEN SPECIFICATIONS . A PLANTING AREA IS ANY AREA IN WHICH NEW PLANTING OCCURS. EXCAVATE THE ENTIRE AREA BOUNDED BY WALKS, WALLS, FENCES, ETC. REMOVE SPOIL MATERIAL AS DIRECTED BY OWNER OR THE OWNER'S REPRESENTATIVE.

(1.2) EXCAVATED SOIL SHOULD BE USED AS BACKFILL MATERIAL IN ORDER TO ELIMINATE OR MINIMIZE THE OCCURRENCE OF HYDROLOGIC DISCONTINUITIES, AND/OR SOIL INTERFACE PROBLEMS COMMON TO PLANTING BEDS CONTAINING SOILS OF DIFFERENT TEXTURE. WHERE THE TEXTURE OF THE EXISTING SOIL IS UNDESIRABLE FOR THE PLANT SPECIES BEING PLANTED (i.e. HEAVY CLAY, PURE SAND) AND WHERE THE pH OF THE EXISTING SOIL IS SUITABLE FOR THE SPECIES BEING PLANTED, THE SOIL SHALL BE BLENDED 66% EXISTING SOIL WITH 33% AMENDED SOIL .

(1.3) WHERE IT IS DETERMINED THAT THE EXISTING SOIL EXCAVATED IS TOTALLY UNSUITABLE FOR USE AS BACKFILL MATERIAL BECAUSE OF IMPROPER pH OR THE PRESENCE OF DEBRIS OR OTHER DELETERIOUS MATTER, THE BACKFILL MATERIAL SHALL BE 100% AMENDED SOIL MIXTURE AS DESCRIBED BELOW WITH THE ADDITION OF 1/2 PART SAND.

LANDSCAPING NOTES (CONT):

AMENDED SOIL: PLANTING SOIL FOR AMENDING BACKFILL SHALL BE 100 % TOPSOIL WITH AMENDMENTS ADDED ACCORDING TO THE RECOMMENDATIONS OF THE SOILS TEST REPORT TO BRING THE pH VALUE OF THE PLANTING BACKFILL MIXTURE WITHIN THE RANGES DESCRIBED BELOW. THE TOPSOIL AND AMENDMENTS SHALL BE MIXED AT AN ON-SITE LOCATION. PLANTING SOIL SHALL NOT BE MIXED AT INDIVIDUAL PLANT LOCATIONS.

(2) TOPSOIL AND ALL SOIL AMENDMENTS

(2.1) NECESSARY QUANTITIES OF TOPSOIL SHALL BE SUPPLIED BY THE CONTRACTOR AND APPROVED BY THE OWNER OR HIS REPRESENTATIVE. THE CONTRACTOR SHALL APPLY TOPSOIL ONLY AFTER SECURING SOIL TEST (V.P.I.), APPLYING RECOMMENDED TREATMENT THEREOF, AND SUBMITTING FOR APPROVAL.

(2.2) ON-SITE TOPSOIL MEETING THE CONDITIONS FOR THESE NOTES MAY BE USED, OR IF INSUFFICIENT QUANTITIES ARE AVAILABLE, OUTSIDE TOPSOIL MEETING THE FOLLOWING CRITERIA SHALL BE PROVIDED.

(2.3) ON-SITE TOPSOIL SHALL BE STOCKPILED TOPSOIL THAT HAS BEEN SALVAGED IN ACCORDANCE WITH SECTION 303.04(A) OF THE V.D.O.T. SPECIFICATIONS. IT SHALL BE FREE FROM REFUSE, OR ANY MATERIAL TOXIC TO PLANT GROWTH, AND REASONABLY FREE FROM SUBSOIL, STUMPS, ROOTS, BRUSH, STONES, CLAY, LUMPS, OR SIMILAR OBJECTS LARGER THAN 3" IN THEIR GREATEST DIMENSION.

(2.4) OFF-SITE TOPSOIL, IF NEEDED, SHALL BE TOPSOIL FURNISHED FROM SOURCES OUTSIDE THE PROJECT LIMITS AND SHALL BE THE ORIGINAL TOP LAYER OF A SOIL PROFILE FORMED UNDER NATURAL CONDITIONS, TECHNICALLY DEFINED AS THE "A" HORIZON BY THE SOIL SOCIETY OF AMERICA. IT SHALL CONSIST OF NATURAL, FRIABLE, LOAMY SOIL WITHOUT ADMIXTURES OF SUBSOIL. OR OTHER FOREIGN MATERIALS, AND SHALL BE REASONABLY FREE FROM STUMPS, ROOTS, HARD LUMPS, STIFF CLAY, STONE, NOXIOUS WEEDS, BRUSH, OR OTHER LITTER. IT SHALL HAVE DEMONSTRATED BY EVIDENCE OF HEALTHY VEGETATION GROWING, OR HAVING GROWN ON IT PRIOR TO STRIPPING, THAT IT IS REASONABLY WELL DRAINED AND DOES NOT CONTAIN SUBSTANCES TOXIC TO PLANTS.

(2.5) TOPSOIL SHALL HAVE A pH IN THE RANGE OF 6.0 TO 7.0 PRIOR TO MIXING WITH AMENDMENTS. IF THE pH IS NOT WITHIN THIS RANGE, THE pH SHALL BE CORRECTED AT THE CONTRACTOR'S EXPENSE OR A DIFFERENT SOURCE OF SUPPLY SHALL BE SELECTED. TOPSOIL SHALL BE SUBJECT TO INSPECTION BY THE OWNER OR THE OWNER'S REPRESENTATIVE AT THE SOURCE OF SUPPLY AND IMMEDIATELY PRIOR TO USE IN THE PLANTING OPERATIONS.

(2.6) PLANTING SOIL AFTER AMENDING FOR DECIDUOUS PLANTS SHALL HAVE A pH VALUE BETWEEN 6.0 AND 7.0, AND FOR EVERGREEN OR SEMI-EVERGREEN PLANTS SHALL HAVE A pH VALUE BETWEEN 5.0 AND 6.0. A REPRESENTATIVE SAMPLE FROM THE EXCAVATED SOIL SHALL BE FIELD TESTED FOR pH UTILIZING A RELIABLE SOIL pH METER OR SOIL pH TEST KIT. THE pH VALUE OF THE NATURAL SOIL BACKFILL MIXTURE MAY BE AMENDED BY ADDING LIMESTONE OR ALUMINUM SULFATE AS NEEDED.

(3) EXCAVATION OF PLANT PITS

(3.1) PRIOR TO EXCAVATION OF TREE PITS, AN AREA EQUAL TO TWO TIMES THE DIAMETER OF THE ROOT BALL SHALL BE ROTO-TILLED TO A DEPTH EQUAL TO THE DEPTH OF THE ROOT BALL.

(3.2) IN CONTINUOUS SHRUB AND GROUND COVER BEDS, THE ROTO-TILLED PERIMETER SHOULD EXTEND TO A DISTANCE OF ONE FOOT BEYOND THE DIAMETER OF A SINGLE ROOTBALL. THE BED SHALL BE TILLED TO A DEPTH EQUAL TO THE ROOT BALL DEPTH PLUS 6".

(3.3) TREE PITS FOR WELL DRAINED SOILS SHALL BE DUG SO THAT THE BOTTOM OF THE ROOT BALL WILL REST ON UNDISTURBED SOIL AND THE TOP OF THE ROOT BALL WILL BE FLUSH WITH FINISH GRADE. IN POORLY DRAINED SOILS THE TREE PIT SHALL BE DUG SO THAT THE ROOT BALL RESTS ON UNDISTURBED SOIL AND THE TOP OF THE ROOT BALL IS 1" ABOVE FINISH GRADE. PLANT PIT WALLS SHALL BE SCARIFIED PRIOR TO PLANT INSTALLATION.

(4) PLANT MATERIAL AND MULCH

(4.1) THE NAMES OF PLANTS REQUIRED UNDER THIS CONTRACT CONFORM TO THOSE GIVEN IN L.H. BAILEY'S HORTUS THIRD, 1976 EDITION. NAMES OF VARIETIES NOT INCLUDED THEREIN CONFORM GENERALLY WITH NAMES ACCEPTED IN THE NURSERY TRADE. ALL PLANTS SHALL HAVE A HABIT OF GROWTH THAT IS NORMAL FOR THEIR SPECIES AND THEY SHALL BE SOUND, HEALTHY AND VIGOROUS, WITH WELL DEVELOPED ROOT SYSTEMS. ALL PLANT MATERIAL SHALL BE FREE FROM INSECT PESTS, PLANT DISEASES, AND INJURIES. ALL PLANTS SHALL EQUAL OR EXCEED THE MEASUREMENTS SPECIFIED IN THE PLANT LIST, WHICH ARE MINIMUM ACCEPTABLE SIZES. TREES SHALL HAVE SINGLE TRUNKS EXCEPT AS NOTED. ALL SHRUBS SHALL BE HEALTHY, VIGOROUS, AND OF GOOD COLOR. ONLY DAMAGED OR BROKEN BRANCHES OF PLANT MATERIAL MAY BE PRUNED AND ANY NECESSARY PRUNING SHALL BE DONE AT THE TIME OF PLANTING. HOWEVER, UNDER NO CIRCUMSTANCES SHALL THE CENTRAL LEADER OF A PLANT BE PRUNED.

(4.2) ALL TAGS, STRINGS OR ANY OTHER MATERIAL ATTACHED TO THE PLANTS SHALL BE REMOVED AT THE TIME OF THE PLANTING. BALLING AND BURLAPPING OF PLANTS SHALL FOLLOW THE CODE OF STANDARDS CURRENTLY RECOMMENDED BY THE AMERICAN STANDARD FOR NURSERY STOCK.

(4.3) SUBSTITUTIONS WILL BE PERMITTED ONLY UPON SUBMISSION OF PROOF THAT ANY PLANT IS NOT OBTAINABLE. ALL SUBSTITUTIONS MUST BE AUTHORIZED BY THE OWNER OR THE OWNER'S REPRESENTATIVE IN WRITING PROVIDING FOR USE OF THE NEAREST EQUIVALENT OBTAINABLE SIZE OR VARIETY OF PLANT HAVING THE SAME ESSENTIAL CHARACTERISTICS AS THE ORIGINAL VARIETY WITH AN EQUITABLE ADJUSTMENT OF CONTRACT PRICE.

(4.4) BALLED AND BURLAPPED PLANTS (B&B) SHALL BE DUG WITH FIRM, NATURAL BALLS OF EARTH OF SUFFICIENT DIAMETER AND DEPTH TO ENCOMPASS THE FIBROUS AND FEEDING ROOT SYSTEM NECESSARY FOR FULL RECOVERY OF THE PLANT. BALLS SHALL BE FIRMLY WRAPPED WITH BURLAP OR SIMILAR MATERIAL AND BOUND WITH TWINE OR CORD. BURLAP SHALL NOT BE PULLED OUT FROM UNDER BALLS DURING PLANTING OPERATIONS. B&B PLANTS WHICH CANNOT BE PLANTED IMMEDIATELY ON DELIVERY SHALL BE COVERED WITH MOIST SOIL, MULCH, OR OTHER MATERIAL TO PROVIDE PROTECTION FROM DRYING WINDS AND SUN.

(4.5) PLANTS NOTED "CONTAINER" ON THE PLANT LIST MUST BE CONTAINER GROWN WITH WELL ESTABLISHED ROOT SYSTEMS. LOOSE CONTAINERIZED PLANT MATERIAL WILL NOT BE ACCEPTED. ALL PLANTS INJURED AND PLANTS WITH ROOT BALLS BROKEN DURING TRANSPORT OR PLANTING OPERATIONS WILL BE REJECTED. BARE-ROOTED PLANTS (BR) SHALL BE PLANTED OR HEELED-IN IMMEDIATELY UPON DELIVERY. ALL PLANTS SHALL BE WATERED AS NECESSARY UNTIL PLANTED.

(4.6) NEW PLANTINGS SHALL BE LOCATED WHERE SHOWN ON THE PLAN EXCEPT WHERE OBSTRUCTIONS BELOW GROUND ARE ENCOUNTERED OR WHERE CHANGES HAVE BEEN MADE IN THE PROPOSED CONSTRUCTION. NECESSARY ADJUSTMENTS SHALL BE MADE ONLY AFTER APPROVAL BY THE OWNER OR THE OWNER'S REPRESENTATIVE. REASONABLE CARE SHALL BE EXERCISED TO HAVE PLANTING PITS DUG AND SOIL PREPARED PRIOR TO MOVING PLANTS TO THEIR RESPECTIVE LOCATIONS TO ENSURE THAT THEY WILL NOT BE UNNECESSARILY EXPOSED TO DRYING OR PHYSICAL DAMAGE.

(4.7) A LIST OF PLANTS, INCLUDING SIZES, QUANTITIES AND OTHER REQUIREMENTS, IS SHOWN ON THE DRAWINGS. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE QUANTITIES AS SHOWN ON THE DRAWINGS. IF DISCREPANCIES OCCUR IN THE QUANTITIES SHOWN, THE PLANTING PLANS SHALL GOVERN.

(4.8) THE PLANTING CONTRACTOR WILL BE NOTIFIED BY THE GENERAL CONTRACTOR WHEN OTHER DIVISIONS OF THE WORK HAVE PROGRESSED SUFFICIENTLY TO COMMENCE WORK ON THE PLANTING OPERATION. THEREAFTER, PLANTING OPERATIONS SHALL BE CONDUCTED UNDER FAVORABLE WEATHER CONDITIONS DURING THE NEXT SEASON OR SEASONS WHICH ARE NORMAL FOR SUCH WORK. REMOVAL OF ROCK OR OTHER UNDERGROUND OBSTRUCTIONS, RELOCATIONS TO AVOID OBSTRUCTIONS, AND PROVISION OF DRAINAGE FOR PLANTING AREAS SHALL BE DONE ONLY AS APPROVED BY THE OWNER OR THE OWNER'S REPRESENTATIVE.

(4.9) ALL PLANTS SHALL BE PLANTED UPRIGHT AND FACED TO GIVE THE BEST APPEARANCE OR RELATIONSHIP TO ADJACENT STRUCTURES. ROOTS SHALL BE SPREAD IN THEIR NORMAL POSITION. ALL BROKEN OR FRAYED ROOTS SHALL BE CUT OFF CLEANLY. PLANTS WITH CIRCLING ROOTS SHALL NOT BE ACCEPTED. BURLAP TWINE AND OTHER FASTENING MATERIAL SHALL BE CUT AND PUSHED TO THE BOTTOM OF THE PLANT PIT PRIOR TO BACKFILL MATERIAL BEING PLACED. THE PLANT SHALL NOT BE ROCKED BACK AND FOURTH TO ENTIRELY REMOVE THE WRAPPING MATERIAL NOR SHALL ANY OTHER PRACTICE BE PERFORMED WHICH COULD CAUSE THE ROOT BALL TO BREAK APART. WHEN WIRE BASKETS ARE USED ON THE ROOT BALL OF PLANTS THE WIRE SHALL BE REMOVED TO AT LEAST 12" BELOW THE TOP OF THE ROOT BALL.

LANDSCAPING NOTES (CONT):

(4.10) AT THE TIME OF PLANTING, AND AS MANY TIMES LATER AS SEASONAL CONDITIONS REQUIRE, EACH PLANT AND THE SOIL AROUND IT SHALL BE THOROUGHLY WATERED. CARE SHOULD BE EXERCISED WHEN WATERING TO AVOID FLOODING OF PLANTS AND BEDS, DISPLACEMENT OF MULCH MATERIAL AND EROSION OF SOIL. AVOID USE OF HIGH PRESSURE HOSES. THE CONTRACTOR SHALL MAKE, AT HIS EXPENSE, WHATEVER ARRANGEMENTS MAY BE NECESSARY TO ENSURE AN ADEQUATE SUPPLY OF WATER TO MEET THE NEEDS OF THIS CONTRACT DURING INSTALLATION. THE CONTRACTOR SHALL ALSO FURNISH ALL NECESSARY HOSE, EQUIPMENT ATTACHMENTS AND ACCESSORIES FOR THE ADEQUATE WATERING OF PLANTED AREAS AS MAY BE REQUIRED UNTIL ACCEPTANCE BY THE OWNER OR THE OWNER'S REPRESENTATIVE.

(4.11) MULCH SHALL BE CLEAN, GROUND OR SHREDDED BARK OR HARDWOOD MULCH. IN PLANTING AREAS WHERE SLOPES EXCEED 3:1 AND AT DRAINAGE DISPERSION POINTS OR ALONG NATURAL WATER WAYS WHERE CONCENTRATIONS OF SURFACE WATER EMPTY FROM CULVERTS OR PAVED DITCHES, HEAVY JUTE MESH SHALL BE INSTALLED. SHREDDED HARDWOOD OR BARK MULCH SHALL HAVE BEEN COMPOSTED FOR AT LEAST TWO MONTHS PRIOR TO APPLICATION. FRESHLY GROUND MULCH WILL NOT BE ACCEPTED. FINELY GROUND MULCH WHICH INHIBITS DRAINAGE, ENCOURAGES WEED GROWTH OR BECOMES WATERLOGGED WILL NOT BE ACCEPTED. MULCH SHALL BE COMPOSED OF SIMILAR SIZED FRAGMENTS AND SHALL NOT CONTAIN STICKS, CONES, LEAVES, UNSHREDDED PIECES, OR OTHER DELETERIOUS MATTER. ALL AZALEA AND CAMELLIA PLANTING BEDS SHALL HAVE 1" OF PINE STRAW MULCH UNDER 2" OF BARK OR SHREDDED HARDWOOD MULCH.

(4.12) ALL PLANTS SHALL BE MULCHED IMMEDIATELY AFTER PLANTING. TREE PLANTINGS SHALL BE MULCHED WITH A 3" MINIMUM LAYER OF MULCH. THIS MULCH SHALL ENTIRELY COVER THE AREA OF THE PLANTING PIT, BED, OR EARTH BERM AROUND EACH PLANT WITH THE EXCEPTION OF THE AREA IMMEDIATELY ADJACENT TO THE PLANT TRUNK OR TRUNKS. THE AREA IMMEDIATELY ADJACENT TO THE PLANT TRUNK OR TRUNKS SHALL BE LEFT FREE OF ANY MULCH. WEED FABRIC SHALL BE INSTALLED IN ALL PLANTING BEDS.

(5) FERTILIZING

(5.1) THE FERTILIZER SHOULD BE A DRY SLOW RELEASE FORM OF FERTILIZER. IT SHOULD CONTAIN AT LEAST 25-50% WATER INSOLUBLE NITROGEN. THE FERTILIZER SELECTED SHOULD ALSO HAVE A LOW ADJUSTED SALT INDEX TO PREVENT BURNING. THE N-P-K RATIO SHOULD NOT EXCEED 3-1-2 UNLESS THE SOIL TEST REVEALS THAT ADDITIONAL LEVELS OF P AND K ARE NECESSARY.

