

INTRODUCED: April 11, 2022

AN ORDINANCE No. 2022-121

As Amended

To authorize the special use of the properties known as 2100, 2106, 2112, 2118, and 2124 Broad Rock Boulevard for the purpose of a commercial building with off-street parking, upon certain terms and conditions.

Patron – Mayor Stoney (By Request)

Approved as to form and legality
by the City Attorney

PUBLIC HEARING: MAY 9 2022 AT 6 P.M.

WHEREAS, the owner of the property known as 2100 Broad Rock Boulevard, which is situated in a R-4 Single-Family Residential District and the properties known as 2106, 2112, 2118, and 2124 Broad Rock Boulevard, which are situated in a B-2 Community Business District, desires to use such properties for the purpose of a commercial building with off-street parking, which use, among other things, is not currently allowed by section 30-408.1, concerning permitted principal uses, 30-408.2, concerning permitted accessory uses and structures, 30-408.4, concerning lot area and width, 30-408.5, concerning yards, 30-408.6, concerning lot coverage, 30-408.7, concerning height, and 30-408.8, concerning driveways from streets, of the Code of the City of Richmond (2020), as amended; and

AYES: 8 NOES: 0 ABSTAIN: _____

ADOPTED: JUN 27 2022 REJECTED: _____ STRICKEN: _____

WHEREAS, in accordance with section 17.11 of the Charter of the City of Richmond (2020), as amended, it has been made to appear that, if granted subject to the terms and conditions set forth in this ordinance, the special use granted by this ordinance will not be detrimental to the safety, health, morals and general welfare of the community involved, will not tend to create congestion in streets, roads, alleys and other public ways and places in the area involved, will not create hazards from fire, panic or other dangers, will not tend to overcrowding of land and cause an undue concentration of population, will not adversely affect or interfere with public or private schools, parks, playgrounds, water supplies, sewage disposal, transportation or other public requirements, conveniences and improvements, and will not interfere with adequate light and air; and

WHEREAS, (i) the City Planning Commission has conducted a public hearing to investigate the circumstances and conditions upon which the Council is empowered to authorize such use, (ii) the City Planning Commission has reported to the Council the results of such public hearing and investigation and its recommendations with respect thereto, and (iii) the Council has conducted a public hearing on this ordinance at which the person in interest and all other persons have had an opportunity to be heard;

NOW, THEREFORE,

THE CITY OF RICHMOND HEREBY ORDAINS:

§ 1. **Finding.** Pursuant to section 30-1050.1 of the Code of the City of Richmond (2020), as amended, the Council hereby finds that the special use set forth in and subject to the terms and conditions of this ordinance will not (i) be detrimental to the safety, health, morals and

general welfare of the community involved, (ii) tend to create congestion in streets, roads, alleys and other public ways and places in the area involved, (iii) create hazards from fire, panic or other dangers, (iv) tend to overcrowding of land and cause an undue concentration of population, (v) adversely affect or interfere with public or private schools, parks, playgrounds, water supplies, sewage disposal, transportation or other public requirements, conveniences and improvements, or (vi) interfere with adequate light and air.

§ 2. Grant of Special Use Permit.

(a) Subject to the terms and conditions set forth in this ordinance, the properties known as 2100, 2106, 2112, 2118, and 2124 Broad Rock Boulevard and identified as Tax Parcel Nos. C006-0542/008, C006-0542/010, C006-0542/012, C006-0542/014, and C006-0542/016, respectively, in the 2022 records of the City Assessor, being more particularly shown on a survey entitled “Existing Conditions Plan,” provided on sheet C2.0 of the plans entitled “Plan of Development for Broad Rock Boulevard Retail Center, 2100 Broad Rock Boulevard, Richmond Gateway 9th District, City of Richmond, Virginia,” prepared by The Site Design Company, dated February 5, 2021, and last revised December 20, 2021, a copy of which is attached to and made a part of this ordinance, hereinafter referred to as “the Property,” is hereby permitted to be used for the purpose of a commercial building with off-street parking, hereinafter referred to as “the Special Use,” substantially as shown on the plans entitled “Plan of Development for Broad Rock Boulevard Retail Center, 2100 Broad Rock Boulevard, Richmond Gateway 9th District, City of Richmond, Virginia,” prepared by The Site Design Company, dated February 5, 2021, and last revised December 20, 2021, and entitled “Shopping Center, 2100 Broad Rock Blvd, Richmond, VA,” prepared by Advanced Engineering, LLC, dated September 9, 2020, and last revised February 12,

2022, and hereinafter referred to, collectively, as “the Plans,” copies of which are attached to and made a part of this ordinance.

(b) The adoption of this ordinance shall constitute the issuance of a special use permit for the Property. The special use permit shall inure to the benefit of the owner or owners of the fee simple title to the Property as of the date on which this ordinance is adopted and their successors in fee simple title, all of which are hereinafter referred to as “the Owner.” The conditions contained in this ordinance shall be binding on the Owner.

§ 3. **Special Terms and Conditions.** This special use permit is conditioned on the following special terms and conditions:

(a) The Special Use of the Property shall be as a commercial building with off-street parking, substantially as shown on the Plans. Nightclub, dance hall, and adult uses shall not be permitted on the Property.

(b) No fewer than 43 parking spaces shall be provided for the Special Use, substantially as shown on the Plans.

(c) The height of the Special Use shall not exceed one story, substantially as shown on the Plans.

(d) All mechanical equipment serving the Property shall be located or screened so as not to be visible from any public right-of-way.

(e) All building materials, elevations, and site improvements, including landscaping, shall be substantially as shown on the Plans.

(f) Outdoor dining shall be permitted on the sidewalk on the Property abutting the commercial building, substantially as shown on the Plans, and on the patio area on the Property abutting the front of the commercial building, between the hours of 7:00 a.m. and 9:00 p.m.,

Monday through Sunday. Covered trash containers shall be provided for outdoor dining areas, and fences, walls, or vegetative screening shall be provided around outdoor dining areas, except at entrances and exits, to prevent refuse from blowing onto adjacent properties or streets. In no case shall chain link, chain link with slats, or any similar fencing be permitted.

(g) No live or amplified music shall be permitted inside or outside of the [commercial] building.

(h) Signs on the Property shall be regulated by the sign requirements for the B-2 Community Business District, pursuant to sections 30-505 and 30-514 of the Code of the City of Richmond (2020), as amended.

(i) Outdoor cooking shall not be permitted on the Property.

(j) Retail sale of beer and wine may take place as part of the Special Use, for off-premises consumption, subject to the regulations of the Virginia Alcoholic Beverage Control Authority, or its successor agency.

(k) Retail sale of beer and wine may take place as part of restaurant uses on the Property, for on-premises or off-premises consumption, subject to the regulations of the Virginia Alcoholic Beverage Control Authority, or its successor agency.

§ 4. **Supplemental Terms and Conditions.** This special use permit is conditioned on the following supplemental terms and conditions:

(a) All required final grading and drainage plans, together with all easements made necessary by such plans, must be approved by the Director of Public Utilities prior to the issuance of the building permit.

(b) Storm or surface water shall not be allowed to accumulate on the land. The Owner, at its sole cost and expense, shall provide and maintain at all times adequate facilities for the

drainage of storm or surface water from the Property so as not to adversely affect or damage any other property or public streets and the use thereof.

(c) Facilities for the collection of refuse shall be provided in accordance with the requirements of the Director of Public Works. Such facilities shall be located or screened so as not to be visible from adjacent properties and public streets.

(d) Any encroachments existing, proposed on the Plans or contemplated in the future shall require separate authorization and shall be subject to the applicable provisions of the Code of the City of Richmond (2020), as amended, and all future amendments to such laws.

(e) The Owner shall make improvements within the public right-of-way substantially as shown on the Plans, including the installation of sidewalk along Cranford Avenue, Broad Rock Boulevard, and Cooks Road, and of three on-street parking spaces along Cranford Avenue, which improvements may be completed in one or more phases as approved by the Director of Public Works. All improvements and work within the public right-of-way shall be (i) completed in accordance with the requirements of the Director of Public Works, (ii) considered completed only upon written confirmation by the Director of Public Works that such improvements and work are in accordance with such requirements, and (iii) transferred to the City, following the written confirmation by the Director of Public Works, pursuant to a transfer of interest document approved as to form by the City Attorney and accepted by the Chief Administrative Officer or the designee thereof on behalf of the City. The Chief Administrative Officer or the designee thereof, for and on behalf of the City, is hereby authorized to accept, in the manner for which this subsection provides, all improvements and work required by and meeting the requirements of this subsection. The final certificate of occupancy shall not be issued for the Property until all requirements of this subsection are fully satisfied.

(e) In all other respects, the use of the Property shall be in accordance with the applicable underlying zoning regulations.

§ 5. **General Terms and Conditions.** This special use permit is conditioned on the following general terms and conditions:

(a) No permit implementing this special use permit shall be approved until satisfactory evidence has been presented to the Zoning Administrator that any delinquent real estate taxes applicable to the Property have been paid.

(b) The Owner shall be bound by, shall observe and shall comply with all other laws, ordinances, rules and regulations applicable to the Property, except as otherwise expressly provided in this ordinance.

(c) Words and phrases used in this ordinance shall be interpreted to have the meanings ascribed to them by section 30-1220 of the Code of the City of Richmond (2020), as amended, unless the context clearly indicates that a different meaning is intended.

(d) Notwithstanding any other provision of law, this special use permit is being approved due, in part, to the mitigating effects of each and every condition attached hereto; consequently, if any portion of this ordinance is determined to be invalid for any reason by a final, non-appealable order of any Virginia or federal court of competent jurisdiction, the invalidity shall cause the entire ordinance to be void and of no further effect from the effective date of such order.

(e) The privileges granted by this ordinance may be revoked pursuant to the provisions of sections 30-1050.7 through 30-1050.11 of the Code of the City of Richmond (2020), as amended, and all future amendments to such laws. Failure to comply with the terms and conditions of this ordinance shall constitute a violation of section 30-1080 of the Code of the City of

Richmond (2020), as amended, and all future amendments to such law, or any other applicable laws or regulations.

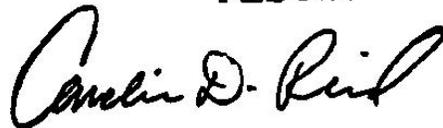
(f) When the privileges granted by this ordinance terminate and the special use permit granted hereby becomes null and void, whether as a result of the Owner relinquishing this special use permit in a writing addressed to the Director of Planning and Development Review or otherwise, use of the Property shall be governed thereafter by the zoning regulations prescribed for the district in which the Property is then situated.

§ 6. **Implementation.** The Commissioner of Buildings is authorized to issue a building permit substantially in accordance with the Plans for the Special Use subject to the terms and conditions set forth in this ordinance. An application for the building permit shall be made within 730 calendar days following the date on which this ordinance becomes effective. If either the application for the building permit is not made within the time period stated in the previous sentence or the building permit terminates under any provision of the Virginia Statewide Building Code, this ordinance and the special use permit granted hereby shall terminate and become null and void.

§ 7. **Effective Date.** This ordinance shall be in force and effect upon adoption.

A TRUE COPY:

TESTE:

A handwritten signature in black ink, appearing to read "Carol D. Reed". The signature is written in a cursive style with a large initial "C".

City Clerk



City of Richmond

900 East Broad Street
2nd Floor of City Hall
Richmond, VA 23219
www.rva.gov

Item Request File Number: PRE.2022.0055

O & R Request

DATE: March 14, 2022

EDITION: 1

TO: The Honorable Members of City Council

THROUGH: The Honorable Levar M. Stoney, Mayor (Mayor, by Request)
(This is no way reflects a recommendation on behalf of the Mayor.)

THROUGH: J.E. Lincoln Saunders, Chief Administrative Officer

THROUGH: Sharon L. Ebert, Deputy Chief Administrative Officer for Economic
Development and Planning

FROM: Kevin J. Vonck, Director, Department of Planning and Development Review

RE: To authorize the special use of the properties known as 2106, 2112, 2118, 2124 and 2100
Broad Rock Boulevard for the purpose of commercial building, with off-street parking, upon
certain terms and conditions.

ORD. OR RES. No. ____

PURPOSE: To authorize the special use of the properties known as 2106, 2112, 2118, 2124 and 2100
Broad Rock Boulevard for the purpose of commercial building, with off-street parking, upon certain terms
and conditions.

REASON: The applicant is requesting a Special Use Permit for the purpose of for the purpose of a
commercial building, with off-street parking, within a B-2 Community Business and an R-4 Single-Family
Residential zoning districts. Those portions that are within the R-4 district are not a permitted use, a Special
Use Permit is therefore required.

RECOMMENDATION: In accordance with the requirements of the City Charter and the Zoning
Ordinance, the City Planning Commission will review this request and make a recommendation to City
Council. This item will be scheduled for consideration by the Commission at its May 2, 2022, meeting.

BACKGROUND: The properties, together, are a combined 44,431 sq. ft. (1.02 acre) parcel of land. The property is located in the McGuire Manor neighborhood. Three of the five parcels are improved including 2100 Broad Rock Boulevard which includes a 661 sq. ft. dwelling constructed in 1947. 2106 Broad Rock Boulevard is improved with a 1,120 sq. ft. commercial building constructed in 1950. 2112 Broad Rock Boulevard includes a 2,780 sq. ft. commercial building constructed in 1969, and 2124 Broad Rock Boulevard is improved with a 456 sq. ft. commercial building constructed in 2012.

The City's Richmond 300 Master Plan designates a future land use for the subject property as Residential which is defined as a "neighborhood consisting primarily of single-family houses on large- or medium-sized lots more homogeneous in nature."

Intensity: Buildings are generally one to three stories. Lot sizes generally range up to 5,000 to 20,000+ sq. ft. Residential density of 2 to 10 housing units per acre.

Primary Uses: Single-family houses, accessory dwelling units, and open space.

Secondary Uses: Duplexes and small multi-family buildings (typically 3-10 units), institutional, and cultural. Secondary uses may be found along major streets

The current zoning for the properties in question is B-2 Community Business and an R-4 Single-Family Residential. Adjacent properties are located within primarily R-4 Single-Family Residential.

FISCAL IMPACT / COST: The Department of Planning and Development Review does not anticipate any impact to the City's budget for this or future fiscal years.

FISCAL IMPLICATIONS: Staff time for processing the request; preparation of draft ordinance; and publishing, mailing and posting of public notices.

BUDGET AMENDMENT NECESSARY: No

REVENUE TO CITY: \$2,400 application fee

DESIRED EFFECTIVE DATE: Upon adoption

REQUESTED INTRODUCTION DATE: April 11, 2022

CITY COUNCIL PUBLIC HEARING DATE: May 9, 2022

REQUESTED AGENDA: Consent

RECOMMENDED COUNCIL COMMITTEE: None

CONSIDERATION BY OTHER GOVERNMENTAL ENTITIES: City Planning Commission
May 2, 2022

AFFECTED AGENCIES: Office of Chief Administrative Officer
Law Department (for review of draft ordinance)

RELATIONSHIP TO EXISTING ORD. OR RES.: None

REQUIRED CHANGES TO WORK PROGRAM(S): None

ATTACHMENTS: Application Form, Applicant's Report, Draft Ordinance, Plans, Survey, Map

STAFF: Jonathan Brown, Senior Planner, Land Use Administration (Room 511) 646-5734

**Application for SPECIAL USE PERMIT**

Department of Planning and Development Review

Land Use Administration Division

900 E. Broad Street, Room 511

Richmond, Virginia 23219

(804) 646-6304

<http://www.richmondgov.com/>

Application is hereby submitted for: (check one)

- special use permit, new**
 special use permit, plan amendment
 special use permit, text only amendment

Project Name/LocationProperty Address: 2100 Broad Rock BoulevardDate: 11-10-2020Tax Map #: C0060542008 Fee: \$2,400.00Total area of affected site in acres: 0.18 acres(See **page 6** for fee schedule, please make check payable to the "City of Richmond")**Zoning**Current Zoning: R-4; ResidentialExisting Use: Residential**Proposed Use**

(Please include a detailed description of the proposed use in the required applicant's report)

Subject parcel is part of an overall 5 lot commercial retail strip center development. Total building square footage on all 5 parcels is 13,520.Existing Use: Residential

Is this property subject to any previous land use cases?

Yes

No

If Yes, please list the Ordinance Number: _____

Applicant/Contact Person: Chris ThompsonCompany: The Site Design CompanyMailing Address: 268 High StreetCity: PetersburgState: VAZip Code: 23803Telephone: (804) 720-9040Fax: ()Email: thompson@sitedesignco.com**Property Owner:** Eric Investment Company, Inc.If Business Entity, name and title of authorized signee: RAUL RAMOS - OWNER

(The person or persons executing or attesting the execution of this Application on behalf of the Company certifies that he or she has or have been duly authorized and empowered to so execute or attest.)

Mailing Address: P.O. BOX 2982City: CHESTERState: VAZip Code: 23831Telephone: (804) 909-3633Fax: ()Email: ADVENGRLLC@GMAIL.COM**Property Owner Signature:** Raul RamosThe names, addresses, telephone numbers and signatures of all owners of the property are required. Please attach additional sheets as needed. If a legal representative signs for a property owner, please attach an executed power of attorney. **Faxed or photocopied signatures will not be accepted.****NOTE:** Please attach the required plans, checklist, and a check for the application fee (see Filing Procedures for special use permits)



The Site Design Company

CIVIL ENGINEERING AND LAND DEVELOPMENT CONSULTING

February 5, 2021

Department of Planning and Development Review
Land Use Administration Division, Room 511
Attn: Jonathan Brown – Senior Planner
900 East Broad Street
Richmond, VA 23219

RE: SUP for Broad Rock Boulevard Retail Center – 2100 Broad Rock Boulevard

A Special Use Permit (SUP) is being requested for a proposed commercial development located along Broad Rock Boulevard, between Cooks Road and Cranford Avenue. The development will consist of a single 13,520 square foot building divided into 7 units along with associated site improvements to support the project. The subject development will occur on (5) parcels addressed as 2100, 2106, 2112, 2118 and 2124 Broad Rock Boulevard with a total area of 1.01 acres for all (5) parcels. Parcels addressed as 2106 through 2124 are zoned B-2 and the proposed development is allowed by-right within this district. The SUP is being requested due to the remaining parcel at 2100 Broad Rock Boulevard being zoned R-4.

A summary of parcels involved in the project is as follows:

- 2100 Broad Rock Boulevard: Parcel ID C0060542008, **Zoned R-4**, 0.18 acres
- 2106 Broad Rock Boulevard: Parcel ID C0060542010, Zoned B-2, 0.18 acres
- 2112 Broad Rock Boulevard: Parcel ID C0060542012, Zoned B-2, 0.23 acres
- 2118 Broad Rock Boulevard: Parcel ID C0060542014, Zoned B-2, 0.23 acres
- 2124 Broad Rock Boulevard: Parcel ID C0060542016, Zoned B-2, 0.20 acres

The City Charter specifies certain conditions must be met before City Council can approve a special use permit. It must be shown that the proposed special use will **NOT** meet certain conditions. Those conditions and how the proposed development addresses these conditions are as follows:

- *Be detrimental to the safety, health, morals and general welfare of the community involved*
 - The proposed development does not meet this condition. The development will provide a new commercial location for residents to visit. The site and building will be designed in accordance with current city standards for the corridor in order to fit well within the overall vision for Broad Rock Boulevard.
- *Tend to create congestion in streets, roads, alleys and other public ways and places in the area involved*
 - The proposed development does not meet this condition. Utilizing the 8th Edition ITE Manual (ITE code 820), the proposed commercial development will generate approximately 567 Average Daily Trips with peak traffic occurring in the afternoon at a rate of 44 Vehicles Per Hour (total in and out trips). The development has been designed to allow vehicles to enter from Cooks Road as well as directly from Broad Rock Boulevard. Vehicles traveling northbound on Broad Rock will likely utilize the existing crossover, turning on Cooks Road, to enter the development from Cooks Road. Vehicles traveling southbound on Broad Rock Boulevard will likely utilize the direct access from Broad Rock Boulevard. This design concept will split traffic accessing the development to not overburden any single point of entry or surrounding roadway.
- *Create hazards from fire, panic or other dangers*
 - The proposed development does not meet this condition. The proposed development will meet all local and federal codes for safety.
- *Tend to cause overcrowding of land and an undue concentration of population*

- The proposed development does not meet this condition. The proposed development will combine the 5 lots into one single development while meeting setback as well as parking requirements for a typical B-2 District development.
- *Adversely affect or interfere with public or private schools, parks, playgrounds, water supplies, sewage disposal, transportation or other public requirements, conveniences and improvements*
 - The proposed development does not meet this condition. The project is minor in scope and will not overburden any public or private infrastructure within the city.
- *Interfere with adequate light and air*
 - The proposed development does not meet this condition. The proposed building and surrounding parking lot will meet all required open space as well as lighting standards.

In addition to the items noted above, the developer will be making the following improvements along the perimeter of the subject development:

- Consolidating (4) individual entrances along Broad Rock Boulevard to a single point of access into the commercial development. This will improve traffic flow on Broad Rock Boulevard.
- Replacing the existing sidewalk along Broad Rock Boulevard
- Installing an ornamental fence along the frontage of Broad Rock Boulevard, Cooks Road and Cranford Avenue.
- Installing a privacy fence along the rear of the site which is adjacent to residential property.

The developer is sensitive to the proposed project being adjacent to residential property at the rear of the site. As a result, lower level building lighting will be used on the rear of the building to adequately light the service alley while avoiding light spillover into the residential property. A photometric plan has been included in the site plan submittal which provides an analysis of the proposed light levels along the adjacent residential property line.

We appreciate your consideration of our Special Use Permit request and look forward to hearing from you. Please feel free to reach out to me at thompson@sitedesignco.com or 804-720-9040 if you have any questions or would like to discuss the project.

Sincerely,



Christopher I. Thompson, P.E.
President

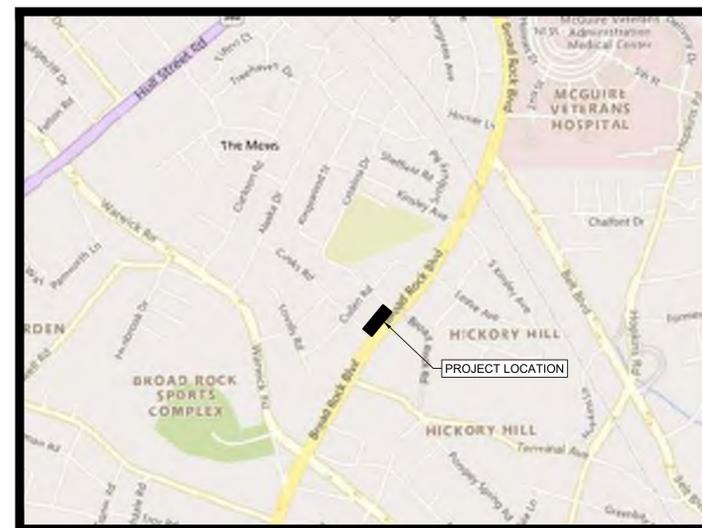


PLAN OF DEVELOPMENT FOR BROAD ROCK BOULEVARD RETAIL CENTER

2100 BROAD ROCK BOULEVARD RICHMOND GATEWAY 9TH DISTRICT CITY OF RICHMOND, VIRGINIA

SITE DATA

- OWNER / DEVELOPER:
ERIC INVESTMENT COMPANY, LLC
4354 STATELY OAK ROAD
NORTH CHESTERFIELD, VA 23234
CONTACT: RAUL RAMOS
- PLANS PREPARED BY:
THE SITE DESIGN COMPANY
268 HIGH STREET
PETERSBURG, VIRGINIA 23803
TELE: 804.720.9040
EMAIL: thompson@sitedesignco.com
CONTACT: CHRIS THOMPSON
- PARCEL ADDRESS: 2100 BROAD ROCK BOULEVARD
- PARCEL ACREAGE: 1.01 ACRES
- DISTURBED AREA: 1.18 ACRES (INCLUDING RIGHT-OF-WAY)
- IMPERVIOUS COVER:
PRE-DEVELOPED = 0.66 ACRES
POST-DEVELOPED = 0.92 ACRES
- UTILITIES: PUBLIC WATER AND SEWER
- BOUNDARY & TOPOGRAPHIC SURVEY:
PERFORMED BY HALDER SURVEYS -
CONTACT: RON LANG
PHONE: 804.720.1995
EMAIL: ron.lang@halder-surveys.com
- DATUM REFERENCE:
HORIZONTAL: NAD83 VIRGINIA STATE PLANE SOUTH ZONE
VERTICAL: NAVD88
- FLOOD ZONE: THE REFERENCED PROPERTY LIES WITHIN "ZONE X" (AREAS DETERMINED OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN) ACCORDING TO THE FEMA FLOOD INSURANCE RATE MAP NUMBER 5101290076D, EFFECTIVE DATE APRIL 2, 2009.
- WETLANDS DO NOT EXIST ON THE PROPERTY AND THERE ARE NO WETLAND IMPACTS ASSOCIATED WITH LAND DISTURBANCE FOR THIS DEVELOPMENT.
- RMA/RPA: THE ENTIRE SITE LIES OUTSIDE OF THE CITY DESIGNATED RMA AND THE CITY DESIGNATED RPA PER THE CITY'S CHESAPEAKE BAY PRESERVATION AREAS MAP.
- COORDINATES: LAT: N 37.487472, LONG: W 77.475428



VICINITY MAP

SCALE: 1"=1000'

SHEET INDEX	
Sheet Number	Sheet Title
C1.0	COVER SHEET
C2.0	EXISTING CONDITIONS PLAN
C2.1	DEMOLITION AND PHASE 1 E&S PLAN
C2.2	EROSION CONTROL NOTES AND DETAILS
C2.3	EROSION CONTROL NOTES AND DETAILS
C3.0	LAYOUT PLAN
C3.1	SITE NOTES AND DETAILS
C3.2	SITE NOTES AND DETAILS
C4.0	UTILITY PLAN
C4.1	UTILITY NOTES AND DETAILS
C4.2	UTILITY NOTES AND DETAILS
C5.0	GRADING AND DRAINAGE PLAN
C6.0	PROFILES
C7.0	HYDROLOGY AND PHASE 2 E&S PLAN
C8.0	STORMWATER QUALITY ANALYSIS
C8.1	STORMWATER QUANTITY ANALYSIS
C8.2	STORMWATER MANAGEMENT NOTES AND DETAILS
C8.3	STORMWATER MANAGEMENT NOTES AND DETAILS
C8.4	STORMWATER MANAGEMENT NOTES AND DETAILS
C9.0	STORMWATER POLLUTION PREVENTION PLAN
C9.1	STORMWATER POLLUTION PREVENTION NOTES AND DETAILS
L1.0	LANDSCAPE PLAN
L1.1	LANDSCAPE SPECIFICATIONS
L1.2	LANDSCAPE SPECIFICATIONS
L2.0	SITE LIGHTING PLAN
L2.1	SITE LIGHTING NOTES AND DETAILS
L2.2	SITE LIGHTING NOTES AND DETAILS
L2.3	SITE LIGHTING NOTES AND DETAILS

CITY OF RICHMOND PROJECT NOTES

- ZONING: B-2 (COMMERCIAL) & R-4 (RESIDENTIAL)
 PARCEL ID #: C0060542008, C0060542010, C0060542012, C0060542014, C0060542016
 PROJECT SUMMARY: 13,520 SF COMMERCIAL RETAIL CENTER
 EXISTING USE: COMMERCIAL AND RESIDENTIAL
 PROPOSED USE: COMMERCIAL
 ACREAGE: 1.01
 BUILDINGS:
- EXISTING: COMMERCIAL AND RESIDENTIAL (TO BE REMOVED)
 - PROPOSED: 13,520 SQUARE FOOT
1 - STORY
- PARKING SUMMARY:
- REQUIRED: 1 SPACE PER 300 SF
 - REQUIRED: 13,520 SF / 300 SF = 45 SPACES
 - PROVIDED: 45 SPACES

C.B.P.A. COMPLIANCE NOTE

STORMWATER COMPLIANCE HAS BEEN SATISFIED THROUGH THE PURCHASE OF 0.77 LBS OF NUTRIENT CREDITS FROM A DEQ APPROVED NUTRIENT CREDIT BANK.

REQUIRED PERMITS

- SPECIAL USE PERMIT
- BUILDING PERMIT
- MECHANICAL PERMIT
- ELECTRICAL PERMIT
- PLUMBING PERMIT
- LAND DISTURBANCE PERMIT
- WORK IN STREET PERMIT

CITY APPROVALS



The Site Design Company
 CIVIL ENGINEERING AND LAND DEVELOPMENT CONSULTING
 268 HIGH STREET - PETERSBURG, VIRGINIA 23803
 www.sitedesignco.com



EMAIL: thompson@sitedesignco.com

PHONE: 804-720-9040

PROJECT MANAGER: CHRIS THOMPSON

PROJECT #: 20038

DATE: FEBRUARY 5, 2021

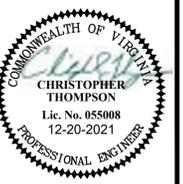
REVISION BLOCK

DATE	REVISION
10-07-21	CITY COMMENTS
12-20-21	CITY COMMENTS

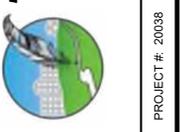
**BROAD ROCK BOULEVARD
 RETAIL CENTER**
 CITY OF RICHMOND, VA

COVER SHEET

SHEET NO.
C1.0



The Site Design Company
 CIVIL ENGINEERING AND LAND DEVELOPMENT CONSULTING
 288 HIGH STREET - PETERSBURG, VIRGINIA 23803
 www.sitedesignco.com



PROJECT # : 20038
 PROJECT MANAGER : CHRIS THOMPSON
 PHONE : 804-720-9040
 EMAIL : thompson@thedesignco.com

DATE : FEBRUARY 5, 2021

REVISION BLOCK

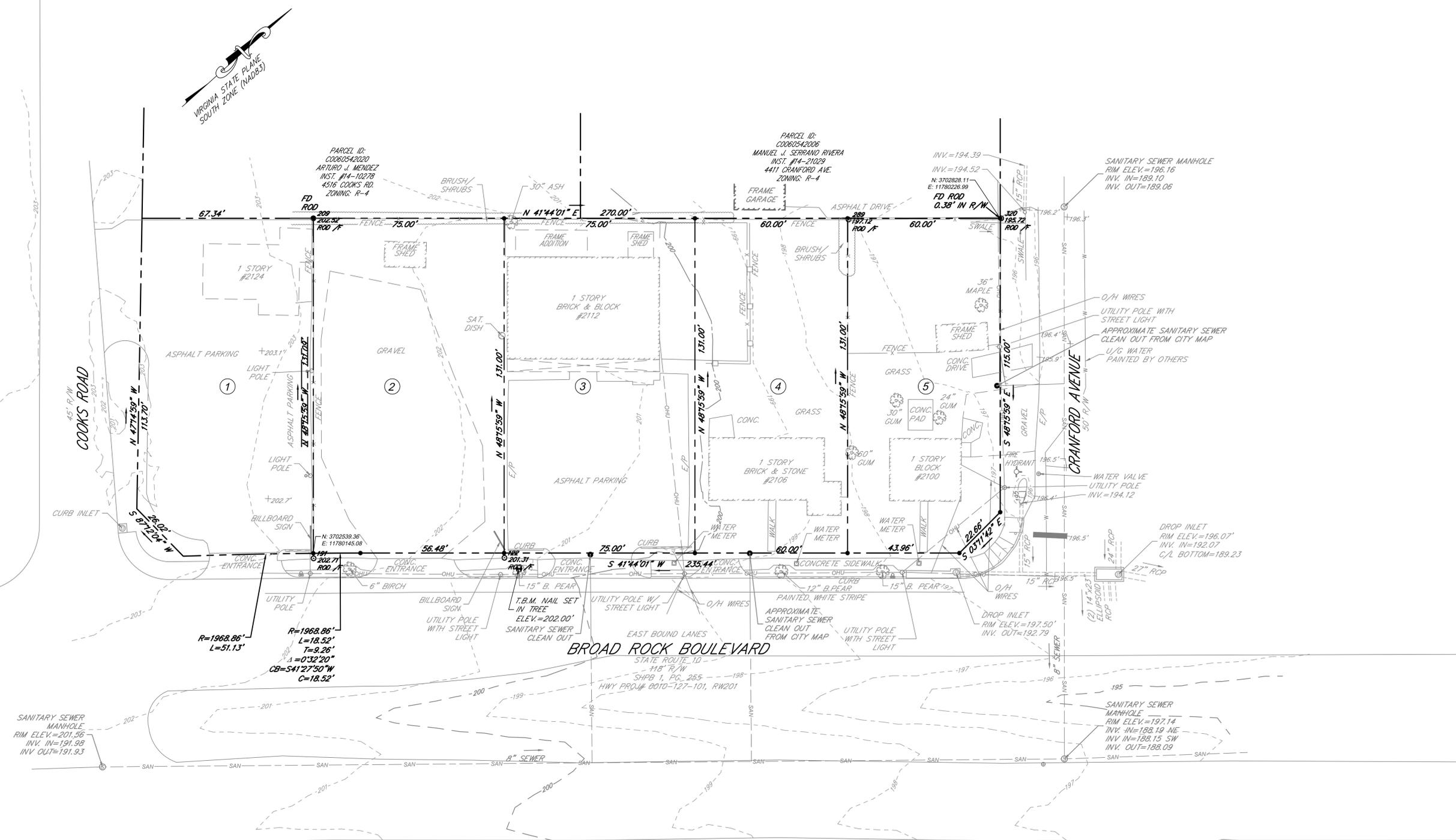
10-07-21	CITY COMMENTS
12-20-21	CITY COMMENTS

**BROAD ROCK BOULEVARD
 RETAIL CENTER**
 CITY OF RICHMOND, VA

EXISTING CONDITIONS PLAN

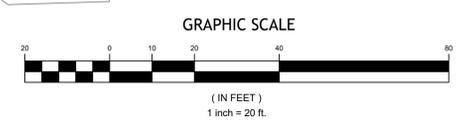
SHEET NO.
C2.0

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- ① **0.2032 AC.**
 PARCEL ID: C0060542016
 ERIC INVESTMENT COMPANY, INC
 2124 BROAD ROCK BLVD.
 ZONING: B-2
- ② **0.2256 AC.**
 PARCEL ID: C0060542014
 ERIC INVESTMENT COMPANY, INC
 INST. #14-3041
 PART OF LOT 5, BLK A
 2118 BROAD ROCK BLVD.
 ZONING: B-2
- ③ **0.2256 AC.**
 PARCEL ID: C0060542012
 ERIC INVESTMENT COMPANY, INC
 INST. #14-3011
 PART OF LOT 6, BLK A
 2112 BROAD ROCK BLVD.
 ZONING: B-2
- ④ **0.1804 AC.**
 PARCEL ID: C0060542010
 ERIC INVESTMENT COMPANY, INC
 INST. #14-3011
 2106 BROAD ROCK BLVD.
 ZONING: B-2
- ⑤ **0.1775 AC.**
 PARCEL ID: C0060542008
 ERIC INVESTMENT COMPANY, INC
 INST. #17-11136
 2100 BROAD ROCK BLVD.
 ZONING: R-4

REFERENCE PLAT
 CRANFORD HEIGHTS
 P.B. 8, PG. 148 (CC)



MISS UTILITY OF VIRGINIA

CONTRACTOR SHALL CALL "MISS UTILITY" 48 HOURS PRIOR TO THE START OF EXCAVATION. CONTRACTOR SHALL VERIFY LOCATION AND ELEVATION OF ALL UNDERGROUND UTILITIES SHOWN ON PLANS IN AREAS OF CONSTRUCTION PRIOR TO STARTING WORK. CONTACT THE ENGINEER IMMEDIATELY IF THE LOCATION OR ELEVATION IS DIFFERENT FROM THAT SHOWN ON THE PLAN. IF THERE APPEARS TO BE A CONFLICT, AND/OR UPON DISCOVERY OF ANY UTILITY NOT SHOWN ON PLAN, CONTACT MISS UTILITY OF VIRGINIA: 1-800-552-7001 (TOLL FREE)

PHASE 1 SEQUENCE OF CONSTRUCTION

1. APPLY FOR A RICHMOND STORMWATER MANAGEMENT PERMIT (RSMP) WITH THE CITY OF RICHMOND DEPARTMENT OF PUBLIC UTILITIES - WATER RESOURCES DIVISION. THE SITE MUST BE REGISTERED PRIOR TO THE START OF CONSTRUCTION ACTIVITIES. A PRE-CONSTRUCTION CONFERENCE IS MANDATORY BEFORE ANY WORK IS DONE AT THE SITE. ARRANGE MEETING WITH THE OWNER, RSMP CONSTRUCTION ACTIVITY OPERATOR, CERTIFIED RESPONSIBLE LAND DISTURBER (CRLD) AND THE CITY INSPECTOR. THE OWNER MUST GIVE THE CITY INSPECTOR 48 HOURS NOTIFICATION TO SCHEDULE AN ON-SITE PRE-CONSTRUCTION MEETING.
2. AT THE TIME OF THE PRE-CONSTRUCTION MEETING, TWO STANDARD SIGNS MUST BE INSTALLED ON EACH SIDE OF THE CONSTRUCTION ACCESS. THESE SIGNS SHOULD STATE EITHER "CONSTRUCTION ENTRANCE AHEAD" OR "TRUCKS ENTERING HIGHWAY".
3. DEMOLITION AND STRIPPING OPERATIONS SHOULD NOT BEGIN UNTIL AFTER THE ISSUANCE OF A LAND DISTURBANCE PERMIT AND THE INSTALLATION OF THE APPROVED EROSION CONTROL DEVICES.
4. INSTALL CONSTRUCTION ENTRANCE, CONCRETE WASHOUT, SILT FENCE, INLET PROTECTION, AND CULVERT INLET PROTECTION WHERE INDICATED ON PLAN.
5. DISTURB ONLY THE PORTION OF THE SITE NEEDED TO INSTALL THE PERIMETER EROSION CONTROL DEVICES. DISTURBANCE OUTSIDE OF THE PRELIMINARY LIMITS OF DISTURBANCE IS NOT ALLOWED UNTIL ALL PERIMETER MEASURES ARE INSTALLED AND INSPECTED BY THE CITY.
6. STRIP SITE AS REQUIRED AND PERFORM ALL DEMOLITION OPERATIONS TO FINAL LIMITS OF CLEARING. TEMPORARILY STOCKPILE SOIL ON SITE. STOCKPILES SHALL REMAIN IN PLACE NO LONGER THAN 1 YEAR FROM THE PLAN APPROVAL DATE. STABILIZE ALL STOCKPILES WITH TEMPORARY SEEDING AND A PERIMETER OF SILT FENCE.
7. UPON COMPLETION OF THE PHASE 1 EROSION CONTROL PLAN, THE CERTIFIED RESPONSIBLE LAND DISTURBER SHALL NOTIFY AND ACCOMPANY THE CITY INSPECTOR ON A SITE WALK-THRU PRIOR TO PROCEEDING WITH EROSION CONTROL PHASE II.

