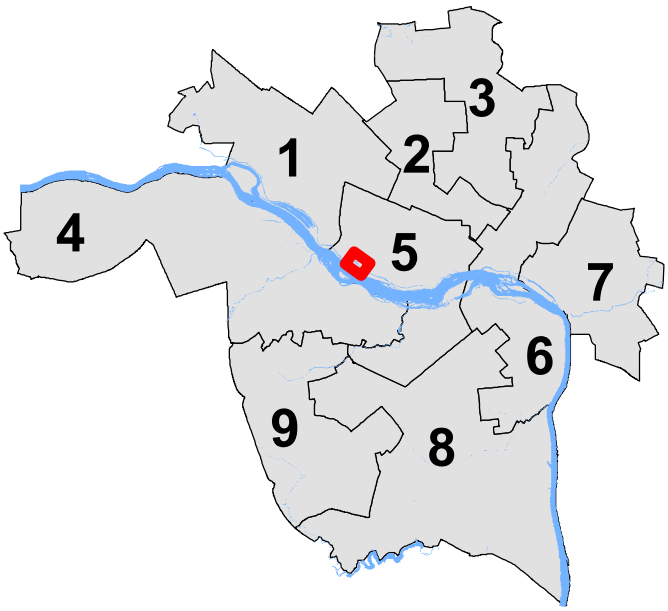
# City of Richmond Department of Planning & Development Review

## Location, Character, and Extent

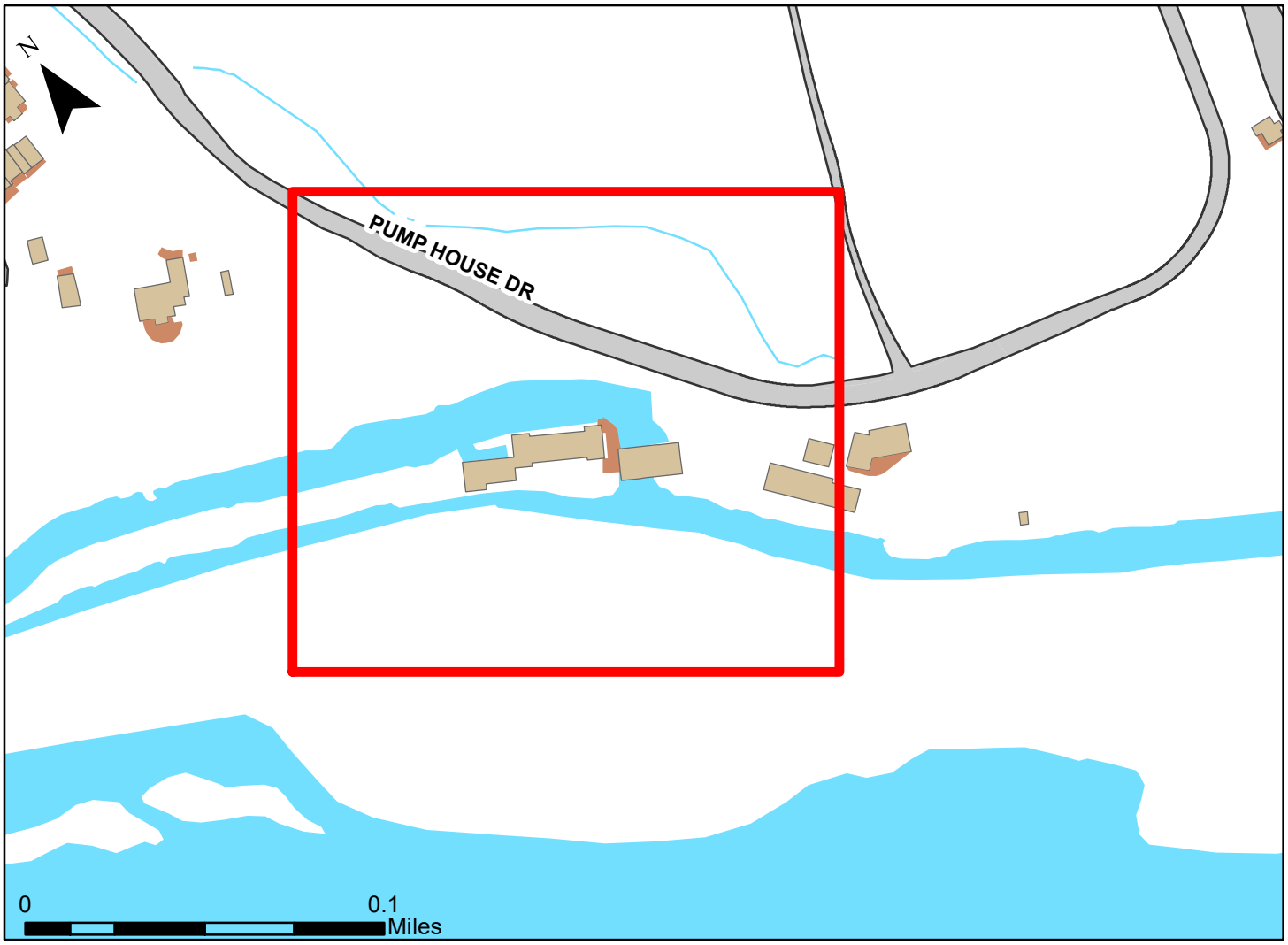
**LOCATION: 1500 Pump House Drive**

**COUNCIL DISTRICT: 5**

**PROPOSAL: Review of Pump House Park ADA Accessibility Improvements**




*For questions, please contact Alex Dandridge at 646-6569 or alex.dandridge@richmondgov.com*



# 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
https://www.rva.gov/planning-development-review/urban-design-committee

RICHMOND PLANNING & DEVELOPMENT REVIEW

**Application Type** (select one)

- [ ] Location, Character, & Extent
- [ ] Section 17.05
- [ ] Other:
- [ ] Encroachment
- [ ] Design Overlay District

**Review Type** (select one)

- [ ] Conceptual
- [x] Final

**Project Information**

Submission Date: 4/15/2021

Project Name: Pump House Park ADA Accessibility Improvements

Project Address: 1799 Pump House Dr, Richmond, VA 23221

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

The Department of Parks, Recreation, and Community Facilities (DPRCF) has completed plans for site improvements for greater ADA-compliant accessibility to the historic Pump House building at Pump House Park. This consists of a pathway and ramp traversing the slope between Pump House Drive and the existing vehicular bridge that crosses Pump House Canal to the building. This improvement was envisioned as part of the master planning for the park completed in 2019.

**Applicant Information** (a City representative must be the applicant, with an exception for encroachments)

Name: Bryce Wilk, Senior Superintendent-South District

Email: bryce.wilk@richmondgov.com

City Agency: Department of Parks, Recreation, and Community Facilities

Phone: (804)347-0066

Main Contact (if different from Applicant): Scott Wiley

Company: Timmons Group

Phone: (804) 200-6424

Email: scott.wiley@timmons.com

**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.**

**Submittal Deadlines**

The UDC is an 11 member committee created by City Council in 1968 whose purpose is to advise the City Planning Commission (CPC) 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.

# Pump House Park ADA Accessibility Improvements
# Project Narrative

## Purpose and Description of the Project

*Introduction*

The Department of Parks, Recreation, and Community Facilities (DPRCF) has completed plans for site improvements for greater ADA-compliant accessibility to the historic Pump House building at Pump House Park. This consists of a pathway and ramp traversing the slope between Pump House Drive and the existing vehicular bridge that crosses Pump House Canal to the building. This improvement was envisioned as part of the master planning for the park completed in 2019. This submittal is intended for Final Review of the site design.

*Park Location and Context*

Pump House Park is located at 1799 Pump House Drive and is situated at the south end of Byrd Park adjacent to the Pump House and James River & Kanawha Canals and near the James River. The primary entrance to the park and building, and only current public entrance, is from Pump House Drive via a steep asphalt driveway leading to a vehicular-grade bridge over the Pump House Canal. There is a ramp on the south side of the canal leading down to the building, but no ramp from Pump House Drive to the bridge. There is also a footbridge over the canal just to the east, but access is currently limited (by a locked fence); improvements for that access point are envisioned and are shown as future improvements in this submittal. The park is located in the 5th Council District; it is nearby to the Carillon neighborhood (just to the west up Pump House Drive), but it is relatively removed from nearby development.

## Project Background

In 2018 and 2019, DPRCF worked with stakeholder groups and community members to complete a master plan for renovations of the Pump House building and surrounding park. A major aspect of that visioning process was making the park and building more open and accessible, which includes a walkway access to the building that is constructed for ADA compliance.

DPRCF engaged Timmons Group (one of the master planning team members) in Winter 2021 to provide design services for an accessible ramp between Pump House Drive and the Pump House Canal to begin implementation of the improvements envisioned in the master plan. Specific funding was available to DPRCF for this project. Timmons Group's landscape architecture, civil engineering, and structural engineering teams have worked together to plan and design this project for construction.

## Project Budget and Funding Sources

The original budget for the project was $100,000. The funding source for the project is DPRCF, which will be reimbursed by the Virginia Department of Conservation and Recreation (DCR) which was allocated $100,000 for "ADA accessible elements in the James River Park System." Additional funding is also anticipated from the Capital Improvement Plan (CIP) that will go into effect in July 2021.

## Construction Program

*Site Improvements*

The site program will consist of the following features:

- Improvements to Pump House Drive to add two ADA-compliant parking spaces
- A concrete walkway ramping downslope from Pump House Drive to the vehicular-grade bridge that crosses the Pump House Canal. The ramp will have simple top-rail handrail; a modern design with a slim profile has been selected to minimize visual obstruction of the Pump House and canal from Pump House Drive and the walk downslope.
- Concrete retaining walls along sections of the walkway to accommodate grading of the slope necessary for the walkway
- A slot drain along a portion of the walkway with underground piping and a small outfall structure at Pump House Canal to manage stormwater runoff
- Landscaping consisting of trees, shrubs, and groundcover seeding to meet requirements for mitigation of disturbance within the Riparian Protection Area (RPA)

*Project Timeline*

After receiving UDC, Planning Commission, and City permitting approvals, DPRCF hopes to bid the project through its on-call contractors in Spring 2021. The $100,000 in funding must be encumbered with invoices before June 30, 2021. Construction completion is anticipated for this year.

## Landscaping Plan and Maintenance Analysis

Landscaping on the site will focus primarily on RPA mitigation planting, as determined by calculations of the total disturbed area within the RPA and planting quotas for restoration and establishment in DCR's *Riparian Buffers Modification and Mitigation Manual*. All native trees and shrubs have been selected. An effort has been made to preserve all healthy, existing trees to the greatest extents possible. All RPA mitigation tree planting will be counted towards the City's requirements for replacement of trees removed; however, the total replacement value will need to be met through payment into the City's tree planting fund. All disturbed areas will be seeded with a mix of perennials and grasses that are appropriate for part-shade to shade conditions.

Landscape maintenance will primarily belong to DPRCF as the property owner. Tree care of trees on City-owned property is the responsibility of the Urban Forestry division of the Department of Public Works (DPW).

## Drawing Attachments

*Design Exhibits*

- Existing Conditions
- Site Plan from 2019 Pump House Park Master Plan
- Design Palette

*Construction Drawings* – Note: Drawings have been scaled by 50% for the 11”×17” UDC exhibits.

- C0.0 – Cover Sheet
- C1.0 – General Notes and Details
- C1.1 – General Notes and Details
- C1.2 – General Notes and Details
- C1.3 – General Notes and Details
- C2.0 – Existing Conditions
- C2.1 – Demolition Plan
- C3.0 – Erosion and Sediment Control – Phase I
- C3.1 – Erosion and Sediment Control – Phase II
- C3.2 – Erosion and Sediment Control Notes
- C3.3 – Erosion and Sediment Control Details
- C4.0 – Layout Plan
- C5.0 – Grading and Drainage Plan
- C5.1 – Storm Drainage Profiles
- C6.0 – Stormwater Management - Energy Balance
- C6.1 – Stormwater Management - Channel Protection
- C6.2 – Stormwater Management - Quality
- C6.3 – Stormwater Calculations – Energy Balance POA1
- C6.4 – Stormwater Calculations – Energy Balance POA2
- C7.0 – Water Quality Impact Assessment
- L1.0 – Existing Tree Inventory & Removal Plan
- L2.0 – RPA Mitigation Landscape Plan
- L2.1 – Landscape Plans and Details
- S1.0 – Structural Notes
- S2.0 – Location Plan
- S3.0 – Retaining Wall Elevations
- S4.0 – Typical Section Details

TOP OF SLOPE AT PUMP HOUSE DRIVE LOOKING WEST AT RECENTLY INSTALLED KIOSK SIGN WHERE THE EXISTING ASPHALT PATH BEGINS

TOP OF SLOPE AT PUMP HOUSE DRIVE LOOKING WEST AT EXISTING ASPHALT PATH WINDING DOWNSLOPE

TOP OF SLOPE AT PUMP HOUSE DRIVE LOOKING EAST AT STAIRS TO FOOTBRIDGE LEADING TO THE PUMP HOUSE

BOTTOM OF SLOPE NEAR THE CANAL LOOKING EAST. FOOT BRIDGE ACROSS CANAL TO PUMP HOUSE IN BACKGROUND.

APRIL 15, 2021

BOTTOM OF SLOPE NEAR THE CANAL LOOKING EAST AT EXISTING ASPHALT PATH

MID-SLOPE LOOKING EAST ACROSS SLOPE

MID-SLOPE LOOKING SOUTH AT CANAL AND PUMP HOUSE BEYOND

BOTTOM OF SLOPE NEAR CANAL LOOKING WEST TO THE ACCESS DRIVE AND VEHICULAR-GRADE BRIDGE LEADING TO THE PUMP HOUSE

# PUMP HOUSE PARK ADA ACCESSIBILITY IMPROVEMENTS

## EXISTING CONDITIONS

TIMMONS GROUP
YOUR VISION ACHIEVED THROUGH OURS.

APRIL 15, 2021

## THE SITE EXPERIENCE

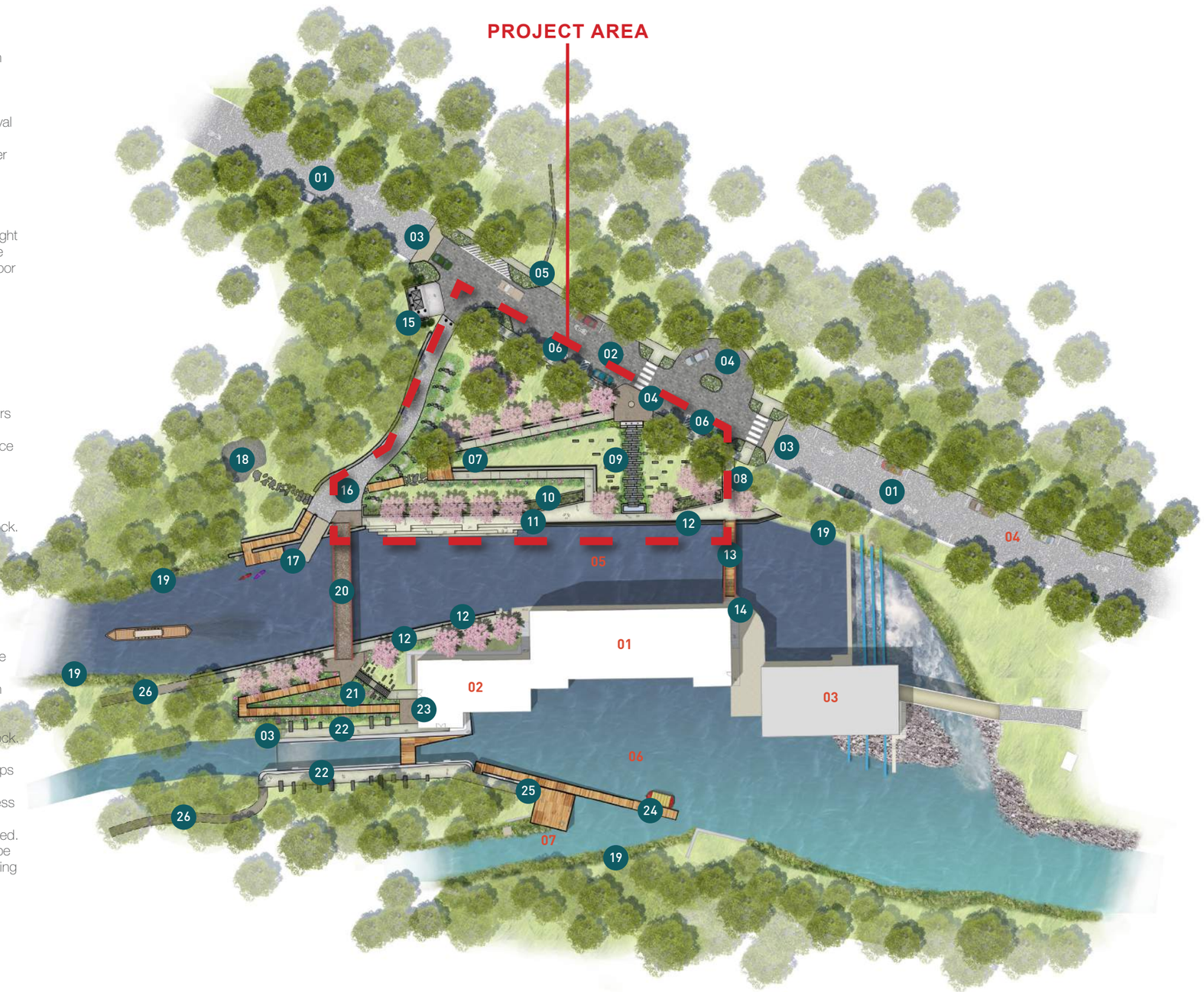
Arriving at the park from Pump House Drive, visitors find a tree-lined street striped for parallel parking and lined with sidewalks leading to the main entrance. An elevated drive with specialty pavers, flush with the curb and sidewalk, slows and calms traffic and delineates the arrival and drop-off point. Entering at a small plaza, visitors look out on a striking water feature formed by a stream cascading down repurposed granite blocks embedded into the slope. The Pump House looms across the canal; during pleasant weather, its upper windows might be open, the sound of a party with a live band emanating out from the second-floor event space.

A switchback ramp lined with stone walls and naturalistic plantings leads to a promenade along the north side of the Pump House Canal. A well-planted modular bioretention system borders the promenade, collecting and treating stormwater runoff. A wide stretch of stairs descends to the canal edge, creating a place for people to gather and experience the water up close.

Walking westward, visitors cross an improved access drive and a relocated and reoriented boat launch and boat dock. The nearby granite quarry is preserved and used for interpretive talks and other educational programming.

Crossing the existing steel truss bridge, the visitors reach a landing at the top of another ramp and a set of granite-slab stairs leading to the main entrance of the building. A bridge spanning the lower canal leads visitors to an overlook—with a stunning view of the Pump House—located above a wide basin in the canal where boats arriving from Downtown dock.

With the addition of ADA-compliant ramps and a the opening of the pedestrian bridge on the east side of the site, access to the site and building and the flow of pedestrian circulation are greatly improved. Up to 145 parallel parking spaces can be striped along Pump House Drive (including five accessible spaces), and additional parking is available at nearby sites.




## KEY

01 New Pump-House (1881-1884)
02 1905 Addition
03 Hydro-Electric Pumping Station
04 Pump House Drive
05 Pump House Canal
06 James River and Kanawha Canal
07 Washington Canal

## SITE FEATURES

01 On-street Parallel Parking
02 Specialty Paver Drive (flush with sidewalk)
03 Mountable Curb
04 Drop-off Lane and Main Entrance
05 Trail Connection to Dogwood Dell Trails
06 Accessible Parking Spaces
07 Entrance Ramp
08 Entrance Stairs (existing)
09 Water Feature
10 Stormwater Planters
11 Promenade and Stairs Along Canal
12 Canal Wall
13 Pedestrian Bridge/Utility Entrance
14 Fence with gate to restrict rear access
15 Dumpster Enclosure
16 Refurbished Driveway to Boat Launches
17 Boat Ramp and Boat Dock
18 Quarry site – Outdoor Educational Space
19 Shoreline Plantings
20 Existing Steel Truss Bridge
21 Entrance Ramp and Stairs to Building
22 Walkways Along Canal (Top of Canal)
23 Main Entrance to Pump House
24 Canal dock (access from Canal to Building)
25 Decking and Overlook
26 Interpretive and Nature Trails

0 40' 80'
1" = 80'

# PUMP HOUSE PARK ADA ACCESSIBILITY IMPROVEMENTS

SITE PLAN FROM 2019 PUMP HOUSE PARK MASTER PLAN

TIMMONS GROUP
YOUR VISION ACHIEVED THROUGH OURS.

# CITY OF RICHMOND, VIRGINIA

## DEPARTMENT OF PARKS, RECREATION AND COMMUNITY FACILITIES

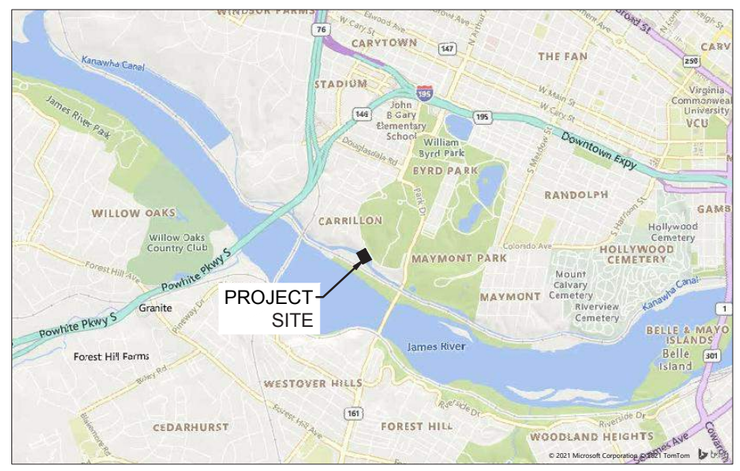
# BYRD PARK PUMP HOUSE ADA ACCESS IMPROVEMENTS

### 1500 PUMP HOUSE DRIVE, RICHMOND VA 23221

**ISSUED FOR PERMITTING**

**Civil & Landscape Sheet List Table**


| Sheet Number | Sheet Title |
|---|---|
| C0.0 | COVER |
| C1.0 | GENERAL NOTES AND DETAILS |
| C1.1 | GENERAL NOTES AND DETAILS |
| C1.2 | GENERAL NOTES AND DETAILS |
| C1.3 | GENERAL NOTES AND DETAILS |
| C2.0 | EXISTING CONDITIONS |
| C2.1 | DEMOLITION PLAN |
| C3.0 | EROSION AND SEDIMENT CONTROL - PHASE I |
| C3.1 | EROSION AND SEDIMENT CONTROL - PHASE II |
| C3.2 | EROSION AND SEDIMENT CONTROL NOTES |
| C3.3 | EROSION AND SEDIMENT CONTROL DETAILS |
| C4.0 | LAYOUT PLAN |
| C5.0 | GRADING AND DRAINAGE PLAN |
| C5.1 | STORM DRAINAGE PROFILES |
| C6.0 | STORMWATER MANAGEMENT - ENERGY BALANCE |
| C6.1 | STORMWATER MANAGEMENT - CHANNEL PROTECTION |
| C6.2 | STORMWATER MANAGEMENT - QUALITY |
| C6.3 | STORMWATER CALCULATIONS - ENERGY BALANCE POA1 |
| C6.4 | STORMWATER CALCULATIONS - ENERGY BALANCE POA2 |
| C6.5 | STORMWATER CALCULATIONS - CHANNEL PROTECTION |
| C7.0 | WATER QUALITY IMPACT ASSESSMENT |
| L1.0 | EXISTING TREE INVENTORY & REMOVAL PLAN |
| L2.0 | RPA MITIGATION LANDSCAPE PLAN |
| L2.1 | LANDSCAPE NOTES AND DETAILS |
| S1.0 | STRUCTURAL DETAILS |
| S2.0 | LOCATION PLAN |
| S3.0 | RETAINING WALL ELEVATIONS |
| S4.0 | TYPICAL SECTION DETAILS |


**VICINITY MAP**

1"=2000'

## PROJECT SUMMARY

| | |
|---|---|
| STREET ADDRESS: | 1500 PUMP HOUSE DRIVE, RICHMOND VA, 23231 |
| PARCEL ID: | W0000879022 |
| ZONING: | R-2 - RESIDENTIAL (SINGLE FAMILY) |
| SITE ACREAGE: | N/A |
| EXISTING/PROPOSED USE: | PARK / PLAYGROUND / COMMUNITY AREA |
| ON-SITE AREA OF DISTURBANCE: | 0.24-AC |
| EXISTING CONDITIONS: | CITY OF RICHMOND UTILITY MAPS, CITY OF RICHMOND GIS<br>TOPOGRAPHIC SURVEY BY TIMMONS GROUP DATED SEPTEMBER 24, 27, 28 & OCTOBER 1 & 3, 2018 |
| DATUM: | HORIZONTAL DATUM: (NAD83) VIRGINIA STATE PLANE COORDINATE SYSTEM SOUTH ZONE (1983). VERTICAL DATUM: NAVD88. |
| YARDS: | 30-FT FRONT YARD, 9-FT SIDE YARDS, 9-FT REAR YARD |

### MATERIAL QUANTITIES*

**EROSION & SEDIMENT CONTROL**

| | | |
|---|---|---|
| SAFETY FENCE | 425 | LF |
| CONSTRUCTION ENTRANCE | 1 | EA |
| SILT FENCE | 185 | LF |
| INLET PROTECTION | 1 | EA |
| TOPSOILING | 0.11 | AC. |
| TEMPORARY SEEDING | 0.11 | AC. |
| PERMANENT SEEDING | 0.11 | AC. |
| TREE PRESERVATION & PROTECTION | 280 | LF |

**STORM SEWER**

REFER TO PIPE AND STRUCTURE TABLES ON STORM DRAINAGE PROFILE (SHEETS C5.0)

| | | |
|---|---|---|
| STORM SEWER PIPE (6" CMP) | 24 | LF |
| STORM SEWER PIPE (12" CMP) | 16 | LF |
| CONTECH SLOTTED DRAIN (12" CMP) | 200 | LF |

**UNDERGROUND STORMWATER DETENTION**

| | | |
|---|---|---|
| 24" Ø CMP | 30 | LF |
| 42" Ø CMP | 70 | LF |

*NOTE: MATERIAL QUANTITIES ARE PROVIDED FOR BONDING PURPOSES ONLY. CONTRACTOR IS REQUIRED TO PERFORM THEIR OWN TAKEOFF TO MEET PLAN REQUIREMENTS.

COMMONWEALTH OF VIRGINIA
AMELIA C. WEHUNT
Lic. No. 049325
04/29/2021
PROFESSIONAL ENGINEER

Stormwater Management Facility Data

| Stormwater Management Facility Type | Stormwater Management Description | Stormwater Management Facility Structure Number | Location | | Acres Treated By Facility | | | Pollutant Removal, lbs | | | Runoff captured, acre-feet | HUC (6th order) Of Location Of Facility | Impaired Water Segment To Which Facility Discharges | Ownership Of Facility (Public/Private) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | *Latitude* | *Longitude* | *Impervious Acres* | *Pervious Acres* | *Total Acres* | *TP* | *TN* | *TSS* | | | | |
| Nutrient Bank | City of Richmond Water Treatment Plant | n/a | n/a | n/a | 0.13 | 0.11 | 0.24 | 0.10 | n/a | n/a | n/a | JM86 | James River - Little Westham Creek | Public |
| Detention | 24" CMP & 42" CMP | n/a | 37° 32' 13.3" | -77° 29' 10.2" | 0.05 | 0.34 | 0.39 | n/a | n/a | n/a | 0.004 | JM86 | James River - Little Westham Creek | Public |

**APRIL 29, 2021**


CONTACT INFORMATION:

BRYCE WILK, SENIOR SUPERINTENDENT-SOUTH DISTRICT
CITY OF RICHMOND, DEPT. OF PARKS, RECREATION AND COMMUNITY FACILITIES
1209 ADMIRAL STREET
RICHMOND, VA 23220
(804) 347-0066
bryce.wilk@richmondgov.com


REQUIRED PERMITS:

- RICHMOND STORMWATER MANAGEMENT PERMIT (RSMP)
- WORK IN STREETS PERMIT, STORM DRAINAGE PERMIT, TRADE PERMITS

THESE PLANS ARE UNFINISHED AND ARE NOT TO BE USED FOR ANY TYPE OF CONSTRUCTION.


TIMMONS GROUP
Site Development | Residential | Infrastructure | Technology
YOUR VISION ACHIEVED THROUGH OURS.
VIRGINIA | NORTH CAROLINA | WEST VIRGINIA
THIS DRAWING PREPARED AT THE
DOWNTOWN OFFICE
117 S 14th Street Suite 303 | Richmond, VA 23219
TEL 804.521.1065 FAX 804.521.1068 www.timmons.com
36157.001


**DRAWING NO: 39490.035**

REVISIONS

| NO. | DATE | COMMENTS |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |

APRIL 15, 2021

S:\31\39490.035 Byrd Park Pump House ADA Access Improvements\DWG\Sheet\C0\39490.035-C0.0-COVR.dwg | Plotted on 4/29/2021 6:07 PM | by Becky Meyer

GENERAL NOTES

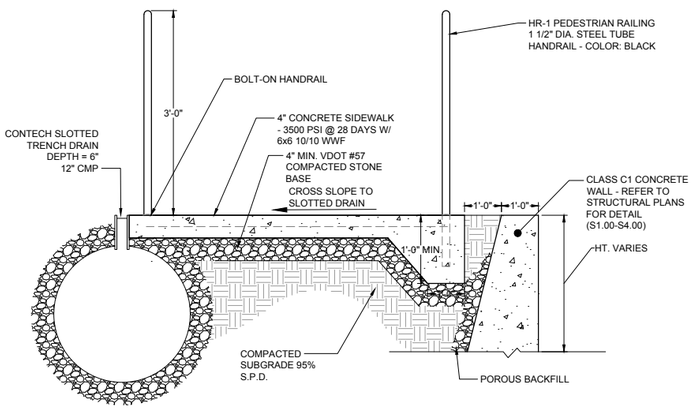
1. THIS PROJECT IS PROPOSED BY: CITY OF RICHMOND
DEPARTMENT OF PARKS AND RECREATION
1209 ADMIRAL STREET
RICHMOND, VA 23220
(804) 347-0066
CONTACT: BRYCE WILK, SENIOR SUPERINTENDENT-SOUTH DISTRICT
2. NUMBER OF LOTS AFFECTED BY THIS PROJECT: 1 --- 1500 PUMP HOUSE DRIVE, VA 23221
3. EXISTING ZONING OF PROPERTY THROUGH WHICH PROJECT IS PROPOSED: R-2
4. UNLESS OTHERWISE SPECIFIED ON THE PLANS, ALL CONSTRUCTION SHALL CONFORM TO THE LATEST VERSION OF VDOT ROAD AND BRIDGE STANDARDS.
5. ALL CONCRETE AND AGGREGATE MATERIALS SHALL CONFORM TO VDOT ROAD AND BRIDGE SPECIFICATIONS AND MATERIALS LISTED IN THE VDOT APPROVED MATERIALS LIST.
6. LOCATE ALL EXISTING UTILITIES PRIOR TO THE START OF CONSTRUCTION. IF ANY UTILITY DIFFERS THAN WHAT IS SHOWN ON THE PLAN, CONTACT THE ENGINEER IMMEDIATELY.
7. IF THE ELEVATIONS SHOWN ON THESE PLANS ARE FOUND TO BE DIFFERENT THAN FIELD CONDITIONS, CONTACT THE ENGINEER IMMEDIATELY.
8. ACQUIRE ALL REQUIRED PERMITS PRIOR TO CONSTRUCTION. ALL FEES ASSOCIATED WITH PERMITS SHALL BE PAID BY THE CONTRACTOR UNLESS OTHERWISE SPECIFIED.
9. EXISTING CONDITIONS SHOWN HEREON COMPILED FROM CITY OF RICHMOND GIS INFORMATION AND FIELD SURVEY DATA FROM TIMMONS GROUP AND MAPPING DATED SEPTEMBER 24, 27, 28 & OCTOBER 1 & 3, 2018.
10. LIMITS OF FEMA FLOODPLAIN AND FLOODWAY PER FIRM COMMUNITY PANEL NUMBER 5101290036D, EFFECTIVE DATE 4/2/2009.

CONSTRUCTION ACCESS AND MAINTENANCE OF TRAFFIC NOTES

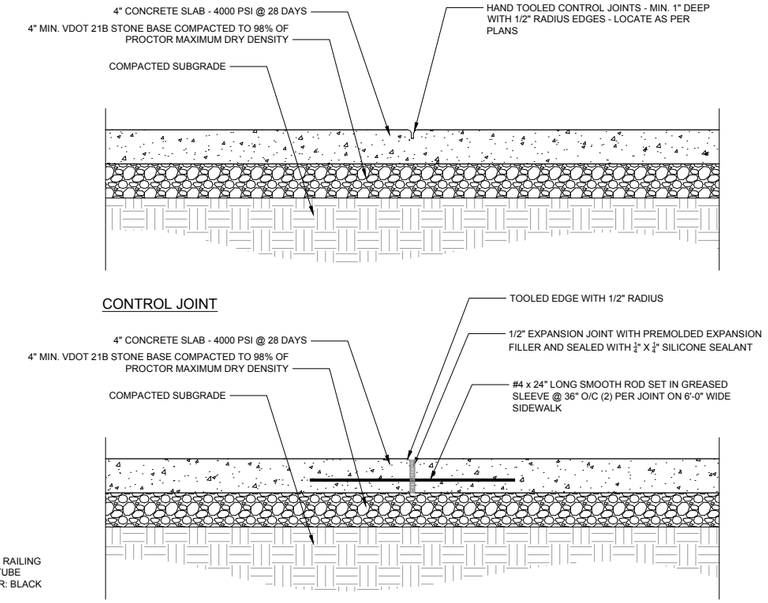
1. IMPLEMENT THE NOTES AND DETAILS PROVIDED IN THE VDOT "VIRGINIA WORK AREA PROTECTION MANUAL STANDARDS AND GUIDELINES" AT ALL TIMES DURING CONSTRUCTION. MAINTAIN A COPY OF THIS MANUAL ONSITE AT ALL TIMES DURING CONSTRUCTION.
2. ALL WORK IS SUBJECT TO INSPECTION BY DPW INSPECTOR. NOTIFY APPROPRIATE CITY OFFICIALS 72 HOURS PRIOR TO START OF WORK.
3. CALL VA811 PRIOR TO CONSTRUCTION. VERIFY LOCATION AND ELEVATION OF ALL UNDERGROUND UTILITIES SHOWN ON THE PLANS IN AREAS OF CONSTRUCTION PRIOR TO STARTING WORK. CONTACT ENGINEER IMMEDIATELY IF LOCATION OR ELEVATION IS DIFFERENT FROM THAT SHOWN ON THE PLAN, IF THERE APPEARS TO BE A CONFLICT, OR UPON DISCOVERY OF ANY UTILITY NOT SHOWN ON THE PLANS.
4. TAKE ALL NECESSARY PRECAUTIONS TO PROTECT AND MAINTAIN UNINTERRUPTED UTILITY SERVICE AT ALL TIMES DURING CONSTRUCTION. ANY DAMAGE TO EXISTING STRUCTURES SHALL BE REPAIRED IMMEDIATELY TO THE SATISFACTION OF THE CITY UTILITY INSPECTOR, AT THE CONTRACTOR'S EXPENSE.
5. MAINTAIN SAFE VEHICULAR AND PEDESTRIAN ACCESS TO ALL PROPERTIES THROUGHOUT CONSTRUCTION AND PREPARE A TRAFFIC MAINTENANCE PLAN IF REQUIRED BY THE CITY. ANY DEVIATIONS FROM THIS PLAN SHALL BE APPROVED BY THE CITY TRAFFIC ENGINEER PRIOR TO IMPLEMENTATION.
6. STOCKPILES OF MATERIAL NOT PERMITTED IN THE TRAVELWAY.
7. THE COST OF ALL CONSTRUCTION SIGNS, SIGN POST, BARRICADES, DELINEATORS, CONCRETE CONSTRUCTION BARRIERS, FLASHING AND STEADY BURN LIGHTS, AND OTHER TRAFFIC CONTROL DEVICES WHICH ARE NECESSARY FOR CONSTRUCTION SHALL BE BORNE BY THE CONTRACTOR. IN ADDITION, THE COST OF ALL TRAFFIC CONTROL WHICH ARE REQUIRED AS A RESULT OF ANY CHANGE IN THE CONSTRUCTION STAGING, AND/OR EXTENSIONS OF TIME WHICH ARE REQUIRED BY THE CONTRACTOR AND ARE APPROVED BY THE TRAFFIC ENGINEER AND CONSTRUCTION ENGINEER, SHALL BE BORNE BY THE CONTRACTOR AND INCLUDED IN THE BID PRICE.
8. ALL SIGNS AND BARRICADES USED IN CONJUNCTION WITH THIS PROJECT SHALL CONFORM WITH THE LATEST EDITIONS OF THE "NATIONAL MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" AND "THE VIRGINIA SUPPLEMENT TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS".
9. EXCAVATIONS WHICH ARE PROPOSED TO BE OPEN PAST NORMAL WORKING HOURS MUST BE APPROVED BY THE TRAFFIC ENGINEER. NO OPEN TRENCHES ARE ALLOWED OVERNIGHT--EITHER TEMPORARY STEEL PLATING OR TEMPORARY BACKFILL ARE REQUIRED. THE COST OF SIGNING AND BARRICADING THESE EXCAVATIONS IS THE RESPONSIBILITY OF THE CONTRACTOR AND MUST BE INCLUDED IN THE BID PRICE.
10. WHEN CONSTRUCTION OCCURS PARALLEL AND/OR PERPENDICULAR TO ROADS, INCLUDE IN THE TRAFFIC MAINTENANCE PLAN AT LEAST AN 11' MINIMUM TRAVEL LANE WITH FLAGMEN TO DIRECT TRAFFIC THROUGH THE WORK AREA.
11. DESIGN FEATURES RELATING TO CONSTRUCTION OR TO REGULATION AND CONTROL OF TRAFFIC MAY BE SUBJECT TO CHANGE AS DEEMED NECESSARY BY THE CITY TRAFFIC ENGINEER.
12. REMOVE UNSUITABLE MATERIAL IF ENCOUNTERED AND REPLACE WITH SUITABLE MATERIAL TO THE SPECIFICATION OF THE CITY INSPECTOR.
13. IF TREES DESIGNATED "TO REMAIN" ARE LOCATED WITHIN 10' OF CONSTRUCTION LIMITS, CONTACT DPW URBAN FORESTRY 48 HOURS PRIOR TO BEGINNING CONSTRUCTION.
14. PROVIDE TEMPORARY DRAINAGE WITHIN THE PROJECT LIMITS DURING CONSTRUCTION OR TO RELIEVE AREAS THAT MAY CAUSE DAMAGE TO ROADWAYS OR IMPEDE TRAFFIC AS DIRECTED BY THE CITY OF RICHMOND INSPECTOR.
15. CLEAN ALL DRAINAGE PIPES AND STRUCTURES OF DEBRIS AND ERODED MATERIAL AT ALL STAGES OF CONSTRUCTION TO THE SATISFACTION OF THE CITY OF RICHMOND INSPECTOR.
16. REFER TO THE LATEST VERSION OF THE VIRGINIA DEPARTMENT OF TRANSPORTATION ROAD AND BRIDGE STANDARDS AND SPECIFICATIONS.
17. PERFORM ALL CUTS IN THE STREET UNDER A WORK IN STREET PERMIT. WORK SHALL BE MONITORED BY THE PERMIT INSPECTOR.
18. DO NOT BEGIN WORK UNTIL THE PERMIT INSPECTOR HAS BEEN NOTIFIED, A PRE-CONSTRUCTION CONFERENCE HAS BEEN HELD AND MISS UTILITY HAS MARKED ALL UTILITIES.
19. ASPHALT PAVEMENT CUTS SHALL BE AS CLEAN AND STRAIGHT AS POSSIBLE, WITH NO OUTLINE DIMENSIONS LESS THAN 3 FEET WITHOUT SPECIAL APPROVAL OF THE PERMIT INSPECTOR. REFER TO DETAIL ON THIS SHEET FOR PAVEMENT RESTORATION.
20. ALL ASPHALT PAVEMENT RESTORATION THICKNESS SHALL BE 1 1/2 TIMES THE EXISTING SECTION OR A MINIMUM OF 8-INCHES WHICHEVER IS GREATER. REFER TO THE DPW TRENCH CUT RESTORATION DETAIL ON THIS SHEET FOR THE TYPICAL CONFORMANCE STANDARDS.
21. THE FINAL RESTORATION ON OPEN TRENCH CUTS REQUIRES THE DISTURBED ASPHALT PAVEMENT ZONE TO BE A SQUARE POINTED OFF AND STRAIGHT LINE. THE AREA OF PAVEMENT RESTORATION IS TO BE FULLY ENVELOPED BY THE FINAL SURFACE COURSE REPAIRS. THE ADJOINING SURFACE/TOP COURSE LAYER IS TO BE OVER-MILLED A MINIMUM DEPTH OF 1.25 INCHES OR MORE, A MINIMUM DISTANCE OF ONE FOOT BEYOND EACH SIDE OF THE TRENCH WALL. THIS STEP OUT IS TO OCCUR ALONG THE ENTIRE TRENCH LINE RUN AND/OR SQUARED POINTED AREA.
22. FINAL ACCEPTANCE BY THE CITY SHALL NOT BE MADE UNTIL ALL WORK SHOWN ON THE APPROVED PLANS IS COMPLETE TO THE SATISFACTION OF THE CITY INSPECTOR AND PROJECT MANAGER.