(5.2) FOR DECIDUOUS TREES, USE OSMOCOTE (18-6-12) AT THE RATE EQUIVALENT TO 4 LBS ACTUAL N/1000 SQ FT OF ROOT ZONE AREA/YEAR. FOR EVERGREEN TREES USE 2 LBS ACTUAL N/1000 SQ FT OF ROOT ZONE AREA/YEAR.

(5.3) MIX THE FERTILIZER INTO THE BACKFILL SOIL OF THE TREE PITS. FOR SHRUB BEDS, MIX THE FERTILIZER INTO THE AREA THAT HAS BEEN ROTO-TILLED FOR THE PLANTS.

(5.4) THE FERTILIZER RATE FOR CONTINUOUS GROUND COVER AND SHRUB BEDS SHOULD BE DERIVED BY CALCULATING THE ENTIRE ROOT ZONE AREA. THE ROOT ZONE AREA IS FOUND BY MEASURING THE AREA CONTAINING THE MULTIPLE PLANT ROOTS. USE OSMOCOTE (18-6-12) AT A RATE EQUIVALENT TO 2 LBS OF N /1000 SQ FT OF ROOT ZONE AREA. THE FERTILIZER SHOULD BE EVENLY DISTRIBUTED WITHIN THE SHRUB BED SOIL.

(5.5) ALWAYS BE SURE THAT ADEQUATE MOISTURE IS AVAILABLE WHEN FERTILIZING SO THAT THE FERTILIZER WILL BE DISSOLVED INTO THE SOIL SOLUTION FOR ROOT UPTAKE AND TO AVOID BURNING THE ROOTS.

(6) STAKING

(6.1) ALL TREES SHALL BE STAKED ACCORDING TO THE TYPICAL DETAILS PROVIDED.

(6.2) THREE STAKES SHALL BE REQUIRED PER TREE. THE STAKES SHALL BE DRIVEN IN A RADIAL PATTERN,VERTICALLY INTO THE GROUND OUTSIDE THE EDGE OF THE ROOTBALL TO A DEPTH OF 2 1/2 ' TO 3', ON OPPOSITE SIDES OF THE TREE IN SUCH A MANNER AS NOT TO INJURE THE ROOT BALL OR ROOTS. STAKES FOR SUPPORTING TREES SHALL BE 1.5" X 1.5" SQUARE OR 1.5" ROUND, BY 8'. THE STAKES SHALL BE SOUND WOOD TREATED WITH A SUITABLE WOOD PRESERVATIVE.

WIRE OR CABLE SIZES FOR TREES UP TO 3" CAL. SHALL BE #10 WIRE:

TIGHTEN WIRE OR CABLE ONLY ENOUGH TO KEEP FROM SLIPPING. ALLOW FOR SOME TRUNK MOVEMENT. PLASTIC HOSE SHALL BE LONG ENOUGH TO ACCOMMODATE 35MM (1.5 IN.) OF GROWTH AND BUFFER ALL BRANCHES FROM THE WIRE. TUCK ANY LOOSE ENDS OF THE WIRE OR CABLE INTO THE WIRE WRAP SO THAT NO SHARP WIRE ENDS ARE EXPOSED. ASSURE THAT THE BEARING SURFACE OF THE PROTECTIVE COVERING OF THE WIRE OR CABLE AGAINST THE TREE TRUNK IS A MINIMUM OF 12 MM (0.5 IN.).

(6.3) WOODEN STAKES AND WIRE TIES SHOULD BE REMOVED AFTER ONE YEAR.

(7) CHEMICAL APPLICATION

(7.1) ALL PESTICIDES SHALL BE PRODUCTS OF RECOGNIZED COMMERCIAL MANUFACTURERS, AND SHALL CONFORM TO ALL APPLICABLE FEDERAL, STATE, AND LOCAL PESTICIDE LAWS. PESTICIDES SHALL BE APPLIED WITH CALIBRATED EQUIPMENT ACCORDING TO EPA LABEL RESTRICTIONS AND REGULATIONS BY A CERTIFIED APPLICATOR. ANY DAMAGE INCURRED TO THE SITE, ADJACENT PROPERTIES, OR APPLICATOR DURING PESTICIDE APPLICATIONS WILL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.

(7.2) PESTICIDES SHOULD BE USED ONLY WHEN NECESSARY TO TREAT AN OUTBREAK OF A HARMFUL PEST OR DISEASE PROBLEM. THE OWNER OR THE OWNER'S REPRESENTATIVE SHALL BE NOTIFIED 24 HOURS PRIOR TO THE APPLICATION OF ANY PESTICIDE.

(8) MAINTENANCE AND GUARANTEE

(8.1) THE LANDSCAPE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING HIS WORK FOR THE PERIOD OF ONE YEAR AFTER ACCEPTANCE BY THE OWNER OR THE OWNER'S REPRESENTATIVE. MAINTENANCE SHALL INCLUDE WATERING, WEEDING, CULTIVATING, MULCHING, REMOVAL OF DEAD MATERIALS, RESETTING OF PLANTS TO PROPER GRADES OR UPRIGHT POSITIONS, RESTORATION OF EARTH BERMS, AND OTHER NECESSARY OPERATIONS. ADEQUATE PROTECTION FOR LAWN AREAS AGAINST TRESPASSING DURING PLANTING OPERATIONS AND AGAINST DAMAGE OF ANY KIND SHALL BE PROVIDED. NOTHING IN THESE NOTES IS INTENDED TO RELIEVE THE CONTRACTOR OF HIS RESPONSIBILITY TO REPAIR EXISTING LAWN AREAS DAMAGED BY WORKMEN ENGAGED IN THE COMPLETION OF THIS PROJECT.

(8.2) INSPECTION OF THE WORK TO DETERMINE COMPLETION OF THE CONTRACT EXCLUSIVE OF THE POSSIBLE REPLACEMENT OF PLANTINGS, WILL BE MADE BY THE OWNER OR THE OWNER'S REPRESENTATIVE AT THE CONCLUSION OF THE INSTALLATION PERIOD UPON WRITTEN NOTICE REQUESTING SUCH INSPECTION. REQUEST SHALL BE SUBMITTED BY CONTRACTOR AT LEAST TEN DAYS PRIOR TO THE ANTICIPATED DATE FOR INSPECTION. AFTER INSPECTION, THE CONTRACTOR WILL BE NOTIFIED IN WRITING BY THE OWNER OR THE OWNER'S REPRESENTATIVE OF ACCEPTANCE OF THE WORK, EXCLUSIVE OF THE POSSIBLE REPLACEMENT OF PLANTS SUBJECT TO GUARANTEE; OR, IF THERE ARE ANY DEFICIENCIES, THE CONTRACTOR WILL BE NOTIFIED OF THE REQUIREMENTS NECESSARY FOR COMPLETION OF THE WORK. PLANTINGS SHALL NOT BE CONSIDERED ACCEPTED UNTIL ALL DEFICIENCIES HAVE BEEN CORRECTED AND APPROVED IN WRITING.

(8.3) NURSERY STOCK SHALL BE FULLY GUARANTEED FOR ONE FULL YEAR. ALL PLANTS THAT FAIL TO MAKE NEW GROWTH FROM A DORMANT CONDITION OR THAT DIE DURING THE FIRST YEAR AFTER PLANTING SHALL BE REPLACED. ALL REPLACEMENTS SHALL CONFORM WITH THE ORIGINAL SPECIFICATIONS AS TO SIZE AND TYPE. ALL COSTS OF REPLACEMENTS SHALL BE BORNE BY THE CONTRACTOR.

(9) ALL OTHER ITEMS NECESSARY TO MAKE WORK COMPLETE

(9.1) ANY PLANT MATERIAL NOT PLANTED SHALL BE REMOVED FROM THE SITE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL UNUSED RUBBISH AND DEBRIS FROM THE SITE UPON COMPLETION OF HIS WORK.

(10) PERMANENT SEEDING (SHALL ONLY APPLY TO DISTURBED AREAS NOT INDICATED TO RECEIVE SOD).

(10.1) TOPSOILING: WHERE TOPSOIL IS REQUIRED ON ADVERSE SOIL CONDITIONS, A MINIMUM OF FOUR INCHES OF TOPSOIL SHOULD BE USED. THE TOPSOIL SHOULD CONTAIN A MINIMUM OF 35% FINE GRAINED MATERIAL (SILT AND CLAY AND 1.5% + ORGANIC MATTER).

(10.2) LIME AND FERTILIZER:
  A. LIME - APPLY GROUND LIMESTONE OR
  B. LIME - APPLY PULVERIZED AGRICULTURAL LIMESTONE OR EQUIVALENT AT THE RATE OF 2 TONS PRE ACRE.
  C. FERTILIZER - 500 POUNDS PER ACRE OF 10-20-10 FERTILIZER OR EQUIVALENT.

LANDSCAPING NOTES (CONT):

IF SOILS ARE UNIFORM, IT IS DESIRABLE TO HAVE LIME AND FERTILIZER RECOMMENDATIONS BASED ON SOIL TESTS. THE LIME AND FERTILIZER SHOULD BE DISKED OR WORKED INTO A GOOD SEEDBED TO A DEPTH OF THREE TO FOUR INCHES.

(10.3) SPRING AND FALL SEEDING: SEED ONE OF THE FOLLOWING VARIETIES AT THE SPECIFIED RATES PER ACRE FOR TURF AREAS SEEDED IN THE SPRING OR FALL (SEE SPECIFIED SEEDING DATES BELOW):

TYPE OF GRASS	SEEDING RATE	SEEDING DATE
TALL FESCUE (1)	5 - 7 LBS./1000 SQ. FT.	SPRING: FEBRUARY 28, TO MAY 15.
		FALL : AUGUST 1 TO NOVEMBER 1

NOTE: PREFERRED FESCUE SEEDING DATES ARE FROM AUGUST 1 TO NOVEMBER 1. SPRING SEEDING DATES WOULD BE FROM FEBRUARY 28, TO MAY 15.

(1) FESCUE SHALL BE SELECTED FROM ONE OF THE FOLLOWING VARIETIES: 2ND MILLENNIUM, AVENGER, BILTMORE, BINGO, BLACKWATCH, BRAVO, COCHISE II(3), COCHISE III, CONSTITUTION, COYOTE II, CROSSFIRE II(3,4), DAVINCI(3), DAYTONA(3), ENDEAVOR(3), FALCON IV, FIDELITY, FORTE, GOOD-EN(3,4), GRANDE(4), GRANDE II, GREENKEEPER WAF, GUARDIAN 21, HOUNDOG 5, HUNTER, INFERNO, JUSTICE, MAGELLAN, MASTERPIECE, MATADOR(3), MATADOR GT(3), ONYX(3,4), PADRE, PICASSO(3), PENN 1901, RAPTOR, REBEL EXEDA, REGIMENT II, REMBRANDT(3), SOUTHERN CHOICE II(3), SR 8250(3), TAOS, TARHEEL, TARHEEL II, TEMPEST, TITANIUM, TOMBSTONE, TURBO, ULTIMATE(3), WATCHDOG, AND WOLFPACK.

(10.4) SEED WITH THE FOLLOWING MIXTURE(S) FOR SPECIFIED DATES OUTSIDE THOSE LISTED ABOVE:

GRASS TYPE	SEEDING RATE	SEEDING DATE
BERMUDA (1)	2 LBS./1000 SQ. FT.(HULLED SEED)	SPRING : MAY 15 - JUNE
	7 LBS./1000 SQ. FT. (UNHULLED BERMUDA SEED)	FALL SEEDING:
ALL OTHERS	AND 5 LBS./1000 SQ. FT. WINTER RYE (LOLLIUM MULTIFLORUM)	

(2) ONLY THE FOLLOWING VARIETIES OF BERMUDA SHALL BE ACCEPTABLE: BLACKJACK, CONTINENTAL, PRINCESS 77, RIVIERA, YUKON OR SAVANNAH. SEED SHALL HAVE A MINIMUM PURITY OF 95% AND AN 85% GERMINATION RATE.

(10.5) MULCH
  A. MULCH WITH ANY OF THE MATERIALS LISTED BELOW AND AT THE RATE INDICATED. SPREADING SHOULD BE UNIFORM AND AT A RATE THAT PERMITS NO MORE THAN 25-50% OF THE GROUND SHOWING THROUGH THE MULCH.

  B. MULCHING IS SPECIFICALLY REQUIRED ON ALL SOILS EXCEEDING 25% SLOPE.
  1. STRAW - 1 TO 2 TONS/ACRE DEPENDING ON SEASON AND METHOD OF APPLICATION.
  2. WOOD FIBER MATERIALS - 1,000 LBS. PER ACRE.

(10.6) MAINTENANCE
  A. IRRIGATION - IF SOIL MOISTURE IS DEFICIENT, SUPPLY NEW SEEDINGS AND PLANTINGS WITH ADEQUATE WATER FOR PLANT GROWTH UNTIL THEY ARE FIRMLY ESTABLISHED.
  B. REPAIR - INSPECT ALL AREAS FOR PLANTING FAILURES AND MAKE NECESSARY REPAIRS, REPLACEMENTS, AND RESEEDING WITH THE PLANTING SEASON IF POSSIBLE.
  C. LIME AND FERTILIZER - SHALL BE APPLIED UNDER A REGULAR PROGRAM THAT IS BASED ON SOIL FERTILITY TESTS AND ON THE USE AND GENERAL APPEARANCE OF THE VEGETATIVE COVER DURING SUBSEQUENT GROWING SEASONS.

SEEDING NOTES:

ALL AREAS WITHIN THE LIMITS OF CONSTRUCTION THAT ARE NOT OTHERWISE COVERED BY BUILDINGS, PAVEMENT, SIDEWALKS, WOODED AREAS AND PLANTING / MULCHED BEDS OR OTHERWISE CALLED OUT AS S OD LAWN AREAS SHALL BE SEEDED PER THE PERMANENT SEEDING SPECIFICATIONS IN THE PRECEDING PARAGRAPH.

SEEDED AREAS WILL ONLY BE ACCEPTED AFTER DISTURBED AREAS ARE COMPLETELY COVERED IN A DENSE LAWN CONSISTING OF THE SPECIFIED PERMANENT GRASS.

GENERAL LANDSCAPE NOTES:

A. CONTRACTOR SHALL REVIEW ALL DRAWINGS, SPECIFICATIONS, PERMITS, AND REGULATORY REQUIREMENTS PRIOR TO COMMENCEMENT OF WORK.

B. CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL REQUIRED LANDSCAPING AND IRRIGATION PERMITS.

C. CONTRACTOR SHALL VERIFY ALL EXISTING AND PROPOSED SITE ELEMENTS AND NOTIFY OWNER'S REPRESENTATIVE OF ANY DISCREPANCIES. SURVEY DATA OF EXISTING CONDITIONS WAS PROVIDED BY OTHERS.

D. THE CONTRACTOR IS RESPONSIBLE FOR THE LOCATION AND PROTECTION OF ALL EXISTING UTILITIES DURING CONSTRUCTION. AT LEAST 48 HOURS PRIOR TO ANY DEMOLITION, GRADING, OR CONSTRUCTION ACTIVITY THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" OF VIRGINIA @ 1-800-552-7001 FOR PROPER IDENTIFICATION OF EXISTING UTILITIES WITHIN THE PROJECT SITE.

E. FINAL LOCATION OF ALL PLANTINGS SHALL BE DETERMINED IN THE FIELD BY THE OWNER'S CHOSEN REPRESENTATIVE.

F. SUBSTITUTIONS AND/OR MODIFICATIONS TO PLANTING LAYOUT, PLANT MATERIALS, ETC. SHALL NOT BE MADE WITHOUT THE WRITTEN CONSENT OF THE LANDSCAPE ARCHITECT.

G. CONTRACTOR SHALL INSTALL ALL PLANT MATERIALS AS SHOWN IN THE DETAILS, AND AS INDICATED IN THE LANDSCAPE SPECIFICATIONS.

H. THE PLANTING OF TREES SHALL BE DONE IN ACCORDANCE WITH THE STANDARDIZED LANDSCAPE SPECIFICATIONS JOINTLY ADOPTED BY THE VIRGINIA NURSERYMEN'S ASSOCIATION, THE VIRGINIA SOCIETY OF LANDSCAPE DESIGNERS AND THE VIRGINIA CHAPTER OF THE AMERICAN SOCIETY OF LANDSCAPE ARCHITECTS.

I. SIZE AND GRADING STANDARDS OF PLANT MATERIALS SHALL CONFORM TO THE LATEST ADDITION OF ANSI Z60.1, AMERICAN STANDARD FOR NURSERY STOCK, BY THE AMERICAN NURSERY AND LANDSCAPE ASSOCIATION.

J. ALL PLANT MATERIALS SHALL BE NURSERY GROWN STOCK AND SHALL BE FREE OF ANY DEFORMITIES, DISEASES, OR INSECT DAMAGE. ANY MATERIALS WITH DAMAGED OR DISFIGURED/ CROOKED LEADERS, BARK ABRASIONS, SUNSCALD, INSECT DAMAGE, ETC., ARE NOT ACCEPTABLE AND WILL BE REJECTED.

K. TREES NOT EXHIBITING A CENTRAL LEADER WILL BE REJECTED UNLESS CALLED OUT IN THE PLANT LIST AS MULTI-STEM.

L. ALL PLANTING BEDS AND LAWN AREAS SHALL BE SEPARATED BY SHOVEL EDGING. NO EDGE SHALL BE INSTALLED ADJACENT TO SIDEWALKS OR CURBS.

M. PLANTING BEDS SHALL RECEIVE 3" OF DARK, SHREDDED HARDWOOD MULCH THROUGHOUT. ORANGE AND/ OR RED MULCH IS NOT ACCEPTABLE.

N. ALL AREAS ON PLANS NOT INDICATED TO RECEIVE SOD PLANTING, PAVEMENT, OR HARDSCAPE WHICH ARE DISTURBED BY CONSTRUCTION ACTIVITIES SHALL BE SEEDED WITH FESCUE, UNLESS OTHERWISE DIRECTED BY THE LANDSCAPE ARCHITECT. SEE SEEDING NOTES THIS SHEET.

O. PLANT MATERIALS SHOWN ON PLANS ARE A GRAPHIC REPRESENTATION ONLY. CONTRACTOR SHALL PERFORM ALL LANDSCAPE INSTALLATION ON THE SUBJECT PROPERTY, AND NOT ON ADJACENT PROPERTIES, UNLESS OTHERWISE DIRECTED BY THE OWNER OR THE OWNER'S REPRESENTATIVE. ROOTBALLS OF SHRUBS AND TREES SHALL BE PLANTED, IN THEIR ENTIRETY, WITHIN THE BOUNDARIES OF THE SUBJECT PROPERTY.

P. CONTRACTOR SHALL PROVIDE A MINIMUM 2% SLOPE AWAY FROM ALL STRUCTURES, UNLESS OTHERWISE DIRECTED BY THE CIVIL ENGINEER.