EROSION CONTROL LEGEND

CE		CONSTRUCTION ENTRANCE	3.02
SF		SILT FENCE	3.05
IP		INLET PROTECTION	3.07
CIP		CULVERT INLET PROTECTION	3.08
TS		TEMPORARY SEEDING	3.31

* VIRGINIA EROSION & SEDIMENT CONTROL HANDBOOK SPECIFICATION NUMBER

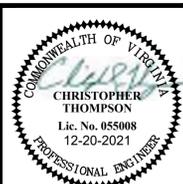
DEMOLITION LEGEND AND NOTES

X	DENOTES EXISTING ITEM TO BE REMOVED
	DENOTES AREA OF EXISTING PAVEMENT / CONCRETE TO BE REMOVED

DEMOLITION NOTES:
ALL ITEMS IN BOLD PRINT TO BE DEMOLISHED OR REMOVED AS INDICATED ON THIS PLAN SHEET AND SHALL BE EXCAVATED ACCORDING TO THE GRADING PLAN AND PAVEMENT DETAILS.

CONTRACTOR WILL TAKE MEASURES NECESSARY TO PROTECT EXISTING UTILITIES AND OTHER REMAINING STRUCTURES DURING DEMOLITION AND CONSTRUCTION PHASES.

ASPHALT, CONCRETE, AND OTHER DEBRIS SHALL BE DISPOSED OF AT AN APPROVED LANDFILL LOCATION.



The Site Design Company
CIVIL ENGINEERING AND LAND DEVELOPMENT CONSULTING
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EMAIL: thompson@sitedesignco.com
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PROJECT # : 20038
PROJECT MANAGER : CHRIS THOMPSON

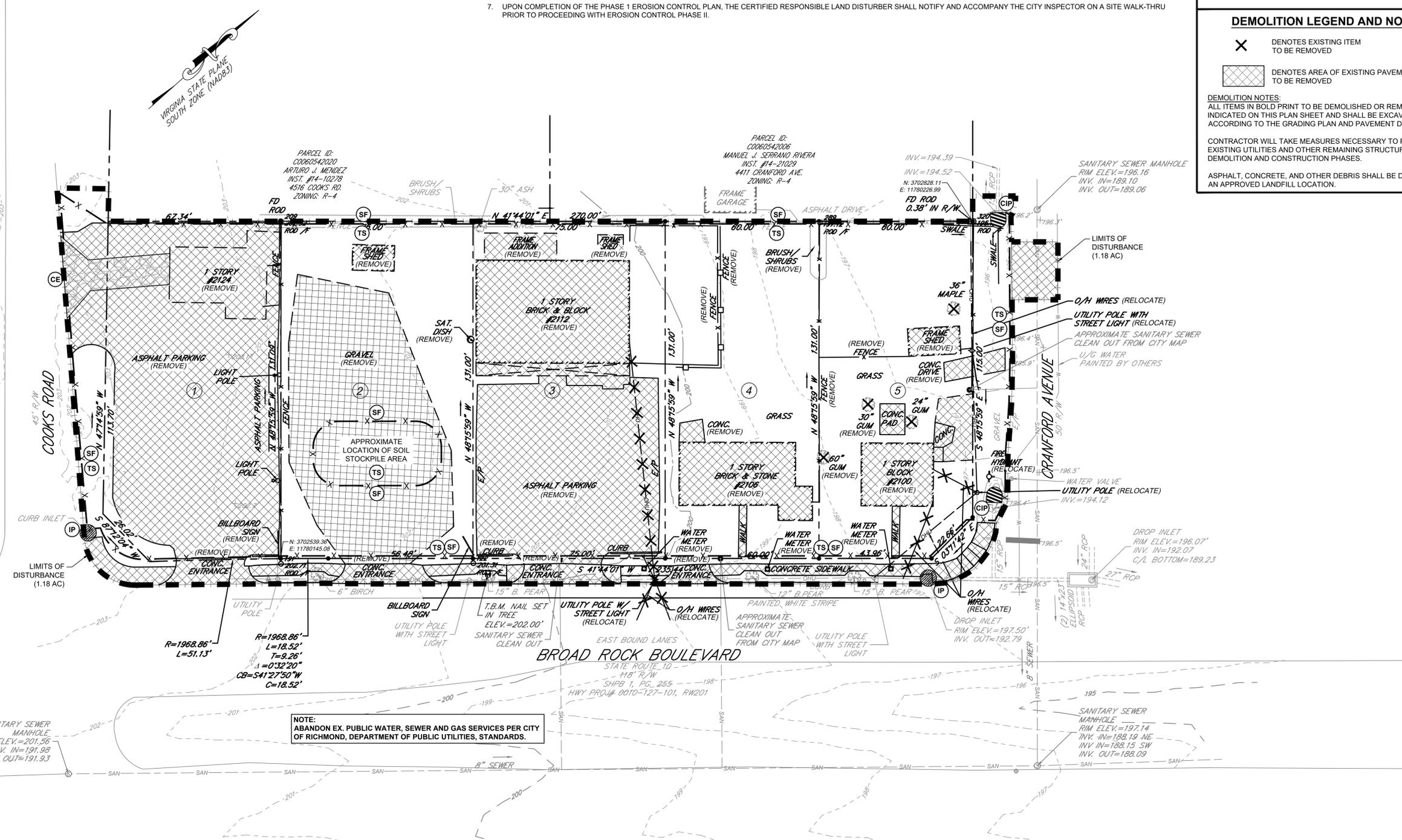


DATE : FEBRUARY 5, 2021

REVISION BLOCK	
10-07-21	CITY COMMENTS
12-20-21	CITY COMMENTS

**BROAD ROCK BOULEVARD
RETAIL CENTER**
CITY OF RICHMOND, VA
DEMOLITION AND PHASE 1 E&S PLAN

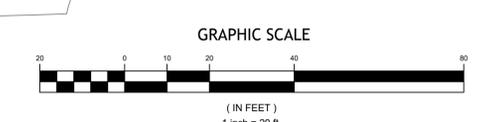
SHEET NO.
C2.1



NOTE:
ABANDON EX. PUBLIC WATER, SEWER AND GAS SERVICES PER CITY OF RICHMOND, DEPARTMENT OF PUBLIC UTILITIES, STANDARDS.

- ① 0.2032 AC.
PARCEL ID: CO060542016
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2124 BROAD ROCK BLVD.
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ZONING: B-2
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ERIC INVESTMENT COMPANY, INC
INST. #17-11136
2100 BROAD ROCK BLVD.
ZONING: R-4

REFERENCE PLAT
CRANFORD HEIGHTS
P.B. 8, PG. 148 (CC)



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EROSION CONTROL NARRATIVE

PROJECT DESCRIPTION

THE PROJECT IS LOCATED OFF OF BROAD ROCK BOULEVARD BETWEEN COOKS ROAD AND CRANFORD AVENUE. THE PURPOSE OF THIS PROJECT IS TO CREATE A COMMERCIAL RETAIL CENTER. THE LIMITS OF DISTURBANCE ASSOCIATED WITH CONSTRUCTION OF THE ACCESS ROADS IS APPROXIMATELY 1.18 +/- ACRES.

EXISTING SITE CONDITIONS

THE EXISTING SITE HAS TWO OUTFALLS, ONE TO THE NORTHEAST THAT OUTFALLS TO AN EXISTING 15" CULVERT ALONG CRANFORD AVENUE AND THE OTHER TO THE SOUTHEAST THAT OUTFALLS TO AN EXISTING PIPE SYSTEM AT THE INTERSECTION OF BROAD ROCK BOULEVARD AND CRANFORD AVENUE.

ADJACENT AREAS

THE SITE IS BORDERED BY BROAD ROCK BOULEVARD TO THE SOUTH, COOKS ROAD TO THE WEST, RESIDENTIAL PROPERTIES TO THE NORTH AND CRANFORD AVENUE TO THE EAST.

OFF-SITE AREAS

NO OFFSITE AREAS ARE ANTICIPATED TO BE IMPACTED WITH THE CONSTRUCTION PROJECT.

SOILS

REFER TO SOIL MAP ON THIS SHEET.

CRITICAL EROSION AREAS

THERE ARE NO CRITICAL EROSION AREAS WITHIN THE LIMITS OF DISTURBANCE FOR THE SITE.

OTHER POTENTIAL POLLUTION SOURCES

OTHER POTENTIAL POLLUTION SOURCES INCLUDE THE STORAGE OF FERTILIZER ON-SITE USED IN ESTABLISHING TEMPORARY AND PERMANENT SEEDING.

DISCHARGE FROM INDUSTRIAL ACTIVITY

NO DISCHARGES FROM INDUSTRIAL ACTIVITIES ARE ANTICIPATED ON THIS PROJECT OTHER THAN NORMAL CONSTRUCTION PRACTICES.

EROSION AND SEDIMENT CONTROL MEASURES

THE PHASE 1 EROSION AND SEDIMENT CONTROL MEASURES WILL BE DESIGNED TO RETAIN SEDIMENT ON-SITE TO THE MAXIMUM EXTENT PRACTICABLE. ALL PERIMETER EROSION CONTROL MEASURES MUST BE PROPERLY SELECTED, INSTALLED, AND MAINTAINED IN ACCORDANCE WITH THE MANUFACTURERS' SPECIFICATIONS AND GOOD ENGINEERING PRACTICES. IF PERIODIC INSPECTIONS OR OTHER INFORMATION INDICATES A CONTROL HAS BEEN USED INAPPROPRIATELY OR INCORRECTLY, THE CONTRACTOR MUST REPLACE OR MODIFY THE CONTROL FOR SITE SPECIFIC SITUATIONS IF SEDIMENT ESCAPES THE CONSTRUCTION SITE. OFF-SITE ACCUMULATIONS OF SEDIMENT MUST BE REMOVED AT A FREQUENCY SUFFICIENT TO MINIMIZE OFF-SITE IMPACTS (E.G. CONSTRUCTION RELATED SEDIMENT COULD BE WASHED ONTO THE ADJOINING ROADWAY DURING THE NEXT RAIN AND POSE A SAFETY HAZARD). LITTER, CONSTRUCTION DEBRIS, AND CONSTRUCTION CHEMICALS EXPOSED TO STORMWATER SHALL BE PREVENTED FROM BECOMING A POLLUTANT SOURCE FOR STORMWATER DISCHARGES BY SCREENING OUTFALLS AND PICKING UP LITTER DAILY.

STRUCTURAL PRACTICES

THE FOLLOWING MEASURES MAY BE USED AS SPECIFIED IN THESE PLANS TO CONTROL EROSION AND SEDIMENT-LADEN RUNOFF ON THIS PROJECT. SEE THE EROSION & SEDIMENT CONTROL PLAN FOR LOCATIONS OF SPECIFIC EROSION CONTROL MEASURES.

PERMANENT STABILIZATION

AFTER CONSTRUCTION IS COMPLETED, OR IN ROUGH-GRADED AREAS WHICH WILL NOT BE BROUGHT TO FINAL GRADE FOR A YEAR OR MORE, PERMANENT SEEDING WILL BE USED TO STABILIZE DISTURBED AREAS. PERMANENT SEEDING INCLUDES LIME FERTILIZER, SEEDING, AND MULCH. SEE SEEDING SPECIFICATIONS FOR PERMANENT SEEDING. PROVIDE SOIL TEST TO DETERMINE THE SOIL AMENDMENTS REQUIRED FOR THIS PROJECT. SEE STANDARD AND SPECIFICATION 3.32 OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK FOR ADDITIONAL INFORMATION AND REQUIREMENTS. ALSO REFER TO ESC TECHNICAL BULLETIN #4 - NUTRIENT MANAGEMENT FOR DEVELOPMENT SITES FOR UPDATED SEEDING SPECIFICATIONS. ALL AREAS THAT ARE NOT ASPHALT OR GRAVEL WILL BE SEED AS DESCRIBED ABOVE.

MAINTENANCE

EROSION CONTROL MEASURES WILL BE CHECKED DAILY AND AFTER EACH RUNOFF-PRODUCING RAINFALL EVENT BY THE CONTRACTOR. THEY WILL BE REPAIRED/REINSTALLED AS NECESSARY TO PREVENT ANY SILT OR MUD FROM LEAVING THE CONSTRUCTION AREA FOR THE DURATION OF CONSTRUCTION. INSPECTIONS OF THE EROSION AND SEDIMENT CONTROL MEASURES WILL BE PERFORMED BY THE CONTRACTOR ONCE EVERY FOUR (4) BUSINESS DAYS, OR ONCE EVERY (5) BUSINESS DAYS AND WITHIN 24 HOURS FOLLOWING A RAINFALL EVENT IN EXCESS OF 0.25 INCHES.

3.02 CONSTRUCTION ENTRANCE

1. 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 TOP DRESSING WITH ADDITIONAL STONE OR THE WASHING AND REWORKING OF EXISTING STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY STRUCTURES USED TO TRAP SEDIMENT.
2. ALL MATERIALS SPILLED, DROPPED, WASHED, OR TRACKED FROM VEHICLES ONTO ROADWAYS OR INTO STORM DRAINS MUST BE REMOVED IMMEDIATELY.
3. THE USE OF WATER TRUCKS TO REMOVE MATERIALS DROPPED, WASHED, OR TRACKED ONTO ROADWAYS WILL NOT BE PERMITTED UNDER ANY CIRCUMSTANCES.

3.05 SILT FENCE

1. SILT FENCES SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL.
2. ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY.
3. CLOSE ATTENTION SHALL BE PAID TO THE REPAIR OF DAMAGED SILT FENCE RESULTING FROM END RUNS AND UNDERCUTTING.
4. SHOULD THE FABRIC ON A SILT FENCE DECOMPOSE OR BECOME INEFFECTIVE PRIOR TO THE END OF THE EXPECTED USEFUL LIFE AND THE BARRIER STILL BE NECESSARY, THE FABRIC SHALL BE REPLACED PROMPTLY.
5. SEDIMENT DEPOSITS SHOULD BE REMOVED AFTER EACH STORM EVENT. THEY 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 IS NO LONGER REQUIRED SHALL BE DRESSED TO CONFORM WITH THE EXISTING GRADE, PREPARED AND SEEDDED.

3.07 STORM DRAIN INLET PROTECTION

1. THE STRUCTURE SHALL BE INSPECTED AFTER EACH RAIN AND REPAIRS MADE AS NEEDED.
2. 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.
3. STRUCTURES SHALL BE REMOVED AND THE AREA STABILIZED WHEN THE REMAINING DRAINAGE AREA HAS BEEN PROPERLY STABILIZED.

3.08 CULVERT INLET PROTECTION

1. THE STRUCTURE SHALL BE INSPECTED AFTER EACH RAIN AND REPAIRS MADE AS NEEDED.
2. AGGREGATE SHALL BE REPLACED OR CLEANED WHEN INSPECTION REVEALS THAT CLOGGED VOIDS ARE CAUSING PONDING PROBLEMS WHICH INTERFERE WITH ON-SITE CONSTRUCTION.
3. SEDIMENT SHALL BE REMOVED AND THE IMPOUNDMENT RESTORED TO ITS ORIGINAL DIMENSIONS WHEN SEDIMENT HAS ACCUMULATED TO ONE-HALF THE DESIGN DEPTH. REMOVED SEDIMENT SHALL BE DEPOSITED IN A SUITABLE AREA AND IN SUCH A MANNER THAT IT WILL NOT ERODE AND CAUSE SEDIMENTATION PROBLEMS.

3.32 PERMANENT SEEDING

NEW SEEDINGS SHALL BE SUPPLIED WITH ADEQUATE MOISTURE. OVER-SEEDING AND FERTILIZING IF COVER IS INADEQUATE TO PREVENT EROSION. TEST THE SOIL AND REEVALUATE PLANT MATERIALS AND QUANTITIES OF LIME AND FERTILIZER IF STAND HAS LESS THAN 40% COVER. RE-SEED AREAS THAT FAIL TO ESTABLISH ADEQUATE VEGETATIVE COVER.

MULCHING

SHOULD BE INSPECTED AFTER RAINSTORMS, AND ADDITIONAL MULCH SHOULD BE APPLIED WHEN EROSION IS OBSERVED. NETS AND MATS SHOULD BE INSPECTED FOR DISLOCATION AFTER RAINSTORMS AND SHOULD BE RE-INSTALLED AS NECESSARY. INSPECTIONS SHOULD TABLE PLACE UNTIL GRASSES AREA ESTABLISHED.

MANAGEMENT STRATEGIES

IF SEDIMENT TRACKING ONTO STAGE ROAD BECOMES A PROBLEM THROUGHOUT CONSTRUCTION, CONTRACTOR SHALL INSTALL A WASH RACK IN THE CONSTRUCTION ENTRANCES WITH AN ADJACENT SETTLING AREA.

CALCULATIONS

THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK WAS USED TO DETERMINE THE SIZE AND STORAGE REQUIREMENTS FOR THE EROSION CONTROL MEASURES.

STORMWATER MANAGEMENT CONSIDERATIONS

REFER TO SHEETS C7.1 AND C7.3 FOR STORMWATER QUANTITY AND QUALITY NARRATIVES.

GENERAL EROSION CONTROL NOTES

MATERIALS, GARBAGE, AND DEBRIS

NO SOLID MATERIAL (WHICH INCLUDES BUILDING MATERIALS, GARBAGE, AND OTHER MISCELLANEOUS DEBRIS) SHALL BE DISCHARGED TO SURFACE WATERS OF THE STATE. DEMOLITION MATERIALS THAT MAY BE CARRIED OFF-SITE BY STORMWATER SHALL BE PICKED UP DAILY AND REMOVED FROM THE SITE. ALL WASTE MATERIALS WILL BE COLLECTED IN A SECURELY SEALED DUMPSTER. THE DUMPSTER SHALL MEET ALL SOLID WASTE MANAGEMENT REQUIREMENTS, AND ALL TRASH AND DEMOLITION DEBRIS FROM THE SITE SHALL BE DEPOSITED IN THE DUMPSTER. THE DUMPSTER SHOULD BE EMPTIED A MINIMUM OF ONCE PER WEEK OR MORE OFTEN IF NECESSARY, AND TRASH WILL BE HAULED AS REQUIRED BY LOCAL REGULATIONS. NO DEMOLITION WASTE WILL BE BURIED ON-SITE. ALL PERSONNEL WILL BE INSTRUCTED ON PROPER PROCEDURES FOR WASTE DISPOSAL.

EXPECTED DEMOLITION AND WASTE MATERIALS MATERIALS COULD POTENTIALLY BE TEMPORARILY STORED ON-SITE: TOPSOIL, FILL DIRT, EXCAVATED MATERIAL, LUMBER, FORMS FOR CONCRETE WORK, SEED, FERTILIZER, HERBICIDES, STONE, CONCRETE PRODUCTS, ASPHALT, PETROLEUM BASED FUELS AND LUBRICANTS FOR EQUIPMENT, AND PVC AND DUCTILE IRON PIPE.

ANY STOCKPILES OF TOPSOIL, EXCAVATED MATERIAL OR FILL DIRT THAT ARE NEEDED SHALL BE SURROUNDED ON THE DOWNSLOPE SIDE BY SILT FENCE. FERTILIZER AND HERBICIDES MUST BE KEPT IN WATERTIGHT CONTAINERS, PREFERABLY IN PORTABLE STORAGE UNITS AND OUT FROM EXPOSURE TO THE WEATHER DURING STORAGE ON-SITE. CARE MUST BE TAKEN TO MINIMIZE SPILLAGE OF FERTILIZER IF MIXING OPERATIONS ARE REQUIRED TO PREPARE THE FERTILIZER FOR APPLICATION. THESE PRODUCTS WILL BE APPLIED AT RATES THAT DO NOT EXCEED THE MANUFACTURER'S SPECIFICATIONS.

COMPLIANCE WITH STATE & LOCAL WASTE, SANITARY, AND/OR SEPTIC REGULATIONS

A MINIMUM OF ONE PORTABLE SANITARY UNIT SHOULD BE PROVIDED FOR EVERY TEN (10) WORKERS ON THE SITE. ALL SANITARY WASTE WILL BE COLLECTED FROM THE PORTABLE UNITS A MINIMUM OF ONE TIME PER WEEK BY A LICENSED PORTABLE FACILITY PROVIDER IN COMPLIANCE WITH LOCAL AND STATE REGULATIONS. ALL SANITARY WASTE UNITS WILL BE LOCATED IN AN AREA WHERE THE CHANCES OF THE UNIT CONTRIBUTING TO STORMWATER DISCHARGE IS NEGLIGIBLE. THE LOCATION OF THE SANITARY WASTE UNITS SHALL BE IDENTIFIED ON THE SWPPP PREPARED BY THE CONTRACTOR ONCE THE LOCATIONS HAVE BEEN DETERMINED.

HOUSEKEEPING AND HANDLING OF PRODUCTS

PRACTICES SUCH AS GOOD HOUSEKEEPING, PROPER HANDLING OF HAZARDOUS PRODUCTS, AND PROPER SPILL CONTROL PRACTICES SHALL BE FOLLOWED TO REDUCE THE RISK OF SPILLS AND DISCHARGING INTO THE STORMWATER RUNOFF. TO MINIMIZE THE AFFECT OF ANY POTENTIAL SPILLS, MAINTAIN ALL ON-SITE FUELING OPERATIONS AS FAR AWAY FROM SURROUNDING SURFACE WATERS AND DRAINAGE FACILITIES AS IS PRACTICAL. QUANTITIES OF PRODUCTS STORED ON-SITE WILL BE LIMITED TO THE AMOUNT NEEDED FOR THE JOB. PRODUCTS AND MATERIALS WILL BE STORED IN A NEAT AND ORDERLY MANNER, AND IN APPROPRIATE CONTAINERS WILL BE ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS. THE DISPOSAL OF PRODUCT CONTAINERS SHALL ALSO BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

IF OVERNIGHT STORAGE OF FUEL IS REQUIRED, THE FUEL STORAGE CONTAINER MUST BE EQUIPPED WITH A FUELING MECHANISM DISABLE DEVICE. DAILY INSPECTIONS OF THE FUEL STORAGE CONTAINER MUST BE IMPLEMENTED TO DETECT THE PRESENCE OF LEAKS. THE FUELING OPERATOR SHALL HAVE A SAFE FILL, SHUTDOWN, AND TRANSFER PROCEDURE IN PLACE TO MINIMIZE SPILLAGE DURING FUELING ACTIVITIES. THE OPERATOR MUST MAINTAIN A FULLY EQUIPPED SPILL KIT ON SITE AT ALL TIMES WITH THE STORED FUEL. THE KIT MUST AT LEAST INCLUDE ABSORBENT MATS OR MATERIAL TO CLEANUP ANY SPILLED FUEL. FOR ANY FUEL SPILL ON SITE EQUAL TO OR EXCEEDING 25 GALLONS, IMMEDIATELY CREATE AN APPROPRIATELY SIZED BERM AROUND THE AREA OF SPILLAGE TO MINIMIZE SURFACE MOVEMENT OF THE FUEL. CONTACT THE LOCAL HAZMAT AUTHORITIES, THE ENGINEER, AND OTHER AUTHORITIES HAVING JURISDICTION AS QUICKLY AS POSSIBLE TO REPORT THE SPILL AND TO SEEK FURTHER ASSISTANCE WITH SPILL CLEANUP.

CONTAINERS FOR PETROLEUM BASED PRODUCTS SUCH AS FUELS, LUBRICANTS AND TARS WILL BE INSPECTED DAILY FOR LEAKS AND SPILLS. THIS INCLUDES ON-SITE VEHICLE AND MACHINERY DAILY INSPECTIONS AND REGULAR PREVENTIVE MAINTENANCE OF SUCH EQUIPMENT. EQUIPMENT MAINTENANCE AREAS WILL BE LOCATED AWAY FROM STATE WATERS, NATURAL DRAINAGE AND STORMWATER DRAINAGE INLETS. IN ADDITION, TEMPORARY FUELING TANKS SHALL HAVE A SECONDARY CONTAINMENT LINER TO PREVENT OR MINIMIZE SITE CONTAINMENT. DISCHARGE OF OILS, FUELS, AND LUBRICANTS IS PROHIBITED. PROPER DISPOSAL METHODS WILL BE COLLECTION IN A SUITABLE CONTAINER AND DISPOSAL AS REQUIRED BY LOCAL AND STATE REGULATIONS.

ALL PAINTS, FINISHES AND SOLVENTS PRODUCTS WILL BE STORED IN TIGHTLY SEALED ORIGINAL CONTAINERS WHEN NOT IN USE. EXCESS PRODUCT WILL NOT BE DISCHARGED TO THE STORMWATER COLLECTION SYSTEM. EXCESS PRODUCT, MATERIALS USED WITH THESE PRODUCTS, AND PRODUCT CONTAINERS WILL BE DISPOSED OF ACCORDING TO MANUFACTURER'S SPECIFICATIONS AND RECOMMENDATIONS.

NO CONCRETE TRUCK WILL BE PERMITTED TO BE WASHED OUT, OR BE ALLOWED TO DISCHARGE SURPLUS CONCRETE OR DRUM WASH-WATER ON-SITE WITHOUT PROPER CONTAINMENT MEASURES AND PROTECTION TO ADJACENT UNDISTURBED AREAS.



Map unit symbol	Map unit name	Rating
7B	Bourne-Urban land complex, 2 to 6 percent slopes	C
27B	Norfolk-Urban land complex, 0 to 6 percent slopes	B
31A	Poconoke silt loam, 0 to 2 percent slopes	B/D
34B	Tetotum-Urban land complex, clayey substratum, 2 to 6 percent slopes	C

SOILS MAP
NO SCALE

TABLE 3.32-D
SITE SPECIFIC SEEDING MEASURES FOR PIEDMONT AREA

Minimum Core Lawn	Total Lbs. Per Acre
- Commercial or Residential	175-200 lbs.
- Kentucky 31 or Turf-Type Tall Fescue	95-100%
- Improved Perennial Ryegrass	0-5%
- Kentucky Bluegrass	0-5%
High Maintenance Lawn	200-250 lbs.
- Kentucky 31 or Turf-Type Tall Fescue	100%
General Slope (3:1 or Less)	
- Kentucky 31 Fescue	128 lbs.
- Red Top Grass	2 lbs.
- Seasonal Nurse Crop *	+20 lbs.
	150 lbs.
Low-Maintenance Slope (Steeper than 3:1)	
- Kentucky 31 Tall Fescue	108 lbs.
- Red Top Grass	2 lbs.
- Seasonal Nurse Crop *	20 lbs.
- Crownvetch **	+20 lbs.
	150 lbs.

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

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

TABLE 3.31-B
ACCEPTABLE TEMPORARY SEEDING PLANT MATERIALS
QUICK REFERENCE FOR ALL REGIONS

PLANTING DATES	SPECIES	RATE (lb./ac)
Sept. 1-Feb. 15	50/50 Mix of Annual Ryegrass (Lolium multi-florum) & Cereal (Winter) Rye (Secale cereale)	50-100
Feb. 16-Apr. 30	Annual Ryegrass (Lolium multi-florum)	60-100
May 1-Aug. 31	German Millet (Setaria Italica)	50

SEEDING NOTES
NO SCALE

EROSION CONTROL (ONLY) SEEDING & FERTILIZING

1. SEEDING SHALL BE DONE IN CONFORMANCE WITH SECTION 603.01 THROUGH 603.04 OF V.D.O.T. SPECIFICATIONS.
2. THE AREA TO BE SEEDDED SHALL FIRST BE FERTILIZED WITH COMMERCIAL 10-10-10 FERTILIZER AT THE RATE OF 30 LBS. PER THOUSAND SQUARE FEET AND TREATED WITH AGRICULTURAL LIME AT THE RATE OF 100 LBS. PER THOUSAND SQUARE FEET. THESE SHALL BE UNIFORMLY WORKED INTO SURFACE TO A MINIMUM DEPTH OF ONE INCH.
3. SEEDING SHALL BE DONE ONLY BETWEEN THE DATES OF FEB. 15 AND APRIL 15 OR BETWEEN SEPT. 15 AND NOV. 15, EXCEPT AS MAY BE OTHERWISE DIRECTED BY THE ENGINEER.
4. SURFACE SHALL BE RAKED AND SMOOTHED TO ELIMINATE RIDGES AND DEPRESSIONS.
5. AFTER PRELIMINARY RAKING, THE SEED SHALL BE SOWN AT THE RATE OF FOUR LBS. PER THOUSAND SQUARE FEET AS FOLLOWS:
 20% PERENNIAL RYE
 35% KENTUCKY 31 FESCUE
 30% CREEPING RED FESCUE
 15% REDTOP (ALL PERCENTAGES ARE BY WEIGHT)
6. SURFACE SHALL THEN BE LIGHTLY RAKED IN ORDER TO COVER SEED NO DEEPER THAN 1/4 INCH AND THEN SPRINKLE WITH WATER. THE SEEDDED SURFACE SHALL BE COVERED WITH STRAW OR HAY TO PREVENT EROSION AND TO PROTECT SEEDING. THE ENTIRE SEEDDED SURFACE SHALL BE ROLLED WITH A CORRUGATED ROLLER AFTER SEEDING AND BEFORE COVERING WITH STRAW. CONTRACTOR SHALL PROTECT SEEDDED SURFACES UNTIL A GOOD STAND OF GRASS IS OBTAINED.
7. THE "HYDRO-SEEDING" METHOD OF SEED APPLICATION MAY BE USED, PROVIDED THE SEED RATE PER SQUARE FOOT IS THE SAME AS HEREIN BEFORE SPECIFIED. THE MULCH RATE SHALL BE SUCH AS TO PROVIDE PROPER SEED PROTECTION AND PREVENT EROSION. IF, IN THE OPINION OF THE INSPECTOR OR ENGINEER, THE MULCH RATE USED (AS EVIDENCED BY SLOPES AFTER SPRAYING) IS NOT SUFFICIENT, THE CONTRACTOR SHALL BE REQUIRED TO INCREASE THE AMOUNT OF MULCH IN THE MIX. NO EXTRA WILL BE ALLOWED FOR ANY REQUESTED INCREASE.

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PROJECT # : 20038
 PROJECT MANAGER : CHRIS THOMPSON
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DATE : FEBRUARY 5, 2021

REVISION BLOCK	
10-07-21	CITY COMMENTS
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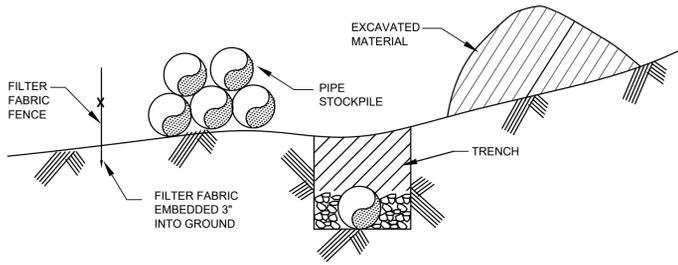
BROAD ROCK BOULEVARD
RETAIL CENTER
 CITY OF RICHMOND, VA

EROSION CONTROL NOTES AND DETAILS

9VAC25-840-40. 19 MINIMUM STANDARDS COMPLIANCE

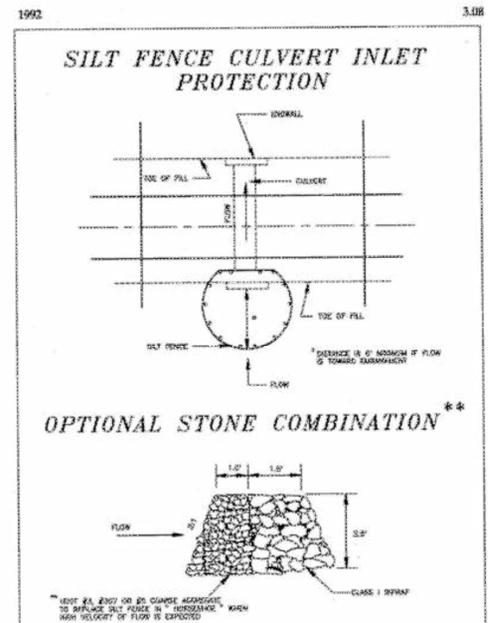
1. PERMANENT OR TEMPORARY SOIL STABILIZATION SHALL BE APPLIED TO DENUDED AREAS WITHIN SEVEN DAYS AFTER FINAL GRADE IS REACHED ON ANY PORTION OF THE SITE. TEMPORARY SOIL STABILIZATION SHALL BE APPLIED WITHIN SEVEN DAYS TO DENUDED AREAS THAT MAY NOT BE AT FINAL GRADE BUT WILL REMAIN DORMANT FOR LONGER THAN 14 DAYS. PERMANENT STABILIZATION SHALL BE APPLIED TO AREAS THAT ARE TO BE LEFT DORMANT FOR MORE THAN ONE YEAR.
 - 1.1. ADDRESSED BY CONTRACTOR PROVIDING TEMPORARY AND PERMANENT SEEDING PER PLAN
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.
 - 2.1. ADDRESSED BY CONTRACTOR PROVIDING A STOCKPILE AREA IF NECESSARY THAT IS WRAPPED IN SILT FENCE. ALL SOIL REMOVED FROM THE SITE MUST BE DISPOSED OF IN A PERMITTED LOCATION BY THE CONTRACTOR.
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.
 - 3.1. ADDRESSED BY CONTRACTOR PROVIDING PERMANENT SEEDING INCLUDING MULCHING, FERTILIZING, AND ESTABLISHING GROWTH PER THE PLAN AND RE-SEEDING AS NECESSARY TO ESTABLISH GROUND COVER.
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.
 - 4.1. ADDRESSED BY CONTRACTOR FOLLOWING SEQUENCE OF CONSTRUCTION THAT REQUIRES APPROPRIATE EROSION MEASURES BE INSTALLED AS A FIRST STEP IN CONSTRUCTION.
5. STABILIZATION MEASURES SHALL BE APPLIED TO EARTHEN STRUCTURES SUCH AS DAMS, DIKES AND DIVERSIONS IMMEDIATELY AFTER INSTALLATION.
 - 5.1. NOT APPLICABLE AS NO DAMS, DIKES AND DIVERSIONS ARE PROPOSED FOR THIS PROJECT.
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.
- 6.1 NOT APPLICABLE AS NO SEDIMENT TRAPS OF BASINS ARE PROPOSED DUE TO THE MINOR NATURE OF THE CONSTRUCTION ACTIVITY.
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.
 - 7.1. ADDRESSED BY CONTRACTOR PROVIDING TEMPORARY AND PERMANENT SEEDING AS THE CONSTRUCTION WILL BE AT EXISTING GRADE SO NO SIGNIFICANT CUT OR FILL SLOPES ARE PROPOSED.
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.
 - 8.1. ADDRESSED BY THE PROJECT LIMITING THE CUT AND FILL SLOPES BY BUILDING ALONG EXISTING GRADE AND MAINTAINING SHEET FLOW ACROSS THE PROPERTY.
9. WHENEVER WATER SEEPS FROM A SLOPE FACE, ADEQUATE DRAINAGE OR OTHER PROTECTION SHALL BE PROVIDED.
 - 9.1. NOT APPLICABLE AS THE PROJECT LACKS STEEP SLOPES AND THERE IS NO INDICATION OF HIGH GROUND WATER TABLE.
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.
 - 10.1. ADDRESSED WITH THE USE OF INLET PROTECTION.
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.
 - 11.1. ALL PROPOSED PIPE SYSTEMS AND STORMWATER CONVEYANCE CHANNELS OUTFALL TO EXISTING STORM SEWER PIPES.
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.
 - 12.1. NOT APPLICABLE AS NO WORK IS BEING PERFORMED IN A LIVE WATERCOURSE
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.
 - 13.1. NOT APPLICABLE AS NO WORK IS BEING PERFORMED IN A LIVE WATERCOURSE
14. ALL APPLICABLE FEDERAL, STATE AND LOCAL REQUIREMENTS PERTAINING TO WORKING IN OR CROSSING LIVE WATERCOURSES SHALL BE MET.
 - 14.1. NOT APPLICABLE AS NO WORK IN A LIVE WATERCOURSE IS PROPOSED.
15. THE BED AND BANKS OF A WATERCOURSE SHALL BE STABILIZED IMMEDIATELY AFTER WORK IN THE WATERCOURSE IS COMPLETED.
 - 15.1. NOT APPLICABLE AS NO WORK IN A LIVE WATERCOURSE IS PROPOSED.
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.
- 16.1 ADDRESSED BY CONTRACTOR FOLLOWING LOCAL DPU STANDARDS AND SPECIFICATIONS ON THESE DRAWINGS
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.
 - 17.1. ADDRESSED BY CONTRACTOR INSTALLING A CONSTRUCTION ENTRANCE AND GENERAL NOTES STATING THAT IF SEDIMENT ON ROADWAYS BECOMES AN ISSUE A WASHRACK WILL NEED TO BE INSTALLED.
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.
 - 18.1. ADDRESSED IN THE REQUIREMENTS OF THE CONTRACTOR IN THE CONSTRUCTION SEQUENCE.
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.
 - a.a. STORMWATER DISCHARGES THE SITE TO ADEQUATE MAN-MADE STORM SEWER CONVEYANCE SYSTEMS.
 - 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) AND
 - (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.
 - b.a. REFER TO STORM SEWER ROUTINGS ON THE PLAN FOR ANALYSIS.
 - c. 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 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.
 - c.a. STORMWATER DETENTION AND A REDUCTION IN IMPERVIOUS AREA HAS BEEN UTILIZED TO PREVENT DOWNSTREAM EROSION.
 - d. THE APPLICANT SHALL PROVIDE EVIDENCE OF PERMISSION TO MAKE THE IMPROVEMENTS.

- d.a. ADDRESSED BY THE APPLICANT BEING THE OWNER OF THE PROPERTY
- e. ALL HYDROLOGIC ANALYSES SHALL BE BASED ON THE EXISTING WATERSHED CHARACTERISTICS AND THE ULTIMATE DEVELOPMENT CONDITION OF THE SUBJECT PROJECT.
 - e.a. UNDERSTOOD
- f. 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.
 - f.a. ACKNOWLEDGED. REFER TO THIS PLAN FOR MAINTENANCE REQUIREMENTS.
- g. 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.
 - g.a. DETENTION FACILITY OUTFALLS TO AN EXISTING PIPE SYSTEM.
 - h. ALL ON-SITE CHANNELS MUST BE VERIFIED TO BE ADEQUATE.
 - h.a. REFER TO STORM SEWER ROUTINGS ON THIS PLAN FOR ADEQUACY.
 - i. INCREASED VOLUMES OF SHEET FLOWS THAT MAY CAUSE EROSION OR SEDIMENTATION ON ADJACENT PROPERTY SHALL BE DIVERTED TO A STABLE OUTLET, ADEQUATE CHANNEL, PIPE OR PIPE SYSTEM, OR TO A DETENTION FACILITY.
 - i.a. REFER TO DETENTION ROUTINGS ON THIS PLAN FOR ADEQUACY.
 - j. 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.
 - j.a. ACKNOWLEDGED.
 - k. ALL MEASURES USED TO PROTECT PROPERTIES AND WATERWAYS SHALL BE EMPLOYED IN A MANNER WHICH MINIMIZES IMPACTS ON THE PHYSICAL, CHEMICAL AND BIOLOGICAL INTEGRITY OF RIVERS, STREAMS AND OTHER WATERS OF THE STATE.
 - k.a. ADDRESSED BY AN EROSION CONTROL PLAN THAT MEETS VIRGINIA REGULATIONS.
 - l. 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.
 - l.a. NOT APPLICABLE AS SITE SITE IS BEING APPROVED FOLLOWING JULY 1, 2014
 - m. 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 (VSM) 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 OF THE ACT.
 - m.a. ACKNOWLEDGED.
 - n. COMPLIANCE WITH THE WATER QUANTITY MINIMUM STANDARDS SET OUT IN 9VAC25-870-66 OF THE VIRGINIA STORMWATER MANAGEMENT PROGRAM (VSM) REGULATION SHALL BE DEEMED TO SATISFY THE REQUIREMENTS OF THIS SUBDIVISION 19.
 - n.a. ACKNOWLEDGED.