CONSTRUCTION SEQUENCE GUIDELINES

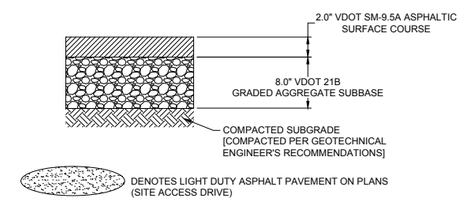
1. PROVIDE A DETAILED SCHEDULE AND SEQUENCE OF CONSTRUCTION TO THE OWNER AND ENGINEER PRIOR TO CONSTRUCTION. CONSTRUCTION SEQUENCE GUIDELINES HAVE BEEN PROVIDED BELOW TO PROVIDE REQUIRED OPERATIONAL PARAMETERS DURING CONSTRUCTION.
2. ACQUIRE ALL REQUIRED PERMITS PRIOR TO CONSTRUCTION. ALL PERMIT FEES TO BE PAID BY CONTRACTOR.
3. SCHEDULE A PRE-CONSTRUCTION MEETING WITH THE CITY OF RICHMOND AND TIMMONS GROUP AT LEAST 72 HOURS PRIOR TO THE START OF WORK.
4. CALL VA811 AT LEAST 48 HOURS PRIOR TO CONSTRUCTION. CONTACT THE ENGINEER IMMEDIATELY IF:
   4.1. LOCATION OR ELEVATION IS DIFFERENT FROM THAT SHOWN ON THE PLAN;
   4.2. IF THERE APPEARS TO BE A CONFLICT;
   4.3. OR UPON DISCOVERY OF ANY UTILITY NOT SHOWN ON THE PLANS.
5. PERFORM CONSTRUCTION SURVEY STAKEOUT FOR PROPOSED IMPROVEMENTS AND CONSTRUCTION LIMITS. ALL SURVEYING OPERATIONS MUST BE PERFORMED BY A VIRGINIA LICENSED SURVEYOR.
6. MAINTAIN UNINTERRUPTED UTILITY SERVICE TO ALL ADJACENT PROPERTIES AT ALL TIMES DURING CONSTRUCTION.
7. INSTALL THE EROSION & SEDIMENT CONTROL MEASURES BEFORE COMMENCING ANY LAND DISTURBING ACTIVITIES. REFER TO SHEET C3.0 FOR EROSION & SEDIMENT CONTROL MEASURES.
8. DEMOLISH/REMOVE ITEMS INDICATED ON SHEET C3.0 ONLY AS NECESSARY FOR SITE CONSTRUCTION.
9. PROVIDE TEMPORARY DRAINAGE MEASURES WITHIN THE PROJECT LIMITS AT THE END OF EACH DAY AS NECESSARY TO PREVENT SEDIMENT RUNOFF INTO THE JAMES RIVER CANAL.
10. ROUGH GRADE AND COMPACT SUBGRADE FOR PROPOSED CONCRETE RAMP, LANDING AND WALLS.
11. INSTALL CONCRETE RAMP WITH WALLS AND CONCRETE PAD.
12. SAWCUT AND REMOVE SECTION OF PAVEMENT TO INSTALL FLUSH CURB AND GUTTER AT PROPOSED ADA-COMPLIANT PARKING SPACES.
13. INSTALL CURB AND GUTTING AND POUR ASPHALT ON BYRD PARK DRIVE TO PROVIDE ADA GRADES AS INDICATED ON THE GRADING PLAN.
14. STRIPE ADA-COMPLIANT PARALLEL PARKING SPACES AS INDICATED ON THE LAYOUT PLAN.
15. BRING SITE TO FINAL GRADE AND INSTALL RIPARIAN PLANTINGS. REFER TO SHEET C5.0 FOR GRADES AND SHEET L1.0 FOR PERMANENT STABILIZATION MEASURES/RIPARIAN PLANTINGS.
16. MAINTAIN ALL EROSION & SEDIMENT CONTROL MEASURES AT ALL TIMES. NO MEASURE CAN BE REMOVED UNTIL APPROVED BY THE CITY OF RICHMOND INSPECTOR.



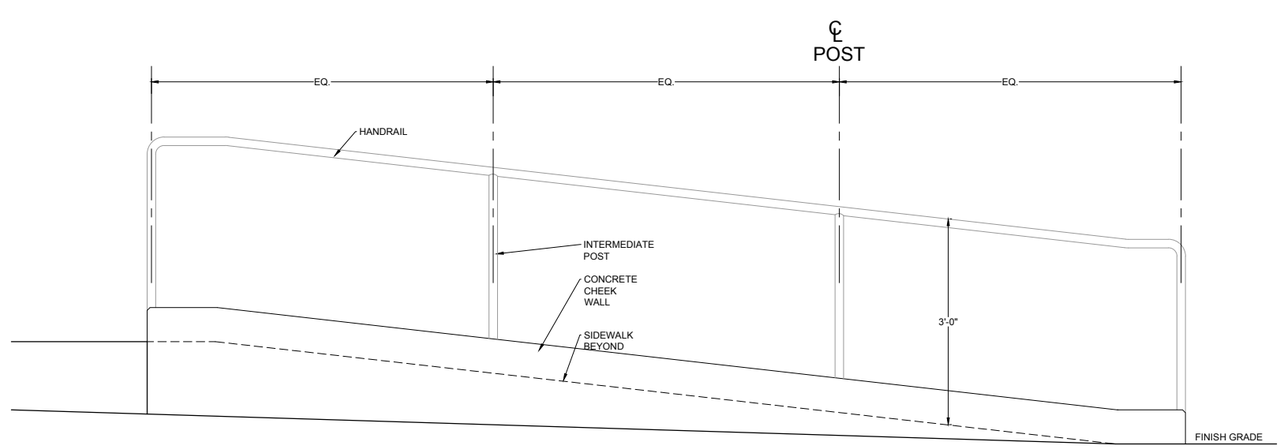

2 **CONCRETE RAMP SECTION**
NOT TO SCALE




1 **CONCRETE PAVING**
NOT TO SCALE




**LIGHT DUTY ASPHALT PAVEMENT SECTION**
NO SCALE




3 **CONCRETE RAMP PROFILE**
NOT TO SCALE

COMMONWEALTH OF VIRGINIA
AMELIA C. WEHUNT
Lic. No. 049325
04/29/2021
PROFESSIONAL ENGINEER

ISSUED FOR PERMITTING

APRIL 15, 2021

SYMBOLS

BOLLARD
BUSH
CAP
ELECTRIC BOX
ELECTRIC METER
ELECTRIC MANHOLE
FIRE HYDRANT
GAS METER
GAS VALVE
GUY
LIGHT POLE
POWER POLE
PROPERTY PIN
SANITARY MANHOLE
SIGNS
STORM MANHOLE
TELEPHONE MANHOLE
TREE
UTILITY BOX
UTILITY PEDESTAL
UTILITY POLE
WATER METER
WATER VALVE
YARD LIGHT
BOULDER

LINE TYPES

PROPERTY LINE
EXISTING MAJOR CONTOUR
EXISTING MINOR CONTOUR
EXISTING ASPHALT
EXISTING CONCRETE
SANITARY SEWER
OVERHEAD ELECTRIC
UNDERGROUND ELECTRIC
WATER PIPE
GAS PIPE
EXISTING FENCING
EXISTING TREELINE
EXISTING EASEMENT
RPA BOUNDARY
RMA BOUNDARY
FEMA 100-YR FLOODPLAIN
FEMA 500-YR FLOODPLAIN

DATE: APRIL 29, 2021 DRAWN BY: B. MEYER
SCALE: AS NOTED CHECKED BY: A. WEHUNT

REVISIONS
AS BUILT DATE

TIMMONS GROUP
YOUR VISION ACHIEVED THROUGH OURS.

Site Development | Residential | Infrastructure | Technology
YOUR VISION ACHIEVED THROUGH OURS.
VIRGINIA | NORTH CAROLINA | WEST VIRGINIA
THIS DRAWING PREPARED AT THE
**DOWNTOWN OFFICE**
117 S 14th Street Suite 303 | Richmond, VA 23219
TEL 804.521.1065 FAX 804.521.1068 www.timmons.com
39490.035

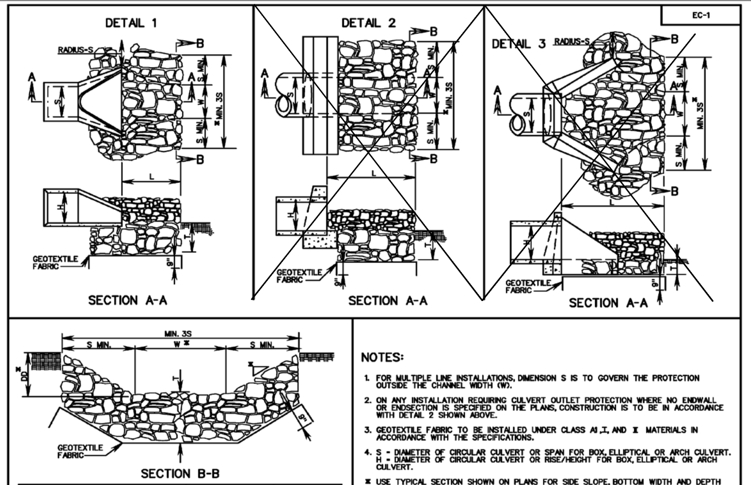
JAMES RIVER PARK SYSTEM
BYRD PARK PUMP HOUSE
ADA ACCESS IMPROVEMENTS

GENERAL NOTES AND DETAILS

DEPARTMENT OF PARKS AND RECREATION
CITY OF RICHMOND, VIRGINIA

SHEET NO.
C1.0

S:\39\39490.035-Byrd Park Pump House ADA Access Improvements\DWG\Sheet\C03\39490.035-C1.0-NTDT.dwg | Plotted on 4/29/2021 6:08 PM | by Becky Meyer




EC-1

NOTES:

1. FOR MULTIPLE LINE INSTALLATIONS, DIMENSION S IS TO GOVERN THE PROTECTION OUTSIDE THE CHANNEL WIDTH (W).
2. ON ANY INSTALLATION REQUIRING CULVERT OUTLET PROTECTION WHERE NO ENDWALL OR ENDSECTION IS SPECIFIED ON THE PLANS, CONSTRUCTION IS TO BE IN ACCORDANCE WITH DETAIL 2 SHOWN ABOVE.
3. GEOTEXTILE FABRIC TO BE INSTALLED UNDER CLASS AI, I, AND II MATERIALS IN ACCORDANCE WITH THE SPECIFICATIONS.
4. S - DIAMETER OF CIRCULAR CULVERT OR SPAN FOR BOX, ELLIPTICAL OR ARCH CULVERT. H - DIAMETER OF CIRCULAR CULVERT OR RISE/HEIGHT FOR BOX, ELLIPTICAL OR ARCH CULVERT.

※ USE TYPICAL SECTION SHOWN ON PLANS FOR SIDE SLOPE, BOTTOM WIDTH AND DEPTH OF CHANNEL OR MATCH EXISTING DITCH OR NATURAL GROUND.

| TYPE OF OUTLET PROTECTION MATERIAL | | MAXIMUM OUTLET VELOCITY (FOR DESIGN STORM) | MINIMUM "T" (INCHES) |
|---|---|---|---|
| CLASS A1 | CLASS A1 DRY RIPRAP | 8 fps | 18 |
| ~~CLASS I~~ | ~~CLASS I DRY RIPRAP~~ | ~~14 fps~~ | ~~24~~ |
| ~~CLASS II~~ | ~~CLASS II DRY RIPRAP~~ | ~~19 fps~~ | ~~36~~ |

| OUTLET PROTECTION MINIMUM LENGTH (L) | |
|---|---|
| TYPE A INSTALLATION | 3H |
| ~~TYPE B INSTALLATION~~ | ~~5H~~ |

SPECIFICATION REFERENCE 204 245 303 414

CULVERT OUTLET PROTECTION

VIRGINIA DEPARTMENT OF TRANSPORTATION

VDOT ROAD AND BRIDGE STANDARDS | REVISION DATE | SHEET 1 OF 1 | 113.01

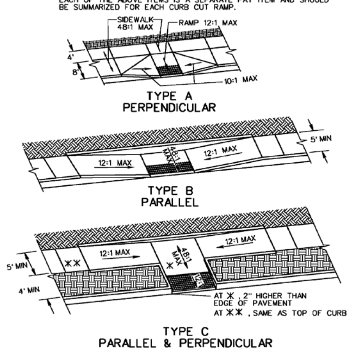
2016 ROAD & BRIDGE STANDARDS

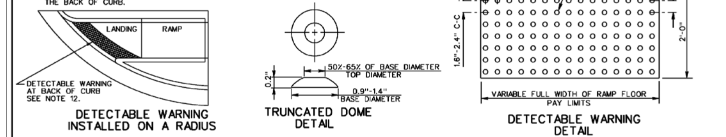
CG-12

GENERAL NOTES:

1. THE DETECTABLE WARNING SHALL BE PROVIDED BY TRUNCATED DOMES.
2. DETECTABLE WARNING SHALL BE FROM THE MATERIALS APPROVED LIST FOR DETECTABLE WARNING SUFACES. PRODUCTS NOT LISTED SHALL MEET THE REQUIREMENTS OF THE SPECIAL PROVISION FOR CG-12 DETECTABLE WARNING SURFACE AND SHALL BE SUBMITTED TO THE STANDARDS AND SPECIAL DESIGN SECTION FOR APPROVAL.
3. SLOPING SIDES OF CURB RAMP MAY BE POURED MONOLITHICALLY WITH RAMP FLOOR OR BY USING PERMISSIBLE CONSTRUCTION JOINT WITH REQUIRED BARS.
4. IF RAMP FLOOR IS PRECAST, HOLES MUST BE PROVIDED FOR DOWEL BARS SO THAT ADJOINING FLARED SIDES CAN BE CAST IN PLACE AFTER PLACEMENT OF PRECAST RAMP FLOOR. PRECAST CONCRETE SHALL BE CLASS A-4.
5. REQUIRED BARS ARE TO BE NO. 5 X 8" PLACED 1' CENTER TO CENTER ALONG BOTH SIDES OF THE RAMP FLOOR, MID-DEPTH OF RAMP FLOOR. MINIMUM CONCRETE COVER 1½".
6. CURB / CURB AND GUTTER SLOPE TRANSITIONS ADJACENT TO CURB RAMPS ARE INCLUDED IN PAYMENT FOR CURB / CURB AND GUTTER.
7. CURB RAMPS ARE TO BE LOCATED AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER. THEY ARE TO BE PROVIDED AT INTERSECTIONS WHEREVER AN ACCESSIBLE ROUTE WITHIN THE RIGHT OF WAY OF A HIGHWAY FACILITY CROSSES A CURB REGARDLESS OF WHETHER SIDEWALK IS EXISTING, PROPOSED, OR NONEXISTENT. THEY MUST BE LOCATED WITHIN PEDESTRIAN CROSSWALKS AS SHOWN ON PLANS OR AS DIRECTED BY THE ENGINEER, AND SHOULD NOT BE LOCATED BEHIND VEHICLE STOP LINES, EXISTING LIGHT POLES, FIRE HYDRANTS, DROP INLETS, ETC. ACCESSIBLE ROUTES PROVIDE A CONTINUOUS UNOBSTRUCTED, STABLE, FIRM AND SLIP RESISTANT PATH CONNECTING ALL ACCESSIBLE ELEMENTS OF A FACILITY THAT CAN BE APPROACHED, ENTERED AND USED BY PEDESTRIANS.
8. RAMPS MAY BE PLACED ON RADIAL OR TANGENTIAL SECTIONS PROVIDED THAT THE CURB OPENING IS PLACED WITHIN THE LIMITS OF THE CROSSWALK AND THAT THE SLOPE AT THE CONNECTION OF THE CURB OPENING IS PERPENDICULAR TO THE CURB.
9. TYPICAL CONCRETE SIDEWALK IS 4" THICK. WHEN THE ENTRANCE RADII CANNOT ACCOMMODATE THE TURNING REQUIREMENTS OF ANTICIPATED HEAVY TRUCK TRAFFIC, REFER TO STANDARD CG-13, COMMERCIAL ENTRANCE (HEAVY TRUCK TRAFFIC) FOR CONCRETE DEPTH.
10. WHEN CURB RAMPS ARE USED IN CONJUNCTION WITH A SHARED USE PATH, THE MINIMUM WIDTH SHALL BE THE WIDTH OF THE SHARED USE PATH.
11. WHEN ONLY ONE CURB RAMP IS PROVIDED FOR TWO CROSSINGS (DIAGONAL), A 4' x 4' LANDING AREA SHALL BE PROVIDED TO MANEUVER A WHEELCHAIR INTO THE CROSSWALK WITHOUT GOING INTO THE TRAVELWAY. THIS 4' x 4' LANDING AREA MAY INCLUDE THE GUTTER PAN.
12. ALL CASES WHERE CURB RAMPS INTERSECT A RADIAL SECTION OF CURB AT ENTRANCES OR STREET CONNECTIONS THE DETECTABLE WARNING SURFACE SHALL HAVE A FACTORY RADIUS OR BE FIELD -MODIFIED AS RECOMMENDED BY THE MANUFACTURER TO MATCH THE BACK OF CURB.

NOTE: COMPONENTS OF CURB RAMPS CONSIST OF THE FOLLOWING:
HYDRAULIC CEMENT SIDEWALK (DEPTH IN INCHES, AREA IN SQUARE YARDS)
CURB WHEN REQUIRED (CG-2 OR CG-3 IN LINEAR FEET)
DETECTABLE WARNING SURFACE (AREA IN SQUARE YARDS)
EACH OF THE ABOVE ITEMS IS A SEPARATE PAY ITEM AND SHOULD BE SUMMARIZED FOR EACH CURB CUT RAMP.




VDOT ROAD AND BRIDGE STANDARDS | SHEET 1 OF 5 203.05 | REVISION DATE 07/15

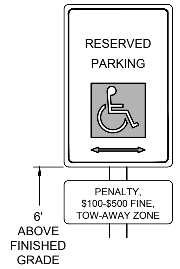
CG-12 DETECTABLE WARNING SURFACE

(GENERAL NOTES)

VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION REFERENCE 105 502

2016 ROAD & BRIDGE STANDARDS




## PARKING SIGN FOR THE DISABLED

NO SCALE

## SIGNAGE NOTES

1. ALL PROPOSED SIGNING AND PAVEMENT MARKINGS SHALL BE IN ACCORDANCE WITH THE MOST CURRENT EDITION OF EACH OF THE FOLLOWING AND ANY REVISION THERETO:
   A. MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
   B. THE VIRGINIA SUPPLEMENT TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
   C. THE VIRGINIA DEPARTMENT OF TRANSPORTATION ROAD AND BRIDGE SPECIFICATIONS.
   D. THE INTERNATIONAL FIRE CODE.
2. PROPOSED SIGN LOCATIONS ARE APPROXIMATE AND SHALL BE MODIFIED IN THE FIELD TO AVOID CONFLICT WITH UNDERGROUND UTILITIES OR OTHER OBSTRUCTIONS, AND TO COMPLY WITH STANDARDS REFERENCED IN NOTE 1 ABOVE.
3. ALL SIGN AND PAVEMENT MARKINGS ARE TO BE FURNISHED AND INSTALLED BY THE CONTRACTOR.

ACCESSIBLE SPACES SHALL BE IDENTIFIED BY ABOVE GRADE SIGNS AS RESERVED FOR PHYSICALLY DISABLED PERSONS. PROVIDE ONE (1) R-7-8 SIGN AT EACH ACCESSIBLE PARKING SPACE INDICATED ON SITE PLAN. THE SIGN WILL BE ALUMINUM (PAINTED WHITE) WITH GREEN LETTERS AND THE INTERNATIONAL WHEELCHAIR SYMBOL. THE SIGN WILL INCLUDE THE LANGUAGE "PENALTY, $100-500 FINE, TOW-AWAY ZONE". THE CENTER OF SIGN SHALL BE AT LEAST FIVE (5) FEET ABOVE GRADE, BUT NO HIGHER THAN SEVEN (7) FEET ABOVE GRADE. THE SIGN SHALL BE PLACED ON A 1-1/2" DIAMETER STEEL POST, PAINTED BLACK, AND SET IN 12" OF CONCRETE. TYPICAL ACCESSIBLE SIGNS SHALL CONFORM TO ADA REQUIREMENTS.

## CITY OF RICHMOND DPW, OPERATIONS DIVISION STANDARD OPERATING PROCEDURES: PAVEMENT REPAIR

Utility Program Managers

DEFINITIONS (If applicable)

Attachment A
Standard Requirements for Repaving Utility Repairs ***(This would take the place of the Age of Pavement Table currently being used)***
Water/Wastewater/ Sewer/ Gas/Communication & Electrical Trenches

1. Street cuts in City right away are required to follow the following steps to repair all patches in accordance with the following requirements and as shown in attachment PAV-2, PAV-2-A, PAV- 2- B, and PAV-2-C for the following utility cuts: water/wastewater/sewer/gas/communication &electrical trenches.

a. All sides shall be saw cut to neat straight line and an approved tack coat shall be applied at a rate of 0.1 gallon per square yard before placing the plant mix.

b. PAV-2 requirements are as follows (See Attached)

- Install PB-l Pipe Bedding No 25, 26, or 57 stone per VDOT standard or an approved equal.
- Backfill remaining trench with Type I, Size 21-A or 21-B stone compacted to 95% theoretical maximum density (Standard Proctor).
- Eight (8") inches BM-25 minimum or install per typical road section if greater, with a minimum of a one (1) foot bench on each side of trench. The 21-A stone sub-base shall be installed from the bottom of the repair to within 10" of final restoration. *If an existing road surface has less than two (2") inches with no sub-base, the standard for restoring the roadway shall apply to all city streets.*
- For Transverse Cuts, **for Arterial Street** mill two (2) inches in depth from center line of trench twenty five (25) feet in both directions and overlay area with two (2) inches of SM-9.5D type asphalt to match existing cross section. For **Local and Collector Streets** mill a total of fifteen (15') feet with the trench located in the middle of the milled area.
- *The 25' in both directions of the trench for **Arterial Streets** and the fifteen (15') feet for **Local and Collector Streets** allows the City to create a smooth transition along the roadway. The 5000 ADT (Average Daily Traffic) is a VDOT standard for their roadways and 25% of the City of Richmond roadways meet these VDOT standards. This requirement shall apply to all of City of Richmond roadways to insure a smooth riding surface.*
- In the event of multiple cuts and the distance between milled areas being twenty (20') feet or less, this area is to be included with restoration of the utility repair.
- For Longitudinal Cuts, mill two (2) inches in depth from edge of pavement or edge of travel lane to center line of roadway and overlay with two (2) inches of SM-9.5D for the entire length of cut. *( This is referencing the travel lane that the cut was made in)*
- When Longitudinal cuts are within two (2) feet of center line of roadway, entire roadway will be milled two (2) inches in depth from edge of pavement to edge of pavement or from edge of travel lane to edge of travel lane for the entire length of cut and overlay with two (2) inches of SM- 9.5D. *( This is referencing the travel lane the cut was made in.)*
- *In the event when the 2" milling is performed to create the smooth transition on the existing roadway and the roadway has insufficient asphalt depth. The segment with insufficient asphalt depth will be milled a total of (4") four inches and install (2.5") two and half inches of BM-25 asphalt and (1 ½") one and half inches of SM-9.5D asphalt. This would apply to all insufficient areas including all transverse cuts and longitudinal cuts*
- *Attachment 1A : Shows in detail what is to be expected for the repair of Transverse Utility Cuts and Longitudinal Utility Cuts*

All asphalt repairs will be checked with a twelve (12) foot straight edge to assure a smooth transition from existing pavement to new pavement.

c. All backfilling, compacting, and inspection reporting shall comply with the SOP labeled Backfill and Compaction of Utility Trenches within the Public Right of Way.

d. The responsible party for any street cuts in City right away will be responsible for any depression greater than (1 1/4") that occurs within the one (1) to three (3) year of completion of patching. Correction shall consist of milling and replacing two (2") inches of surface course mix (SM) for the entire area of repair. In the event any depression is greater than one and half inches, the failure will be evaluated by the Paving Engineer for the proper repair.

*(The City streets that have documented compaction testing performed would have the one-year warranty period requirement, and the City streets without documented compaction test would require a three-year warranty period)*

*If the depression occurs, the entire area will have to be repaired and repaved to provide a smooth riding surface.*

e. Replacement of all asphalt shall be rolled where possible, with a vibratory roller having a manufacturer's rating of five (5) tons and rolled until the aggregate is keyed into the bitumen. Where rolling is not possible, a mechanical tamp will be used. If the application of the bituminous layer is delayed for adverse weather conditions, the contractor shall provide and maintain a base course that is acceptable to the City of Richmond, Department of Public Works, until such time as the appropriate pavement patch can be applied and completion of the installation of the gas, water, sewer, electric, and communication lines. Contractor shall restore pavement in the manner prescribed within 10 calendar days, weather permitting.

f. When final two (2) inch layer of SM-9.5D is to be placed on roadway which has been milled, the contractor shall use a bituminous paver with electronically controlled screed to insure a smooth riding surface. Once final surface is installed, the grade will be checked with a twelve (12) foot straight edge on the finished paved surface. When grade is out of tolerance one quarter (1/4) of an inch or more, the final surface will be corrected to meet Department of Public Works' Paving and Restoration Standards for all underground utility cuts.

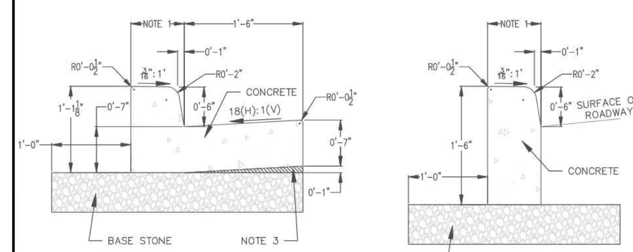
g. Final compaction of the top two (2) inches of SM-9.5 D will be performed using a five (5) ton vibratory roller at a minimum.

h. All damages to existing road(s) caused by the responsible party will be restored to the satisfaction of the City of Richmond's Paving Engineer.

i. Permitting shall notify the City of Richmond, DPW Inspector, a minimum of 72 hours prior to open cutting any streets in the City of Richmond. *(This does not apply to emergency repairs. Department of Public Works needs to be notified within 24 hours of the location of all emergency utility repairs)*

j. At no time shall the contractor park equipment to protect the excavation. Protection of an excavation is either by backfilling the hole or the use of steel plates.

k. All Excavations or Open Cuts shall comply with OSHA Technical Manual, Chapter 2, Titled Excavations: Hazard Recognition in Trenching and Shoring.




MONOLITHIC CONCRETE CURB & GUTTER

CONCRETE CURB

NOTES:

1. CURB THICKNESS SHALL BE 8" IN COMMERCIAL, CENTRAL BUSINESS DISTRICT, INDUSTRIAL, THE FAN, HIGH DENSITY AND MULTI-FAMILY AREAS. CURB THICKNESS SHALL BE 6" IN SINGLE-FAMILY RESIDENTIAL AREAS.
2. BASE STONE SHALL MATCH ROADWAY PAVEMENT SECTION OR BE 6" COMPACTED THICKNESS, WHICHEVER IS THICKER. BASE STONE SHALL CONSIST OF AGGREGATE BASE MATERIAL 21A OR 21B.
3. THE BOTTOM OF THE CURB AND GUTTER MAY BE CONSTRUCTED PARALLEL TO THE SLOPE OF SUB-BASE COURSE, PROVIDED A MINIMUM DEPTH OF 7" IS MAINTAINED.
4. CONCRETE SHALL BE CLASS A3 (MIN.).

NOTES 1. SUPERCEDES ALL PREVIOUS VERSIONS.

ROADWAY GEOMETRIC DETAILS
MONOLITHIC CURB AND CURB & GUTTER

| REFERENCES: | REVISIONS | DEPARTMENT OF PUBLIC WORKS RICHMOND, VIRGINIA | DRAWN BY: DPW | CHECKED BY: | FIELD NOTES | SCALE: NO SCALE | DATE: 9/30/19 | DRAWING NO. RGM-CD-01 |
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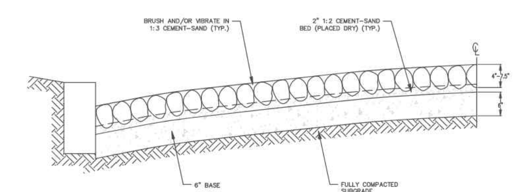


CONSTRUCTION NOTES:

SUBBASE PREPARATION:
1. SHAPE SUBGRADE TO CORRECT ELEVATIONS.
2. PROFILE GRADE SHALL MAINTAIN A STRAIGHT LINE ON A CONTINUOUS POSITIVE FALL ON VALLEY OR STRAIGHT LINE CROSS-SECTION.
3. SUBGRADE SHALL BE PLACE IN A MINIMUM STATE OF 95% COMPACTION BY STANDARD PROCTOR, AND SHALL BE PROVEN NON-YIELDING THROUGHOUT
4. SUBGRADE ELEVATION CHECKS SHALL ACCOMMODATE EXISTING FACILITIES (THRESHOLDS, DOWNSPOUTS, WINDOW WELLS, STAIR WELLS, ETC.) WITHOUT CREATING DRAINAGE ISSUES.
5. 6" BASE SHALL BE AGGREGATE BASE MATERIAL (21A OR 21B) OR 3,000 (MIN.) PSI CONCRETE AS REQUIRED BY THE ENGINEER.

GRANITE SPALL PLACEMENT
1. GRANITE SPALL OR PAVING BLOCKS SHALL BUTTRESS TIGHTLY AGAINST EACH UNIT AND SHALL BE SET ON A 2" (MIN.) CEMENT-SAND (1:2 MIX) SETTING BED.
2. CEMENT-SAND (1:3) MIX SHALL PROVIDE THE VOID FILLER MATERIAL BETWEEN EACH UNIT.
3. FILLER MATERIAL SHALL BE SWEPT INTO AND/OR VIBRATED INTO THE VOIDS TO A STATE OF TOTAL REFUSAL. THE CEMENT-SAND MIX SHALL BE WATERED BETWEEN EACH LAYER.
4. AFTER TOTAL REFUSAL HAS BEEN OBTAINED, THE FILLER MATERIAL SHALL BE WETTED DOWN COMPLETELY THEN ALLOWED TO DRY.

NOTES 1. SUPERCEDES ALL PREVIOUS VERSIONS.

ROADWAY GEOMETRIC DETAILS
GRANITE SPALL PAVEMENT DETAIL

| REFERENCES: | REVISIONS | DEPARTMENT OF PUBLIC WORKS RICHMOND, VIRGINIA | DRAWN BY: DPW | CHECKED BY: | FIELD NOTES | SCALE: NO SCALE | DATE: 9/30/19 | DRAWING NO. RGM-CD-08 |
|---|---|---|---|---|---|---|---|---|

## BOAT LAUNCH RECONSTRUCTION

COMMONWEALTH OF VIRGINIA
Amelia Wehunt
AMELIA C. WEHUNT
Lic. No. 049325
04/29/2021
PROFESSIONAL ENGINEER

ISSUED FOR PERMITTING

APRIL 15, 2021

SYMBOLS

| | |
|---|---|
| BOLLARD | SANITARY MANHOLE |
| BUSH | SIGNS |
| CAP | STORM MANHOLE |
| ELECTRIC BOX | TELEPHONE MANHOLE |
| ELECTRIC METER | TREE |
| ELECTRIC MANHOLE | UTILITY BOX |
| FIRE HYDRANT | UTILITY PEDESTAL |
| GAS METER | UTILITY POLE |
| GAS VALVE | WATER METER |
| GUY | WATER VALVE |
| LIGHT POLE | YARD LIGHT |
| POWER POLE | BOULDER |
| PROPERTY PIN | |

LINE TYPES

PROPERTY LINE
EXISTING MAJOR CONTOUR
EXISTING MINOR CONTOUR
EXISTING ASPHALT
EXISTING CONCRETE
SANITARY SEWER
OVERHEAD ELECTRIC
UNDERGROUND ELECTRIC
WATER PIPE
GAS PIPE
EXISTING FENCING
EXISTING TREELINE
EXISTING EASEMENT
RPA BOUNDARY
RMA BOUNDARY
FEMA 100-YR FLOODPLAIN
FEMA 500-YR FLOODPLAIN

DATE: APRIL 29, 2021 DRAWN BY: B. MEYER
SCALE: AS NOTED CHECKED BY: A. WEHUNT

REVISIONS

AS BUILT DATE

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39490.035

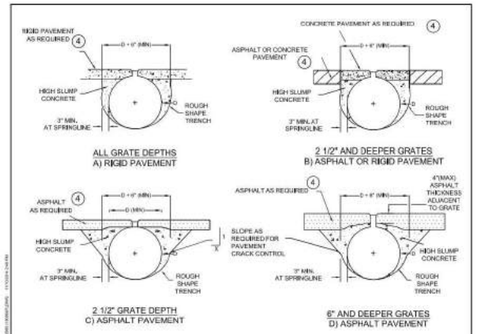
JAMES RIVER PARK SYSTEM
BYRD PARK PUMP HOUSE
ADA ACCESS IMPROVEMENTS

GENERAL NOTES AND DETAILS

DEPARTMENT OF PARKS AND RECREATION
CITY OF RICHMOND, VIRGINIA

SHEET NO. C1.1

S:\310\39490.035-Byrd Park Pump House ADA Access Improvements\DWG\Sheet\CD\39490.035-C1.0-NTDT.dwg | Plotted on 4/29/2021 6:08 PM | by Becky Meyer




REQUIREMENTS:

1. EITHER 2-1/2" OR 6" DEEP GRATING IS ACCEPTABLE FOR STANDARD HIGHWAY (H10 THROUGH H25) LOADS USING THE GAGES IN TABLE 1, SEE DRAWING NO. 1009776. HIGH SLUMP CONCRETE BACKFILL IS REQUIRED, WITH THE ENVELOPE EXTENDING A MINIMUM OF 3 INCHES BEYOND THE SPRINGLINE, AS SHOWN ABOVE. THE HIGH SLUMP CONCRETE MUST PROVIDE A MINIMUM 750 psi COMPRESSIVE STRENGTH.
2. FOR INSTALLATIONS SUBJECTED TO OCCASIONAL LIGHT VEHICLE (LESS THAN H10) LOADS, SELECT GRANULAR BACKFILL MAY BE USED, HOWEVER, THE DRAIN MUST BE SET IN A TRENCH WIDE ENOUGH TO PROPERLY HAUNCH THE PIPE (TYPICALLY D + 36"). THE GRANULAR BACKFILL MUST BE A CLEAN, NON-PLASTIC, WELL GRADED MATERIAL, COMPACTED TO 95% STANDARD PROCTOR DENSITY.
3. DURING INSTALLATION, RECESS THE TOP OF THE GRATE 1/4" BELOW THE FINISHED GRADE OF THE PAVEMENT.
4. PAVEMENT DESIGNS AS REQUIRED FOR LOADING CONDITIONS. FOR REINFORCED CONCRETE PAVEMENTS, CONTINUE THE REINFORCEMENT OVER THE SLOTTED DRAIN. FOR UNREINFORCED CONCRETE PAVEMENTS, MINIMUM SHRINKAGE STEEL IS RECOMMENDED.
5. HEAVIER WHEEL LOADS DICTATE THE USE OF A MINIMUM 6" DEEP GRATING AND TYPICALLY A LARGER HIGH SLUMP CONCRETE EMBEDMENT ZONE. (SEE DRAWING 1008136)

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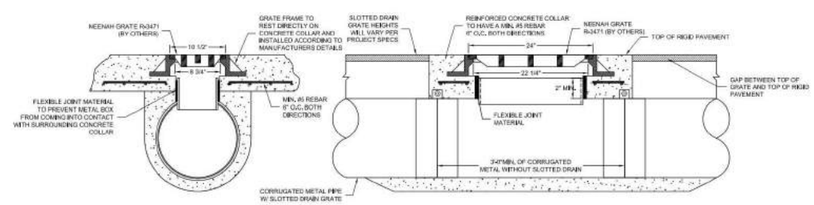
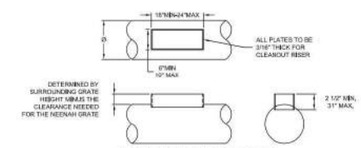
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

SLOTTED DRAIN INSTALLATION
HIGHWAY WHEEL LOADINGS

| DRAWN BY: F.B. | REV. BY: D.E.N. | SCALE: N/A |
|---|---|---|
| 5-28-92 | 7-19-95 | 1009807C |




GRATE & FRAME INSTALLATION FOR CLEANOUT ACCESS
N.T.S.




CLEANOUT BOX RISER DETAIL
N.T.S.

| MARK | DATE | REVISION DESCRIPTION | BY |
|---|---|---|---|

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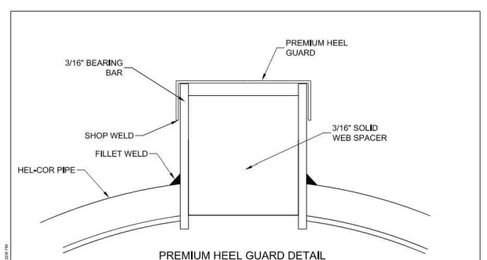
CONTECH PIPE SOLUTIONS

SLOTTED DRAIN
FLDOT SLOTTED DRAIN CLEANOUT
TRAFFIC RATED FRAME & GRATE

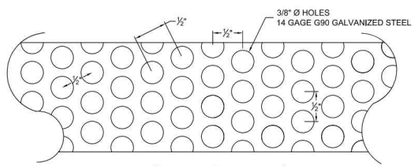
SLOTTED DRAIN CLEANOUT

| SCALE: N.T.S. | DATE DRAWN: 11/8/2017 |
|---|---|
| REV #: XX | REV DATE: |
| DRAWING TYPE: 001 | |

1




PREMIUM HEEL GUARD DETAIL
STRAIGHT GRATE
(NTS)




PREMIUM HEEL GUARD DETAIL
(NTS)

NOTE: ALL DIMENSIONS ARE SUBJECT TO MANUFACTURING TOLERANCES

CONTECH DRAINAGE SYSTEMS

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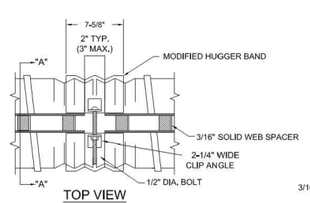
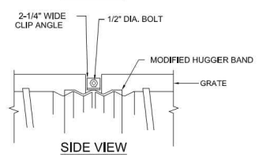
www.conteches.com
8301 State Highway 23 North, Alexandria, MN 56308
800-328-2047 320-852-7500 320-852-7087 FAX

PREMIUM HEEL GUARD
STRAIGHT GRATE
STANDARD DETAIL

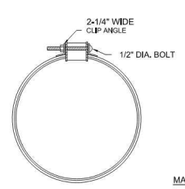
| DATE: 4/14/2015 | SCALE: NONE | PROJECT No: STD DTL | SEQ. No: — | DRAWN: JAP | CHECKED: BOH |
|---|---|---|---|---|---|



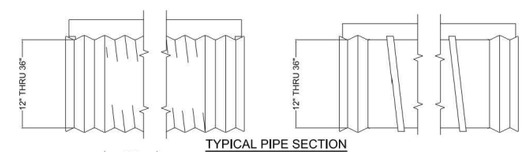

TOP VIEW



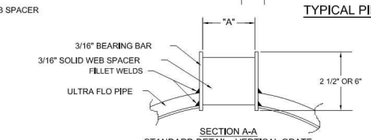

SIDE VIEW



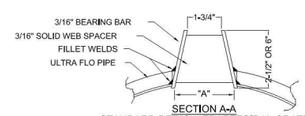

END VIEW



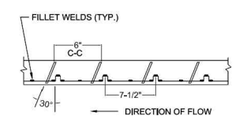

TYPICAL PIPE SECTION

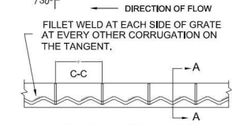



SECTION A-A
STANDARD DETAIL - VERTICAL GRATE




SECTION A-A
STANDARD DETAIL - TRAPEZOIDAL GRATE




GRATE WELDING DETAIL

| STANDARD SIZES | | | | | | |
|---|---|---|---|---|---|---|
| GAGE OF PIPE | DIAMETER OF PIPE | | | | | |
| | 12" | 15" | 18" | 24" | 30" | 36" |
| 16 | X | X | X | X | X | X |
| 14 | X | X | X | X | X | X |
| 12 | N.A. | N.A. | N.A. | N.A. | X | X |

| GRATE TYPE | | "A" |
|---|---|---|
| VERT | 2-1/2" | 1-3/4" |
| VERT | 6" | 1-3/4" |
| TRAP | 2-1/2" | 2-1/4" |
| TRAP | 6" | 3" |

VERT=VERTICAL
TRAP=TRAPEZOIDAL

MANUFACTURING TOLERANCES

1. VERTICAL BOW ± 3/8"
2. HORIZONTAL BOW ± 5/8"
3. TWIST ± 1/2"

SLOTTED DRAIN NOTES

1. FOR 6" VERTICAL REQUIREMENTS, THE SLOTTED DRAIN BAND MAY BE FURNISHED WITH THE 4" TECHCO BAND ANGLE.
2. DIMENSIONS ARE SUBJECT TO MANUFACTURING TOLERANCES.
3. REFERENCE CONTECH BAND MANUAL DWG. NO. 1008466 FOR BAND DETAILS.
4. SLOTTED DRAIN PIPE MAY HAVE TABS EVERY 59-1/2" TO ACCEPT GRATE NOTCHES.

ULTRA FLO SLOTTED DRAIN NOTES

1. ULTRA FLO PIPE SHALL BE SPIRAL RIB CONFORMING TO AASHTO M36, TYPE IR.
2. GRATE MATERIAL SHALL CONFORM TO THE DETAILS SHOWN AND CONFORM TO ASTM A-36, OR A570, GRADE 36, HOT DIP GALVANIZED PER ASTM A-123.
3. DIMENSIONS ARE SUBJECT TO MANUFACTURING TOLERANCES.