Q. ALL MULCHED BEDS SHALL HAVE AN APPROVED GEO-TEXTILE WEED BARRIER INSTALLED PER THE PLANTING DETAILS . PRODUCT SPECIFICATION SHEETS SHALL BE SUBMITTED TO THE OWNER OR OWNERS REPRESENTATIVE PRIOR TO ORDERING MATERIAL.

No.	REVISIONS	DATE	BY
1	ADDRESS DPU 60% COMMENTS	2-27-13	KHA
2	ADDRESS DPU 60% COMMENTS	8-16-13	KHA
3	100% SUBMITTAL	1-15-14	KHA

Kimley-Horn
and Associates, Inc.

1700 WILLOW LAWN DR, SUITE 200, RICHMOND, VA 23230
PHONE: 804-673-3882 FAX: 804-673-3980
WWW.KIMLEY-HORN.COM

100%
SUBMITTAL

KHA PROJECT
113157004
DATE
01/15/2014
SCALE AS SHOWN
DESIGNED BY RRP
DRAWN BY RRP
CHECKED BY BJB

GENERAL NOTES

T STREET GREEN ALLEY
PREPARED FOR
THE CITY OF RICHMOND
RICHMOND VIRGINIA

SHEET NUMBER
CA-102

SHEET CS-101

SHEET CS-102

No.	REVISIONS	DATE	BY
1	ADDRESS DPU 60% COMMENTS	2-27-13	KHA
2	ADDRESS DPU 60% COMMENTS	8-16-13	KHA
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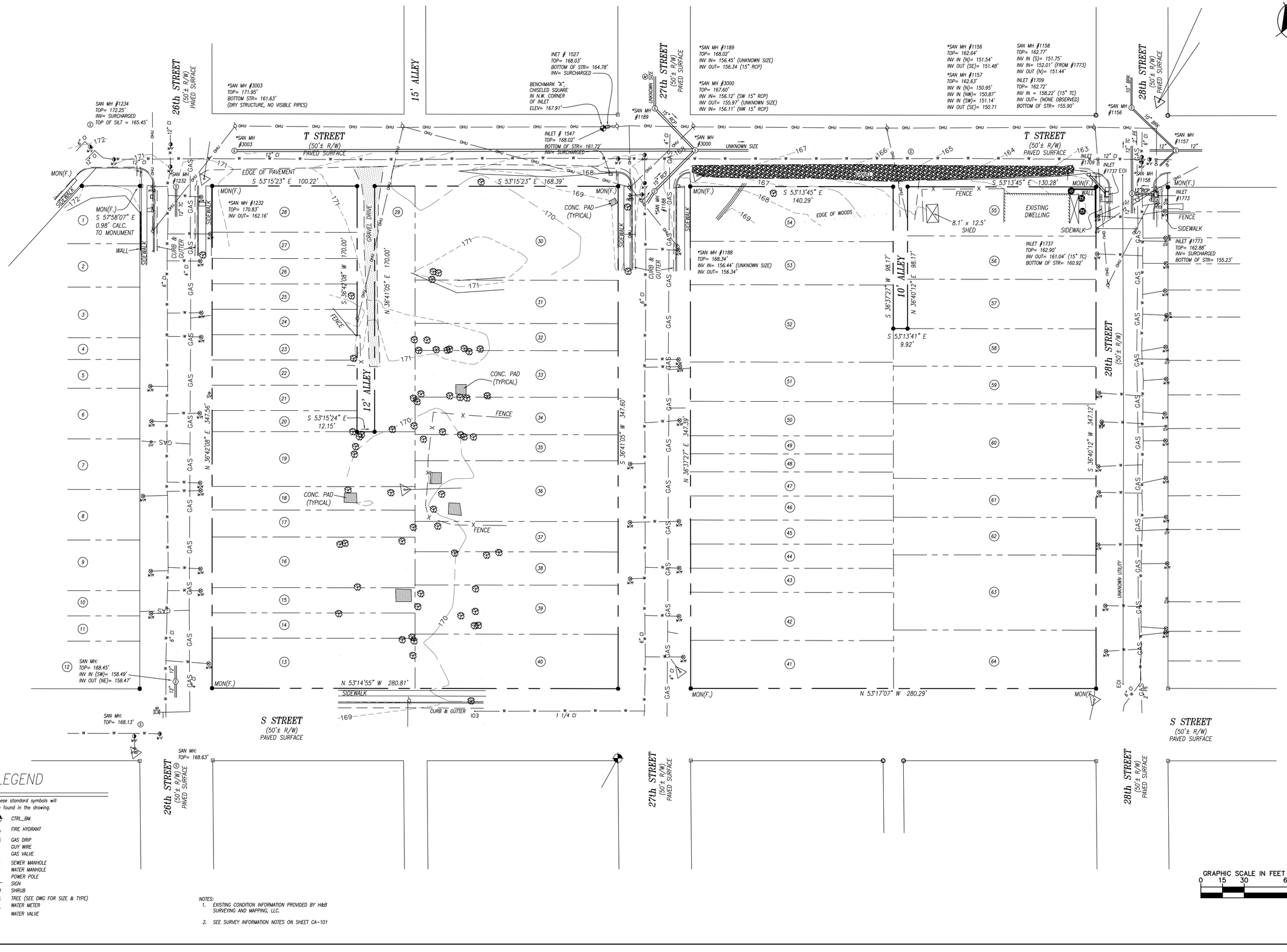
SHEET INDEX

T STREET GREEN ALLEY
PREPARED FOR
THE CITY OF RICHMOND
RICHMOND VIRGINIA

SHEET NUMBER
CV-100

Plotted By: Brewer, Brian Sheet Set: Kho Layout: 24x36 January 15, 2014 04:48:13pm K:\RIC_ROW\113157_RIC_OnCall\004_Church Hill Model Housing Block\CAD\Sheets\CV-101 EX_CON.dwg



LEGEND

These standard symbols will be found in the drawing.

- CTRL_BM
- FIRE HYDRANT
- GAS DRIP
- GUY WIRE
- GAS VALVE
- SEWER MANHOLE
- WATER MANHOLE
- POWER POLE
- SIGN
- SHRUB
- TREE (SEE DWG FOR SIZE & TYPE)
- WATER METER
- WATER VALVE

NOTES:
1. EXISTING CONDITION INFORMATION PROVIDED BY H&B SURVEYING AND MAPPING, LLC.
2. SEE SURVEY INFORMATION NOTES ON SHEET CA-101

GRAPHIC SCALE IN FEET
0 15 30 60

No.	REVISIONS	DATE	BY
1	ADDRESS DPU 60% COMMENTS	2-27-13	KHA
2	ADDRESS DPU 60% COMMENTS	8-16-13	KHA
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EXISTING CONDITIONS

T STREET GREEN ALLEY
PREPARED FOR
THE CITY OF RICHMOND
VIRGINIA
RICHMOND

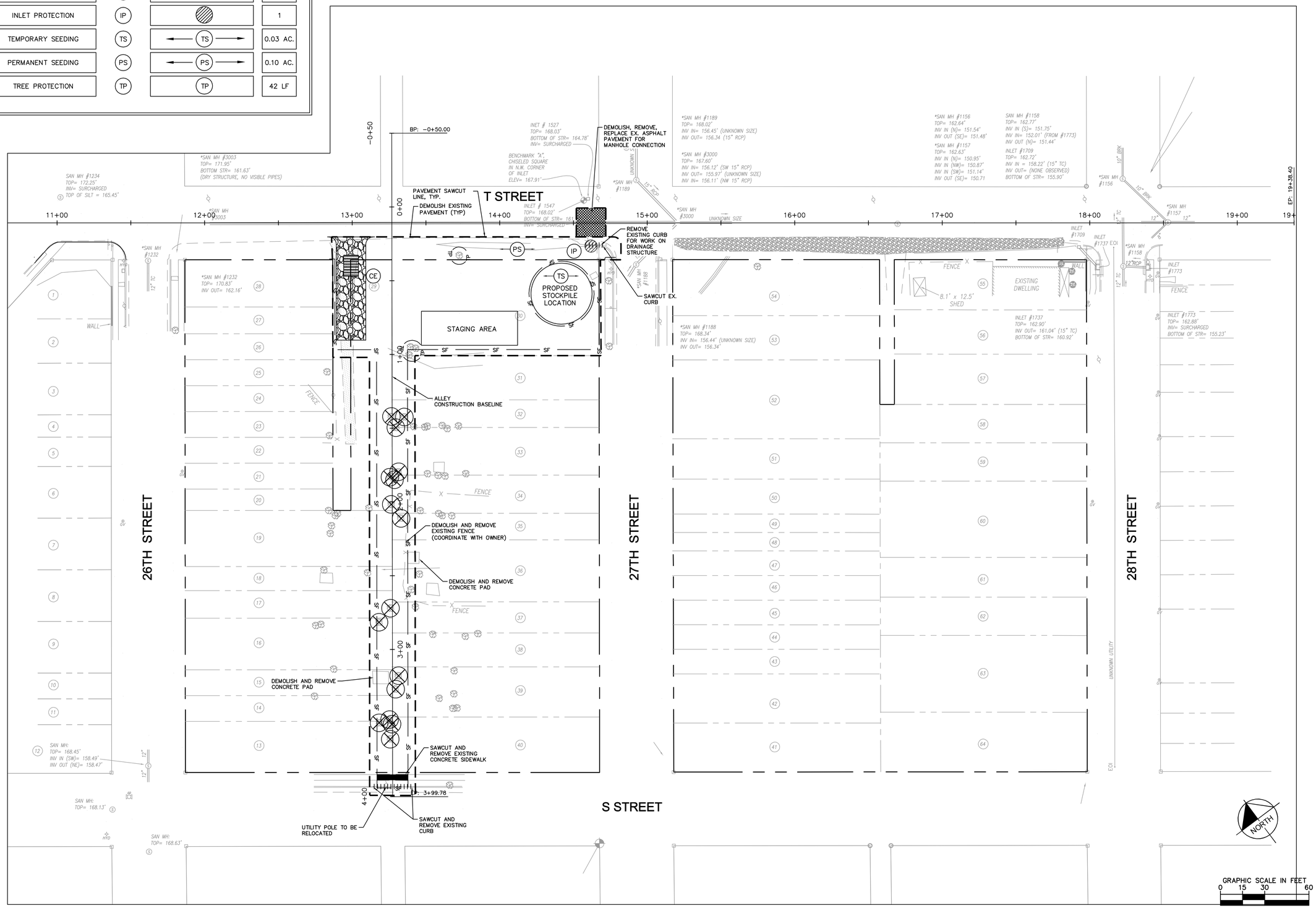
SHEET NUMBER
CV-101

VIRGINIA UNIFORM CODING SYSTEM FOR EROSION AND SEDIMENT CONTROL

STD. & SPEC.	MEASURE	CALLOUT	SYMBOL	QUANITY
3.02	CONSTRUCTION ENTRANCE	CE		1
3.05	SILT FENCE	SF	SF SF	915 LF.
3.07	INLET PROTECTION	IP		1
3.31	TEMPORARY SEEDING	TS	TS	0.03 AC.
3.31	PERMANENT SEEDING	PS	PS	0.10 AC.
3.38	TREE PROTECTION	TP	TP	42 LF

LEGEND

- LIMITS OF DISTURBANCE
- TREE DEMO
- CURB AND GUTTER DEMO



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1	ADDRESS DPU 60% COMMENTS	2-27-13	KHA
2	ADDRESS DPU 60% COMMENTS	8-16-13	KHA
3	100% SUBMITTAL	1-15-14	KHA

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100% SUBMITTAL

KHA PROJECT	113157004
DATE	01/15/2014
SCALE	AS SHOWN
DESIGNED BY	RRP
DRAWN BY	RRP
CHECKED BY	BJB

DEMOLITION, EROSION AND SEDIMENT CONTROL

T STREET GREEN ALLEY
PREPARED FOR
THE CITY OF RICHMOND
RICHMOND VIRGINIA

SHEET NUMBER
CE-101

CITY OF RICHMOND STANDARD EROSION CONTROL MEASURES

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 (UNDISTURBED) FOR LONGER THAN 30 DAYS. PERMANENT STABILIZATION SHALL BE APPLIED TO AREAS THAT ARE TO BE LEFT DORMANT FOR MORE THAN ONE YEAR.
2. EXCESS EXCAVATION DISPOSED OF OFF THE SITE SHALL BE DISPOSED OF IN ACCORDANCE WITH THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK.
3. EROSION AND SEDIMENT CONTROLS SHALL BE INSTALLED IN ACCORDANCE WITH VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK AND SHALL BE PLACED PRIOR TO OR AS THE FIRST STEP OF THE LAND DISTURBING ACTIVITY.
4. EROSION AND SEDIMENT CONTROLS SHALL BE MAINTAINED SO THAT THE SEDIMENT CARRYING RUNOFF FROM THE SITE WILL NOT ENTER STORM DRAINAGE FACILITIES.
5. EROSION AND SEDIMENT CONTROLS SHALL BE MAINTAINED UNTIL THE DISTURBED AREA IS STABILIZED.
6. PROPERTIES ADJOINING THE SITE SHALL BE KEPT CLEAN OF MUD OR SILT CARRIED FROM THE SITE BY VEHICULAR TRAFFIC OR RUNOFF.
7. THE DISPOSAL OF WASTE MATERIALS REMOVED FROM EROSION AND SEDIMENT CONTROL FACILITIES AND THE DISPOSAL OF THESE FACILITIES SHALL BE IN ACCORDANCE WITH THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK.
8. STABILIZATION MEASURES SHALL BE APPLIED TO EARTHEN STRUCTURES SUCH AS DAMS, DIKES AND DIVERSIONS IMMEDIATELY AFTER INSTALLATION.
9. DURING CONSTRUCTION OF THE PROJECT, SOIL STOCKPILES 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 SOIL INTENTIONALLY TRANSPORTED FROM THE PROJECT SITE.

GENERAL EROSION AND SEDIMENT CONTROL NOTES

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 EROSION AND SEDIMENT CONTROL REGULATIONS.
2. THE PLAN APPROVING AUTHORITY MUST BE NOTIFIED ONE WEEK PRIOR TO THE PRECONSTRUCTION CONFERENCE, ONE WEEK PRIOR TO THE COMMENCEMENT OF LAND DISTURBING ACTIVITY, AND ONE WEEK PRIOR TO THE FINAL INSPECTION.
3. ALL EROSION AND SEDIMENT CONTROL MEASURES ARE TO BE PLACED PRIOR TO OR AS THE FIRST STEP IN CLEARING.
4. A COPY OF THE APPROVED EROSION AND SEDIMENT CONTROL PLAN SHALL BE MAINTAINED ON THE SITE AT ALL TIMES.
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.
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.
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.
8. DURING DEWATERING OPERATIONS, WATER WILL BE PUMPED INTO AN APPROVED FILTERING DEVICE.
9. THE CONTRACTOR SHALL INSPECT ALL EROSION CONTROL MEASURES PERIODICALLY AND AFTER EACH RUNOFF-PRODUCING RAINFALL EVENT. ANY NECESSARY REPAIRS OR CLEANUPTO MAINTAIN THE EFFECTIVENESS OF THE EROSION CONTROL DEVICES SHALL BE MADE IMMEDIATELY.

PROJECT DESCRIPTION

THIS PROJECT CONSISTS OF IMPROVEMENTS ASSOCIATED WITH THE CONSTRUCTION OF A NEW 20' WIDE ALLEY WITH PERMEABLE PAVERS AND UNDERDRAIN SYSTEM ALONG WITH ROADWAY IMPROVEMENTS ALONG THE SOUTH SID E OF T STREET. THE PROJECT IS LOCATED BETWEEN 26TH AND 28TH STREET AND T STREET AND S STREET IN THE CITY OF RICHMOND. THE DISTURBED AREA OF THE PROJECT WILL TOTAL APPROXIMATELY 0.55± ACRES. PROPOSED IMPROVEMENTS INCLUDE A NEW ALLEY WITH PERMEABLE PAVERS AND CONCRETE APRON, AND SUBSURFACE DRAINAGE SYSTEM. PROJECT WORK INCLUDES DEMOLITION, CLEARING, MINOR GRADING, UTILITY INSTALLATIONS, PAVING, AND LANDSCAPING.

CONSTRUCTION IS EXPECTED TO BE COMPLETE WITHIN SEVEN MONTHS OF THE COMMENCEMENT OF LAND-DISTURBING ACTIVITY.

EXISTING SITE CONDITIONS

CURRENTLY, THE PROJECT AREA IS A DEVELOPED RESIDENTIAL BLOCK OF HOMES WITH EXISTING VEGETATION AND TREES. ELEVATIONS RANGE FROM APPROXIMATELY 163 FEET TO 172 FEET ABOVE SEA LEVEL WITH EXISTING SLOPES AS MINIMAL AS LESS THAN ONE-HALF PERCENT. EXISTING ON-SITE VEGETATION IN THE ALLEY AREA CONSISTS MAINLY OF GRASS BUT THERE ARE SEVERAL LARGE TREES WITHIN THE ALIGNMENT OF THE ALLEY THAT WILL REQUIRE REMOVAL AND SEVERAL TREES IN THE AREA THAT MUST BE PROTECTED. T STREET IS AN EXISTING ASPHALT PAVEMENT STREET WITH NO CURB AND GUTTER OR DEDICATED DRAINAGE CONVEYANCE SYSTEM ON THE SOUTH SIDE OF THE STREET.

STORMWATER RUNOFF FROM T STREET FLOWS WEST TO EAST AND IS INTERCEPTED BY A CATCH BASIN (#1547) LOCATED AT THE INTERSECTION OF T STREET AND 27TH STREET. THE EXISTING ALLEY AREA IS VERY FLAT AND THERE IS NO DISCERNABLE DRAINAGE PATH FOR A MAJORITY OF THIS AREA HOWEVER IT DOES APPEAR THIS DRAINAGE AREA FOR SPLITS NORTH AND SOUTH APPROXIMATELY 115 FEET SOUTH OF TREET STREET. BASED ON SITE RECONNAISSANCE, THE OBSERVABLE DRAINAGE STRUCTURES APPEAR ADEQUATE AND THERE NO SERIOUS DRAINAGE ISSUES OR EROSION PROBLEMS OBSERVED.

ADJACENT AREAS

THE SUBJECT SITE IS BORDERED BY S STREET TO THE SOUTH, 26TH STREET AND NINE MILE ROAD TO THE WEST, 26TH STREET TO THE EAST, AND T STREET TO THE NORTH. APPROPRIATE PERIMETER CONTROLS AS SHOWN THE EROSION CONTROL PLAN SHEET(S) OF THE SITE PLAN WILL PROVIDE SUFFICIENT PROTECTION FROM THESE ADJACENT AREAS.

OFF-SITE AREAS

MINIMAL OFF-SITE LAND DISTURBANCE WITHIN THE PROJECT AREA WILL BE REQUIRED FOR STOCKPILING OF MATERIALS AND TEMPORARY SOIL EXCAVATIONS. NO OTHER OFF-SITE LAND DISTURBANCE IS NECESSARY OR PROPOSED TO COMPLETE THIS PROJECT.