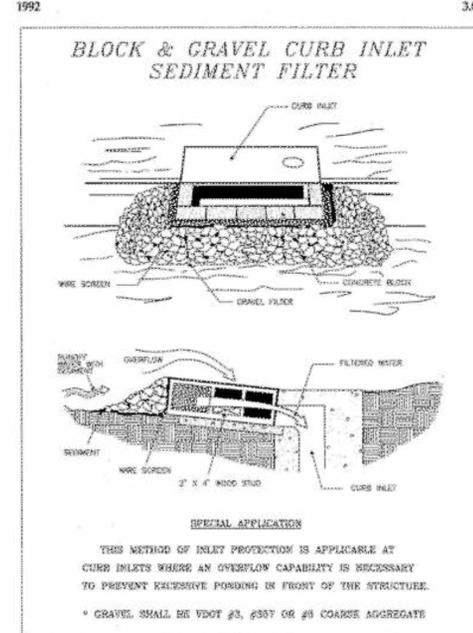
NOTE: AN ACCEPTABLE ALTERNATE TO FILTER FABRIC FENCE IS A LINE OF STAKED STRAW BALES

EROSION CONTROL PROTECTION FOR PIPE TRENCHING TYPICAL DETAIL
NO SCALE



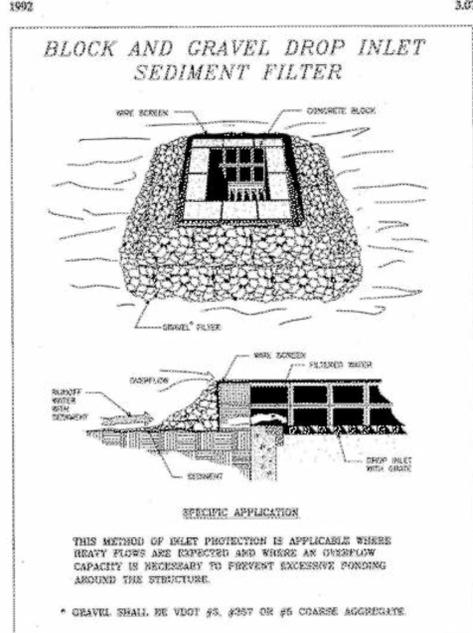
Source: Adapted from VDOT Standard Sheets and Va. DSWC Plate 3.08-1

CULVERT INLET PROTECTION DETAIL
NO SCALE



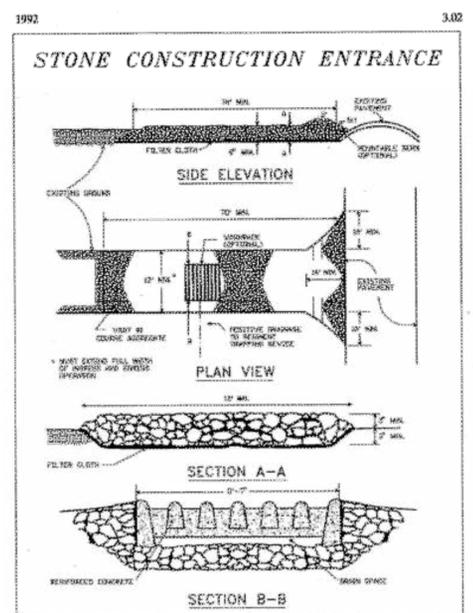
Source: Va. DSWC Plate 3.07-4

INLET PROTECTION DETAILS
NO SCALE



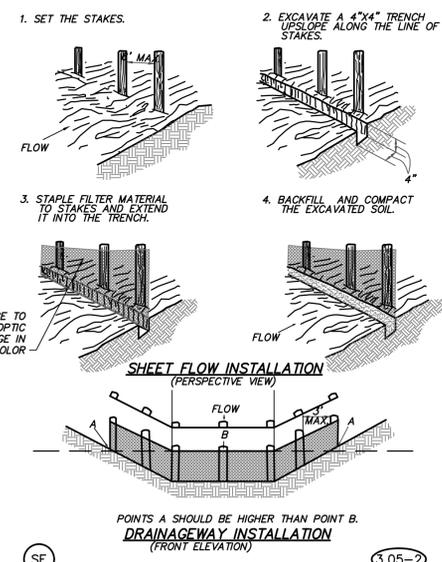
Source: Va. DSWC Plate 3.07-5

INLET PROTECTION DETAILS
NO SCALE



Source: Adapted from 1963 Maryland Standards for Soil Erosion and Sediment Control, and Va. DSWC Plate 3.02-1

CONSTRUCTION ENTRANCE DETAIL
NO SCALE



Source: Adapted from 1963 Maryland Standards for Soil Erosion and Sediment Control, and Va. DSWC Plate 3.05-2

SILT FENCE DETAIL
NO SCALE

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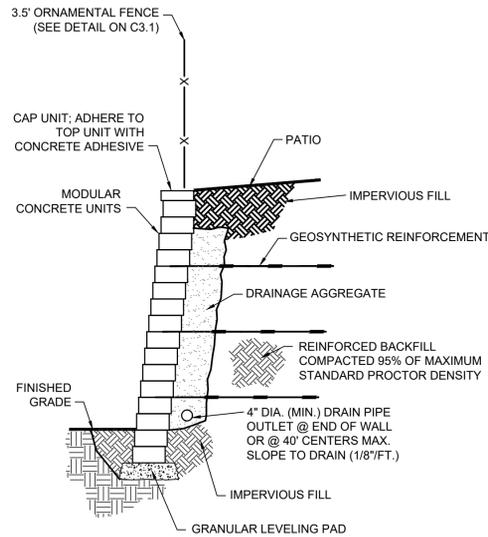
DATE : FEBRUARY 5, 2021	
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10-07-21	CITY COMMENTS
12-20-21	CITY COMMENTS

**BROAD ROCK BOULEVARD
RETAIL CENTER**
CITY OF RICHMOND, VA

EROSION CONTROL NOTES AND DETAILS

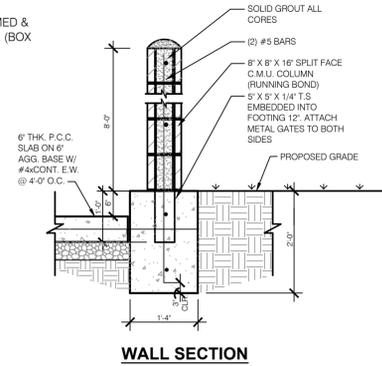
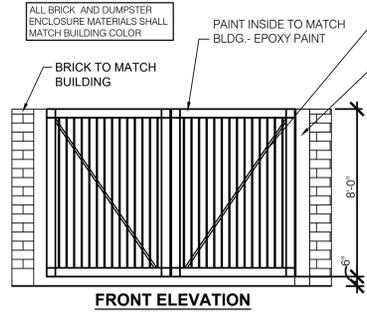
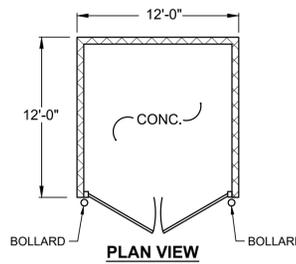
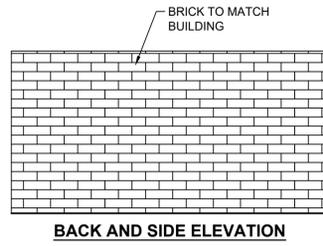
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C2.3

NOTE: FINAL RETAINING WALL DESIGN SHALL BE COMPATIBLE IN APPEARANCE WITH THE PRINCIPAL STRUCTURE AND/OR THE VIEW SHED IN WHICH THEY ARE LOCATED. COMPATIBILITY SHALL BE ACCOMPLISHED THROUGH THE USE OF INTEGRATED COLOR BLOCK OR OTHER MATERIAL THAT IS SIMILAR IN APPEARANCE TO THE PRIMARY STRUCTURES OR IS AN EARTH TONE ACCEPTABLE TO THE DIRECTOR OF PLANNING.

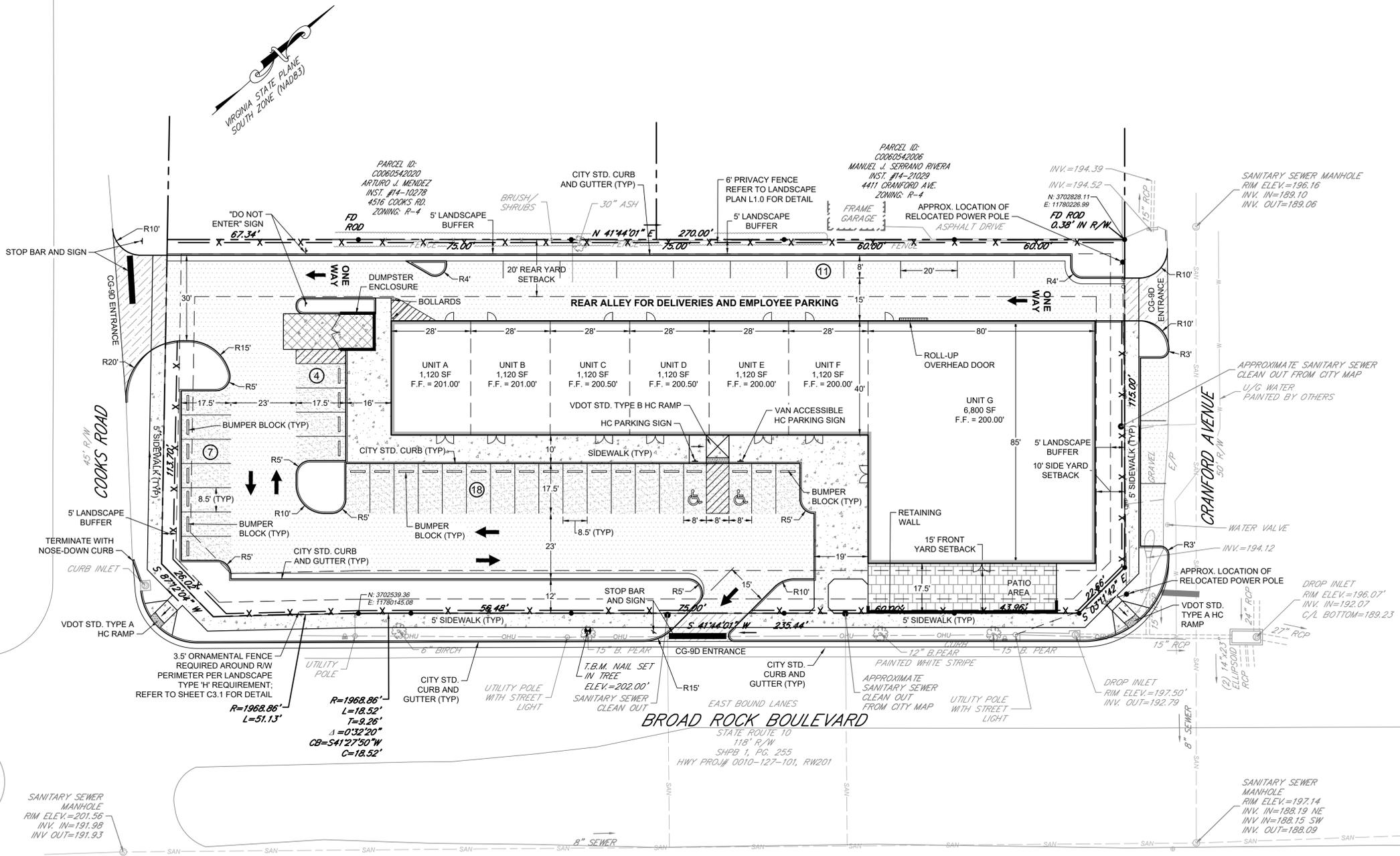


NOTE: DETAIL SHOWN FOR REFERENCE ONLY. FINAL DESIGN SHALL BE PERFORMED BY STRUCTURAL ENGINEER BASED UPON A GEOTECHNICAL ENGINEERS RECOMMENDATIONS.

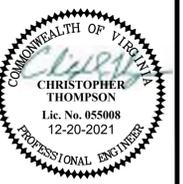
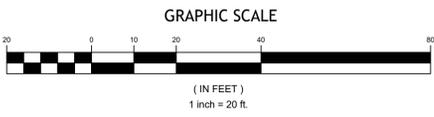
TYPICAL SEGMENTAL RETAINING WALL DETAIL
NO SCALE



DUMPSTER ENCLOSURE DETAIL
NO SCALE



- NOTES:
1. ALL CURB RADII ARE 5' UNLESS NOTED OTHERWISE.
 2. ALL DIMENSIONS ARE TO FACE OF CURB UNLESS NOTED OTHERWISE.



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DATE: FEBRUARY 5, 2021

REVISION BLOCK	
10-07-21	CITY COMMENTS
12-20-21	CITY COMMENTS

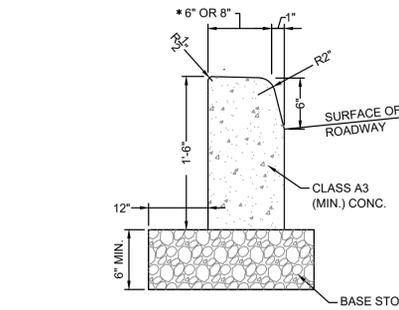
**BROAD ROCK BOULEVARD
RETAIL CENTER**
CITY OF RICHMOND, VA
LAYOUT PLAN

SHEET NO.
C3.0

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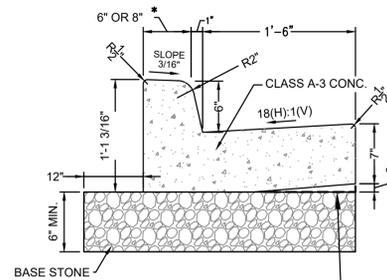
- ALL CONSTRUCTION MATERIALS AND WORKMANSHIP MUST CONFORM TO THE FOLLOWING STANDARDS AND SPECIFICATIONS:
 - VIRGINIA DEPARTMENT OF TRANSPORTATION
 - VIRGINIA DEPARTMENT OF HEALTH
 - RICHMOND DEPARTMENT OF UTILITIES
 - RICHMOND DEPARTMENT OF COMMUNITY DEVELOPMENT
- ALL STORM SEWER SHALL BE ASTM, C-76, CLASS III, EXCEPT AS NOTED.
- ALL DRAINAGE STRUCTURES SHALL BE EITHER PRECAST OR CAST-IN-PLACE CONCRETE.
- THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF PUBLIC UTILITIES PRIOR TO MAKING ANY ADJUSTMENTS TO THE WATER OR SEWERAGE SYSTEMS.
- THE CONTRACTOR SHALL NOTIFY RICHMOND PUBLIC WORKS AT LEAST 24 HOURS PRIOR TO STARTING WORK ON THE PROJECT.
- A DI ON GRADE SHALL BE POURED WITH THE THROAT ON THE SAME GRADE AS THE ADJOINING CURB AND GUTTER.
- THE PAVEMENT DESIGN IS SUBJECT TO CHANGE DUE TO SOIL CONDITION AT THE TIME OF CONSTRUCTION, AS DETERMINED BY GEOTECHNICAL ENGINEER.
- ALL DIMENSIONS ARE TO FACE OF CURB OR BUILDING.
- ANY DIMENSION THAT DOES NOT SCALE AS NOTED MUST BE CONFIRMED WITH THE DESIGN ENGINEER.
- ALL CURB RADII ARE 5.0' UNLESS NOTED OTHERWISE.
- TRAFFIC PAINT SHALL BE WHITE (ON ASPHALT) OR 'ADA' BLUE (ON HANDICAPPED SPACES). PARKING STRIPES SHALL BE 4" WIDE. STOP BARS SHALL BE 24" WIDE AND BE PLACED 10' FROM RIGHT OF WAY.
- STOP SIGNS AND HANDICAP PARKING SIGNS SHALL CONFORM TO THE "MANUAL OF UNIFORM TRAFFIC CODE DEVICES" AND THE VIRGINIA SUPPLEMENT.
- CONTRACTOR SHALL ACQUIRE ANY AND ALL NECESSARY CONSTRUCTION PERMITS.
- ELECTRIC POWER, TELEPHONE POWER, AND GAS SUPPLY TRENCHES ARE TO BE COMPACTED, MULCHED AND SEEDED WITHIN 14 DAYS AFTER BACKFILL.
- VIRGINIA LAW REQUIRES THE CONTRACTOR NOTIFY MISS UTILITY AT 1-800-552-7001 AT LEAST 48 HRS. PRIOR TO ANY LAND DISTURBANCE.
- THIS PLAN DOES NOT GUARANTEE THE EXISTENCE OF LOCATION OF UNDERGROUND UTILITIES. THE UNDERGROUND UTILITIES SHOWN HEREON WERE ESTABLISHED USING ABOVE GROUND STRUCTURES (VALVES, METERS, MANHOLES, ETC.) AND AVAILABLE UTILITY MAPS. PRIOR TO ANY EXCAVATION OR CONSTRUCTION, THE CONTRACTOR SHALL UNCOVER ALL UTILITIES WHICH ARE SHOWN ON THE PLANS OR WHICH HAVE BEEN MARKED BY MISS UTILITY AS BEING IN THE AREA OF EXCAVATION OR CONSTRUCTION. THE CONTRACTOR SHALL TAKE VERTICAL AND HORIZONTAL MEASUREMENTS ADEQUATE TO DETERMINE IF ANY CONFLICT WILL OCCUR. IF ANY POTENTIAL CONFLICT IS FOUND, THE CONTRACTOR SHALL NOTIFY THE SITE ENGINEER PRIOR TO BEGINNING ANY EXCAVATION OR CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVING AND REINSTALLING AT HIS EXPENSE ANY UTILITY WHICH MUST BE RELOCATED BECAUSE OF A CONFLICT WHICH WAS NOT REPORTED TO THE SITE ENGINEER PRIOR TO THE BEGINNING OF ANY EXCAVATION OR CONSTRUCTION.
- ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS. ANY WORK OR MATERIAL NOT IN CONFORMANCE WITH THESE DOCUMENTS IS SUBJECT TO REMOVAL AND REPLACEMENT AT THE CONTRACTOR'S EXPENSE.
- ANY QUANTITIES PROVIDED ON THE PLANS ARE APPROXIMATE. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE QUANTITIES AND SUBMITTING HIS BID ACCORDINGLY.
- ALL EXISTING UTILITIES, SERVICE POLES, AND CONNECTIONS SHALL BE PROTECTED AT THE CONTRACTOR'S EXPENSE. IF DAMAGE IS CAUSED BY CONSTRUCTION TO ANY EXISTING UTILITY, THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REPAIR OR RESTORATION OF SAME.
- CONTRACTOR SHALL PRESERVE ALL CONERSTONES, IRON PINS, CONCRETE MONUMENTS, OR ANY OTHER TYPE OF MONUMENTATION. THE CONTRACTOR SHALL ALSO PROVIDE A REGISTERED SURVEYOR TO RESTORE ANY/ALL MONUMENTATION SHOULD THAT MONUMENTATION BECOME DAMAGED OR DESTROYED.
- ROOF DRAINS, FOUNDATION DRAINS, AND OTHER CLEAN WATER CONNECTIONS TO THE SANITARY SEWER SYSTEM ARE PROHIBITED, EXCEPT IN THE INSTANCE OF EXISTING COMBINED SEWER.
- ALL EQUIPMENT AND MATERIALS DESIGNATED FOR REMOVAL SHALL BECOME THE PROPERTY OF THE CONTRACTOR UNLESS NOTED ON PLANS.
- NO LANDSCAPING OF ANY TYPE SHALL BE PLACED WITHIN A THREE FOOT RADIUS OF ANY FIRE HYDRANT, FIRE PUMP TEST HEADER, FIRE DEPARTMENT SPRINKLER SYSTEM CONNECTION, FIRE DEPARTMENT STANDPIPE CONNECTION OR FIRE SUPPRESSION CONTROL VALVE. LANDSCAPING IN THE AREA OF FIRE HYDRANTS, FIRE PUMP TEST HEADERS, FIRE DEPARTMENT SPRINKLER SYSTEM CONNECTIONS OR FIRE DEPARTMENT STANDPIPE CONNECTIONS SHALL BE OF THE TYPE THAT WILL NOT ENCRONCH ON THE REQUIRED THREE FOOT CLEAR RADIUS ON MATURITY OF THE LANDSCAPING.
- CLEARING AND GRUBBING:
 - ALL GROWTH OF TREES, OTHER VEGETATION AND OBJECTIONABLE DEBRIS SHALL BE CLEARED AND GRUBBED FROM THE PROPOSED PAVED AND BUILDING AREAS AS WELL AS AREAS INDICATED TO BE GRADED ON THE PLANS.
 - ALL CLEARING AND GRUBBING WITHIN THE UTILITY EASEMENTS AND SPECIAL FILL AREAS SHALL BE TO THE LENGTH AND WIDTH NECESSARY TO CONSTRUCT THE IMPROVEMENTS SHOWN ON PLANS.
 - ALL TREES, BRANCHES, VEGETATION AND DEBRIS SHALL BE DISPOSED OF IN A LEGAL MANNER ACCEPTABLE TO THE OWNER, ENGINEER AND THE CITY OF RICHMOND.
- CONTRACTOR SHALL REMOVE TOPSOIL TO ITS ENTIRE DEPTH FROM ALL AREAS TO BE GRADED AND/OR FILLED. STOCKPILE OR REMOVE THE TOPSOIL FROM THE SITE SUCH THAT TOPSOIL FOR FINAL GRADING SHALL BE PROVIDED AND EXCESS PROPERLY DISPOSED OF.
- GRADING:
 - IF UNSUITABLE MATERIAL IS ENCOUNTERED WITHIN THE BUILDING AREA, PAVED AREA OR ANY SPECIAL FILL AREA, IT SHALL BE REMOVED FROM THE ENTIRE PROPOSED PAVED AREA OR FILL AREA EFFECTED AND REPLACED WITH SELECT BACKFILL TO PROVIDE ADEQUATE STABLE SUBGRADE.
 - FILL AND BACKFILL MATERIAL SHALL BE COMPACTED TO 95% STD. PROCTOR DENSITY AT OPTIMUM MOISTURE ±2% UNLESS SPECIFIED OTHERWISE ON THE PLAN.
 - ALL GRADING OPERATION SHALL BE DONE IN SUCH A MANNER SO AS TO PROVIDE POSITIVE DRAINAGE AT ALL TIMES.
 - AT ALL ROAD INTERSECTIONS IN A CUT SECTION, THE BACK SLOPES AND VEGETATION SHALL BE CUT BACK WITH AT LEAST 3:1 BACK SLOPES SO AS TO PROVIDE THE BEST POSSIBLE SIGHT DISTANCE.

GENERAL NOTES
NO SCALE



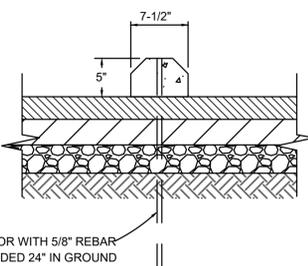
- NOTES:**
- USE 6" CURB REQ'D. FOR SINGLE FAMILY RESIDENTIAL AREAS.
 - USE 8" CURB REQUIRED FOR COMMERCIAL, CENTRAL BUSINESS DISTRICT, FAN, HIGH DENSITY AND MULTI-FAMILY AREAS.
 - BASE STONE SHALL BE 6" MIN. COMPACTED THICKNESS 21A OR 21B.

CONCRETE CURB DETAIL
NO SCALE

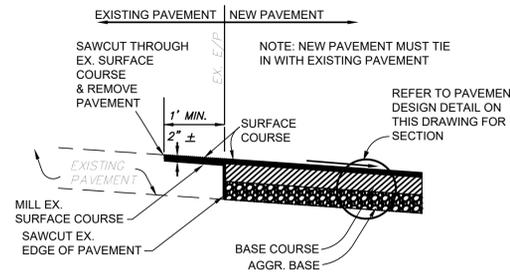


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 - BASE STONE SHALL BE 6" MIN. COMPACTED THICKNESS 21A OR 21B.

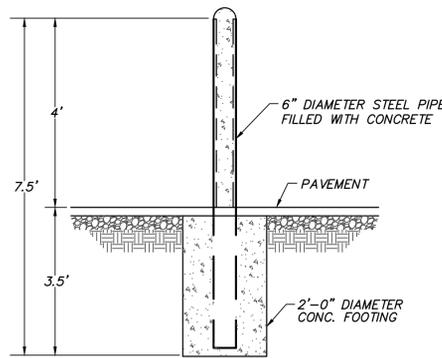
MONOLITHIC CURB AND GUTTER DETAIL
NO SCALE



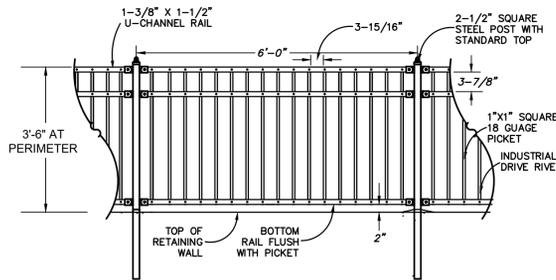
PRECAST BUMPER BLOCK DETAIL
NO SCALE



LAP JOINT DETAIL
NO SCALE



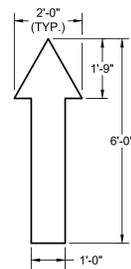
PIPE BOLLARD DETAIL
NO SCALE



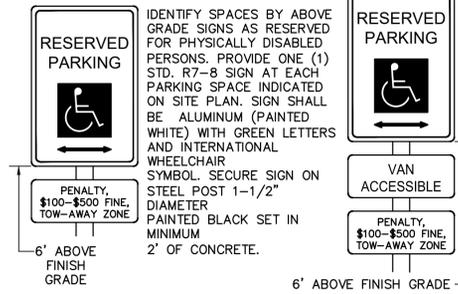
ORNAMENTAL FENCE DETAIL
(ALONG CRANFORD AVE., COOKS RD. AND BROAD ROCK BLVD.)
NO SCALE

- ASPHALT SURFACE COURSE SHALL BE LAID WITH THE DIRECTION OF TRAFFIC IN ALL DRIVE LANES WITHIN PARKING FIELDS.
- ALL SIGNS, PAVEMENT MARKINGS, AND OTHER TRAFFIC CONTROL DEVICES SHALL CONFORM TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
- ALL PAVEMENT MARKINGS SHALL BE FOUR (4") WIDE SOLID WHITE UNLESS OTHERWISE INDICATED.
- A MINIMUM CLEARANCE OF TWO FEET SHALL BE MAINTAINED BETWEEN THE FACE OF CURB AND ANY PART OF A TRAFFIC SIGN OR LIGHT POLE.
- CONTRACTOR SHALL FURNISH AND INSTALL ALL PAVEMENT MARKINGS AS SHOWN.
- CONTRACTOR SHALL COORDINATE INSTALLATION OF ALL SIGNS, PAVEMENT MARKINGS, AND OTHER TRAFFIC CONTROL DEVICES WITH OTHER CONTRACTORS ON SIGNS OR LIGHT POLES.
- CONTRACTOR SHALL SAW-CUT TO PROVIDE SMOOTH TRANSITIONS AT TIE-INS TO EXISTING EDGES OF PAVEMENT AND AT COLD JOINTS OF RECENTLY PAVED ASPHALT.
- JOINTS OR SCORE MARKS ARE TO BE SHARP AND CLEAN WITHOUT SHOWING EDGES OF JOINTING TOOL.
- ALL WORK SHALL COMPLY WITH ALL APPLICABLE CODES, REGULATIONS, AND/OR LOCAL STANDARDS IMPOSED BY LOCAL COUNTY AND STATE.
- PAVING CONTRACTOR SHALL INSTALL PAPER BREAKAWAY EDGES AT COLD JOINTS OR SAWCUT AS REQUIRED TO INSURE A STRAIGHT, FULL-DEPTH JOINT FACE IMMEDIATELY PRIOR TO INSTALLING ABUTTING HOT ASPHALT.
- ALL CONCRETE SHALL BE CLASS A 4000 P.S.I. UNLESS OTHERWISE NOTED. DO NOT POUR ANY CONCRETE BEFORE FORMS ARE INSPECTED AND APPROVED BY THE INSPECTOR.
- ALL RAMPS CONSTRUCTED ARE NOT TO EXCEED A SLOPE OF 1:12.
- CONTRACTOR SHALL BE RESPONSIBLE FOR COST OF PAVEMENT REPLACEMENT WHERE UTILITY LINES ARE EXTENDED ACROSS EXISTING ASPHALT.
- CONTRACTOR SHALL PROVIDE ALL NECESSARY BARRICADES, SUFFICIENT LIGHTS, SIGNS AND OTHER TRAFFIC CONTROL METHODS AS MAY BE NECESSARY FOR THE PROTECTION AND SAFETY OF THE PUBLIC THROUGHOUT THE CONSTRUCTION OF CONNECTIONS TO EXISTING ROADWAYS. CONTRACTOR SHALL SUBMIT TRAFFIC CONTROL PLAN TO CITY AND STATE FOR APPROVAL AS NECESSARY.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPLACING, WITH MATCHING MATERIALS, ANY EXISTING PAVEMENT, DRIVEWAYS, WALKS, CURBS, ETC., THAT MUST BE CUT OR THAT ARE DAMAGED DURING CONSTRUCTION.

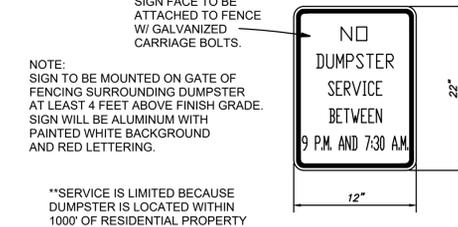
PARKING AND PAVING NOTES
NO SCALE



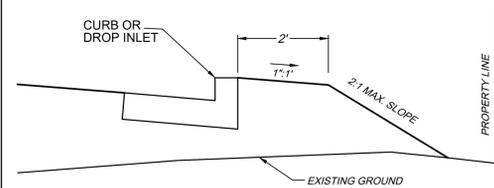
PAINTED DIRECTIONAL ARROW DETAIL
NO SCALE



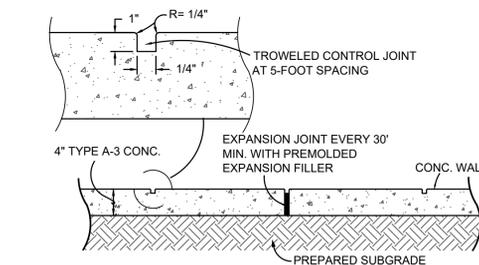
PARKING SIGNS FOR THE DISABLED
NO SCALE



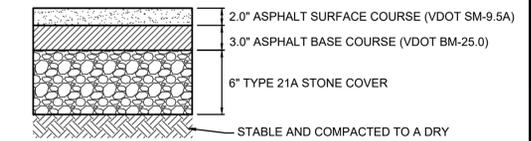
DUMPSTER SERVICE SIGN DETAIL
NO SCALE



CURB & DROP INLET BACKFILL DETAIL
NO SCALE

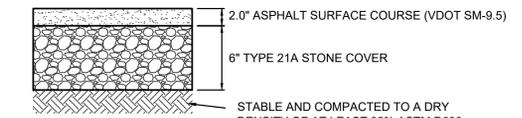


SIDEWALK CONTROL JOINT DETAIL
NO SCALE

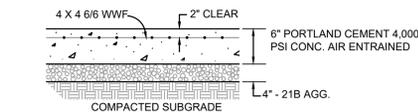


NOTE: PAVEMENT DESIGN IS BASED ON AN ASSUMED CBR VALUE OF 10. IF CBR OF 10 IS NOT ACHIEVED DURING PREPARATION OF SUBGRADE, NOTIFY ENGINEER IMMEDIATELY FOR A REVISED PAVEMENT SECTION.

HEAVY DUTY ASPHALT PAVEMENT SECTION



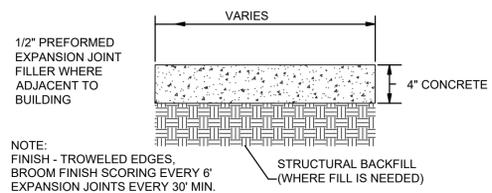
LIGHT DUTY ASPHALT PAVEMENT SECTION



HEAVY DUTY CONCRETE PAVEMENT SECTION



CG-9D ENTRANCE PAVEMENT



CONCRETE SIDEWALK DETAIL



DECORATIVE CONCRETE DETAIL

PAVEMENT SECTION DETAILS
NO SCALE



The Site Design Company
CIVIL ENGINEERING AND LAND DEVELOPMENT CONSULTING
288 HIGH STREET - PETERSBURG, VIRGINIA 23803
www.sitedesignco.com



DATE: FEBRUARY 5, 2021

REVISION BLOCK	
10-07-21	CITY COMMENTS
12-20-21	CITY COMMENTS

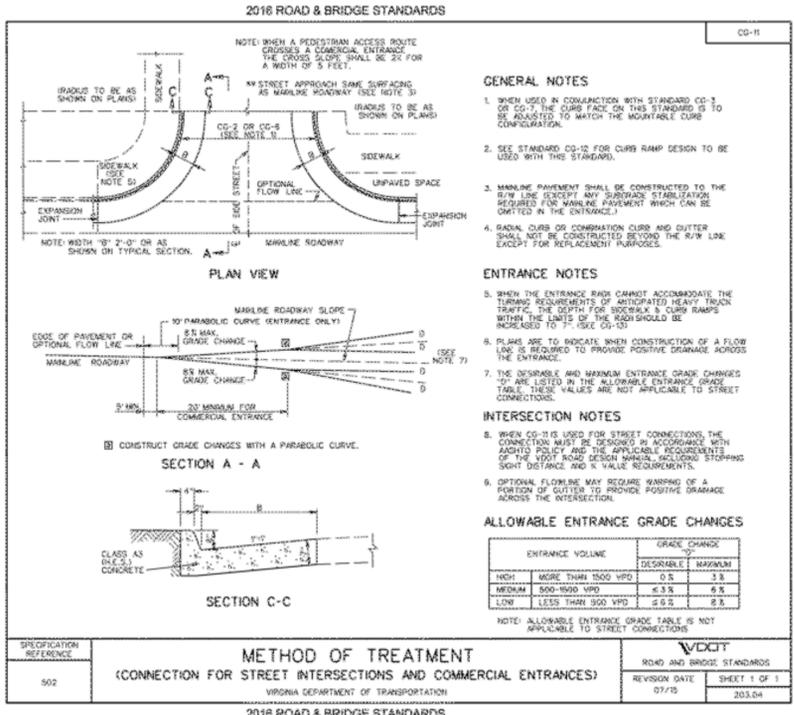
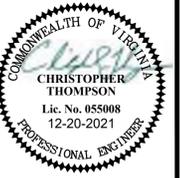
**BROAD ROCK BOULEVARD
RETAIL CENTER**
CITY OF RICHMOND, VA

SHEET NO.
C3.1

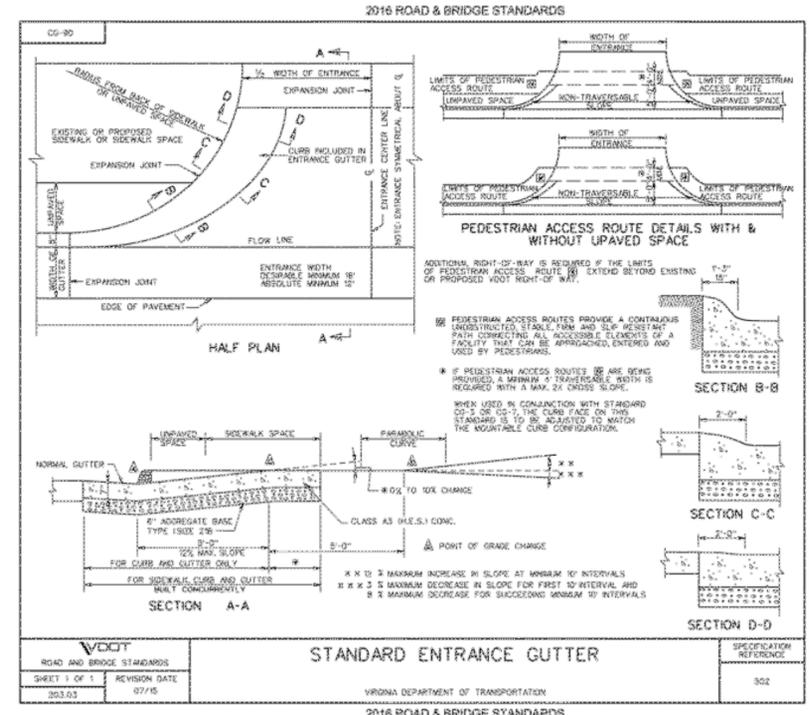
PROJECT # : 20038
PROJECT MANAGER : CHRIS THOMPSON
PHONE : 804-720-9040
EMAIL : thompson@site-designco.com