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SLOTTED DRAIN STANDARD DETAILS

| DRAWING DATE: 0 | REVISION DATE: 0 | DRAWING NUMBER: 0 |
|---|---|---|

COMMONWEALTH OF VIRGINIA
AMELIA C. WEHUNT
Lic. No. 049325
04/29/2021
PROFESSIONAL ENGINEER

ISSUED FOR PERMITTING

APRIL 15, 2021

SYMBOLS

BOLLARD
BUSH
CAP
ELECTRIC BOX
ELECTRIC METER
ELECTRIC MANHOLE
FIRE HYDRANT
GAS METER
GAS VALVE
GUY
LIGHT POLE
POWER POLE
PROPERTY PIN
SANITARY MANHOLE
SIGNS
STORM MANHOLE
TELEPHONE MANHOLE
TREE
UTILITY BOX
UTILITY PEDESTAL
UTILITY POLE
WATER METER
WATER VALVE
YARD LIGHT
BOULDER

LINE TYPES

PROPERTY LINE
EXISTING MAJOR CONTOUR
EXISTING MINOR CONTOUR
EXISTING ASPHALT
EXISTING CONCRETE
SANITARY SEWER
OVERHEAD ELECTRIC
UNDERGROUND ELECTRIC
WATER PIPE
GAS PIPE
EXISTING FENCING
EXISTING TREELINE
EXISTING EASEMENT
RPA BOUNDARY
RMA BOUNDARY
FEMA 100-YR FLOODPLAIN
FEMA 500-YR FLOODPLAIN

DATE: APRIL 29, 2021 DRAWN BY: B. MEYER
SCALE: AS NOTED CHECKED BY: A. WEHUNT

REVISIONS

AS BUILT DATE

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39490.035

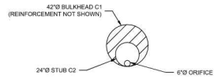
JAMES RIVER PARK SYSTEM
BYRD PARK PUMP HOUSE
ADA ACCESS IMPROVEMENTS

GENERAL NOTES AND DETAILS

DEPARTMENT OF PARKS AND RECREATION
CITY OF RICHMOND, VIRGINIA

SHEET NO. C1.2

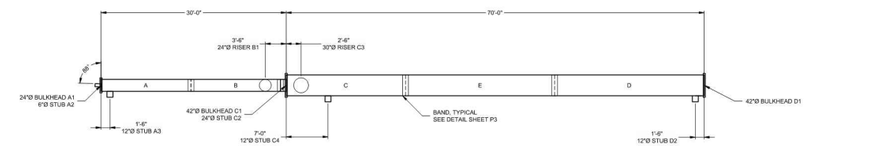
S:\31\39490.035 Byrd Park Pump House ADA Access Improvements\DWG\Sheet\C2\39490.035-C1.0-NTDT.dwg | Plotted on 4/29/2021 6:09 PM | by Becky Meyer




**42" Ø BULKHEAD C1 DETAIL**
(NOT TO SCALE)

| STUB INFORMATION | | |
|---|---|---|
| PIECE | STUB INVERT | SYSTEM INVERT |
| 6"Ø STUB A2 | 105.35 | 105.35 |
| 12"Ø STUB A3 | 106.30 | 105.35 |
| 24"Ø STUB C2 | 105.35 | 105.35 |
| 12"Ø STUB C4 | 107.80 | 105.35 |
| 12"Ø STUB D2 | 107.80 | 105.35 |

| RISER INFORMATION | | |
|---|---|---|
| PIECE | RIM ELEV. | SYSTEM INVERT |
| 24"Ø RISER B1 | 110.00 | 105.35 |
| 30"Ø RISER C3 | 110.60 | 105.35 |




THE UNDERSIGNED HEREBY APPROVES THE ATTACHED (4) PAGES INCLUDING THE FOLLOWING:

- **PIPE STORAGE = 768 CF**
- **MAINLINE PIPE GAGE = 16**
- **WALL TYPE = SOLID**
- **DIAMETER = 42, 24"**
- **FINISH = ALT2**
- **CORRUGATION = 2 2/3x1/2**

CUSTOMER DATE

## ASSEMBLY

SCALE: 1" = 10'
PIPE STORAGE: 768 CF
LOADING: H20
PIPE INV. = 105.35'±

NOTES

- ALL RISER AND STUB DIMENSIONS ARE TO CENTERLINE.
- ALL ELEVATIONS, DIMENSIONS, AND LOCATIONS OF RISERS AND INLETS, SHALL BE VERIFIED BY THE ENGINEER OF RECORD (EOR) PRIOR TO RELEASING FOR FABRICATION.
- ALL FITTINGS AND REINFORCEMENT COMPLY WITH ASTM A998.
- ALL RISERS AND STUBS ARE *2⅔" x ½"* CORRUGATION AND 16 GAGE UNLESS OTHERWISE NOTED.
- RISERS TO BE FIELD TRIMMED TO GRADE AS REQUIRED, BY CONTRACTOR.
- QUANTITY OF PIPE SHOWN DOES NOT PROVIDE EXTRA PIPE FOR CONNECTING THE SYSTEM TO EXISTING PIPE OR DRAINAGE STRUCTURES. OUR SYSTEM AS DETAILED PROVIDES NOMINAL INLET AND/OR OUTLET PIPE STUB FOR CONNECTION TO EXISTING DRAINAGE FACILITIES. IF ADDITIONAL PIPE IS NEEDED IT IS THE RESPONSIBILITY OF THE CONTRACTOR.
- ALL ACCESS CASTINGS ARE THE RESPONSIBILITY OF THE CONTRACTOR AND ARE NOT SUPPLIED BY CONTECH.

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| MARK | DATE | REVISION DESCRIPTION | BY |
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www.ContechES.com
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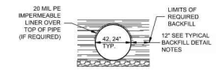
866-740-3319 410-796-5505 866-376-8511 FAX

CONTECH CMP DETENTION SYSTEMS

CONTRACT DRAWING
PROPOSAL DRAWING

42"Ø UNDERGROUND DETENTION SYSTEM - 676501-010
JAMES RIVER PARK SYSTEM BYRD PARK PUMP HOUSE
RICHMOND, VA
SITE DESIGNATION: CMP DETENTION PIPE

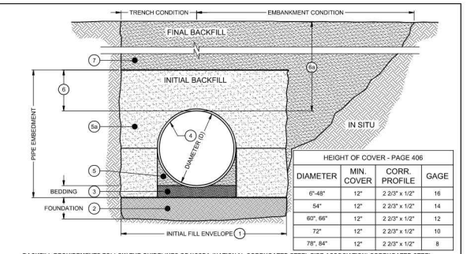
| PROJECT No. | REV. No. | DATE |
|---|---|---|
| 676501 | 010 | 4/29/2021 |
| DESIGNED: MAK | DRAWN: MAK | |
| CHECKED: MAK | APPROVED: | |
| SHEET No. P1 OF 4 | | |




## TYPICAL SECTION VIEW

NOT TO SCALE

**NOTE:** IF SALTING AGENTS FOR SNOW AND ICE REMOVAL ARE USED ON OR NEAR THE PROJECT, A GEOMEMBRANE BARRIER IS RECOMMENDED WITH THE SYSTEM. THE GEOMEMBRANE LINER IS INTENDED TO HELP PROTECT THE SYSTEM FROM THE POTENTIAL ADVERSE EFFECTS THAT MAY RESULT FROM A CHANGE IN THE SURROUNDING ENVIRONMENT OVER A PERIOD OF TIME. PLEASE REFER TO THE CORRUGATED METAL PIPE DETENTION DESIGN GUIDE FOR ADDITIONAL INFORMATION.




| HEIGHT OF COVER - PAGE 406 | | | |
|---|---|---|---|
| DIAMETER | MIN. COVER | CORR. PROFILE | GAGE |
| 6"-48" | 12" | 2 2/3" x 1/2" | 16 |
| 54" | 12" | 2 2/3" x 1/2" | 14 |
| 60", 66" | 12" | 2 2/3" x 1/2" | 12 |
| 72" | 12" | 2 2/3" x 1/2" | 10 |
| 78", 84" | 12" | 2 2/3" x 1/2" | 8 |

**BACKFILL REQUIREMENTS FOLLOW THE GUIDELINES OF NCSPA (NATIONAL CORRUGATED STEEL PIPE ASSOCIATION) CORRUGATED STEEL PIPE DESIGN MANUAL**

1. MINIMUM WIDTH DEPENDS ON SITE CONDITIONS AND ENGINEERING JUDGEMENT (PAGE 509) THE MANUFACTURER'S SUGGESTED MINIMUM VALUE IS 1.5D+12"
2. THE FOUNDATION UNDER THE PIPE MUST PROVIDE BOTH LONGITUDINAL AND LATERAL SUPPORT (PAGE 493)
3. ENGINEER TO DETERMINE IF BEDDING IS REQUIRED. PIPE MAY BE PLACED ON THE TRENCH BOTTOM OF A RELATIVELY LOOSE MATERIAL THAT IS EITHER FLAT OR SHAPED TO FIT THE BOTTOM OF THE PIPE AND A DEPTH OF 1/2" PER FOOT OF FILL HEIGHT (6A), 24" MAX (PAGE 495). THE MAXIMUM PARTICLE SIZE IS NOT TO EXCEED 3" IN DIAMETER. UNSUITABLE MATERIAL SHOULD BE OVER-EXCAVATED AND REPLACED WITH A 4"-6" LAYER OF WELL GRADED & GRANULAR STONE PER THE MATERIAL DESIGNATION. (PAGE 496)
4. CORRUGATED STEEL PIPE (CSP / HEL-COR)
5. HAUNCH ZONE MATERIAL SHALL BE PLACED AND UNIFORMLY COMPACTED WITHOUT SOFT SPOTS (PAGE 511)

5a. INITIAL BACKFILL FOR PIPE EMBEDMENT SHOULD PREFERABLY BE GRANULAR TO PROVIDE GOOD STRUCTURAL PERFORMANCE (PAGE 507) AND COMPACTED TO 90% STANDARD PROCTOR PER AASHTO T-99. MAXIMUM PARTICLE SIZE NOT TO EXCEED 3" (PAGE 511). ALL LIFTS SHALL BE PLACED IN A CONTROLLED MANNER 0" TO 12" IN DEPTH AND COMPACTED BEFORE ADDING THE NEXT LIFT, AND NO MORE THAN 24" OR ONE-THIRD OF THE RISE (WHICHEVER IS LESS) SIDE TO SIDE DIFFERENCE SHALL BE PERMITTED. (PAGE 510)

6. INITIAL BACKFILL ABOVE PIPE MUST MEET OR EXCEED THE MINIMUM COVER VALUE IN THE TABLE ABOVE. THIS BACKFILL IS TYPICALLY AN AASHTO M145 MATERIAL MEETING AN A-1,A-2, OR A-3 CLASSIFICATION. (PAGE 380)

6a. TOTAL HEIGHT OF COMPACTED COVER FOR CONVENTIONAL HIGHWAY LOADS IS MEASURED FROM TOP OF PIPE TO BOTTOM OF FLEXIBLE PAVEMENT OR TOP OF RIGID PAVEMENT ( PAGES 406-410).

7. FINAL BACKFILL MATERIAL MUST PROVIDE SUPPORT AND STRUCTURAL STRENGTH. GEOTECHNICAL ADVICE IS RECOMMENDED IF COHESIVE MATERIAL IS CONSIDERED TO BE USED (PAGE 508).

NOTES:

- ENGINEER TO DETERMINE IF GEOTEXTILE SHOULD BE USED TO PREVENT SOIL MIGRATION INTO VARYING SOIL TYPES. (PAGE 507).
- FOR MULTIPLE BARREL INSTALLATIONS THE RECOMMENDED MINIMUM STANDARD SPACING BETWEEN PARALLEL PIPE RUNS SHALL BE NO LESS THAN 24" FOR DIAMETERS UP TO 48". FOR DIAMETERS> 48", THE MINIMUM SPACING IS DIAMETER/2 OR 36", WHICHEVER IS LESS. (PAGE 518)
- BACKFILL USING CONTROLLED LOW-STRENGTH MATERIAL (CLSM OR "FLOWABLE FILL") WHEN THE SPACING BETWEEN THE PIPES WILL NOT ALLOW FOR PLACEMENT AND ADEQUATE COMPACTION OF THE BACKFILL. (PAGE 519)
- CONTACT YOUR CONTECH REPRESENTATIVE FOR NON-STANDARD SPACING.

## TYPICAL BACKFILL DETAIL

NOT TO SCALE

**CMP DETENTION INSPECTION AND MAINTENANCE**

THE UNDERGROUND STORMWATER DETENTION AND INFILTRATION SYSTEM MUST BE INSPECTED AND MAINTAINED AT REGULAR INTERVALS FOR PURPOSES OF PERFORMANCE AND LONGEVITY.

MAINTENANCE IS REQUIRED WHEN:

- PONDING IS OBSERVED ON SURFACE AREA DRAINING TO SYSTEM.
- SEDIMENT AND DEBRIS IS ACCUMULATED AT THE INLETS OR OUTLETS OF THE SYSTEM.
- THERE IS VISIBLE DAMANGE TO THE INLETS OR OUTLETS.
- INSPECTION OF PIPES THROUGH INSPECTION PORT USING A FLASHLIGHT AND STADIA ROD REVEAL SEDIMENT ACCUMULATION THAT EXCEEDS DESIGN CRITERIA.

IN GENERAL, THE SYSTEM, INCLUDING STORMWATER INLETS, OUTLET CONTROL STRUCTURE AND OUTFALL SHOULD BE INSPECTED ANNUALLY. INSPECTION ACTIVITIES SHALL BE PERFORMED AS FOLLOWS:

| BMP ELEMENT | INSPECTION | MAINTENANCE |
|---|---|---|
| *ENTIRE FACILITY* | *TRASH/DEBRIS IS PRESENT* | *REMOVE TRASH/DEBRIS* |
| *STORMWATER INLET PIPES* | *SEDIMENTATION DAMAGED* | *CLEAN OUT THE DRAIN LINES REPAIR OR REPLACE THE DRAIN LINES* |
| *STORMWATER OUTLET PIPES* | *SEDIMENTATION DAMAGED* | *CLEAN OUT THE DRAIN LINES REPAIR OR REPLACE THE DRAIN LINES* |
| *STRUCTURAL COMPONENTS* | *DAMAGED LEAKS* | *REPAIR OR REPLACE THE DAMAGED STRUCTURE* |

OCCUPTIONAL SAFETY & HEALTH ADMINISTRATION (OSHA) REGULATIONS FOR CONFINED SPACE ENTRY MUST BE FOLLOWED WHEN ENTERING THE UNDERGROUND DETENTION ACCESS MANHOLES.

A RECORD OF EACH INSPECTION SHALL BE MAINTAINED FOR THE LIFE OF THE SYSTEM.

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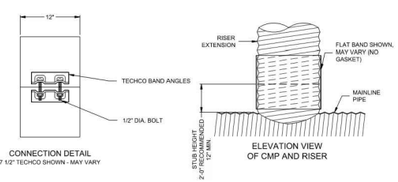
CONTECH CMP DETENTION SYSTEMS

CONTRACT DRAWING
PROPOSAL DRAWING

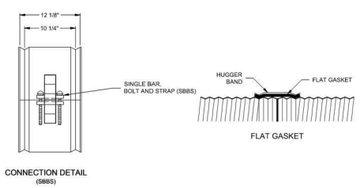
42"Ø UNDERGROUND DETENTION SYSTEM - 676501-010
JAMES RIVER PARK SYSTEM BYRD PARK PUMP HOUSE
RICHMOND, VA
SITE DESIGNATION: CMP DETENTION PIPE

| PROJECT No. | REV. No. | DATE |
|---|---|---|
| 676501 | 010 | 4/29/2021 |
| DESIGNED: MAK | DRAWN: MAK | |
| CHECKED: MAK | APPROVED: | |
| SHEET No. P2 OF 4 | | |




CONNECTION DETAIL
7 1/2" TECHCO SHOWN - MAY VARY

ELEVATION VIEW
OF CMP AND RISER




CONNECTION DETAIL
(SBBS)

## PLAIN END CMP RISER PIPE

GENERAL NOTES:

1. **DELIVERED BAND STYLE AND FASTENER TYPE MAY VARY BY FABRICATION PLANT.**
2. JOINT IS TO BE ASSEMBLED PER AASHTO BRIDGE CONSTRUCTION SPECIFICATION SEC 26.4.2.4.
3. BAND MATERIAL AND GAGE TO BE SAME AS RISER MATERIAL.
4. IF RISER HAS A HEIGHT OF COVER OF 10' OR MORE, USE A SLIP JOINT.
5. BANDS ARE NORMALLY FURNISHED AS FOLLOWS:
   - 12" THRU 48" 1-PIECE
   - 54" 2-PIECES
6. ALL RISER JOINT COMPONENTS WILL BE FIELD ASSEMBLED.
7. MANHOLE RISERS IN APPLICATIONS WHERE TRAFFIC LOADS ARE IMPOSED REQUIRE SPECIAL DESIGN CONSIDERATIONS.
8. DIMENSIONS SUBJECT TO MANUFACTURING TOLERANCES.

## 12" RISER BAND DETAIL

NOT TO SCALE

## 2 2/3"x1/2" RE-ROLLED END HEL-COR PIPE

GENERAL NOTES:

1. JOINT IS TO BE ASSEMBLED PER AASHTO BRIDGE CONSTRUCTION SPECIFICATION SEC 26.4.2.4.
2. BAND MATERIALS AND/OR COATING CAN VARY BY LOCATION. CONTACT YOUR CONTECH REPRESENTATIVE FOR AVAILABILITY.
3. BANDS ARE SHAPED TO MATCH THE PIPE-ARCH WHEN APPLICABLE.
4. BANDS ARE NORMALLY FURNISHED AS FOLLOWS:
   - 12" THRU 48" 1-PIECE
   - 54" THRU 96" 2-PIECES
   - 102" THRU 144" 3-PIECES
5. BAND FASTENERS ARE ATTACHED WITH SPOT WELDS, RIVETS OR HAND WELDS.
6. ALL CMP IS REROLLED TO HAVE ANNULAR END CORRUGATIONS OF 2 2/3"x1/2"
7. DIMENSIONS ARE SUBJECT TO MANUFACTURING TOLERANCES.
8. ORDER SHALL DESIGNATE GASKET OPTION, IF REQUIRED (SEE DETAILS ABOVE).

## H-12 HUGGER BAND DETAIL

NOT TO SCALE

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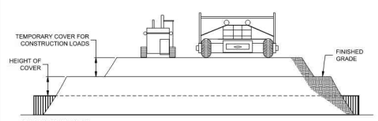
CONTECH CMP DETENTION SYSTEMS

CONTRACT DRAWING
PROPOSAL DRAWING

42"Ø UNDERGROUND DETENTION SYSTEM - 676501-010
JAMES RIVER PARK SYSTEM BYRD PARK PUMP HOUSE
RICHMOND, VA
SITE DESIGNATION: CMP DETENTION PIPE

| PROJECT No. | REV. No. | DATE |
|---|---|---|
| 676501 | 010 | 4/29/2021 |
| DESIGNED: MAK | DRAWN: MAK | |
| CHECKED: MAK | APPROVED: | |
| SHEET No. P3 OF 4 | | |




CONSTRUCTION LOADS

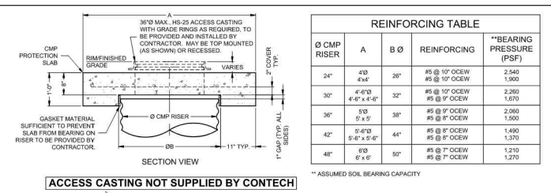
FOR TEMPORARY CONSTRUCTION VEHICLE LOADS, AN EXTRA AMOUNT OF COMPACTED COVER MAY BE REQUIRED OVER THE TOP OF THE PIPE. THE HEIGHT-OF-COVER SHALL MEET THE MINIMUM REQUIREMENTS SHOWN IN THE TABLE BELOW. THE USE OF HEAVY CONSTRUCTION EQUIPMENT NECESSITATES GREATER PROTECTION FOR THE PIPE THAN FINISHED GRADE COVER MINIMUMS FOR NORMAL HIGHWAY TRAFFIC.

| PIPE SPAN, INCHES | AXLE LOADS (kips) | | | |
|---|---|---|---|---|
| | 18-50 | 50-75 | 75-110 | 110-150 |
| | MINIMUM COVER (FT) | | | |
| 12-42 | 2.0 | 2.5 | 3.0 | 3.0 |
| 48-72 | 3.0 | 3.0 | 3.5 | 4.0 |
| 78-120 | 3.0 | 3.5 | 4.0 | 4.0 |
| 126-144 | 3.5 | 4.0 | 4.5 | 4.5 |

*MINIMUM COVER MAY VARY, DEPENDING ON LOCAL CONDITIONS. THE CONTRACTOR MUST PROVIDE THE ADDITIONAL COVER REQUIRED TO AVOID DAMAGE TO THE PIPE. MINIMUM COVER IS MEASURED FROM THE TOP OF THE PIPE TO THE TOP OF THE MAINTAINED CONSTRUCTION ROADWAY SURFACE.

## CONSTRUCTION LOADING DIAGRAM

NOT TO SCALE

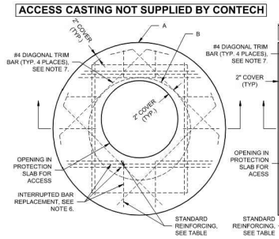



SECTION VIEW

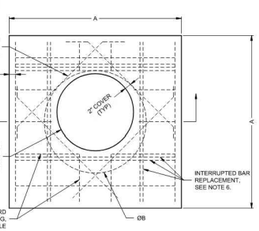
| REINFORCING TABLE | | | | |
|---|---|---|---|---|
| Ø CMP RISER | A | B Ø | REINFORCING | **BEARING PRESSURE (PSF) |
| 24" | 4'0"<br>4'x4' | 26" | #5 @ 10" OCEW<br>#5 @ 10" OCEW | 2,540<br>1,900 |
| 30" | 4'-6"0"<br>4'-6" x 4'-6" | 32" | #5 @ 10" OCEW<br>#5 @ 9" OCEW | 2,260<br>1,670 |
| 36" | 5'0"<br>5' x 5' | 38" | #5 @ 9" OCEW<br>#5 @ 8" OCEW | 2,060<br>1,500 |
| 42" | 5'-6"0"<br>5'-6" x 5'-6" | 44" | #5 @ 8" OCEW<br>#5 @ 8" OCEW | 1,490<br>1,370 |
| 48" | 6'0"<br>6' x 6' | 50" | #5 @ 7" OCEW<br>#5 @ 7" OCEW | 1,210<br>1,270 |

** ASSUMED SOIL BEARING CAPACITY

**ACCESS CASTING NOT SUPPLIED BY CONTECH**




ROUND OPTION PLAN VIEW




SQUARE OPTION PLAN VIEW

NOTES:

1. DESIGN IN ACCORDANCE WITH AASHTO, 17th EDITION AND ACI 350.
2. DESIGN LOAD HS25.
3. EARTH COVER = 1' MAX.
4. CONCRETE STRENGTH = 4,000 psi
5. REINFORCING STEEL = ASTM A615, GRADE 60.
6. PROVIDE ADDITIONAL REINFORCING AROUND OPENINGS EQUAL TO THE BARS INTERRUPTED, HALF EACH SIDE. ADDITIONAL BARS TO BE IN THE SAME PLANE.
7. TRIM OPENING WITH DIAGONAL #4 BARS. EXTEND BARS A MINIMUM OF 12" BEYOND OPENING. BEND BARS AS REQUIRED TO MAINTAIN BAR COVER.
8. PROTECTION SLAB AND ALL MATERIALS TO BE PROVIDED AND INSTALLED BY CONTRACTOR.
9. DETAIL DESIGN BY DELTA ENGINEERS, ARCHITECTS AND LAND SURVEYORS, ENDWELL, NY.

## MANHOLE CAP DETAIL

NOT TO SCALE

SPECIFICATION FOR CORRUGATED STEEL PIPE-ALUMINIZED TYPE 2 STEEL

SCOPE

THIS SPECIFICATION COVERS THE MANUFACTURE AND INSTALLATION OF THE CORRUGATED STEEL PIPE (CSP) DETAILED IN THE PROJECT PLANS.

MATERIAL

THE ALUMINIZED TYPE 2 STEEL COILS SHALL CONFORM TO THE APPLICABLE REQUIREMENTS OF AASHTO M274 OR ASTM A929.

PIPE

THE CSP SHALL BE MANUFACTURED IN ACCORDANCE WITH THE APPLICABLE REQUIREMENTS OF AASHTO M36 OR ASTM A760. THE PIPE SIZES, GAGES AND CORRUGATIONS SHALL BE AS SHOWN ON THE PROJECT PLANS.

ALL FABRICATION OF THE PRODUCT SHALL OCCUR WITHIN THE UNITED STATES.

HANDLING AND ASSEMBLY

SHALL BE IN ACCORDANCE WITH RECOMMENDATIONS OF THE NATIONAL CORRUGATED STEEL PIPE ASSOCIATION (NCSPA)

INSTALLATION

SHALL BE IN ACCORDANCE WITH AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, SECTION 26, DIVISION II OR ASTM A798 AND IN CONFORMANCE WITH THE PROJECT PLANS AND SPECIFICATIONS. IF THERE ARE ANY INCONSISTENCIES OR CONFLICTS THE CONTRACTOR SHOULD DISCUSS AND RESOLVE WITH THE SITE ENGINEER.

IT IS ALWAYS THE RESPONSIBILITY OF THE CONTRACTOR TO FOLLOW OSHA GUIDELINES FOR SAFE PRACTICES.

## MATERIAL SPECIFICATION

NOT TO SCALE

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| 676501 | 010 | 4/29/2021 |
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| CHECKED: MAK | APPROVED: | |
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COMMONWEALTH OF VIRGINIA
Amelia C. Wehunt
AMELIA C. WEHUNT
Lic. No. 049325
04/29/2021
PROFESSIONAL ENGINEER

ISSUED FOR PERMITTING

APRIL 15, 2021

## SYMBOLS

- BOLLARD
- BUSH
- CAP
- ELECTRIC BOX
- ELECTRIC METER
- ELECTRIC MANHOLE
- FIRE HYDRANT
- GAS METER
- GAS VALVE
- GUY
- LIGHT POLE
- POWER POLE
- PROPERTY PIN
- SANITARY MANHOLE
- SIGNS
- STORM MANHOLE
- TELEPHONE MANHOLE
- TREE
- UTILITY BOX
- UTILITY PEDESTAL
- UTILITY POLE
- WATER METER
- WATER VALVE
- YARD LIGHT
- BOULDER

## LINE TYPES

- PROPERTY LINE
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- EXISTING ASPHALT
- EXISTING CONCRETE
- SANITARY SEWER
- OVERHEAD ELECTRIC
- UNDERGROUND ELECTRIC
- WATER PIPE
- GAS PIPE
- EXISTING FENCING
- EXISTING TREELINE
- EXISTING EASEMENT
- RPA BOUNDARY
- RMA BOUNDARY
- FEMA 100-YR FLOODPLAIN
- FEMA 500-YR FLOODPLAIN

DATE: APRIL 29, 2021 DRAWN BY: B. MEYER
SCALE: AS NOTED CHECKED BY: A. WEHUNT

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*39490.035*

*JAMES RIVER PARK SYSTEM BYRD PARK PUMP HOUSE ADA ACCESS IMPROVEMENTS*

*GENERAL NOTES AND DETAILS*

DEPARTMENT OF PARKS AND RECREATION
CITY OF RICHMOND, VIRGINIA

SHEET NO. C1.3

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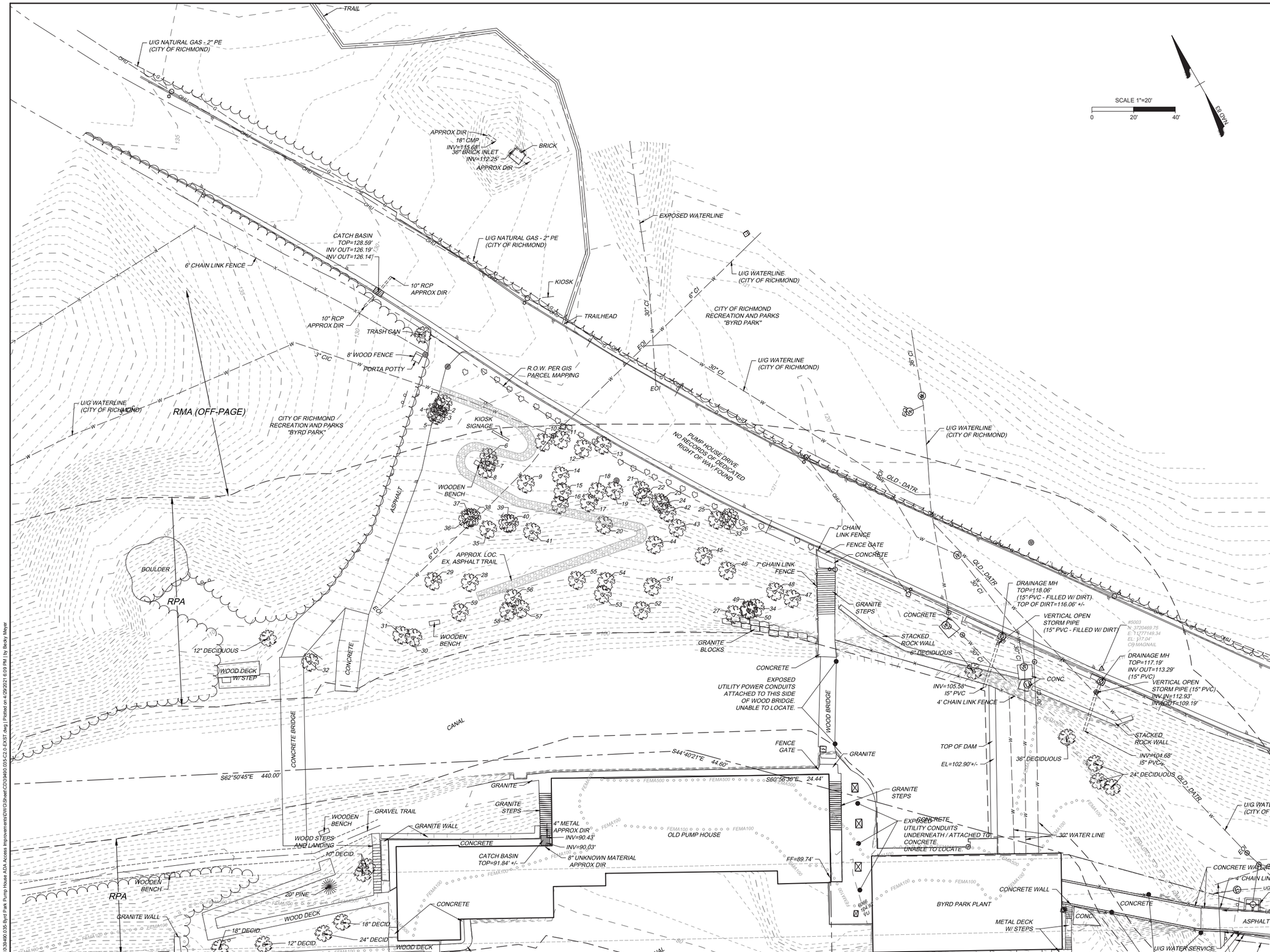


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AMELIA C. WEHUNT
Lic. No. 049325
04/29/2021
PROFESSIONAL ENGINEER

ISSUED FOR PERMITTING

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# JAMES RIVER PARK SYSTEM BYRD PARK PUMP HOUSE ADA ACCESS IMPROVEMENTS

## EXISTING CONDITIONS

DEPARTMENT OF PARKS AND RECREATION
CITY OF RICHMOND, VIRGINIA

SHEET NO. C2.0

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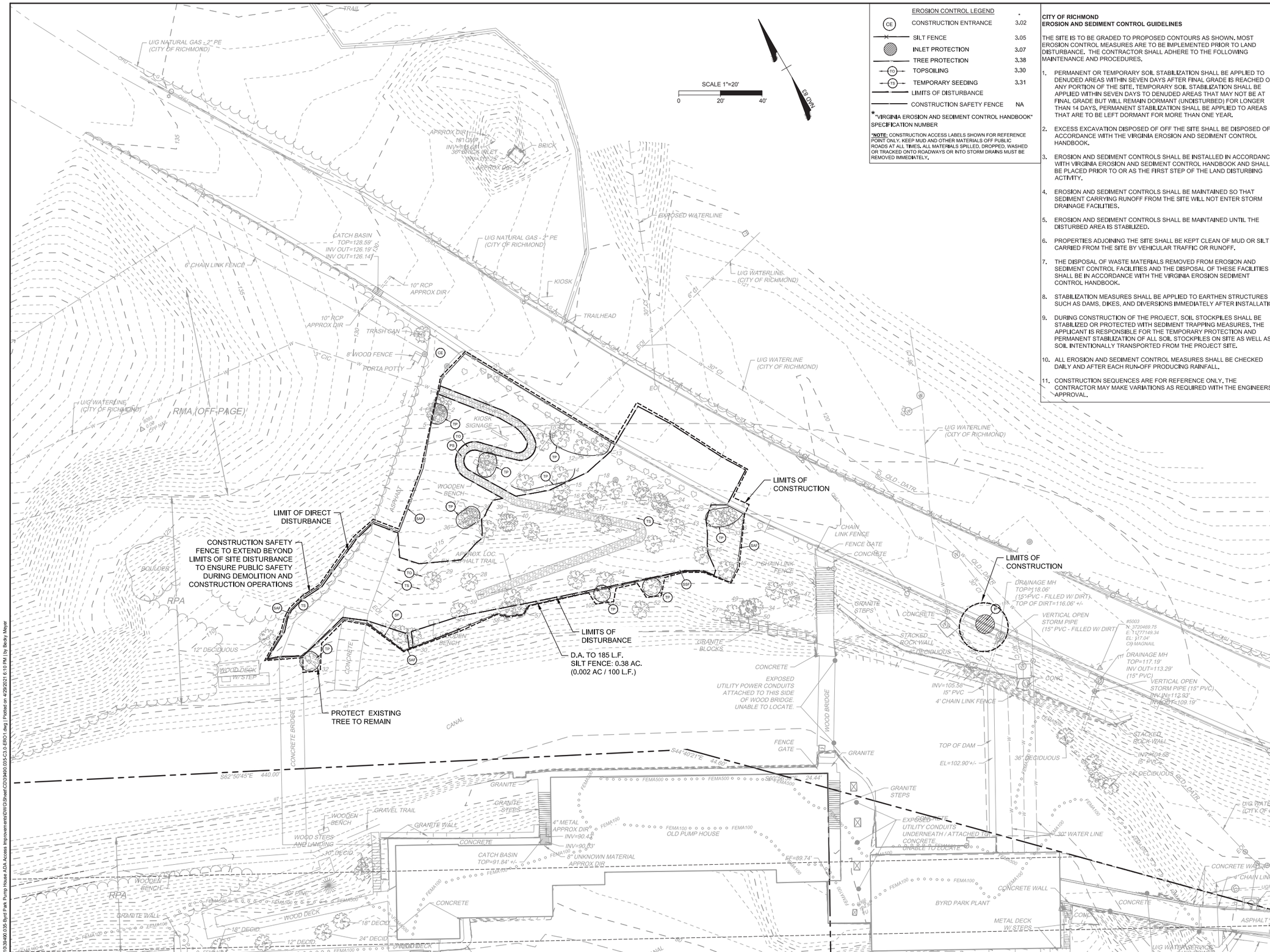


| EROSION CONTROL LEGEND | | * |
|---|---|---|
| CE | CONSTRUCTION ENTRANCE | 3.02 |
| | SILT FENCE | 3.05 |
| | INLET PROTECTION | 3.07 |
| | TREE PROTECTION | 3.38 |
| TO | TOPSOILING | 3.30 |
| TS | TEMPORARY SEEDING | 3.31 |
| | LIMITS OF DISTURBANCE | |
| | CONSTRUCTION SAFETY FENCE | NA |

*"VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK" SPECIFICATION NUMBER

***NOTE:** CONSTRUCTION ACCESS LABELS SHOWN FOR REFERENCE POINT ONLY. KEEP MUD AND OTHER MATERIALS OFF PUBLIC ROADS AT ALL TIMES. ALL MATERIALS SPILLED, DROPPED, WASHED OR TRACKED ONTO ROADWAYS OR INTO STORM DRAINS MUST BE REMOVED IMMEDIATELY.

**CITY OF RICHMOND**
**EROSION AND SEDIMENT CONTROL GUIDELINES**

THE SITE IS TO BE GRADED TO PROPOSED CONTOURS AS SHOWN. MOST EROSION CONTROL MEASURES ARE TO BE IMPLEMENTED PRIOR TO LAND DISTURBANCE. THE CONTRACTOR SHALL ADHERE TO THE FOLLOWING MAINTENANCE AND PROCEDURES.

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 14 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 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 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.
10. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE CHECKED DAILY AND AFTER EACH RUN-OFF PRODUCING RAINFALL.
11. CONSTRUCTION SEQUENCES ARE FOR REFERENCE ONLY. THE CONTRACTOR MAY MAKE VARIATIONS AS REQUIRED WITH THE ENGINEERS APPROVAL.

COMMONWEALTH OF VIRGINIA
AMELIA C. WEHUNT
Lic. No. 049325
04/29/2021
PROFESSIONAL ENGINEER

ISSUED FOR PERMITTING

APRIL 15, 2021

## SYMBOLS

BOLLARD, BUSH, CAP, ELECTRIC BOX, ELECTRIC METER, ELECTRIC MANHOLE, FIRE HYDRANT, GAS METER, GAS VALVE, GUY, LIGHT POLE, POWER POLE, PROPERTY PIN, SANITARY MANHOLE, SIGNS, STORM MANHOLE, TELEPHONE MANHOLE, TREE, UTILITY BOX, UTILITY PEDESTAL, UTILITY POLE, WATER METER, WATER VALVE, YARD LIGHT, BOULDER

## LINE TYPES

PROPERTY LINE
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EXISTING MINOR CONTOUR
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EXISTING CONCRETE
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DATE: APRIL 29, 2021 DRAWN BY: B. MEYER
SCALE: 1"=20' CHECKED BY: A. WEHUNT

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JAMES RIVER PARK SYSTEM
BYRD PARK PUMP HOUSE
ADA ACCESS IMPROVEMENTS

EROSION AND SEDIMENT CONTROL – PHASE I

DEPARTMENT OF PARKS AND RECREATION
CITY OF RICHMOND, VIRGINIA

SHEET NO. C3.0

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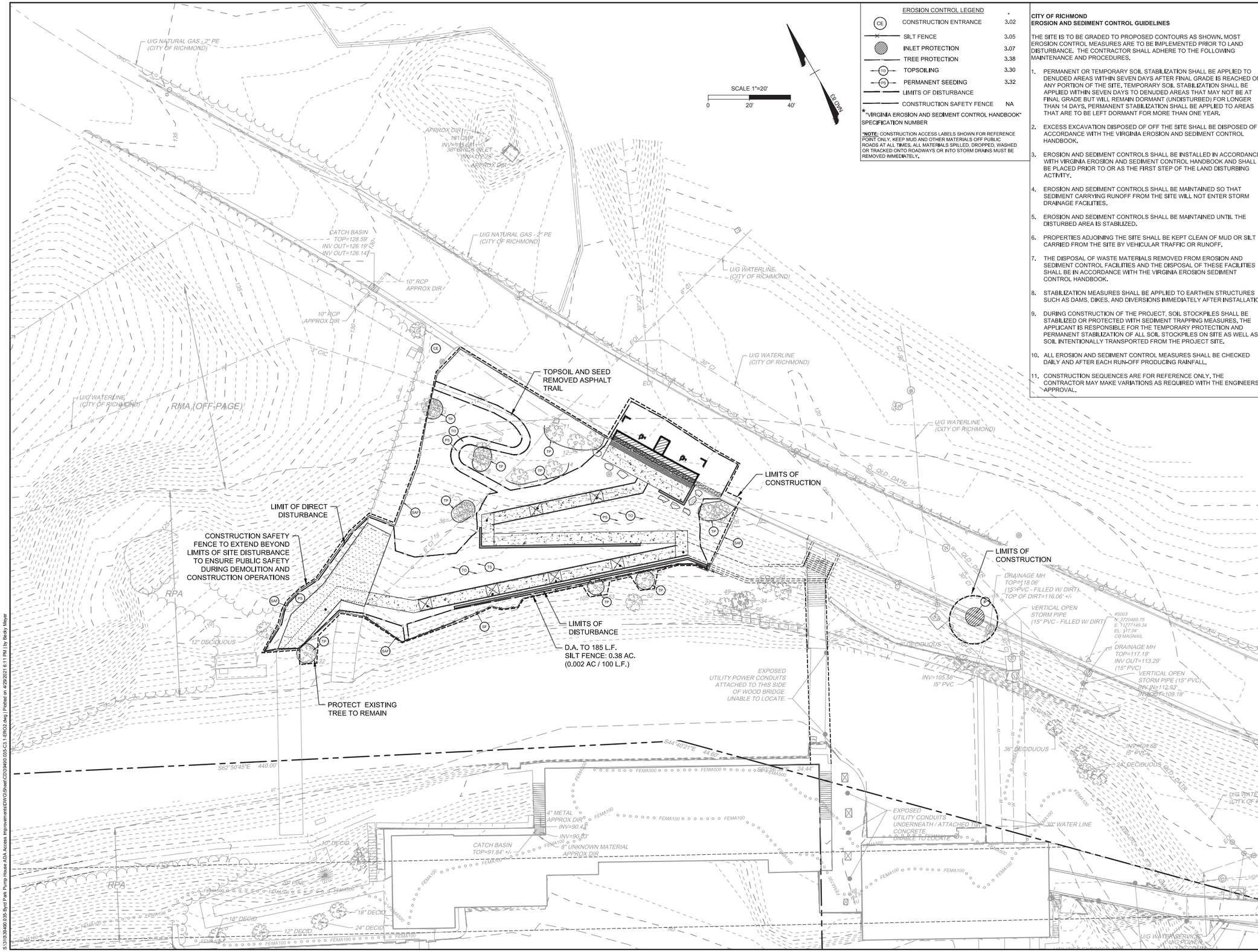


| EROSION CONTROL LEGEND | | * |
|---|---|---|
| CE | CONSTRUCTION ENTRANCE | 3.02 |
| | SILT FENCE | 3.05 |
| | INLET PROTECTION | 3.07 |
| | TREE PROTECTION | 3.38 |
| TO | TOPSOILING | 3.30 |
| PS | PERMANENT SEEDING | 3.32 |
| | LIMITS OF DISTURBANCE | |
| | CONSTRUCTION SAFETY FENCE | NA |

*"VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK" SPECIFICATION NUMBER

***NOTE:** CONSTRUCTION ACCESS LABELS SHOWN FOR REFERENCE POINT ONLY. KEEP MUD AND OTHER MATERIALS OFF PUBLIC ROADS AT ALL TIMES. ALL MATERIALS SPILLED, DROPPED, WASHED OR TRACKED ONTO ROADWAYS OR INTO STORM DRAINS MUST BE REMOVED IMMEDIATELY.