SOILS

ACCORDING TO THE NATIONAL RESOURCES CONSERVATION SERVICE (NRCS) THE PROJECT AREA HAS TWO IDENTIFIED SOIL TYPES 5A-ATLEE URBAN LAND COMPLEX AND 41-URBAN LAND. NEITHER SOIL TYPE IS LISTED AS A HIGHLY ERODIBLE SOIL AND BOTH ARE COMMON IN URBAN DEVELOPED AREAS.

CRITICAL AREAS

CRITICAL AREAS INCLUDE AREAS OF STEEP SLOPES, AREAS ADJACENT TO WETLANDS, AND OTHER AREAS WITH SERIOUS EROSION POTENTIAL. NO CRITICAL AREAS HAVE BEEN IDENTIFIED FOR THIS PROJECT.

EROSION CONTROL MEASURES

THE FOLLOWING EROSION CONTROL MEASURES AS SHOWN ON THE EROSION CONTROL PLAN SHEET(S) WILL BE USED FOR THIS PROJECT:

3.02 TEMPORARY STONE CONSTRUCTION ENTRANCE – A STABILIZED STONE PAD WITH A FILTER FABRIC UNDERLINER WILL BE PROVIDED AT EACH CONSTRUCTION ACCESS POINT. THE PURPOSE OF THIS PRACTICE IS TO REDUCE THE AMOUNT OF MUD TRANSPORTED ONTO PAVED PUBLIC ROADS BY MOTOR VEHICLES OR RUNOFF.

3.05 SILT FENCE – A TEMPORARY SEDIMENT BARRIER CONSISTING OF A SYNTHETIC FILTER FABRIC STRETCHED ACROSS AND ATTACHED TO SUPPORTING POSTS AND ENTRENCHED WILL BE PROVIDED AROUND MOST OF THE SITE PERIMETER. THE PURPOSE OF THIS PRACTICE IS TO INTERCEPT AND DETAIN SMALL AMOUNTS OF SEDIMENT FROM DISTURBED AREAS DURING CONSTRUCTION OPERATIONS IN ORDER TO PREVENT SEDIMENT FROM LEAVING THE SITE.

3.07 STORM DRAIN INLET PROTECTION – A SEDIMENT FILTER OR AN EXCAVATED IMPOUNDING AREA AROUND A STORM DRAIN DROP INLET OR CURB INLET WILL BE PROVIDED AT ALL INLET LOCATIONS WITHIN THE LIMITS OF DISTURBANCE. THE PURPOSE OF THIS PRACTICE IS TO PREVENT SEDIMENT FROM ENTERING STORM DRAINAGE SYSTEMS PRIOR TO PERMANENT STABILIZATION OF THE DISTURBED AREA.

3.31 TEMPORARY SEEDING – THE ESTABLISHMENT OF A TEMPORARY VEGETATIVE COVER ON DISTURBED AREAS BY SEEDING WITH APPROPRIATE RAPIDLY GROWING ANNUAL PLANTS WILL BE PROVIDED ON ALL DISTURBED AREAS THAT WILL NOT BE BROUGHT TO FINAL GRADE WITHIN 30 DAYS. THE PURPOSE OF THIS PRACTICE IS TO PROVIDE PROTECTION TO BARE SOILS EXPOSED DURING CONSTRUCTION UNTIL PERMANENT VEGETATION OR OTHER EROSION CONTROL MEASURES CAN BE ESTABLISHED.

3.32 PERMANENT SEEDING – THE ESTABLISHMENT OF PERENNIAL VEGETATIVE COVER ON DISTURBED AREAS BY PLANTING SEED WILL BE PROVIDED AS SHOWN ON THE LANDSCAPING PLAN. THE PURPOSE OF THIS PRACTICE IS TO REDUCE EROSION AND DECREASE SEDIMENT YIELD FROM DISTURBED AREAS AND TO PERMANENTLY STABILIZE DISTURBED AREAS IN A MANNER THAT IS ECONOMICAL, ADAPTABLE TO SITE CONDITIONS, AND ALLOWS SELECTION OF THE MOST APPROPRIATE PLANT MATERIALS.

3.38 TREE PROTECTION – A BOUNDARY WILL BE ESTABLISHED AROUND EXISTING TREES TO ENSURE THE SURVIVAL OF DESIRABLE TREES WHERE THEY WILL BE EFFECTIVE FOR EROSION AND SEDIMENT CONTROL, WATERHSHED PROTECTION, LANDSCAPE BEAUTIFICATION, DUST AND POLLUTION CONTROL, NOISE REDUCTION, SHADE AND OTHER ENVIRONMENTAL BENEFITS WHILE THE LAND IS BEING DEVELOPED.

PERMANENT STABILIZATION

PERMANENT STABILIZATION WILL BE ACHIEVED WITH SEEDING OR SODDING AS SHOWN ON THE EROSION CONTROL PLAN SHEETS FOR ALL VEGETATED AREAS. CONCRETE, PAVEMENT, AND OTHER IMPERVIOUS SURFACES WILL STABILIZE THE REMAINDER OF THE SITE.

STORMWATER MANAGEMENT

POST-DEVELOPMENT DRAINAGE PATTERNS HAVE GENERALLY BEEN MAINTAINED COMPARED TO PRE-DEVELOPMENT DRAINAGE PATTERNS AS SHOWN ON SHEET CG-101. THE OVERALL 10-YEAR PEAK FLOW WILL BE CONTROLLED THROUGH THE USE OF A MANHOLE CONTROL STRUCTURE EQUIPPED WITH AN ORIFICE AND CONCRETE WEIR THAT WILL CONTROL STORMWATER FLOWS AND UTILIZE THE STONE RESERVOIR OF THE PERMEABLE PAVER SYSTEM FOR STORAGE. MINIMUM STANDARD 19 OF THE VIRGINIA EROSION AND SEDIMENT CONTROL REGULATIONS WILL BE MET.

CALCULATIONS

RATIONAL METHOD CALCULATIONS HAVE BEEN PERFORMED TO CONFIRM THAT THE 10-YEAR HYDRAULIC GRADE LINE IS CONTAINED THROUGHOUT THE ENTIRE STORM DRAINAGE SYSTEM AND STONE RESERVOIR LAYER IN THE ALLEY. STORMWATER CALCULATIONS FOR THE PROJECT MAY BE FOUND ON SHEETS CG-101 AND CG-102.

MINIMUM STANDARDS (4VAC50-30-40)

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

1. PERMANENT OF TEMPORARY SOIL STABILIZATION SHALL BE APPLIED TO DENUDED AREAS WITHIN SEVEN DAYS AFTER FINAL GRADE IS REACHED ON ANY PORTION OF THE SITE. TEMPORARY SOIL STABILIZATION SHALL BE APPLIED WITHIN SEVEN DAYS TO DENUDED AREAS THAT MAY NOT BE AT FINAL GRADE BUT WILL REMAIN DORMANT FOR LONGER THAN 14 DAYS. PERMANENT STABILIZATION SHALL BE APPLIED TO AREAS THAT ARE TO BE LEFT DORMANT FOR MORE THAN ONE YEAR.

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 UPSLOPE LAND DISTURBANCE TAKES PLACE.

5. STABILIZATION MEASURES SHALL BE APPLIED TO EARTHEN STRUCTURES SUCH AS DAMS, DIKES AND DIVERSION 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 SLOPE STABILIZING MEASURES UNTIL THE PROBLEM IS CORRECTED.

8. CONCENTRATED RUNOFF SHALL NOT FLOW DOWN CUT 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 OPERATIONAL, 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 SUED FOR THESE STRUCTURES IF ARMORED BY NONERODIBLE COVER MATERIALS.

13. 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 WORK IN OR CROSSING LIVE WATERCOURSES SHALL BE MET.

15. THE BED AND BANKS OF A WATERCOURSE 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 AF SEDIMENT IS REMOVED IN THIS MANNER. THIS PROVISION SHALL APPLY TO INDIVIDUAL DEVELOPMENT LOTS AS WELL AS TO LARGER LAND-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 MEASURE 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 INCREASE 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 SITE SHALL BE DISCHARGED DIRECTLY INTO AN ADEQUATE NATURAL OR MAN-MADE RECEIVING CHANNEL, PIPE OR STORM SEWER SYSTEM. FOR THOSE SITES WHERE RUNOFF IS DISCHARGED INTO A PIPE OR PIPE SYSTEM, DOWNSTREAM STABILITY ANALYSES 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 QUESTIONS;
      2. OR
         - NATURAL CHANNELS SHALL BE ANALYZED BY THE USE OF A TWO-YEAR STORM TO VERIFY THAT STORMWATER WILL NOT OVERTOP CHANNEL BANKS OR CAUSE EROSION OF CHANNEL BED OR BANKS; AND
         - 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 STORMWATER WILL NOT CAUSE EROSION OF CHANNEL BED OR BANKS; AND
         - PIPES AND STORM SEWER 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; OR
      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 ANALYSES 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 CONDITION 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.

No.	REVISIONS	DATE	BY
1	ADDRESS DPU 60% COMMENTS	2-27-13	KHA
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3	100% SUBMITTAL	1-15-14	KHA

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100% SUBMITTAL

KHA PROJECT 011315700
DATE 01/15/2014
SCALE AS SHOWN
DESIGNED BY RRP
DRAWN BY RRP
CHECKED BY BJB

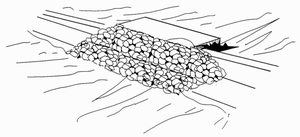
EROSION AND SEDIMENT CONTROL NOTES

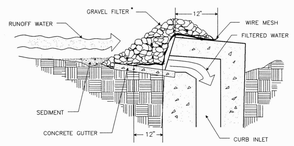
T STREET GREEN ALLEY
PREPARED FOR
THE CITY OF RICHMOND
VIRGINIA
RICHMOND

SHEET NUMBER
CE-501

1992 3.07

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.

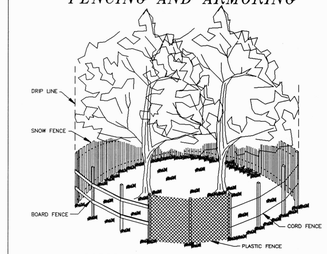
Source: Va. DSWC Plate 3.07-6

CURB INLET PROTECTION

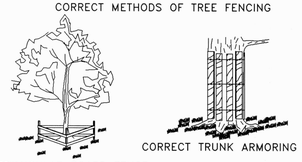
SCALE: N.T.S.

1992 3.38

FENCING AND ARMORING



CORRECT METHODS OF TREE FENCING



TRIANGULAR BOARD FENCE

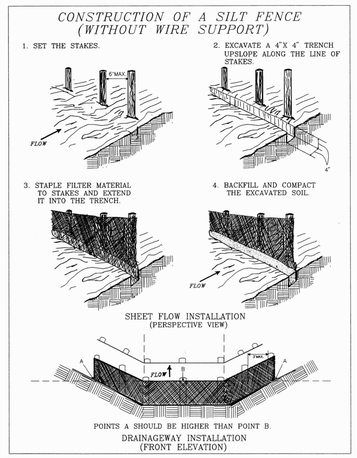
Source: Va. DSWC Plate 3.38-2

TREE PROTECTION

SCALE: N.T.S.

1992 3.05

CONSTRUCTION OF A SILT FENCE (WITHOUT WIRE SUPPORT)



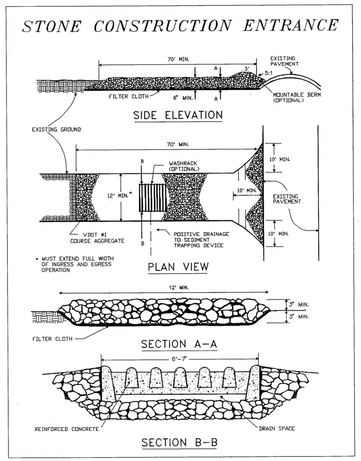
Source: Adapted from Installation of Straw and Fabric Filter Barriers for Sediment Control, Sherwood and Wyant Plate 3.05-2

SILT FENCE

SCALE: N.T.S.

1992 3.02

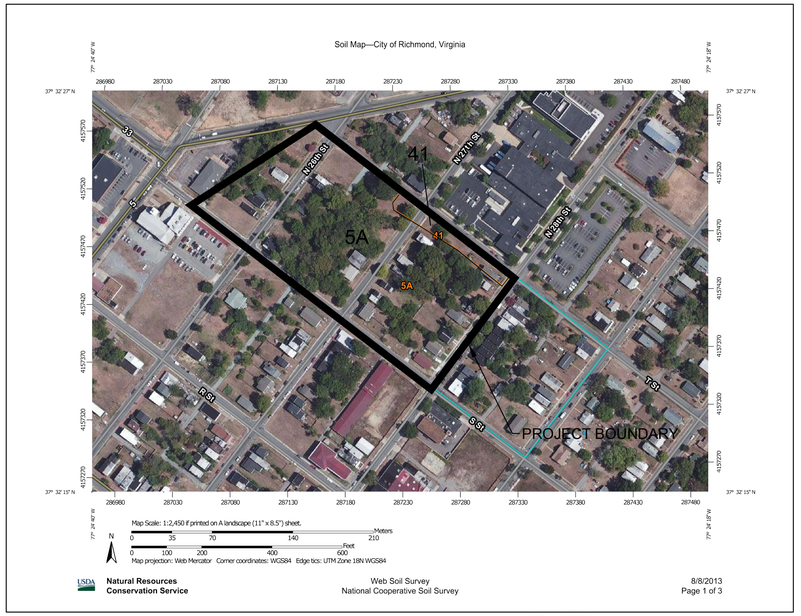
STONE CONSTRUCTION ENTRANCE



Source: Adapted from 1983 Maryland Standards for Soil Erosion and Sediment Control, and Va. DSWC Plate 3.02-1

CONSTRUCTION ENTRANCE

SCALE: N.T.S.



SOIL MAP

SCALE: N.T.S.

SOIL TYPES

5A — ATLEE URBAN LAND COMPLEX
41 — URBAN LAND

1992 3.31

Mulching

1. Seedings made in fall for winter cover and during hot and dry summer months shall be mulched according to MULCHING, Std. & Spec. 3.35, except that hydromulches (fiber mulch) will not be considered adequate. Straw mulch should be used during these periods.

2. Temporary seedings made under favorable soil and site conditions during optimum spring and fall seeding dates may not require mulch.

Re-seeding

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

TEMPORARY SEEDING

SCALE: N.T.S.

1992 3.32

TABLE 3.32-D
SITE SPECIFIC SEEDING MIXTURES FOR PIEDMONT AREA

	Total Lbs. Per Acre
Minimum Care Lawn	
- Commercial or Residential	175-200 lbs.
- Kentucky 31 or Turf-Type Tall Fescue	95-100%
- Improved Perennial Ryegrass	0-5%
- Kentucky Bluegrass	0-5%
High-Maintenance Lawn	200-250 lbs.
- Kentucky 31 or Turf-Type Tall Fescue	100%
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 Fescue	108 lbs.
- Red Top Grass	2 lbs.
- Seasonal Nurse Crop *	20 lbs.
- Crownvetch **	20 lbs.
	150 lbs.

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

** Substitute Sericea lespedeza for Crownvetch east of Farmville, Va. (May through September use hulled Sericea, all other periods, use unhulled Sericea). If Flatpea is used in lieu of Crownvetch, increase rate to 30 lbs./acre. All legume seed must be properly inoculated. Weeping Lovegrass may be added to any slope or low-maintenance mix during warmer seeding periods; add 10-20 lbs./acre in mixes.

PERMANENT SEEDING

SCALE: N.T.S.

No.	REVISIONS	DATE	BY
1	ADDRESS DPU 60% COMMENTS	2-27-13	KHA
2	ADDRESS DPU 60% COMMENTS	8-16-13	KHA
3	100% SUBMITTAL	1-15-14	KHA

Kimley-Horn and Associates, Inc.

1700 WILLOW LAWN DR., SUITE 200, RICHMOND, VA 23230
PHONE: 804-673-3882 FAX: 804-673-3980
WWW.KIMLEY-HORN.COM

100% SUBMITTAL

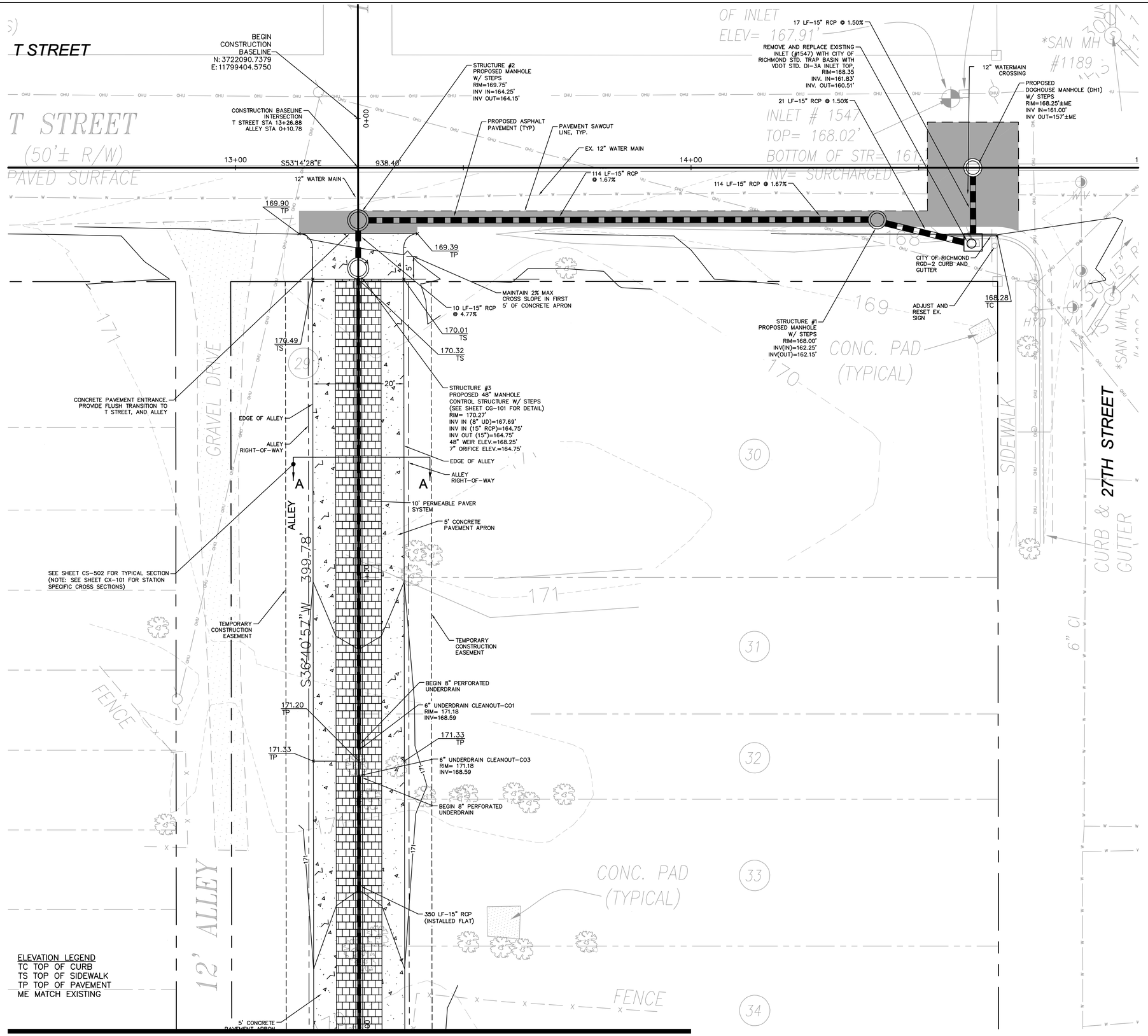
KHA PROJECT 113157004
DATE 01/15/2014
SCALE AS SHOWN
DESIGNED BY RRP
DRAWN BY RRP
CHECKED BY BJB