SITE NOTES AND DETAILS

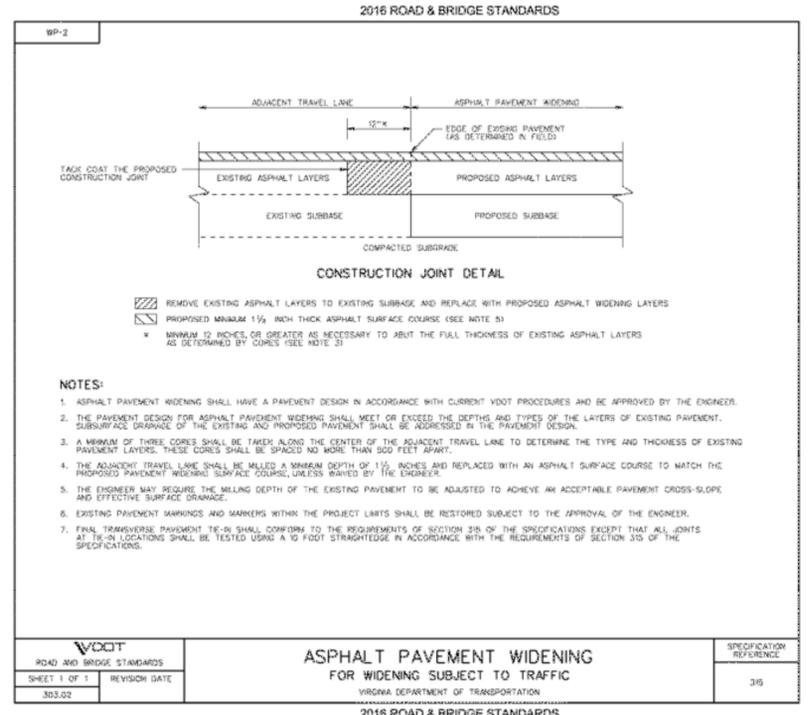
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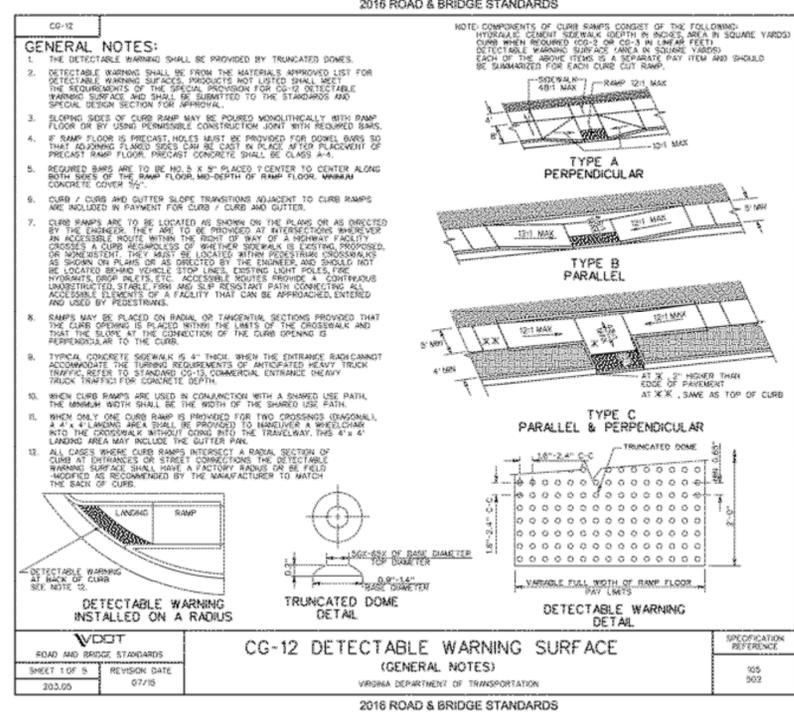
VDOT STANDARD CG-11 COMMERCIAL ENTRANCE DETAIL
NO SCALE



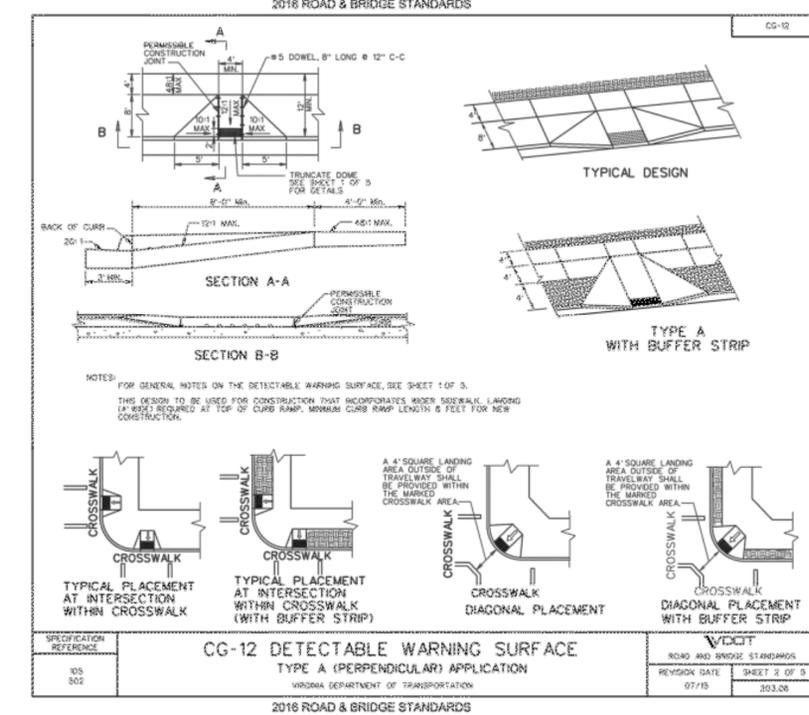
VDOT STANDARD CG-9D ENTRANCE DETAIL
NO SCALE



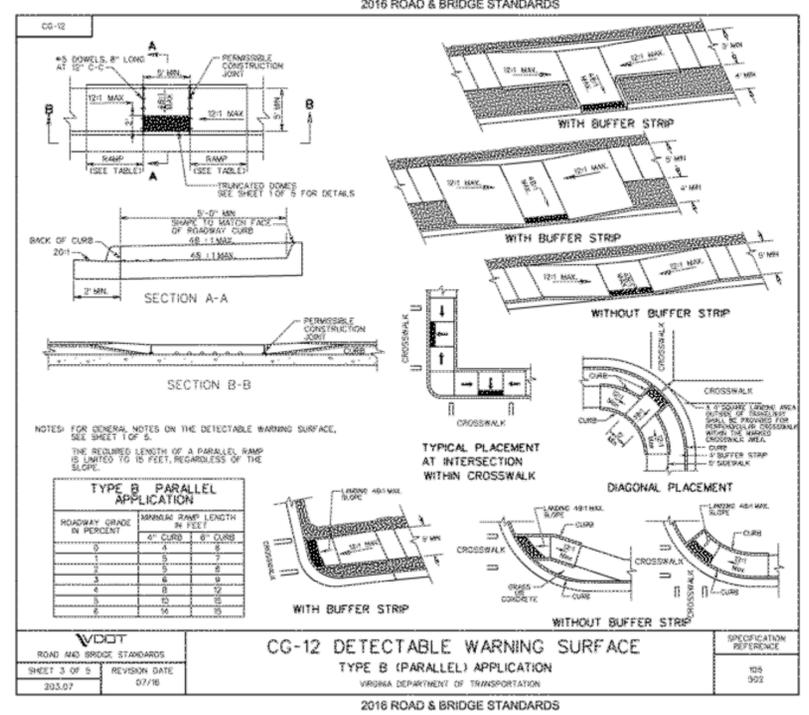
VDOT ASPHALT WIDENING DETAIL
NO SCALE



CG-12 DETECTABLE WARNING SURFACE (GENERAL NOTES)
 VIRGINIA DEPARTMENT OF TRANSPORTATION
 SHEET 1 OF 5
 2022.05
 07/16
 303
 302



CG-12 DETECTABLE WARNING SURFACE TYPE A (PERPENDICULAR) APPLICATION
 VIRGINIA DEPARTMENT OF TRANSPORTATION
 SHEET 2 OF 5
 2022.05
 07/16
 303.06



CG-12 DETECTABLE WARNING SURFACE TYPE B (PARALLEL) APPLICATION
 VIRGINIA DEPARTMENT OF TRANSPORTATION
 SHEET 3 OF 5
 2022.07
 07/16
 303

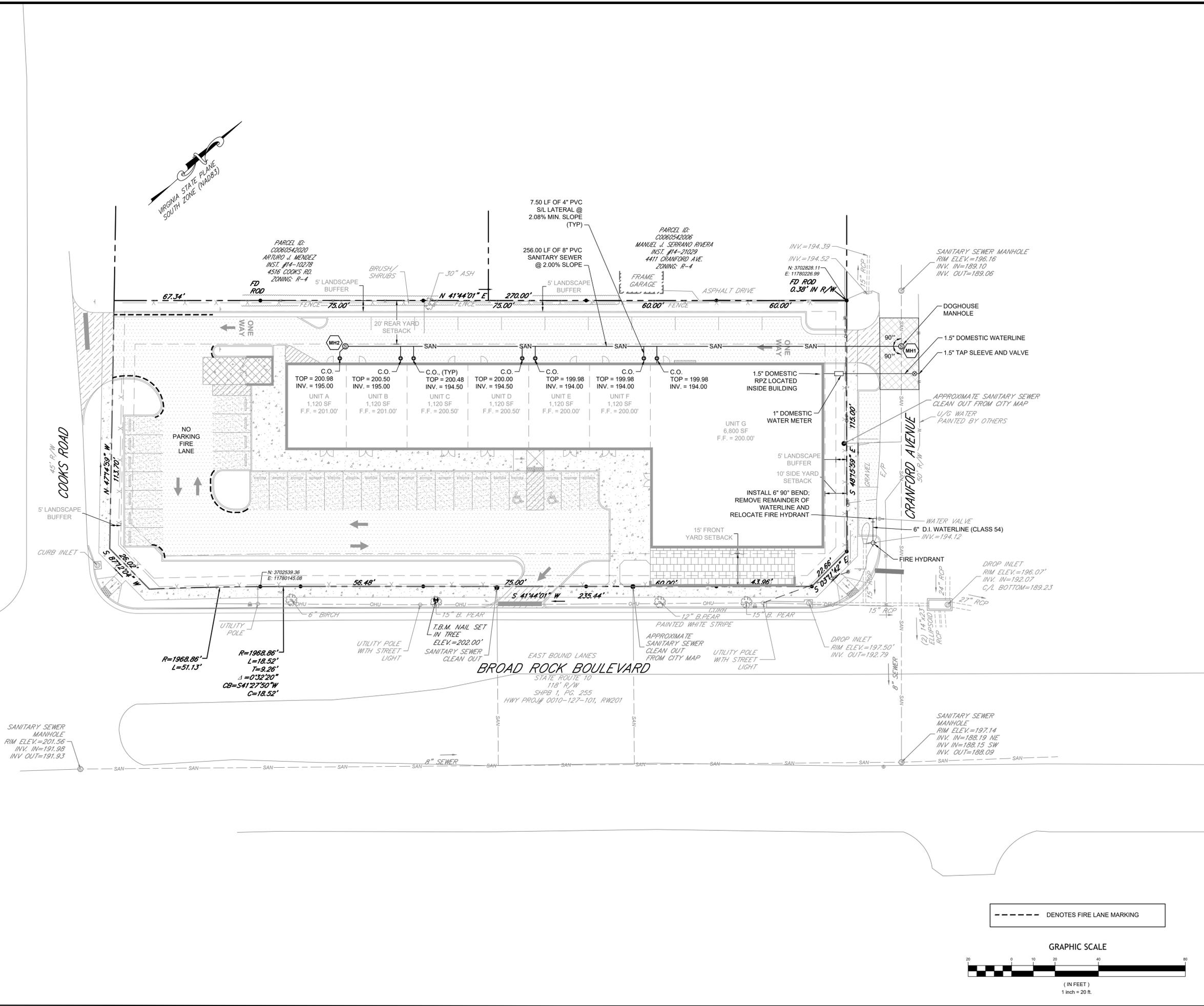
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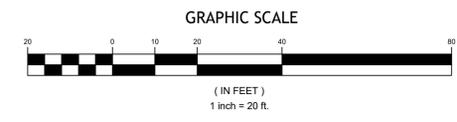
**BROAD ROCK BOULEVARD
 RETAIL CENTER**
 CITY OF RICHMOND, VA
SITE NOTES AND DETAILS

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--- DENOTES FIRE LANE MARKING



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PROJECT # : 20038
 PROJECT MANAGER : CHRIS THOMPSON
 PHONE : 804-720-9040
 EMAIL : thompson@sitedesignco.com

DATE : FEBRUARY 5, 2021

REVISION BLOCK	
10-07-21	CITY COMMENTS
12-20-21	CITY COMMENTS

**BROAD ROCK BOULEVARD
 RETAIL CENTER**
 CITY OF RICHMOND, VA

UTILITY PLAN

SHEET NO.
C4.0

- ALL MATERIALS FOR WATER SHOWN SHALL BE SUPPLIED AND INSTALLED IN ACCORDANCE WITH THE LATEST APPLICABLE CODES AND SPECIFICATIONS OF THE CITY OF RICHMOND. DEPARTMENT OF PUBLIC UTILITIES REQUIREMENTS ARE STANDARD SPECIFICATIONS FOR GAS AND WATER AND WATER SYSTEM CONSTRUCTION & MAINTENANCE (DPU NO. 192 OR LATEST EDITION). RULES AND REGULATIONS FOR THE MUNICIPAL WATER SUPPLY OF RICHMOND, VIRGINIA, LATEST EDITION. CITY OF RICHMOND SPECIFICATIONS FOR DUCTILE IRON WATER PIPE AND FITTINGS, LATEST EDITION. CITY OF RICHMOND STANDARD DETAIL DRAWINGS FOR METERS AND FIRELINES.
- ALL WORK SHALL BE SUBJECT TO INSPECTION BY UTILITY DEPARTMENT OFFICIALS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFICATION OF APPROPRIATE CITY OFFICIALS 48 HOURS PRIOR TO START OF WORK.
- THE UTILITY CONTRACTOR IS RESPONSIBLE FOR OBTAINING ANY HIGHWAY PERMITS AND SENDING A COPY OF THE PERMIT TO THE CITY PRIOR STARTING ANY CONSTRUCTION WORK.
- MINIMUM CLEAR COVER FOR ALL WATER PIPE, FIRE SERVICE LATERALS AND SERVICES SHALL BE 3.5 FEET, INCLUDING DITCH CROSSINGS.
- ALL WATER SERVICES ARE TO BE COPPER, TYPE K DRAWN TUBING. SERVICE 3/4" TO 1" SHALL BE TYPE K SOFT COPPER AND SERVICE 1-1/2" TO 2" SHALL BE TYPE K HARD COPPER.
- ON WATER MAINS INSTALLED BY THE CONTRACTOR, THE CONTRACTOR SHALL INSTALL ALL WATER SERVICE CONNECTIONS, EXCEPT FIRELINE SERVICES AND METER BOXES.
- BACKFILL FOR ALL UTILITIES WITHIN CITY STREETS SHALL BE PLACED GENERALLY IN ACCORDANCE WITH CITY SPECIFICATIONS, AND THE FOLLOWING CRITERIA:
 - NO TRENCH SHALL BE BACKFILLED UNTIL AUTHORIZED BY THE CITY. MATERIAL USED FOR BACKFILL FROM THE BOTTOM OF THE TRENCH TO 12" (TWELVE INCHES) ABOVE THE PIPE SHALL BE SELECT MATERIAL, FREE FROM FROST, LARGE CLODS, STONES AND DEBRIS, AND SHALL BE THOROUGHLY AND CAREFULLY COMPACTED.
 - BACKFILL SHALL BE COMPACTED BY MECHANICAL TAMPERING THROUGHOUT THE DEPTH OF THE TRENCH TO INSURE A SUITABLE SUBBASE, ACCEPTABLE TO THE ROAD ENGINEER. IF THE MATERIAL TAKEN FROM THE TRENCH IS NOT A SUITABLE SUBBASE, IT SHALL BE REMOVED AND ACCEPTABLE MATERIAL USED FOR BACKFILLING THE TRENCH.
- THE ENGINEER WILL CERTIFY THAT THE ROADS AND DITCHES ARE WITHIN 6" OF SUBGRADE BEFORE WATERLINE CONSTRUCTION CAN BEGIN.
- FOR WATER INSTALLATION WITHIN EXISTING RIGHT-OF-WAY, THE UTILITY CONTRACTOR MUST NOTIFY THE CITY INSPECTOR WHEN INSTALLATION BEGINS SO THAT DENSITY CAN BE TESTED (95% @ OPTIMUM MOISTURE +20%).
- THE CONTRACTOR SHALL VERIFY LOCATION AND ELEVATION OF ALL UNDERGROUND UTILITIES IN AREAS OF CONSTRUCTION PRIOR TO STARTING WORK. CONTACT ENGINEER IMMEDIATELY IF LOCATION OR ELEVATION IS DIFFERENT FROM THAT SHOWN ON THE PLAN, OR IF THERE APPEARS TO BE A CONFLICT OR IF ANY UTILITY NOT SHOWN ON THE PLAN IS DISCOVERED. TO LOCATE UTILITIES, CALL "MISS UTILITY" OF CENTRAL VIRGINIA: 1-800-552-7001 (TOLL FREE).
- ALL PLUMBING DIAGRAMS SHALL BE REVIEWED BY THE CROSS-CONNECTION SPECIALIST FOR CROSS-CONNECTION CONTROL AND BACKFLOW PREVENTION PRIOR TO ANY WATER PERMIT REQUEST. THE INSTALLATION OF BACKFLOW DEVICES IS REQUIRED IN ALL BUILDINGS WHERE THE FINISHED GRADE IS BELOW THE TOP ELEVATION OF NEAREST MANHOLE. THIS DEVICE WILL BE INSPECTED BY THE CITY PLUMBING INSPECTOR AT TELEPHONE NUMBER 646-6981 AND THE CROSS-CONNECTION SPECIALIST AT TELEPHONE NUMBER 646-8534.
- ALL FUTURE BUILDINGS BELOW THE CONTOUR WILL REQUIRE INDIVIDUAL PRESSURE REGULATORS.
- ALL UTILITIES SHALL BE IN PLACE PRIOR TO PLACEMENT OF BASE MATERIAL.
- THE CONTRACTOR SHALL OPEN AND PREPARE ALL TRENCHES FOR THE CITY TO MAKE ANY CONNECTIONS TO THE EXISTING WATER MAIN FOR THE PROJECT WATER MAINS OR SERVICES TO CONNECT TO.

GENERAL WATER NOTES
NO SCALE

- THE CONTRACTOR SHALL NOTIFY THE APPROPRIATE CITY DEPARTMENT PRIOR TO MAKING ANY UTILITY ADJUSTMENTS OR PERFORMING OTHER WORK WITHIN THE RIGHT-OF-WAY.
- THE SEQUENCE OF UTILITY CONSTRUCTION SHALL BE DEVELOPED IN SUCH A MANNER THAT WATER AND SANITARY SEWER SERVICE IS MAINTAINED AT ALL TIMES DURING CONSTRUCTION EXCEPT DURING TIE-INS AND CONNECTIONS. WHEN SERVICE IS INTERRUPTED, THE CONTRACTOR SHALL PROVIDE THE CITY WITH 72 HOURS NOTICE PRIOR TO THE INTERRUPTION. THE AFFECTED PROPERTY OWNER SHALL BE NOTIFIED WITHIN 48 HOURS PRIOR TO SERVICE INTERRUPTIONS. CONTRACTORS SHALL PROVIDE THE CITY WITH A DETAILED PLAN AND SCHEDULE FIVE (5) WORKING DAYS IN ADVANCE TO PERFORMING WORK WHICH REQUIRES INTERRUPTION TO CUSTOMER UTILITY SERVICE. SERVICE INTERRUPTIONS SHALL BE KEPT TO A MINIMUM.
- UNLESS OTHERWISE NOTED, ALL GAS AND WATER UTILITY MATERIALS AND CONSTRUCTION METHODS SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATION FOR GAS AND WATER SYSTEM CONSTRUCTION AND MAINTENANCE DPU NO. 1-92, LATEST EDITION. THE CITY OF RICHMOND'S SEWER SPECIFICATIONS AND THE LATEST EDITIONS OF THE VIRGINIA DEPARTMENT OF HEALTH WATERWORKS REGULATIONS AND PROPOSED SEWAGE COLLECTION AND TREATMENT REGULATIONS.
- LOCATIONS OF EXISTING UTILITIES ACROSS OR ALONG THE LINE OF THE PROPOSED WORK ARE SHOWN ONLY IN AN APPROXIMATE LOCATION ON THE PLANS. CONTRACTOR SHALL LOCATE ALL UNDERGROUND LINES AND STRUCTURES AS NECESSARY. CONTRACTOR SHALL CALL "MISS UTILITY" 1-800-552-7001 PRIOR TO CONSTRUCTION AND IS RESPONSIBLE FOR ANY DAMAGE TO UNDERGROUND LINES OR STRUCTURES.
- GATE VALVES SHALL BE U.S. PIPE, METROSEAL 250, OPEN RIGHT (CLOCKWISE), WITH MECHANICAL JOINT END FITTINGS, NON-RISING STEM.
- FIRE HYDRANTS SHALL BE U.S. PIPE, METROPOLITAN 250, OPEN RIGHT (CLOCKWISE), WITH A 4 1/2" VALVE OPENING.
- ALL FIRE HYDRANTS AND VALVE BOXES DESIGNATED TO BE REMOVED SHALL BE SALVAGED AND DELIVERED TO THE DEPARTMENT OF UTILITIES AT 400 JEFFERSON DAVIS HIGHWAY.
- ALL GAS AND WATER SERVICES AND SEWER CONNECTIONS SHALL BE RENEWED AS DIRECTED BY THE CITY OF RICHMOND, DEPARTMENT OF PUBLIC UTILITIES ENGINEER.
- THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL PERMITS.
- DATUM FOR ALL ELEVATIONS SHOWN IS NATIONAL GEODETIC SURVEY.
- MINIMUM DEPTH OF COVER FOR GAS AND WATER MAINS IS 42 INCHES.
- WATER MAINS SHALL BE DUCTILE IRON, DOUBLE COAT CEMENT LINED AS MANUFACTURED BY U.S. PIPE OR EQUAL. PIPE CLASS SHALL BE AS FOLLOWS:

DIAMETER (INCHES)	SPECIAL CLASS
(3)	52
(4)	53
(6)	54
(8)	54
(12) & LARGER	51
- THE CITY WILL INSPECT ALL GAS, WATER AND SANITARY SEWER MAINS, CONNECTIONS AND APPURTENANCES TO INSURE THAT THE MATERIALS AND CONSTRUCTION METHODS ARE IN ACCORDANCE WITH THE APPROVED PLANS, SPECIFICATION AND STANDARDS. ALL OTHER LINES AND CONNECTIONS WILL BE INSPECTED AND APPROVED BY THE DEPARTMENT OF BUILDING INSPECTIONS.
- THE CONTRACTOR SHALL REQUEST VALVE OPERATION BY THE OWNER'S FORCES NO LESS THAN 48 HOURS IN ADVANCE. THE CONTRACTOR SHALL NOT OPERATE ANY EXISTING VALVES UNLESS DIRECTED BY THE OWNER.
- THE CITY DOES NOT GUARANTEE A 100 PERCENT SHUT-DOWN OF ITS EXISTING WATER MAINS. THE CONTRACTOR SHALL PROVIDE ALL PLUGS AND DE WATERING EQUIPMENT NECESSARY TO PERFORM THE WORK.
- MECHANICAL JOINT LONG SOLID SLEEVES SHALL BE USED FOR ALL CONNECTION TO EXISTING WATER MAINS.
- COUPLINGS FOR CONNECTIONS TO EXISTING SANITARY SEWER LATERALS SHALL BE FERNO OR EQUAL.
- BASED ON CITY RECORDS, EXISTING SANITARY SEWER LATERALS ARE ASSUMED TO BE 6-INCHES WITHIN THE RIGHT-OF-WAY AND 18.4-INCHES ON PRIVATE PROPERTY.
- FOR WATERLINE CONSTRUCTION, RESTRAINED JOINT PIPE SHALL BE USED AT ALL FITTINGS IN ACCORDANCE WITH DETAIL M5A ON DRAWING C1.2.

UTILITY NOTES
NO SCALE

DEPARTMENT OF PUBLIC UTILITIES
RICHMOND, VIRGINIA

PIPELINE EXCAVATION
NOT TO SCALE

REV 2/09
1 A

CUT FROM 1' TO 14.99' INCL.				CUT FROM 15' TO 29.99' INCL.			
PIPE SIZE	THICKNESS OF PIPE (SEE NOTE 2)	TRENCH WIDTH (FT)	EXPOSED LENGTH OF PIPE (FT)	PIPE SIZE	THICKNESS OF PIPE (SEE NOTE 2)	TRENCH WIDTH (FT)	EXPOSED LENGTH OF PIPE (FT)
6"	0.180	2.75	0.100	6"	0.180	3.00	0.110
8"	0.240	2.75	0.100	8"	0.240	3.00	0.110
12"	0.300	2.75	0.100	12"	0.300	3.10	0.117
14"	0.300	2.75	0.100	14"	0.300	3.40	0.119
18"	0.337	3.00	0.110	18"	0.337	3.75	0.124

NOTES:
1. ALLOWABLE EXCAVATIONS ARE IN CUBIC YARDS PER FT. OF DEPTH PER FT. OF LENGTH.
2. DIMENSIONS ALLOWED FOR DEEPER EXCAVATIONS FOR SOH 3D PVC.
3. FOR DEPTHS GREATER THAN 20' CONTACT THE REGIONAL SURVEYING DIVISION OF DPU FOR ALLOWABLE EXCAVATIONS.

DEPARTMENT OF PUBLIC UTILITIES
RICHMOND, VIRGINIA

THRUST RESTRAINT TABLE

RESERVED JOINT LENGTH

Joint End	12"		14"		18"		24"	
	Min	Max	Min	Max	Min	Max	Min	Max
12" x 12" (top)	2'	4'	2'	4'	2'	4'	2'	4'
12" x 12" (bottom)	2'	4'	2'	4'	2'	4'	2'	4'
12" x 14" (top)	2'	4'	2'	4'	2'	4'	2'	4'
12" x 14" (bottom)	2'	4'	2'	4'	2'	4'	2'	4'
12" x 18" (top)	2'	4'	2'	4'	2'	4'	2'	4'
12" x 18" (bottom)	2'	4'	2'	4'	2'	4'	2'	4'
12" x 24" (top)	2'	4'	2'	4'	2'	4'	2'	4'
12" x 24" (bottom)	2'	4'	2'	4'	2'	4'	2'	4'

NOTES:
1. RESTRAINED JOINTS ARE BASED ON THE FOLLOWING LAYERING CONDITIONS:
Restrained joints shall be in layering conditions: Type B
Soil Conditions: Coh. green
Depth of Cover: 3.5 ft.
Design Pressure: 200 psf
Safety Factor: 1.5
2. RESTRAINED JOINT LENGTHS ARE TO BE CONFIRMED BY ENGINEER BASED ON FIELD CONDITIONS.

DRAWN BY: [Signature]
DATE: 8/22/08
SCALE: 1/8" = 1'-0" SCALE
SHEET NO. 5

CITY OF RICHMOND, VIRGINIA
RESERVED JOINT TABLE

DPU DWG. NUMBER: M-5A

DEPARTMENT OF PUBLIC UTILITIES
RICHMOND, VIRGINIA

TYPICAL WATER MAIN TAPPING SLEEVE AND TAPPING VALVE DETAIL

NOTES:
1. DETAIL FOR DUCTILE IRON PIPE ONLY.
2. CONTRACTOR TO DETERMINE OD OF EXISTING PIPE FOR SLEEVE SUITABILITY.
3. CITY TO PROVIDE TAPPING SLEEVE AND VALVE.
4. CONTRACTOR TO INSTALL SLEEVE.
5. CITY TO PERFORM TAPPING.

DRAWN BY: [Signature]
DATE: 8/22/08
SCALE: 1/8" = 1'-0" SCALE
SHEET NO. 6

CITY OF RICHMOND, VIRGINIA
TYPICAL WATER MAIN TAPPING SLEEVE AND TAPPING VALVE DETAIL

DPU DWG. NUMBER: M-934

DEPARTMENT OF PUBLIC UTILITIES
RICHMOND, VIRGINIA

LOWERING WATER MAIN ON NEW CONSTRUCTION

NOTES:
1. LOWERED SECTION TO BE OF DUCTILE IRON MECHANICAL JOINT PIPE WITH RESTRAINED JOINTS AS ANY INCLUDED JOINTS. THE ENGINEER SHALL CALCULATE LENGTH (L) OF RESTRAINED SECTION.
2. THRUST BLOCKS FOR VERTICAL BENDS MAY BE OBTAINED WITH RESTRAINED JOINTS.
3. VERTICAL BENDS MAY BE TERMINATED BY USING JOINT DEFLECTIONS. JOINT DEFLECTIONS SHALL NOT EXCEED 1/2" MANUFACTURERS RECOMMENDED DEFLECTION.

DRAWN BY: [Signature]
DATE: 8/22/08
SCALE: 1/8" = 1'-0" SCALE
SHEET NO. 7

CITY OF RICHMOND, VIRGINIA
LOWERING WATER MAIN ON NEW CONSTRUCTION

DPU DWG. NUMBER: M-13

DEPARTMENT OF PUBLIC UTILITIES
RICHMOND, VIRGINIA

WATER SERVICE CONNECTION

NOTES:
1. 1 1/2" x 2" TAP SHALL BE MADE AT THE SPRING LINE OF THE MAIN LINE.
2. SADDLE MUST BE USED IF TAP IS MADE 6" OR MORE ON A/C PIPE.

DRAWN BY: [Signature]
DATE: 8/22/08
SCALE: 1/8" = 1'-0" SCALE
SHEET NO. 8

CITY OF RICHMOND, VIRGINIA
WATER SERVICE CONNECTION

DPU DWG. NUMBER: M-18

DEPARTMENT OF PUBLIC UTILITIES
RICHMOND, VIRGINIA

STANDARD METER BOX INSTALLATION FOR 5/8" AND 1" SERVICES

NOTES:
1. ALL WATER METERS TO BE FURNISHED AND INSTALLED BY THE CITY.
2. METER SETTERS SHALL BE PROVIDED FOR 5/8" AND 1" METERS. EACH END SHALL HAVE REMOVABLE PACK JOINTS SUITABLE FOR COPPER OR POLYETHYLENE PIPE. ALL METER SETTERS SHALL HAVE SADDLE VALVE. PACKING WINGS AND SHALL BE SIMILAR TO FORD OR MUELLER.
3. FOR EXISTING METER BOX LOCATIONS, EXISTING METER BOX COVER CAN BE BRIDLED WITH 1-817" CORE FOR PLACEMENT OF AIR ANTENNA.

DRAWN BY: [Signature]
DATE: 8/22/08
SCALE: 1/8" = 1'-0" SCALE
SHEET NO. 9

CITY OF RICHMOND, VIRGINIA
STANDARD METER BOX INSTALLATION FOR 5/8" AND 1" SERVICES

DPU DWG. NUMBER: M-19

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EMAIL: thompson@site-designco.com

PHONE: 804-720-9040

PROJECT MANAGER: CHRIS THOMPSON

PROJECT #: 20038

DATE: FEBRUARY 5, 2021

REVISION BLOCK	
10-07-21	CITY COMMENTS
12-20-21	CITY COMMENTS

**BROAD ROCK BOULEVARD
RETAIL CENTER**
CITY OF RICHMOND, VA

UTILITY NOTES AND DETAILS

SHEET NO.
C4.1

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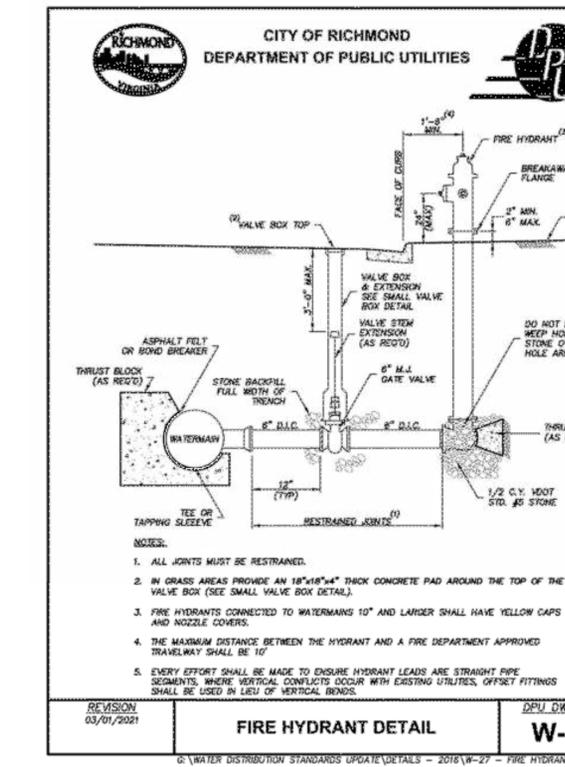
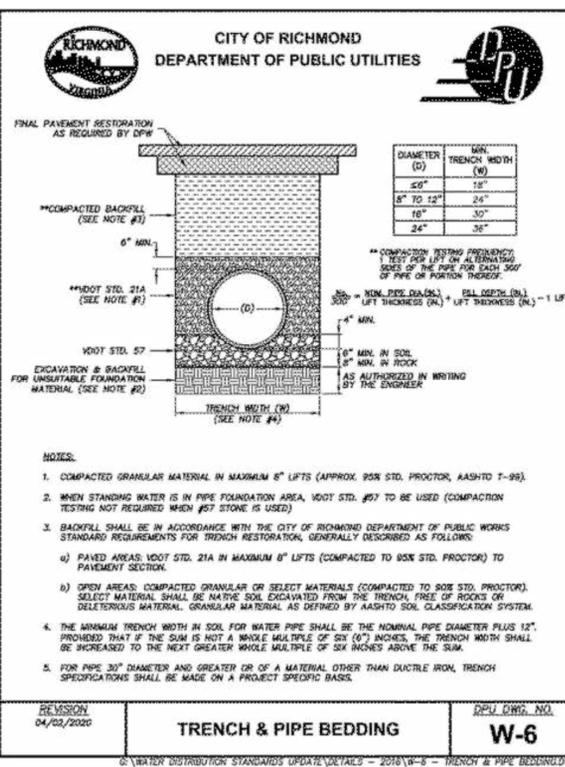
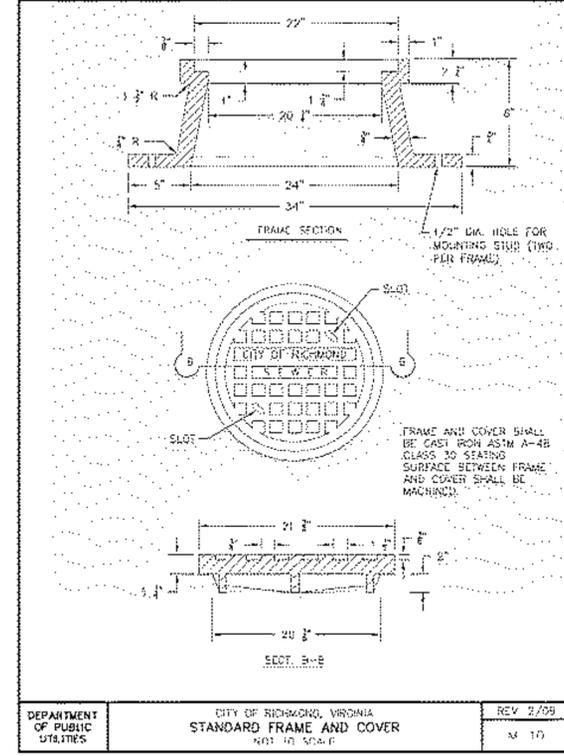
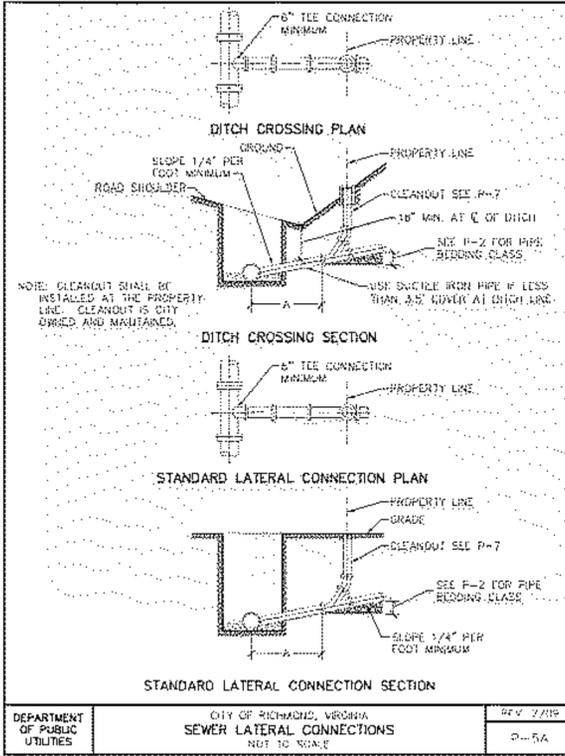
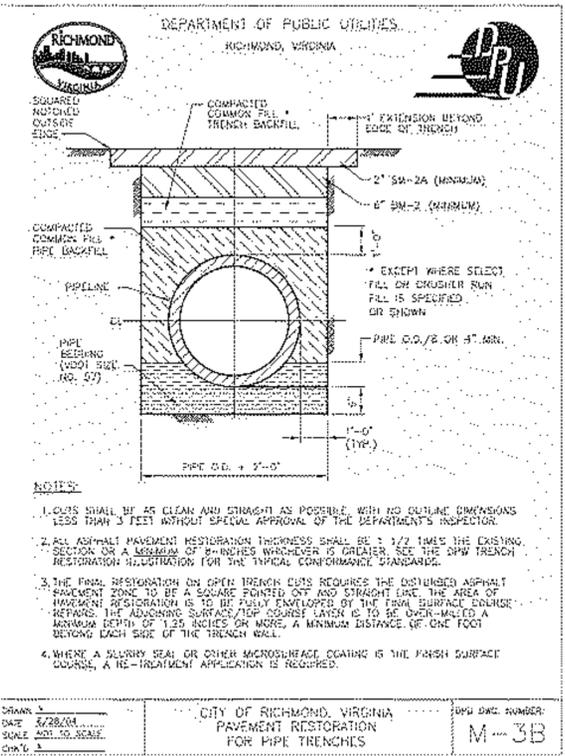
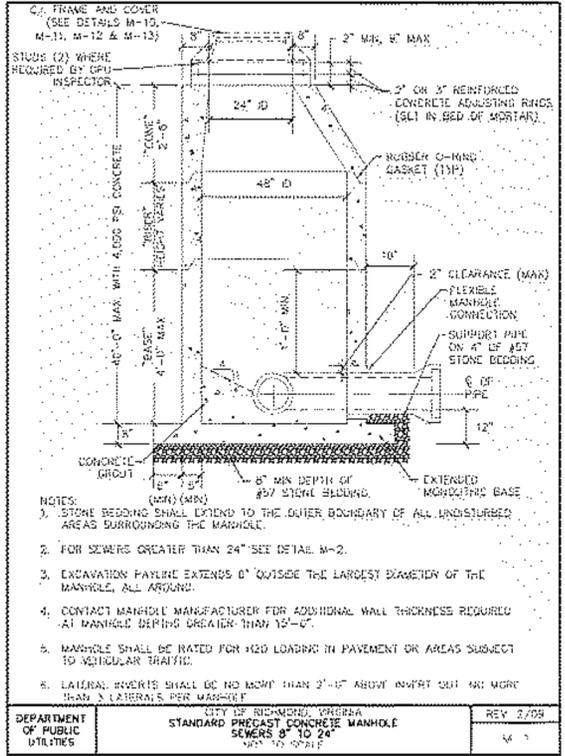
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 PROJECT MANAGER: CHRIS THOMPSON
 PHONE: 804-720-9040
 EMAIL: thompson@itedesignco.com
 PROJECT #: 20038