**CITY OF RICHMOND**
**EROSION AND SEDIMENT CONTROL GUIDELINES**

THE SITE IS TO BE GRADED TO PROPOSED CONTOURS AS SHOWN. MOST EROSION CONTROL MEASURES ARE TO BE IMPLEMENTED PRIOR TO LAND DISTURBANCE. THE CONTRACTOR SHALL ADHERE TO THE FOLLOWING MAINTENANCE AND PROCEDURES.

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 14 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 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 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.
10. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE CHECKED DAILY AND AFTER EACH RUN-OFF PRODUCING RAINFALL.
11. CONSTRUCTION SEQUENCES ARE FOR REFERENCE ONLY. THE CONTRACTOR MAY MAKE VARIATIONS AS REQUIRED WITH THE ENGINEERS APPROVAL.

COMMONWEALTH OF VIRGINIA
AMELIA C. WEHUNT
Lic. No. 049325
04/29/2021
PROFESSIONAL ENGINEER

ISSUED FOR PERMITTING

APRIL 15, 2021

## SYMBOLS

BOLLARD, BUSH, CAP, ELECTRIC BOX, ELECTRIC METER, ELECTRIC MANHOLE, FIRE HYDRANT, GAS METER, GAS VALVE, GUY, LIGHT POLE, POWER POLE, PROPERTY PIN, SANITARY MANHOLE, SIGNS, STORM MANHOLE, TELEPHONE MANHOLE, TREE, UTILITY BOX, UTILITY PEDESTAL, UTILITY POLE, WATER METER, WATER VALVE, YARD LIGHT, BOULDER

## LINE TYPES

PROPERTY LINE
EXISTING MAJOR CONTOUR
EXISTING MINOR CONTOUR
EXISTING ASPHALT
EXISTING CONCRETE
SANITARY SEWER
OVERHEAD ELECTRIC
UNDERGROUND ELECTRIC
WATER PIPE
GAS PIPE
EXISTING FENCING
EXISTING TREELINE
EXISTING EASEMENT
RPA BOUNDARY
RMA BOUNDARY
FEMA 100-YR FLOODPLAIN
FEMA 500-YR FLOODPLAIN

DATE: APRIL 29, 2021 DRAWN BY: B. MEYER
SCALE: 1"=20' CHECKED BY: A. WEHUNT

REVISIONS

AS BUILT DATE

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THIS DRAWING PREPARED AT THE
**DOWNTOWN OFFICE**
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39490.035

# JAMES RIVER PARK SYSTEM BYRD PARK PUMP HOUSE ADA ACCESS IMPROVEMENTS

# EROSION AND SEDIMENT CONTROL – PHASE II

DEPARTMENT OF PARKS AND RECREATION
CITY OF RICHMOND, VIRGINIA

SHEET NO. C3.1

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# EROSION CONTROL NARRATIVE

## PROJECT DESCRIPTION
THE SUBJECT PROPERTY IS LOCATED AT BYRD PARK PUMP HOUSE, WHICH IS OWNED BY THE CITY OF RICHMOND. THE CONSTRUCTION LIMITS FOR THE PROPOSED ADA ACCESS IMPROVEMENTS IMPACT 0.24-ACRE OF THE TOTAL PARCEL OF LAND. IMPACTS INCLUDE THE DEMOLITION OF ASPHALT, CONCRETE, AND CONCRETE CURB AND GUTTER; TREE REMOVAL; GRADING; AND INSTALLATION OF CONCRETE RAMP WITH HANDRAILS AND RETAINING WALLS. ALL PORTIONS OF THE SITE NOT PROPOSED TO BE PAVEMENT OR SIDEWALK WILL BE PERMANENTLY STABILIZED WITH LAWN OR PLANTINGS.

## EXISTING SITE CONDITIONS
THE SITE LIES ON A PARCEL LOCATED ON PUMP HOUSE DRIVE, ADJACENT TO THE JAMES RIVER. A CANAL SEPARATES THE SITE FROM THE PUMP HOUSE AND THE JAMES RIVER. THE SLOPED PARCEL IS SPARSELY VEGETATED, WITH MINIMAL EXISTING PUBLIC PARK IMPROVEMENTS THAT INCLUDE AN ASPHALT DRIVEWAY TO A PEDESTRIAN BRIDGE, CONCRETE BOAT LAUNCH, ASPHALT RAMP AND AMENITIES SUCH AS BENCHES AND SIGNAGE. ENTRANCE TO THE SITE IS VIA PUMP HOUSE DRIVE. THE PERIMETER OF THE SITE IS WOODED.

STORMWATER RUNOFF FROM THE SITE IS CONVEYED VIA SHEETFLOW TO THE CANAL ON THE NORTH SIDE OF THE PUMP HOUSE. STORMWATER RUNOFF FROM PUMP HOUSE DRIVE IS COLLECTED IN A DRAINAGE INLET AND DISCHARGED TO THE CANAL VIA A 15" RCP.

## ADJACENT PROPERTY
THE SITE IS BOUND TO THE WEST, NORTH, AND EAST BY WOODED PARK LAND AND TO THE SOUTH BY THE CANAL/JAMES RIVER PUMP HOUSE. THERE WILL BE NO LAND DISTURBANCE ON ADJACENT PROPERTIES.

## OFF-SITE AREAS
THERE WILL BE NO OFF-SITE LAND DISTURBANCE ASSOCIATED WITH THIS PROJECT. SPOILS WILL BE DISPOSED OF IN STRICT ACCORDANCE WITH CITY AND STATE REQUIREMENTS.

## SOILS
ACCORDING TO THE NRCS WEB SOIL SURVEY MAPPING, THE SITE IS UNDERLAIN BY FOUR SOIL TYPES AND WATER. REFER TO THE STORMWATER MANAGEMENT SHEETS FOR SOILS MAP. THE PREDOMINANT SOILS ON THE PROJECT SITE ARE:

**MAP UNIT: 21A—JOHNSTON MUCKY LOAM, 0 TO 3 PERCENT SLOPES, FREQUENTLY FLOODED, HYDROLOGIC GROUP A/D**

COMPONENT: JOHNSTON (85%)

THE JOHNSTON COMPONENT MAKES UP 85 PERCENT OF THE MAP UNIT. SLOPES ARE 0 TO 3 PERCENT. THIS COMPONENT IS ON FLOOD PLAINS ON COASTAL PLAINS. THE PARENT MATERIAL CONSISTS OF LOAMY ALLUVIUM. DEPTH TO A ROOT RESTRICTIVE LAYER IS GREATER THAN 60 INCHES. THE NATURAL DRAINAGE CLASS IS VERY POORLY DRAINED. WATER MOVEMENT IN THE MOST RESTRICTIVE LAYER IS HIGH. AVAILABLE WATER TO A DEPTH OF 60 INCHES (OR RESTRICTED DEPTH) IS MODERATE. SHRINK-SWELL POTENTIAL IS LOW. THIS SOIL IS FREQUENTLY FLOODED. IT IS FREQUENTLY PONDED. A SEASONAL ZONE OF WATER SATURATION IS AT 0 INCHES DURING JANUARY, FEBRUARY, MARCH, APRIL, MAY, JUNE, NOVEMBER, DECEMBER. ORGANIC MATTER CONTENT IN THE SURFACE HORIZON IS ABOUT 9 PERCENT. NONIRRIGATED LAND CAPABILITY CLASSIFICATION IS 7W. THIS SOIL MEETS HYDRIC CRITERIA. THIS SOIL TYPE HAS AN ERODIBILITY FACTOR OF 0.32, WHICH IS CONSIDERED MODERATE.

REMAINING COMPONENTS: CHASTAIN (5%), TOMOTLEY (5%), NAWNEY (5%)

**MAP UNIT: 37B—TURBEVILLE-URBAN LAND COMPLEX, 2 TO 6 PERCENT SLOPES, HYDROLOGIC GROUP B**

COMPONENT: TURBEVILLE (70%)

THE TURBEVILLE COMPONENT MAKES UP 70 PERCENT OF THE MAP UNIT. SLOPES ARE 2 TO 6 PERCENT. THIS COMPONENT IS ON TERRACES ON COASTAL PLAINS. THE PARENT MATERIAL CONSISTS OF CLAYEY ALLUVIUM. DEPTH TO A ROOT RESTRICTIVE LAYER IS GREATER THAN 60 INCHES. THE NATURAL DRAINAGE CLASS IS WELL DRAINED. WATER MOVEMENT IN THE MOST RESTRICTIVE LAYER IS MODERATELY HIGH. AVAILABLE WATER TO A DEPTH OF 60 INCHES (OR RESTRICTED DEPTH) IS MODERATE. SHRINK-SWELL POTENTIAL IS LOW. THIS SOIL IS NOT FLOODED. IT IS NOT PONDED. THERE IS NO ZONE OF WATER SATURATION WITHIN A DEPTH OF 72 INCHES. ORGANIC MATTER CONTENT IN THE SURFACE HORIZON IS ABOUT 1 PERCENT. NONIRRIGATED LAND CAPABILITY CLASSIFICATION IS 2E. THIS SOIL DOES NOT MEET HYDRIC CRITERIA.THIS SOIL TYPE HAS AN ERODIBILITY FACTOR OF 0.32, WHICH IS CONSIDERED MODERATE.

COMPONENT: URBAN LAND (20%)

GENERATED BRIEF SOIL DESCRIPTIONS ARE CREATED FOR MAJOR SOIL COMPONENTS. THE URBAN LAND IS A MISCELLANEOUS AREA.

**MAP UNIT: 40 - UDORTHENTS-DUMP COMPLEX, PITS, HYDROLOGIC GROUP D**

COMPONENT: DUMPS (50%)

GENERATED BRIEF SOIL DESCRIPTIONS ARE CREATED FOR MAJOR SOIL COMPONENTS. THE DUMPS IS A MISCELLANEOUS AREA.

COMPONENT: UDORTHENTS (50%)

THE UDORTHENTS COMPONENT MAKES UP 50 PERCENT OF THE MAP UNIT. SLOPES ARE DEPTH TO A ROOT RESTRICTIVE LAYER IS GREATER THAN 60 INCHES. AVAILABLE WATER TO A DEPTH OF 60 INCHES (OR RESTRICTED DEPTH) IS VERY LOW. SHRINK-SWELL POTENTIAL IS LOW. THIS SOIL IS NOT FLOODED. IT IS NOT PONDED. THERE IS NO ZONE OF WATER SATURATION WITHIN A DEPTH OF 72 INCHES.

**MAP UNIT: 45F - WATEREE-WEDOWEE-ROCK OUTCROP COMPLEX, 45 TO 60 PERCENT SLOPES, HYDROLOGIC GROUP A**

COMPONENT: WATEREE (50%)

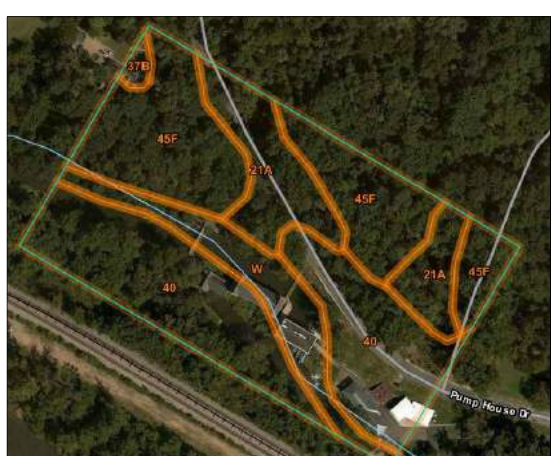
THE WATEREE COMPONENT MAKES UP 50 PERCENT OF THE MAP UNIT. SLOPES ARE 45 TO 60 PERCENT. THIS COMPONENT IS ON HILLSLOPES ON PIEDMONTS. THE PARENT MATERIAL CONSISTS OF LOAMY RESIDUUM WEATHERED FROM GRANITE AND GNEISS. DEPTH TO A ROOT RESTRICTIVE LAYER, BEDROCK, PARALITHIC, IS 20 TO 40 INCHES. THE NATURAL DRAINAGE CLASS IS WELL DRAINED. WATER MOVEMENT IN THE MOST RESTRICTIVE LAYER IS VERY LOW. AVAILABLE WATER TO A DEPTH OF 60 INCHES (OR RESTRICTED DEPTH) IS VERY LOW. SHRINK-SWELL POTENTIAL IS LOW. THIS SOIL IS NOT FLOODED. IT IS NOT PONDED. THERE IS NO ZONE OF WATER SATURATION WITHIN A DEPTH OF 72 INCHES. ORGANIC MATTER CONTENT IN THE SURFACE HORIZON IS ABOUT 1 PERCENT. NONIRRIGATED LAND CAPABILITY CLASSIFICATION IS 7E. THIS SOIL DOES NOT MEET HYDRIC CRITERIA. THIS SOIL TYPE HAS AN ERODIBILITY FACTOR OF 0.24, WHICH IS CONSIDERED MODERATE.

COMPONENT: WEDOWEE (30%)

THE WEDOWEE COMPONENT MAKES UP 30 PERCENT OF THE MAP UNIT. SLOPES ARE 45 TO 60 PERCENT. THIS COMPONENT IS ON HILLSLOPES ON PIEDMONTS. THE PARENT MATERIAL CONSISTS OF CLAYEY RESIDUUM WEATHERED FROM GRANITE AND GNEISS. DEPTH TO A ROOT RESTRICTIVE LAYER IS GREATER THAN 60 INCHES. THE NATURAL DRAINAGE CLASS IS WELL DRAINED. WATER MOVEMENT IN THE MOST RESTRICTIVE LAYER IS MODERATELY HIGH. AVAILABLE WATER TO A DEPTH OF 60 INCHES (OR RESTRICTED DEPTH) IS MODERATE. SHRINK-SWELL POTENTIAL IS LOW. THIS SOIL IS NOT FLOODED. IT IS NOT PONDED. THERE IS NO ZONE OF WATER SATURATION WITHIN A DEPTH OF 72 INCHES. ORGANIC MATTER CONTENT IN THE SURFACE HORIZON IS ABOUT 2 PERCENT. NONIRRIGATED LAND CAPABILITY CLASSIFICATION IS 7E. THIS SOIL DOES NOT MEET HYDRIC CRITERIA.

COMPONENT: ROCK OUTCROP (10%)

GENERATED BRIEF SOIL DESCRIPTIONS ARE CREATED FOR MAJOR SOIL COMPONENTS. THE ROCK OUTCROP IS A MISCELLANEOUS AREA.




## CRITICAL AREAS
THE SITE CONTAINS SOME AREAS OF 3:1 OR STEEPER SLOPES. IT IS ALSO LOCATED WITHIN THE RPA OF THE JAMES RIVER. EROSION AND SEDIMENT CONTROL MEASURES ARE TO BE IMPLEMENTED IN ACCORDANCE WITH THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK, 3RD EDITION AT ALL TIMES DURING CONSTRUCTION.

## STORMWATER RUN-OFF CONSIDERATIONS
1. EXISTING DRAINAGE OUTFALL PATTERNS WILL REMAIN THE SAME TO THE GREATEST EXTENT POSSIBLE.
2. STORMWATER IS DISCHARGED VIA SHEET FLOW INTO THE JAMES RIVER CANAL.
3. STORMWATER BEST MANAGEMENT PRACTICES HAVE BEEN DESIGNED TO MAINTAIN THE EXISTING 10-YEAR PEAK RATE OF RUNOFF FROM THE PROJECT SITE, PROVIDE FOR RUNOFF REDUCTION FOR THE 1-YEAR STORM, AND PROVIDE FOR STORMWATER QUALITY MEASURES IN ACCORDANCE WITH VRRM.

## RSMP/VSMP CONSIDERATIONS
THE SITE DISTURBANCE FOR THIS PROJECT IS 0.24-AC. AN RSMP PERMIT IS NOT REQUIRED.

## PERMANENT STABILIZATION
ALL DISTURBED AREAS WITHIN THE PROJECT LIMITS WILL BE STABILIZED WITH EITHER ASPHALT, SIDEWALK, SEEDING, LANDSCAPING OR OTHER PERMANENT STABILIZATION MEASURES AS PROPOSED IN THE PLANS.

## EROSION AND SEDIMENT CONTROL MEASURES
UNLESS OTHERWISE NOTED, ALL VEGETATIVE AND STRUCTURAL EROSION AND SEDIMENT CONTROL PRACTICES ARE TO BE CONSTRUCTED AND MAINTAINED ACCORDING TO THE MINIMUM STANDARDS AND SPECIFICATIONS OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK. THESE MINIMUM STANDARDS ARE TO BE ADHERED TO UNLESS OTHERWISE WAIVED OR APPROVED BY A VARIANCE BY AUTHORITIES HAVING JURISDICTION.

## MANAGEMENT STRATEGIES
1. THE SITE MUST BE STABILIZED AT THE END OF EACH CONSTRUCTION DAY.
2. PROVIDE PERMANENT SEEDING OR OTHER STABILIZATION IMMEDIATELY AFTER GRADING.
3. ALL EROSION AND SEDIMENT CONTROL PRACTICES ARE TO BE MAINTAINED UNTIL THEY ARE NO LONGER REQUIRED TO COMPLY WITH THE CONTRACT.

## STRUCTURAL PRACTICES

1. SAFETY FENCE - 3.01
A PROTECTIVE BARRIER INSTALLED TO PROHIBIT UNDESIRABLE USE OF AN EROSION CONTROL MEASURE. SAFETY FENCE SHALL BE CHECKED REGULARLY FOR WEATHER-RELATED OR OTHER DAMAGE. ANY NECESSARY REPAIRS MUST BE MADE IMMEDIATELY. CARE SHOULD BE TAKEN TO SECURE ALL ACCESS POINTS (GATES) AT THE END OF EACH WORKING DAY. ALL LOCKING DEVICES MUST BE REPAIRED OR REPLACED AS NECESSARY.

2. CONSTRUCTION ENTRANCE - 3.02
A STONE PAD, LOCATED AT POINTS OF VEHICULAR INGRESS AND EGRESS ON A CONSTRUCTION SITE, TO REDUCE THE SOIL TRANSPORTED ONTO PUBLIC ROADS AND OTHER PAVED AREAS. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOW OF MUD ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC REPAIR AND/OR CLEANOUT OF ANY STRUCTURES USED TO TRAP SEDIMENT. ALL MATERIALS SPILLED, DROPPED, WASHED, OR TRACKED FROM VEHICLES ONTO ROADWAYS OR INTO STORM DRAINS MUST BE REMOVED IMMEDIATELY. THE USE OF WATER TRUCKS TO REMOVE MATERIALS DROPPED, WASHED, OR TRACKED ONTO ROADWAYS WILL NOT BE PERMITTED UNDER ANY CIRCUMSTANCES.

3. STRAW BALE BARRIER - 3.04
A TEMPORARY SEDIMENT BARRIER COMPOSED OF A ROW OF ENTRENCHED AND ANCHORED STRAW BALES. APPLICABLE WHERE SHEET AND RILL EROSION MAY BE A PROBLEM IN DRAINAGE AREAS OF LIMITED SIZE. STRAW BALE BARRIERS ARE PLACED ACROSS OR AT THE TOE OF A SLOPE TO INTERCEPT AND DETAIN SEDIMENT AND DECREASE SHEET FLOW VELOCITIES. MAXIMUM EFFECTIVE LIFE IS 3 MONTHS. STRAW BALE BARRIERS SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. CLOSE ATTENTION SHALL BE PAID TO THE REPAIR OF DAMAGED BALES, END RUNS, AND UNDERCUTTING BENEATH BALES. NECESSARY REPAIRS TO BARRIERS OR REPLACEMENT OF BALES SHALL BE ACCOMPLISHED PROMPTLY. SEDIMENT DEPOSITS SHOULD BE REMOVED AFTER EACH RAINFALL. THEY MUST BE REMOVED WHEN THE LEVEL OF DEPOSITION REACHES ONE-HALF THE HEIGHT OF THE BARRIER. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE STRAW BALE BARRIER IS NO LONGER REQUIRED SHALL BE DRESSED TO CONFORM TO THE EXISTING GRADE, PREPARED, AND SEEDED.

4. SILT FENCE BARRIER - 3.05
A TEMPORARY SEDIMENT BARRIER CONSTRUCTED OF POSTS, FILTER FABRIC AND, IN SOME CASES, A WIRE SUPPORT FENCE, PLACED ACROSS OR AT THE TOE OF A SLOPE OR IN A MINOR DRAINAGE WAY TO INTERCEPT AND DETAIN SEDIMENT AND DECREASE FLOW VELOCITIES FROM DRAINAGE AREAS OF LIMITED SIZE; APPLICABLE WHERE SHEET AND RILL EROSION OR SMALL CONCENTRATED FLOWS MAY BE A PROBLEM. MAXIMUM EFFECTIVE LIFE OF 6 MONTHS. SILT FENCES SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY. CLOSE ATTENTION SHALL BE PAID TO THE REPAIR OF DAMAGED SILT FENCE RESULTING FROM END RUNS AND UNDERCUTTING. SHOULD THE FABRIC ON A SILT FENCE DECOMPOSE OR BECOME INEFFECTIVE PRIOR TO THE END OF THE EXPECTED USABLE LIFE AND THE BARRIER STILL BE NECESSARY, THE FABRIC SHALL BE REPLACED PROMPTLY. SEDIMENT DEPOSITS SHOULD BE REMOVED AFTER EACH STORM EVENT. THEY MUST BE REMOVED WHEN DEPOSITS REACH APPROXIMATELY ONE-HALF THE HEIGHT OF THE BARRIER. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE SILT FENCE IS NO LONGER REQUIRED SHALL BE DRESSED TO CONFORM WITH THE EXISTING GRADE, PREPARED AND SEEDED.

5. STORM DRAIN INLET PROTECTION - 3.07
THE INSTALLATION OF VARIOUS KINDS OF SEDIMENT TRAPPING MEASURES AROUND DROP INLETS OR CURB INLET STRUCTURES PRIOR TO PERMANENT STABILIZATION OF THE DISTURBED AREA; LIMITED TO DRAINAGE AREAS NOT EXCEEDING ONE ACRE, AND NOT INTENDED TO CONTROL LARGE, CONCENTRATED STORMWATER FLOWS. THE STRUCTURE SHALL BE INSPECTED AFTER EACH RAIN AND REPAIRS MADE AS NEEDED. SEDIMENT SHALL BE REMOVED AND THE TRAP RESTORED TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO ONE HALF THE DESIGN DEPTH OF THE TRAP. REMOVED SEDIMENT SHALL BE DEPOSITED IN A SUITABLE AREA AND IN SUCH A MANNER THAT IT WILL NOT ERODE. STRUCTURES SHALL BE REMOVED AND THE AREA STABILIZED WHEN THE REMAINING DRAINAGE AREA HAS BEEN PROPERLY STABILIZED.

6. TEMPORARY SEDIMENT TRAP - 3.13
A SMALL PONDING AREA, FORMED BY CONSTRUCTING AN EARTHEN EMBANKMENT WITH A STONE OUTLET ACROSS A DRAINAGE SWALE, TO DETAIN SEDIMENT-LADEN RUNOFF FROM SMALL DISTURBED AREAS FOR ENOUGH TIME TO ALLOW MOST OF THE SUSPENDED SOLIDS TO SETTLE OUT. MAXIMUM EFFECTIVE LIFE IS 18 MONTHS. SEDIMENT SHALL BE REMOVED AND THE TRAP RESTORED TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO ONE HALF THE DESIGN VOLUME OF THE WET STORAGE. SEDIMENT REMOVED FROM THE BASIN SHALL BE DEPOSITED IN A SUITABLE AREA AND IN SUCH A MANNER THAT IT WILL NOT ERODE AND CAUSE SEDIMENTATION PROBLEMS. FILTER STONE SHALL BE REGULARLY CHECKED TO ENSURE THAT FILTRATION PERFORMANCE IS MAINTAINED. STONE CHOKED WITH SEDIMENT SHALL BE REMOVED AND CLEANED OR REPLACED. THE STRUCTURE SHOULD BE CHECKED REGULARLY TO ENSURE THAT IT IS STRUCTURALLY SOUND AND HAS NOT BEEN DAMAGED BY EROSION OR CONSTRUCTION EQUIPMENT. THE HEIGHT OF THE STONE OUTLET SHOULD BE CHECKED TO ENSURE THAT ITS CENTER IS AT LEAST 1 FOOT BELOW THE TOP OF THE EMBANKMENT.

7. TEMPORARY SEEDING - 3.31:
ESTABLISHMENT OF TEMPORARY VEGETATIVE COVER ON DISTURBED AREAS THAT WILL NOT BE BROUGHT TO FINAL GRADE FOR PERIODS OF 30 DAYS TO ONE YEAR BY SEEDING WITH APPROPRIATE RAPIDLY-GROWING PLANTS.

8. PERMANENT SEEDING - 3.32:
ESTABLISHMENT OF PERENNIAL VEGETATIVE COVER BY PLANTING SEED ON ROUGH-GRADED AREAS THAT WILL NOT BE BROUGHT TO FINAL GRADE FOR A YEAR OR MORE OR WHERE PERMANENT, LONG-LIVED VEGETATIVE COVER IS NEEDED ON FINE-GRADED AREAS.
NEW SEEDING SHOULD BE SUPPLIED WITH ADEQUATE MOISTURE. SUPPLY WATER AS NEEDED, ESPECIALLY LATE IN THE SEASON, IN ABNORMALLY HOT OR DRY WEATHER, OR ON ADVERSE SITES. WATER APPLICATION RATES SHOULD BE CONTROLLED TO PREVENT EXCESSIVE RUNOFF. INADEQUATE AMOUNTS OF WATER MAY BE MORE HARMFUL THAN NO WATER. INSPECT SEEDED AREAS FOR FAILURE AND MAKE NECESSARY REPAIRS AND RESEED WITHIN THE SAME SEASON, IF POSSIBLE. FERTILIZE COOL SEASON GRASSES 90 DAYS AFTER PLANTING TO ENSURE PROPER STAND AND DENSITY. FERTILIZE WARM SEASON GRASSES 30 DAYS AFTER PLANTING.

## GENERAL EROSION AND SEDIMENT CONTROL NOTES

ES-1: UNLESS OTHERWISE INDICATED, CONSTRUCT AND MAINTAIN ALL VEGETATIVE AND STRUCTURAL EROSION AND SEDIMENT CONTROL PRACTICES ACCORDING TO MINIMUM STANDARDS AND SPECIFICATIONS OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK AND VIRGINIA REGULATIONS 9 VAC 25-840-40

ES-2: NOTIFY THE DEPARTMENT OF PUBLIC UTILITIES ONE WEEK PRIOR TO THE PRE-CONSTRUCTION CONFERENCE, ONE WEEK PRIOR TO THE COMMENCEMENT OF LAND DISTURBING ACTIVITY, AND ONE WEEK PRIOR TO THE FINAL INSPECTION.

ES-3: PLACE ALL EROSION AND SEDIMENT CONTROL MEASURES PRIOR TO OR AS THE FIRST STEP IN CLEARING, GRADING, OR LAND DISTURBANCE.

ES-4: MAINTAIN A COPY OF THE APPROVED EROSION AND SEDIMENT CONTROL PLAN ON THE SITE AT ALL TIMES.

ES-5: PRIOR TO COMMENCING LAND-DISTURBING ACTIVITIES IN AREAS OTHER THAN INDICATED ON THESE PLANS (INCLUDING, BUT NOT LIMITED TO, OFFSITE BORROW OR WASTE AREA), THE CONTRACTOR SHALL SUBMIT A SUPPLEMENTARY EROSION CONTROL PLAN TO THE ARCHITECT/ENGINEER FOR REVIEW AND APPROVAL BY THE PLAN APPROVING AUTHORITY.

ES-6: PROVIDE ADDITIONAL EROSION CONTROL MEASURES NECESSARY TO PREVENT EROSION AND SEDIMENTATION AS DETERMINED BY THE DPU INSPECTOR.

ES-7: ALL DISTURBED AREAS ARE TO DRAIN TO APPROVED SEDIMENT CONTROL MEASURES AT ALL TIMES DURING LAND-DISTURBING ACTIVITIES AND DURING SITE DEVELOPMENT UNTIL FINAL STABILIZATION IS ACHIEVED.

ES-8: DURING DEWATERING OPERATIONS, PUMP WATER INTO AN APPROVED FILTERING DEVICE.

ES-9: INSPECT ALL EROSION CONTROL MEASURES DAILY AND AFTER EACH RUNOFF-PRODUCING RAINFALL EVENT. MAKE ANY NECESSARY REPAIRS OR CLEANUP TO MAINTAIN THE EFFECTIVENESS OF THE EROSION CONTROL DEVICES IMMEDIATELY.

## EROSION & SEDIMENT CONTROL MINIMUM STANDARDS

A VESCP MUST BE CONSISTENT WITH THE FOLLOWING CRITERIA, TECHNIQUES AND METHODS:

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

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

MS-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.

MS-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.

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

MS-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 25-YEAR STORM OF 24-HOUR DURATION. RUNOFF COEFFICIENTS USED IN RUNOFF CALCULATIONS SHALL CORRESPOND TO A BARE EARTH CONDITION OR THOSE CONDITIONS EXPECTED TO EXIST WHILE THE SEDIMENT BASIN IS UTILIZED.

MS-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.

MS-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.

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

MS-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.

MS-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.

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

MS-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.

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

MS-15: THE BED AND BANKS OF A WATERCOURSE SHALL BE STABILIZED IMMEDIATELY AFTER WORK IN THE WATERCOURSE IS COMPLETED.
MS-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 THIS CHAPTER.
F. APPLICABLE SAFETY REQUIREMENTS SHALL BE COMPLIED WITH.

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

MS-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 VESCP AUTHORITY. TRAPPED SEDIMENT AND THE DISTURBED SOIL AREAS RESULTING FROM THE DISPOSITION OF TEMPORARY MEASURES SHALL BE PERMANENTLY STABILIZED TO PREVENT FURTHER EROSION AND SEDIMENTATION.

MS-19: PROPERTIES AND WATERWAYS DOWNSTREAM FROM DEVELOPMENT SITES SHALL BE PROTECTED FROM SEDIMENT DEPOSITION, EROSION AND DAMAGE DUE TO INCREASES IN VOLUME, VELOCITY AND PEAK FLOW RATE OF STORMWATER RUNOFF FOR THE STATED FREQUENCY STORM OF 24-HOUR DURATION IN ACCORDANCE WITH THE FOLLOWING STANDARDS AND CRITERIA. STREAM RESTORATION AND RELOCATION PROJECTS THAT INCORPORATE NATURAL CHANNEL DESIGN CONCEPTS ARE NOT MAN-MADE CHANNELS AND SHALL BE EXEMPT FROM ANY FLOW RATE CAPACITY AND VELOCITY REQUIREMENTS FOR NATURAL OR MAN-MADE CHANNELS:

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 100 TIMES GREATER THAN THE CONTRIBUTING DRAINAGE AREA OF THE PROJECT IN QUESTION;
(2) (A) NATURAL CHANNELS SHALL BE ANALYZED BY THE USE OF A TWO-YEAR STORM TO VERIFY THAT STORMWATER WILL NOT OVERTOP CHANNEL BANKS NOR CAUSE EROSION OF CHANNEL BED OR BANKS.
(B) ALL PREVIOUSLY CONSTRUCTED MAN-MADE CHANNELS SHALL BE ANALYZED BY THE USE OF A 10-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
(C) PIPES AND STORM SEWER SYSTEMS SHALL BE ANALYZED BY THE USE OF A 10-YEAR STORM TO VERIFY THAT STORMWATER WILL BE CONTAINED WITHIN THE PIPE OR SYSTEM.

A. IF EXISTING NATURAL RECEIVING CHANNELS OR PREVIOUSLY CONSTRUCTED MAN-MADE CHANNELS OR PIPES ARE NOT ADEQUATE, THE APPLICANT SHALL:
(1) IMPROVE THE CHANNELS TO A CONDITION WHERE A 10-YEAR STORM WILL NOT OVERTOP THE BANKS AND A TWO-YEAR STORM WILL NOT CAUSE EROSION TO THE CHANNEL, THE BED, OR THE BANKS;
(2) IMPROVE THE PIPE OR PIPE SYSTEM TO A CONDITION WHERE THE 10-YEAR STORM IS CONTAINED WITHIN THE APPURTENANCES;
(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 10-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 VESCP AUTHORITY TO PREVENT DOWNSTREAM EROSION.

B. THE APPLICANT SHALL PROVIDE EVIDENCE OF PERMISSION TO MAKE THE IMPROVEMENTS.

C. ALL HYDROLOGIC ANALYSES SHALL BE BASED ON THE EXISTING WATERSHED CHARACTERISTICS AND THE ULTIMATE DEVELOPMENT CONDITION OF THE SUBJECT PROJECT.

D. IF THE APPLICANT CHOOSES AN OPTION THAT INCLUDES STORMWATER DETENTION, HE SHALL OBTAIN APPROVAL FROM THE VESCP 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.

E. OUTFALL FROM A DETENTION FACILITY SHALL BE DISCHARGED TO A RECEIVING CHANNEL, AND ENERGY DISSIPATORS SHALL BE PLACED AT THE OUTFALL OF ALL DETENTION FACILITIES AS NECESSARY TO PROVIDE A STABILIZED TRANSITION FROM THE FACILITY TO THE RECEIVING CHANNEL.

F. ALL ON-SITE CHANNELS MUST BE VERIFIED TO BE ADEQUATE.

G. 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.

H. IN APPLYING THESE STORMWATER MANAGEMENT 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.

## EROSION & SEDIMENT CONTROL MINIMUM STANDARDS (CONT'D)

I. 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.

J. ANY PLAN APPROVED PRIOR TO JULY 1, 2014, THAT PROVIDES FOR STORMWATER MANAGEMENT THAT ADDRESSES ANY FLOW RATE CAPACITY AND VELOCITY REQUIREMENTS FOR NATURAL OR MAN-MADE CHANNELS SHALL SATISFY THE FLOW RATE CAPACITY AND VELOCITY REQUIREMENTS FOR NATURAL OR MAN-MADE CHANNELS IF THE PRACTICES ARE DESIGNED TO (I) DETAIN THE WATER QUALITY VOLUME AND TO RELEASE IT OVER 48 HOURS; (II) DETAIN AND RELEASE OVER A 24-HOUR PERIOD THE EXPECTED RAINFALL RESULTING FROM THE ONE YEAR, 24-HOUR STORM; AND (III) REDUCE THE ALLOWABLE PEAK FLOW RATE RESULTING FROM THE 1.5, 2, AND 10-YEAR, 24-HOUR STORMS TO A LEVEL THAT IS LESS THAN OR EQUAL TO THE PEAK FLOW RATE FROM THE SITE ASSUMING IT WAS IN A GOOD FORESTED CONDITION, ACHIEVED THROUGH MULTIPLICATION OF THE FORESTED PEAK FLOW RATE BY A REDUCTION FACTOR THAT IS EQUAL TO THE RUNOFF VOLUME FROM THE SITE WHEN IT WAS IN A GOOD FORESTED CONDITION DIVIDED BY THE RUNOFF VOLUME FROM THE SITE IN ITS PROPOSED CONDITION, AND SHALL BE EXEMPT FROM ANY FLOW RATE CAPACITY AND VELOCITY REQUIREMENTS FOR NATURAL OR MAN-MADE CHANNELS AS DEFINED IN ANY REGULATIONS PROMULGATED PURSUANT TO § 62.1-44.15:54 OR 62.1-44.15:65 OF THE ACT.

K. FOR PLANS APPROVED ON AND AFTER JULY 1, 2014, THE FLOW RATE CAPACITY AND VELOCITY REQUIREMENTS OF § 62.1-44.15:52 A OF THE ACT AND THIS SUBSECTION SHALL BE SATISFIED BY COMPLIANCE WITH WATER QUANTITY REQUIREMENTS IN THE STORMWATER MANAGEMENT ACT (§ 62.1-44.15:24 ET SEQ. OF THE CODE OF VIRGINIA) AND ATTENDANT REGULATIONS, UNLESS SUCH LAND-DISTURBING ACTIVITIES (I) ARE IN ACCORDANCE WITH PROVISIONS FOR TIME LIMITS ON APPLICABILITY OF APPROVED DESIGN CRITERIA IN 9VAC25-870-47 OR GRANDFATHERING IN 9VAC25-870-48 OF THE VIRGINIA STORMWATER MANAGEMENT PROGRAM (VSMP) REGULATION, IN WHICH CASE THE FLOW RATE CAPACITY AND VELOCITY REQUIREMENTS OF § 62.1-44.15:52 A OF THE ACT SHALL APPLY, OR (II) ARE EXEMPT PURSUANT TO § 62.1-44.15:34 C 7 OF THE ACT.

L. COMPLIANCE WITH THE WATER QUANTITY MINIMUM STANDARDS SET OUT IN 9VAC25-870-66 OF THE VIRGINIA STORMWATER MANAGEMENT PROGRAM (VSMP) REGULATION SHALL BE DEEMED TO SATISFY THE REQUIREMENTS OF THIS SUBDIVISION 19.

EROSION CONTROL LEGEND

| LABEL | SYMBOL | STANDARD NAME | SPEC.# |
|---|---|---|---|
| CE | | CONSTRUCTION ENTRANCE | 3.02 |
| SF | | SILT FENCE | 3.05-2 |
| SFB | | SILT FENCE BREAK | N/A |
| IP | | INLET PROTECTION | 3.07 |
| TS | TS | TEMPORARY SEEDING | 3.31 |
| PS | PS | PERMANENT SEEDING | 3.32 |
| MU | MU | MULCHING | 3.35 |
| B/M | | SOIL STABILIZATION BLANKETS & MATTING | 3.36 |

## ESC NARRATIVE & SEQUENCE

1. CONSTRUCTION OF THIS PROJECT SHALL NOT COMMENCE UNTIL THE ISSUANCE OF A LAND DISTURBANCE PERMIT, ALL OTHER REQUIRED STATE AND FEDERAL AGENCY APPROVALS ARE RECEIVED, AND PROPER INSTALLATION OF PERIMETER EROSION CONTROL MEASURES IS COMPLETE. WETLAND FLAGGING SHALL BE PRESENT AROUND LIMITS OF WETLANDS PRIOR TO LAND DISTURBANCE. CONTACT ENGINEER IF FIELD CONDITIONS DIFFERE FROM PLANS AND/OR IF CONTRACTOR IDENTIFIES A FIELD CHANGE IS NECESSARY.
2. CONSTRUCTION ACTIVITY SHALL BE LIMITED TO THAT WHICH IS DESCRIBED IN THIS PLAN AND THE CONTRACTOR SHALL AVOID DISTURBING AREAS THAT WILL REMAIN DORMANT (UNDISTURBED) FOR GEATER THAN FOURTEEN (14) DAYS. THROUGH IMPLEMENTATION OF THE GRADING PLAN, ENSURE POSTIVE DRAINAGE TO SEDIMENT TRAPPING DEVICES AT ALL TIMES.
3. A PRE-CONSTRUCTION CONFERENCE IS MANDATORY BEFORE ANY WORK IS DONE AT THE SITE WITH THE ENGINEER, CONTRACTOR, AND CITY ENVIRONMENTAL INSPECTOR. A MINIMUM OF 48 HOURS NOTICE IS REQUIRED.
4. FLAG PRELIMINARY LIMITS OF DISTURBANCE TO INSTALL EROSION AND SEDIMENT CONTROL MEASURES AS SHOWN ON THE DEMOLITION PLAN.
5. INSTALL INLET PROTECTION AT EXISTING DRAINAGE INLET ON PUMP HOUSE DRIVE.
6. SEED/STABILIZE WITH BLANKET MATTING IMMEDIATELY AFTER COMPLETION OF ROUGH GRADING.
7. ALL TEMPORARY SOIL STOCKPILE AREAS MUST BE ENCLOSED WITH SILT FENCE OR SUPER SILT FENCE AT THE DIRECTION OF THE CITY EROSION AND SEDIMENT CONTROL INSPECTOR.
8. ENSURE ALL EROSION CONTROL MEASURES ARE IN GOOD WORKING ORDER AND FUNCTIONING AS INTENDED PRIOR TO FURTHER LAND DISTURBANCE. IF IT IS NOTICED THAT E&S MEASURES ARE NOT PROVIDING ADEQUATE PROTECTION, INSTALL ADDITIONAL MEASURES IMMEDIATELY AND/OR CONTACT ENGINEER FOR GUIDANCE.
9. TEMPORARILY STABILIZE STOCKPILES WITH TEMPORARY SEEDING AND MULCH. STRAW OR HAY MULCH IS REQUIRED. PROVIDE SILT FENCE AROUND PERIMETER OF STOCKPILES.
10. COMPLETE SITE DEMOLITION ACTIVITIES AS SHOWN ON SHEET C3.0.
11. FOLLOWING PAVEMENT REMOVAL TREAT WITH TOPSOIL AND GRADE THE SITE TO PROPOSED GRADES.
12. FINE GRADE CONCRETE LANDING AND RAMP AND SEED/STABILIZE SLOPES WITH BLANKET MATTING IMMEDIATELY AFTER COMPLETION. INSTALL CONCRETE RAMP WITH RETAINING WALLS, HANDRAILS AND SLOTTED DRAIN.
13. ADDITIONAL EROSION CONTROL MAY BE REQUESTED BY THE CITY INSPECTOR AT ANY TIME DURING LAND DISTURBANCE. IF THE CONTRACTOR IDENTIFIES A STAGE OF GRADING THAT WILL RESULT IN SEDIMENT LADEN RUN-OFF LEAVING THE SITE UNIMPEDED, CONTACT ENGINEER IMMEDIATELY FOR PLACEMENT OF INTERMEDIATE EROSION CONTROL MEASURES.
14. CONSTRUCTION ENTRANCES AND CONSTRUCTION FENCING SHALL REMAIN FOLLOWING PERMANENT STABILIZATION OF THE SITE.
15. AFTER FINAL STABILIZATION AND AT THE APPROVAL OF THE INSPECTOR REMOVE REMAINING E&S MEASURES.