EROSION AND SEDIMENT CONTROL DETAILS

T STREET GREEN ALLEY

PREPARED FOR
THE CITY OF RICHMOND
VIRGINIA
RICHMOND

SHEET NUMBER
CE-502



No.	REVISIONS	DATE	BY
1	ADDRESS DPU 60% COMMENTS	2-27-13	KHA
2	ADDRESS DPU 60% COMMENTS	8-16-13	KHA
3	100% SUBMITTAL	1-15-14	KHA

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100% SUBMITTAL

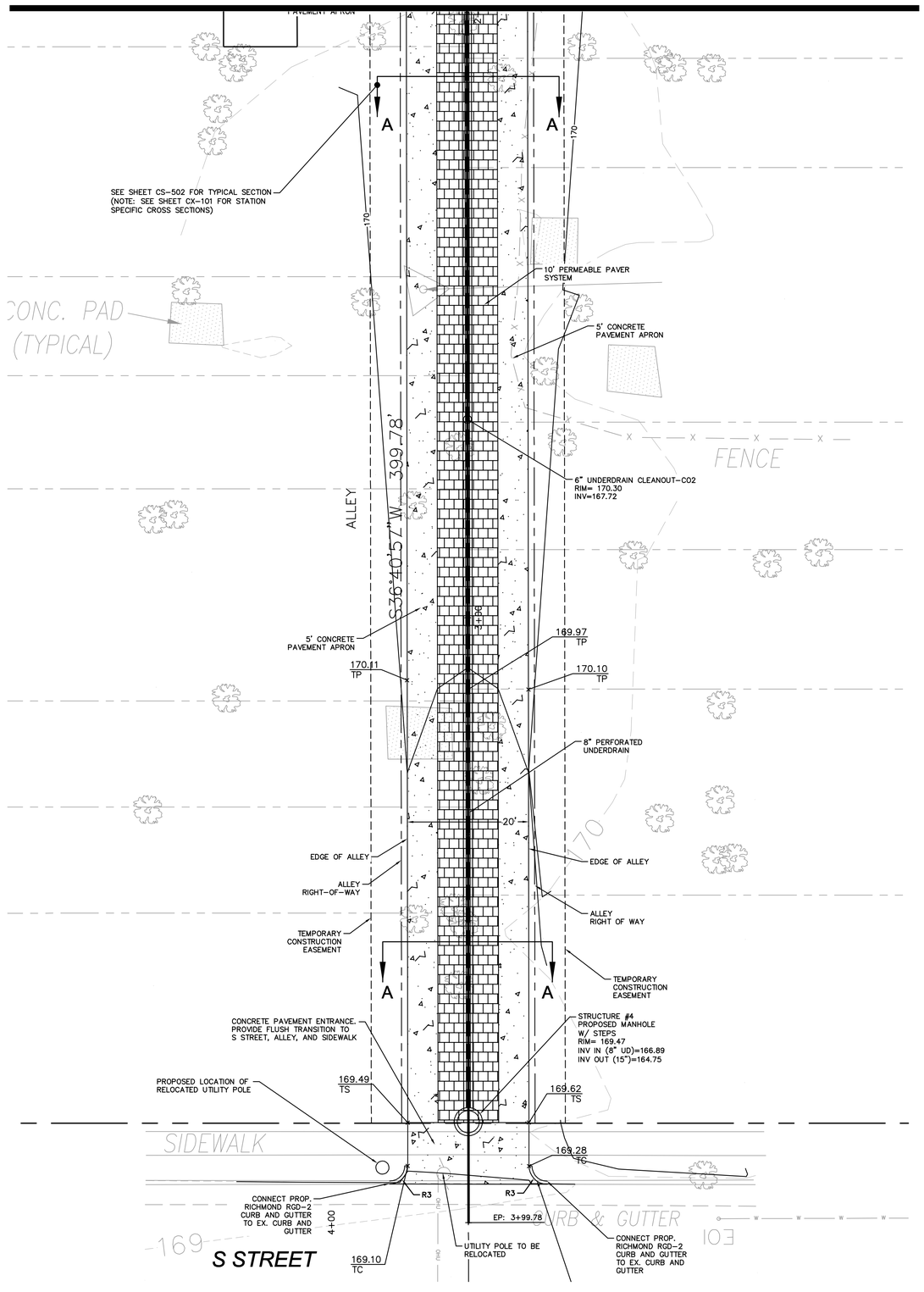
KHA PROJECT	113157004
DATE	01/15/2014
SCALE	AS SHOWN
DESIGNED BY	RRP
DRAWN BY	RRP
CHECKED BY	BJB

SITE PLAN

T STREET GREEN ALLEY
PREPARED FOR
THE CITY OF RICHMOND
RICHMOND VIRGINIA

SHEET NUMBER
CS-101

MATCHLINE 2+00 SHEET CS-101



ELEVATION LEGEND
TC TOP OF CURB
TS TOP OF SIDEWALK
TP TOP OF PAVEMENT
ME MATCH EXISTING

NORTH

GRAPHIC SCALE IN FEET
0 # ## ##

No.	REVISIONS	DATE	BY
1	ADDRESS DPU 60% COMMENTS	2-27-13	KHA
2	ADDRESS DPU 60% COMMENTS	8-16-13	KHA
3	100% SUBMITTAL	1-15-14	KHA

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100% SUBMITTAL

KHA PROJECT 113157004
DATE 01/15/2014
SCALE AS SHOWN
DESIGNED BY RRP
DRAWN BY RRP
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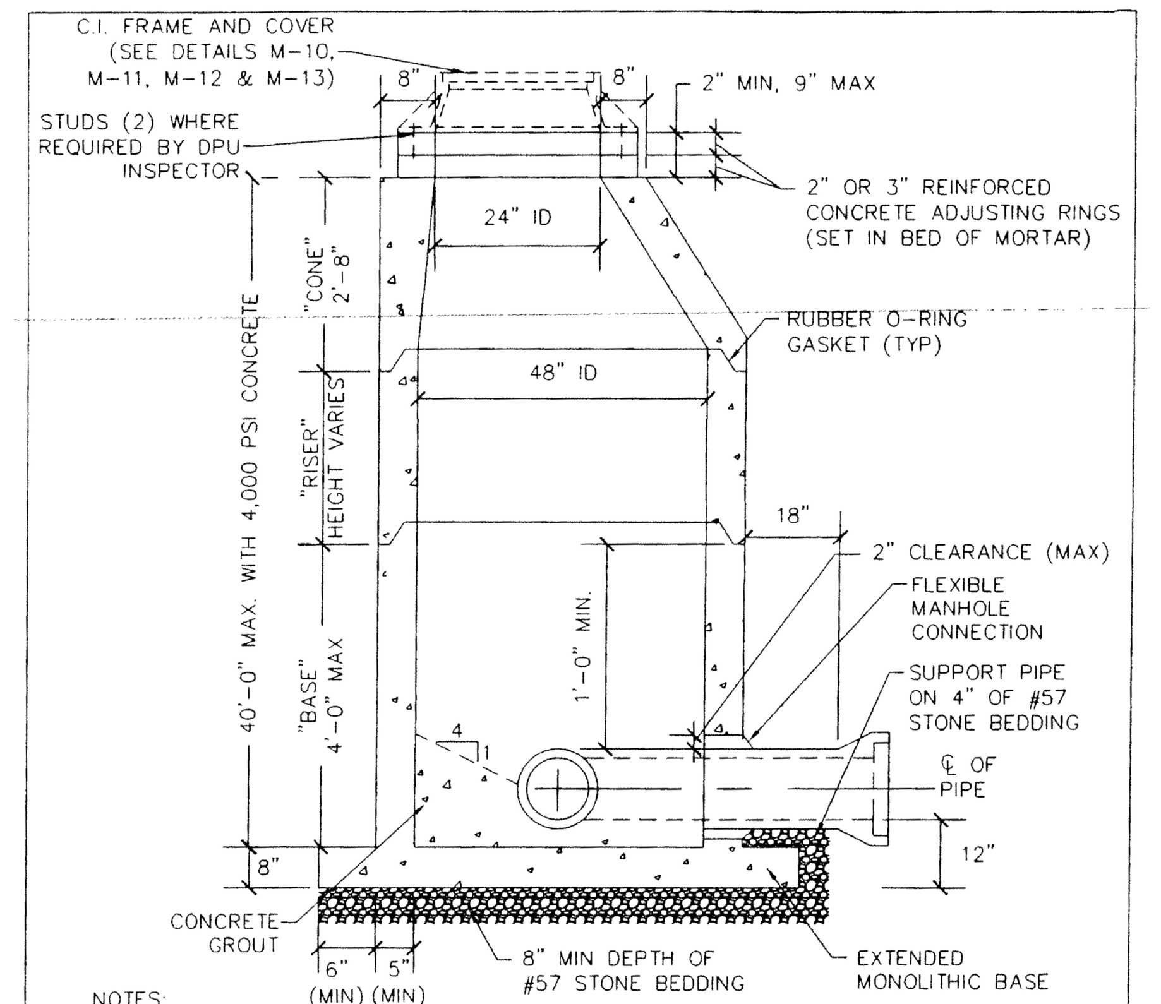
STREET AND ALLEY PLAN

T STREET GREEN ALLEY
PREPARED FOR
THE CITY OF RICHMOND
VIRGINIA
RICHMOND

SHEET NUMBER
CS-102



NOTES:

1. STONE BEDDING SHALL EXTEND TO THE OUTER BOUNDARY OF ALL UNDISTURBED AREAS SURROUNDING THE MANHOLE.
2. FOR SEWERS GREATER THAN 24" SEE DETAIL M-2.
3. EXCAVATION PAYLINE EXTENDS 6" OUTSIDE THE LARGEST DIAMETER OF THE MANHOLE, ALL AROUND.
4. CONTACT MANHOLE MANUFACTURER FOR ADDITIONAL WALL THICKNESS REQUIRED AT MANHOLE DEPTHS GREATER THAN 15'-0".
5. MANHOLE SHALL BE RATED FOR H20 LOADING IN PAVEMENT OR AREAS SUBJECT TO VEHICULAR TRAFFIC.
6. LATERAL INVERTS SHALL BE NO MORE THAN 2'-0" ABOVE INVERT OUT. NO MORE THAN 3 LATERALS PER MANHOLE.

DEPARTMENT OF PUBLIC UTILITIES — CITY OF RICHMOND, VIRGINIA — STANDARD PRECAST CONCRETE MANHOLE SEWERS 8" TO 24" — NOT TO SCALE — REV. 12/09 — M-1