DATE: FEBRUARY 5, 2021
 REVISION BLOCK

10-07-21	CITY COMMENTS
12-20-21	CITY COMMENTS

**BROAD ROCK BOULEVARD
 RETAIL CENTER**
 CITY OF RICHMOND, VA
 UTILITY NOTES AND DETAILS

SHEET NO.
C4.2



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**CITY OF RICHMOND
 DEPARTMENT OF PUBLIC UTILITIES
 DEVELOPMENT SERVICES**

Application for WATER, SANITARY, & STORM SEWER
 Tel: 804-646-8544 Fax: 804-646-3438

Applicant's Signature _____ Date _____
 DPU Engineer or APSA Signature _____ Date _____
 DPU Project Manager Signature _____ Date _____

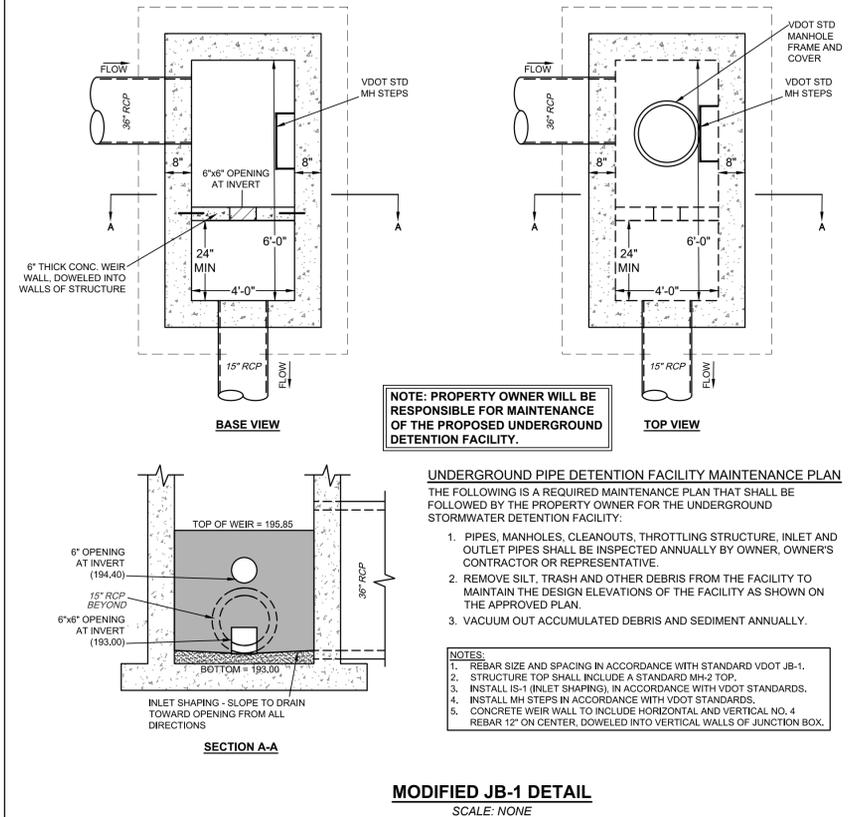
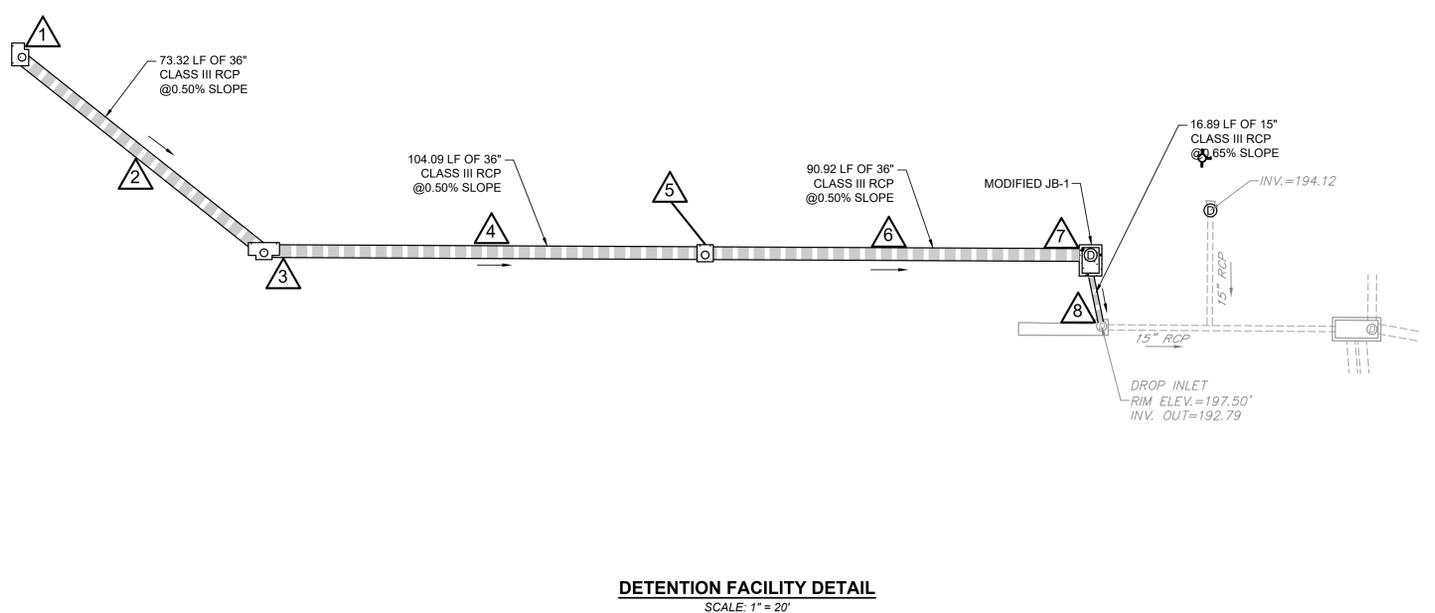
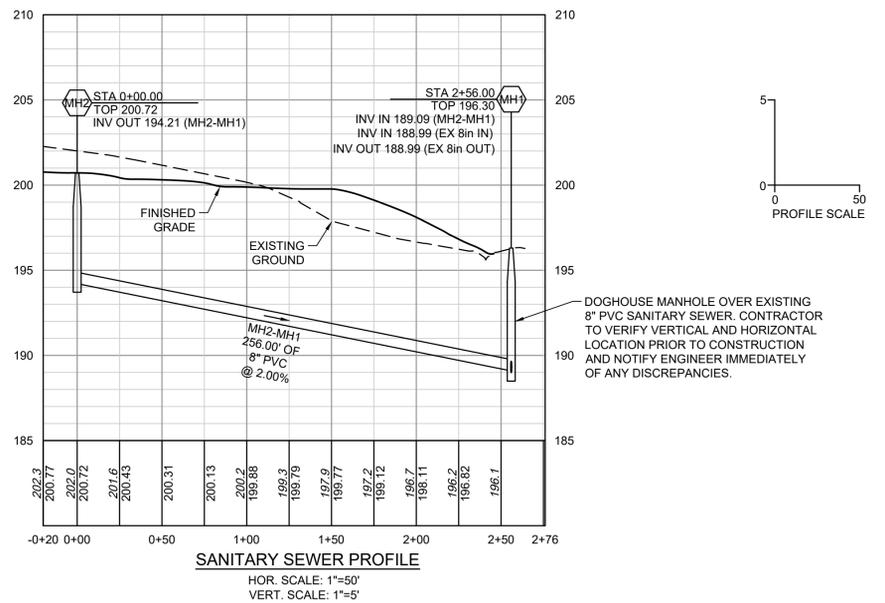
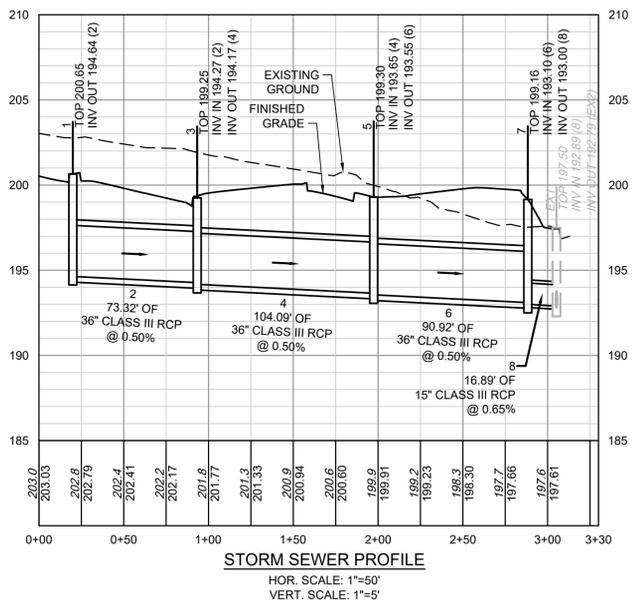
City of Richmond DPU Fixture Values Meter Sizing

Fixture	Fixture Value @ 35 psi	No. of Fixtures (not to exceed if none)	Fixture Value	COMMENTS
Bathtub	8	x	= 0	
Whirlpool	8	x	= 0	
Shower Head (shower only)	4	x	= 0	
Toilet-Flush Valve	35	x	= 0	
Toilet-Tank Type	3	x	= 0	
Wash Sink (ea. set of faucets)	4	x	= 0	
Kitchen Sink- 1/2" Connection	3	x	= 0	
Kitchen Sink- 3/4" Connection	7	x	= 0	
Dishwasher- 1/2" Conn	5	x	= 0	
Dishwasher- 3/4" Connection	10	x	= 0	
Washing Machine- 1/2" Conn	5	x	= 0	
Washing Machine- 3/4" Conn	12	x	= 0	
Washing Machine- 1" Conn	25	x	= 0	
Hose Bib- 1/2" Conn	6	x	= 0	
Hose Bib- 5/8" Conn	9	x	= 0	
Hose Bib- 3/4" Conn	12	x	= 0	
Lawn Sprinkler (per head)	1	x	= 0	
Bedpan Washers	10	x	= 0	
Combination Sink & Tray	3	x	= 0	
Lavatory- 3/8" Connection	2	x	= 0	
Lavatory- 1/2" Connection	4	x	= 0	
Laundry Tray- 1/2" Connection	3	x	= 0	
Laundry Tray- 3/4" Connection	7	x	= 0	
Service Sink- 1/2" Connection	3	x	= 0	
Service Sink- 3/4" Connection	7	x	= 0	
Urinal - Pedestal Flush Valve	35	x	= 0	
Urinal- Wall Flush Valve	12	x	= 0	
Trough (2ft Unit)	2	x	= 0	
Fixture Value Total			40	

Meter Size based on Fixture Value Total → 1"

NOTE: Other factors, such as distance/length of service or elevation, may make it necessary to utilize a larger meter than that which is indicated by this calculation.

FORM NO. 28, Rev. 04/2011, Page 5 of 14, Noted by Applicant



DATE : FEBRUARY 5, 2021

REVISION BLOCK	
10-07-21	CITY COMMENTS
12-20-21	CITY COMMENTS

**BROAD ROCK BOULEVARD
 RETAIL CENTER**
 CITY OF RICHMOND, VA
PROFILES

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PHASE 2 SEQUENCE OF CONSTRUCTION

- BEGIN ROUGH GRADING OPERATIONS. PHASE I MEASURES SHALL BE MAINTAINED OR REPLACED AS AREAS ARE STABILIZED.
- THE FILL SLOPES SHALL BE LEFT IN A TOUGHENED CONDITION TO REDUCE THE CHANCE OF SHEET AND RILL EROSION. CONCENTRATED FLOWS SHALL BE DIVERTED AWAY FROM FILL SLOPES AND INTO A STABILIZED CHANNEL OR TEMPORARY SLOPE DRAINS UNTIL THE SLOPES ARE STABILIZED WITH A STAND OF GRASS.
- INSTALL STORM SEWER WITH ASSOCIATED INLET PROTECTION.
- ENSURE THAT POSITIVE DRAINAGE IS MAINTAINED AND ALL DRAINAGE IS DIVERTED TO THE PERIMETER EROSION CONTROL MEASURES. MAINTAIN ALL EROSION CONTROL MEASURES IN ACCORDANCE WITH THE LATEST EDITION OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK.
- COMPLETE SITE WORK CONSTRUCTION INCLUDING UTILITIES, CURBING, ENTRANCES, SIDEWALKS AS WELL AS TEMPORARY AND PERMANENT SEEDING FOR STABILIZATION.
- PLACE FINAL PAVEMENT AND STABILIZE ANY PROBLEM AREAS ON SITE.
- ONCE ALL CONTRIBUTING AREAS ARE STABILIZED, AND WITH APPROVAL FROM THE CITY EROSION CONTROL INSPECTOR, DEWATER THE TEMPORARY SEDIMENT TRAPS. CLEAN OUT ACCUMULATED SEDIMENT IN ACCORDANCE WITH THE LATEST EDITION OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK.
- PLACE TOPSOIL ON LANDSCAPE AREAS. PERMANENT SEED AND MULCH ALL DENUED AREAS.
- DO NOT REMOVE EROSION CONTROL MEASURES UNTIL ALL CONTRIBUTING AREAS HAVE BEEN PERMANENTLY STABILIZED. REMOVE ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES IN ACCORDANCE WITH THE LATEST EDITION OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK. NOTIFY THE CITY EROSION CONTROL INSPECTOR BEFORE THE EROSION AND SEDIMENT CONTROL MEASURES ARE REMOVED.

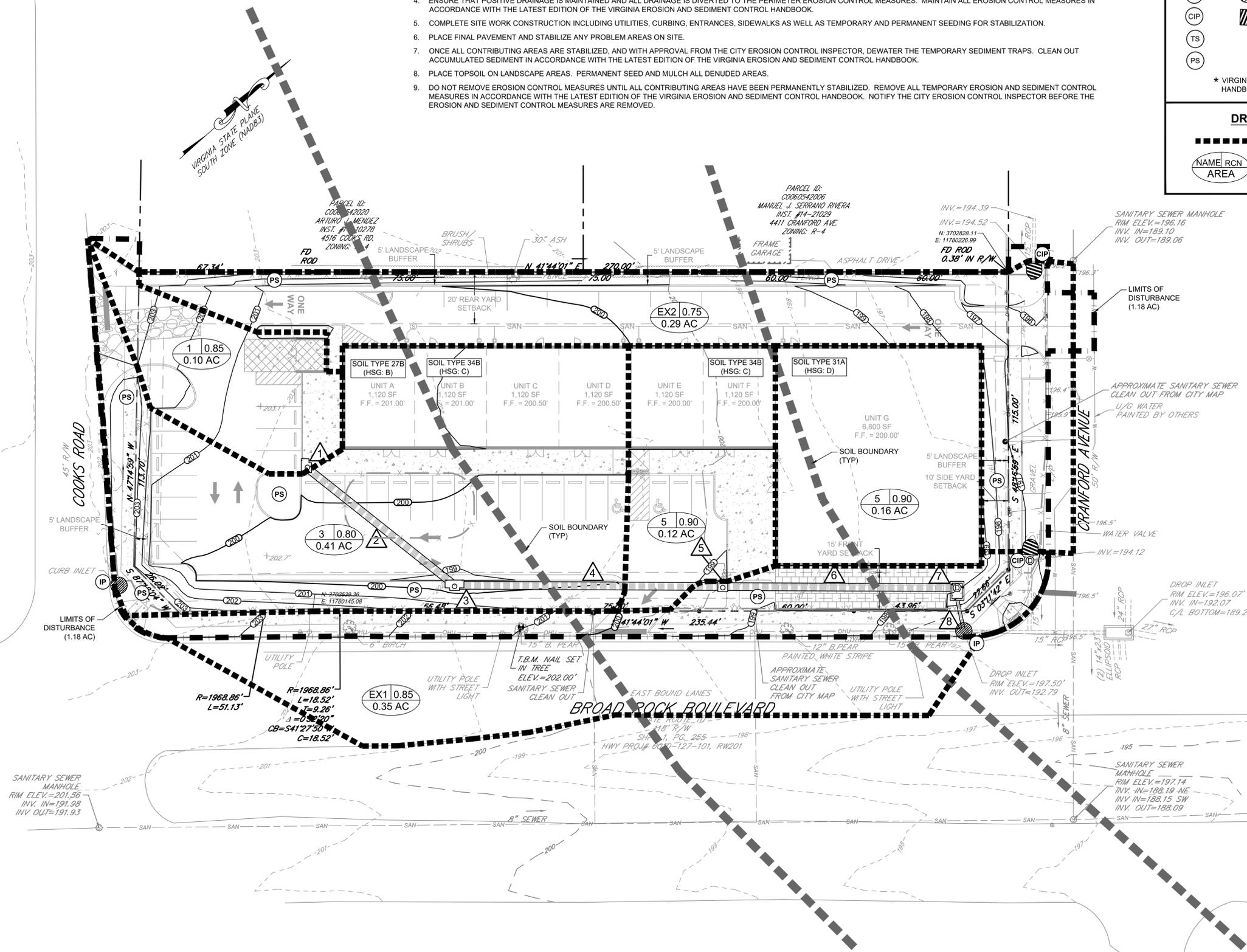
EROSION CONTROL LEGEND

CE		CONSTRUCTION ENTRANCE	3.02
SF		SILT FENCE	3.05
IP		INLET PROTECTION	3.07
CIP		CULVERT INLET PROTECTION	3.08
TS		TEMPORARY SEEDING	3.31
PS		PERMANENT SEEDING	3.32

* VIRGINIA EROSION & SEDIMENT CONTROL HANDBOOK SPECIFICATION NUMBER

DRAINAGE AREA MAP LEGEND

	DRAINAGE DIVIDE TO INLET
	DRAINAGE AREA DATA (RATIONAL)



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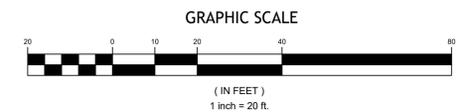
REVISION BLOCK

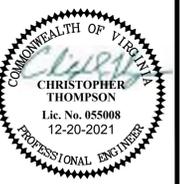
10-07-21	CITY COMMENTS
12-20-21	CITY COMMENTS

**BROAD ROCK BOULEVARD
 RETAIL CENTER**
 CITY OF RICHMOND, VA

HYDROLOGY AND PHASE 2 E&S PLAN

SHEET NO.
C7.0





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DATE: FEBRUARY 5, 2021
 REVISION BLOCK

10-07-21	CITY COMMENTS
12-20-21	CITY COMMENTS

**BROAD ROCK BOULEVARD
 RETAIL CENTER**
 CITY OF RICHMOND, VA
STORMWATER QUALITY ANALYSIS

SHEET NO.
C8.0

PRE-DEVELOPMENT LAND COVER LEGEND

- DENOTES LIMITS OF ANALYSIS (1.18 AC)
- DENOTES PRE-DEVELOPMENT VRRM IMPERVIOUS AREA FOR "B" SOILS (0.37 AC)
- DENOTES PRE-DEVELOPMENT VRRM MANAGED TURF AREA FOR "B" SOILS (0.09 AC)
- DENOTES PRE-DEVELOPMENT VRRM IMPERVIOUS AREA FOR "C" SOILS (0.24 AC)
- DENOTES PRE-DEVELOPMENT VRRM MANAGED TURF AREA FOR "C" SOILS (0.20 AC)
- DENOTES PRE-DEVELOPMENT VRRM IMPERVIOUS AREA FOR "D" SOILS (0.05 AC)
- DENOTES PRE-DEVELOPMENT VRRM MANAGED TURF AREA FOR "D" SOILS (0.23 AC)

POST-DEVELOPMENT LAND COVER LEGEND

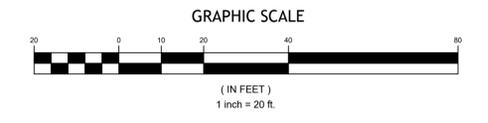
- DENOTES LIMITS OF ANALYSIS (1.18 AC)
- DENOTES POST-DEVELOPMENT VRRM IMPERVIOUS AREA FOR "B" SOILS (0.31 AC)
- DENOTES POST-DEVELOPMENT VRRM MANAGED TURF AREA FOR "B" SOILS (0.15 AC)
- DENOTES POST-DEVELOPMENT VRRM IMPERVIOUS AREA FOR "C" SOILS (0.40 AC)
- DENOTES POST-DEVELOPMENT VRRM MANAGED TURF AREA FOR "C" SOILS (0.04 AC)
- DENOTES POST-DEVELOPMENT VRRM IMPERVIOUS AREA FOR "D" SOILS (0.23 AC)
- DENOTES POST-DEVELOPMENT VRRM MANAGED TURF AREA FOR "D" SOILS (0.05 AC)

STORMWATER QUALITY ANALYSIS SUMMARY:
 9VAC25-870-63

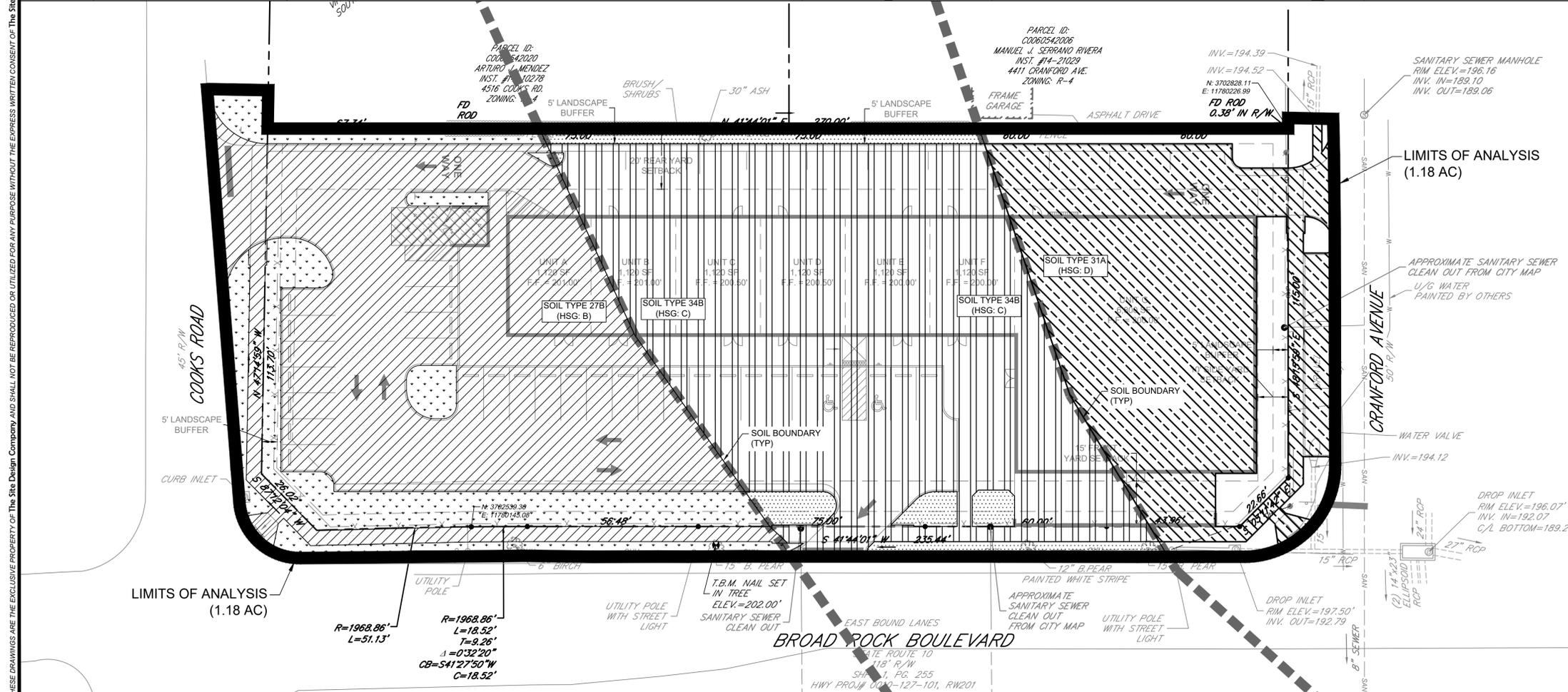
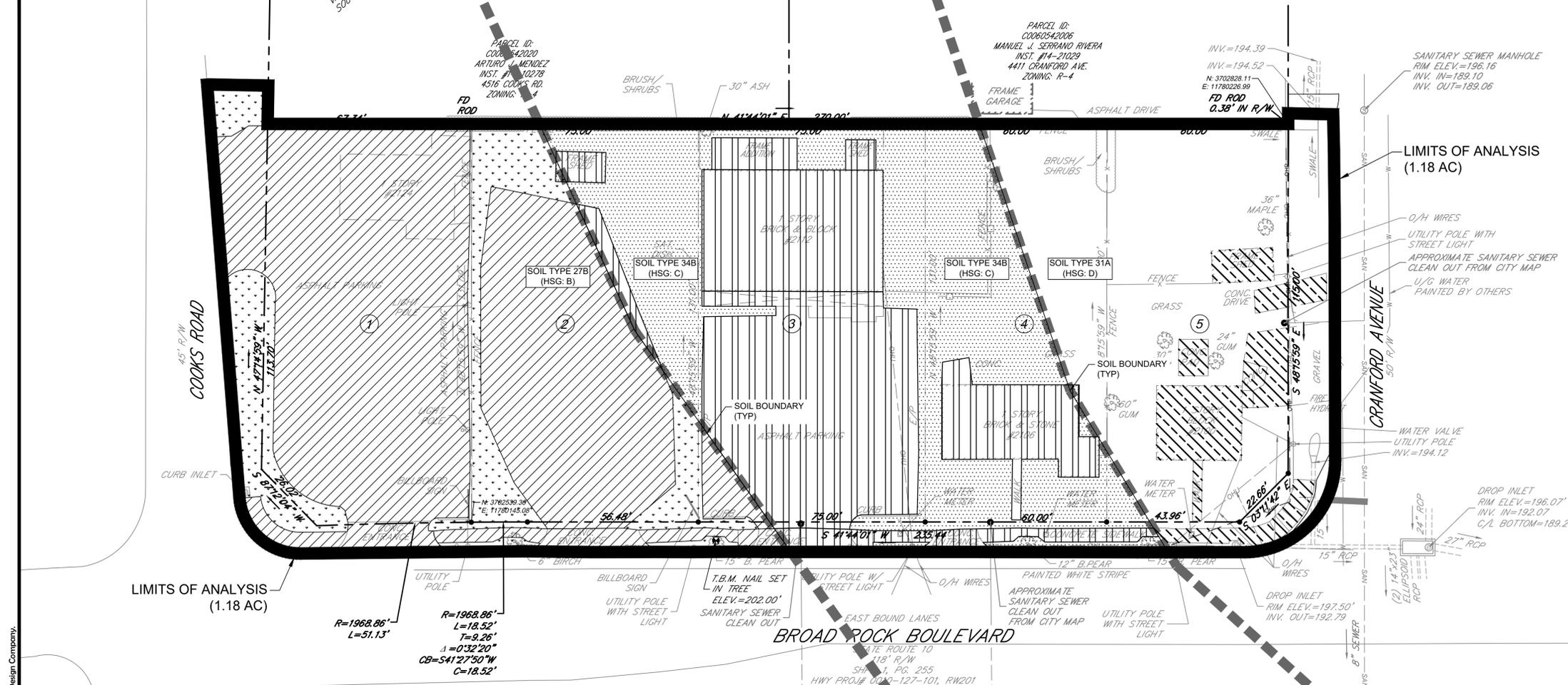
THIS SITE WAS ANALYZED FOR COMPLIANCE WITH STORMWATER QUALITY REQUIREMENTS BY UTILIZING THE VIRGINIA RUNOFF REDUCTION METHOD (VRRM) FOR DEVELOPMENT ON PRIOR DEVELOPED LANDS. IN ACCORDANCE WITH 9VAC25-870-63, ITEM 2(A)(C), AS A RESULT OF LAND DISTURBING ACTIVITIES GREATER THAN OR EQUAL TO ONE ACRE THAT RESULT IN A NET INCREASE IN IMPERVIOUS COVER, THE DESIGN CRITERIA FOR NEW DEVELOPMENT SHALL BE APPLIED TO THE INCREASED IMPERVIOUS AREA AND THE EXISTING IMPERVIOUS AREA SHALL BE REDUCED AT LEAST 20% BELOW THE PREDEVELOPMENT TOTAL PHOSPHOROUS LOAD FOR THIS PROJECT.

THE TOTAL LOAD REDUCTION REQUIRED FOR THE DEVELOPMENT IS 0.80 LBS. COMPLIANCE WILL BE ACHIEVED VIA PURCHASE OF NUTRIENT CREDITS FROM A DEQ APPROVED NUTRIENT CREDIT FACILITY WITHIN THE SUBJECT WATERSHED. PROOF OF PURCHASE WILL BE PROVIDED UPON COMPLETED TRANSACTION.

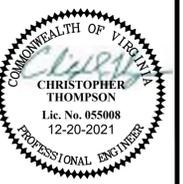
REFER TO SHEET C8.2 FOR VIRGINIA RUNOFF REDUCTION METHOD WORKSHEET.



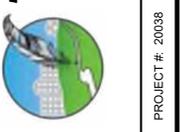
GRAPHIC SCALE
 (IN FEET)
 1 inch = 20 ft.



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 EMAIL: thompson@sitedesignco.com



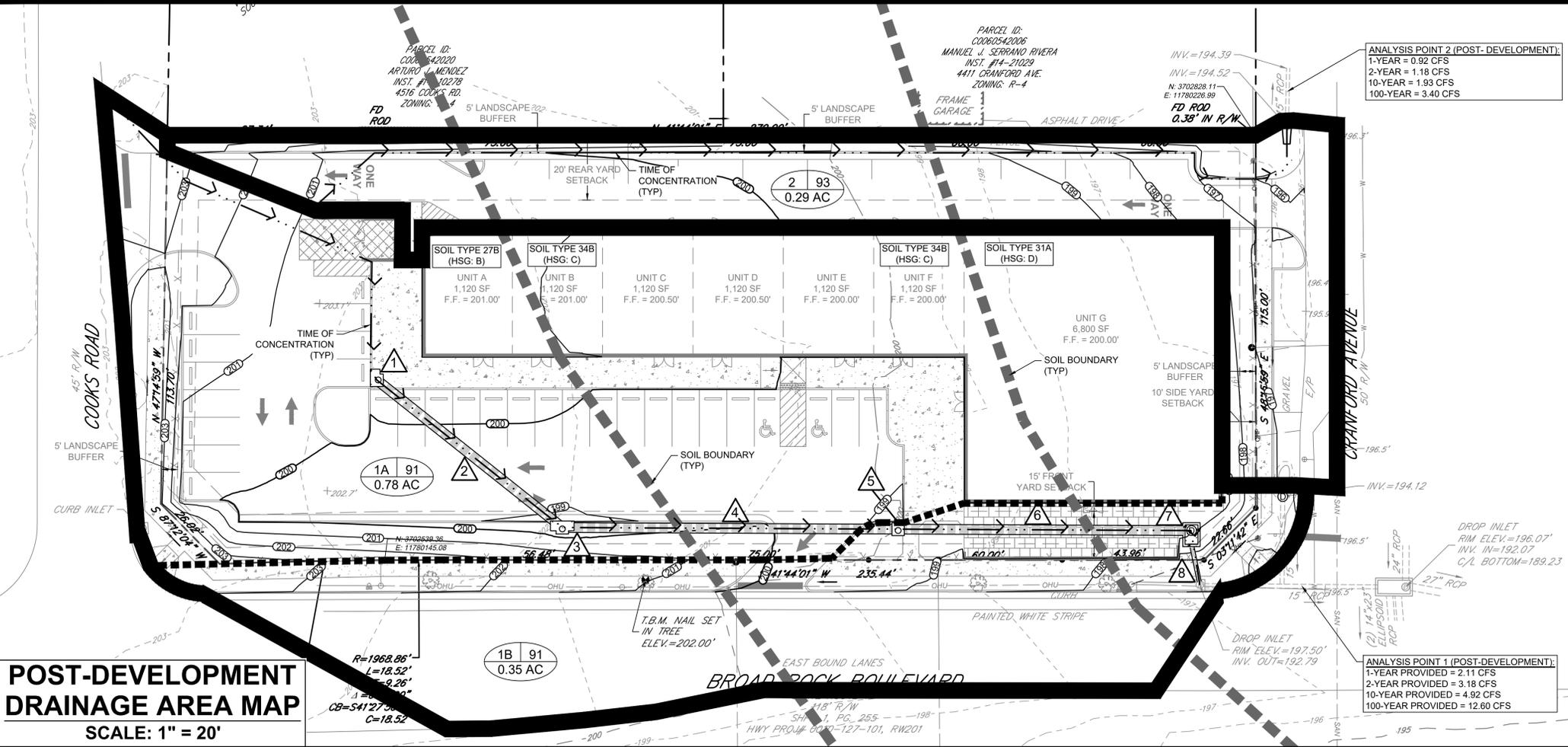
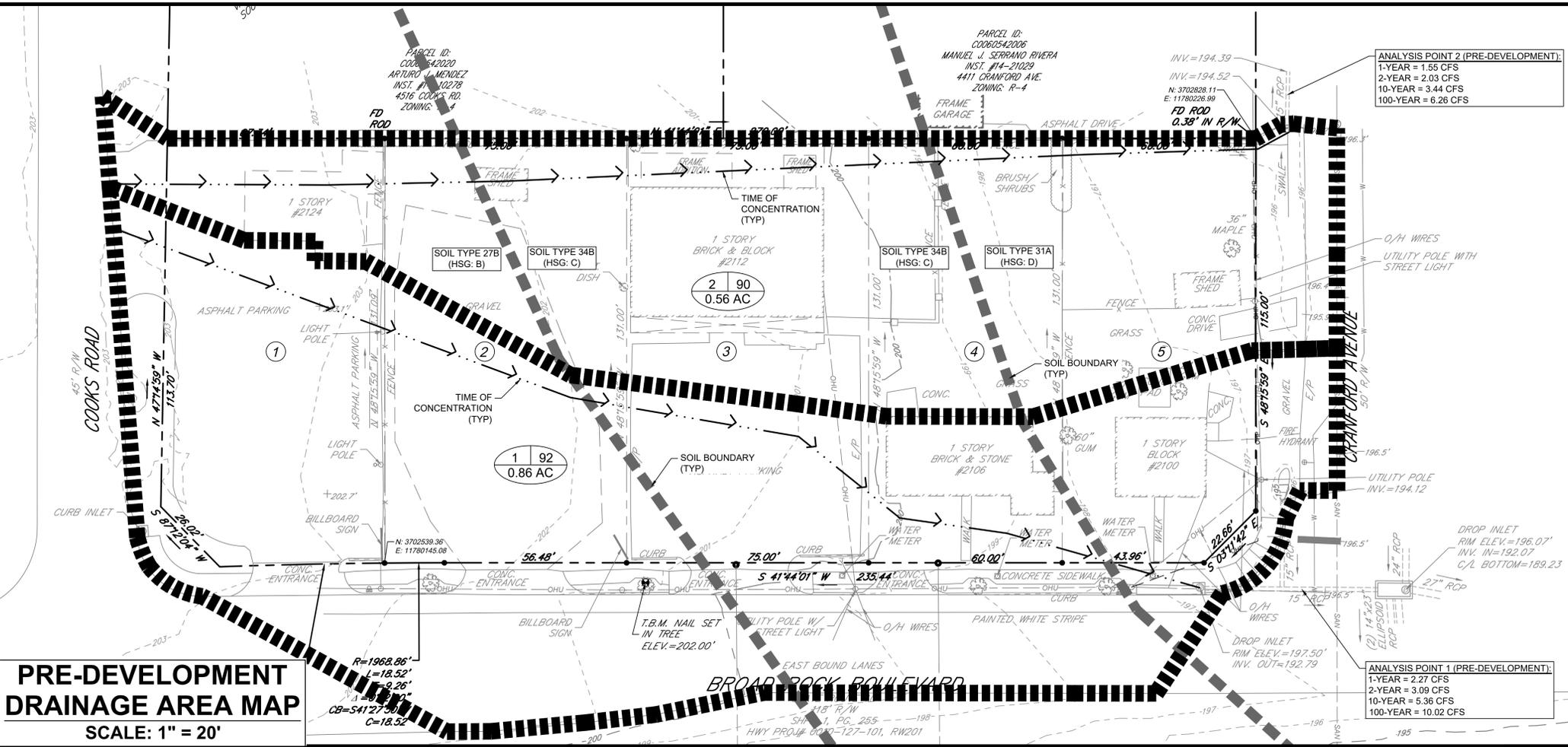
DATE: FEBRUARY 5, 2021

REVISION BLOCK	
10-07-21	CITY COMMENTS
12-20-21	CITY COMMENTS

**BROAD ROCK BOULEVARD
 RETAIL CENTER**
 CITY OF RICHMOND, VA

STORMWATER QUANTITY ANALYSIS

SHEET NO.
C8.1



STORMWATER QUANTITY ANALYSIS SUMMARY (ANALYSIS POINT 1):
 9VAC25-870-66
 THIS OUTFALL WAS ANALYZED FOR COMPLIANCE WITH STORMWATER QUANTITY REQUIREMENT 9VAC25-870-66, CHANNEL AND FLOOD PROTECTION. THE FOLLOWING IS A SUMMARY OF COMPLIANCE WITH CHANNEL AND FLOOD PROTECTION REQUIREMENTS.

CHANNEL PROTECTION:
 CHANNEL PROTECTION HAS BEEN ANALYZED FOR COMPLIANCE WITH STORMWATER QUANTITY REQUIREMENT 9VAC25-870-66, PART 1A, FOR DEVELOPMENTS WHERE THE SITE'S CONTRIBUTING DRAINAGE AREA DISCHARGES INTO A MANMADE STORMWATER CONVEYANCE SYSTEM. CHANNEL PROTECTION COMPLIANCE IS ACHIEVED BY CONVEYING THE POST-DEVELOPMENT PEAK FLOW RATE FROM THE 2-YEAR 24-HOUR STORM EVENT WITHOUT CAUSING EROSION OF THE SYSTEM. THE STORMWATER IS BEING RELEASED INTO A CONCRETE PIPE SYSTEM AND THE PRE-DEVELOPMENT 2-YEAR PEAK FLOW RATE IS 3.09 CFS AND THE POST-DEVELOPMENT 2-YEAR PEAK FLOW RATE IS 3.18 CFS. THE FLOW IS THEREFORE NON EROSION AND CHANNEL PROTECTION REQUIREMENTS HAVE BEEN MET.