## CITY OF RICHMOND STANDARD E&S NOTES

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 14 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.

COMMONWEALTH OF VIRGINIA
Amelia Wehunt
AMELIA C. WEHUNT
Lic. No. 049325
04/29/2021
PROFESSIONAL ENGINEER

ISSUED FOR PERMITTING

APRIL 15, 2021

SYMBOLS

- BOLLARD
- BUSH
- CAP
- ELECTRIC BOX
- ELECTRIC METER
- ELECTRIC MANHOLE
- FIRE HYDRANT
- GAS METER
- GAS VALVE
- GUY
- LIGHT POLE
- POWER POLE
- PROPERTY PIN
- SANITARY MANHOLE
- SIGNS
- STORM MANHOLE
- TELEPHONE MANHOLE
- TREE
- UTILITY BOX
- UTILITY PEDESTAL
- UTILITY POLE
- WATER METER
- WATER VALVE
- YARD LIGHT
- BOULDER

LINE TYPES

- PROPERTY LINE
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- EXISTING ASPHALT
- EXISTING CONCRETE
- SANITARY SEWER
- OVERHEAD ELECTRIC
- UNDERGROUND ELECTRIC
- WATER PIPE
- GAS PIPE
- EXISTING FENCING
- EXISTING TREELINE
- EXISTING EASEMENT
- RPA BOUNDARY
- RMA BOUNDARY
- FEMA 100-YR FLOODPLAIN
- FEMA 500-YR FLOODPLAIN

DATE: APRIL 29, 2021 DRAWN BY: B. MEYER
SCALE: AS NOTED CHECKED BY: A. WEHUNT

RICHMOND VIRGINIA

REVISIONS

AS BUILT DATE

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JAMES RIVER PARK SYSTEM
BYRD PARK PUMP HOUSE
ADA ACCESS IMPROVEMENTS

EROSION AND SEDIMENT CONTROL NOTES

DEPARTMENT OF PARKS AND RECREATION
CITY OF RICHMOND, VIRGINIA

SHEET NO. C3.2

S:\310\39490.035-Byrd Park Pump House ADA Access Improvements\DWG\Sheet\CD\39490.035-C1.2-ESNTDT.dwg | Plotted on 4/29/2021 6:12 PM | by Becky Meyer

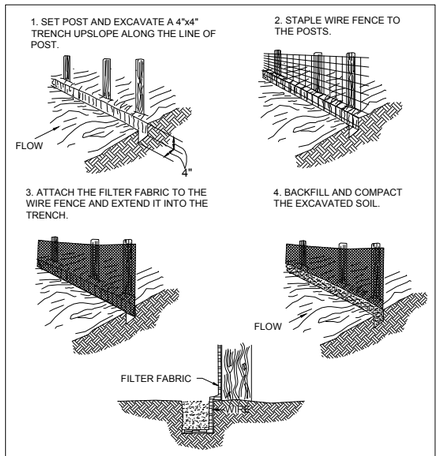



PLATE 3.05-1

SF CONSTRUCTION OF A SILT FENCE (WITH WIRE SUPPORT)

No Scale

## SILT FENCE NOTES

1. SILT FENCE AND FILTER FABRIC MUST BE ENTRENCHED.
2. POST FOR SILT FENCES SHALL BE EITHER 2.5 X 2 INCH DIAMETER WOOD OR 1.25 POUNDS PER LINEAR FOOT STEEL WITH A MINIMUM LENGTH OF 5 FEET.
3. POST SHALL BE SPACED A MAXIMUM OF 6 FEET APART AT THE BARRIER LOCATION AND DRIVEN SECURELY INTO THE GROUND (MIN. OF 12 INCHES) WHEN EXTRA STRENGTH FABRIC IS USED.
4. STAPLE OR WIRE THE FILTER FABRIC DIRECTLY TO THE POST.
5. SEDIMENT MUST BE REMOVED WHEN DEPOSITS REACH APPROXIMATELY ONE-HALF THE HEIGHT OF THE BARRIER.
6. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE SILT FENCE OR FILTER BARRIER IS NO LONGER REQUIRED SHALL BE DRESSED TO CONFORM WITH THE EXISTING GRADE, PREPARED AND SEEDED.
7. SILT FENCE SHALL BE REMOVED UPON COMPLETION OF THE PROJECT.

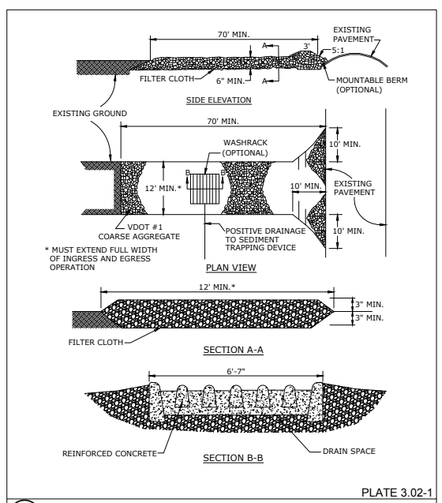



PLATE 3.02-1

CE CONSTRUCTION ENTRANCE

No Scale

*NOTE: CONSTRUCTION ACCESS AREA SHOWN ALONG SOUTH 25th STREET IN THE PHASE II E&S CONTROL PLAN (SHEET ####) IS ON PAVED ROADS/ENTRANCES AND DOES NOT NEED STONE PADS. KEEP MUD AND CONSTRUCTION MATERIALS OFF OF PUBLIC ROADWAYS AT ALL TIMES DURING CONSTRUCTION.

***NOTE:** STABILIZATION MEASURES FOR LANDSCAPED AREAS SHALL BE FOR REFERENCE ONLY. REFER TO LANDSCAPE/PLANTING NOTES AND DETAILS FOR PERMANENT SEEDING AND QUANTITIES.

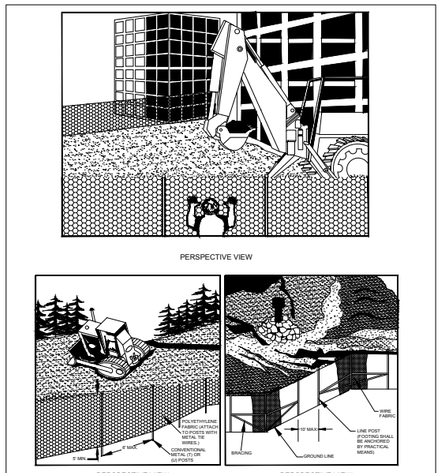



PLATE 3.01-1

SAF SAFETY FENCE

NO SCALE

## SAFETY FENCE DESIGN CRITERIA

1. SAFETY FENCES SHOULD BE LOCATED SO AS TO CREATE A FORMIDABLE BARRIER TO UNDESIRED ACCESS, WHILE ALLOWING FOR THE CONTINUATION OF NECESSARY CONSTRUCTION OPERATIONS.
2. SAFETY FENCES ARE MOST APPLICABLE TO THE CONSTRUCTION OF BERMS, TRAPS, AND DAMS. IN USE WITH THOSE STRUCTURES, SAFETY FENCES SHOULD BE LOCATED FAR ENOUGH BEYOND THE OUTER TOE OF THE EMBANKMENT TO ALLOW FOR THE PASSAGE OF MAINTENANCE VEHICLES. FENCES SHOULD NOT BE INSTALLED ACROSS THE SLOPE OF A DAM OR DIKE.
3. THE HEIGHT OF THE FENCE SHALL BE A MINIMUM OF 6 FEET FOR METAL FENCE. A FENCE MUST NEVER BE SO SHORT AS TO BECOME AN ATTRACTION FOR CHILDREN TO CLIMB ON OR OVER.
4. SIGNS NOTING POTENTIAL HAZARDS SUCH AS "DANGER-QUICK-SAND" OR "HAZARDOUS AREA-KEEP OUT" SHOULD BE POSTED AND EASILY SEEN BY ANYONE APPROACHING THE PROTECTED AREA.
5. METAL OR CHAIN-LINK FENCE SHOULD BE USED WHEN A POTENTIALLY DANGEROUS CONTROL MEASURE WILL REMAIN IN PLACE PERMANENTLY, SUCH AS A STORMWATER DETENTION OR RETENTION BASIN. HOWEVER, THEY MAY ALSO BE USED FOR MEASURES WHICH WILL ONLY SERVE A TEMPORARY FUNCTION, AT THE DISCRETION OF THOSE RESPONSIBLE FOR PROJECT SAFETY. THE METAL FENCE MUST MEET THE FOLLOWING PHYSICAL REQUIREMENTS:
   - A. FABRIC SHALL BE ZINC-COATED STEEL, 2-INCH MESH, 9-GAUGE, MINIMUM.
   - B. ZINC COATING SHALL HAVE A MINIMUM WEIGHT OF 1.8 OUNCES PER SQUARE FOOT.
   - C. POSTS SHALL BE STEEL PIPE, ZINC-COATED.
   - D. TOP NAILS SHALL BE STEEL PIPE, ZINC-COATED.
   - E. BRACES SHALL BE MADE OF ZINCE-COATED STEEL.
   - F. GATES SHALL BE SINGLE OR DOUBLE SWING, ZINC-COATED STEEL. THEY SHALL BE A MINIMUM OF 12-FEET WIDE.

## SAFETY FENCE CONSTRUCTION CRITERIA

1. SAFETY FENCES MUST BE INSTALLED PRIOR TO THE E&S MEASURE BECOMING ACCESSIBLE.
2. THE SAFETY FENCE SHALL BE INSTALLED AS PER THE FOLLOWING PROCEDURE:
3. LINE POSTS SHALL BE USED AT INTERVALS OF 10 FEET, MEASURED FROM CENTER TO CENTER OF ADJACENT POSTS. IN DETERMINING THE POST SPACING, MEASUREMENT WILL BE MADE PARALLEL WITH THE GROUND SURFACE. SEE PERSPECTIVE VIEW IN PLATE 3.01-1.
   - a. POSTS WILL BE ANCHORED BY OTHER ACCEPTABLE MEANS (NOT CONCRETE FOOTINGS).
   - b. ALL CORNER POSTS, END POSTS, GATE POSTS, AND PULL POSTS SHALL BE EMBEDDED, BRACED AND TRUSSED AS SHOWN IN THE STANDARD FENCE - CHAIN LINK DETAIL FOUND IN THE LATEST VERSION OF THE VDOT STANDARDS.
   - c. THE FABRIC SHALL BE STRETCHED TAUT AND SECURELY FASTENED, BY MEANS OF TIE CLIPS, TO THE POSTS AT INTERVALS NOT EXCEEDING 15 INCHES AND TO THE TOP RAILS OR TENSION WIRES AT INTERVALS NOT EXCEEDING 2 FEET. CARE SHALL BE TAKEN TO EQUALIZE THE TENSION ON EACH SIDE OF EACH POST.
4. APPLICABLE WARNING SIGNS NOTING HAZARDOUS CONDITIONS MUST BE INSTALLED IMMEDIATELY UPON INSTALLATION OF SAFETY FENCE.

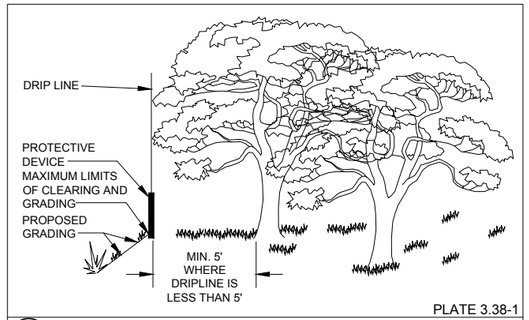
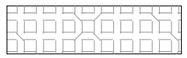



PLATE 3.38-1

TP TREE PRESERVATION AND PROTECTION

No Scale



STANDARD ORANGE VINYL OR PLASTIC CONSTRUCTION FENCE ATTACHED TO POSTS (PRE-WEATHERED WOOD, GALVANIZED STEEL, IRON OR THICK PVC PLASTIC), AT LEAST 40" ABOVE FINISH GRADE WITH SPAN BETWEEN POSTS NO GREATER THAN 6' ON CENTER. EVERY NINTH POST SHALL CONTAIN A WARNING SIGN THAT CLEARLY IDENTIFIES THE FENCE AS A TREE PROTECTION FENCE.

**TABLE 3.32-D**
(REVISED JUNE 2003)
**PERMANENT SEEDING SPECIFICATIONS FOR PIEDMONT AREA**

| SEED[1] | | |
|---|---|---|
| **LAND USE** | **SPECIES** | **APPLICATION PER ACRE** |
| MINIMUM CARE LAWN (COMMERCIAL OR RESIDENTIAL) | TALL FESCUE[1]<br>PERENNIAL RYEGRASS<br>KENTUCKY BLUEGRASS[1] | 95-100%<br>0-5%<br>0-5%<br>TOTAL: 175-200 LBS. |
| HIGH-MAINTENANCE LAWN | TALL FESCUE[1] | TOTAL: 200-250 LBS. |
| GENERAL SLOPE (3:1 OR LESS) | TALL FESCUE[1]<br>RED TOP GRASS OR CREEPING RED FESCUE<br>SEASONAL NURSE CROP[2] | 128 LBS.<br>2 LBS.<br>20 LBS.<br>TOTAL: 150 LBS. |
| LOW-MAINTENANCE SLOPE (STEEPER THAN 3:1) | TALL FESCUE[1]<br>RED TOP GRASS OR CREEPING RED FESCUE<br>SEASONAL NURSE CROP[2]<br>CROWNVETCH[3] | 108 LBS.<br>2 LBS.<br>20 LBS.<br>20 LBS.<br>TOTAL: 150 LBS. |

1. WHEN SELECTING VARIETIES OF TURFGRASS, USE THE VIRGINIA CROP IMPROVEMENT ASSOCIATION (VCIA) RECOMMENDED TURFGRASS VARIETY LIST. QUALITY SEED WILL BEAR A LABEL INDICATING THAT THEY ARE APPROVED BY VCIA. A CURRENT TURFGRASS VARIETY LIST IS AVAILABLE AT THE LOCAL COUNTY EXTENSION OFFICE OR THROUGH VCIA AT 804-746-4884 OR AT http://sudan.cses.vt.edu/html/turf/turf/publications/publications2.html
2. USE SEASONAL NURSE CROP IN ACCORDANCE WITH SEEDING DATES AS STATED BELOW:
   - FEBRUARY 16th - APRIL ..... ANNUAL RYE
   - MAY 1st - AUGUST 15th ..... FOXTAIL MILLET
   - AUGUST 16th - OCTOBER ..... ANNUAL RYE
   - NOVEMBER - FEBRUARY 15th ..... WINTER RYE
3. SUBSTITUTE SERICEA LESPEDEZA FOR CROWNVETCH EAST OF FARMVILLE, VA (MAY THROUGH SEPTEMBER USE HULLED SEED, ALL OTHER PERIODS, USE UNHULLED SERICEA). IF FLATPEA IS USED, INCREASE RATE TO 30 LBS./ACRE. IF WEEPING LOVEGRASS IS USED, INCLUDE IN ANY SLOPE OR LOW MAINTENANCE MIXTURE DURING WARMER SEEDING PERIODS. INCREASE TO 30 -40

**FERTILIZER & LIME**

- APPLY 10-20-10 **FERTILIZER** AT A RATE OF **500** LBS. / ACRE (OR 12 LBS. / 1,000 SQ. FT.)
- APPLY **PULVERIZED AGRICULTURAL LIMESTONE** AT A RATE OF 2 TONS/ACRE (90 LBS. / 1,000 SQ. FT.)

**NOTE:**
- A SOIL TEST IS NECESSARY TO DETERMINE THE ACTUAL AMOUNT OF LIME REQUIRED TO ADJUST THE SOIL pH OF SITE.
- INCORPORATE THE LIME AND FERTILIZER INTO THE TOP 4 - 6 INCHES OF THE SOIL BY DISKING OR BY OTHER MEANS.
- WHEN APPLYING SLOWLY AVAILABLE NITROGEN, USE RATES AVAILABLE IN EROSION & SEDIMENT CONTROL TECHNICAL BULLETIN #4, 2003 NUTRIENT MANAGEMENT FOR DEVELOPMENT SITES AT http://www.dcr.state.va.us/sw/e&s.htm#pubs

**TABLE 3.31-B**
(REVISED JUNE 2003)
**TEMPORARY SEEDING SPECIFICATIONS**
**QUICK REFERENCE FOR ALL REGIONS**

| SEED | | |
|---|---|---|
| **APPLICATION DATES** | **SPECIES** | **APPLICATION RATES** |
| Sept. 1 - Feb. 15 | 50/50 Mix of Annual Ryegrass (lolium multi-florum) & Cereal (Winter) Rye (Secale cereale) | 50 -100 (lbs/acre) |
| Feb. 16 - Apr. 30 | Annual Ryegrass (lolium multi-florum) | 60 - 100 (lbs/acre) |
| May 1 - Aug. 31 | German Millet | 50 (lbs/acre) |

**FERTILIZER & LIME**

- Apply 10-10-10 **fertilizer** at a rate of 450 lbs / acre (or 10 lbs. / 1,000 sq. ft.)
- Apply **Pulverized Agricultural Limestone** at a rate of 2 tons / acre (or 90 lbs. / 1,000 sq. ft.)

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

APPLYING TOPSOIL

TOPSOIL SHALL NOT BE PLACED WHILE IN A FROZEN OR MUDDY CONDITION. WHEN TOPSOIL OR SUBGRADE IS EXCESSIVELY WET, OR IN A CONDITION THAT MAY OTHERWISE BE DETRIMENTAL TO PROPER GRADING OR PROPOSED SODDING OR SEEDING. THE TOPSOIL SHALL BE UNIFORMLY DISTURBED TO A MINIMUM COMPACTED DEPTH OF 6 INCHES ON 3:1 OR STEEPER SLOPES AND 4 INCHES ON FLATTER SLOPES. ANY IRREGULARITIES IN THE SURFACE, RESULTING FROM TOPSOILING OR OTHER OPERATIONS, SHALL BE CORRECTED IN ORDER TO PREVENT THE FORMATION OF DEPRESSIONS OR WATER POCKETS.

IT IS NECESSARY TO COMPACT THE TOPSOIL ENOUGH TO ENSURE GOOD CONTACT WITH THE UNDERLYING SOIL AND TO OBTAIN A LEVEL SEEDBED FOR THE ESTABLISHMENT OF HIGH MAINTENANCE TURF. HOWEVER, UNDUE COMPACTION IS TO BE AVOIDED AS IT INCREASES RUNOFF VELOCITY AND VOLUME, AND DETERS SEED GERMINATION. SPECIAL CONSIDERATION SHOULD BE GIVEN TO THE TYPES OF EQUIPMENT USED TO PLACE TOPSOIL IN AREAS TO RECEIVE FINE TURF. AVOID UNNECESSARY COMPACTION BY HEAVY MACHINERY WHENEVER POSSIBLE.

THE FOLLOWING TABLE LIST VARIOUS DEPTHS AND PROVIDES CORRESPONDING INFORMATION ON VOLUMES AND APPLIED AREAS:

TABLE 3.30-A

TO TOPSOILING

NO SCALE

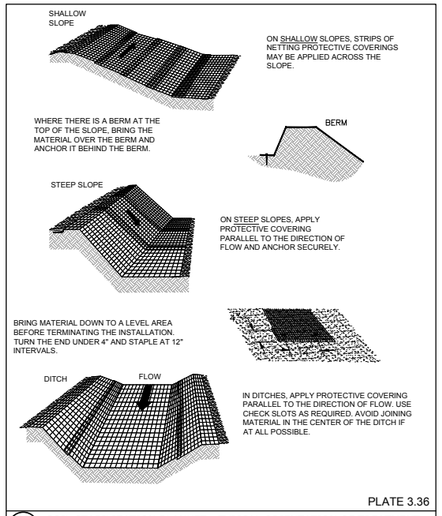



PLATE 3.36

B/M SOIL STABILIZATION BLANKET - TYPICAL ORIENTATION OF TREATMENT

NO SCALE

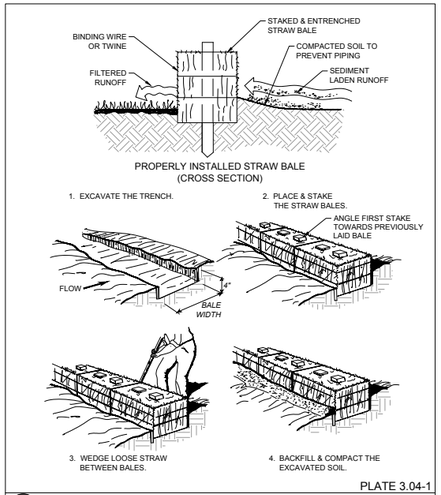



PLATE 3.04-1

STB CONSTRUCTION OF A STRAW BALE BARRIER

NO SCALE

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AMELIA C. WEHUNT
Lic. No. 049325
04/29/2021
PROFESSIONAL ENGINEER

ISSUED FOR PERMITTING

APRIL 15, 2021

## SYMBOLS

BOLLARD, BUSH, CAP, ELECTRIC BOX, ELECTRIC METER, ELECTRIC MANHOLE, FIRE HYDRANT, GAS METER, GAS VALVE, GUY, LIGHT POLE, POWER POLE, PROPERTY PIN, SANITARY MANHOLE, SIGNS, STORM MANHOLE, TELEPHONE MANHOLE, TREE, UTILITY BOX, UTILITY PEDESTAL, UTILITY POLE, WATER METER, WATER VALVE, YARD LIGHT, BOULDER

## LINE TYPES

PROPERTY LINE, EXISTING MAJOR CONTOUR, EXISTING MINOR CONTOUR, EXISTING ASPHALT, EXISTING CONCRETE, SANITARY SEWER, OVERHEAD ELECTRIC, UNDERGROUND ELECTRIC, WATER PIPE, GAS PIPE, EXISTING FENCING, EXISTING TREELINE, EXISTING EASEMENT, RPA BOUNDARY, RMA BOUNDARY, FEMA 100-YR FLOODPLAIN, FEMA 500-YR FLOODPLAIN

DATE: APRIL 29, 2021 DRAWN BY: B. MEYER

SCALE: AS NOTED CHECKED BY: A. WEHUNT

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JAMES RIVER PARK SYSTEM
BYRD PARK PUMP HOUSE
ADA ACCESS IMPROVEMENTS

EROSION AND SEDIMENT CONTROL DETAILS

DEPARTMENT OF PARKS AND RECREATION
CITY OF RICHMOND, VIRGINIA

SHEET NO. C3.3

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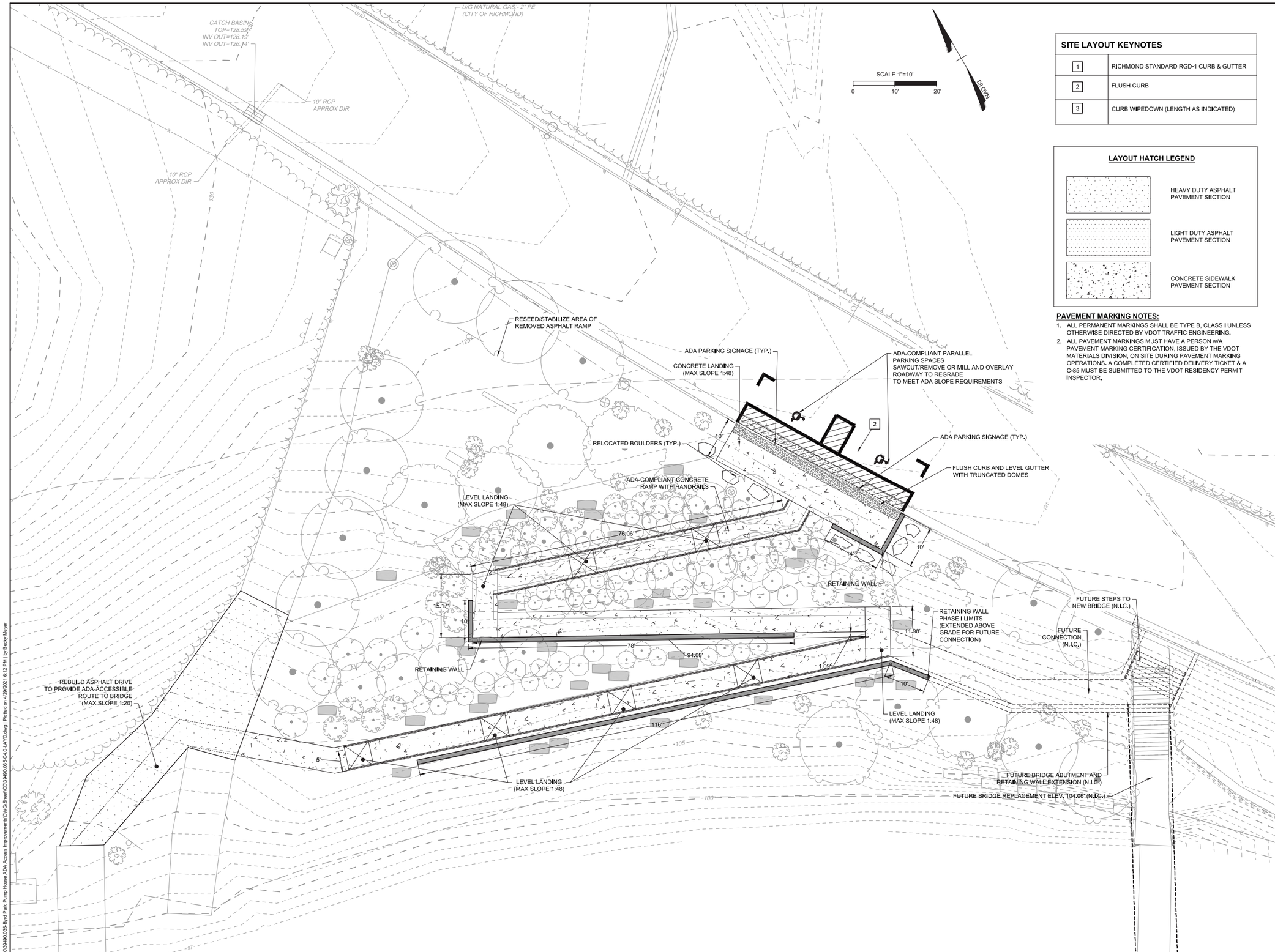


## SITE LAYOUT KEYNOTES

| | |
|---|---|
| 1 | RICHMOND STANDARD RGD-1 CURB & GUTTER |
| 2 | FLUSH CURB |
| 3 | CURB WIPEDOWN (LENGTH AS INDICATED) |

## LAYOUT HATCH LEGEND

- HEAVY DUTY ASPHALT PAVEMENT SECTION
- LIGHT DUTY ASPHALT PAVEMENT SECTION
- CONCRETE SIDEWALK PAVEMENT SECTION

## PAVEMENT MARKING NOTES:

1. ALL PERMANENT MARKINGS SHALL BE TYPE B, CLASS I UNLESS OTHERWISE DIRECTED BY VDOT TRAFFIC ENGINEERING.
2. ALL PAVEMENT MARKINGS MUST HAVE A PERSON w/A PAVEMENT MARKING CERTIFICATION, ISSUED BY THE VDOT MATERIALS DIVISION, ON SITE DURING PAVEMENT MARKING OPERATIONS. A COMPLETED CERTIFIED DELIVERY TICKET & A C-85 MUST BE SUBMITTED TO THE VDOT RESIDENCY PERMIT INSPECTOR.

COMMONWEALTH OF VIRGINIA
AMELIA C. WEHUNT
Lic. No. 049325
04/29/2021
PROFESSIONAL ENGINEER

ISSUED FOR PERMITTING

APRIL 15, 2021

## SYMBOLS

- BOLLARD
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- CAP
- ELECTRIC BOX
- ELECTRIC METER
- ELECTRIC MANHOLE
- FIRE HYDRANT
- GAS METER
- GAS VALVE
- GUY
- LIGHT POLE
- POWER POLE
- PROPERTY PIN
- SANITARY MANHOLE
- SIGNS
- STORM MANHOLE
- TELEPHONE MANHOLE
- TREE
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- EXISTING MINOR CONTOUR
- EXISTING ASPHALT
- EXISTING CONCRETE
- SANITARY SEWER
- OVERHEAD ELECTRIC
- UNDERGROUND ELECTRIC
- WATER PIPE
- GAS PIPE
- EXISTING FENCING
- EXISTING TREELINE
- EXISTING EASEMENT
- RPA BOUNDARY
- RMA BOUNDARY
- FEMA 100-YR FLOODPLAIN
- FEMA 500-YR FLOODPLAIN

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SCALE: 1"=10' CHECKED BY: A. WEHUNT

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*ADA ACCESS IMPROVEMENTS*

*LAYOUT PLAN*

DEPARTMENT OF PARKS AND RECREATION
CITY OF RICHMOND, VIRGINIA

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C4.0

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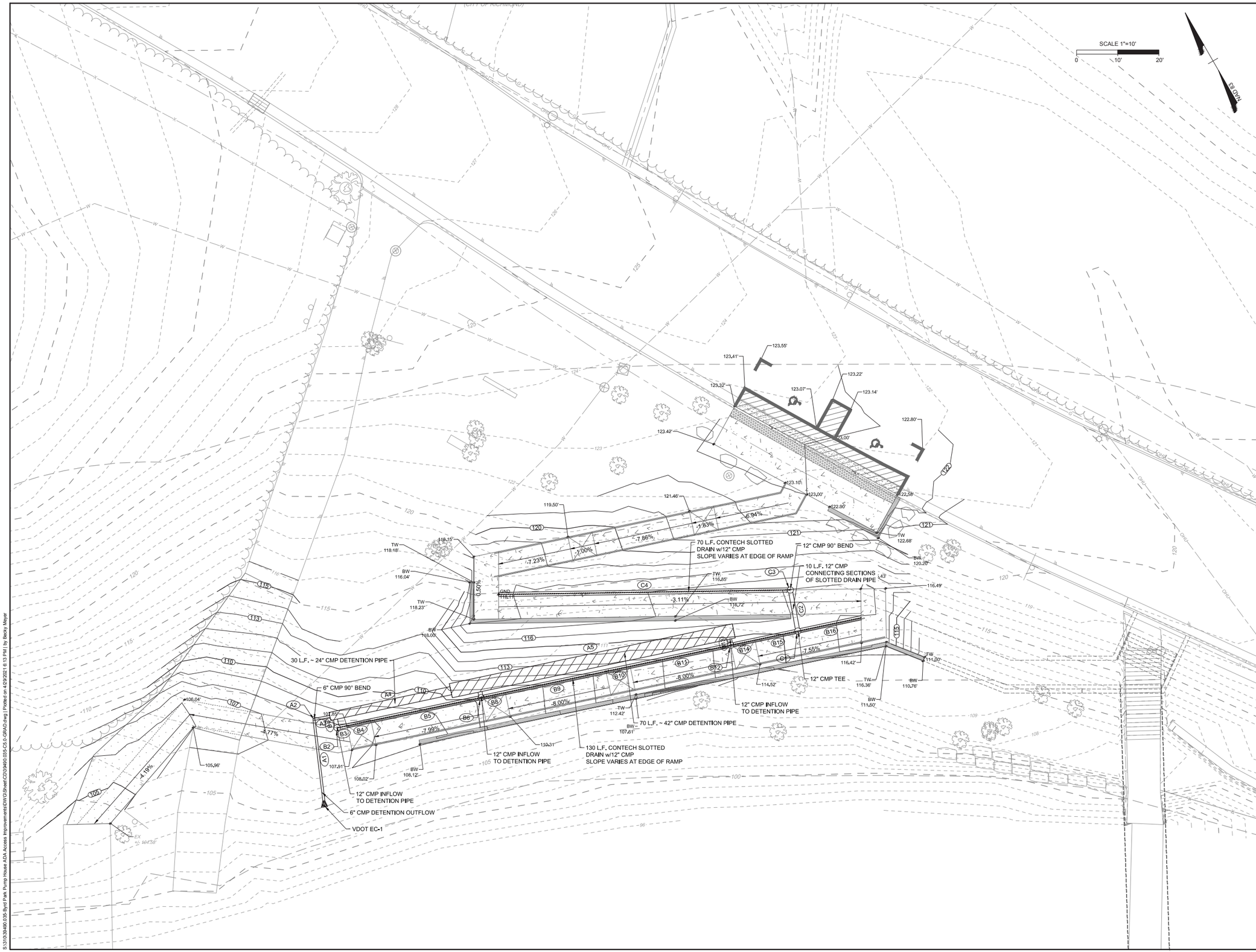


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- GAS PIPE
- EXISTING FENCING
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- EXISTING EASEMENT
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- RMA BOUNDARY
- FEMA 100-YR FLOODPLAIN
- FEMA 500-YR FLOODPLAIN

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*GRADING AND DRAINAGE PLAN*

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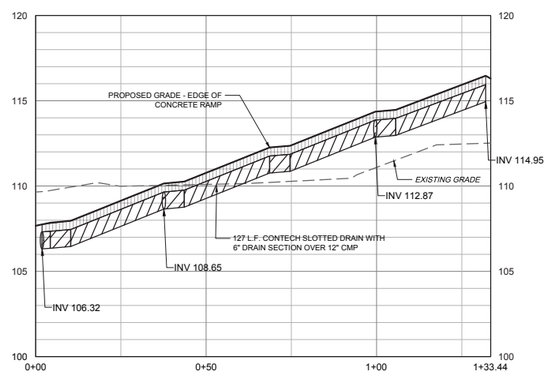
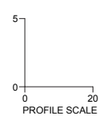
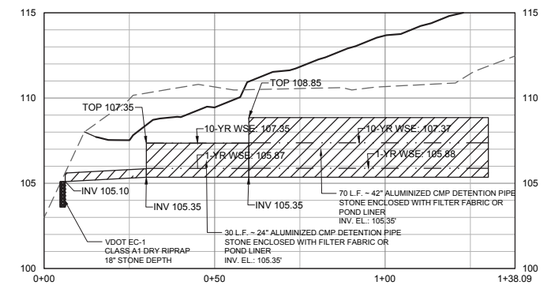


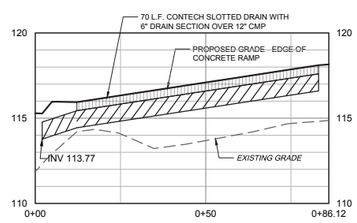

## CONTECH SLOTTED DRAIN PROFILE - LOWER RAMP

**HORZ.: 1" = 20'**
**VERT.: 1" = 5'**




## STORMWATER DETENTION PIPE PROFILE

**HORZ.: 1" = 20'**
**VERT.: 1" = 5'**




## CONTECH SLOTTED DRAIN PROFILE - UPPER RAMP

**HORZ.: 1" = 20'**
**VERT.: 1" = 5'**

**STORM STRUCTURE TABLE**

| STRUCTURE # | TOP | DESCRIPTION |
|---|---|---|
| A2 | 105.73 | 6" CMP 90-DEG BEND |
| B2 | 107.60 | 12" CMP 90-DEG BEND |
| B6 | 109.93 | 12" CMP TEE |
| B12 | 114.18 | 12" CMP TEE |
| C1 | 115.05 | 12" CMP TEE |
| C3 | 115.72 | 12" CMP 90-DEG. BEND |

**STORM PIPE TABLE**

| PIPE # | DIA | UPSTREAM INVERT | DOWNSTREAM INVERT | SLOPE | LENGTH | DESCRIPTION |
|---|---|---|---|---|---|---|
| A1 | 6" | 105.31 | 105.10 | 1.06% | 19.92 LF | 6" ALUMINIZED CMP (16 GAUGE) |
| A3 | 6" | 105.35 | 105.31 | 1.00% | 3.94 LF | 6" ALUMINIZED CMP (16 GAUGE) |
| A4 | 24" | 105.35 | 105.35 | 0.00% | 30.05 LF | 24" ALUMINIZED CMP (16 GAUGE) |
| A5 | 42" | 105.35 | 105.35 | 0.00% | 70.26 LF | 42" ALUMINIZED CMP (16 GAUGE) |
| B1 | 12" | 106.32 | 106.30 | 1.00% | 2.09 LF | 12" ALUMINIZED CMP (16 GAUGE) |
| B3 | 12" | 106.35 | 106.32 | 1.25% | 2.43 LF | CONTECH SLOTTED DRAIN w/12" CMP |
| B4 | 12" | 106.46 | 106.35 | 1.83% | 6.00 LF | CONTECH SLOTTED DRAIN w/12" CMP |
| B5 | 12" | 108.65 | 106.46 | 8.02% | 27.31 LF | CONTECH SLOTTED DRAIN w/12" CMP |
| B8 | 12" | 108.76 | 108.65 | 1.83% | 6.00 LF | CONTECH SLOTTED DRAIN w/12" CMP |
| B9 | 12" | 110.76 | 108.76 | 8.00% | 25.00 LF | CONTECH SLOTTED DRAIN w/12" CMP |
| B10 | 12" | 110.86 | 110.76 | 1.67% | 6.00 LF | CONTECH SLOTTED DRAIN w/12" CMP |
| B11 | 12" | 112.87 | 110.86 | 8.04% | 25.00 LF | CONTECH SLOTTED DRAIN w/12" CMP |
| B13 | 12" | 112.90 | 107.80 | 339.35% | 1.50 LF | 12" ALUMINIZED CMP (16 GAUGE) |
| B14 | 12" | 112.97 | 112.87 | 1.67% | 6.00 LF | CONTECH SLOTTED DRAIN w/12" CMP |
| B15 | 12" | 113.77 | 112.97 | 7.51% | 10.63 LF | CONTECH SLOTTED DRAIN w/12" CMP |
| B16 | 12" | 114.95 | 113.77 | 7.51% | 15.73 LF | CONTECH SLOTTED DRAIN w/12" CMP |
| C2 | 12" | 114.44 | 113.77 | 6.59% | 10.17 LF | 12" ALUMINIZED CMP(16 GAUGE) |
| C4 | 12" | 116.60 | 114.44 | 3.05% | 70.88 LF | CONTECH SLOTTED DRAIN w/12" CMP |

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### SYMBOLS

BOLLARD
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ELECTRIC METER
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FIRE HYDRANT
GAS METER
GAS VALVE
GUY
LIGHT POLE
POWER POLE
PROPERTY PIN
SANITARY MANHOLE
SIGNS
STORM MANHOLE
TELEPHONE MANHOLE
TREE
UTILITY BOX
UTILITY PEDESTAL
UTILITY POLE
WATER METER
WATER VALVE
YARD LIGHT
BOULDER

### LINE TYPES

PROPERTY LINE
EXISTING MAJOR CONTOUR
EXISTING MINOR CONTOUR
EXISTING ASPHALT
EXISTING CONCRETE
SANITARY SEWER
OVERHEAD ELECTRIC
UNDERGROUND ELECTRIC
WATER PIPE
GAS PIPE
EXISTING FENCING
EXISTING TREELINE
EXISTING EASEMENT
RPA BOUNDARY
RMA BOUNDARY
FEMA 100-YR FLOODPLAIN
FEMA 500-YR FLOODPLAIN

DATE: APRIL 29, 2021 DRAWN BY: B. MEYER
SCALE: AS NOTED CHECKED BY: A. WEHUNT

REVISIONS
AS BUILT DATE

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THIS DRAWING PREPARED AT THE
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117 S 14th Street Suite 303 | Richmond, VA 23219
TEL 804.521.1065 FAX 804.521.1068 www.timmons.com