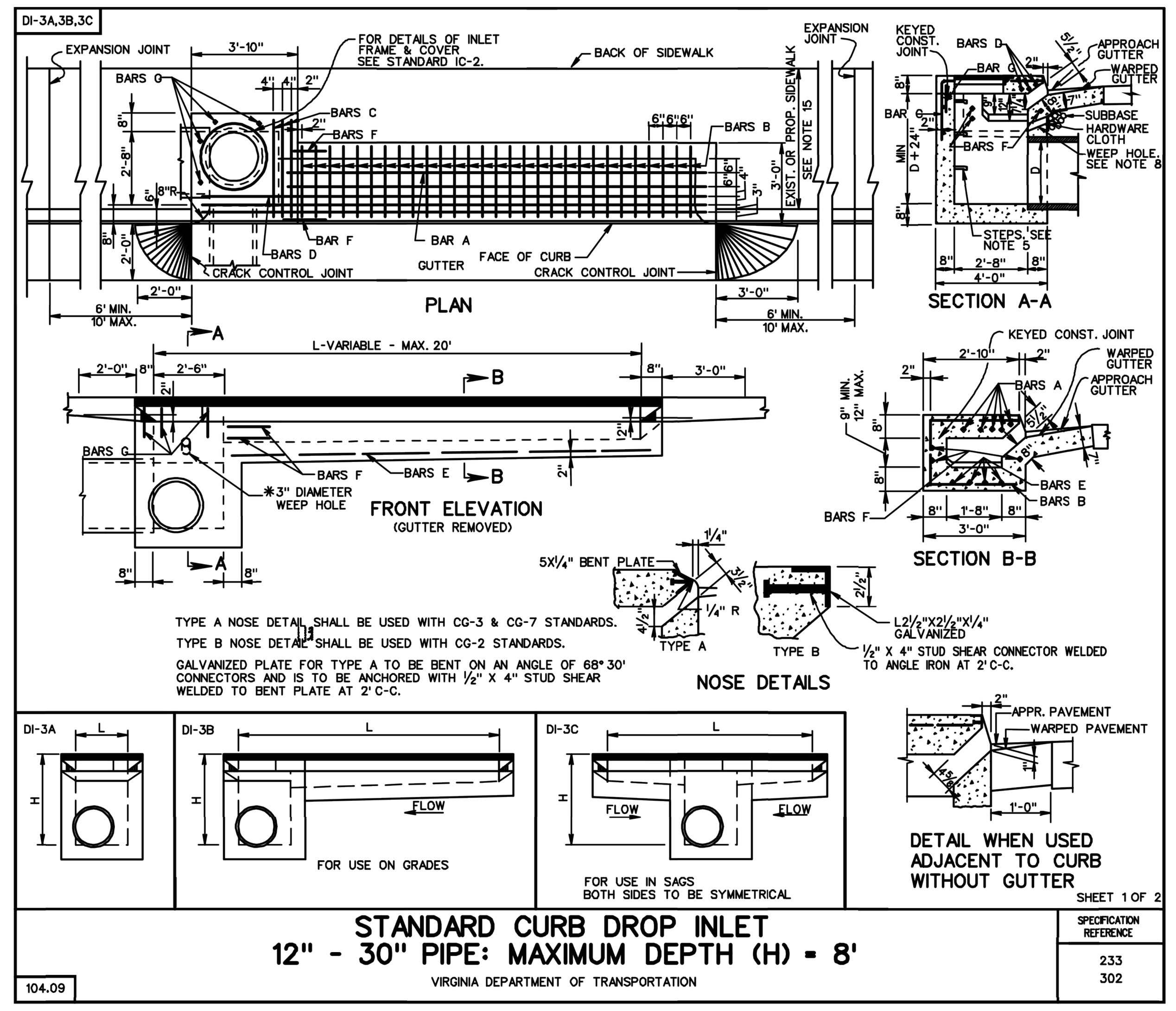


TABLE OF QUANTITIES

DI-3A,3B,3C

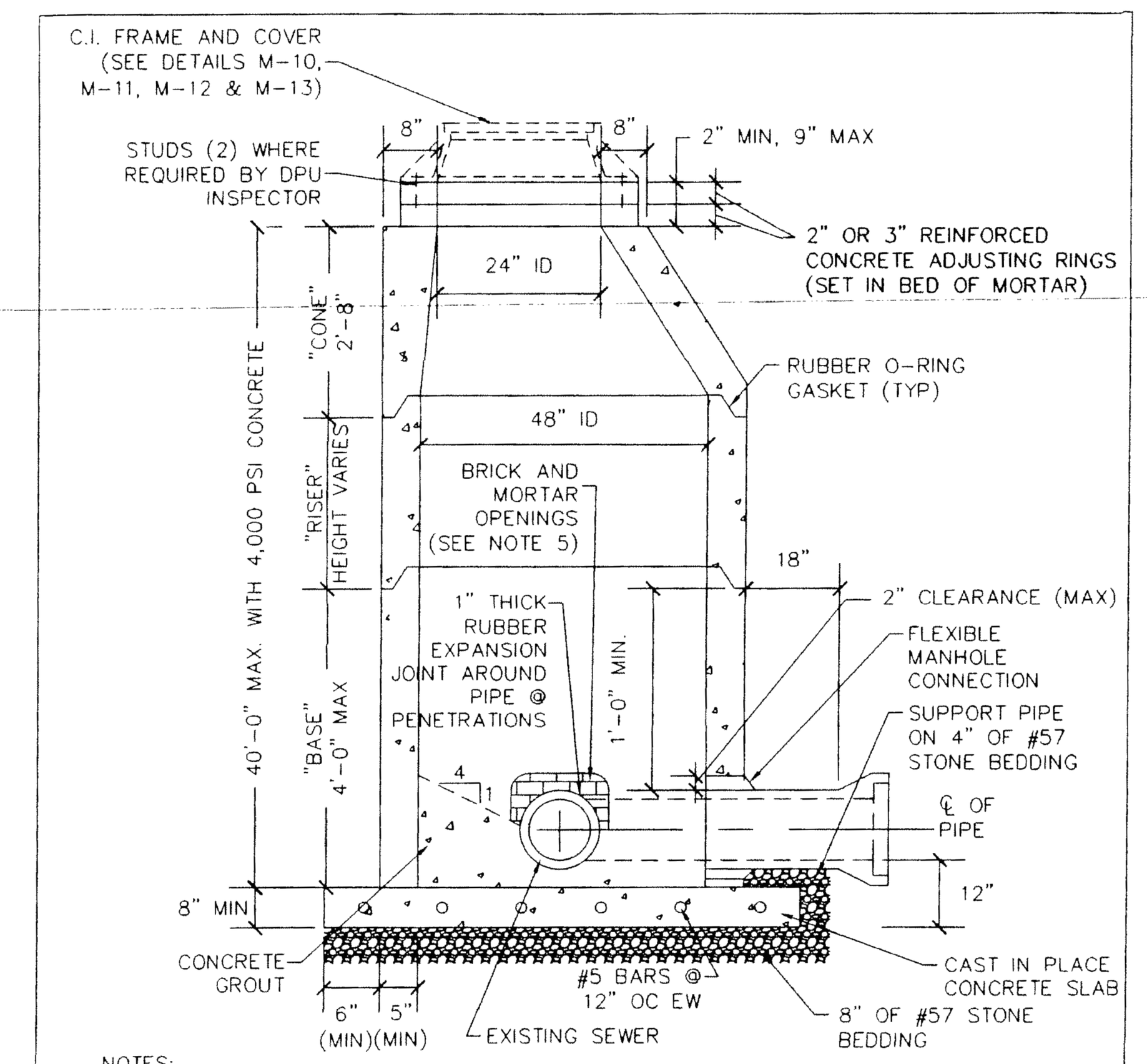
TYPE	L	AREA OF SLOT	Concrete	BARS A		BARS B		BARS C		BARS D		BARS E		BARS F		BARS G		WEIGHT
	Ft.	Sq. Ft.	Cu. Yds.	No.	Lin. Ft. ✱	No.	Lin. Ft. ✱	No.	Lin. Ft. ✱	No.	Lin. Ft.✱	No.	Lin. Ft.✱	No.	Lin. Ft.✱	No.	Lin. Ft.✱	Lbs.
DI-3A	2'-6"	1.15	2.26	-	-	-	-	1	5'-7"	3	3'-2"	-	-	-	-	6	1'-0"	22
DI-3B	4'	1.83	2.59	5	1'-6"	2	6'-7" to 6'-10"	3	5'-7"	3	3'-2"	4	1'-6"	3	1'-6"	4	1'-0"	64
	6'	2.75	3.02	5	3'-6"	6	6'-7" to 6'-10"	3	5'-7"	3	3'-2"	4	3'-6"	3	1'-6"	4	1'-0"	111
	8'	3.67	3.46	5	5'-6"	10	6'-7" to 6'-10"	3	5'-7"	3	3'-2"	4	5'-6"	3	1'-6"	4	1'-0"	158
	10'	4.58	3.90	5	7'-6"	14	6'-7" to 6'-10"	3	5'-7"	3	3'-2"	4	7'-6"	3	1'-6"	4	1'-0"	204
	12'	5.50	4.34	5	9'-6"	18	6'-7" to 6'-10"	3	5'-7"	3	3'-2"	4	9'-6"	3	1'-6"	4	1'-0"	251
	14'	6.42	4.78	5	11'-6"	22	6'-7" to 6'-10"	3	5'-7"	3	3'-2"	4	11'-6"	3	1'-6"	4	1'-0"	298
	16'	7.33	5.22	5	13'-6"	26	6'-7" to 6'-10"	3	5'-7"	3	3'-2"	4	13'-6"	3	1'-6"	4	1'-0"	345
	18'	8.25	5.66	5	15'-6"	30	6'-7" to 6'-10"	3	5'-7"	3	3'-2"	4	15'-6"	3	1'-6"	4	1'-0"	391
	20'	9.17	6.09	5	17'-6"	34	6'-7" to 6'-10"	3	5'-7"	3	3'-2"	4	17'-6"	3	1'-6"	4	1'-0"	438
DI-3C	6'	2.75	3.01	10	1'-9"	4	6'-7" to 6'-10"	5	5'-7"	3	3'-2"	8	1'-9"	6	1'-6"	2	1'-0"	111
	8'	3.67	3.45	10	2'-9"	8	6'-7" to 6'-10"	5	5'-7"	3	3'-2"	8	2'-9"	6	1'-6"	2	1'-0"	158
	10'	4.58	3.89	10	3'-9"	12	6'-7" to 6'-10"	5	5'-7"	3	3'-2"	8	3'-9"	6	1'-6"	2	1'-0"	205
	12'	5.50	4.33	10	4'-9"	16	6'-7" to 6'-10"	5	5'-7"	3	3'-2"	8	4'-9"	6	1'-6"	2	1'-0"	252
	14'	6.42	4.77	10	5'-9"	20	6'-7" to 6'-10"	5	5'-7"	3	3'-2"	8	5'-9"	6	1'-6"	2	1'-0"	298
	16'	7.33	5.21	10	6'-9"	24	6'-7" to 6'-10"	5	5'-7"	3	3'-2"	8	6'-9"	6	1'-6"	2	1'-0"	345
	18'	8.25	5.65	10	7'-9"	28	6'-7" to 6'-10"	5	5'-7"	3	3'-2"	8	7'-9"	6	1'-6"	2	1'-0"	392
	20'	9.17	6.09	10	8'-9"	32	6'-7" to 6'-10"	5	5'-7"	3	3'-2"	8	8'-9"	6	1'-6"	2	1'-0"	439

NOTES

1. DEPTH OF INLET (H) TO BE SHOWN ON PLANS.
2. THE "H" DIMENSION SHOWN ON THE STANDARDS AND SPECIFIED ON THE PLANS WILL BE MEASURED FROM THE INVERT OF THE OUTFALL PIPE TO THE TOP OF THE STRUCTURE. PLAN "H" DIMENSIONS ARE APPROXIMATE ONLY FOR ESTIMATING PURPOSES AND THE ACTUAL DIMENSIONS SHALL BE DETERMINED BY THE CONTRACTOR FROM FIELD CONDITIONS.
3. WHEN SPECIFIED ON THE PLANS THE INVERT IS TO BE SHAPED IN ACCORDANCE WITH STANDARD IS-1. THE COST OF FURNISHING AND PLACING ALL MATERIALS INCIDENTAL TO THE SHAPING IS TO BE INCLUDED IN THE BID PRICE FOR THE STRUCTURE.
4. IN THE EVENT THE INVERT OF THE OUTFALL PIPE IS HIGHER THAN THE BOTTOM OF THE STRUCTURE, THE INVERT OF THE STRUCTURE SHALL BE SHAPED WITH CEMENT MORTAR TO PREVENT STANDING OR PONDING OF WATER IN THE STRUCTURE. THE COST OF FURNISHING AND PLACING ALL MATERIALS INCIDENTAL TO THE SHAPING IS TO BE INCLUDED IN THE BID PRICE FOR THE STRUCTURE.
5. STEPS ARE TO BE PROVIDED WHEN H IS 4'-0" OR GREATER. FOR DETAILS SEE STANDARD ST-1.
6. THIS ITEM MAY BE PRECAST OR CAST-IN-PLACE.
7. #4 X 8" SMOOTH DOWELS AT APPROXIMATELY 12" C-C TO BE PLACED IN ALL AREAS ADJACENT TO ABUTTING CONCRETE TO PREVENT SETTLEMENT.
8. 3" DIAMETER WEEP HOLE TO BE LOCATED TO DRAIN SUBBASE MATERIAL. WEEP HOLE WITH 12"X12" PLASTIC HARDWARE CLOTH 1/4" MESH OR GALVANIZED STEEL WIRE, MINIMUM WIRE DIAMETER 0.03", NUMBER 4 MESH HARDWARE CLOTH ANCHORED FIRMLY TO THE OUTSIDE OF THE STRUCTURE.
9. ALL REINFORCING STEEL SHALL HAVE A MIN. COVER OF 2".
10. ALL REINFORCING STEEL TO BE CUT CLEAR OF ALL OPENINGS BY 2".
11. CAST-IN PLACE CONCRETE IS TO BE CLASS A3 (3000 PSI). PRECAST CONCRETE IS TO BE 4000 PSI.
12. LENGTH OF SLOT (L) WILL, IN EVERY CASE, BE SHOWN ON PLANS.
13. IF INLET IS CONSTRUCTED IN MEDIAN CURB OR WITH INTEGRAL CURB, GUTTER IS TO BE OMITTED (SEE DETAIL).
14. STANDARD INLETS MAY BE CONSTRUCTED WITH CONCRETE BLOCKS IN ACCORDANCE WITH THE DETAILS SHOWN ON STANDARD DRAWING DI-MB.
15. THIS AREA MAY BE EARTHEN, IN WHICH CASE THE EXPANSION JOINTS WILL APPLY ONLY TO CURB AND GUTTER.
16. CONCRETE QUANTITIES SHOWN ARE FOR DEPTH (H) OF 5'-2" WITHOUT PIPES. THE AMOUNT DISPLACED BY PIPES MUST BE DEDUCTED TO OBTAIN TRUE QUANTITIES. FOR INLETS OF DIFFERENT DEPTHS ADD OR SUBTRACT 0.32 CUBIC YARDS OF CONCRETE FOR EACH FOOT OF DEPTH.
17. LENGTH OF ANGLE IRON AS SHOWN ON SHEET 1 OF 2 IS TO BE L +16" AT 4.10 LBS./FT..
18. ✱ DENOTES LENGTH OF ONE (1) BAR.
19. ALL REINFORCING BARS TO BE #5.
20. WHEN INLET IS USED IN 4'-0" MEDIAN, BACK OF INLET IS TO BE SHAPED TO CONFORM TO PROPOSED CURB.

Sheet 2 of 2

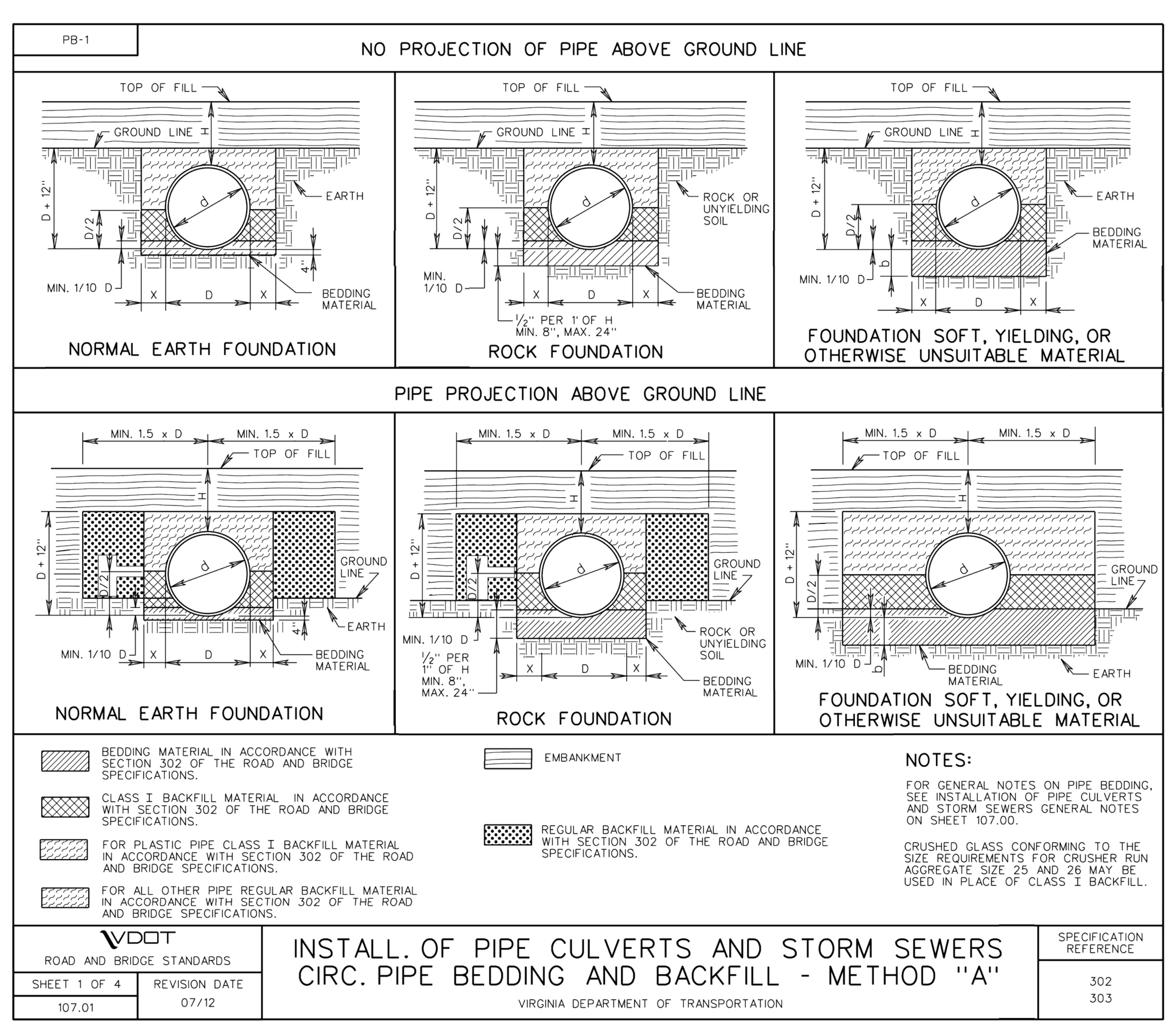
SPECIFICATION REFERENCE 233 302 — STANDARD CURB DROP INLET 12" - 30" PIPE: MAXIMUM DEPTH (H) = 8' — VIRGINIA DEPARTMENT OF TRANSPORTATION — 104.10

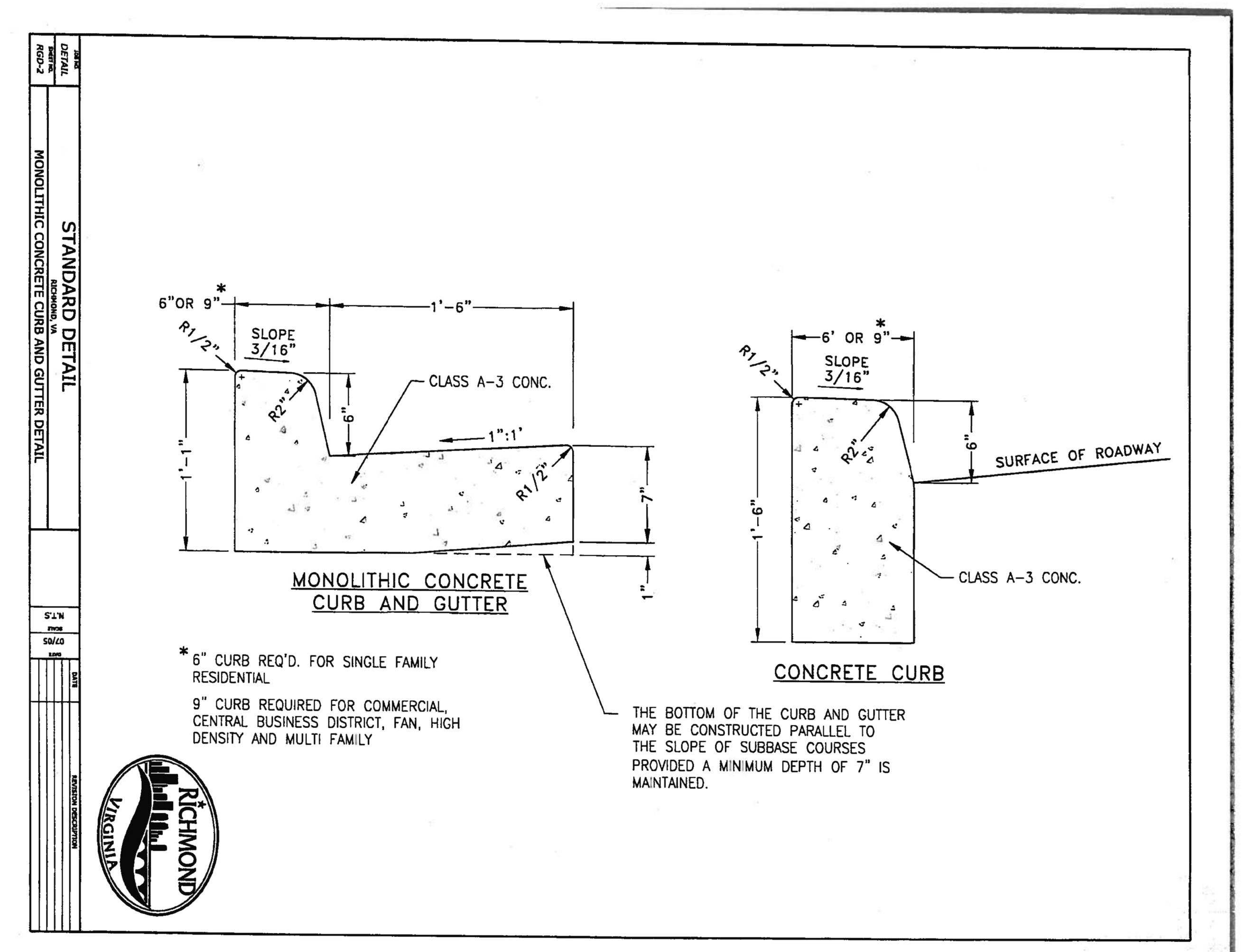


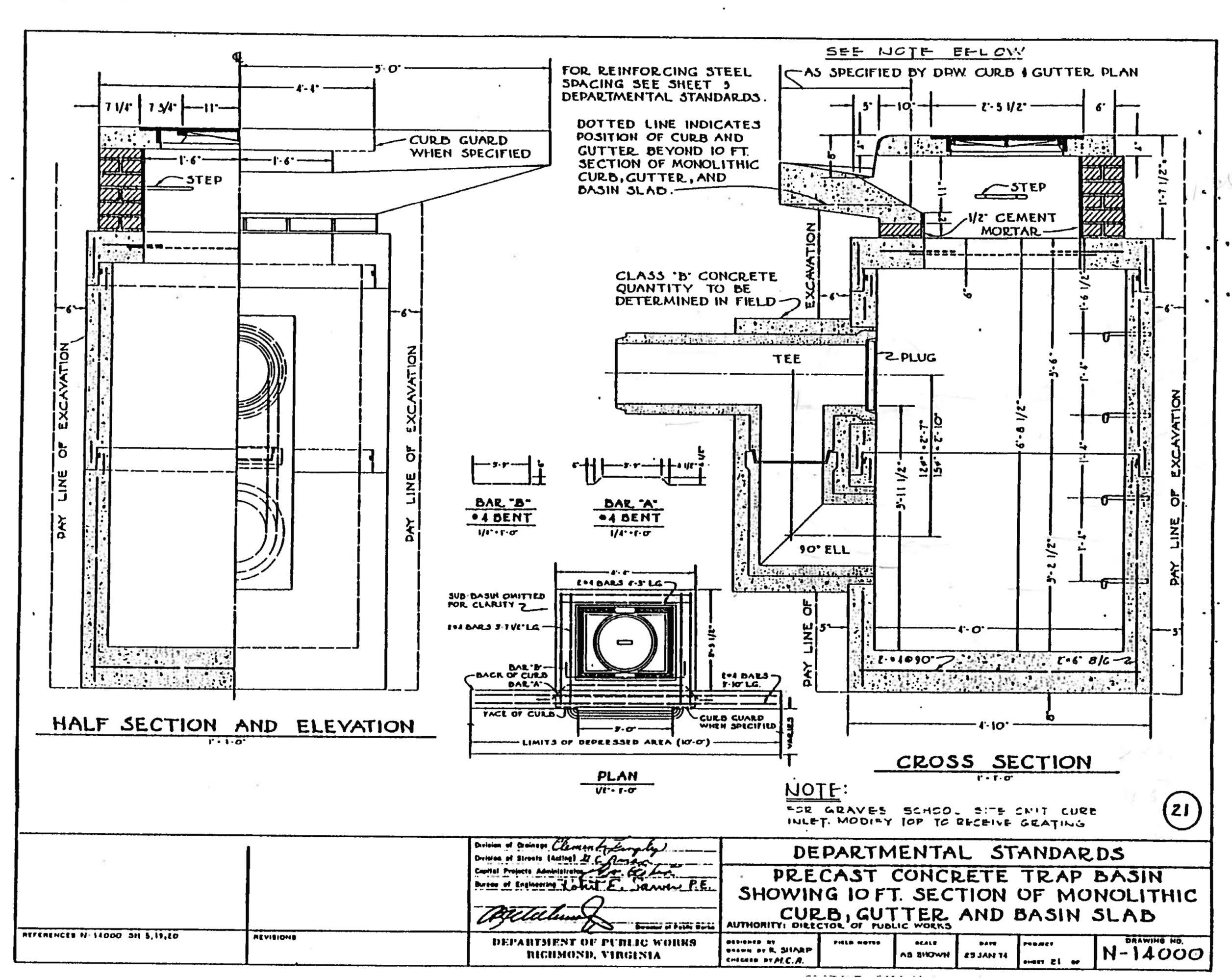
NOTES:

1. STONE BEDDING SHALL EXTEND TO THE OUTER BOUNDARY OF ALL UNDISTURBED AREAS SURROUNDING THE MANHOLE.
2. EXCAVATION PAYLINE EXTENDS 6" OUTSIDE THE LARGEST DIAMETER OF THE MANHOLE, ALL AROUND.
3. CONTACT MANHOLE MANUFACTURER FOR ADDITIONAL WALL THICKNESS REQUIRED AT MANHOLE DEPTHS GREATER THAN 15'-0".
4. MANHOLE SHALL BE RATED FOR H20 LOADING IN PAVEMENT OR AREAS SUBJECT TO VEHICULAR TRAFFIC.
5. BRICK SHALL BE CONCRETE OR CINDER BRICK.