FLOOD PROTECTION:
 FLOOD PROTECTION HAS BEEN ANALYZED FOR COMPLIANCE WITH STORMWATER QUANTITY REQUIREMENT 9VAC25-870-66, PART 1, FOR DEVELOPMENTS WHERE THE STORMWATER CONVEYANCE SYSTEM DOES NOT EXPERIENCE LOCALIZED FLOODING DURING THE 10-YEAR 24-HOUR STORM EVENT. FLOOD PROTECTION IS ACHIEVED BY CONFINING THE POST DEVELOPED PEAK FLOW RATE FROM THE 10-YEAR 24-HOUR STORM EVENT WITHIN THE STORMWATER CONVEYANCE SYSTEM AND RELEASING IT AT A LESSER RATE THAN IN PRE-DEVELOPMENT CONDITIONS. THE PRE-DEVELOPMENT 10-YEAR PEAK FLOW RATE IS 5.36 CFS AND THE POST-DEVELOPMENT 10-YEAR PEAK FLOW RATE IS 4.92 CFS.

STORMWATER QUANTITY ANALYSIS SUMMARY (ANALYSIS POINT 2):
 9VAC25-870-66
 THIS OUTFALL WAS ANALYZED FOR COMPLIANCE WITH STORMWATER QUANTITY REQUIREMENT 9VAC25-870-66, CHANNEL AND FLOOD PROTECTION. THE FOLLOWING IS A SUMMARY OF COMPLIANCE WITH CHANNEL AND FLOOD PROTECTION REQUIREMENTS.

CHANNEL PROTECTION:
 CHANNEL PROTECTION HAS BEEN ANALYZED FOR COMPLIANCE WITH STORMWATER QUANTITY REQUIREMENT 9VAC25-870-66, PART 1A, FOR DEVELOPMENTS WHERE THE SITE'S CONTRIBUTING DRAINAGE AREA DISCHARGES INTO A MANMADE STORMWATER CONVEYANCE SYSTEM. CHANNEL PROTECTION COMPLIANCE IS ACHIEVED BY CONVEYING THE POST-DEVELOPMENT PEAK FLOW RATE FROM THE 2-YEAR 24-HOUR STORM EVENT WITHOUT CAUSING EROSION OF THE SYSTEM. THE PRE-DEVELOPMENT 2-YEAR PEAK FLOW RATE IS 2.03 CFS AND THE POST-DEVELOPMENT 2-YEAR PEAK FLOW RATE IS 1.18 CFS. THE FLOW IS THEREFORE NON EROSION AND CHANNEL PROTECTION REQUIREMENTS HAVE BEEN MET.

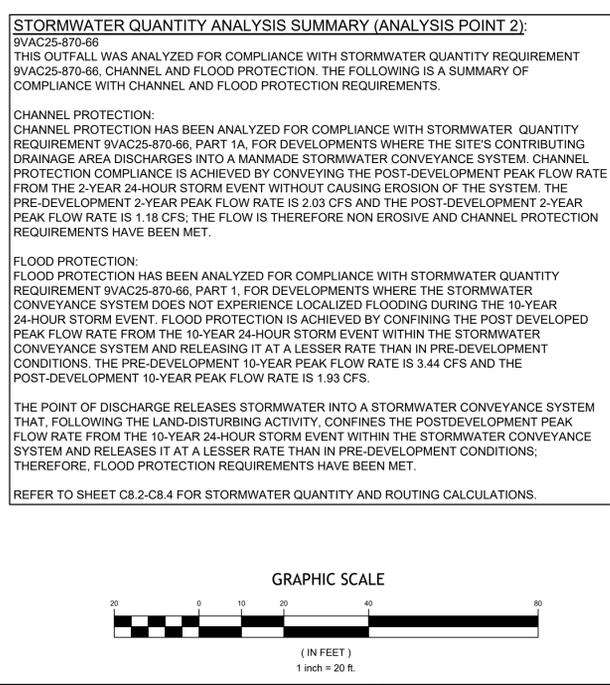
FLOOD PROTECTION:
 FLOOD PROTECTION HAS BEEN ANALYZED FOR COMPLIANCE WITH STORMWATER QUANTITY REQUIREMENT 9VAC25-870-66, PART 1, FOR DEVELOPMENTS WHERE THE STORMWATER CONVEYANCE SYSTEM DOES NOT EXPERIENCE LOCALIZED FLOODING DURING THE 10-YEAR 24-HOUR STORM EVENT. FLOOD PROTECTION IS ACHIEVED BY CONFINING THE POST DEVELOPED PEAK FLOW RATE FROM THE 10-YEAR 24-HOUR STORM EVENT WITHIN THE STORMWATER CONVEYANCE SYSTEM AND RELEASING IT AT A LESSER RATE THAN IN PRE-DEVELOPMENT CONDITIONS. THE PRE-DEVELOPMENT 10-YEAR PEAK FLOW RATE IS 3.44 CFS AND THE POST-DEVELOPMENT 10-YEAR PEAK FLOW RATE IS 1.93 CFS.

THE POINT OF DISCHARGE RELEASES STORMWATER INTO A STORMWATER CONVEYANCE SYSTEM THAT, FOLLOWING THE LAND-DISTURBING ACTIVITY, CONFINES THE POSTDEVELOPMENT PEAK FLOW RATE FROM THE 10-YEAR 24-HOUR STORM EVENT WITHIN THE STORMWATER CONVEYANCE SYSTEM AND RELEASES IT AT A LESSER RATE THAN IN PRE-DEVELOPMENT CONDITIONS; THEREFORE, FLOOD PROTECTION REQUIREMENTS HAVE BEEN MET.

REFER TO SHEET C8.2-C8.4 FOR STORMWATER QUANTITY AND ROUTING CALCULATIONS.

STORMWATER QUANTITY ANALYSIS SUMMARY (ANALYSIS POINT 1):
 1-YEAR PROVIDED = 2.11 CFS
 2-YEAR PROVIDED = 3.18 CFS
 10-YEAR PROVIDED = 4.92 CFS
 100-YEAR PROVIDED = 12.60 CFS

STORMWATER QUANTITY ANALYSIS SUMMARY (ANALYSIS POINT 2):
 1-YEAR PROVIDED = 2.11 CFS
 2-YEAR PROVIDED = 3.18 CFS
 10-YEAR PROVIDED = 4.92 CFS
 100-YEAR PROVIDED = 12.60 CFS



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WORKSHEET FOR SCS HYDROLOGIC PARAMETERS

Site Conditions:	<input checked="" type="checkbox"/> Existing <input type="checkbox"/> Proposed	Project: Broad Rock Retail Subarea Number: AREA 1
Off-Site Land Use:	<input checked="" type="checkbox"/> Existing <input type="checkbox"/> Proposed	By: Chris Thompson Date:

Soil Group	Land Use or Zoning	Area (acres)	RCN	RCN x Area
B	On-Site Managed Turf	0.07	61	4.3
H	On-Site Impervious	0.40	98	39.2
C	On-Site Managed Turf	0.05	74	3.7
C	On-Site Impervious	0.21	98	20.8
D	On-Site Managed Turf	0.07	80	5.6
D	On-Site Impervious	0.06	98	5.9

Total Area = 0.80 ac 0.001 sq. mi Weighted RCN = 92

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 = 3.4 in.)								
	Grass	0.15	100	0.01			$T_c = 0.007 (nL)^{0.9} / (P_2)^{0.48} S^{0.22}$	0.21
Shallow Concentrated Flow								
	Paved		250	0.02			Fig. 3.1, TR-55 $T_c = L / (3600V)$	2.0
	Channel Flow						$T_c = L / (3600V)$	
Total T _c = 11.21								

WORKSHEET FOR SCS HYDROLOGIC PARAMETERS

Site Conditions:	<input checked="" type="checkbox"/> Existing <input type="checkbox"/> Proposed	Project: Broad Rock Retail Subarea Number: AREA 1
Off-Site Land Use:	<input checked="" type="checkbox"/> Existing <input type="checkbox"/> Proposed	By: Chris Thompson Date:

Soil Group	Land Use or Zoning	Area (acres)	RCN	RCN x Area
B	On-Site Managed Turf	0.12	61	7.3
B	On-Site Impervious	0.42	98	41.2
C	On-Site Managed Turf	0.02	74	1.5
C	On-Site Impervious	0.41	98	40.2
D	On-Site Managed Turf	0.01	80	0.8
D	On-Site Impervious	0.10	98	9.8

Total Area = 1.13 ac 0.002 sq. mi Weighted RCN = 93

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 = 3.4 in.)								
	Grass	0.15	25	0.01			$T_c = 0.007 (nL)^{0.9} / (P_2)^{0.48} S^{0.22}$	0.07
Shallow Concentrated Flow								
	Paved		50	0.05			Fig. 3.1, TR-55 $T_c = L / (3600V)$	5
	Paved		90	0.01				2
	Channel Flow						$T_c = L / (3600V)$	
	38" RCP	0.011	298	0.005	7.069	9.4248	7.91	0.009
Total T _c = 0.10								

WORKSHEET FOR SCS GRAPHICAL PEAK DISCHARGE

Project: Broad Rock Retail
Subarea Number: AREA 1
By: Chris Thompson

Existing Conditions

Proposed Project Data Summary		
Drainage Area	0.86 acres	0.001 square mi
Runoff Curve Number	92	
Time of Concentration	0.23 hours	
Rainfall Distribution Assumed Type II		

	Storm 1	Storm 2	Storm 3	Storm 4
Frequency	yr 1	2	10	100
P ₂ 24-hour rainfall	in 2.8	3.4	5.1	8.4
Initial Abstraction, I _a	in 0.171	0.171	0.171	0.171
Comoute, μP	0.06	0.05	0.03	0.02
Unit Peak Discharge, q _p	csf/in 950	900	950	1000
Runoff, q	in 1.98	2.55	4.20	7.46
Peak Discharge, C	csf	2.27	3.09	5.36
RV (Runoff Volume)		0.142		

WORKSHEET FOR SCS HYDROLOGIC PARAMETERS

Site Conditions:	<input checked="" type="checkbox"/> Existing <input type="checkbox"/> Proposed	Project: Broad Rock Retail Subarea Number: AREA 2
Off-Site Land Use:	<input checked="" type="checkbox"/> Existing <input type="checkbox"/> Proposed	By: Chris Thompson Date:

Soil Group	Land Use or Zoning	Area (acres)	RCN	RCN x Area
B	On-Site Managed Turf	0.02	61	1.2
B	On-Site Impervious	0.09	98	8.8
C	On-Site Managed Turf	0.15	74	11.1
C	On-Site Impervious	0.11	98	10.8
D	On-Site Managed Turf	0.02	80	1.6
D	On-Site Impervious	0.17	98	16.7

Total Area = 0.55 ac 0.001 sq. mi Weighted RCN = 90

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 = 3.4 in.)								
	Grass	0.15	100	0.1			$T_c = 0.007 (nL)^{0.9} / (P_2)^{0.48} S^{0.22}$	0.08
Shallow Concentrated Flow								
	Unpaved		297	0.028			Fig. 3.1, TR-55 $T_c = L / (3600V)$	2.7
	Channel Flow						$T_c = L / (3600V)$	
Total T _c = 0.11								

WORKSHEET FOR SCS HYDROLOGIC PARAMETERS

Site Conditions:	<input checked="" type="checkbox"/> Existing <input type="checkbox"/> Proposed	Project: Broad Rock Retail Subarea Number: AREA 2
Off-Site Land Use:	<input checked="" type="checkbox"/> Existing <input type="checkbox"/> Proposed	By: Chris Thompson Date:

Soil Group	Land Use or Zoning	Area (acres)	RCN	RCN x Area
B	On-Site Managed Turf	0.01	61	0.6
B	On-Site Impervious	0.03	98	2.9
C	On-Site Managed Turf	0.02	74	1.5
C	On-Site Impervious	0.09	98	8.8
D	On-Site Managed Turf	0.04	80	3.2
D	On-Site Impervious	0.10	98	9.8

Total Area = 0.29 ac 0.000 sq. mi Weighted RCN = 93

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 = 3.4 in.)								
	Grass	0.01	25	0.02			$T_c = 0.007 (nL)^{0.9} / (P_2)^{0.48} S^{0.22}$	0.01
Shallow Concentrated Flow								
	Paved		295	0.037			Fig. 3.1, TR-55 $T_c = L / (3600V)$	1.7
	Channel Flow						$T_c = L / (3600V)$	
Total T _c = 0.10								

WORKSHEET FOR SCS GRAPHICAL PEAK DISCHARGE

Project: Broad Rock Retail
Subarea Number: AREA 2
By: Chris Thompson

Existing Conditions

Proposed Project Data Summary		
Drainage Area	0.56 acres	0.001 square mi
Runoff Curve Number	90	
Time of Concentration	0.11 hours	
Rainfall Distribution Assumed Type II		

	Storm 1	Storm 2	Storm 3	Storm 4
Frequency	yr 1	2	10	100
P ₂ 24-hour rainfall	in 2.8	3.4	5.1	8.4
Initial Abstraction, I _a	in 0.232	0.232	0.232	0.232
Comoute, μP	0.08	0.07	0.05	0.03
Unit Peak Discharge, q _p	csf/in 1000	1000	1000	1000
Runoff, q	in 1.77	2.32	3.93	7.5
Peak Discharge, C	csf	1.55	2.03	3.44
RV (Runoff Volume)	AC*FT	3.083		

Proposed Conditions

Proposed Project Data Summary		
Drainage Area	0.29 acres	0.000 square mi
Runoff Curve Number	93	
Time of Concentration	0.10 hours	
Rainfall Distribution Assumed Type II		

	Storm 1	Storm 2	Storm 3	Storm 4
Frequency	yr 1	2	10	100
P ₂ 24-hour rainfall	in 2.8	3.4	5.1	8.4
Initial Abstraction, I _a	in 0.160	0.160	0.160	0.160
Comoute, μP	0.06	0.05	0.03	0.02
Unit Peak Discharge, q _p	csf/in 1000	1000	1000	1000
Runoff, q	in 2.03	2.60	4.25	7.51
Peak Discharge, C	csf	0.92	1.18	1.93
RV (Runoff Volume)	AC*FT	3.049		

DEQ Virginia Runoff Reduction Method Re-Development Compliance Spreadsheet - Version 3.0

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Project Name: Broad Rock Retail
Date: 9/30/2021
Linear Development Project? No

CLEAR ALL (Ctrl+Shift+F)

data input cells
constant values
calculation cells
final results

Site Information

Post-Development Project (Treatment Volume and Loads)

Enter Total Disturbed Area (acres) → 1.18

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

Maximum reduction required: 20%
The site's net increase in impervious cover (acres) is: 0.28
Post-Development TP Load Reduction for Site (lb/yr): 0.80

Pre-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
Managed Turf (acres) - disturbed, graded for yards or other turf to be		0.09	0.20	0.25	0.52
Impervious Cover (acres)	0.37	0.24	0.05		0.66
Totals					1.18

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
Managed Turf (acres) - disturbed, graded for yards or other turf to be		0.15	0.04	0.05	0.24
Impervious Cover (acres)	0.31	0.40	0.23		0.94
Totals					1.18

Area Check: OK OK OK OK

Constants

Annual Rainfall (inches)	48
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
TP (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

	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)	0.52	0.24
Weighted Rv(turf)	0.23	0.21
% Managed Turf	44%	27%
Impervious Cover (acres)	0.66	0.66
Rv(Impervious)	0.95	0.95
% Impervious	56%	73%
Total Site Area (acres)	1.18	0.90
Site Rv	0.63	0.75

LAND COVER SUMMARY - POST DEVELOPMENT

	Post-Development	Post-Development New Impervious
Forest/Open Space Cover (acres)	0.00	0.00
Weighted Rv(Forest)	0.00	0.00
% Forest	0%	0%
Managed Turf Cover (acres)	0.24	0.24
Weighted Rv (turf)	0.21	0.21
% Managed Turf	27%	27%
Impervious Cover (acres)	0.94	0.66
Rv(Impervious)	0.95	0.95
% Impervious	80%	73%
Final Site Area (acres)	1.18	0.90
Final Post-Dev Site Rv	0.80	0.75

Treatment Volume and Nutrient Load

	Pre-Development	Post-Development
Pre-Development Treatment Volume (acre-ft)	0.0622	0.0565
Pre-Development Treatment Volume (cubic feet)	2,730	2,452
Pre-Development TP Load (lb/yr)	1.70	1.55
Pre-Development TP Load per acre (lb/acre/yr)	1.44	1.72
Baseline TP Load (lb/yr)		0.37

Treatment Volume and Nutrient Load

	Post-Development	Post-Development New Impervious
Post-Development Treatment Volume (acre-ft)	0.2565	0.0222
Post-Development Treatment Volume (cubic feet)	2,452	966
Post-Development TP Load (lb/yr)	1.55	0.61
Post-Development TP Load per acre (lb/acre/yr)	1.72	
Min. Reduction Required (Below Pre-Development Load)	20%	
TP Load Reduction Required for Redeveloped Area (lb/yr)	0.31	
TP Load Reduction Required for New Impervious Area (lb/yr)		0.49

Post-Development Requirement for Site Area

TP Load Reduction Required (lb/yr)	0.80
------------------------------------	------

¹Adjusted Land Cover Summary: Pre-Development 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-Development acreage (minus acreage of new impervious cover).
Column 1 shows load reduction requirement for new impervious cover (based on new development load limit, 2.42 lb/acre/yr).

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The Site Design Company
CIVIL ENGINEERING AND LAND DEVELOPMENT CONSULTING
288 HIGH STREET - PETERSBURG, VIRGINIA 23803
www.sitedesignco.com

PROJECT MANAGER: CHRIS THOMPSON
PHONE: 804-720-9040
EMAIL: thompson@sitedesignco.com

PROJECT #: 20038

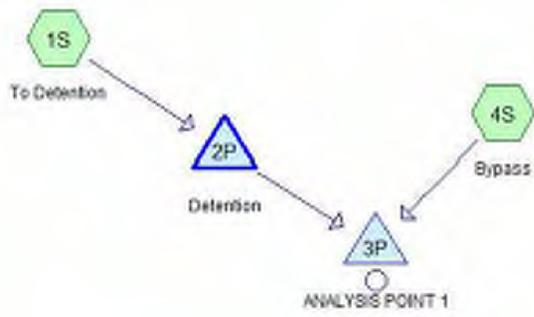
DATE: FEBRUARY 5, 2021

REVISION BLOCK	
10-07-21	CITY COMMENTS
12-20-21	CITY COMMENTS

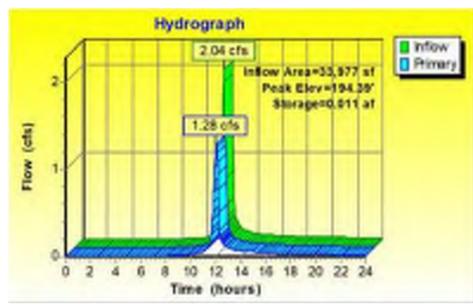
**BROAD ROCK BOULEVARD
RETAIL CENTER**
CITY OF RICHMOND, VA

STORMWATER MANAGEMENT NOTES AND DETAILS

SHEET NO.
C8.2



ROUTING DIAGRAM
NO SCALE



Summary for Pond 2P: Detention

[4] Inlet Outlet device #2 is below defined storage

Inflow Area = 33,977 sf, 0.00% Impervious, Inflow Depth = 1.52' for 1 Year event
 Inflow = 2.04 cfs @ 12.05 hrs, Volume = 4,298 cf
 Outflow = 1.28 cfs @ 12.05 hrs, Volume = 4,297 cf, Atten 33%, Lagn 4.6 min
 Primary = 1.28 cfs @ 12.05 hrs, Volume = 4,297 cf

Routing by Stor Ind method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs / 9
 Peak Elev= 194.39' @ 12.05 hrs, Surf Area= 0.011 ac, Storage= 0.011 af

Plug-Flow detention time= 1.9 min (calculated for 4,298 cf (100% of inflow))
 Center-of-Mass det. time= 1.8 min (811.7 - 702.9)

Volume	Invert	Avail Storage	Storage Description
#1	193.10'	0.000 af	36.0" Round Pipe Storage x 2 L= 91.0' S= 0.00507
#2	193.60'	0.017 af	36.0" Round Pipe Storage L= 104.0' S= 0.00507
#3	194.27'	0.012 af	36.0" Round Pipe Storage L= 73.0' S= 0.00507
0.058 af Total Available Storage			

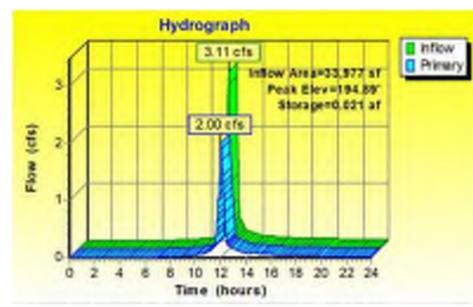
Device	Routing	Invert	Outlet Devices
#1	Primary	193.00'	18.0" Round Culvert, L= 16.0', K= 0.500 Inlet/Outlet Invert= 193.00' / 192.80' S= 0.00657 C= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	193.00'	6.0' W x 6.0' H Vert. Orifice Gate, C= 0.800 Limited to weir flow at low heads
#3	Device 1	194.40'	6.0' Vert. Orifice Gate, C= 0.800 Limited to weir flow at low heads
#4	Device 1	195.85'	4.0' long x 6.0' breadth Broad-Crested Rectangular Weir Head (feet): 0.20 0.40 0.80 1.00 Coef (English): 2.80 2.92 3.08 3.30 3.32

Primary Outflow: 1.28 cfs @ 12.05 hrs HW= 194.39' (Free Discharge)
 1-2=Orifice Gate (Orifice Controls 1.28 cfs @ 5.11 hrs)
 1-3=Orifice Gate (Orifice Controls 0.00 cfs)
 1-4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Hydrograph for Pond 2P: Detention

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.000	193.10	0.00
0.80	0.00	0.000	193.10	0.00
1.60	0.00	0.000	193.10	0.00
2.40	0.00	0.000	193.10	0.00
3.20	0.00	0.000	193.10	0.00
4.00	0.00	0.000	193.10	0.00
4.80	0.00	0.000	193.10	0.00
5.60	0.00	0.000	193.10	0.00
6.40	0.00	0.000	193.10	0.00
7.20	0.00	0.000	193.10	0.00
8.00	0.01	0.000	193.10	0.01
8.80	0.01	0.000	193.11	0.01
9.60	0.02	0.000	193.11	0.02
10.40	0.03	0.000	193.12	0.03
11.20	0.08	0.000	193.14	0.08
12.00	1.90	0.010	194.32	1.24
12.80	0.12	0.000	193.18	0.12
13.60	0.08	0.000	193.15	0.08
14.40	0.06	0.000	193.13	0.06
15.20	0.05	0.000	193.13	0.05
16.00	0.04	0.000	193.12	0.04
16.80	0.04	0.000	193.12	0.04
17.60	0.03	0.000	193.12	0.03
18.40	0.03	0.000	193.12	0.03
19.20	0.03	0.000	193.12	0.03
20.00	0.02	0.000	193.11	0.02
20.80	0.02	0.000	193.11	0.02
21.60	0.02	0.000	193.11	0.02
22.40	0.02	0.000	193.11	0.02
23.20	0.02	0.000	193.11	0.02
24.00	0.02	0.000	193.11	0.02

1-YEAR



Summary for Pond 2P: Detention

[4] Inlet Outlet device #2 is below defined storage

Inflow Area = 33,977 sf, 0.00% Impervious, Inflow Depth = 2.37' for 2 Year event
 Inflow = 3.11 cfs @ 12.04 hrs, Volume = 8,708 cf
 Outflow = 2.00 cfs @ 12.04 hrs, Volume = 8,707 cf, Atten 25%, Lagn 5.1 min
 Primary = 2.00 cfs @ 12.04 hrs, Volume = 8,707 cf

Routing by Stor Ind method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs / 9
 Peak Elev= 194.89' @ 12.04 hrs, Surf Area= 0.021 ac, Storage= 0.021 af

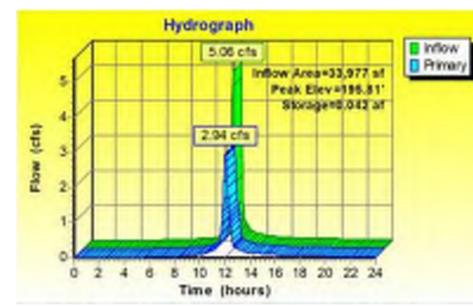
Plug-Flow detention time= (not calculated; outflow precedes inflow)
 Center-of-Mass det. time= 2.7 min (760.7 - 762.8)

Volume	Invert	Avail Storage	Storage Description
#1	193.10'	0.000 af	36.0" Round Pipe Storage x 2 L= 91.0' S= 0.00507
#2	193.60'	0.017 af	36.0" Round Pipe Storage L= 104.0' S= 0.00507
#3	194.27'	0.012 af	36.0" Round Pipe Storage L= 73.0' S= 0.00507
0.058 af Total Available Storage			

Device	Routing	Invert	Outlet Devices
#1	Primary	193.00'	18.0" Round Culvert, L= 16.0', K= 0.500 Inlet/Outlet Invert= 193.00' / 192.80' S= 0.00657 C= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	193.00'	6.0' W x 6.0' H Vert. Orifice Gate, C= 0.800 Limited to weir flow at low heads
#3	Device 1	194.40'	6.0' Vert. Orifice Gate, C= 0.800 Limited to weir flow at low heads
#4	Device 1	195.85'	4.0' long x 6.0' breadth Broad-Crested Rectangular Weir Head (feet): 0.20 0.40 0.80 1.00 Coef (English): 2.80 2.92 3.08 3.30 3.32

Primary Outflow: 2.00 cfs @ 12.04 hrs HW= 194.89' (Free Discharge)
 1-2=Orifice Gate (Orifice Controls 2.00 cfs @ 5.11 hrs)
 1-3=Orifice Gate (Orifice Controls 0.00 cfs)
 1-4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

2-YEAR



Summary for Pond 2P: Detention

[4] Inlet Outlet device #2 is below defined storage

Inflow Area = 33,977 sf, 0.00% Impervious, Inflow Depth = 3.99' for 10 Year event
 Inflow = 5.06 cfs @ 12.05 hrs, Volume = 11,261 cf
 Outflow = 2.94 cfs @ 12.05 hrs, Volume = 11,260 cf, Atten 42%, Lagn 5.1 min
 Primary = 2.94 cfs @ 12.05 hrs, Volume = 11,260 cf

Routing by Stor Ind method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs / 9
 Peak Elev= 196.81' @ 12.05 hrs, Surf Area= 0.042 ac, Storage= 0.042 af

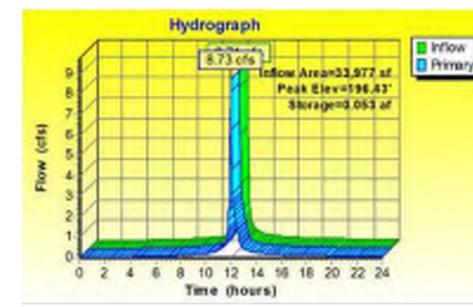
Plug-Flow detention time= 3.5 min (calculated for 11,260 cf (100% of inflow))
 Center-of-Mass det. time= 3.3 min (760.7 - 762.8)

Volume	Invert	Avail Storage	Storage Description
#1	193.10'	0.000 af	36.0" Round Pipe Storage x 2 L= 91.0' S= 0.00507
#2	193.60'	0.017 af	36.0" Round Pipe Storage L= 104.0' S= 0.00507
#3	194.27'	0.012 af	36.0" Round Pipe Storage L= 73.0' S= 0.00507
0.058 af Total Available Storage			

Device	Routing	Invert	Outlet Devices
#1	Primary	193.00'	18.0" Round Culvert, L= 16.0', K= 0.500 Inlet/Outlet Invert= 193.00' / 192.80' S= 0.00657 C= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	193.00'	6.0' W x 6.0' H Vert. Orifice Gate, C= 0.800 Limited to weir flow at low heads
#3	Device 1	194.40'	6.0' Vert. Orifice Gate, C= 0.800 Limited to weir flow at low heads
#4	Device 1	195.85'	4.0' long x 6.0' breadth Broad-Crested Rectangular Weir Head (feet): 0.20 0.40 0.80 1.00 Coef (English): 2.80 2.92 3.08 3.30 3.32

Primary Outflow: 2.94 cfs @ 12.05 hrs HW= 196.81' (Free Discharge)
 1-2=Orifice Gate (Orifice Controls 1.92 cfs @ 5.11 hrs)
 1-3=Orifice Gate (Orifice Controls 1.01 cfs @ 5.11 hrs)
 1-4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

10-YEAR



Summary for Pond 2P: Detention

[4] Inlet Outlet device #2 is below defined storage
 [8] Warning: Gate-Or may require smaller than Free Routing

Inflow Area = 33,977 sf, 0.00% Impervious, Inflow Depth = 7.13' for 100 Year event
 Inflow = 8.73 cfs @ 11.98 hrs, Volume = 20,175 cf
 Outflow = 8.73 cfs @ 11.98 hrs, Volume = 20,183 cf, Atten 0%, Lagn 0.5 min
 Primary = 8.73 cfs @ 11.98 hrs, Volume = 20,183 cf

Routing by Stor Ind method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs / 9
 Peak Elev= 198.43' @ 11.98 hrs, Surf Area= 0.063 ac, Storage= 0.063 af

Plug-Flow detention time= (not calculated; outflow precedes inflow)
 Center-of-Mass det. time= 3.6 min (771.3 - 762.8)

Volume	Invert	Avail Storage	Storage Description
#1	193.10'	0.000 af	36.0" Round Pipe Storage x 2 L= 91.0' S= 0.00507
#2	193.60'	0.017 af	36.0" Round Pipe Storage L= 104.0' S= 0.00507
#3	194.27'	0.012 af	36.0" Round Pipe Storage L= 73.0' S= 0.00507
0.058 af Total Available Storage			

Device	Routing	Invert	Outlet Devices
#1	Primary	193.00'	18.0" Round Culvert, L= 16.0', K= 0.500 Inlet/Outlet Invert= 193.00' / 192.80' S= 0.00657 C= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	193.00'	6.0' W x 6.0' H Vert. Orifice Gate, C= 0.800 Limited to weir flow at low heads
#3	Device 1	194.40'	6.0' Vert. Orifice Gate, C= 0.800 Limited to weir flow at low heads
#4	Device 1	195.85'	4.0' long x 6.0' breadth Broad-Crested Rectangular Weir Head (feet): 0.20 0.40 0.80 1.00 Coef (English): 2.80 2.92 3.08 3.30 3.32

Primary Outflow: 8.73 cfs @ 11.98 hrs HW= 198.43' (Free Discharge)
 1-2=Orifice Gate (Orifice Controls 2.13 cfs @ 5.11 hrs)
 1-3=Orifice Gate (Orifice Controls 1.25 cfs @ 5.11 hrs)
 1-4=Broad-Crested Rectangular Weir (Weir Controls 4.88 cfs @ 2.24 hrs)

100-YEAR

Hydrograph for Pond 2P: Detention

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.000	193.10	0.00
0.80	0.00	0.000	193.10	0.00
1.60	0.00	0.000	193.10	0.00
2.40	0.00	0.000	193.10	0.00
3.20	0.00	0.000	193.10	0.00
4.00	0.00	0.000	193.10	0.00
4.80	0.01	0.000	193.11	0.01
5.60	0.03	0.000	193.12	0.03
6.40	0.07	0.000	193.14	0.07
7.20	0.08	0.000	193.15	0.08
8.00	0.10	0.000	193.16	0.10
8.80	0.14	0.000	193.20	0.14
9.60	0.16	0.000	193.22	0.16
10.40	0.25	0.000	193.29	0.25
11.20	0.46	0.001	193.43	0.46
12.00	7.98	0.052	196.39	8.14
12.80	0.48	0.001	193.51	0.58
13.60	0.30	0.000	193.33	0.30
14.40	0.22	0.000	193.27	0.22
15.20	0.19	0.000	193.24	0.19
16.00	0.15	0.000	193.21	0.15
16.80	0.14	0.000	193.19	0.14
17.60	0.12	0.000	193.18	0.12
18.40	0.11	0.000	193.17	0.11
19.20	0.10	0.000	193.16	0.10
20.00	0.08	0.000	193.15	0.08
20.80	0.08	0.000	193.15	0.08
21.60	0.08	0.000	193.15	0.08
22.40	0.08	0.000	193.14	0.08
23.20	0.07	0.000	193.14	0.07
24.00	0.07	0.000	193.14	0.07

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PROJECT # : 20038
 PROJECT MANAGER : CHRIS THOMPSON
 PHONE : 804-720-9040
 EMAIL : thompson@sitedesignco.com



DATE : FEBRUARY 5, 2021

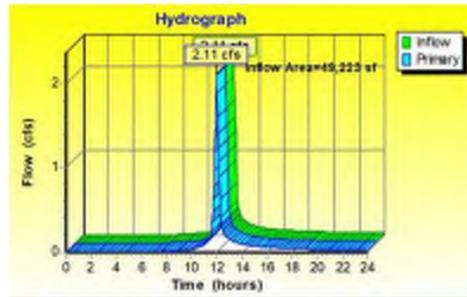
REVISION BLOCK	
10-07-21	CITY COMMENTS
12-20-21	CITY COMMENTS

**BROAD ROCK BOULEVARD
 RETAIL CENTER**
 CITY OF RICHMOND, VA

STORMWATER MANAGEMENT NOTES AND DETAILS

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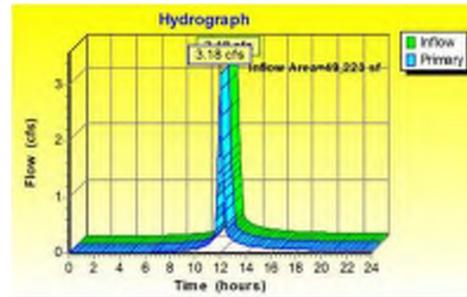
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Hydrograph for Pond 3P: ANALYSIS POINT 1

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00		0.00
0.80	0.00		0.00
1.60	0.00		0.00
2.40	0.00		0.00
3.20	0.00		0.00
4.00	0.00		0.00
4.80	0.00		0.00
5.60	0.00		0.00
6.40	0.00		0.00
7.20	0.00		0.00
8.00	0.01		0.01
8.80	0.02		0.02
9.60	0.03		0.03
10.40	0.05		0.05
11.20	0.11		0.11
12.00	2.09		2.09
12.80	0.18		0.18
13.60	0.11		0.11
14.40	0.08		0.08
15.20	0.07		0.07
16.00	0.06		0.06
16.80	0.05		0.05
17.60	0.05		0.05
18.40	0.04		0.04
19.20	0.04		0.04
20.00	0.03		0.03
20.80	0.03		0.03
21.60	0.03		0.03
22.40	0.03		0.03
23.20	0.03		0.03
24.00	0.03		0.03

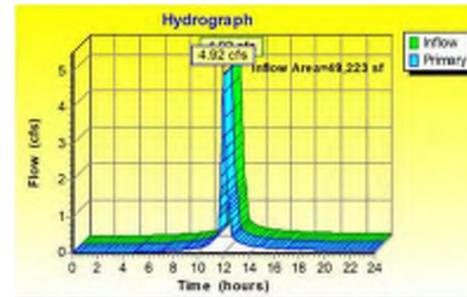
1-YEAR



Hydrograph for Pond 3P: ANALYSIS POINT 1

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00		0.00
0.80	0.00		0.00
1.60	0.00		0.00
2.40	0.00		0.00
3.20	0.00		0.00
4.00	0.00		0.00
4.80	0.00		0.00
5.60	0.00		0.00
6.40	0.01		0.01
7.20	0.02		0.02
8.00	0.02		0.02
8.80	0.04		0.04
9.60	0.06		0.06
10.40	0.09		0.09
11.20	0.19		0.19
12.00	3.18		3.18
12.80	0.26		0.26
13.60	0.16		0.16
14.40	0.12		0.12
15.20	0.10		0.10
16.00	0.08		0.08
16.80	0.07		0.07
17.60	0.07		0.07
18.40	0.06		0.06
19.20	0.05		0.05
20.00	0.05		0.05
20.80	0.04		0.04
21.60	0.04		0.04
22.40	0.04		0.04
23.20	0.04		0.04
24.00	0.04		0.04

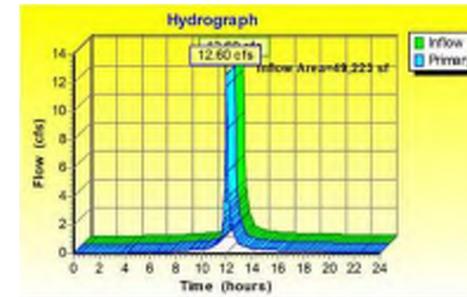
2-YEAR



Hydrograph for Pond 3P: ANALYSIS POINT 1

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00		0.00
0.80	0.00		0.00
1.60	0.00		0.00
2.40	0.00		0.00
3.20	0.00		0.00
4.00	0.01		0.01
4.80	0.01		0.01
5.60	0.03		0.03
6.40	0.04		0.04
7.20	0.05		0.05
8.00	0.06		0.06
8.80	0.09		0.09
9.60	0.11		0.11
10.40	0.19		0.19
11.20	0.35		0.35
12.00	4.89		4.89
12.80	0.42		0.42
13.60	0.26		0.26
14.40	0.19		0.19
15.20	0.16		0.16
16.00	0.13		0.13
16.80	0.12		0.12
17.60	0.11		0.11
18.40	0.10		0.10
19.20	0.08		0.08
20.00	0.07		0.07
20.80	0.07		0.07
21.60	0.07		0.07
22.40	0.07		0.07
23.20	0.06		0.06
24.00	0.06		0.06

10-YEAR



Hydrograph for Pond 3P: ANALYSIS POINT 1

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00		0.00
0.80	0.00		0.00
1.60	0.00		0.00
2.40	0.00		0.00
3.20	0.02		0.02
4.00	0.04		0.04
4.80	0.06		0.06
5.60	0.08		0.08
6.40	0.10		0.10
7.20	0.12		0.12
8.00	0.14		0.14
8.80	0.20		0.20
9.60	0.24		0.24
10.40	0.36		0.36
11.20	0.66		0.66
12.00	11.72		11.72
12.80	0.80		0.80
13.60	0.43		0.43
14.40	0.32		0.32
15.20	0.27		0.27
16.00	0.22		0.22
16.80	0.20		0.20
17.60	0.18		0.18
18.40	0.16		0.16
19.20	0.14		0.14
20.00	0.12		0.12
20.80	0.12		0.12
21.60	0.11		0.11
22.40	0.11		0.11
23.20	0.11		0.11
24.00	0.10		0.10

100-YEAR



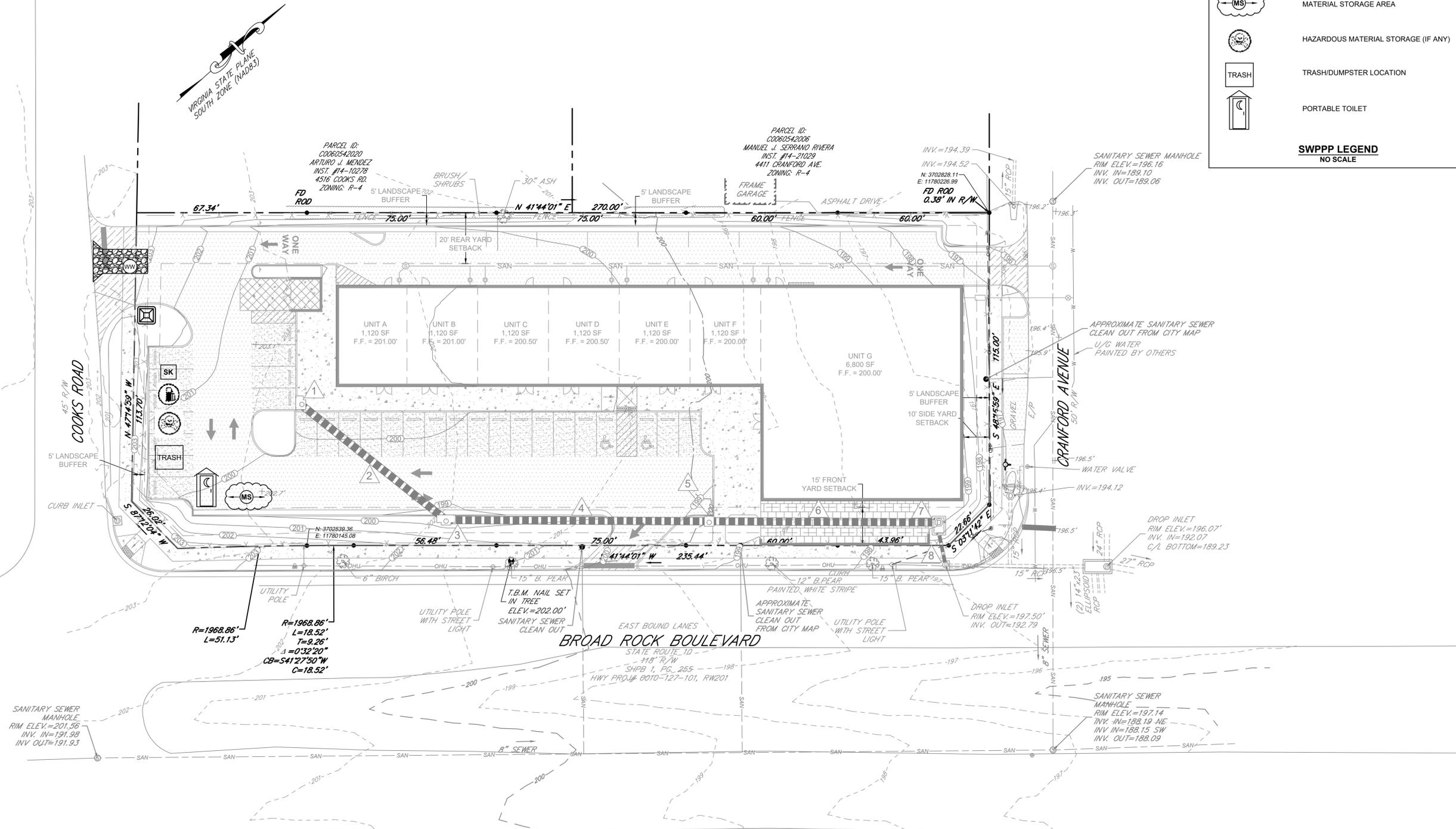
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DATE : FEBRUARY 5, 2021

REVISION BLOCK	
10-07-21	CITY COMMENTS
12-20-21	CITY COMMENTS

**BROAD ROCK BOULEVARD
 RETAIL CENTER**
 CITY OF RICHMOND, VA
STORMWATER MANAGEMENT NOTES AND DETAILS

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- SWPPP LEGEND**
NO SCALE
-  SPILL CONTAINMENT KIT
 -  STONE WHEEL WASH AREA
 -  CONCRETE WASH-OUT
 -  VEHICLE FUELING AREA
 -  MATERIAL STORAGE AREA
 -  HAZARDOUS MATERIAL STORAGE (IF ANY)
 -  TRASH/DUMPSTER LOCATION
 -  PORTABLE TOILET



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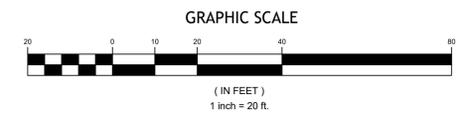
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REVISION BLOCK	
10-07-21	CITY COMMENTS
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**BROAD ROCK BOULEVARD
RETAIL CENTER**
CITY OF RICHMOND, VA

STORMWATER POLLUTION PREVENTION PLAN

SHEET NO.
C9.0



DATE : FEBRUARY 5, 2021

PURPOSE

SWAC25-870-54 of the Virginia Stormwater Management Program (VSMP) Permit Regulations requires that Stormwater Pollution Prevention Plan (SWPPP) be developed for all regulated land disturbing activities. The SWPPP must include, but not be limited to, an approved erosion and sediment control plan, an approved stormwater management plan, and this Pollution Prevention Plan (PPP) for regulated land disturbing activities, and a description of any additional control measure necessary to address a TMDL, as applicable.