39490.035

JAMES RIVER PARK SYSTEM
BYRD PARK PUMP HOUSE
ADA ACCESS IMPROVEMENTS

STORM DRAINAGE PROFILES

DEPARTMENT OF PARKS AND RECREATION
CITY OF RICHMOND, VIRGINIA

SHEET NO. C5.1

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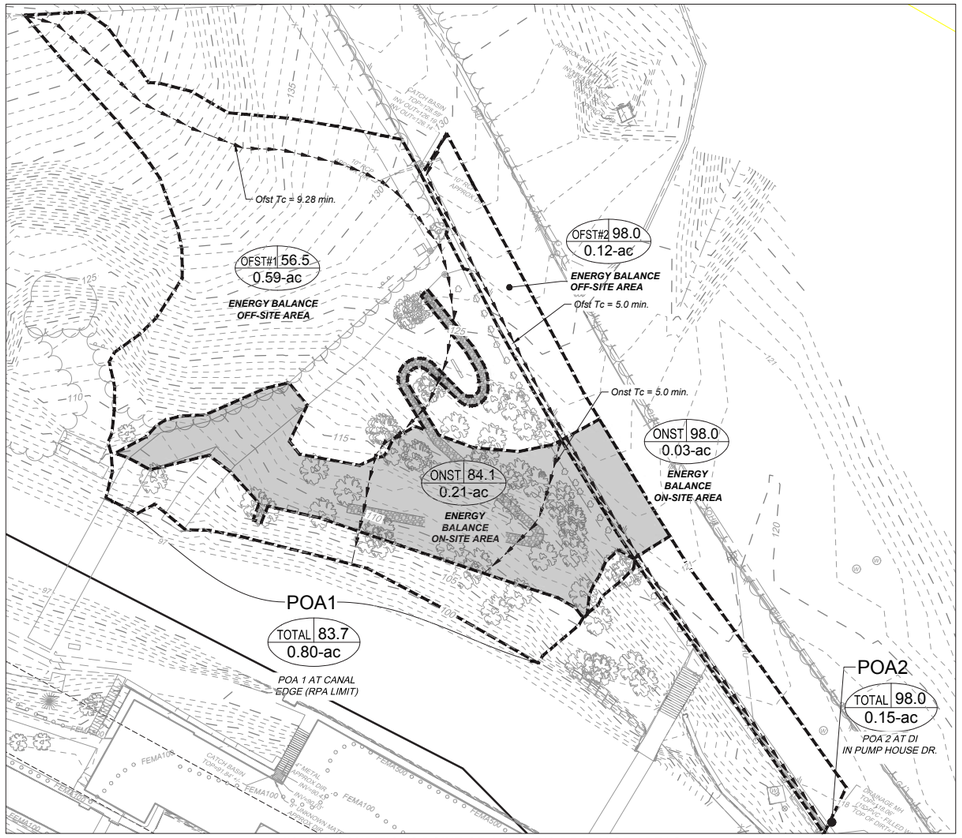
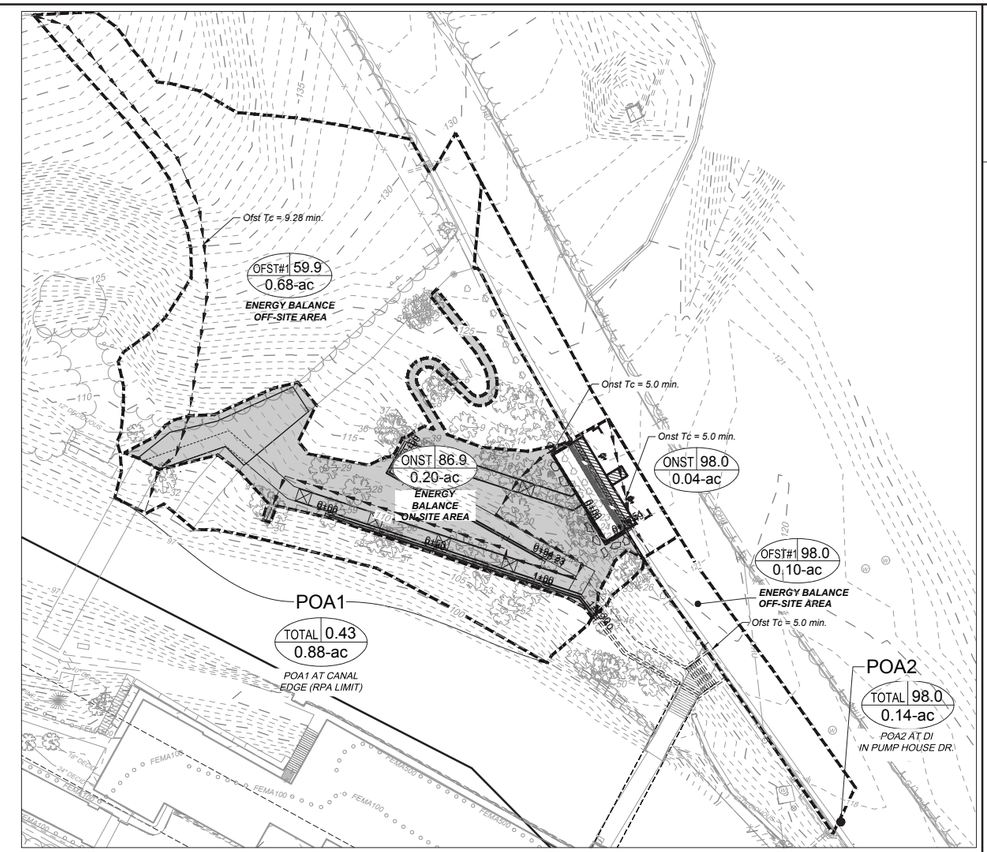



**EXISTING CONDITIONS POINT OF ANALYSIS DRAINAGE AREAS**
**ENERGY BALANCE ANALYSIS**

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**STORMWATER MANAGEMENT NARRATIVE**

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**EB/FP Analysis Summary**

| | Q1 allow | Q1 | Q10pre | Q10post |
|---|---|---|---|---|
| POA1 | 0.41 | 0.35 | 1.75 | 1.40 |
| POA2 | 0.50 | 0.50 | 0.99 | 0.93 |

**LEGEND:**

DRAINAGE AREA — RUNOFF CURVE NUMBER OR C-FACTOR — ACRES

SCALE 1"=30'
0 30' 60'

NORTH

COMMONWEALTH OF VIRGINIA
AMELIA C. WEHUNT
Lic. No. 049325
04/29/2021
PROFESSIONAL ENGINEER

ISSUED FOR PERMITTING

APRIL 15, 2021

SYMBOLS

BOLLARD, BUSH, CAP, ELECTRIC BOX, ELECTRIC METER, ELECTRIC MANHOLE, FIRE HYDRANT, GAS METER, GAS VALVE, GUY, LIGHT POLE, POWER POLE, PROPERTY PIN, SANITARY MANHOLE, SIGNS, STORM MANHOLE, TELEPHONE MANHOLE, TREE, UTILITY BOX, UTILITY PEDESTAL, UTILITY POLE, WATER METER, WATER VALVE, YARD LIGHT, BOULDER

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SCALE: AS SHOWN CHECKED BY: A. WEHUNT

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JAMES RIVER PARK SYSTEM
BYRD PARK PUMP HOUSE
ADA ACCESS IMPROVEMENTS

STORMWATER MANAGEMENT – ENERGY BALANCE

DEPARTMENT OF PARKS AND RECREATION
CITY OF RICHMOND, VIRGINIA

SHEET NO. C6.0

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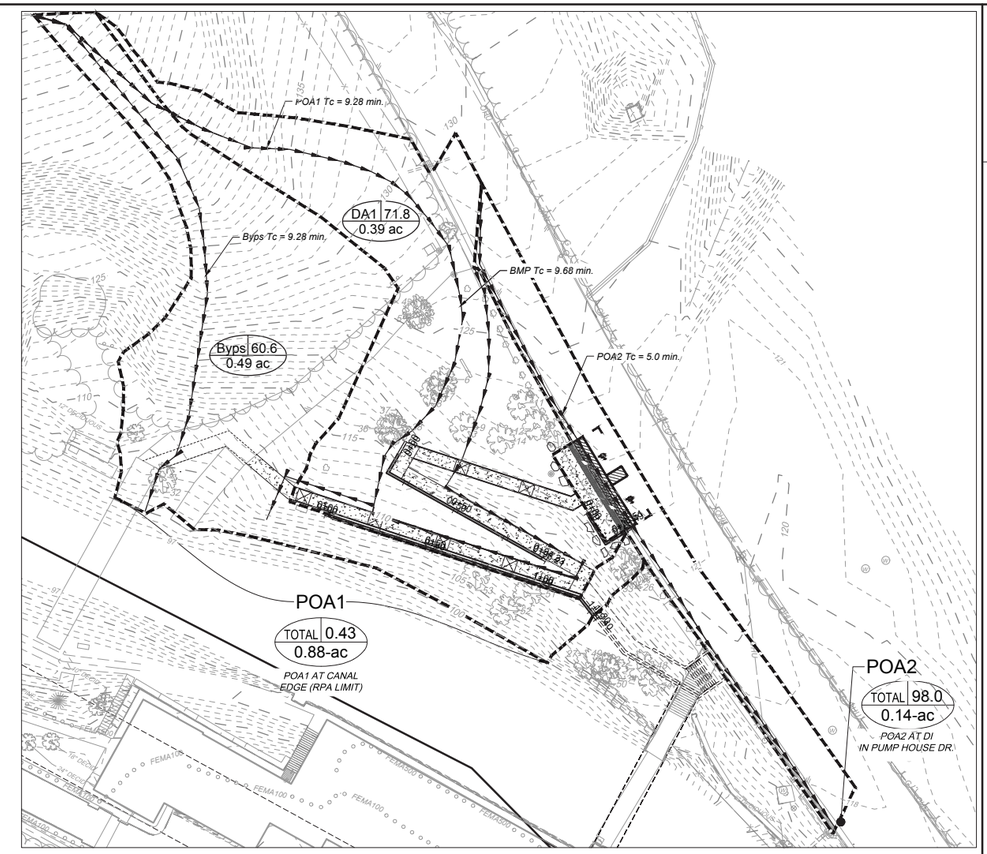
**EXISTING CONDITIONS POINT OF ANALYSIS DRAINAGE AREAS**
**CHANNEL PROTECTION ANALYSIS**

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|---|---|---|---|---|
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| POA2 | 0.50 | 0.50 | 0.99 | 0.93 |

**LEGEND:**

DRAINAGE AREA — RUNOFF CURVE NUMBER OR C-FACTOR — ACRES

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0 30' 60'

GRAPHIC SCALE

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Lic. No. 049325
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PROFESSIONAL ENGINEER

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SHEET NO. C6.1

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| | |
|---|---|
| Project Name: | Byrd Park Pump House ADA Access Improvements |
| Date: | 3/12/2021 |
| Linear Development Project? | No |

CLEAR ALL (Ctrl+Shift+R)

data input cells
constant values
calculation cells
final results

## Site Information

## Post-Development Project (Treatment Volume and Loads)

Enter Total Disturbed Area *(acres)* → 0.24

| | |
|---|---|
| *Maximum reduction required:* | 10% |
| *The site's net increase in impervious cover (acres) is:* | 0.041 |
| *Post-Development TP Load Reduction for Site (lb/yr):* | 0.10 |

*Check:*
*BMP Design Specifications List:* 2013 Draft Stds & Specs
*Linear project?* No
*Land cover areas entered correctly?* ✔
*Total disturbed area entered?* ✔

**Pre-ReDevelopment Land Cover (acres)**

| | A Soils | B Soils | C Soils | D Soils | Totals |
|---|---|---|---|---|---|
| **Forest/Open Space (acres)** – undisturbed forest/open space | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Managed Turf (acres)** – disturbed, graded for yards or other turf to be | 0.00 | 0.00 | 0.00 | 0.15 | 0.15 |
| **Impervious Cover (acres)** | 0.00 | 0.00 | 0.00 | 0.09 | 0.09 |
| | | | | | 0.24 |

**Post-Development Land Cover (acres)**

| | A Soils | B Soils | C Soils | D Soils | Totals |
|---|---|---|---|---|---|
| **Forest/Open Space (acres)** – undisturbed, protected forest/open space or reforested | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Managed Turf (acres)** – disturbed, graded for yards or other turf to be | 0.00 | 0.00 | 0.00 | 0.11 | 0.11 |
| **Impervious Cover (acres)** | 0.00 | 0.00 | 0.00 | 0.13 | 0.13 |
| **Area Check** | OK. | OK. | OK. | OK. | 0.24 |

**Constants**

| | |
|---|---|
| Annual Rainfall (inches) | 42 |
| Target Rainfall Event (inches) | 1.00 |
| Total Phosphorus (TP) EMC (mg/L) | 0.26 |
| Total Nitrogen (TN) EMC (mg/L) | 1.86 |
| Target TP Load (lb/acre/yr) | 0.41 |
| Pj (unitless correction factor) | 0.90 |

**Runoff Coefficients (Rv)**

| | A Soils | B Soils | C Soils | D Soils |
|---|---|---|---|---|
| Forest/Open Space | 0.02 | 0.03 | 0.04 | 0.05 |
| Managed Turf | 0.15 | 0.20 | 0.22 | 0.25 |
| Impervious Cover | 0.95 | 0.95 | 0.95 | 0.95 |

### LAND COVER SUMMARY -- PRE-REDEVELOPMENT

*Land Cover Summary-Pre*

| Pre-ReDevelopment | Listed | Adjusted[1] |
|---|---|---|
| Forest/Open Space Cover (acres) | 0.00 | 0.00 |
| Weighted Rv(forest) | 0.00 | 0.00 |
| % Forest | 0% | 0% |
| Managed Turf Cover (acres) | 0.16 | 0.11 |
| Weighted Rv(turf) | 0.25 | 0.25 |
| % Managed Turf | 64% | 56% |
| Impervious Cover (acres) | 0.09 | 0.09 |
| Rv(impervious) | 0.95 | 0.95 |
| % Impervious | 36% | 44% |
| **Total Site Area (acres)** | **0.24** | **0.20** |
| **Site Rv** | **0.50** | **0.56** |

### LAND COVER SUMMARY -- POST DEVELOPMENT

*Land Cover Summary-Post (Final)*

| Post ReDev. & New Impervious | |
|---|---|
| Forest/Open Space Cover (acres) | 0.00 |
| Weighted Rv(forest) | 0.00 |
| % Forest | 0% |
| Managed Turf Cover (acres) | 0.11 |
| Weighted Rv (turf) | 0.25 |
| % Managed Turf | 47% |
| Impervious Cover (acres) | 0.13 |
| Rv(impervious) | 0.95 |
| % Impervious | 53% |
| **Final Site Area (acres)** | **0.24** |
| **Final Post Dev Site Rv** | **0.62** |

*Land Cover Summary-Post*

| Post-ReDevelopment | |
|---|---|
| Forest/Open Space Cover (acres) | 0.00 |
| Weighted Rv(forest) | 0.00 |
| % Forest | 0% |
| Managed Turf Cover (acres) | 0.11 |
| Weighted Rv (turf) | 0.25 |
| % Managed Turf | 56% |
| ReDev. Impervious Cover (acres) | 0.09 |
| Rv(impervious) | 0.95 |
| % Impervious | 44% |
| **Total ReDev. Site Area (acres)** | **0.20** |
| **ReDev Site Rv** | **0.56** |

*Land Cover Summary-Post*

| Post-Development New Impervious | |
|---|---|
| New Impervious Cover (acres) | 0.04 |
| Rv(impervious) | 0.95 |

### Treatment Volume and Nutrient Load

| | | | | | | |
|---|---|---|---|---|---|---|
| **Pre-ReDevelopment Treatment Volume (acre-ft)** | 0.0102 | 0.0094 | **Final Post-Development Treatment Volume (acre-ft)** | 0.0126 | **Post-ReDevelopment Treatment Volume (acre-ft)** | 0.0094 | **Post-Development Treatment Volume (acre-ft)** | 0.0032 |
| **Pre-ReDevelopment Treatment Volume (cubic feet)** | 445 | 408 | **Final Post-Development Treatment Volume (cubic feet)** | 549 | **Post-ReDevelopment Treatment Volume (cubic feet)** | 408 | **Post-Development Treatment Volume (cubic feet)** | 141 |
| **Pre-ReDevelopment TP Load (lb/yr)** | **0.28** | **0.26** | **Final Post-Development TP Load (lb/yr)** | **0.35** | **Post-ReDevelopment Load (TP) (lb/yr)** | **0.26** | **Post-Development TP Load (lb/yr)** | **0.09** |
| Pre-ReDevelopment TP load per acre (lb/acre/yr) | 1.19 | 1.27 | Final Post-Development TP load per acre (lb/acre/yr) | 1.42 | Post-ReDevelopment TP load per acre (lb/acre/yr) | 1.27 | | |
| **Baseline TP Load (lb/yr)** (0.41 lbs/acre/yr applied to pre-redevelopment area excluding pervious land proposed for new impervious cover) | 0.08 | | | | **Max. Reduction Required (Below Pre-ReDevelopment Load)** | 10% | | |
| | | | | | **TP Load Reduction Required for Redeveloped Area (lb/yr)** | **0.03** | **TP Load Reduction Required for New Impervious Area (lb/yr)** | **0.07** |

[1] *Adjusted Land Cover Summary:*
*Pre ReDevelopment land cover minus pervious land cover (forest/open space or managed turf) acreage proposed for new impervious cover.*

*Adjusted total acreage is consistent with Post-ReDevelopment acreage (minus acreage of new impervious cover).*

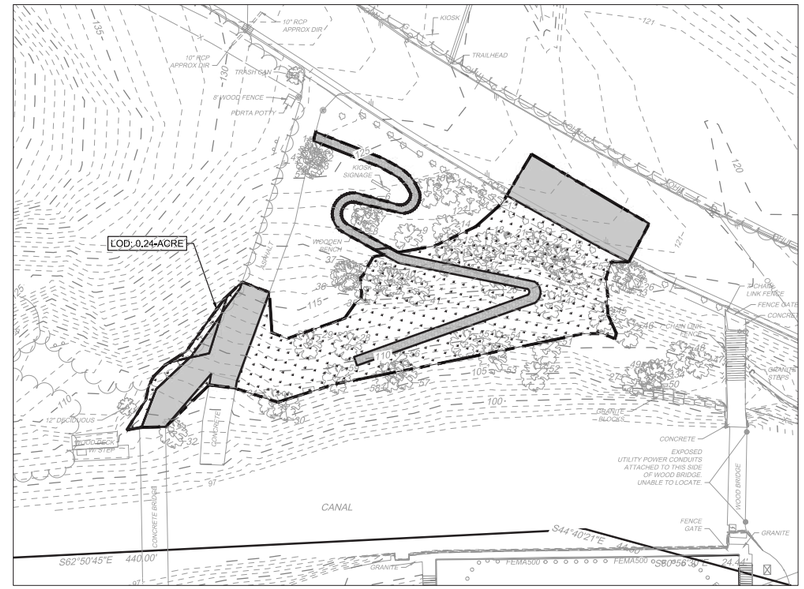
*Column I shows load reduction requirement for new impervious cover (based on new development load limit, 0.41 lbs/acre/year).*

### Post-Development Requirement for Site Area

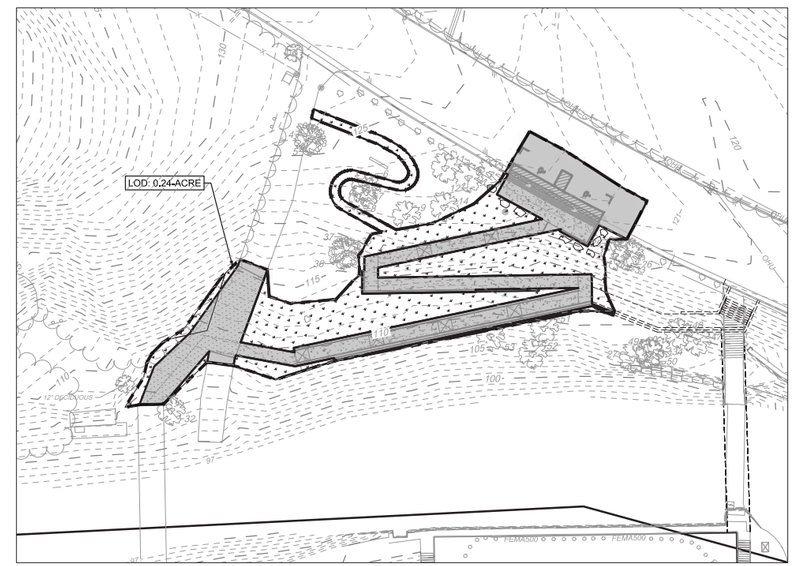
| | |
|---|---|
| **TP Load Reduction Required (lb/yr)** | **0.10** |

### Nitrogen Loads (Informational Purposes Only)

| | | | |
|---|---|---|---|
| Pre-ReDevelopment TN Load (lb/yr) | 2.00 | Final Post-Development TN Load (Post-ReDevelopment & New Impervious) (lb/yr) | 2.47 |




## EXISTING CONDITIONS LAND COVER




## PROPOSED CONDITIONS LAND COVER

### CHESAPEAKE BAY PLAN PROJECT SUMMARY

TOTAL SITE AREA (DIRECT LIMITS OF DISTURBANCE): 0.24-ACRE

TOTAL CHESBAY AREA (RPA + RMA): 0.24-ACRE

TOTAL SITE AREA IN RPA: 0.23-ACRE (10,197 S.F.)

TOTAL SITE AREA IN RMA: 0.006-ACRE (257 S.F.)

AMOUNT OF IMPERVIOUS AREA: 0.09 ACRES - EXISTING
0.13 ACRES - PROPOSED

AMOUNT OF IMPERVIOUS AREA IN CHESBAY (RPA + RMA): 0.09 ACRES - EXISTING
0.13 ACRES - PROPOSED

AMOUNT OF OPEN/FORESTED SPACE ON SITE: 0.16 ACRES - EXISTING
0.11 ACRES - PROPOSED

AMOUNT OF OPEN/FORESTED SPACE IN CHESBAY (RPA + RMA): 0.16 ACRES - EXISTING
0.11 ACRES - PROPOSED

PERCENTAGE OF IMPERVIOUS AREA - EXISTING CONDITIONS: 37.5% TOTAL SITE
37.5% CHESBAY

PERCENTAGE OF IMPERVIOUS AREA - PROPOSED CONDITIONS: 54.2% TOTAL SITE
54.2% CHESBAY

### CHESAPEAKE BAY PROTECTION AREA NOTES

THE SITE IS LOCATED WITHIN A RESOURCE PROTECTION AREA (RPA) AND RESOURCE MANAGEMENT AREA (RMA).

RETAIN AN UNDISTURBED AND VEGETATIVE 100-FOOT BUFFER AREA, AS SPECIFIED IN THE CHESAPEAKE BAY PRESERVATION AREA DESIGNATION AND MANAGEMENT REGULATIONS.

ONLY WATER-DEPENDENT FACILITIES OR REDEVELOPMENT IS PERMISSIBLE IN RESOURCE PROTECTION AREAS, INCLUDING THE 100-FOOT WIDE BUFFER AREAS.

### STORMWATER MANAGEMENT NARRATIVE - QUALITY

THE PROJECT IS LOCATED IN THE LOWER JAMES WATERSHED (HUC CODE 02080206).

THE TOTAL WATER QUALITY COMPLIANCE AREA FOR THE PROJECT IS 0.24-ACRE, WHICH EQUALS THE PROJECT LIMITS OF DISTURBANCE. THE EXISTING CONDITIONS WITHIN THE PROJECT LIMITS CONSIST OF PUMP HOUSE DRIVE, AN ASPHALT DRIVEWAY TO AN EXISTING PEDESTRIAN BRIDGE, A COBBLESTONE BOAT LAUNCH, AN ASPHALT RAMP, AND PARK AMENITIES SUCH AS SIGNAGE AND BENCHES. THE NORTHERN BANK OF THE JAMES RIVER CANAL IS LIGHTLY WOODED, WITH SPARSE TREES AS NOTED ON THE EXISTING CONDITIONS PLAN. THE PROJECT PROPOSES REMOVAL OF THE EXISTING ASPHALT RAMP AND REPLACEMENT WITH AN ADA-COMPLIANT CONCRETE RAMP FROM A NEW LANDING AT PUMP HOUSE DRIVE TO THE EXISTING ASPHALT DRIVEWAY. THE CONCRETE RAMP WILL REQUIRE RETAINING WALLS IN THREE LOCATIONS TO TIE INTO EXISTING GRADES. TWO PARALLEL ADA-COMPLIANT SPACES WILL BE STRIPED ON PUMP HOUSE DRIVE AND THE PAVEMENT REGRADED TO PROVIDE CROSS SLOPES IN COMPLIANCE WITH ACCESSIBILITY REQUIREMENTS. IT IS ANTICIPATED THAT ASPHALT WILL BE POURED OVER THE EXISTING PAVEMENT, AND NO PAVEMENT DEMOLITION WITHIN PUMP HOUSE DRIVE WILL BE REQUIRE OUTSIDE THE REPLACEMENT OF THE CURB AND GUTTER AT THE RAMP LANDING. STORMWATER RUNOFF WILL BE MANAGED VIA SWALES AND A FRENCH DRAIN.

PER 9VAC25-870-63 AND 9VAC25-870-65 OF THE VIRGINIA STORMWATER REGULATIONS, WATER QUALITY REQUIREMENTS FOR THE PROJECT WERE DETERMINED USING THE VIRGINIA RUNOFF REDUCTION METHOD (VRRM) AND THE "REDEVELOPMENT" DESIGN CRITERIA. THE SOIL/AREA DATA WAS CALCULATED USING NRCS TR-55 METHOD AND INPUT INTO THE VRRM REDEVELOPMENT SPREADSHEET (v3.0) TO OBTAIN THE PHOSPHOROUS REDUCTION REQUIREMENT. REFER TO THE VRRM SUMMARY ON THIS SHEET.

WATER QUALITY REQUIREMENTS WILL BE MET THROUGH THE PURCHASE OF NUTRIENT CREDITS FROM THE CITY OF RICHMOND WATER TREATMENT PLAN.

**LEGEND**

- IMPERVIOUS COVER
- MANAGED TURF
- FOREST/OPEN
- SITE AREA / BOUNDARY
- RESOURCE MANAGEMENT AREA

COMMONWEALTH OF VIRGINIA
AMELIA C. WEHUNT
Lic. No. 049325
04/29/2021
PROFESSIONAL ENGINEER

ISSUED FOR PERMITTING

APRIL 15, 2021

**SYMBOLS**

BOLLARD, BUSH, CAP, ELECTRIC BOX, ELECTRIC METER, ELECTRIC MANHOLE, FIRE HYDRANT, GAS METER, GAS VALVE, GUY, LIGHT POLE, POWER POLE, PROPERTY PIN, SANITARY MANHOLE, SIGNS, STORM MANHOLE, TELEPHONE MANHOLE, TREE, UTILITY BOX, UTILITY PEDESTAL, UTILITY POLE, WATER METER, WATER VALVE, YARD LIGHT, BOULDER

**LINE TYPES**

PROPERTY LINE
EXISTING MAJOR CONTOUR
EXISTING MINOR CONTOUR
EXISTING ASPHALT
EXISTING CONCRETE
SANITARY SEWER
OVERHEAD ELECTRIC
UNDERGROUND ELECTRIC
WATER PIPE
GAS PIPE
EXISTING FENCING
EXISTING TREELINE
EXISTING EASEMENT
RPA BOUNDARY
RMA BOUNDARY
FEMA 100-YR FLOODPLAIN
FEMA 500-YR FLOODPLAIN

**THIS SHEET IS PROVIDED FOR CALCULATION PURPOSES ONLY AND IS NOT TO BE USED FOR CONSTRUCTION.**

DATE: APRIL 29, 2021 DRAWN BY: B. MEYER
SCALE: AS SHOWN CHECKED BY: A. WEHUNT

REVISIONS
AS BUILT DATE

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117 S 14th Street Suite 303 | Richmond, VA 23219
TEL 804.521.1065 FAX 804.521.1068 www.timmons.com
*39490.035*

*JAMES RIVER PARK SYSTEM*
*BYRD PARK PUMP HOUSE*
*ADA ACCESS IMPROVEMENTS*

*STORMWATER MANAGEMENT – QUALITY*

DEPARTMENT OF PARKS AND RECREATION
CITY OF RICHMOND, VIRGINIA

SHEET NO. C6.2

S:\3\0\39490\035 Byrd Park Pump House ADA Access Improvements\DWG\Sheet\C\039490.035-C6.0-SWMP.dwg | Plotted on 4/29/2021 6:15 PM | by Becky Meyer

**Byrd Park Pump House ADA Improvements**

**POA 1** — **ENERGY BALANCE EQUATION**

***Q1YR POST ≤ Q1YR PRE * (Rv PRE ÷ Rv POST) * (IF)***

| | | | |
|---|---|---|---|
| Q 1YR PRE Condition<br>*Existing land cover* | 0.44 | cfs | *from Routing 1 year SCS Rainfall Event (Storm Analysis Software)* |
| Q 1YR PRE - Forested<br>*All forested in good condition* | 0.27 | cfs | *from Routing 1 year SCS Rainfall Event (Storm Analysis Software)* |
| Q 1YR POST | 0.48 | cfs | *from Routing 1 year SCS Rainfall Event (Storm Analysis Software)* |
| Rv PRE Condition<br>*Existing land cover* | 1,017 | cu ft | *Pre Sub Basin Runoff Volume* |
| Rv PRE - Forested<br>*All forested in good condition* | 665 | cu ft | *Pre Sub Basin Runoff Volume* |
| Rv POST | 1,111 | cu ft | *Post Unattenuated Sub Basin Runoff Volume* |
| IF<br>*Improvement Factor - Use '0.90' for Areas less than or equal to 1 ac. All else use 0.80* | 0.9 | | (Forested pre-condition) |
| Q 1yr OFFSITE Run-on<br>*Existing Runon to Project Site* | 0.05 | cfs | |

**Q1YR PRE * (Rv PRE ÷ Rv POST) * (IF) + Q1YR PRE OFFSITE =** 0.41 **

**Q1YR PRE FOREST* (Rv PRE FOREST ÷ Rv POST) + Q1YR PRE OFFSITE** 0.21

*9VAC25-870-66 #3a - Under no condition shall $Q_{Developed}$ be required to be less than that calculated in equation ($Q_{forest}$ * $RV_{Forest}$)/$RV_{Developed}$*

**Q1YR POST =** **0.35**

**OK! Energy Balance is Satisfied!**

## WORKSHEET FOR SCS HYDROLOGIC PARAMETERS

Land Use: Existing / X Proposed — Project: 39490.035 Byrd Park Pump House ADA Improvements — Subarea Number: Post **TOTAL** DA for **POA1** (Canal)

Off-Site Land Use: X Existing / Proposed — By: B. Meyer — Date: 4/28/2021

### RUNOFF CURVE NUMBER

| Soil Group | Land Use or Zoning: Area | Cover Type | Area (acres) | RCN | RCN x Area |
|---|---|---|---|---|---|
| A | Urban | Impervious Area - Paved; curbs and s | 0.00 | 98 | 0.2 |
| A | Urban | Open Space - Good | 0.00 | 39 | 0.1 |
| A | Other Agricultural | Woods - Good | 0.29 | 30 | 8.7 |
| D | Urban | Impervious Area - Paved; curbs and s | 0.11 | 98 | 10.5 |
| D | Urban | Open Space - Good | 0.45 | 80 | 35.7 |
| D | Other Agricultural | Woods - Good | 0.03 | 77 | 2.5 |

Total Area = 0.88 AC — 0.0014 SQ MI — Weighted RCN = 85.6

### TIME OF CONCENTRATION

| ID | Type of Flow | n | Length (ft) | Slope (ft/ft) | Area (sf) | Wet P (ft) | Velocity (fps) | Tc (hrs) |
|---|---|---|---|---|---|---|---|---|
| Sheet Flow ($P_2$ = 3.34 in.) | | | | | | | | |
| 1 | Woods (Light) | 0.4 | 100.0 | 0.185185 | $T_t = \frac{0.007\,(nL)^{0.8}}{(P_2)^{0.5}\,S^{0.4}}$ | | | 0.144 |
| Shallow Concentrated Flow | | | | | | | Fig. 3-1, TR-55 | $T_t$=L/(3600V) |
| 2 | Unpaved | | 269.0 | 0.1852 | | | 6.94 | 0.011 |
| Channel Flow | | | | | | | | $T_t$=L/(3600V) |
| (*Pipe Flow) | | | | *PIPE FLOW ASSUMED 4 FT/SEC. | | | 4.00 | |
| | | | | | | | Total $T_c$ = | 0.155 |
| | | | | | | | $T_L$ = | 0.093 |

## WORKSHEET FOR SCS HYDROLOGIC PARAMETERS

Land Use: Existing / X Proposed — Project: 39490.035 Byrd Park Pump House ADA Improvements — Subarea Number: Post **SITE** DA for **POA 1**

Off-Site Land Use: X Existing / Proposed — By: B. Meyer — Date: 4/28/2021

### RUNOFF CURVE NUMBER

| Soil Group | Land Use or Zoning: Area | Cover Type | Area (acres) | RCN | RCN x Area |
|---|---|---|---|---|---|
| A | Urban | Impervious Area - Paved; curbs and s | 0.00 | 98 | 0.1 |
| A | Urban | Open Space - Good | 0.00 | 39 | 0.1 |
| A | Other Agricultural | Woods - Good | 0.00 | 30 | 0.0 |
| D | Urban | Impervious Area - Paved; curbs and s | 0.08 | 98 | 7.8 |
| D | Urban | Open Space - Good | 0.12 | 80 | 9.3 |

Total Area = 0.2 AC — 0.0003 SQ MI — Weighted RCN = 86.9

### TIME OF CONCENTRATION

| ID | Type of Flow | n | Length (ft) | Slope (ft/ft) | Area (sf) | Wet P (ft) | Velocity (fps) | Tc (hrs) |
|---|---|---|---|---|---|---|---|---|
| Sheet Flow ($P_2$ = 3.34 in.) | | | | | | | | |
| A | Short Grass | 0.15 | 47.0 | 0.250 | $T_t = \frac{0.007\,(nL)^{0.8}}{(P_2)^{0.5}\,S^{0.4}}$ | | | 0.032 |
| Shallow Concentrated Flow | | | | | | | Fig. 3-1 | $T_t$=L/(3600V) |
| B | Unpaved | | 0.0 | 0.000 | | | 0.00 | |
| Channel Flow | | | | | | | Eq. 3-4 | $T_t$=L/(3600V) |
| C (*Pipe Flow) | | - | 203.0 | *PIPE FLOW ASSUMED 4 FT/SEC. | | | 4.00 | 0.014 |
| | | | | | | | Total $T_c$ = | 0.083 |
| | | | | | | | $T_L$ = | 0.050 |

## WORKSHEET FOR SCS HYDROLOGIC PARAMETERS

Land Use: Existing / X Proposed — Project: 39490.035 Byrd Park Pump House ADA Improvements — Subarea Number: Post **FOREST** DA for **POA 1**

Off-Site Land Use: X Existing / Proposed — By: B. Meyer — Date: 4/28/2021

### RUNOFF CURVE NUMBER

| Soil Group | Land Use or Zoning: Area | Cover Type | Area (acres) | RCN | RCN x Area |
|---|---|---|---|---|---|
| A | Other Agricultural | Woods - Good | 0.00 | 30 | 0.0 |
| A | Other Agricultural | Woods - Good | 0.00 | 30 | 0.1 |
| A | Other Agricultural | Woods - Good | 0.00 | 30 | 0.0 |
| D | Other Agricultural | Woods - Good | 0.08 | 77 | 6.2 |
| D | Other Agricultural | Woods - Good | 0.12 | 77 | 9.0 |

Total Area = 0.2 AC — 0.0003 SQ MI — Weighted RCN = 76.1

### TIME OF CONCENTRATION

| ID | Type of Flow | n | Length (ft) | Slope (ft/ft) | Area (sf) | Wet P (ft) | Velocity (fps) | Tc (hrs) |
|---|---|---|---|---|---|---|---|---|
| Sheet Flow ($P_2$ = 3.34 in.) | | | | | | | | |
| A | Woods (Light) | 0.4 | 47.0 | 0.250 | $T_t = \frac{0.007\,(nL)^{0.8}}{(P_2)^{0.5}\,S^{0.4}}$ | | | 0.070 |
| Shallow Concentrated Flow | | | | | | | Fig. 3-1 | $T_t$=L/(3600V) |
| B | Unpaved | | 0.0 | 0.000 | | | 0.00 | |
| Channel Flow | | | | | | | Eq. 3-4 | $T_t$=L/(3600V) |
| C (*Pipe Flow) | | - | 203.0 | *PIPE FLOW ASSUMED 4 FT/SEC. | | | 4.00 | 0.014 |
| | | | | | | | Total $T_c$ = | 0.084 |
| | | | | | | | $T_L$ = | 0.050 |

## WORKSHEET FOR SCS HYDROLOGIC PARAMETERS

Land Use: Existing / X Proposed — Project: 39490.035 Byrd Park Pump House ADA Improvements — Subarea Number: Post **OFFSITE** DA for **POA 1**

Off-Site Land Use: X Existing / Proposed — By: B. Meyer — Date: 4/28/2021

### RUNOFF CURVE NUMBER

| Soil Group | Land Use or Zoning: Area | Cover Type | Area (acres) | RCN | RCN x Area |
|---|---|---|---|---|---|
| A | Urban | Impervious Area - Paved; curbs and s | 0.00 | 98 | 0.0 |
| A | Other Agricultural | Woods - Good | 0.29 | 30 | 8.7 |
| D | Urban | Impervious Area - Paved; curbs and s | 0.05 | 98 | 4.9 |
| D | Urban | Open Space - Good | 0.31 | 80 | 24.6 |
| D | Other Agricultural | Woods - Good | 0.03 | 77 | 2.5 |

Total Area = 0.68 AC — 0.0011 SQ MI — Weighted RCN = 59.9

### TIME OF CONCENTRATION

| ID | Type of Flow | n | Length (ft) | Slope (ft/ft) | Area (sf) | Wet P (ft) | Velocity (fps) | Tc (hrs) |
|---|---|---|---|---|---|---|---|---|
| Sheet Flow ($P_2$ = 3.34 in.) | | | | | | | | |
| 1 | Woods (Light) | 0.4 | 100.0 | 0.185185 | $T_t = \frac{0.007\,(nL)^{0.8}}{(P_2)^{0.5}\,S^{0.4}}$ | | | 0.144 |
| Shallow Concentrated Flow | | | | | | | Fig. 3-1, TR-55 | $T_t$=L/(3600V) |
| 2 | Unpaved | | 269.0 | 0.1852 | | | 6.94 | 0.011 |
| Channel Flow | | | | | | | | $T_t$=L/(3600V) |
| (*Pipe Flow) | | | | *PIPE FLOW ASSUMED 4 FT/SEC. | | | 4.00 | |
| | | | | | | | Total $T_c$ = | 0.155 |
| | | | | | | | $T_L$ = | 0.093 |

COMMONWEALTH OF VIRGINIA
AMELIA C. WEHUNT
Lic. No. 049325
04/29/2021
PROFESSIONAL ENGINEER

ISSUED FOR PERMITTING

APRIL 15, 2021

### SYMBOLS

BOLLARD, BUSH, CAP, ELECTRIC BOX, ELECTRIC METER, ELECTRIC MANHOLE, FIRE HYDRANT, GAS METER, GAS VALVE, GUY, LIGHT POLE, POWER POLE, PROPERTY PIN, SANITARY MANHOLE, SIGNS, STORM MANHOLE, TELEPHONE MANHOLE, TREE, UTILITY BOX, UTILITY PEDESTAL, UTILITY POLE, WATER METER, WATER VALVE, YARD LIGHT, BOULDER

### LINE TYPES

PROPERTY LINE, EXISTING MAJOR CONTOUR, EXISTING MINOR CONTOUR, EXISTING ASPHALT, EXISTING CONCRETE, SANITARY SEWER, OVERHEAD ELECTRIC, UNDERGROUND ELECTRIC, WATER PIPE, GAS PIPE, EXISTING FENCING, EXISTING TREELINE, EXISTING EASEMENT, RPA BOUNDARY, RMA BOUNDARY, FEMA 100-YR FLOODPLAIN, FEMA 500-YR FLOODPLAIN

**THIS SHEET IS PROVIDED FOR CALCULATION PURPOSES ONLY AND IS NOT TO BE USED FOR CONSTRUCTION.**

DATE: APRIL 29, 2021 — DRAWN BY: B. MEYER
SCALE: AS SHOWN — CHECKED BY: A. WEHUNT

REVISIONS
AS BUILT — DATE


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39490.035

JAMES RIVER PARK SYSTEM
BYRD PARK PUMP HOUSE
ADA ACCESS IMPROVEMENTS

STORMWATER CALCULATIONS
– ENERGY BALANCE POA1

DEPARTMENT OF PARKS AND RECREATION
CITY OF RICHMOND, VIRGINIA

SHEET NO. C6.3

S:\310\39490.035-Byrd Park Pump House ADA Access Improvements\DWG\Sheet\C2\39490.035-C6.0-SWMP.dwg | Plotted on 4/29/2021 6:15 PM | by Becky Meyer

**Byrd Park Pump House ADA Improvements**

**POA 2** — **ENERGY BALANCE EQUATION**

*Q1YR POST ≤ Q1YR PRE * (Rv PRE ÷ Rv POST) * (IF)*

| | | |
|---|---|---|
| Q 1YR PRE Condition<br>*Existing land cover* | 0.11 cfs | *from Routing 1 year SCS Rainfall Event (Storm Analysis Software)* |
| Q 1YR PRE - Forested<br>*All forested in good condition* | 0.04 cfs | *from Routing 1 year SCS Rainfall Event (Storm Analysis Software)* |
| Q 1YR POST | 0.14 cfs | *from Routing 1 year SCS Rainfall Event (Storm Analysis Software)* |
| Rv PRE Condition<br>*Existing land cover* | 276 cu ft | *Pre Sub Basin Runoff Volume* |
| Rv PRE - Forested<br>*All forested in good condition* | 99 cu ft | *Pre Sub Basin Runoff Volume* |
| Rv POST | 368 cu ft | *Post Unattenuated Sub Basin Runoff Volume* |
| IF<br>*Improvement Factor - Use '0.90' for Areas less than or equal to 1 ac. All else use 0.80* | 0.9 | (Forested pre-condition) |
| Q 1yr OFFSITE Run-on<br>*Existing Runon to Project Site* | 0.43 cfs | |
| **Q1YR PRE * (Rv PRE ÷ Rv POST) * (IF) + Q1YR PRE OFFSITE =** | 0.50 ** | |
| **Q1YR PRE FOREST* (Rv PRE FOREST ÷ Rv POST) + Q1YR PRE OFFSITE** | 0.44 | |
| *9VAC25-870-66 #3a - Under no condition shall $Q_{Developed}$ be required to be less than that calculated in equation ($Q_{forest}$ * $RV_{Forest}$)/$RV_{Develop}$* | | |
| **Q1YR POST =** | **0.50** | |

**OK! Energy Balance is Satisfied!**

## WORKSHEET FOR SCS HYDROLOGIC PARAMETERS

Land Use: X Existing / Proposed — Project: 39490.035 Byrd Park Pump House ADA Improvements — Subarea Number: Pre **TOTAL** DA for **POA 2** (Dl in Pump House Dr.)