DEPARTMENT OF PUBLIC UTILITIES — CITY OF RICHMOND, VIRGINIA — STANDARD DOG-HOUSE MANHOLE — NOT TO SCALE — REV. 12/09 — M-6







No.	REVISIONS	DATE	BY
1	ADDRESS DPU 60% COMMENTS	2-27-13	KHA
2	ADDRESS DPU 60% COMMENTS	8-16-13	KHA
3	100% SUBMITTAL	1-15-14	KHA

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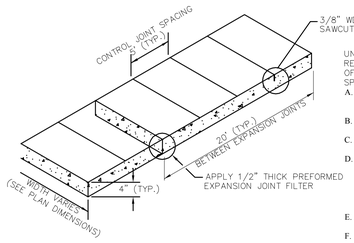
100% SUBMITTAL

KHA PROJECT 113157004
DATE 01/15/2014
SCALE AS SHOWN
DESIGNED BY RRP
DRAWN BY RRP
CHECKED BY BJB

DETAILS

T STREET GREEN ALLEY
PREPARED FOR
THE CITY OF RICHMOND
RICHMOND VIRGINIA

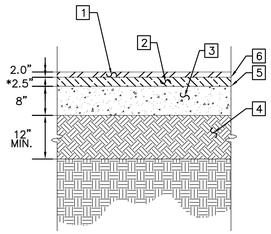
SHEET NUMBER
CS-501



UNLESS OTHERWISE NOTED, ALL SECTION REFERENCES ARE TO THE VIRGINIA DEPARTMENT OF TRANSPORTATION – ROAD AND BRIDGE SPECIFICATIONS, 2008 STANDARDS.

A. PORTLAND CEMENT CONCRETE SHALL BE CLASS A3 CONCRETE CONFORMING TO THE REQUIREMENTS OF SECTION 217.
B. REINFORCING STEEL SHALL CONFORM TO THE REQUIREMENTS OF SECTION 223.
C. CURING MATERIALS SHALL CONFORM TO THE REQUIREMENTS OF SECTION 220.
D. PREFORMED JOINT FILLER SHALL CONFORM TO THE APPLICABLE REQUIREMENTS OF SECTION 212. MATERIAL SHALL BE APPROXIMATELY 1/2 INCH IN THICKNESS AND SHALL HAVE A WIDTH AND DEPTH EQUAL TO THOSE OF THE STRUCTURE.
E. ASPHALT CONCRETE SHALL CONFORM TO THE REQUIREMENTS OF SECTION 211.
F. GEOTEXTILE DRAINAGE FABRIC SHALL CONFORM TO THE REQUIREMENTS OF SECTION 245.

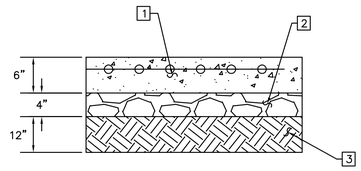
TYPICAL SIDEWALK DETAIL
N.T.S.



1. ASPHALTIC CONCRETE SURFACE (SM–9.5A OR EQUIVALENT)
2. ASPHALTIC CONCRETE BINDER (IM–19.0 OR EQUIVALENT)
3. GRADED AGGREGATE BASE (VDOT 21–A OR EQUIVALENT)
4. SUBGRADE (95% MIN. RELATIVE COMPACTION)
5. PRIME COAT
6. TACK COAT

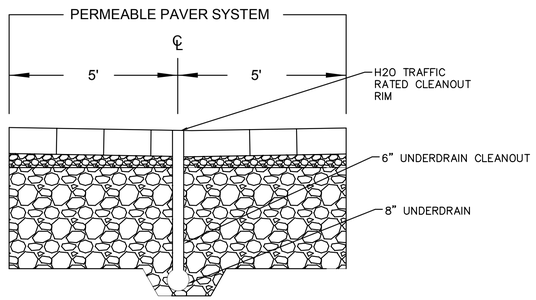
* MIN. 2.5" IM–19. CONTRACTOR TO MATCH EX. PAVEMENT SECTION OF ROADWAY. MAX. 3" LIFTS

TYPICAL ASPHALT PAVEMENT SECTION
N.T.S.

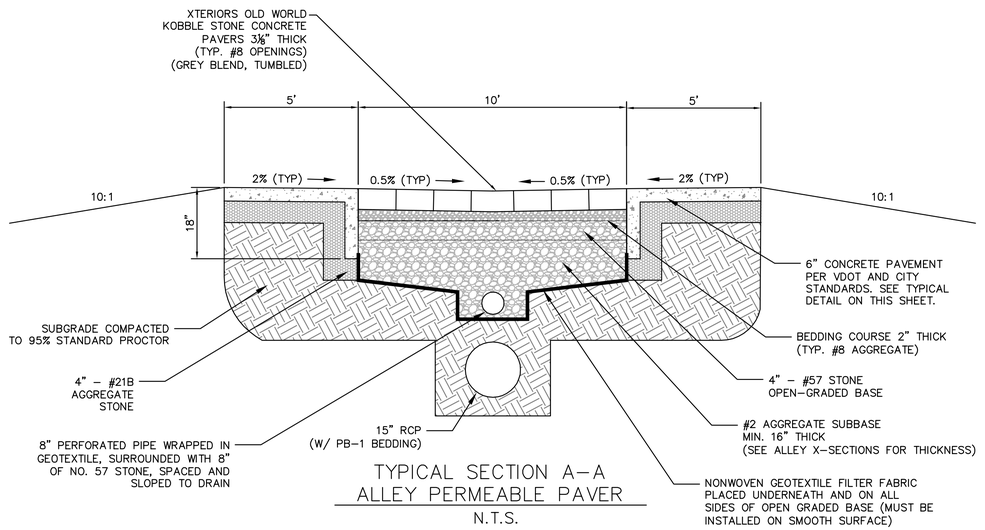


1. 6" CLASS A–3 PORTLAND CEMENT W/ 4X4–4/4 WELDED WIRE FABRIC
2. 4" 21B AGGREGATE STONE
3. SUBGRADE (95% MIN. RELATIVE COMPACTION)

TYPICAL CONCRETE PAVEMENT SECTION
N.T.S.



UNDERDRAIN CLEAN OUT
N.T.S.



TYPICAL SECTION A–A
ALLEY PERMEABLE PAVER
N.T.S.

No.	REVISIONS	DATE	BY
1	ADDRESS DPU 60% COMMENTS	2–27–13	KHA
2	ADDRESS DPU 60% COMMENTS	8–16–13	KHA
3	100% SUBMITTAL	1–15–14	KHA

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KHA PROJECT	011357004
DATE	01/15/2014
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DETAILS

T STREET GREEN ALLEY
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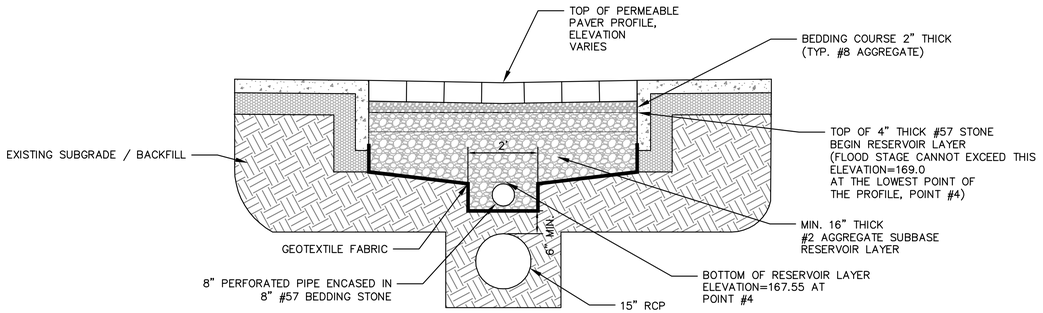
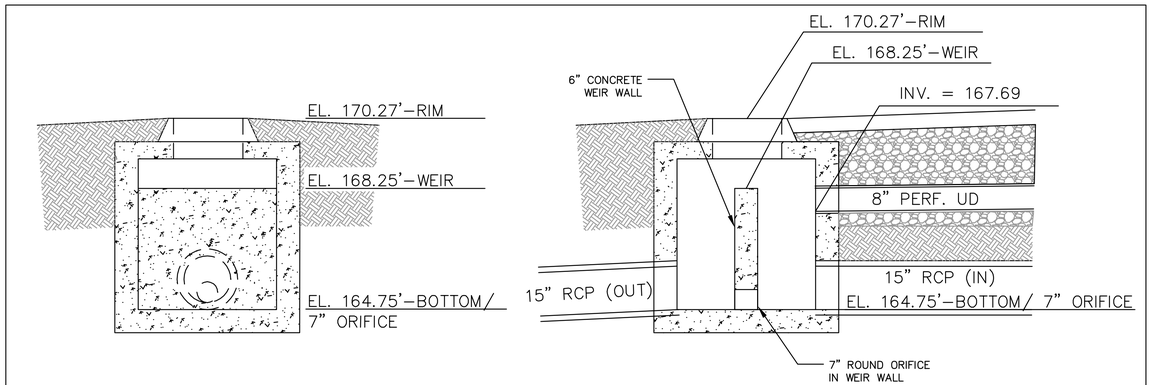
SHEET NUMBER
CS-502

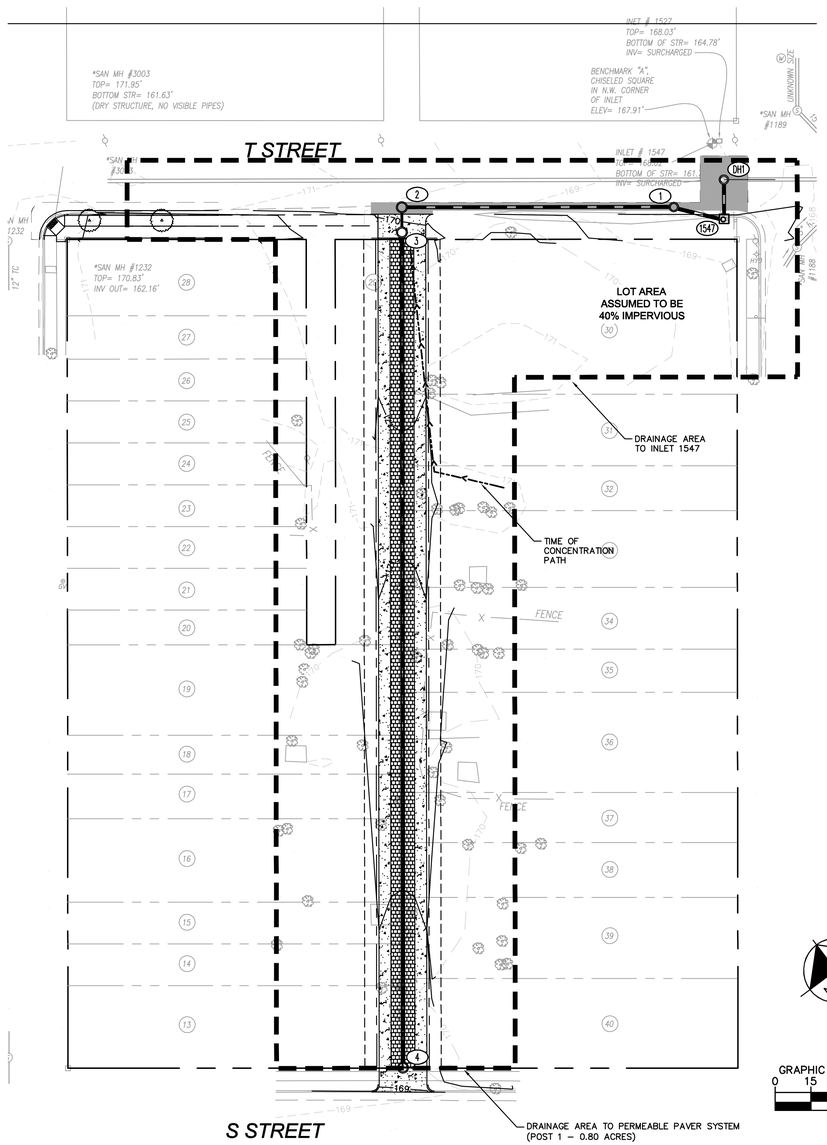


GREEN ALLEY DRAINAGE ANALYSIS DETAIL

N.T.S.



STR. #3 DETAIL



DRAINAGE AREA SUMMARY

DRAINAGE AREA	INLET	TOTAL AREA (AC.)	PERVIOUS AREA (AC.)	IMPERVIOUS AREA (AC.)	PAVERS AREA (AC.)	C	CN	TIME OF CONC. T_c (min)	OVERLAND FLOW TIME (SEELYE) $T_{of} = 0.225L^{0.47}s^{-0.19}C^{-1.0}$				SHALLOW CONCENTRATED FLOW TIME (TR-55) V = 16.1345$S^{0.5}$ (UNPAVED), V = 20.3282$S^{0.5}$ (PAVED)				
									L (ft)	C	S (ft/ft)	T_{of} (min)	PAVED?	S (ft/ft)	V (ft/s)	L (ft)	T_{sct} (min)
PRE 1	N/A	0.80	0.780	0.020	0.000	0.32	75	10.9	100	0.30	0.020	10.91	U	0.020	2.28	0	0.00
POST 1	3	0.80	0.539	0.180	0.080	0.47	81	10.0	50	0.30	0.020	8.16	U	0.020	2.28	250	1.83
POST TO #1547	1547	0.370	0.101	0.269	0.000	0.74	91	8.7	50	0.30	0.020	8.16	PAVED?	0.010	1.61	50	0.52

NOTE: AN ADDITIONAL 4350 SF OF FUTURE IMPERVIOUS AREA HAS BEEN ACCOUNTED FOR IN THE POST–DEVELOPMENT DRAINAGE ANALYSIS (EXCLUSIVE OF CONCRETE APRON)

STORM DRAIN DESIGN

VDOT Form LD-229

FROM POINT	TO POINT	DRAINAGE AREA (acres)	RUNOFF COEFFICIENT C	CA incr	CA accum	INLET TIME (min)	RAINFALL (in/hr)	RUNOFF (cfs)	INVERT ELEVATIONS upper end (ft)	INVERT ELEVATIONS lower end (ft)	LENGTH (ft)	SLOPE (%)	SIZE (in)	PIPE CAPACITY (cfs)	Q_i / Q_f (8) / (15)	FULL VELOCITY (fps)	v / v_f (%)	VELOCITY (fps)	FLOW TIME incr (min)	FLOW TIME accum (min)	REMARKS
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)			(16)		(17)		(18)
3	2	0.800	0.465	0.372	0.372	10.0	5.70	1.19	164.75	164.25	11	4.55%	15	13.81	9%	11.23	35%	3.9	0.0	10.0	Routed Flow
2	1	0.000	0.000	0.000	0.372	10.0	5.70	1.19	164.15	162.25	114	1.67%	15	8.36	14%	6.80	48%	3.3	0.3	10.3	
1	1547	0.000	0.00	0.000	0.372	10.3	5.64	1.19	162.15	161.82	22	1.50%	15	7.93	15%	6.45	50%	3.2	0.1	10.3	
1547	DH1	0.370	0.74	0.273	0.645	10.3	5.63	2.72	160.51	160.26	16	1.56%	15	8.10	34%	6.58	81%	5.3	0.0	10.4	

HGL CALCULATIONS

VDOT Form LD-347

INLET	0.8D + INV (OUT)	ACTUAL OUTLET WSE	DESIGN OUTLET WSE	D_o	Q_o	L_o	S_{lo}	H_f	JUNCTION LOSS V_o	H_o	Q_i	V_i	$Q_i V_i$	$V_i^2/2g$	H_i	Angle	H_b	H_t	Surface Runoff	1.3 H_t	IS-17 Y=1 N=0	0.5 H_t	FINAL H	INLET WSE	FL ELEV
(1)			(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)		(13)	(14)	(15)	(16)		(17)	N=0 (18)		(19)	(20)	(21)
1547	161.26	161.26	161.26	15	2.72	16	0.0018	0.03	5.32	0.11	1.19	0.97	1.15	0.01	0.01	90	0.01	0.13	42%	0.16	0	0.16	0.19	161.45	168.02
1	162.82	161.45	162.82	15	1.19	22	0.0003	0.01	3.21	0.04	1.19	0.97	1.15	0.01	0.01	15	0.00	0.05	0%	0.05	1	0.02	0.03	162.85	168.00
2	163.25	162.85	163.25	15	1.19	114	0.0003	0.04	3.26	0.04	1.19	0.97	1.15	0.01	0.01	90	0.01	0.06	0%	0.06	1	0.03	0.07	163.32	169.80
3	165.25	163.32	165.25	15	1.19	11	0.0003	0.00	3.94	0.06	0.00	0.00	0.00	0.00	0.00	0	0.00	0.06	100%	0.08	1	0.04	0.04	165.29	170.27

ROUTING RESULTS

Project Data

Project: Church Hill-Green Alley
Project #: 113157004
Date: 8/16/2013
Locality: Richmond (city)
Rainfall Zone: Richmond (City)
SCS Distribution: Type II
Notes: Permeable Pavement Analysis

Rainfall Data

$i = B / (Tc + D)^E$ Storm Event	Intensity Factors B	D	E	SCS 24-hr Rainfall Depth, P (inches)
2 -year	57.69	11.50	0.85	3.34
5 -year	54.99	10.75	0.78	4.28
10 -year	47.91	9.25	0.72	5.08
25 -year	41.66	7.75	0.65	6.27
50 -year	36.88	6.50	0.60	7.29
100 -year	33.15	5.25	0.56	8.42

Modified Rational Outfall Summary (uncontrolled flows)

	Pre-Development	Post-Development
Runoff C-factor (C)	0.32	0.47
Drainage Area	0.800 acres	0.800 acres
Impervious Area C = 0.9	*0.020 acres*	*0.180 acres*
Permeable Pavers C = 0.6	*0.000 acres*	*0.080 acres*
Pervious Area C = 0.30	*0.780 acres*	*0.539 acres*
Time of Concentration (Tc)	10.9 min	10.0 min

Stage-Storage Data (average end area method)

Stage (ft)	Area (sq ft)	Incr. Storage (cu ft)	Accum. Storage (cu ft)	Voids	NOTES
164.75	-	-	-	100%	BOTTOM 15" RCP
166.00	-	-	430	100%	TOP 15" RCP
167.55	3,500	0	430	40%	STONE RESERVOIR
168.00	3,500	1,575	1,060	40%	STONE RESERVOIR
169.00	3,500	3,500	2,460	40%	STONE RESERVOIR

Outlet Structure Data

	Device 1	Device 2	Device 3
Hydraflow Label	Culvert/orifice	Culvert/orifice	Weir
Multiplier	1	1	1
Size (in)	15	7	48"
Type	culvert	orifice	manhole weir
Elevation (ft)	164.75	164.75	168.25
Slope (%)	0.50	-	-
Coefficient	0.013	0.60	3.33
Exfiltration Rate (in/hr)	0.00	0.00	0.00

Routing Summary (results from Hydraflow)

Hydrograph Description	Hyd. #	Peak Flow 2-yr	Peak Flow 10-yr	Flood Stage 2-yr	Flood Stage 10-yr	Runoff Volume 2-yr	Runoff Volume 10-yr
Pre-Development (Allowable)	1	1.05	1.41			691	928
Post-Development (uncontrolled)	2	1.13	1.48			1,418	2,039
Post-Development (routed)	3	1.02	1.19	165.86	166.13	**380	**599

** indicates storage volume

Hydrograph Description	Peak Flow 2-yr	Peak Flow 10-yr
Pre-Development (Allowable)	1.05	1.41
Post-Development (Routed)	1.02	1.19

STONE RESERVOIR CALCULATIONS

NOTE: THE CALCULATIONS BELOW REPRESENT AN ESTIMATION OF THE MINIMUM STONE RESERVOIR DEPTH REQUIRED FOR THE ALLEY. PLEASE SEE THE ROUTING RESULTS SECTION PROVIDED ON THIS SHEET FOR DESIGN MODEL ANALYSIS CONFIRMING ADEQUACY OF THE STONE RESERVOIR AND UNDERDRAIN SYSTEM.