The plan for implementing pollution prevention measures during construction activities developed on this sheet must be implemented and updated as necessary. Any TMDL requirements not included on this sheet must be incorporated in the SWPPP required by SWAC25-870-54 that must be developed before land disturbance commences. This PPP identifies potential sources of pollutants that may reasonably be expected to affect the quality stormwater discharges from the construction site (both on- and off-site activities) and describes control measures that will be used to minimize pollutants in stormwater discharges from the construction site.

OTHER REFERENCED PLANS

SWPPP requirements may be fulfilled by incorporating, by reference, other plans. All plans incorporated by reference become enforceable under the VSMP Permit Regulations and General Plan WAT13 for Discharges of Stormwater from Construction Activities. If a plan incorporated by reference does not contain all of the required elements of the PPP, the operator must develop the missing elements and include them in the SWPPP.

Referenced Plans Incorporated by Reference	Date Approved
Stormwater Management Plan (Regional or Master)	IN THESE PLANS
SP Prevention, Control, and Compensation Plans	IN SWPPP
OTB Site Bookplate	N/A
OTB Review Area	N/A

POTENTIAL POLLUTANT SOURCES

The following sources of potential pollutants must be addressed in the Pollution Prevention Plan. Various controls and/or measures designed to prevent and/or minimize pollutants in stormwater discharges from the project site must be applied to the sources found on the site. Additional information concerning the following sources and/or measures may be found in the SWPPP. Deviations from the location criteria may be approved by the City of Richmond State Inspector.

LEAKS, SPILLS, AND OTHER RELEASES

- The operator(s) shall ensure procedures are in place to prevent and respond to leaks, spills and other releases of pollutants.
- The operators shall ensure all leaks, spills and other releases of pollutant are contained and cleaned immediately upon discovery. Any contaminated materials are to be disposed in accordance with federal, state, and/or local requirements.
- The operator(s) shall ensure spill containment kits containing appropriate materials (e.g., absorbent mats, pads, linings, gloves, spill kits) are available at appropriate locations, including but not limited to designated areas for vehicle and equipment maintenance, vehicle and equipment fueling, storage and disposal of construction materials, products, and waste; and storage and disposal of hazardous and toxic materials and sanitary waste facilities.
- The operators of the spill containment kits are identified as described below.

Date	Shown on Plan Sheet #s	Location	
Approved Plan	SWPPP PLAN	ALONG WESTERN PROPERTY LINE	
REVISIONS TO LOCATIONS			
Date	Shown on Plan Sheet #s	Location	Operator's Initials

- The operator(s) shall notify the Department of Environmental Quality (DEQ) of leaks, spills, and other releases that discharge to or have the potential to discharge to surface waters immediately upon discovery of the discharge but in no case later than 24 hours after the discovery. Notification of the discharge must be sent to DEQ and the City of Richmond Department of Public Utilities within five (5) days of the discovery.
- The operator(s) shall notify the Department of Environmental Quality (DEQ) of leaks, spills, and other releases that discharge to or have the potential to discharge to surface waters immediately upon discovery of the discharge but in no case later than 24 hours after the discovery. Notification of the discharge must be sent to DEQ and the City of Richmond Department of Public Utilities within five (5) days of the discovery.

Virginia Department of Environmental Quality
 Filtration Regional Office
 7878-A Cox Road
 Glen Allen, VA 23060
 (804) 627-6000 (phone)
 (804) 527-6000 (fax)
 or by e-mail

City of Richmond
 Department of Public Utilities
 Water Resources
 730 East Broad Street, 5th Floor
 Richmond, VA 23219
 (804) 646-3636 (phone)
 (804) 646-3636 (fax)

EQUIPMENT / VEHICLE WASHING

- Washing must be conducted in a dedicated area that is located to maximize the distance from storm drain inlets, ditches, waterbodies or wetlands but no less than 50 feet from these features.
- If wash water used in vehicle wheel washing must be directed to a sediment basin/trap.
- All vehicle washing activities other than wheel washing must have secondary containment.
- Each facility must have appropriate signage to inform users where the dedicated area(s) are located.

Activity	Location of Dedicated Area(s)	Shown on Plan Sheet #s	Water Source Location
Wheel Wash	CONSTRUCTION ENTRANCE	SWPPP PLAN	TANKER TRUCK
Other Wash Areas	NONE	N/A	N/A

REVISIONS TO LOCATIONS

Activity	Location of Dedicated Area(s)	Shown on Plan Sheet #s	Water Source Location	Operator's Initials

VEHICLE FUELING AND MAINTENANCE

- Conduct fueling and maintenance in a dedicated area that is located to maximize the distance from storm drain inlets, ditches, waterbodies or wetlands but no less than 50 feet from these features.
- Fueling is conducted in a dedicated area, the location must be located to maximize the distance from storm drain inlets, ditches, waterbodies or wetlands but no less than 50 feet from these features.
- The dedicated areas must be designed to minimize the discharge of spilled and leaked fuels and chemicals from vehicle fueling and maintenance activities by providing secondary containment (e.g., berms, dikes, spill containment dikes, secondary containment, and having spill kits readily available).
- Each facility must have appropriate signage to inform users where the dedicated area(s) are located.

Date	Shown on Plan Sheet #s	Location of Dedicated Area(s)	
Approved Plan	SWPPP PLAN	ALONG WESTERN PROPERTY LINE	
REVISIONS TO LOCATIONS			
Date	Shown on Plan Sheet #s	Location of Dedicated Area(s)	Operator's Initials

- Mobile fueling will be used, the fueling must be done in an area that is located to maximize the distance from storm drain inlets, ditches, waterbodies or wetlands but no less than 50 feet from these features.
- Spill kits must be readily available at all mobile fueling locations.
- On-site storage tanks must have a means of secondary containment (spill berms, dikes, secondary containment pallets, etc.) and must be covered where appropriate.
- All vehicles on site must be monitored for leaks and receive regular preventive maintenance to reduce the chance of leakage.

DISCHARGE FROM STORAGE, HANDLING, AND DISPOSAL OF CONSTRUCTION PRODUCTS, MATERIALS, AND WASTE

- Storage of construction products, materials, and waste is to be conducted in dedicated areas.
- The dedicated area must be located to maximize the distance from storm drain inlets, ditches, waterbodies or wetlands but no less than 50 feet from these features. Deviations of less than 50 feet may be approved by the Environmental Inspector.
- The dedicated areas must be designed to minimize the discharge of pollutants from storage, handling and disposal of construction products, materials and waste including: (i) building products such as asphalt sealants, concrete, hot bit, roofing materials, adhesives, concrete admixtures; (ii) pesticides, herbicides, insecticides, fertilizers, and landscape materials; and (iii) construction and domestic wastes such as packaging materials, scrap construction materials, masonry products, timber chips and electrical cuttings, pipes, glass, concrete, and other trash of building products.
- Each facility must have appropriate signage to inform users where the dedicated area(s) are located.

Date	Shown on Plan Sheet #s	Location(s) of Dedicated Area(s) for storage of construction products and materials	
Approved Plan	SWPPP PLAN	ALONG WESTERN PROPERTY LINE	
REVISIONS TO LOCATIONS			
Date	Shown on Plan Sheet #s	Location(s) of Dedicated Area(s) for storage of construction products and materials	Operator's Initials

Date	Shown on Plan Sheet #s	Location(s) of Dedicated Area(s) for waste from construction products and materials	
Approved Plan	SWPPP PLAN	ALONG WESTERN PROPERTY LINE	
REVISIONS TO LOCATIONS			
Date	Shown on Plan Sheet #s	Location(s) of Dedicated Area(s) for waste from construction products and materials	Operator's Initials

- Follow all federal, state, and local requirements that apply to the use, handling and disposal of pesticides, herbicides and fertilizers.
- Keep chemicals on-site in small quantities and in closed, well marked containers.
- Close up and seal waste including bagging materials, garbage and debris on a daily basis and deposit into covered dumpsters that are periodically emptied.
- Schedule waste collection to avoid exceeding the capacity of these containers. Additional containers may be necessary depending on the phase of construction (e.g., demolition, etc.).
- Dispose of all toxic waste at an authorized disposal site.
- Ensure that containers have lids or are otherwise protected from exposure to precipitation.

DISCHARGES FROM OTHER POTENTIAL POLLUTANT SOURCES

- Discharges from other pollutant sources (e.g., water line flush, storm sewer flushing, septic ground storage tanks, etc.) that are not otherwise addressed must be addressed.

Other Potential Pollutant Sources	Location(s) of Potential Pollutant Sources

- Above ground oil storage tanks with a storage capacity exceeding 1,320 gallons and have a responsible authorization of a discharge line or upon waters of the U.S. are required to have a Spill Prevention Control and Countermeasure (SPCC) Plan.
- The discharge of contained flush water and material removed during fueling operations must be collected and disposed of in accordance with appropriate federal, state, and local requirements.

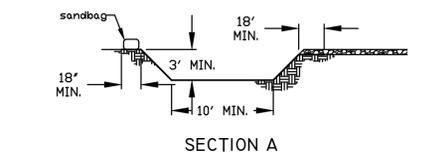
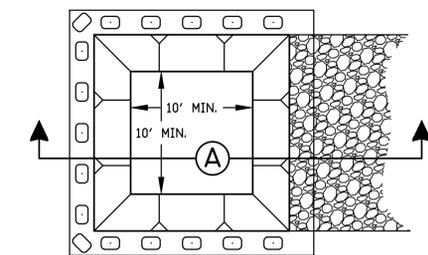
DISCHARGES FROM CONCRETE RELATED WASH ACTIVITIES

- Concrete trucks are not allowed to wash out or discharge surplus concrete or slurry wash water or any slurry in a dedicated area(s) that is located to prevent discharge to storm drain inlets, ditches, waterbodies or wetlands but no less than 50 feet from these features.
- Each facility must have a stabilized access to prevent mud tracking into the street.
- Each facility must have appropriate signage to inform users where the dedicated area(s) are located.

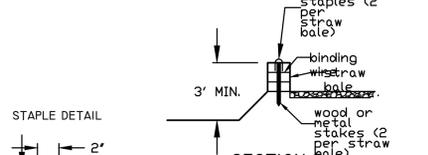
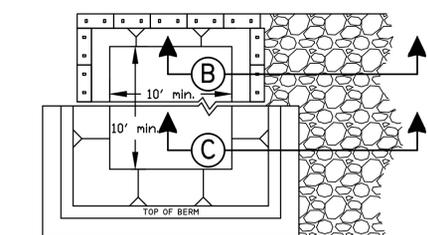
Date	Shown on Plan Sheet #s	Location of Dedicated Area(s)	
Approved Plan	SWPPP PLAN	ADJACENT TO CONSTRUCTION ENTRANCE	
REVISIONS TO LOCATIONS			
Date	Shown on Plan Sheet #s	Location of Dedicated Area(s)	Operator's Initials

- Facilities must be cleaned or new facilities constructed, once the washout area is two-thirds (2/3) full.

BELOW GRADE CONCRETE WASHOUT AREA



ABOVE GRADE CONCRETE WASHOUT AREA



CONCRETE WASHOUT AREA NOTES

- The facility must be lined with 10 mil plastic lining that is free from holes, tears, or other defects that might compromise the material's impermeability.
- The lining must be anchored with staples (2 per sq ft) or edge caps.
- Staples must be 1 1/2 inches long and 1/4 inch wide.
- Edge access must be provided between the street and the concrete washout area.
- A concrete washout sign must be installed within 30 feet of the washout facility. The sign must be no less than 2' tall by 4' wide.

DISCHARGES OF SOAPS, DETERGENTS, SOLVENTS, AND WASH WATER FROM CONSTRUCTION ACTIVITIES SUCH AS CLEANUP OF STUCCO, PAINT, FORM RELEASE OILS, AND CURING COMPOUNDS

- Washing activities associated with construction activities other than vehicle and equipment washing such as cleanup of stucco, paint, form release oils, and curing compounds are to be conducted in a dedicated area.
- The dedicated area must be located to maximize the distance from storm drain inlets, ditches, waterbodies or wetlands but no less than 50 feet from these features. Deviations of less than 50 feet may be approved by the Environmental Inspector.
- The dedicated areas must be designed to prevent the discharge of soaps, detergents, solvents, and wash water.

Date	Shown on Plan Sheet #s	Location(s) of Dedicated Area(s)	
Approved Plan	N/A	NONE ANTICIPATED. MAY USE CONCRETE WASH-OUT AREA IF NEEDED	
REVISIONS TO LOCATIONS			
Date	Shown on Plan Sheet #s	Location(s) of Dedicated Area(s)	Operator's Initials

- The dedicated area must be covered (e.g., plastic sheeting, temporary roof, etc.) to prevent contact with atmosphere.
- The contained wastewater from the dedicated area must be collected for disposal by a waste hauler or discharged to the sanitary sewer.
- In situations where these pollutants are or could be generated at other locations that are designated areas (e.g., concrete pour, building washing, etc.), cover (e.g., plastic sheeting, temporary roof, etc.) must be provided to prevent contact with stormwater and the contained wastewater from the activity must be collected for disposal by a waste hauler or discharged to the sanitary sewer.

DISCHARGES OF HAZARDOUS, TOXIC, AND SANITARY WASTE

- Storage and disposal of hazardous, toxic and sanitary wastes are to be conducted in dedicated areas.
- The dedicated areas must be located to maximize the distance from storm drain inlets, ditches, waterbodies or wetlands but no less than 50 feet from these features. Deviations of less than 50 feet may be approved by the Environmental Inspector.
- The dedicated areas must be designed to prevent the discharge of hazardous, toxic and sanitary wastes by avoiding contact with precipitation.
- Each facility must have appropriate signage to inform users where the dedicated area(s) are located.

Date	Shown on Plan Sheet #s	Location(s) of Dedicated Area(s) for storage and disposal of hazardous and toxic wastes	
Approved Plan	SWPPP PLAN	ALONG WESTERN PROPERTY LINE	
REVISIONS TO LOCATIONS			
Date	Shown on Plan Sheet #s	Location(s) of Dedicated Area(s) for storage and disposal of hazardous and toxic wastes	Operator's Initials

Date	Shown on Plan Sheet #s	Location(s) of Dedicated Area(s) for portable toilets	
Approved Plan	SWPPP PLAN	ALONG WESTERN PROPERTY LINE	
REVISIONS TO LOCATIONS			
Date	Shown on Plan Sheet #s	Location(s) of Dedicated Area(s) for portable toilets	Operator's Initials

- Consult with local waste management authorities or private firms about the requirements for disposing of hazardous materials and soils that may be contaminated with hazardous materials.
- Never remove the original product label from the container. Follow the manufacturer's recommended method of disposal.
- Schedule regular curbing of portable toilets and dispose of waste.
- Dispose of all toxic waste at an authorized disposal site.

SWPPP MODIFICATIONS AND REVISIONS

- The operator(s) shall ensure the SWPPP is modified and/or revised to reflect:
 - Changes in qualified personnel, designated authorities or other personnel required as a condition of the General Construction Permit;
 - Changes in site conditions;
 - Changes in the design, construction, operation, or maintenance of the construction site that affect the potential for discharge of pollutants that are not addressed in the permit or implementation of the plan; and
 - Any other circumstances that require the SWPPP to be modified.

Modifications to the SWPPP shall include additional or modified control measures to address the identified deficiencies.

If the necessary modification/revisions do not require approval by the Administrator, the modification/revisions must be implemented prior to the next anticipated storm event or as soon as practicable.

If the necessary modification/revisions do not require approval by the Administrator, the modification/revisions must be implemented prior to the next anticipated storm event or as soon as practicable.

SWPPP UPDATES

- The operator(s) shall update the SWPPP to include:
 - A record of dates when 1) major grading activities occur; 2) construction activities temporarily or permanently cease on a portion of the site; and 3) stabilization measures are initiated;
 - Documentation of modifications and additions to the SWPPP;
 - Areas that have reached final stabilization where no further SWPPP or erosion control measures are required;
 - A properties that are no longer under the legal control of the operator and the dates on which the operator no longer had legal control over each property; and
 - The date, volume and characteristics of any discharges implemented for any prohibited discharges.

The operator(s) shall update the SWPPP no later than seven (7) days following any of the situations identified above.

OPERATOR INSPECTIONS

The operator(s) identified below shall provide for inspections of the permitted land disturbing activities by the qualified personnel identified below. The inspections will be conducted according to the following options:

- At least once every four (4) business days, or
- At least once every two (2) business days and no more than 48 hours following any measurable storm event.

Where areas are in a stabilized condition or it is unlikely due to winter conditions, the inspection frequency may be reduced to once every 30 days while these conditions exist. Otherwise, the operator(s) shall resume the regular inspection frequency outlined above.

The operator(s) shall provide for inspections of the permitted land disturbing activity to ensure implementation and continued maintenance of all requirements of the Stormwater Pollution Prevention Plan (General Construction Permit, Stormwater Management Plan, Pollution Prevention Plan, TRC, etc., Permits, etc.).

Records of the required inspections must be maintained and included in the SWPPP binder. The qualified personnel are encouraged to use the Operator Inspection form provided in the SWPPP binder to document the required inspections. If inspections are conducted once every five (5) business days, no later than 48 hours following any measurable storm event, the location of the rain gauge used to determine the amount of rain must be included in the SWPPP and documented in the inspection report.

ACKNOWLEDGEMENTS

I certify under penalty of law that I:

- have been designated by the Operator to conduct inspections of the permitted site;
- am knowledgeable in the principles and practices of erosion and sediment control and stormwater management;
- possess the skills to assess conditions at the permitted site for the Operator(s) that could impact stormwater quality and quantity;
- will assess the effectiveness of any erosion and sediment control measures or stormwater management facilities selected to control the stormwater discharges from the permitted site; and
- will conduct inspections in accordance with the frequency noted above in the OPERATOR INSPECTIONS section of this sheet.

QUALIFIED PERSONNEL	
Name (print)	
Phone	

Additional information is located in Tab 6 of the SWPPP Binder.

As the Operator(s), we understand that prior to starting and disturbing the site the pollutant sources, appropriate control measures, and all responsible parties (operator, qualified inspector, personnel, contractors, etc.) required as a condition of the General Construction Permit (GCP) and the Stormwater Pollution Prevention Plan (SWPPP) must be certified. I also understand this information must be updated as necessary throughout all phases of construction until the GCP is terminated.

Further more
 I/we certify under penalty of law that I/we read and understand all requirements of the SWPPP (permit, and sediment control plan, stormwater management plan, pollution prevention plan, TMDL provisions, and all other requirements, etc.) and CCF and that the information herein is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines or imprisonment or both.

I/we understand that we are ultimately responsible for compliance with all conditions and requirements of the SWPPP and CCF and for ensuring a contractor's and subcontractor's on the permitted site are aware of the conditions and requirements of the SWPPP and CCF.

I/we shall comply with all conditions and requirements of the SWPPP and shall at all times properly operate and maintain all measures and control (and related equipment) which are installed or used to achieve compliance with the conditions of the CCF. Proper operation and maintenance also includes accurate funding and adequate staffing.

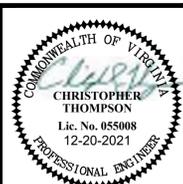
I/we shall take all reasonable steps to minimize or prevent any discharge or violation of the SWPPP and/or CCF.

I/we understand that if determined by the Department of Environmental Quality (DEQ) in consultation with the State Water Control Board at any time that stormwater discharges are causing, have reasonable potential to cause, or contribute to and exceed on above applicable water quality standard, the DEQ may in consultation with the Administrator, take appropriate enforcement action and require:

- Modification of control measures to adequately address water quality concerns;
- Submission of valid and verifiable data and information that are necessary to assess the current conditions and indicate that the existing water quality standards are being achieved; or
- Closure of the discharge of pollutants from construction activity and a final and valid permit application according to SWAC25-870-47D.

OPERATOR(S) / DELEGATED AUTHORITY		
Name (print)	Signature	Date

Additional contact information can be found in the SWPPP Binder.



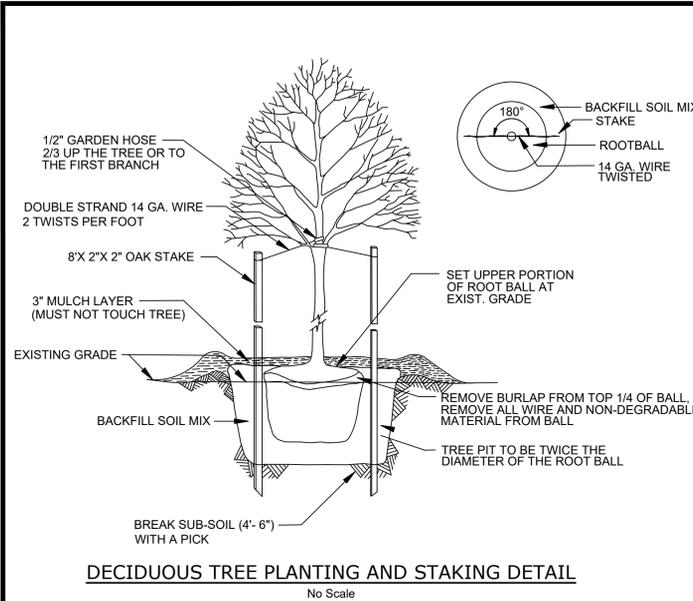
The Site Design Company
 CIVIL ENGINEERING AND LAND DEVELOPMENT CONSULTING
 2688 HIGH STREET - PETERSBURG, VIRGINIA 23803
 www.sitedesignco.com
 EMAIL: thompson@sitedesignco.com
 PHONE: 804-720-9040
 PROJECT #: 20038
 PROJECT MANAGER: CHRIS THOMPSON



REVISION BLOCK	
10-07-21	CITY COMMENTS
12-20-21	CITY COMMENTS

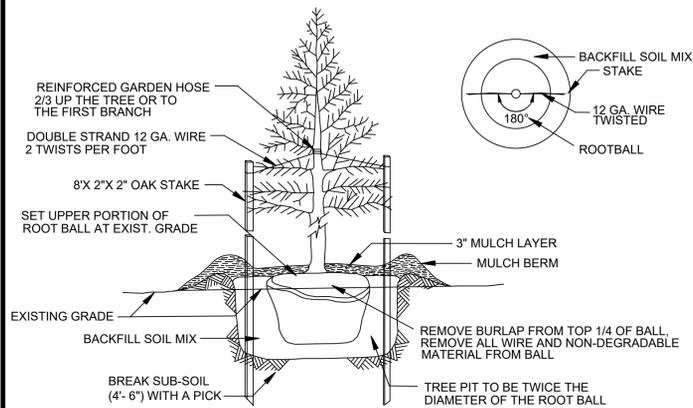
BROAD ROCK BOULEVARD RETAIL CENTER
 CITY OF RICHMOND, VA
 STORMWATER POLLUTION PREVENTION NOTES AND DETAILS
 SHEET NO. C9.1

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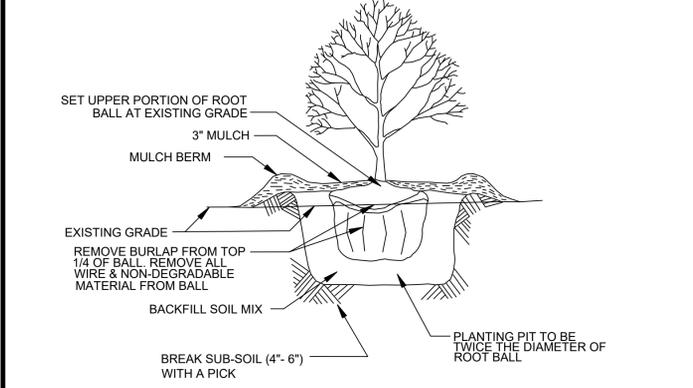
DECIDUOUS TREE PLANTING AND STAKING DETAIL

No Scale



EVERGREEN TREE PLANTING AND STAKING DETAIL

No Scale



SHRUB PLANTING DETAIL

No Scale

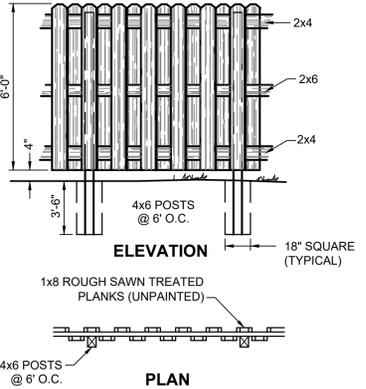
- PLANT NOTES:**
1. ALL PLANTING SHALL BE IN ACCORDANCE WITH THE AMERICAN ASSOCIATION OF NURSERYMEN UNLESS SPECIFIED OTHERWISE ON PLANS OR SPECIFICATIONS.
 2. ALL PLANT MATERIAL SHALL CONFIRM TO THE SIZE GIVEN IN THE PLANT LIST AND SHALL BE GROWN IN ACCORDANCE WITH THE 'AMERICAN STANDARD FOR NURSERY STOCK'.
 3. ALL PLANT BEDS AND TREE PITS SHALL HAVE GRANULATED PRE-EMERGENT WEED CONTROL APPLIED PER MANUFACTURERS RECOMMENDATIONS PRIOR TO MULCHING. WEED CONTROL WILL BE INCIDENTAL TO PLANTING ITEM.
 4. AMENDED SOIL FOR PLANTING PITS SHALL BE 60% EXISTING SOIL AND 30% TOPSOIL AND 10% ORGANIC MATTER.
 5. TREES PLANTED DURING SUMMER MONTHS (JUNE 15-AUGUST 30) SHALL HAVE A 28 GALLON TREE GATOR WATERING BAG OR APPROVED EQUAL WITH EACH TREE. GATOR BAGS WILL BE INCIDENTAL TO TREE.
 6. SEED OR SOD ALL AREAS DISTURBED BY CONSTRUCTION.

LANDSCAPE NOTES

No Scale

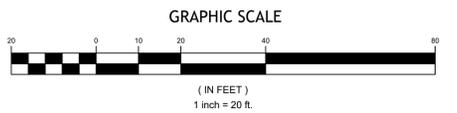
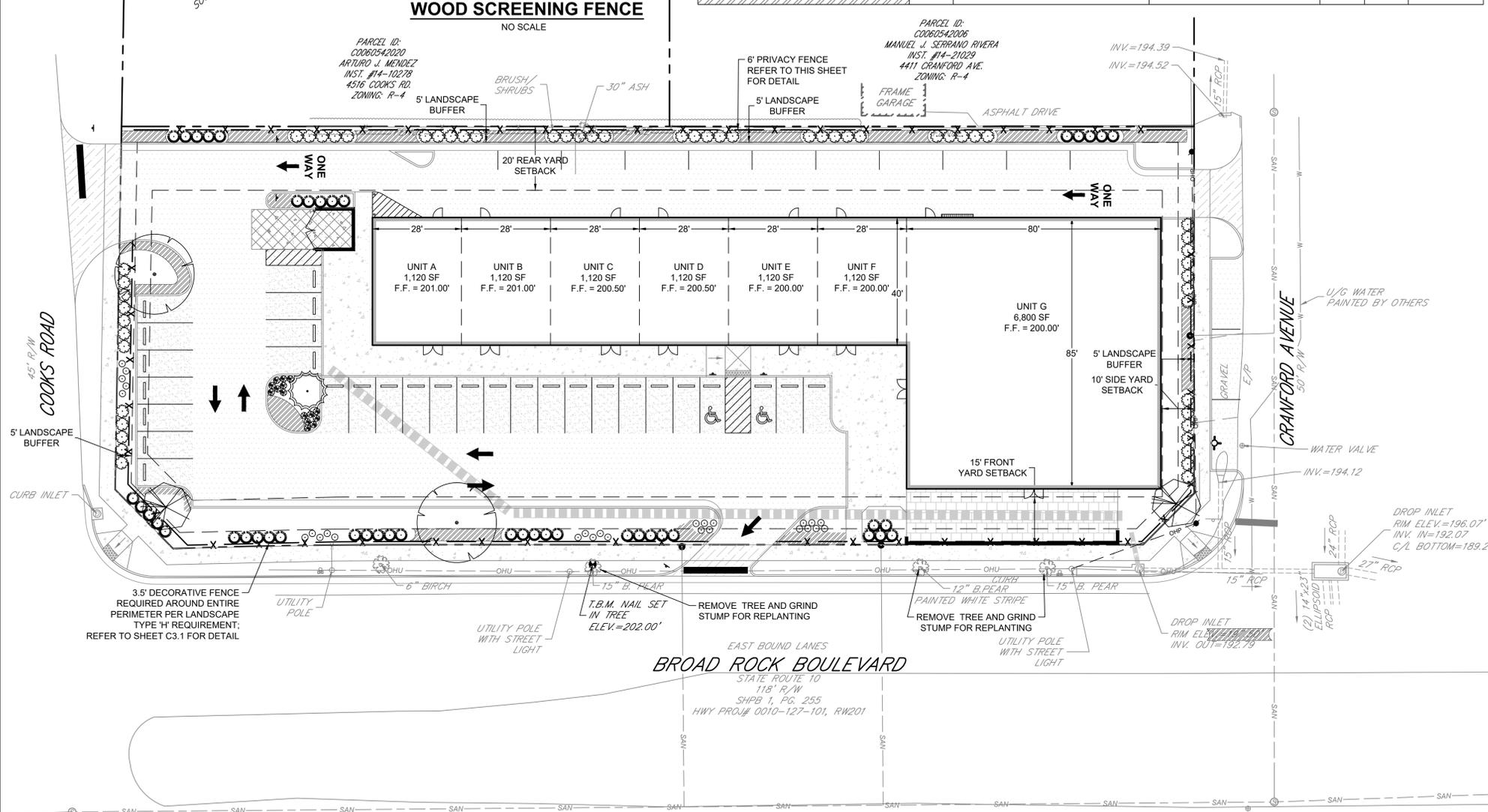
LANDSCAPE CALCULATIONS

PERIMETER LANDSCAPE BUFFER (ALONG STREET)	
REQUIRED (PER ORDINANCE)	DECORATIVE FENCE OR WALL NOT LESS THAN 3.5' IN HEIGHT AND 4 SHRUBS PER 50 LINEAR FOOT
BROAD ROCK BOULEVARD (305' OF FRONTAGE)	REQUIRED: (305 L.F. / 50) * 4 = 25 SHRUBS PROVIDED: 35 SHRUBS
COOKS ROAD (131' OF FRONTAGE)	REQUIRED: (131 L.F. / 50) * 4 = 11 SHRUBS PROVIDED: 12 SHRUBS
CRANFORD AVENUE (131' OF FRONTAGE)	REQUIRED: (131 L.F. / 50) * 4 = 11 SHRUBS PROVIDED: 14 SHRUBS



WOOD SCREENING FENCE

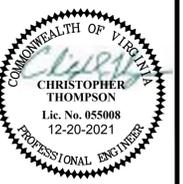
NO SCALE



PLANTING SCHEDULE

SYMBOL	QTY.	SCIENTIFIC NAME	COMMON NAME	SIZE	TYPE	REMARKS
DECIDUOUS TREES						
	2 EACH	NYSSA SYLVATICA	BLACK GUM	3" CAL	B&B	SINGLE LEADER
EVERGREEN TREES						
	2 EACH	MAGNOLIA GRANDIFLORA 'LITTLE GEM'	LITTLE GEM MAGNOLIA	6' TALL	B&B	SINGLE LEADER
	1 EACH	ILEX X ATTENUATA 'FOSTERI'	FOSTER'S NO. 2 HOLLY	6' TALL	B&B	SINGLE LEADER
SHRUBS						
	43 EACH	ILEX CRENATA 'STEEDS'	STEEDS UPRIGHT HOLLY	24" TALL	CONT.	FULL, DENSE
	100 EACH	ILEX CORNUTA 'DWARF BURFORD'	DWARF BURFORD HOLLY	12" TALL	CONT.	FULL, DENSE
	27 EACH	ROSA 'MEIGILLI'	PEACH DRIFT GROUNDCOVER ROSE	12" TALL	CONT.	3' O.C.
	15 EACH	KOELERIA MACRANTHA	PRAIRIE JUNEGRASS	3" POT	CONT.	24" O.C.
		LIRIOPE MUSCARI 'VARIEGATA'	VARIEGATED LILLY TURF	3" POT	CONT.	18" O.C.

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The Site Design Company
CIVIL ENGINEERING AND LAND DEVELOPMENT CONSULTING
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PROJECT MANAGER: CHRIS THOMPSON
PHONE: 804-720-9040
EMAIL: thompson@sitedesignco.com

DATE: FEBRUARY 5, 2021

REVISION BLOCK	
10-07-21	CITY COMMENTS
12-20-21	CITY COMMENTS

**BROAD ROCK BOULEVARD
RETAIL CENTER**
CITY OF RICHMOND, VA

LANDSCAPE PLAN

SHEET NO.
L1.0

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SPECIFICATIONS - LAWNS AND GRASSES - SEED/SOD

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The provisions of the Contract Documents apply to the work of this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Fine grading and preparing lawn areas (including courtyards)
2. Topsoil Placement
3. Soil amendments
4. Fertilizers
5. Seeding
6. Sodding
7. Hydroseeding

1.3 DEFINITIONS

- A. Finish Grade: Elevation of finished surface of planting soil.
- B. Lawns: All areas disturbed by construction and not otherwise covered by paving, buildings or other structures.

1.4 SUBMITTALS

A. Certification by product manufacturer that the following products supplied comply with requirements:

1. Grass Seed
 - a) Certification of grass seed from seed vendor for each grass-seed mixture stating the botanical and common name and percentage by weight of each species and variety, and percentage of purity, germination, and weed seed. Include the year of production and date of packaging.
 - b) Blue Tag Certification tag for each bag of seed.
2. Sod
 - a) Gold Tag Certification.

1.5 QUALITY ASSURANCE

- B. Installers qualifications
 1. Provide a list, with references, of the past three projects of a similar magnitude.
- C. Topsoil Amendment Plan
 1. Provide copy of topsoil testing report.
 2. List of amendments proposed for topsoil, including application rates.