Off-Site Land Use: X Existing / Proposed — By: B. Meyer — Date: 4/28/2021

### RUNOFF CURVE NUMBER

| Soil Group | Land Use or Zoning: Area | Land Use or Zoning: Cover Type | Area (acres) | RCN | RCN x Area |
|---|---|---|---|---|---|
| D | Urban | Impervious Area - Paved; curbs and s | 0.15 | 98 | 14.7 |

Total Area = 0.15 AC 0.0002 SQ MI — Weighted RCN = 98.0

### TIME OF CONCEPTION

| ID | Type of Flow | n | Length (ft) | Slope (ft/ft) | Area (sf) | Wet P (ft) | Velocity (fps) | Tc (hrs) |
|---|---|---|---|---|---|---|---|---|
| Sheet Flow ($P_2$= 3.34 in.) | | | | | | | | |
| 1 | Paved | 0.011 | 100.0 | 0.04 | $T_t = \frac{0.007\,(nL)^{0.8}}{(P_2)^{0.5}\,S^{0.4}}$ | | | 0.015 |
| Shallow Concentrated Flow | | | | | | | Fig. 3.1, TR-55 | $T_t$=L/(3600V) |
| 2 | Paved | | 357.0 | 0.0400 | | | 3.23 | 0.031 |
| Channel Flow | | | | | | | | $T_t$=L/(3600V) |
| (*Pipe Flow) | | | | *PIPE FLOW ASSUMED 4 FT/SEC. | | | 4.00 | |
| | | | | | | | Total $T_c$ = | 0.083 |
| | | | | | | | $T_L$ = | 0.050 |

## WORKSHEET FOR SCS HYDROLOGIC PARAMETERS

Land Use: X Existing / Proposed — Project: 39490.035 Byrd Park Pump House ADA Improvements — Subarea Number: Pre **SITE** DA for **POA 2**

Off-Site Land Use: X Existing / Proposed — By: B. Meyer — Date: 4/28/2021

### RUNOFF CURVE NUMBER

| Soil Group | Land Use or Zoning: Area | Land Use or Zoning: Cover Type | Area (acres) | RCN | RCN x Area |
|---|---|---|---|---|---|
| D | Urban | Impervious Area - Paved; curbs and s | 0.03 | 98 | 2.9 |

Total Area = 0.03 AC 0 SQ MI — Weighted RCN = 98.0

### TIME OF CONCEPTION

| ID | Type of Flow | n | Length (ft) | Slope (ft/ft) | Area (sf) | Wet P (ft) | Velocity (fps) | Tc (hrs) |
|---|---|---|---|---|---|---|---|---|
| Sheet Flow ($P_2$= 3.34 in.) | | | | | | | | |
| A | Paved | 0.011 | 63.0 | 0.06 | $T_t = \frac{0.007\,(nL)^{0.8}}{(P_2)^{0.5}\,S^{0.4}}$ | | | 0.009 |
| Shallow Concentrated Flow | | | | | | | Fig. 3-1 | $T_t$=L/(3600V) |
| B | Unpaved | | | | | | 0.00 | |
| Channel Flow | | | | | | | Eq. 3-4 | $T_t$=L/(3600V) |
| | | | | | | | Total $T_c$ = | 0.083 |
| | | | | | | | $T_L$ = | 0.050 |

## WORKSHEET FOR SCS HYDROLOGIC PARAMETERS

Land Use: X Existing / Proposed — Project: 39490.035 Byrd Park Pump House ADA Improvements — Subarea Number: Pre **FOREST** DA for **POA 2**

Off-Site Land Use: X Existing / Proposed — By: B. Meyer — Date: 4/28/2021

### RUNOFF CURVE NUMBER

| Soil Group | Land Use or Zoning: Area | Land Use or Zoning: Cover Type | Area (acres) | RCN | RCN x Area |
|---|---|---|---|---|---|
| D | Other Agricultural | Woods - Good | 0.03 | 77 | 2.3 |

Total Area = 0.03 AC 0 SQ MI — Weighted RCN = 77.0

### TIME OF CONCEPTION

| ID | Type of Flow | n | Length (ft) | Slope (ft/ft) | Area (sf) | Wet P (ft) | Velocity (fps) | Tc (hrs) |
|---|---|---|---|---|---|---|---|---|
| Sheet Flow ($P_2$= 3.34 in.) | | | | | | | | |
| A | Woods (Light) | 0.4 | 66.0 | 0.06 | $T_t = \frac{0.007\,(nL)^{0.8}}{(P_2)^{0.5}\,S^{0.4}}$ | | | 0.163 |
| Shallow Concentrated Flow | | | | | | | Fig. 3-1 | $T_t$=L/(3600V) |
| B | Unpaved | | | | | | 0.00 | |
| Channel Flow | | | | | | | Eq. 3-4 | $T_t$=L/(3600V) |
| | | | | | | | Total $T_c$ = | 0.163 |
| | | | | | | | $T_L$ = | 0.098 |

## WORKSHEET FOR SCS HYDROLOGIC PARAMETERS

Land Use: X Existing / Proposed — Project: 39490.035 Byrd Park Pump House ADA Improvements — Subarea Number: Pre/Post **OFFSITE** DA for **POA 2**

Off-Site Land Use: X Existing / Proposed — By: B. Meyer — Date: 4/28/2021

### RUNOFF CURVE NUMBER

| Soil Group | Land Use or Zoning: Area | Land Use or Zoning: Cover Type | Area (acres) | RCN | RCN x Area |
|---|---|---|---|---|---|
| D | Urban | Impervious Area - Paved; curbs and s | 0.12 | 98 | 11.8 |

Total Area = 0.12 AC 0.0002 SQ MI — Weighted RCN = 98.0

### TIME OF CONCEPTION

| ID | Type of Flow | n | Length (ft) | Slope (ft/ft) | Area (sf) | Wet P (ft) | Velocity (fps) | Tc (hrs) |
|---|---|---|---|---|---|---|---|---|
| Sheet Flow ($P_2$= 3.34 in.) | | | | | | | | |
| 1 | Paved | 0.011 | 100.0 | 0.04 | $T_t = \frac{0.007\,(nL)^{0.8}}{(P_2)^{0.5}\,S^{0.4}}$ | | | 0.015 |
| Shallow Concentrated Flow | | | | | | | Fig. 3.1, TR-55 | $T_t$=L/(3600V) |
| 2 | Paved | | 357.0 | 0.0400 | | | 3.23 | 0.031 |
| Channel Flow | | | | | | | | $T_t$=L/(3600V) |
| (*Pipe Flow) | | | | *PIPE FLOW ASSUMED 4 FT/SEC. | | | 4.00 | |
| | | | | | | | Total $T_c$ = | 0.083 |
| | | | | | | | $T_L$ = | 0.050 |

## WORKSHEET FOR SCS HYDROLOGIC PARAMETERS

Land Use: X Existing / Proposed — Project: 39490.035 Byrd Park Pump House ADA Improvements — Subarea Number: Post **TOTAL** DA for **POA 2** (Dl in Pump House Dr.)

Off-Site Land Use: X Existing / Proposed — By: B. Meyer — Date: 4/28/2021

### RUNOFF CURVE NUMBER

| Soil Group | Land Use or Zoning: Area | Land Use or Zoning: Cover Type | Area (acres) | RCN | RCN x Area |
|---|---|---|---|---|---|
| D | Urban | Impervious Area - Paved; curbs and s | 0.14 | 98 | 13.7 |

Total Area = 0.14 AC 0.0002 SQ MI — Weighted RCN = 98.0

### TIME OF CONCEPTION

| ID | Type of Flow | n | Length (ft) | Slope (ft/ft) | Area (sf) | Wet P (ft) | Velocity (fps) | Tc (hrs) |
|---|---|---|---|---|---|---|---|---|
| Sheet Flow ($P_2$= 3.34 in.) | | | | | | | | |
| 1 | Paved | 0.011 | 100.0 | 0.04 | $T_t = \frac{0.007\,(nL)^{0.8}}{(P_2)^{0.5}\,S^{0.4}}$ | | | 0.015 |
| Shallow Concentrated Flow | | | | | | | Fig. 3.1, TR-55 | $T_t$=L/(3600V) |
| 2 | Paved | | 228.0 | 0.0294 | | | 2.77 | 0.023 |
| Channel Flow | | | | | | | | $T_t$=L/(3600V) |
| (*Pipe Flow) | | | | *PIPE FLOW ASSUMED 4 FT/SEC. | | | 4.00 | |
| | | | | | | | Total $T_c$ = | 0.083 |
| | | | | | | | $T_L$ = | 0.050 |

## WORKSHEET FOR SCS HYDROLOGIC PARAMETERS

Land Use: X Existing / Proposed — Project: 39490.035 Byrd Park Pump House ADA Improvements — Subarea Number: Post **OFFSITE** DA for **POA 2**

Off-Site Land Use: X Existing / Proposed — By: B. Meyer — Date: 4/28/2021

### RUNOFF CURVE NUMBER

| Soil Group | Land Use or Zoning: Area | Land Use or Zoning: Cover Type | Area (acres) | RCN | RCN x Area |
|---|---|---|---|---|---|
| D | Urban | Impervious Area - Paved; curbs and s | 0.04 | 98 | 3.9 |

Total Area = 0.04 AC 0.0001 SQ MI — Weighted RCN = 98.0

### TIME OF CONCEPTION

| ID | Type of Flow | n | Length (ft) | Slope (ft/ft) | Area (sf) | Wet P (ft) | Velocity (fps) | Tc (hrs) |
|---|---|---|---|---|---|---|---|---|
| Sheet Flow ($P_2$= 3.34 in.) | | | | | | | | |
| A | Paved | 0.011 | 66.0 | 0.02 | $T_t = \frac{0.007\,(nL)^{0.8}}{(P_2)^{0.5}\,S^{0.4}}$ | | | 0.015 |
| Shallow Concentrated Flow | | | | | | | Fig. 3-1 | $T_t$=L/(3600V) |
| B | Unpaved | | | | | | 0.00 | |
| Channel Flow | | | | | | | Eq. 3-4 | $T_t$=L/(3600V) |
| | | | | | | | Total $T_c$ = | 0.083 |
| | | | | | | | $T_L$ = | 0.050 |

## WORKSHEET FOR SCS HYDROLOGIC PARAMETERS

Land Use: X Existing / Proposed — Project: 39490.035 Byrd Park Pump House ADA Improvements — Subarea Number: Post **FOREST** DA for **POA 2**

Off-Site Land Use: X Existing / Proposed — By: B. Meyer — Date: 4/28/2021

### RUNOFF CURVE NUMBER

| Soil Group | Land Use or Zoning: Area | Land Use or Zoning: Cover Type | Area (acres) | RCN | RCN x Area |
|---|---|---|---|---|---|
| D | Other Agricultural | Woods - Good | 0.04 | 77 | 3.1 |

Total Area = 0.04 AC 0.0001 SQ MI — Weighted RCN = 77.0

### TIME OF CONCEPTION

| ID | Type of Flow | n | Length (ft) | Slope (ft/ft) | Area (sf) | Wet P (ft) | Velocity (fps) | Tc (hrs) |
|---|---|---|---|---|---|---|---|---|
| Sheet Flow ($P_2$= 3.34 in.) | | | | | | | | |
| A | Woods (Light) | 0.4 | 66.0 | 0.01 | $T_t = \frac{0.007\,(nL)^{0.8}}{(P_2)^{0.5}\,S^{0.4}}$ | | | 0.308 |
| Shallow Concentrated Flow | | | | | | | Fig. 3-1 | $T_t$=L/(3600V) |
| B | Unpaved | | | | | | 0.00 | |
| Channel Flow | | | | | | | Eq. 3-4 | $T_t$=L/(3600V) |
| | | | | | | | Total $T_c$ = | 0.308 |
| | | | | | | | $T_L$ = | 0.185 |

## WORKSHEET FOR SCS HYDROLOGIC PARAMETERS

Land Use: X Existing / Proposed — Project: 39490.035 Byrd Park Pump House ADA Improvements — Subarea Number: Post **OFFSITE** DA for **POA 2**

Off-Site Land Use: X Existing / Proposed — By: B. Meyer — Date: 4/28/2021

### RUNOFF CURVE NUMBER

| Soil Group | Land Use or Zoning: Area | Land Use or Zoning: Cover Type | Area (acres) | RCN | RCN x Area |
|---|---|---|---|---|---|
| D | Urban | Impervious Area - Paved; curbs and s | 0.06 | 98 | 5.9 |

Total Area = 0.06 AC 0.0001 SQ MI — Weighted RCN = 98.0

### TIME OF CONCEPTION

| ID | Type of Flow | n | Length (ft) | Slope (ft/ft) | Area (sf) | Wet P (ft) | Velocity (fps) | Tc (hrs) |
|---|---|---|---|---|---|---|---|---|
| Sheet Flow ($P_2$= 3.34 in.) | | | | | | | | |
| 1 | Paved | 0.011 | 100.0 | 0.04 | $T_t = \frac{0.007\,(nL)^{0.8}}{(P_2)^{0.5}\,S^{0.4}}$ | | | 0.015 |
| Shallow Concentrated Flow | | | | | | | Fig. 3.1, TR-55 | $T_t$=L/(3600V) |
| 2 | Paved | | 228.0 | 0.0294 | | | 2.77 | 0.023 |
| Channel Flow | | | | | | | | $T_t$=L/(3600V) |
| (*Pipe Flow) | | | | *PIPE FLOW ASSUMED 4 FT/SEC. | | | 4.00 | |
| | | | | | | | Total $T_c$ = | 0.083 |
| | | | | | | | $T_L$ = | 0.050 |

COMMONWEALTH OF VIRGINIA
AMELIA C. WEHUNT
Lic. No. 049325
04/29/2021
PROFESSIONAL ENGINEER

ISSUED FOR PERMITTING

APRIL 15, 2021

### SYMBOLS

BOLLARD, BUSH, CAP, ELECTRIC BOX, ELECTRIC METER, ELECTRIC MANHOLE, FIRE HYDRANT, GAS METER, GAS VALVE, GUY, LIGHT POLE, POWER POLE, PROPERTY PIN, SANITARY MANHOLE, SIGNS, STORM MANHOLE, TELEPHONE MANHOLE, TREE, UTILITY BOX, UTILITY PEDESTAL, UTILITY POLE, WATER METER, WATER VALVE, YARD LIGHT, BOULDER

### LINE TYPES

PROPERTY LINE, EXISTING MAJOR CONTOUR, EXISTING MINOR CONTOUR, EXISTING ASPHALT, EXISTING CONCRETE, SANITARY SEWER, OVERHEAD ELECTRIC, UNDERGROUND ELECTRIC, WATER PIPE, GAS PIPE, EXISTING FENCING, EXISTING TREELINE, EXISTING EASEMENT, RPA BOUNDARY, RMA BOUNDARY, FEMA 100-YR FLOODPLAIN, FEMA 500-YR FLOODPLAIN

**THIS SHEET IS PROVIDED FOR CALCULATION PURPOSES ONLY AND IS NOT TO BE USED FOR CONSTRUCTION.**

DATE: APRIL 29, 2021 DRAWN BY: B. MEYER
SCALE: AS SHOWN CHECKED BY: A. WEHUNT

REVISIONS

AS BUILT DATE

RICHMOND VIRGINIA

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*39490.035*

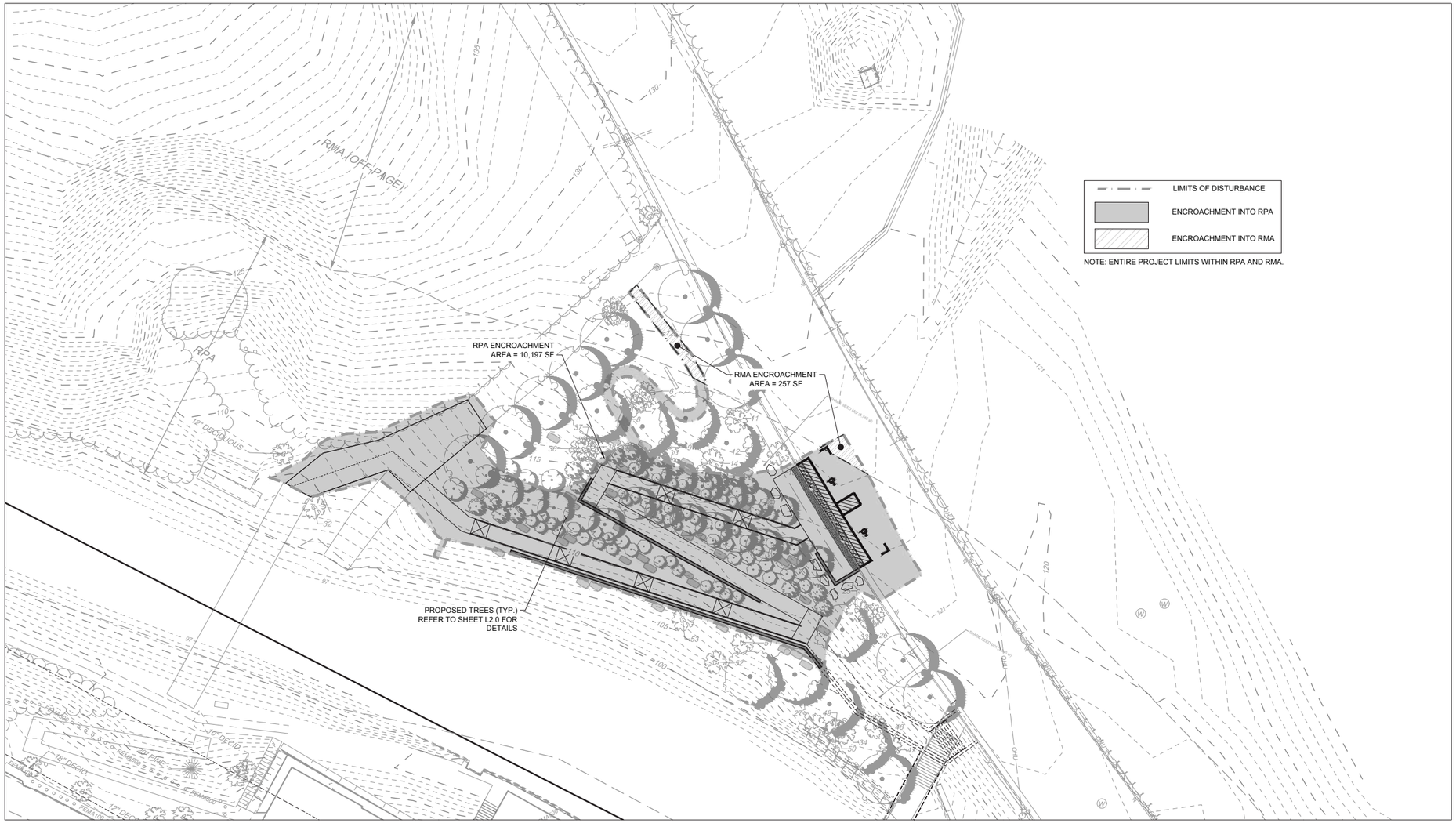
*JAMES RIVER PARK SYSTEM*
*BYRD PARK PUMP HOUSE*
*ADA ACCESS IMPROVEMENTS*

*STORMWATER CALCULATIONS – ENERGY BALANCE POA2*

DEPARTMENT OF PARKS AND RECREATION
CITY OF RICHMOND, VIRGINIA

SHEET NO. C6.4

S:\310\39490.035-Byrd Park Pump House ADA Access Improvements\DWG\Sheet\C2\39490.035-C6.0-SWMP.dwg | Plotted on 4/29/2021 6:15 PM | by Becky Meyer




BYRD PARK PUMP HOUSE ADA ACCESS IMPROVEMENTS IMPACT ASSESSMENT

EXISTING CONDITIONS

THE SITE CURRENTLY CONTAINS AN ASPHALT DRIVEWAY TO AN EXISTING BRIDGE TO THE PUMP HOUSE AND A CONCRETE / COBBLESTONE BOAT LAUNCH. A NARROW, NON-ADA-COMPLIANT ASPHALT RAMP HAS BEEN CONSTRUCTED FROM THE ASPHALT DRIVEWAY TO A GRASSED AREA AT THE BOTTOM OF THE SLOPE. AN INFORMATION KIOSK AND WOODEN BENCHES ARE LOCATED WITHIN THE PROJECT AREA. VEHICULAR PARKING IS ON PUMP HOUSE DRIVE. THE MAJORITY OF THE SITE IS COMPOSED OF LIGHTLY WOODED OVERBANK AREAS.

EXISTING HYDROLOGY

THE SITE CONSISTS MAINLY OF JOHNSTON MUCKY LOAM (HSG: D), WITH A SMALL PORTION OF OFF-SITE CONTRIBUTING DRAINAGE LOCATED IN AN AREA UNDERLAIN BY WATEREE-WEDOWEE-ROCK OUTCROP COMPLEX (HSG:A). THE PROJECT SITE LIES WITHIN BOTH THE RPA AND RMA BOUNDARY. ANY STORMWATER ON SITE SHEET FLOWS DIRECTLY INTO THE JAMES RIVER CANAL AT SLOPES RANGING FROM 20% TO 50%. ALL IMMEDIATELY ADJACENT LANDS DEMONSTRATE SIMILAR CHARACTERISTICS, AND SHEET FLOW DIRECTLY INTO THE JAMES RIVER OR THE CANAL. REFER TO SHEETS C6.0 AND C6.1 FOR MORE INFORMATION PERTAINING TO EXISTING HYDROLOGY.

PROPOSED SITE DEVELOPMENT

THE PROJECT CONSISTS OF THE INSTALLATION OF AN ADA-COMPLIANT CONCRETE RAMP WHICH WILL PROVIDE ACCESS TO THE CANAL BRIDGE THAT ACCESSES THE PUMP HOUSE.

1. THE PROPOSED PROJECT HAS BEEN SPECIFICALLY DESIGNED TO IMPROVE UPON EXISTING CONDITIONS WHILE ALSO MAKING SURE TO NOT CREATE ADDITIONAL HARMFUL IMPACTS TO EXISTING TOPOGRAPHY, SOILS, HYDROLOGY OR GEOLOGY.
2. RAMP GRADING HAS BEEN DESIGNED TO BE COMPLIANT ADA GUIDELINES WHILE PROPOSED RETAINING WALLS HAVE BEEN INCORPORATE TO MINIMIZE THE IMPACTS OF GRADING BEYOND THE RAMP AND TO MAINTAIN SLOPES SHALLOWER THAN 3:1 IN THE PROJECT AREA. FILL MATERIAL WILL BE SUPPLIED FROM EXCESS CUT MATERIAL, PROVIDED IT IS SUITABLE FOR USE. ANY ADDITIONAL CUT WILL BE DISPOSED OF AT A LANDFILL OR OTHER APPROVED LOCATION.
3. EXISTING DRAINAGE OUTFALL PATTERNS AND STREAM CIRCULATION PATTERNS WILL BE MAINTAINED. REFER TO SHEET C5.0 FOR GRADING INFORMATION, AND SHEET C6.1 FOR STORMWATER RUN-OFF CONSIDERATIONS.
4. THE PROJECT WILL REQUIRE THE REMOVAL OF A NUMBER OF TREES. REFER TO SHEET L1.0, BUT WILL BE ENHANCED WITH RIPARIAN PLANTINGS IN ACCORDANCE WITH THE RPA MITIGATION PLAN (SHEET L2.0). EXTENSIVE NATIVE PLANTINGS ARE PROPOSED WITHIN DISTURBED AREAS.
5. WATER QUALITY REQUIREMENTS WILL BE MET THROUGH THE PURCHASE OF WATER QUALITY CREDITS IN ADDITION TO THE EXTENSIVE RIPARIAN BUFFER PLANTINGS PROPOSED AS A MITIGATION MEASURE. REFER TO SHEET C6.2 FOR FURTHER WATER QUALITY INFORMATION. PURCHASING CREDITS WAS CHOSEN AS THE PREFERRED ALTERNATIVE FOR STORMWATER QUALITY MEASURES. OTHER ALTERNATIVES EVALUATED INCLUDED THE INSTALLATION OF PERVIOUS PAVEMENT OR PAVERS OR BIORETENTION AREAS. PERMEABLE PAVERS WOULD PRESENT THE ISSUE OF CLOGGING, IN ADDITION TO POTENTIALLY FLOATING AWAY FROM THE SITE DURING SIGNIFICANT RAINFALL EVENTS. SHOULD PAVERS BECOME DISLODGED, THEY WOULD PRESENT A BARRIER TO ADA-ACCESSIBILITY, WHICH IS THE PRIMARY GOAL OF THIS PROJECT. BIORETENTION AREAS WOULD REQUIRE ADDITIONAL SITE CLEARING, LAND DISTURBANCE, AND SIGNIFICANT PIPING. THIS WOULD RESULT IN A NET DECREASE TO WATER QUALITY BECAUSE OF THE LAND DISTURBANCE IMPACTS.

MITIGATION MEASURES

BEYOND THE PROPOSED PROJECT'S DESIGN ARE MITIGATION MEASURES WHICH WILL ALSO SERVE TO MINIMIZE HARMFUL IMPACTS TO EXISTING ENVIRONMENTAL CONDITIONS.

- A COMPLETE EROSION AND SEDIMENT CONTROL PLAN HAS BEEN PREPARED TO ENSURE PROPER EROSION AND STORMWATER RUNOFF CONTROL THROUGHOUT THE CONSTRUCTION. REFER TO SHEETS C3.0 AND C3.1 FOR DETAILS.
- THE NECESSARY GRADING MEASURES WERE MINIMIZED TO AVOID MAJOR ENVIRONMENTAL IMPACTS.
- THE PROPOSED PROJECT HAS BEEN DESIGNED TO MINIMIZE REQUIRED VEGETATION CLEARING, CUT AND FILL EARTHWORK AND DISTURBANCE OF SURROUNDING NATURAL AREAS. ALL DENUDED AREAS WILL BE STABILIZED ACCORDING TO THE EROSION AND SEDIMENT CONTROL PLAN. REFER TO SHEET C5.0 FOR ADDITIONAL GRADING AND DRAINAGE INFORMATION.
- LANDSCAPING HAS BEEN PROVIDED IN AREAS WHERE EXISTING VEGETATION WILL BE DISTURBED. REFER TO LANDSCAPING PLAN ON SHEETS L2.0 AND L2.1 FOR DETAILS.

SCALE 1"=20'
0 20' 40'
NAD 83

COMMONWEALTH OF VIRGINIA
AMELIA C. WEHUNT
Lic. No. 049325
04/29/2021
PROFESSIONAL ENGINEER

ISSUED FOR PERMITTING

APRIL 15, 2021

SYMBOLS

BOLLARD
BUSH
CAP
ELECTRIC BOX
ELECTRIC METER
ELECTRIC MANHOLE
FIRE HYDRANT
GAS METER
GAS VALVE
GUY
LIGHT POLE
POWER POLE
PROPERTY PIN
SANITARY MANHOLE
SIGNS
STORM MANHOLE
TELEPHONE MANHOLE
TREE
UTILITY BOX
UTILITY PEDESTAL
UTILITY POLE
WATER METER
WATER VALVE
YARD LIGHT
BOULDER

LINE TYPES

PROPERTY LINE
EXISTING MAJOR CONTOUR
EXISTING MINOR CONTOUR
EXISTING ASPHALT
EXISTING CONCRETE
SANITARY SEWER
OVERHEAD ELECTRIC
UNDERGROUND ELECTRIC
WATER PIPE
GAS PIPE
EXISTING FENCING
EXISTING TREELINE
EXISTING EASEMENT
RPA BOUNDARY
RMA BOUNDARY
FEMA 100-YR FLOODPLAIN
FEMA 500-YR FLOODPLAIN

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DATE: APRIL 29, 2021 DRAWN BY: B. MEYER
SCALE: 1"=20' CHECKED BY: A. WEHUNT

REVISIONS
AS BUILT DATE

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39490.035

JAMES RIVER PARK SYSTEM
BYRD PARK PUMP HOUSE
ADA ACCESS IMPROVEMENTS

WATER QUALITY IMPACT ASSESSMENT

DEPARTMENT OF PARKS AND RECREATION
CITY OF RICHMOND, VIRGINIA
SHEET NO. C7.0

S:\310\39490\035-Byrd Park Pump House ADA Access Improvements\DWG\Sheet\CD\39490.035-C7.0-WQIA.dwg | Plotted on 4/29/2021 6:23 PM | by Becky Meyer

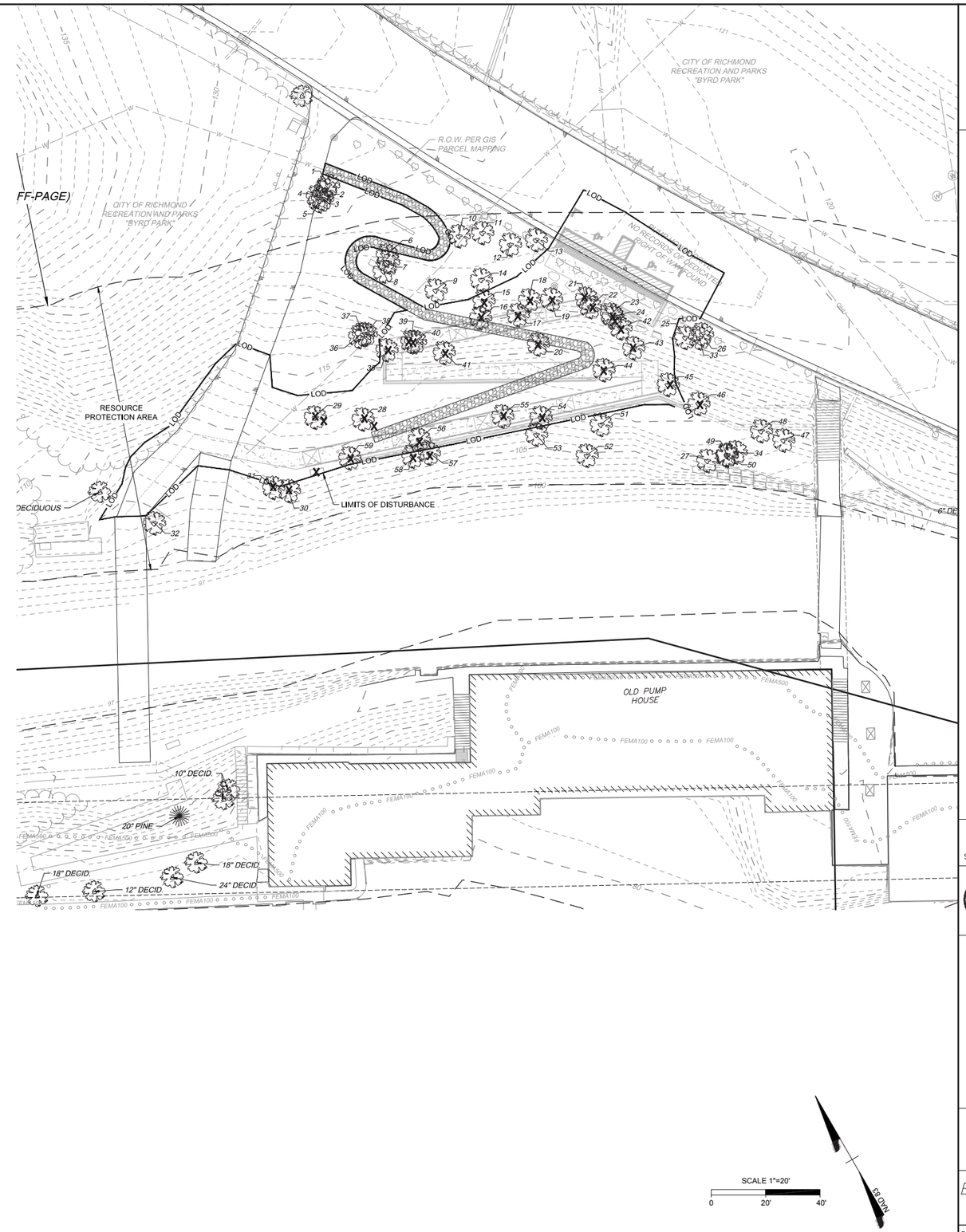
# EXISTING TREE INVENTORY

| FIELD ID[1] | BOTANICAL NAME | COMMON NAME | DBH (IN) | CITY TREE ID[2] | CONDITION[3] | PRESERVE?[4] | NOTES |
|---|---|---|---|---|---|---|---|
| 1 | QUERCUS RUBRA | NORTHERN RED OAK | N/A | 129126 | REMOVED | N/A | ALREADY REMOVED |
| 2 | QUERCUS ALBA | WHITE OAK | N/A | 129125 | REMOVED | N/A | ALREADY REMOVED |
| 3 | ACER SACCHARUM | SUGAR MAPLE | 11 | 129124 | OK | YES | |
| 4 | LIQUIDAMBAR STYRACIFLUA | SWEETGUM | 30 | 129123 | OK | YES | |
| 5 | ULMUS ALATA | WINGED ELM | 6 | 129122 | OK | YES | |
| 6 | CARYA CORDIFORMIS | BITTERNUT HICKORY | 7 | 129127 | OK | YES | |
| 7 | CARYA CORDIFORMIS | BITTERNUT HICKORY | 9 | 129128 | OK | YES | |
| 8 | LIQUIDAMBAR STYRACIFLUA | SWEETGUM | 24 | 129129 | OK | YES | |
| 9 | CARYA ALBA | MOCKERNUT HICKORY | 12 | 129130 | OK | YES | |
| 10 | QUERCUS RUBRA | NORTHERN RED OAK | N/A | 129131 | REMOVED | N/A | ALREADY REMOVED |
| 11 | CARYA ALBA | MOCKERNUT HICKORY | 9 | 129132 | OK | YES | |
| 12 | LIQUIDAMBAR STYRACIFLUA | SWEETGUM | 4 | 129133 | OK | YES | |
| 13 | QUERCUS RUBRA | NORTHERN RED OAK | 47 | 126537 | OK | YES | |
| 14 | ACER SACCHARUM | SUGAR MAPLE | 9 | 129134 | OK | YES | |
| 15 | PLATANUS OCCIDENTALIS | AMERICAN SYCAMORE | N/A | 129135 | DEAD | NO | MAIN LEADER DEAD AT TOP |
| 16 | ULMUS ALATA | WINGED ELM | 5 | 129136 | OK | NO | |
| 17 | LIQUIDAMBAR STYRACIFLUA | SWEETGUM | 17 | 129137 | OK | NO | |
| 18 | ACER SACCHARUM | SUGAR MAPLE | 5 | 129138 | OK | NO | |
| 19 | ACER SACCHARUM | SUGAR MAPLE | 5 | 129139 | OK | NO | |
| 20 | CARYA ALBA | MOCKERNUT HICKORY | 7 | 129142 | OK | NO | |
| 21 | PINUS VIRGINIANA | VIRGINIA PINE | 15 | 129140 | OK | NO | |
| 22 | ACER SACCHARUM | SUGAR MAPLE | 3 | 129141 | OK | NO | |
| 23 | ACER SACCHARUM | SUGAR MAPLE | 6 | 129143 | OK | NO | |
| 24 | ACER SACCHARUM | SUGAR MAPLE | 3 | 129144 | OK | NO | |
| 25 | QUERCUS RUBRA | NORTHERN RED OAK | 49 | 126539 | OK | YES | TWO LEADERS, SPLIT BELOW 3 FEET. DBH: 31", 18". |
| 26 | AILANTHUS ALTISSIMA | TREE OF HEAVEN | 18 | 126538 | OK | YES | |
| 27 | LIQUIDAMBAR STYRACIFLUA | SWEETGUM | 19 | 129119 | OK | YES | LEANING OVER CANAL. DBH ESTIMATED. |
| 28 | ULMUS ALATA | WINGED ELM | 18 | 129120 | OK | NO | |
| 29 | PINUS TAEDA | LOBLOLLY PINE | N/A | 129121 | REMOVED | N/A | ALREADY REMOVED |
| 30 | ROBINIA PSEUDOACACIA | BLACK LOCUST | N/A | 129118 | DEAD | N/A | DEAD, FALLEN |
| 31 | ROBINIA PSEUDOACACIA | BLACK LOCUST | N/A | 129117 | DEAD | N/A | DEAD, FALLEN |
| 32 | ROBINIA PSEUDOACACIA | BLACK LOCUST | 13 | 129106 | OK | YES | |
| 33 | QUERCUS RUBRA | NORTHERN RED OAK | 5 | N/A | OK | YES | |
| 34 | LIQUIDAMBAR STYRACIFLUA | SWEETGUM | 20 | N/A | OK | YES | |
| 35 | CARYA ALBA | MOCKERNUT HICKORY | 11 | N/A | OK | NO | |
| 36 | ULMUS ALATA | WINGED ELM | 10 | N/A | OK | YES | |
| 37 | LIQUIDAMBAR STYRACIFLUA | SWEETGUM | 19 | N/A | OK | YES | |
| 38 | QUERCUS RUBRA | NORTHERN RED OAK | 8 | N/A | OK | YES | |
| 39 | CARYA SPP. | HICKORY | 9 | N/A | OK | NO | |
| 40 | CARYA SPP. | HICKORY | 10 | N/A | OK | NO | |
| 41 | PINUS TAEDA | LOBLOLLY PINE | 32 | N/A | OK | NO | |
| 42 | CARYA SPP. | HICKORY | 5 | N/A | OK | NO | |
| 43 | PINUS TAEDA | LOBLOLLY PINE | N/A | N/A | DEAD | NO | DEAD |
| 44 | PINUS TAEDA | LOBLOLLY PINE | 19 | N/A | OK | NO | |
| 45 | CARYA SPP. | HICKORY | 7 | N/A | OK | NO | |
| 46 | CARYA SPP. | HICKORY | 7 | N/A | OK | NO | |
| 47 | CARYA SPP. | HICKORY | 7 | N/A | OK | YES | |
| 48 | LIQUIDAMBAR STYRACIFLUA | SWEETGUM | 26 | N/A | OK | YES | VINES WRAPPING TRUNK. DBH ESTIMATED. |
| 49 | ULMUS SPP. | ELM | 17 | N/A | OK | YES | TWO LEADERS, SPLIT BELOW 3 FEET. DBH: 9", 8". |
| 50 | ULMUS SPP. | ELM | 21 | N/A | OK | YES | TWO LEADERS, SPLIT BELOW 3 FEET. DBH: 12", 9". |
| 51 | ACER SACCHARUM | SUGAR MAPLE | 11 | N/A | OK | YES | |
| 52 | ULMUS ALATA | WINGED ELM | 20 | N/A | OK | YES | |
| 53 | ACER SACCHARUM | SUGAR MAPLE | 19 | N/A | OK | YES | |
| 54 | CARYA SPP. | HICKORY | 23 | N/A | OK | NO | TWO LEADERS, SPLIT BELOW 3 FEET. DBH: 15", 8". |
| 55 | ACER SACCHARUM | SUGAR MAPLE | 10 | N/A | OK | NO | |
| 56 | ULMUS ALATA | WINGED ELM | 15 | N/A | OK | NO | |
| 57 | PLATANUS OCCIDENTALIS | AMERICAN SYCAMORE | 14 | N/A | OK | NO | |
| 58 | PLATANUS OCCIDENTALIS | AMERICAN SYCAMORE | 16 | N/A | OK | NO | |
| 59 | ULMUS ALATA | WINGED ELM | 14 | N/A | OK | NO | |

| | |
|---|---|
| **TOTAL DBH** | 726 |
| **TO BE RETAINED** | 450 |
| **TO BE REMOVED** | 276 |
| **REPLACEMENT RATIO** | 1:1 |
| **ONSITE REPLACEMENT VALUE** | 100 |
| **OFFSITE REPLACEMENT VALUE[5]** | 176 |

NOTES

1. THIS TREE INVENTORY WAS COMPLETED IN MARCH 2021.
2. TREES WITH CITY TREE ID NUMBER WERE INCLUDED IN A PRIOR TREE INVENTORY COMPLETED BY DAVEY RESOURCE GROUP BETWEEN 2013 AND 2015.
3. SOME TREES INCLUDED IN THE CITY'S TREE INVENTORY WERE ALREADY RECENTLY BEEN REMOVED AT THE TIME OF THIS TREE INVENTORY: #1, #2, #10, #29.
4. TREES PROPOSED FOR REMOVAL (EXCEPT THOSE THAT ARE DEAD) WILL BE REPLACED ON A 1:1 RATIO BY TOTAL DBH REMOVED PER CITY OF RICHMOND TREE ORDINANCE.
5. ALL REMAINING TREE REPLACEMENT WILL BE MET OFFSITE BY PAYING INTO THE CITY'S FUND FOR TREE PLANTING.