VA DCR Stormwater Design Specification #7

Depth of Reservoir Layer (d_p), Equation 7.4

$$d_p = \frac{\{(d_c * R) + P - (\frac{i}{2} * tf) - (qu * tf)\}}{V_r}$$

d_c = Depth of runoff from contributing drainage area for the Treatment Volume (ft)
R = Ratio of contributing drainage area (not including permeable surfaces) to permeable pavement surface
P = Rainfall depth for treatment volume (ft) - (Level 1 - 1 inch)
i = Infiltration rate of native soils (ft/day)
t_f = Time to fill reservoir (days)
V_r = Void ratio for reservoir layer
q_u = Outflow through underdrain (ft/day)

FROM POINT	TO POINT	d_c (ft)	R Non-Permeable Surface Area (sf)	R Permeable Surface Area (sf)	R Ratio	P (ft)	i (ft/day)	t_f (days)	V_r -	$q_{u\ (Eq\ 7.3)}$ (ft/day)	d_p (ft)	d_p (inches)
4	3	0.278	7850	3476	2.3	0.083	0	0.083	0.4	0.72	1.6	19.6

Outflow Through Underdrain (q_u), Equation 7.3

$$q_u = k * m$$

k = Hydraulic conductivity for reservoir layer (assume 100 ft./day)
m = Underdrain pipe slope (ft./ft.)

FROM POINT	TO POINT	k (ft/day)	m (ft/ft)	q_u (ft/day)
4	3	100	0.0072	0.72

No.	REVISIONS	DATE	BY
1	ADDRESS DPU 60% COMMENTS	2-27-13	KHA
2	ADDRESS DPU 60% COMMENTS	8-16-13	KHA
3	100% SUBMITTAL	1-15-14	KHA

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100% SUBMITTAL

KHA PROJECT 113157004
DATE 01/15/2014
SCALE AS SHOWN
DESIGNED BY RRP
DRAWN BY RRP
CHECKED BY BJB

DRAINAGE AREA MAP AND CALCULATIONS

T STREET GREEN ALLEY

PREPARED FOR THE CITY OF RICHMOND

VIRGINIA

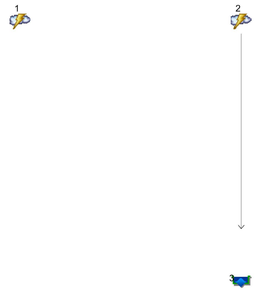
RICHMOND

SHEET NUMBER CG-101

1

Watershed Model Schematic

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10



Legend

Hyd.	Origin	Description
1	Rational	PRE
2	Mod. Rational	Post
3	Reservoir	UNDERDRAIN

Project: Green Alley 6.3.13 mod rat.gpw | Tuesday, 08 / 6 / 2013

2

Hydrograph Return Period Recap

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10

Hyd. No.	Hydrograph type (origin)	Inflow hyd(s)	Peak Outflow (cfs) 1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	Hydrograph Description
1	Rational	------	-------	1.047	-------	-------	1.406	-------	-------	-------	PRE
2	Mod. Rational	------	-------	1.125	-------	-------	1.477	-------	-------	-------	Post
3	Reservoir	2	-------	1.020	-------	-------	1.193	-------	-------	-------	UNDERDRAIN

Proj. file: Green Alley 6.3.13 mod rat.gpw | Tuesday, 08 / 6 / 2013

3

Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	Rational	1.047	1	11	691	------	------	------	PRE
2	Mod. Rational	1.125	1	10	1,418	------	------	------	Post
3	Reservoir	1.020	1	22	1,416	2	165.86	380	UNDERDRAIN

Green Alley 6.3.13 mod rat.gpw | Return Period: 2 Year | Tuesday, 08 / 6 / 2013

4

Hydrograph Report

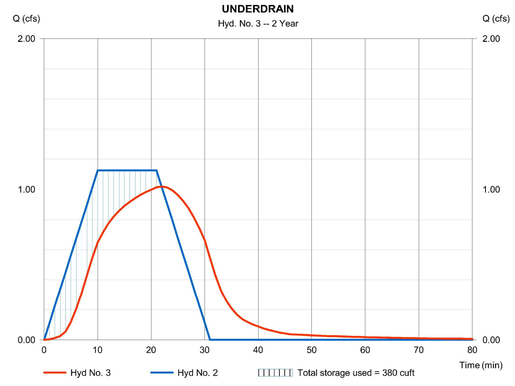
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10 — Tuesday, 08 / 6 / 2013

Hyd. No. 3

UNDERDRAIN

Hydrograph type	= Reservoir	Peak discharge	= 1.020 cfs
Storm frequency	= 2 yrs	Time to peak	= 22 min
Time interval	= 1 min	Hyd. volume	= 1,416 cuft
Inflow hyd. No.	= 2 - Post	Max. Elevation	= 165.86 ft
Reservoir name	= Paver System	Max. Storage	= 380 cuft

Storage Indication method used.



5

Pond Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10 — Friday, 08 / 16 / 2013

Pond No. 1 - Paver System

Pond Data

Pond storage is based on user-defined values.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	164.75	n/a	0	0
1.25	166.00	n/a	430	430
2.80	167.55	n/a	7	437
3.25	168.00	n/a	924	1,361
4.25	169.00	n/a	1,400	2,761

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 15.00	7.00	0.00	0.00
Span (in)	= 15.00	7.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 164.75	164.75	0.00	0.00
Length (ft)	= 11.00	0.00	0.00	0.00
Slope (%)	= 4.55	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 4.00	0.00	0.00	0.00
Crest El. (ft)	= 168.25	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	---	---	---
Multi-Stage	= Yes	No	No	No
Exfil.(in/hr)	= 0.000 (by Wet area)			
TW Elev. (ft)	= 0.00			

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	164.75	0.00	0.00	---	---	0.00	---	---	---	---	---	0.000
1.25	430	166.00	1.12 ic	1.12 ic	---	---	0.00	---	---	---	---	---	1.116
2.80	437	167.55	1.88 ic	1.88 ic	---	---	0.00	---	---	---	---	---	1.878
3.25	1,361	168.00	2.07 ic	2.05 ic	---	---	0.00	---	---	---	---	---	2.053
4.25	2,761	169.00	9.84 ic	1.19 ic	---	---	8.65	---	---	---	---	---	9.839

6

Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	Rational	1.406	1	11	928	------	------	------	PRE
2	Mod. Rational	1.477	1	10	2,039	------	------	------	Post
3	Reservoir	1.193	1	25	2,038	2	166.13	599	UNDERDRAIN

Green Alley 6.3.13 mod rat.gpw | Return Period: 10 Year | Tuesday, 08 / 6 / 2013

7

Hydrograph Report

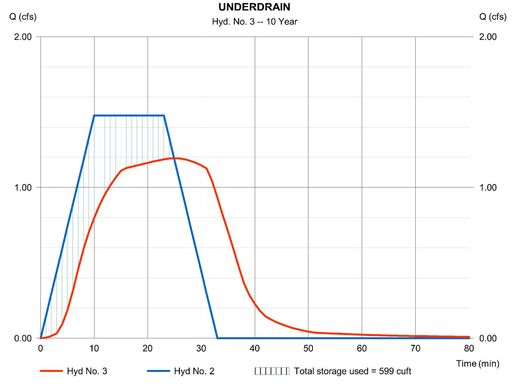
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10 — Tuesday, 08 / 6 / 2013

Hyd. No. 3

UNDERDRAIN

Hydrograph type	= Reservoir	Peak discharge	= 1.193 cfs
Storm frequency	= 10 yrs	Time to peak	= 25 min
Time interval	= 1 min	Hyd. volume	= 2,038 cuft
Inflow hyd. No.	= 2 - Post	Max. Elevation	= 166.13 ft
Reservoir name	= Paver System	Max. Storage	= 599 cuft

Storage Indication method used.



8

Hydraflow Rainfall Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10 — Tuesday, 08 / 6 / 2013

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA) B	D	E	(N/A)
1	0.0000	0.0000	0.0000	---------
2	57.6900	11.5000	0.8500	---------
3	0.0000	0.0000	0.0000	---------
5	0.0000	0.0000	0.0000	---------
10	47.9100	9.2500	0.7200	---------
25	0.0000	0.0000	0.0000	---------
50	36.8800	6.5000	0.6000	---------
100	33.1500	5.2500	0.5600	---------

File name: RICHMOND IDF.IDF

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr) 5 min	10	15	20	25	30	35	40	45	50	55	60
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	5.32	4.25	3.56	3.07	2.71	2.43	2.21	2.02	1.87	1.74	1.63	1.53
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	7.07	5.70	4.82	4.22	3.76	3.41	3.13	2.90	2.70	2.54	2.39	2.27
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
50	8.52	6.86	5.85	5.16	4.65	4.26	3.94	3.68	3.47	3.28	3.12	2.97
100	9.00	7.21	6.15	5.44	4.91	4.51	4.19	3.92	3.70	3.51	3.34	3.19

Tc = time in minutes. Values may exceed 60.

Precip. file name: henrico.pcp

Storm Distribution	Rainfall Precipitation Table (in) 1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	1.00	3.34	4.00	4.33	5.08	6.26	7.28	8.42
SCS 6-Hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-1st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

No.	REVISIONS	DATE	BY
1	ADDRESS DPU 60% COMMENTS	2-27-13	KHA
2	ADDRESS DPU 60% COMMENTS	8-16-13	KHA
3	100% SUBMITTAL	1-15-14	KHA

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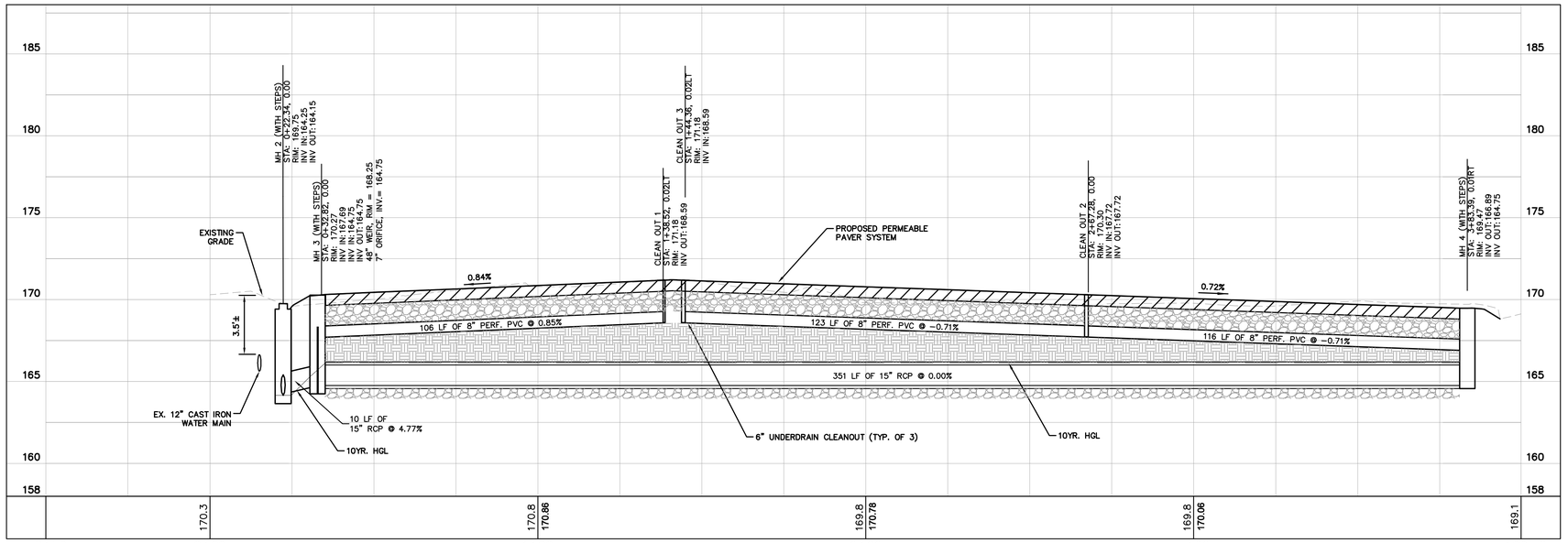
100% SUBMITTAL

KHA PROJECT 113157004
DATE 01/15/2014
SCALE AS SHOWN
DESIGNED BY RRP
DRAWN BY RRP
CHECKED BY BJB

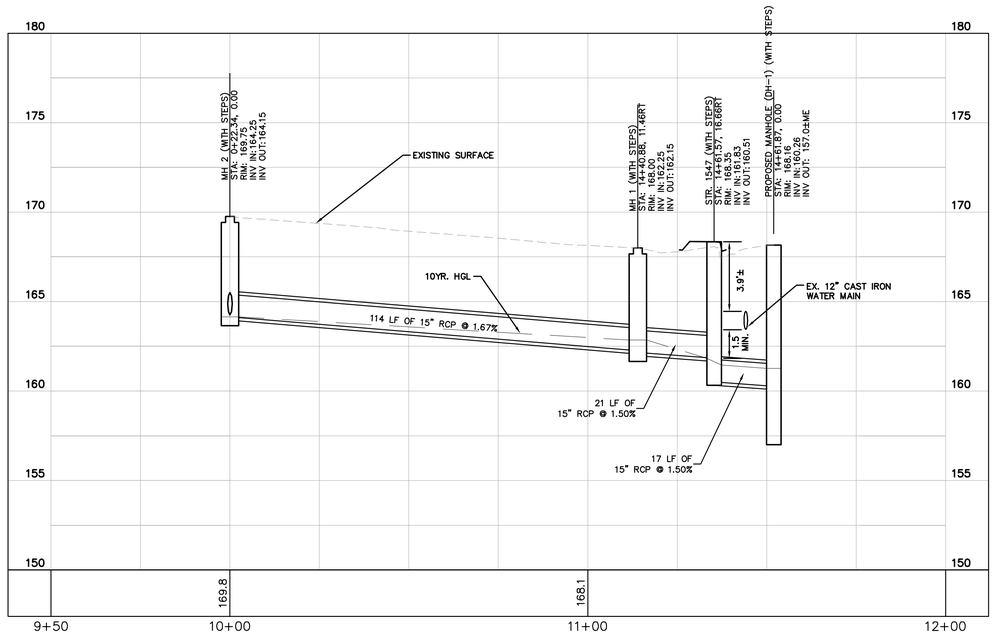
HYDRAFLOW CALCULATIONS

T STREET GREEN ALLEY
PREPARED FOR
THE CITY OF RICHMOND
RICHMOND VIRGINIA

SHEET NUMBER
CG-102



GREEN ALLEY PROFILE



STR. 2 TO DOGHOUSE MH PROFILE

GRAPHIC SCALE IN FEET
0 10 20 40
HORIZONTAL
VERTICAL
8
4
2
0

No.	REVISIONS	DATE	BY
1	ADDRESS DPU 60% COMMENTS	2-27-13	KHA
2	ADDRESS DPU 60% COMMENTS	8-16-13	KHA
3	100% SUBMITTAL	1-15-14	KHA

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100% SUBMITTAL

KHA PROJECT 113157004
DATE 01/15/2014
SCALE AS SHOWN
DESIGNED BY RRP
DRAWN BY RRP
CHECKED BY BJB

STORM PROFILES

T STREET GREEN ALLEY
PREPARED FOR
THE CITY OF RICHMOND
RICHMOND VIRGINIA

SHEET NUMBER
CG-201

No.	REVISIONS	DATE	BY
1	ADDRESS DPU 60% COMMENTS	2-27-13	KHA
2	ADDRESS DPU 60% COMMENTS	8-16-13	KHA
3	100% SUBMITTAL	1-15-14	KHA

Kimley-Horn and Associates, Inc.

1700 WILLOW LAWN DR., SUITE 200, RICHMOND, VA 23230
PHONE: 804-673-3882 FAX: 804-673-3980
WWW.KIMLEY-HORN.COM

100%
SUBMITTAL

KHA PROJECT	113157004
DATE	01/15/2014
SCALE	AS SHOWN
DESIGNED BY	RRP
DRAWN BY	RRP
CHECKED BY	BJB

ALLEY CROSS-SECTIONS

T STREET GREEN ALLEY

PREPARED FOR
THE CITY OF RICHMOND

VIRGINIA

RICHMOND

SHEET NUMBER
CX-101