COMMONWEALTH OF VIRGINIA
SCOTT W. WILEY
No. 1629
4/29/2021
LANDSCAPE ARCHITECT

ISSUED FOR PERMITTING

APRIL 15, 2021

SYMBOLS

BOLLARD, BUSH, CAP, ELECTRIC BOX, ELECTRIC METER, ELECTRIC MANHOLE, FIRE HYDRANT, GAS METER, GAS VALVE, GUY, LIGHT POLE, POWER POLE, PROPERTY PIN, SANITARY MANHOLE, SIGNS, STORM MANHOLE, TELEPHONE MANHOLE, TREE, UTILITY BOX, UTILITY PEDESTAL, UTILITY POLE, WATER METER, WATER VALVE, YARD LIGHT, BOULDER

LINE TYPES

PROPERTY LINE
EXISTING MAJOR CONTOUR
EXISTING MINOR CONTOUR
EXISTING ASPHALT
EXISTING CONCRETE
SANITARY SEWER
OVERHEAD ELECTRIC
UNDERGROUND ELECTRIC
WATER PIPE
GAS PIPE
EXISTING FENCING
EXISTING TREELINE
EXISTING EASEMENT
RPA BOUNDARY
RMA BOUNDARY
FEMA 100-YR FLOODPLAIN
FEMA 500-YR FLOODPLAIN

DATE: APRIL 29, 2021 DRAWN BY: T. BUCKLEY
SCALE: 1"=20' CHECKED BY: S. WILEY

REVISIONS
AS BUILT DATE

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39490.035

JAMES RIVER PARK SYSTEM
BYRD PARK PUMP HOUSE
ADA ACCESS IMPROVEMENTS

EXISTING TREE INVENTORY & REMOVAL PLAN

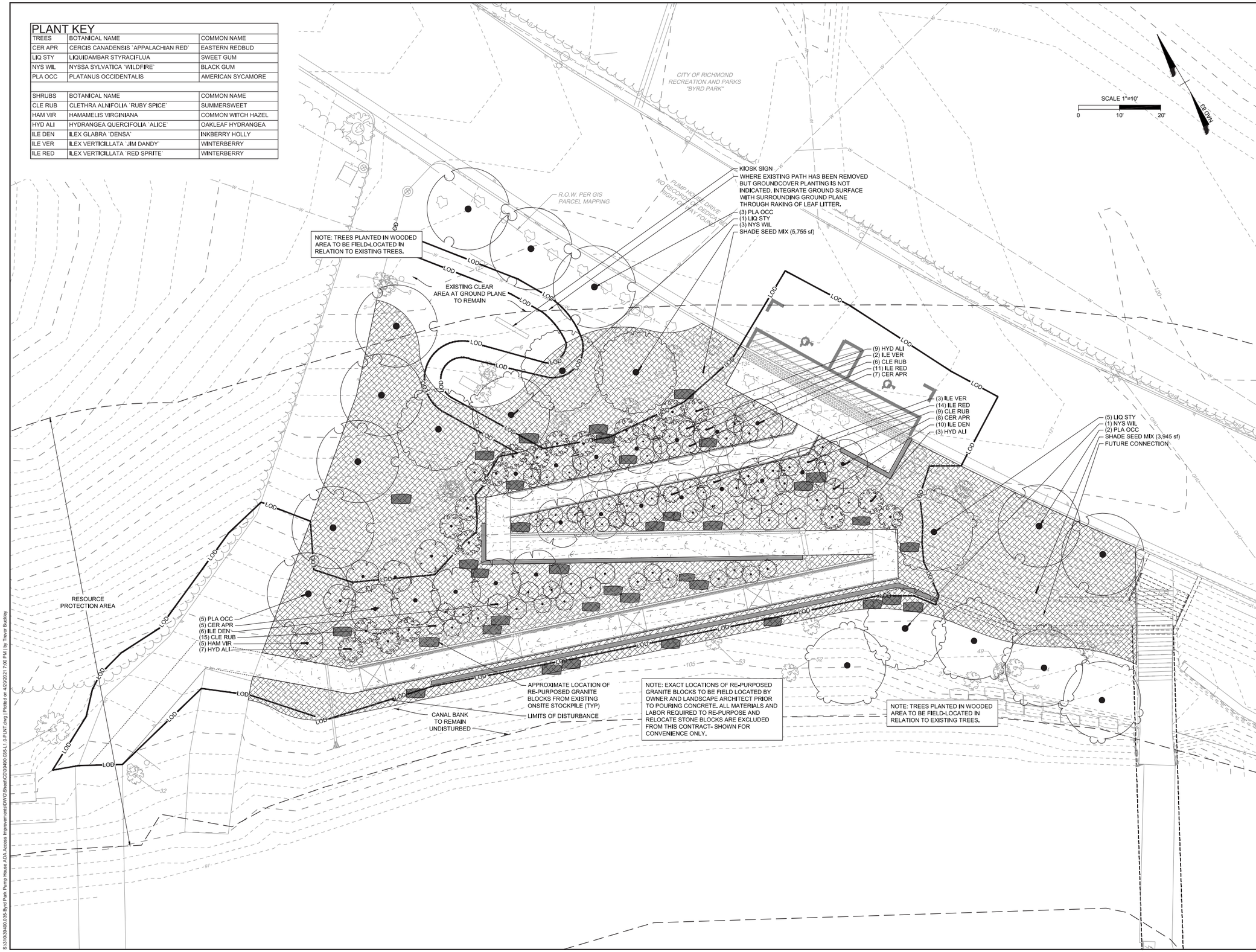
DEPARTMENT OF PARKS AND RECREATION
CITY OF RICHMOND, VIRGINIA

SHEET NO. L1.0

S:\3\39490.035-Byrd Park Pump House ADA Access Improvements\DWG\Sheet\CD\39490.035-L1.0-PLNT.dwg | Plotted on 4/29/2021 7:00 PM | by Trevor Buckley

## PLANT KEY

| TREES | BOTANICAL NAME | COMMON NAME |
|---|---|---|
| CER APR | CERCIS CANADENSIS `APPALACHIAN RED` | EASTERN REDBUD |
| LIQ STY | LIQUIDAMBAR STYRACIFLUA | SWEET GUM |
| NYS WIL | NYSSA SYLVATICA `WILDFIRE` | BLACK GUM |
| PLA OCC | PLATANUS OCCIDENTALIS | AMERICAN SYCAMORE |
| | | |
| SHRUBS | BOTANICAL NAME | COMMON NAME |
| CLE RUB | CLETHRA ALNIFOLIA `RUBY SPICE` | SUMMERSWEET |
| HAM VIR | HAMAMELIS VIRGINIANA | COMMON WITCH HAZEL |
| HYD ALI | HYDRANGEA QUERCIFOLIA `ALICE` | OAKLEAF HYDRANGEA |
| ILE DEN | ILEX GLABRA `DENSA` | INKBERRY HOLLY |
| ILE VER | ILEX VERTICILLATA `JIM DANDY` | WINTERBERRY |
| ILE RED | ILEX VERTICILLATA `RED SPRITE` | WINTERBERRY |

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COMMONWEALTH OF VIRGINIA
SCOTT W. WILEY
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4/29/2021
LANDSCAPE ARCHITECT

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### SYMBOLS

- BOLLARD
- BUSH
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- ELECTRIC BOX
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- TELEPHONE MANHOLE
- TREE
- UTILITY BOX
- UTILITY PEDESTAL
- UTILITY POLE
- WATER METER
- WATER VALVE
- YARD LIGHT
- BOULDER

### LINE TYPES

- PROPERTY LINE
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- EXISTING ASPHALT
- EXISTING CONCRETE
- SAN — SANITARY SEWER
- OHP — OVERHEAD ELECTRIC
- UGP — UNDERGROUND ELECTRIC
- W — WATER PIPE
- G — GAS PIPE
- X — EXISTING FENCING
- EXISTING TREELINE
- EXISTING EASEMENT
- RPA BOUNDARY
- RMA — RMA BOUNDARY
- FEMA 100-YR FLOODPLAIN
- FEMA 500-YR FLOODPLAIN

DATE: APRIL 29, 2021 DRAWN BY: T. BUCKLEY

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RPA MITIGATION
LANDSCAPE PLAN

DEPARTMENT OF PARKS AND RECREATION
CITY OF RICHMOND, VIRGINIA

SHEET NO. L2.0

## BUFFER REMOVAL AREA CALCULATION

| | SF | AC |
|---|---|---|
| DISTURBED RPA- WATERSIDE PORTION | 5,419 | |
| DISTURBED RPA - LANDWARD PORTION | 2,669 | |
| TOTAL DISTURBED BUFFER | 8,088 | 0.19 |
| AREA / 400 SF = # PLANTING UNITS | 20 | |

| PLANTING REQUIREMENTS CALCULATION | | | PLANTING SIZE |
|---|---|---|---|
| 1. CANOPY TREES | 20 × 1 | 20 | 6 FT. HT. |
| 2. UNDERSTORY TREES | 20 × 2 | 40 | 4 FT. HT. |
| OR 2. ALTERNATIVE: UNDERSTORY TREES | 20 × 1 | 20 | 4 FT.HT. |
| AND LARGE SHRUBS | 20 × 2 | 40 | 3-4 FT.HT. |
| 3. SMALL SHRUBS | 20 × 3 | 60 | 15-18 IN. |

**NOTE**: CALCULATIONS ARE BASED ON REQUIREMENTS FROM THE DCR PUBLICATION *RIPARIAN BUFFERS MODIFICATION & MITIGATION GUIDANCE MANUAL*. SEE RESTORATION/ESTABLISHMENT TABLE A.

## PLANT SCHEDULE

| TREES | QTY | BOTANICAL NAME | COMMON NAME | MIN. INSTALLED SIZE | ROOT | TYPE |
|---|---|---|---|---|---|---|
| CER APR | 20 | CERCIS CANADENSIS `APPALACHIAN RED` | EASTERN REDBUD | 6` HT. | B&B OR CONTAINER | MULTI-STEM |
| LIQ STY | 6 | LIQUIDAMBAR STYRACIFLUA | SWEET GUM | 2.5" CAL. | B&B | |
| NYS WIL | 4 | NYSSA SYLVATICA `WILDFIRE` | BLACK GUM | 2.5" CAL. | B&B | |
| PLA OCC | 10 | PLATANUS OCCIDENTALIS | AMERICAN SYCAMORE | 2.5" CAL. | B&B | |
| | | | | | | |
| SHRUBS | QTY | BOTANICAL NAME | COMMON NAME | MIN. INSTALLED SIZE | ROOT | SPACING |
| CLE RUB | 30 | CLETHRA ALNIFOLIA `RUBY SPICE` | SUMMERSWEET | 24" HT./SPRD. | CONTAINER | 54" o.c. |
| HAM VIR | 5 | HAMAMELIS VIRGINIANA | COMMON WITCH HAZEL | 36" HT. | CONTAINER | 96" o.c. |
| HYD ALI | 19 | HYDRANGEA QUERCIFOLIA `ALICE` | OAKLEAF HYDRANGEA | 36" HT. | CONTAINER | 72" o.c. |
| ILE DEN | 16 | ILEX GLABRA `DENSA` | INKBERRY HOLLY | 36" HT. | CONTAINER | 60" o.c. |
| ILE VER | 5 | ILEX VERTICILLATA `JIM DANDY` | WINTERBERRY | 24" HT./SPRD. | CONTAINER | 48" o.c. |
| ILE RED | 25 | ILEX VERTICILLATA `RED SPRITE` | WINTERBERRY | 24" HT./SPRD. | CONTAINER | 42" o.c. |

**NOTE**: PLANT SCHEDULE QUANTITIES PROVIDED FOR CONVENIENCE ONLY AND SHALL BE VERIFIED PRIOR TO BIDDING.
SEED ALL DISTURBED AREAS AS INDICATED

## GROUNDCOVER SCHEDULE

SHADE SEED MIX — 9,597 SF
PARTIALLY SHADED AREA ROADSIDE
MIX - ERNMX-140 BY ERNST
CONSERVATION SEEDS

ERNST SEEDS

**Ernst Conservation Seeds**
8884 Mercer Pike
Meadville, PA 16335
(800) 873-3321 Fax (814) 336-5191
www.ernstseed.com

**Date: April 28, 2021**

### Partially Shaded Area Roadside Mix - ERNMX-140

| | Botanical Name | Common Name | Price/lb |
|---|---|---|---|
| 49.90 % | *Schizachyrium scoparium, 'Prairie View'-IN Ecotype* | Little Bluestem 'Prairie View'-IN Ecotype | 12.88 |
| 20.00 % | *Elymus virginicus, Madison-NY Ecotype* | Virginia Wildrye, Madison-NY Ecotype | 5.01 |
| 8.00 % | *echinacea purpurea* | Purple Coneflower | 43.20 |
| 6.50 % | *Elymus hystrix, PA Ecotype* | Bottlebrush Grass, PA Ecotype | 60.20 |
| 3.50 % | *Chamaecrista fasciculata, PA Ecotype* | Partridge Pea, PA Ecotype | 7.20 |
| 3.00 % | *Rudbeckia hirta* | Blackeyed Susan | 24.00 |
| 2.00 % | *Helianthus helianthoides, PA Ecotype* | Ownye Sunflower, PA Ecotype | 33.60 |
| 1.00 % | *Pycnanthemum tenuifolium* | Narrowleaf Mountainmint | 168.00 |
| 0.60 % | *Liatris spicata, PA Ecotype* | Marsh Blazing Star, PA Ecotype | 252.00 |
| 0.60 % | *Tradescantia ohiensis, PA Ecotype* | Ohio Spiderwort, PA Ecotype | 192.00 |
| 0.60 % | *Zizia aurea, PA Ecotype* | Golden Alexanders, PA Ecotype | 288.00 |
| 0.50 % | *Aster macrophyllus, PA Ecotype* | Bigleaf Aster, PA Ecotype | 432.00 |
| 0.50 % | *Aster prenanthoides, PA Ecotype* | Zigzag Aster, PA Ecotype | 432.00 |
| 0.50 % | *Baptisia australis, Southern WV Ecotype* | Blue False Indigo, Southern WV Ecotype | 96.00 |
| 0.40 % | *Monarda fistulosa, Fort Indiantown Gap-PA Ecotype* | Wild Bergamot, Fort Indiantown Gap-PA Ecotype | 120.00 |
| 0.30 % | *Asclepias tuberosa* | Butterfly Milkweed | 432.00 |
| 0.30 % | *Oenothera fruticosa var. fruticosa* | Sundrops | 360.00 |
| 0.30 % | *Penstemon digitalis* | Tall White Beardtongue | 192.00 |
| 0.30 % | *Penstemon laevigatus, PA Ecotype* | Appalachian Beardtongue, PA Ecotype | 336.00 |
| 0.20 % | *Agrostis perennans, Albany Pine Bush-NY Ecotype* | Autumn Bentgrass, Albany Pine Bush-NY Ecotype | 16.80 |
| 0.20 % | *Anemone virginiana, PA Ecotype* | Thimbleweed, PA Ecotype | 235.20 |
| 0.20 % | *Solidago bicolor, PA Ecotype* | White Goldenrod, PA Ecotype | 408.00 |
| 0.20 % | *Solidago nemoralis, PA Ecotype* | Gray Goldenrod, PA Ecotype | 336.00 |
| 0.10 % | *Asclepias syriaca* | Common Milkweed | 163.20 |
| 0.10 % | *Penstemon hirsutus* | Hairy Beardtongue | 480.00 |
| 0.10 % | *Solidago juncea, PA Ecotype* | Early Goldenrod, PA Ecotype | 336.00 |
| 0.10 % | *Solidago odora, PA Ecotype* | Licorice Scented Goldenrod, PA Ecotype | 384.00 |
| **100.00 %** | | **Mix Price/lb Bulk:** | **$35.11** |

**Seeding Rate:** 20 lbs/acre with 30 lbs/acre of a cover crop. For a cover crop use either grain oats (1 Jan to 31 Jul) or grain rye (1 Aug to 31 Dec).

Pollinator Favorites; Woodland Openings

The native grasses and forbs are ideal for roadside areas and woodland margins. Mix formulations are subject to change without notice depending on the availability of existing and new products. While the formula may change, the guiding philosophy and function of the mix will not.

**Price quotes guaranteed for 30 days.**
**All prices are FOB Meadville, PA.**
**Please check our web site at www.ernstseed.com**
**for current pricing when placing orders.**

# GENERAL NOTES

PRE-CONSTRUCTION

- CONTRACTOR IS RESPONSIBLE FOR CONTACTING "MISS UTILITY" AT 1.800.552.7001 FOR LOCATION OF ALL UTILITY LINES.TREES SHALL BE LOCATED A MINIMUM OF 5 FEET FROM SEWER/WATER CONNECTIONS. NOTIFY LANDSCAPE ARCHITECT OF CONFLICTS.
- VERIFY ALL PLANT MATERIAL QUANTITIES ON THE PLAN PRIOR TO BIDDING, PLANT LIST TOTALS ARE FOR CONVENIENCE ONLY AND SHALL BE VERIFIED PRIOR TO BIDDING.
- PROVIDE PLANT MATERIALS OF QUANTITY, SIZE, GENUS, SPECIES, AND VARIETY INDICATED ON PLANS. ALL PLANT MATERIALS AND INSTALLATION SHALL COMPLY WITH RECOMMENDATIONS AND REQUIREMENTS OF ANSI Z60.1 "AMERICAN STANDARD FOR NURSERY STOCK". IF SPECIFIED PLANT MATERIAL IS NOT OBTAINABLE, SUBMIT PROOF OF NON AVAILABILITY TO THE LANDSCAPE ARCHITECT, TOGETHER WITH PROPOSAL FOR USE OF EQUIVALENT MATERIAL.
- PROVIDE AND INSTALL ALL PLANTS AS IN ACCORDANCE WITH DETAILS AND CONTRACT SPECIFICATIONS.
- SOIL TESTS SHALL BE PERFORMED TO DETERMINE SOIL CHARACTER AND QUALITY. NECESSARY SOIL AMENDMENTS SHALL BE PERFORMED PER TEST RESULTS TO ENSURE PLANT HEALTH.

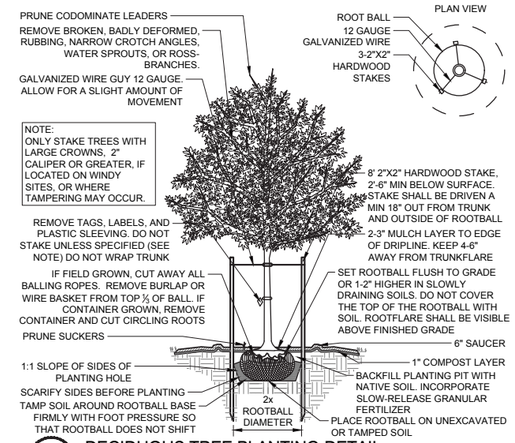
CONSTRUCTION/INSTALLATION

- LANDSCAPE ARCHITECT RESERVES THE RIGHT TO REJECT ANY PLANTS AND MATERIALS THAT ARE IN AN UNHEALTHY OR UNSIGHTLY CONDITION, AS WELL AS PLANTS AND MATERIALS THAT DO NOT CONFORM TO ANSI Z60.1 "AMERICAN STANDARD FOR NURSERY STOCK"
- LABEL AT LEAST ONE TREE AND ONE SHRUB OF EACH VARIETY AND CALIPER WITH A SECURELY ATTACHED, WATERPROOF TAG BEARING THE DESIGNATION OF BOTANICAL AND COMMON NAME.
- INSTALL LANDSCAPE PLANTINGS AT ENTRANCES/EXITS AND PARKING AREAS ACCORDING TO PLANS SO THAT MATERIALS WILL NOT INTERFERE WITH SIGHT DISTANCES.
- CONTRACTOR IS RESPONSIBLE FOR WATERING ALL PLANT MATERIAL DURING INSTALLATION AND UNTIL FINAL INSPECTION AND ACCEPTANCE BY OWNER. CONTRACTOR SHALL NOTIFY OWNER OF CONDITIONS WHICH AFFECTS THE GUARANTEE.

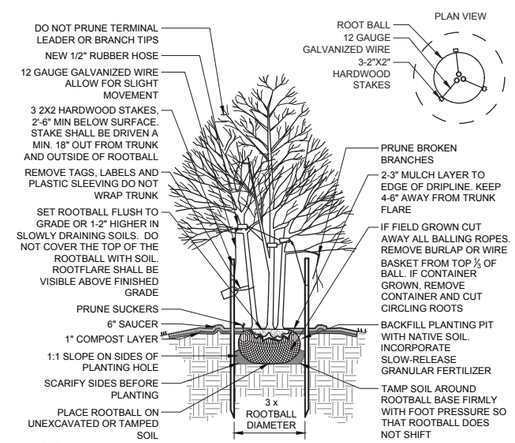
INSPECTIONS/GUARANTEE

- UPON COMPLETION OF LANDSCAPE INSTALLATION, THE LANDSCAPE CONTRACTOR SHALL NOTIFY THE GENERAL CONTRACTOR WHO WILL VERIFY COMPLETENESS, INCLUDING THE REPLACEMENT OF ALL DEAD PLANT MATERIAL. CONTRACTOR IS RESPONSIBLE FOR SCHEDULING A FINAL INSPECTION BY THE LANDSCAPE ARCHITECT.
- ALL EXTERIOR PLANT MATERIALS SHALL BE GUARANTEED FOR ONE FULL YEAR AFTER DATE OF FINAL INSPECTION AGAINST DEFECTS INCLUDING DEATH AND UNSATISFACTORY GROWTH. DEFECTS RESULTING FROM NEGLECT BY THE OWNER, ABUSE OR DAMAGE BY OTHERS, OR UNUSUAL PHENOMENA OR INCIDENTS WHICH ARE BEYOND THE CONTRACTORS CONTROL ARE NOT THE RESPONSIBILITY OF THE CONTRACTOR.
- PLANT MATERIAL QUANTITIES AND SIZES WILL BE INSPECTED FOR COMPLIANCE WITH APPROVED PLANS BY A SITE PLAN REVIEW AGENT OF THE PLANNING DEPARTMENT PRIOR TO THE RELEASE OF THE CERTIFICATE OF OCCUPANCY.
- REMOVE ALL GUY WIRES AND STAKES 12 MONTHS AFTER INSTALLATION.

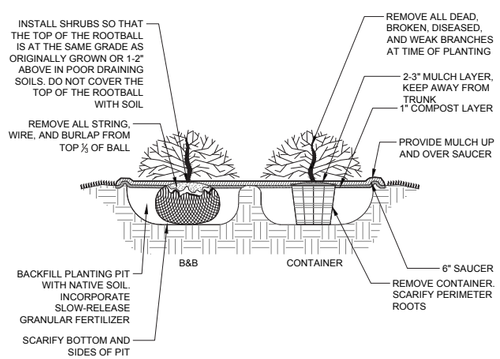
5 GENERAL NOTES
NTS



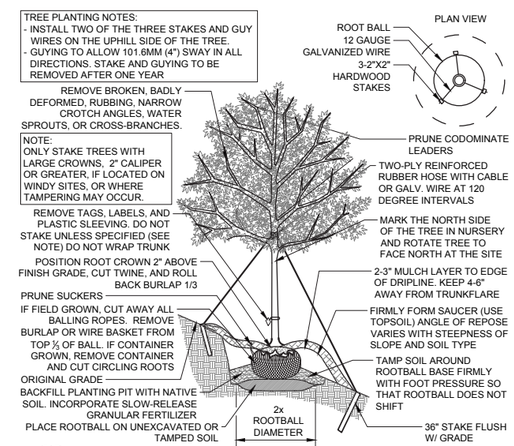

1 DECIDUOUS TREE PLANTING DETAIL
NTS




2 MULTI-STEM TREE PLANTING DETAIL
NTS




4 SHRUB PLANTING DETAIL
NTS




3 TREE PLANTING WITH GUYS ON SLOPE DETAIL
NTS

COMMONWEALTH OF VIRGINIA
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RICHMOND VIRGINIA

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JAMES RIVER PARK SYSTEM
BYRD PARK PUMP HOUSE
ADA ACCESS IMPROVEMENTS

LANDSCAPE NOTES AND DETAILS

DEPARTMENT OF PARKS AND RECREATION
CITY OF RICHMOND, VIRGINIA

SHEET NO. L2.1

S:\31039490.035-Byrd Park Pump House ADA Access Improvements\DWG\Sheet\C203\9490.035-L1.0-PLNT.dwg | Plotted on 4/30/2021 10:34 AM | by Trevor Buckley

## STRUCTURAL NOTES

### DESIGN

DESIGN IS IN ACCORDANCE WITH THE VIRGINIA UNIFORM STATEWIDE BUILDING CODE (USBC), DATED 2015, THE INTERNATIONAL BUILDING CODE (IBC), DATED 2015, AMERICAN SOCIETY OF CIVIL ENGINEERS MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES (ASCE 7), DATED 2010, AND THE BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE (ACI 318), DATED 2014.

### DESIGN LOADS

A. GRAVITY - SUPERIMPOSED DEAD LOADS (DL) IN ADDITION TO STRUCTURE DEAD LOADS: NONE.

B. GRAVITY - LIVE LOADS (LL) CONTRIBUTING TO LATERAL SURCHARGE LOADS:

PEDESTRIAN LIVE LOAD 90 PSF

### DESIGN RESPONSIBILITY

TIMMONS GROUP IS THE ENGINEER OF RECORD FOR THE STRUCTURAL DESIGN OF THE SITE RETAINING WALLS, AS INDICATED ON THE FOLLOWING SHEETS.

### EXISTING CONDITIONS

THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF RECORD IMMEDIATELY UPON DISCOVERY OF ANY DISCREPANCIES BETWEEN INFORMATION SHOWN ON THE PLANS AND THE ACTUAL FIELD CONDITIONS. THE CONTRACTOR SHALL BE REQUIRED TO DOCUMENT EXISTING CONDITIONS BY SKETCHES OR OTHER METHODS.

DEPTHS AND LOCATIONS OF EXISTING STRUCTURES AND UTILITY LOCATIONS TO BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO THE START OF THE WORK. THE CONTRACTOR SHALL TAKE APPROPRIATE MEASURES TO ENSURE THAT EXISTING STRUCTURES AND UTILITIES ARE NOT DAMAGED AS PART OF THE WORK.

### CONSTRUCTION METHODS

THE CONTRACTOR SHALL TAKE THE PROPER PRECAUTIONS TO ENSURE THE STABILITY AND SAFE PERFORMANCE OF ALL STRUCTURAL ELEMENTS DURING CONSTRUCTION.

### GEOTECHNICAL INFORMATION

ALLOWABLE DESIGN SOIL BEARING PRESSURE IS TAKEN AS 2000 PSF BASED ON THE AVAILABLE GEOTECHNICAL INFORMATION.

THE SITE SHALL BE PREPARED UNIFORM IN ACCORDANCE WITH CIVIL DRAWINGS, SPECIFICATIONS, AND THE DESIGN SOIL BEARING PRESSURE. A LICENSED GEOTECHNICAL ENGINEER SHALL VERIFY ALL ASSUMPTIONS AND REPORTS ANY VARIATIONS TO THE ENGINEER.

ALL EXCAVATIONS SHALL BE INSPECTED BY A LICENSED GEOTECHNICAL ENGINEER TO VERIFY THE DESIGN ASSUMPTIONS AND REPORT ADVERSE CONDITIONS.

WHERE FILL IS REQUIRED, IT SHALL BE PLACED IN ACCORDANCE WITH INSTRUCTIONS OF A LICENSED GEOTECHNICAL ENGINEER TO MAINTAIN DESIGN BEARING PRESSURE.

SOIL BELOW THE RETAINING WALLS NOT MEETING THE DESIGN BEARING PRESSURE SHALL BE EXCAVATED TO A DEPTH OF VERIFIABLE DESIGN PRESSURE AND BACKFILLED WITH VDOT NO. 57 STONE TO THE LEVEL OF FOUNDATION BEARING. THIS SHALL BE APPROVED BY A LICENSED GEOTECHNICAL ENGINEER.

DO NOT BACKFILL AGAINST RETAINING WALLS UNTIL THE CONCRETE HAS REACHED THE REQUIRED 28-DAY COMPRESSIVE STRENGTH.

BACKFILL RETAINING WALLS WITH MAXIMUM 8" LIFTS MAINTAINING EQUAL HEIGHT EACH SIDE.

USE HAND COMPACTION EQUIPMENT WITHIN FIVE FEET OF RETAINING WALLS.

REFER TO THE 22 MARCH 2021 REPORT OF GEOTECHNICAL STUDY TITLED "PUMP HOUSE ADA IMPROVEMENTS," PREPARED FOR TIMMONS GROUP BY FROEHLING & ROBERTSON, INC. FOR GEOTECHNICAL RECOMMENDATIONS AND REQUIREMENTS.

### MATERIALS

A. CONCRETE

1. 28-DAY STRENGTH: 4,500 PSI
2. DENSITY: NORMAL WEIGHT
3. W/C (MAX): 0.45
4. AIR CONTENT: 6% +/- 1.5
5. NOMINAL MAX. AGGREGATE SIZE: 3/4 IN.
6. DURABILITY REQUIREMENTS (PER ACI 318): F2, S0, C1

NO ADDITIONAL WATER SHALL BE ADDED TO THE CONCRETE AT THE JOB SITE.

B. STRUCTURAL STEEL

SHALL BE GALVANIZED AND SHALL MEET THE FOLLOWING REQUIREMENTS:

1. ANCHOR BOLT: ASTM A36
2. PLATE: ASTM A36

C. PEDESTRIAN HANDRAIL/GUARDRAIL

REFERENCE VDOT ROAD AND BRIDGE STANDARD HR-1 DRAWING FOR HANDRAIL DETAILS AND HANDRAIL ANCHORAGE DETAILS.

### SUBMITTALS

CONTRACTOR SHALL PROVIDE THE FOLLOWING PRIOR TO FABRICATION AND INSTALLATION FOR THE ENGINEER'S APPROVAL:

A. PRODUCT DATA SHEETS FOR EACH MATERIAL TO BE INSTALLED.

B. CONCRETE MIX DESIGN

C. MATERIAL AND MILL CERTIFICATIONS.

D. SHOP DRAWINGS.

### ABBREVIATIONS AND NOTATIONS:

| | |
|---|---|
| ACI | AMERICAN CONCRETE INSTITUTE |
| APPROX. | APPROXIMATELY |
| ASCE | AMERICAN SOCIETY OF CIVIL ENGINEERS |
| ASTM | AMERICAN SOCIETY FOR TESTING MATERIALS |
| B | BOTTOM |
| ℄ | BASELINE |
| BTWN | BETWEEN |
| CIP | CAST-IN-PLACE |
| CLR | CLEAR CONCRETE COVER |
| ℄ | CENTERLINE |
| CONT. | CONTINUOUS |
| DIA. OR Ø | DIAMETER |
| DL | DEAD LOAD |
| E. OR ELEV. | ELEVATION |
| HORIZ. | HORIZONTAL |
| IBC | INTERNATIONAL BUILDING CODE |
| LL | LIVE LOAD |
| MAX. | MAXIMUM |
| MIN. | MINIMUM |
| NOM. | NOMINAL |
| N.T.S. | NOT TO SCALE |
| O.C. | ON-CENTER |
| PCF | POUNDS PER CUBIC FOOT |
| PSF | POUNDS PER SQUARE FOOT |
| ℙ | PLATE |
| REINF. | REINFORCEMENT |
| REQ. | REQUIRED |
| STA. | STATION |
| T | TOP |
| TYP. | TYPICAL |
| UON | UNLESS OTHERWISE NOTED |
| VIF | VERIFY IN FIELD |
| W/C | WATER-CEMENTITIOUS RATIO |

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APRIL 15, 2021

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TIMMONS GROUP

| REVISION DESCRIPTION | DATE |
|---|---|
| | |

DATE 04/12/2021
DRAWN BY S.POPE
DESIGNED BY S. POPE
CHECKED BY G. Johnson
SCALE AS SHOWN

PUMP HOUSE ADA ACCESS IMPROVEMENTS
RICHMOND, VIRGINIA
STRUCTURAL NOTES

PROJECT NO. 39490.035
SHEET NO. S1.00

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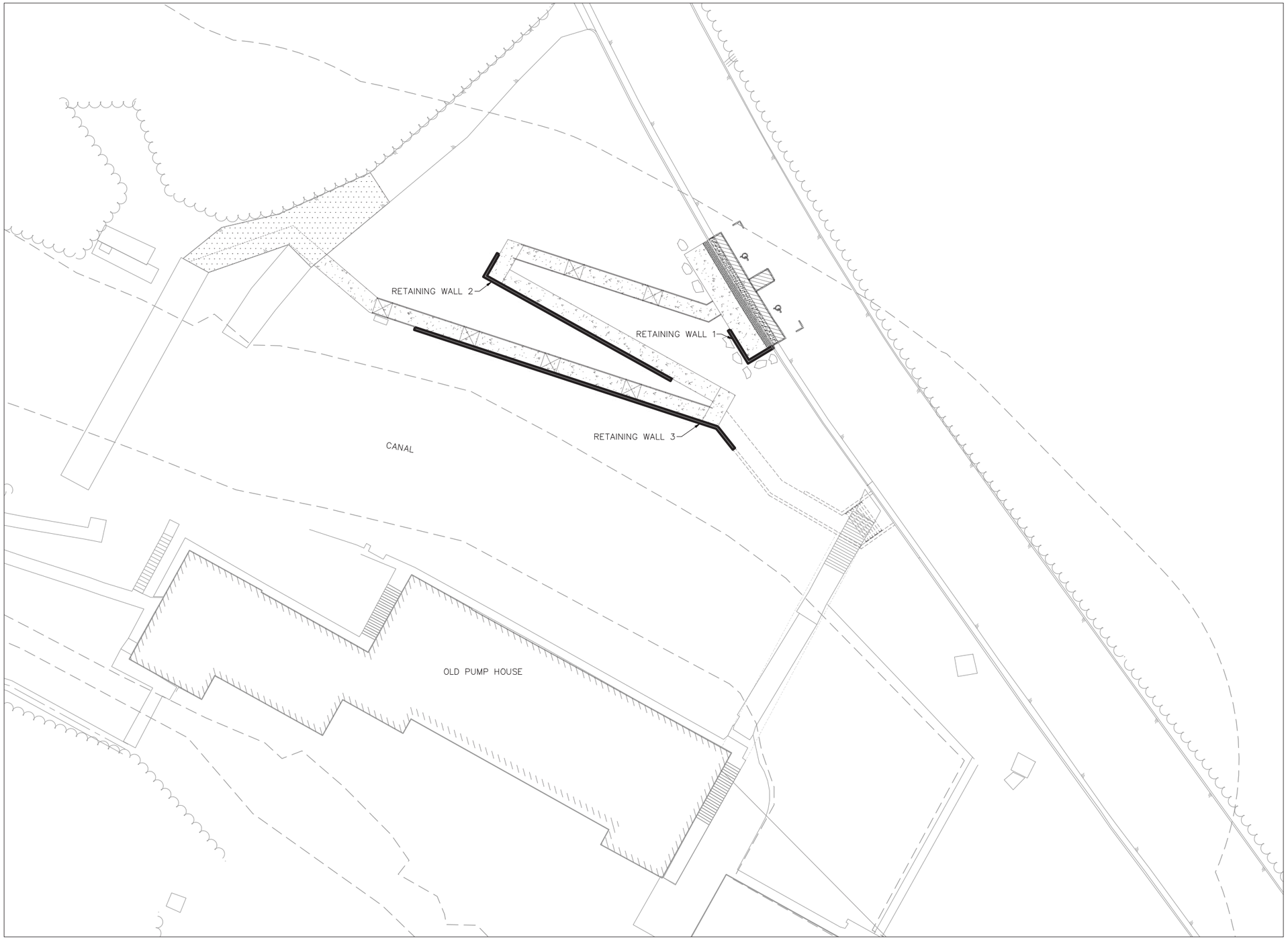


1 LOCATION PLAN

SCALE: 1" = 200'

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DATE: 04/12/2021
DRAWN BY: S.POPE
DESIGNED BY: S. POPE
CHECKED BY: G. Johnson
SCALE: AS SHOWN

TIMMONS GROUP

# PUMP HOUSE ADA ACCESS IMPROVEMENTS

RICHMOND, VIRGINIA

LOCATION PLAN

PROJECT NO. 39490.035

SHEET NO. S2.00

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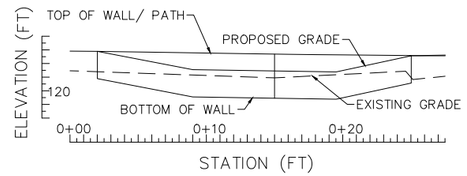
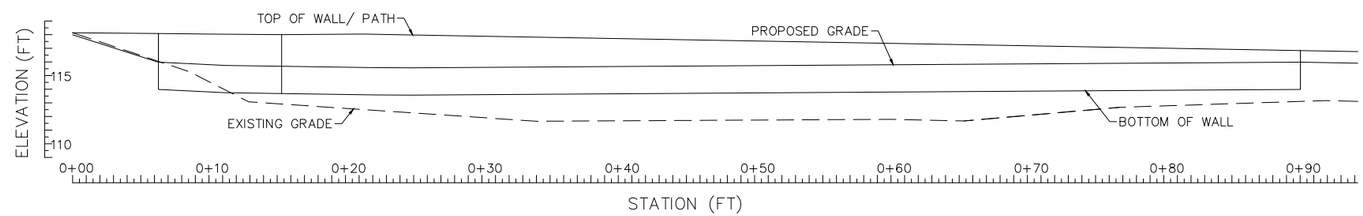
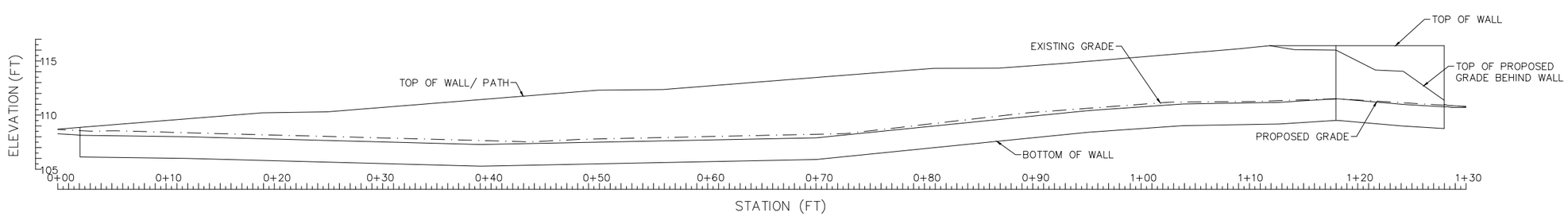



1 WALL 1 ELEVATION
SCALE: 1" = 5'-0"




2 WALL 2 ELEVATION
SCALE: 1" = 5'-0"




3 WALL 3 ELEVATION
SCALE: 1" = 5'-0"

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|---|---|
| | |

DATE
04/12/2021
DRAWN BY
S.POPE
DESIGNED BY
S. POPE
CHECKED BY
G. Johnson
SCALE
AS SHOWN

TIMMONS GROUP

# PUMP HOUSE ADA ACCESS IMPROVEMENTS

RICHMOND, VIRGINIA

RETAINING WALL ELEVATIONS

PROJECT NO.
39490.035

SHEET NO.
S3.00

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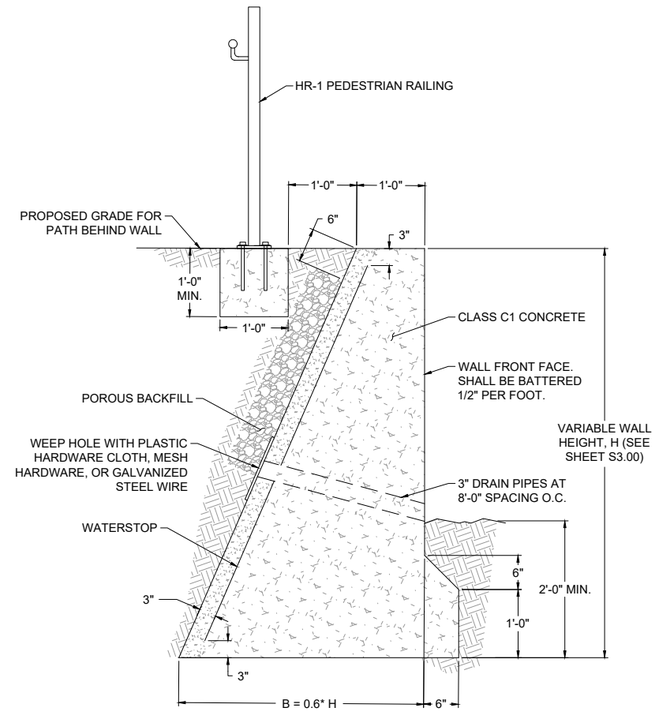


1 SECTION - CONCRETE RETAINING WALL

SCALE: 1" = 1'-0"

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DESIGNED BY: S. POPE
CHECKED BY: G. Johnson
SCALE: AS SHOWN

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PUMP HOUSE ADA ACCESS IMPROVEMENTS
RICHMOND, VIRGINIA

TYPICAL SECTION DETAILS

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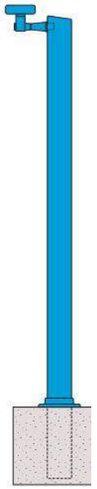
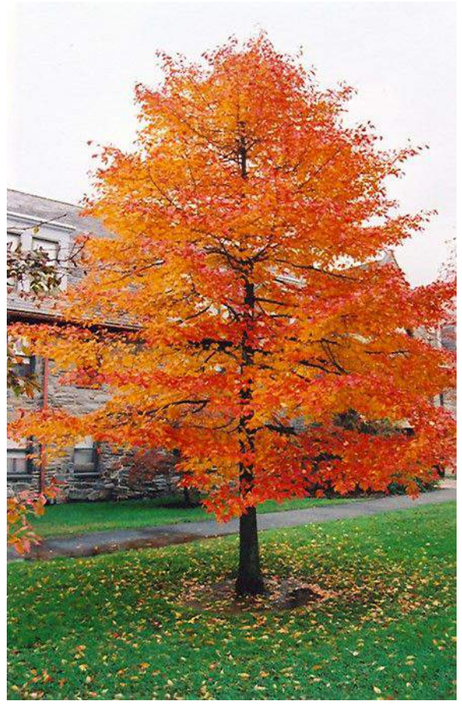
CONCRETE SIDEWALK AND RAMP WITH STAINLESS STEEL RAILING



RAILING SPECIFICATION: CARLSTADT RAILING SYSTEM BY JULIUS BLUM – TOP RAIL SERVES AS HANDRAIL

CONCRETE RETAINING WALL WITH TEXTURE CREATED FROM FORM SUPPORTS

APRIL 15, 2021



CANOPY TREES – NYSSA SYLVATICA 'WILDFIRE' AND OTHERS

UNDERSTORY TREES – CERCIS CANADENSIS 'APPALACHIAN RED'

LARGE SHRUBS – HAMAMELIS VIRGINIANA AND OTHERS

SMALL SHRUBS – ILEX VERTICILLATA 'RED SPRITE' AND OTHERS

# PUMP HOUSE PARK ADA ACCESSIBILITY IMPROVEMENTS

## DESIGN PALETTE

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