A. Installer Qualifications: Engage an experienced installer, who has successfully completed lawn establishment projects similar in size and complexity to this project. The installer's primary business (defined as a minimum of 60% of total billings) shall be establishment of lawns.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Seed: Deliver seed in original sealed, labeled, and undamaged containers.
- B. Sod: Harvest, deliver, store and handle sod according to the requirements of the American Sod Producers Association (ASPA) "Specifications for Turfgrass Sod Materials and Transplanting/Installing".

1.7 COORDINATION AND SCHEDULING

- A. Planting Season: Sow lawn seed during normal planting seasons for type of lawn work required.
 1. Spring Planting Season: March 15 through May 15
 2. Fall Planting Season: September 15 through November 15
- B. Weather Limitations: Proceed with planting only when existing and forecast weather conditions are suitable for work.
- C. Lawn Seeding Schedule
 1. Refer to the drawings for early seeding requirements for specified lawn areas.
 2. If job completion schedule does not allow seeding within a normal planting season, provide interim temporary seeding necessary to stabilize site. Complete permanent seeding during the next planting season.

1.8 LIMITS OF SEEDING/SODDING

A. Spread topsoil and seed lawn areas. Hydroseed all slopes greater than 3:1. Sod infields of ball fields.

1.9 PAYMENT PROCEDURES FOR LAWNS AND GRASSES

- A. Establish a line item in the Schedule of Values for Lawn Maintenance. This line item shall represent a minimum of thirty percent (30%) of the total value of the seeding for the project.
- B. Lawn maintenance will be paid on a monthly basis, following the satisfactory maintenance of the lawns.

PART 2 - PRODUCTS

2.1 TOPSOIL

A. Topsoil: ASTM D 5268, pH range of 5.5 to 7, a minimum of 6 percent organic material content; free of stones 1" or larger in any dimension and other extraneous materials harmful to plant growth.

1. Topsoil Source: Reuse surface soil stockpiled on-site. Verify suitability of stockpiled surface soil to produce topsoil. Clean surface soil of roots, plants, sod, stones, clay lumps, and other extraneous materials harmful to plant growth.

a) Supplement with imported or manufactured topsoil from off-site sources when quantities are insufficient. Obtain topsoil displaced from naturally well-drained construction or mining sites where topsoil occurs at least 4 inches (100 mm) deep; do not obtain from agricultural land, bogs or marshes.

Have topsoil tested by a certified soil testing laboratory to determine the type and quantity of soil amendments necessary. Add amendments to topsoil as necessary to meet these requirements.

2.2 INORGANIC SOIL AMENDMENTS

- A. If the topsoil analysis indicates the need for inorganic soil amendments, the following standards apply:
- B. Lime: ASTM C 602, agricultural limestone containing a minimum 80 percent calcium carbonate equivalent and as follows:
 1. Class: Class O, with a minimum 95 percent passing through No. 8 (2.36-mm) sieve and a minimum 55 percent passing through No. 60 (0.25-mm) sieve.
 2. Provide lime in form of dolomitic limestone.
- C. Sulfur: Granular, biodegradable, containing a minimum of 90 percent sulfur, with a minimum 99 percent passing through No. 6 (3.35-mm) sieve and a maximum 10 percent passing through No. 40 (0.425-mm) sieve.
- D. Iron Sulfate: Granulated ferrous sulfate containing a minimum of 20 percent iron and 10 percent sulfur.
- E. Aluminum Sulfate: Commercial grade, unadulterated.
- F. Perlite: Horticultural perlite, soil amendment grade.
- G. Agricultural Gypsum: Finely ground, containing a minimum of 90 percent calcium sulfate.
- H. Sand: Clean, washed, natural or manufactured, free of toxic materials.
- I. Diatomaceous Earth: Calcined, diatomaceous earth, 90 percent silica, with approximately 140 percent water absorption capacity by weight.
- J. Zeolites: Mineral clinoptilolite with at least 60 percent water absorption by weight.

2.3 ORGANIC SOIL AMENDMENTS

- A. If the topsoil analysis indicates the need for organic soil amendments, the following standards apply:
- B. Compost: Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through 3/4-inch (19-mm) sieve; soluble salt content of 5 to 10 decisiemens/m; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings; and as follows:
 1. Organic Matter Content: 50 percent of dry weight.
 2. Feedstock: Agricultural, food, or industrial residuals; biosolids; yard trimmings; or source-separated or compostable mixed solid waste.
 3. Peat: Finely divided or granular texture, with a pH range of 6 to 7.5, containing partially decomposed moss peat, native peat, or reed-sedge peat and having a water-absorbing capacity of 1100 to 2000 percent.
 4. Wood Derivatives: Decomposed, nitrogen-treated sawdust, ground bark, or wood waste; of uniform texture, free of chips, stones, sticks, soil, or toxic materials.
 5. Manure: Well-rotted, unleached, stable or cattle manure containing not more than 25 percent by volume of straw, sawdust, or other bedding materials; free of toxic substances, stones, sticks, soil, weed seed, and material harmful to plant growth.

2.4 HERBICIDES

A. Selective Herbicides: EPA registered and approved, of type recommended by manufacturer for application.

2.5 FERTILIZER

- A. Bonemeal: Commercial, raw or steamed, finely ground; a minimum of 4 percent nitrogen and 20 percent phosphoric acid.
- B. Superphosphate: Commercial, phosphate mixture, soluble; a minimum of 20 percent available phosphoric acid.
- C. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition:
 1. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in topsoil analysis reports from a qualified soil-testing agency.
 2. Minimum Composition: No less than 1 lb/1000 sq. ft. (0.45 kg/92.9 sq. m) of actual nitrogen, 4 percent phosphorous, and 2 percent potassium, by weight.

2.6 SEED

A. Grass Seed: All grass seed must be fresh, clean, and dry.

B. Seed Species

1. General Lawn Areas

Proportion by Weight	Grass Species	Min. % Germination	Min. % Pure Seed	Max. % Weed Seed
10%	Kentucky bluegrass (<i>Poa prantensis</i>)	80	85	0.50
90%	Tall Fescue (<i>Festuca arundinacea</i>)	85	98	0.50

Proportion by Weight	Grass Species	Min. % Germination	Min. % Pure Seed	Max. % Weed Seed
2%	Red Top Grass	85	85	0.50
85%	Tall Fescue (<i>Festuca arundinacea</i>)	85	98	0.50
13%	Tall Fescue (<i>Festuca arundinacea</i>)	85	85	0.50

Proportion by Weight	Grass Species	Min. % Germination	Min. % Pure Seed	Max. % Weed Seed
72%	Kentucky 31 Fescue	85	98	0.50
2%	Red Top Grass	85	85	0.50
13%	Seasonal Nurse Crop*	85	85	0.50
13%	Sericea lespedeza**	85	85	0.50

- C. Varieties shall be selected from the 2005-2006 lists of recommended turf grass varieties, published by Virginia Tech.
- D. All seed shall be Gold Tag certified by the Oregon State Seed Laboratory. Tags must be attached to each bag delivered on site.

2.7 TURFGRASS SOD

A. Turf grass Sod: Certified sod, complying with TPI's "Specifications for Turf grass Sod Materials" in its "Guideline Specifications to Turf grass Sodding." Comply with ASPA specifications for machine cut thickness, size, strength, moisture content and mowed height and free of weeds and undesirable native grasses. Provide viable sod of uniform density, color, and texture, strongly rooted, and capable of vigorous growth and development when planted. Provide the following turf grass species:

1. 90% Tall Fescue (*Festuca arundinacea*), 10% Kentucky bluegrass (*Poa pratensis*) mix.

B. All sod shall be Gold Tag certified by the Virginia Crop Improvement Association.

2.8 MULCHES

A. Straw Mulch: Provide air-dry, clean, mildew- and seed-free, salt hay or threshed straw of wheat, rye, oats, or barley.

B. Peat Mulch: Finely divided or granular texture, with a pH range of 6 to 7.5, containing partially decomposed moss peat, native peat, or reed-sedge peat and having a water-absorbing capacity of 1100 to 2000 percent.

C. Compost Mulch: Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through 1-inch (25-mm) sieve; 0.5 percent inert contaminants and free of substances toxic to plantings; and as follows:

1. Organic Matter Content: 50 percent of dry weight.

D. Fiber Mulch: Biodegradable, dyed-wood, cellulose-fiber mulch; nontoxic; free of plant-growth or germination inhibitors; with maximum moisture content of 15 percent and a pH range of 4.5 to 6.5.

2.9 EROSION-CONTROL MATERIALS

A. Erosion-Control Fiber Mesh: Biodegradable twisted jute or spun-coir mesh, a minimum of 0.92 lb/sq. yd. (0.5 kg/sq.m) with 50 to 65 percent open area. Include manufacturer's recommended steel wire staples, 6 inches (150 mm) long.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas to receive lawns and grass for compliance with requirements and for conditions affecting performance of the Work. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities, trees, shrubs, and plantings from damage caused by planting operations.
- B. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.
- C. Protect adjacent and adjoining areas from hydroseed overspray.

3.3 TOPSOIL PLACEMENT FOR LAWNS

A. Limit subgrade preparation to areas that will be planted in the immediate future.

B. Loosen subgrade to a minimum depth of 4 inches. Remove stones, sticks and roots larger than 2 inches in any dimension from subgrade, 1" in playing fields. Completely remove trash and other extraneous debris from subgrade.

C. Have topsoil tested by a certified soil testing laboratory to determine the type and quantity of soil amendments necessary.

D. Sift topsoil to remove stones and other objects larger than 1" in any dimension. Sift topsoil to remove stones and other objects larger than 1/2" in any dimension in all playing fields. Maximum object size for topsoil shall be achieved by sifting not by hand removal or raking following placement of topsoil.

E. Mix soil amendments and fertilizers with topsoil at rates required by soil testing. Delay mixing fertilizer if planting does not follow placing of planting soil within 4 days. Either mix soil before spreading or apply soil amendments on surface of spread topsoil and mix thoroughly into top 4 inches (100 mm) of topsoil before planting.

F. Mix lime with dry soil prior to mixing fertilizer.

G. Spread topsoil to a minimum depth of six inches (6").

3.4 SEEDING LAWNS

A. Sow seed with a spreader or a seeding machine. Do not broadcast or drop seed when wind velocity exceeds 5 mph (8 km/h).

Evenly distribute seed by sowing equal quantities in 2 directions at right angles to each other.

B. Do not use wet seed or seed that is moldy or otherwise damaged in transit or storage.

C. Sow seed at the following rates:

1. Seeding Rate: 200 lbs./acre.

D. Rake seed lightly into top 1/4 inch of topsoil, roll lightly, and water with fine spray.

E. Hydroseed all slopes 3:1 or steeper.

F. Protect seeded areas 3:1 slope/grade or steeper against erosion by providing erosion-control blankets installed and stapled according to manufacturer's recommendations.

G. Protect seeded areas less than 3:1 slope/grade against erosion by spreading straw mulch after completion of seeding operations. Spread uniformly at a minimum rate of 2 tons per acre (45 kg per 100 sq. m) to form a continuous blanket 1-1/2 inches (38 mm) loose depth over seeded areas. Spread by hand, blower, or other suitable equipment.

1. Anchor straw mulch by crimping into topsoil by suitable mechanical equipment.

SODDING NEW LAWNS

A. Lay sod within 24 hours of stripping. Do not lay sod if dormant or if ground is frozen.

B. Lay sod to form a solid mass with tightly fitted joints. Butt ends and sides of sod; do not stretch or overlap. Stagger sod strips or pads to offset joints in adjacent courses. Avoid damage to subgrade or sod during installation. Tamp and roll lightly to ensure contact with subgrade, eliminate air pockets, and form a smooth surface. Work sifted soil or fine sand into minor cracks between pieces of sod; remove excess to avoid smothering sod and adjacent grass.

C. Lay sod across angle of slopes exceeding 3:1.

D. Anchor sod on slopes exceeding 6:1 with wood pegs spaced as recommended by sod manufacturer but not less than two anchors per sod strip to prevent slippage.

E. Saturate sod with fine water spray within 2 hours of planting. During first week, water daily or more frequently as necessary to maintain moist soil to a minimum depth of 1-1/2 inches below sod.

3.6 MAINTENANCE OF NEW LAWNS

A. Begin maintenance of lawns immediately after each area is planted and continue until acceptable lawn is established. Maintain seeded lawns until Substantial Completion. Maintain all grassed areas as necessary to ensure a satisfactory lawn is achieved at Substantial Completion.

B. Maintain and establish lawns by watering, fertilizing, weeding, mowing, trimming, replanting, and other operations. Roll, regrade, and replant bare or eroded areas and remulch to produce a uniformly smooth lawn.

1. Replant bare areas with same materials as for lawns.
2. Replace disturbed mulch.

C. Watering: Provide and maintain temporary hoses, and lawn-watering equipment to convey water from a water source to keep lawns uniformly moist to a depth of 4 inches.

1. Provide a source of water for irrigation. Utilize temporary irrigation meters, a well or water trucks as necessary for the water source.
2. Water seeded areas as necessary to promote vigorous growth of grass but at the minimum rate of 1 inch per week.
3. Water sodded areas per the requirements of the grower. Maintain moist soil to a depth of at least four inches.

D. Mow lawns as soon as there is enough top growth to cut with mower set at indicated height. Repeat mowing as required to maintain indicated height without cutting more than 40 percent of the grass height (minimum of 3 mowings). Remove no more than 40 percent of grass-leaf growth in initial or subsequent mowings. Do not delay mowing until grass blades bend over and become matted. Do not mow when grass is wet. Schedule initial and subsequent mowings to maintain following grass height:

1. Mow grass to a finished height of 2 to 3 inches high.
2. Apply pre-emergent herbicide to lawns areas. Apply 60 - 90 days after planting.

3.7 SATISFACTORY LAWN

A. Seeded lawns shall be considered satisfactory/acceptable provided requirements, including maintenance, have been met and a healthy, uniform, close stand of grass is established, of weeds, bare spots exceeding 5 by 5 inches (125 by 125 mm), and surface irregularities.

B. Sodded lawns shall be considered satisfactory/acceptable provided requirements, including maintenance, have been met and a healthy, well-rooted, even-colored, viable lawn is established, free of weeds, open joints, bare areas exceeding 5 by 5 inches (125 by 125 mm), and surface irregularities.

C. Replant lawns that do not meet requirements and continue maintenance until lawns are satisfactory/acceptable.

D. Substantial Completion of the building and the remainder of the project may be achieved (pending prior Architect and Owner approval) before achieving a satisfactory/acceptable lawn. Continue to replant and maintain unsatisfactory or unacceptable lawn areas until acceptance is obtained. WARRANTIES for lawns shall begin at the time of acceptance of the lawn.

3.8 CLEANUP AND PROTECTION

A. Promptly remove soil and debris created by lawn work from sidewalks and paved areas. Clean wheel of vehicles before leaving site to avoid tracking soil onto surface of roads, walks, or other paved areas.

B. Erect barricades and warning signs as required to protect newly planted areas from traffic. Maintain barricades throughout maintenance period until lawn is established.



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DATE : FEBRUARY 5, 2021

REVISION BLOCK

NO.	DATE	REVISION
10-07-21		CITY COMMENTS
12-20-21		CITY COMMENTS

**BROAD ROCK BOULEVARD
RETAIL CENTER**
CITY OF RICHMOND, VA

LANDSCAPE SPECIFICATIONS

SHEET NO.
L1.1

EMAIL: thompson@site-designco.com

PHONE: 804-720-9040

PROJECT MANAGER : CHRIS THOMPSON

PROJECT #: 20038

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02930-SPECIFICATIONS - EXTERIOR PLANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The provisions of the Contract Documents apply to the work of this Section.

1.2 SUMMARY

A. This Section includes the following:

- 1. Trees
2. Shrubs
3. Groundcovers
4. Other Plant Materials
5. Stakes & Guys

1.3 SUBMITTALS

A. Installers Qualifications: Provide a list, with references, of the past three projects of similar scope.
B. Product Data: For each type of product indicated.
C. Plant Material Certifications:

- 1. Certificates of inspection as required by governmental authorities.
2. Label data substantiating that plant materials comply with specified requirements.

D. Planting Schedule:

- 1. Typewritten planting schedule.
2. Once accepted, revise dates only as approved in writing and submitted to Architect.
E. Maintenance Schedules: Typewritten instructions recommending procedures for maintenance of landscape work for one full year. Submit prior to completion of project.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Engage an experienced installer, who has successfully completed planting projects similar in size and complexity to this project. The installer's primary business (defined as a minimum of 60% of total billings) shall be exterior plant installation.
B. Installer's Field Supervision: Installer to maintain an experienced full-time supervisor on the project site when exterior planting is in progress.

C. Exterior Plant Materials:

- 1. Provide plant materials of quantity, size, genus, species, and variety indicated on the drawings.
2. All plant materials and work shall comply with recommendations and requirements of ANSI Z60.1 "American Standard for Nursery Stock."
3. Do not make substitutions. If specified landscape material is not obtainable, submit proof of nonavailability to Architect, together with proposal for use of equivalent material.
4. The Architect may inspect plant materials either at place of growth or on site before planting, for compliance with requirements for genus, species, variety, size, and quality. Architect retains right to further inspect trees for size and condition of balls and root systems, insects, injuries and latent defects, and to reject unsatisfactory or defective material at any time during progress of work. Remove rejected trees immediately from project site.
D. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination."

1.5 DELIVERY, STORAGE AND HANDLING

A. Packaged Materials:

- 1. Deliver packaged materials in containers showing weight, analysis, and name of manufacturer or grower.
2. Protect materials from deterioration during delivery, and while stored at site.
B. Exterior Plant Materials

- 1. Protect bark, branches, and root systems from sun scald, drying, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie trees or shrubs in such a manner as to destroy their natural shape. Provide protective covering of exterior plants during delivery. Do not drop exterior plants during delivery.
2. Deliver exterior plant materials after preparations for planting have been completed and plant immediately. If planting is delayed more than 6 hours after delivery, set plant materials in shade, protect from weather and mechanical damage, and keep roots moist and free from frost.
3. Do not remove container-grown stock from containers until planting time.
4. Balled and burlapped material shall be freshly dug.
5. Handle planting stock by root ball.

1.6 PROJECT CONDITIONS

- A. Examine the subgrade, verify the elevations, and observe the conditions under which work is to be performed.
B. Determine location of underground utilities and perform work in a manner which will avoid possible damage. Hand excavate as required.
C. When conditions detrimental to plant growth are encountered, such as rubble fill, adverse drainage conditions, or obstructions, notify Architect before planting.
D. Provide all necessary safeguards for the protection of all planted areas until provisional inspection/acceptance is accomplished.
E. Planting Restrictions: Plant during one of the following periods.

- 1. Spring Planting: Unfrozen soil conditions March 1-June 1st.
2. Fall Planting: September 1-November 1st or until frozen soil conditions prevent work.
3. Summer Planting: June 1 - September 1 with approved irrigation system.

F. Coordination with Lawns: Install plant materials after finish grades are established and before planting lawns, unless otherwise acceptable to the Architect.

- 1. When planting exterior plants after lawns, protect lawn areas and promptly repair damage caused by planting operations.

1.7 WARRANTY

A. Warranty exterior plant materials for a period of one year after date of Final Completion against defects including death and unsatisfactory growth, except for defects resulting from neglect by Owner, abuse or damage by others, or unusual phenomena or incidents which are beyond Contractor's control.

- 1. The Contractor shall provide written notice to the Architect of any practice which will affect the warranty if not remedied promptly. The Architect will render an opinion of the conflict if necessary.
2. Make replacements of all dead plants or plants in impaired condition (more than 25% dead or dying) condition in early spring/fall following installation. Replacements of dead or rejected plants should again be made prior to the expiration of the warranty period.

1.8 MAINTENANCE

A. The Owner is responsible for maintaining all exterior plant material throughout the warranty period according to the submitted Maintenance Schedule.
B. Remove all stakes and guy wires at the end of the 12 month guarantee period.

PART 2 - PRODUCTS

2.1 EXTERIOR PLANT MATERIALS

A. General: Provide nursery-grown plant materials complying with ANSI Z60.1, with healthy root systems developed by transplanting or root pruning. Provide well-shaped, fully branched, healthy, vigorous stock free of disease, insects, eggs, larvae, and defects such as knots, sun scald, injuries, abrasions, and disfigurement.
B. Label at least one tree and one shrub of each variety and caliper with a securely attached, waterproof tag bearing legible designation of botanical and common name.

2.2 PLANTS

A. Annuals: Provide healthy, disease-free plants of species and variety indicated. Provide only plants that are acclimated to outdoor conditions before delivery and that are in bud but not yet in bloom.
B. Perennials: Provide healthy, field-grown plants from a commercial nursery of species and variety shown or listed.
C. Vines: Provide plants with heavy, well-branched tops, with not less than three runners and a vigorous welldeveloped root system.

2.3 FERTILIZER

A. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast and slowrelease nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorus, and potassium. Revise fertilizer mix to remedy deficiencies found in soil.

- 1. Composition: 1 lb/1000 sq. ft. (0.45 kg/92.9 sq. m. of actual nitrogen, 4 percent phosphorus, and 2 percent potassium, by weight.
2. Composition: Nitrogen, phosphorus, and potassium in amounts recommended in soil reports from a qualified soil-testing agency.

B. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium. Revise fertilizer mix to remedy deficiencies found in soil.

- 1. Composition: 20 percent nitrogen, 10 percent phosphorus, and 10 percent potassium, by weight.
2. Composition: Nitrogen, phosphorus, and potassium in amounts recommended in soil reports from a qualified soil-testing agency.

2.4 MULCHES

A. Organic Mulch: Six (6) month old well rotted double shredded native hardwood bark mulch not larger than 4" in length and 1/2" in width, free of woodchips and sawdust.

2.5 WATER

A. Free of substances harmful to plant growth.

2.6 TOPSOIL

A. Topsoil: ASTM D 5268, pH range of 5.5 to 7, a minimum of 4 percent organic material content. Topsoil shall be fertile, friable, natural topsoil of loamy character, without admixture of subsoil material, obtained from a well-drained arable site, reasonably free from clay, lumps, coarse sands, stones, plants, roots, sticks and other foreign materials.

B. Topsoil Source:

- 1. Reuse surface soil stockpiled on-site. Verify suitability of stockpiled surface soil to produce topsoil. Clean surface soil of roots, plants, sod, stones, clay lumps, and other extraneous materials harmful to plant growth.
a) Supplement with imported or manufactured topsoil from off-site sources when quantities are insufficient. Obtain topsoil displaced from naturally well-drained sites where topsoil occurs at least 4 inches (100 mm) deep; do not obtain from agricultural land, bogs or marshes.

- 2. Import topsoil or manufactured topsoil from off-site sources. Obtain topsoil displaced from naturally well-drained sites where topsoil occurs at least 4 inches (100 mm) deep; do not obtain from agricultural land.
3. Amend existing in-place surface soil to produce topsoil. Verify suitability of surface soil to produce topsoil. Clean surface soil of roots, plants, sod, stones, clay lumps, and other extraneous materials harmful to plant growth.
a) Surface soil may be supplemented with imported or manufactured topsoil from off-site sources. Obtain topsoil displaced from naturally well-drained sites where topsoil occurs at least 4 inches (100 mm) deep; do not obtain from agricultural land, bogs or marshes.

2.7 INORGANIC SOIL AMENDMENTS

A. Lime: ASTM C 602, agricultural limestone containing a minimum 80 percent calcium carbonate equivalent and as follows:

- 1. Class: Class T, with a minimum 99 percent passing through No. 8 (2.36-mm) sieve and a minimum 75 percent passing through No. 60 (0.25-mm) sieve.
2. Class: Class O, with a minimum 95 percent passing through No. 8 (2.36-mm) sieve and a minimum 55 percent passing through No. 60 (0.25-mm) sieve.
3. Provide lime in form of dolomitic limestone.

B. Sulfur: Granular, biodegradable, containing a minimum of 90 percent sulfur, with a minimum 99 percent passing through No. 6 (3.35-mm) sieve and a maximum 10 percent passing through No. 40 (0.425-mm) sieve.

C. Iron Sulfate: Granulated ferrous sulfate containing a minimum of 20 percent iron and 10 percent sulfur.

D. Aluminum Sulfate: Commercial grade, unadulterated.

E. Perlite: Horticultural perlite, soil amendment grade.

F. Agricultural Gypsum: Finely ground, containing a minimum of 90 percent calcium sulfate.

G. Sand: Clean, washed, natural or manufactured, free of toxic materials.

H. Diatomaceous Earth: Calcined, diatomaceous earth, 90 percent silica, with approximately 140 percent absorption water capacity by weight.

I. Zeolites: Mineral clinoptilolite with at least 60 percent water absorption by weight.

2.8 ORGANIC SOIL AMENDMENTS

A. Compost: Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through 3/4-inch (19-mm) sieve; soluble salt content of 5 to 10 decisiemens/m; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings; and as follows:

- 1. Organic Matter Content: 50 to 60 percent of dry weight.
2. Feedstock: Agricultural, food, or industrial residuals; bio-solids; yard trimmings; or source-separated or compostable mixed solid waste.
B. Sphagnum peat moss: Sphagnum peat moss shall be partially decomposed, finely divided or granular texture, with a pH range of 3.4 to 4.8.
C. Peat: Finely divided or granular texture, with a pH range of 6 to 7.5, containing partially decomposed moss peat, native peat, or reed-sedge peat and having a water-absorbing capacity of 1100 to 2000 percent.

D. Wood Derivatives: Decomposed, nitrogen-treated sawdust, ground bark, or wood waste; of uniform texture, free of chips, stones, sticks, soil, or toxic materials.

1. In lieu of decomposed wood derivatives, mix partially decomposed wood derivatives with at least 0.15 lb (2.4 kg) of ammonium nitrate or 0.25 lb (4 kg) of ammonium sulfate per cubic foot (cubic meter) of loose sawdust or ground bark.

E. Manure: Well-rotted, unleached, poultry, stable or cattle manure containing not more than 25 percent by volume of straw, sawdust, or other bedding materials; free of toxic substances, stones, sticks, soil, weed seed, and material harmful to plant growth.

2.9 MISCELLANEOUS PRODUCTS

A. Antidesiccant: Water-insoluble emulsion, permeable moisture retarder, film forming, for trees and shrubs. Deliver in original, sealed, and fully labeled containers and mix according to manufacturer's written instructions.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas to receive exterior plants for compliance with requirements and conditions affecting installation and performance. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Tree save areas as indicated shall be tagged and approved by the Architect prior to any clearing and/or thinning.
B. Protect structures, utilities, sidewalks, pavements, and other facilities, and lawns and existing exterior plants from damage caused by planting operations.
C. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

D. Lay out individual tree and shrub locations and areas for multiple exterior plantings. Stake locations, outline areas, adjust locations when requested, and obtain Landscape Architect's acceptance of layout before planting. Make minor adjustments as required.

E. Lay out exterior plants at locations indicated. Stake locations of individual trees and shrubs and outline areas for multiple plantings.

F. Apply antidesiccant to trees and shrubs using power spray to provide an adequate film over trunks, branches, stems, twigs, and foliage to protect during digging, handling, and transportation.

1. If deciduous trees or shrubs are moved in full leaf, spray with antidesiccant at nursery before moving and again two weeks after planting.

3.3 PLANTING BED ESTABLISHMENT

A. Loosen subgrade of planting beds to a minimum depth of 4 inches (100 mm). Remove stones larger than 1 inch (25 mm) in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off of Owner's property.

- 1. Apply fertilizer directly to subgrade before loosening.
2. Spread topsoil, apply soil amendments and fertilizer on surface, and thoroughly blend planting soil mix.
a) Delay mixing fertilizer with planting soil if planting will not proceed within a few days.
b) Mix lime with dry soil before mixing fertilizer.

B. Finish Grading: Grade planting beds to a smooth, uniform surface plane with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades.

C. Restore planting beds if eroded or otherwise disturbed after finish grading and before planting.

3.4 TREE AND SHRUB PLANTING

A. Set all plant materials plumb and in center of pit or trench as per detail.

1. Remove burlap and wire baskets from tops of root balls and partially from sides, but do not remove from under root balls. Remove pallets, if any, before setting. Do not use planting stock if root ball is cracked or broken before or during planting operation.

2. Carefully remove root ball from container without damaging root ball or plant.

3. Place planting soil mix around root ball in layers, tamping to settle mix and eliminate voids and air pockets. When pit is approximately one-half backfilled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed. Water again after placing and tamping final layer of planting soil mix.

4. Spread roots without tangling or turning toward surface, and carefully work backfill around roots by hand. Puddle with water until backfill layers are completely saturated. Plumb before backfilling and maintain plumb while working backfill around roots and placing layers above roots. Tamp final layer of backfill. Remove injured roots by cutting cleanly, do not break.

5. Dish top of backfill to allow for mulching.

B. Organic Mulching: Apply 3 -inch (75-mm.) average thickness of organic mulch extending 12 inches (300 mm) beyond edge of planting pit or trench. Do not place mulch within 3 inches (75 mm) of trunks or stems.

3.5 TREE AND SHRUB PRUNING

A. Prune, thin, and shape trees and shrubs as indicated.

3.6 GROUND COVER AND PLANT PLANTING

A. Set out and space ground cover and plants as indicated in details.
B. Water thoroughly after planting, taking care not to cover plant crowns with wet soil.

3.7 CLEANUP AND PROTECTION

A. During exterior planting, keep adjacent pavings and construction clean and work area in an orderly condition.
B. Protect exterior plants from damage due to landscape operations, operations by other contractors and trades, and others. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged exterior planting.

3.8 DISPOSAL

A. Disposal: Remove surplus soil and waste material, including excess subsoil, unsuitable soil, trash, and debris, and and legally dispose of them off Owner's property.

END OF SECTION 02930



The Site Design Company
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DATE : FEBRUARY 5, 2021

REVISION BLOCK

Table with 2 columns: Date, City Comments. Rows for 10-07-21 and 12-20-21.

BROAD ROCK BOULEVARD
RETAIL CENTER
CITY OF RICHMOND, VA

LANDSCAPE SPECIFICATIONS

SHEET NO.
L1.2

EMAIL: thompson@site-design.com

PHONE: 804-720-9040

PROJECT MANAGER : CHRIS THOMPSON

PROJECT #: 20038



The Site Design Company
 CIVIL ENGINEERING AND LAND DEVELOPMENT CONSULTING
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PROJECT # : 20038
 PROJECT MANAGER : CHRIS THOMPSON
 PHONE : 804-720-9040
 EMAIL : thompson@sitedesignco.com

DATE : FEBRUARY 5, 2021

REVISION BLOCK	
10-07-21	CITY COMMENTS
12-20-21	CITY COMMENTS

**BROAD ROCK BOULEVARD
 RETAIL CENTER**
 CITY OF RICHMOND, VA

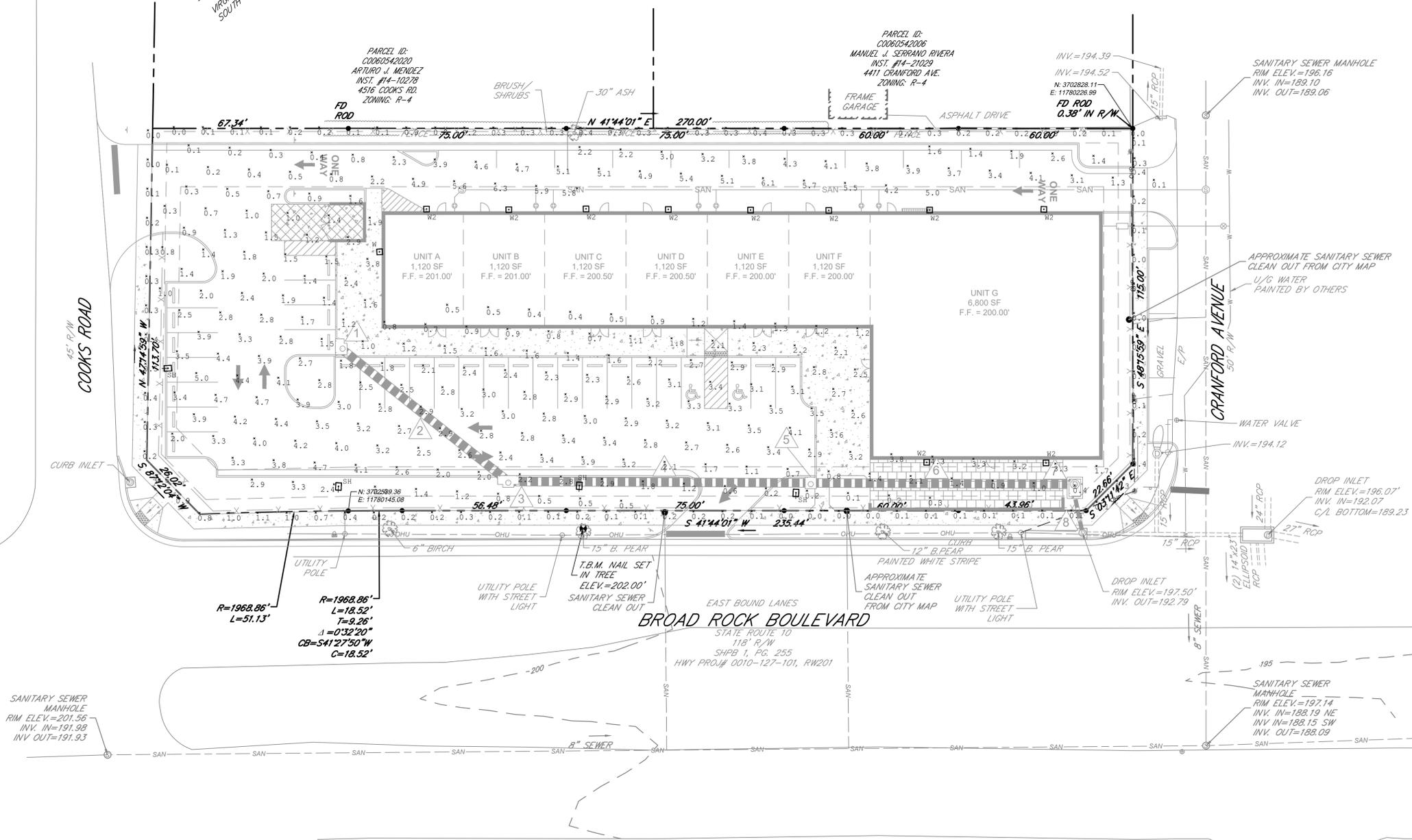
SITE LIGHTING PLAN

SHEET NO.
L2.0

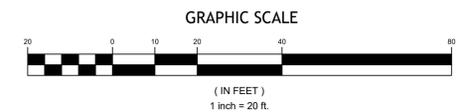
Luminaire Schedule				
Symbol	Qty	Label	Arrangement	Description
■	4	SH	SINGLE	MRM-LED-18L-SIL-FT-UNV-DIM-30-70CRI-BRZ-IL (26.5' MH)
□	1	W	SINGLE	XWM-FT-LED-3L-30-UE-BRZ (10' MH)
■	10	W2	SINGLE	XWM-2-LED-3L-30-UE-BRZ (10' MH)

POLES TO BE LSI #4SQB3-S11G-24'-S-BR2-4BC

Calculation Summary						
Label	CalcType	Units	Avg	Max	Min	Avg/Min
CALCULATIONS	ILLUMINANCE	Fc	2.45	6.3	0.1	24.50
PROPERTY LINE	ILLUMINANCE	Fc	0.24	1.1	0.0	N.A.



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PROJECT # : 20038
 PROJECT MANAGER : CHRIS THOMPSON
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DATE : FEBRUARY 5, 2021

REVISION BLOCK	
10-07-21	CITY COMMENTS
12-20-21	CITY COMMENTS

**BROAD ROCK BOULEVARD
 RETAIL CENTER**
 CITY OF RICHMOND, VA

SHEET NO.
L2.1

Mirada Medium (MRM)
 Outdoor LED Area Light

Thomas Harris & Co., Inc.
 8505 Bell Creek Road, Suite B
 Mechanicsville, VA 23116

OVERVIEW	
Lumen Package	7000 - 48,000
Wattage Range	53 - 401
Efficacy Range (LPW)	93 - 148
Weight (lbs)	30 (3.6)

- QUICK LINKS**
- Ordering Guide
 - Performance
 - Photometrics
 - Dimensions

FEATURES & SPECIFICATIONS

- Construction**
- Rugged die-cast aluminum housing contains factory pre-wired driver and optical unit. Cast aluminum wiring access door located underneath.
 - Designed to mount to square or round poles.
 - Fixtures are finished with LSI's DuraGrip® powder-coated steel finishing process. The DuraGrip finish withstands extreme weather changes without cracking or peeling. Other standard LSI finishes available. Consult factory.
 - Shipping weight: 30 lbs in carton.
- Optical System**
- State-of-the-art one piece silicone optic sheet delivers industry leading optical control with an integrated gasket to provide IP66 rated sealed optical chamber in 1 component.
 - Prismatic silicone refractor optics provide exceptional coverage and uniformity in IEEE Types 2, 3, SW, FT, FTA and AH.
 - Silicone optical material does not yellow or crack with age and provides a typical light transmittance of 93%.
 - Zero sagging.
 - Available in 5000K, 4000K, and 3000K color temperatures per ANSI C18.77. Also Available in Phosphor Converted Amber with Peak Intensity at 600nm.
 - Minimum CRI of 70.
 - Integral louver (L) and house-side shield (HS) options available for improved backlight control without sacrificing street side performance. See page 3 for more details.
- Electrical**
- High-performance programmable driver features over-voltage, under-voltage, short-circuit and over-temperature protection. Custom lumen and wattage packages available.
 - 0-10V dimming (10% - 100%) standard.
 - Standard Universal Voltage (100-277 Vac) Input 50/60 Hz or optional High Voltage (347-480 Vac).
 - LSI Calculated Life >50K Hours (See Lumen Maintenance on Page 3)
 - Total Harmonic Distortion <20%
 - Operating temperature: -40°C to +50°C (-40°F to +122°F). 43L and 48L lumen packages rated to +40°C.
 - Power Factor >.90
 - Input power stays constant over life.
 - Field replaceable LED range protection device meets a minimum Category C Low operation per ANSI/IEEE C62.41.2.
 - High efficiency LEDs mounted to metal core circuit board to maximize heat dissipation
 - Components are fully encased in potting material for moisture resistance. Driver complies with FCC standards. Driver and key electronic components can easily be accessed.
- Controls**
- Optional integral passive infrared (PIR) motion and photo-aid sensor (see page 9 for more details). Fixtures operate independently and can be commissioned via IOS or Arched configuration app
 - LSI's ARL™ wireless control system options reduce energy and maintenance costs while optimizing light quality 24/7. (See page 9 for more details.)
 - A single fastener secures the hinged door underneath the housing and provides quick & easy access to the electrical compartment.
 - Included terminal block accounts up to 12 ga. wires.
 - Utilizes LSI's traditional 3" drill pattern B3 for easy fastening of LSI products. (See drawing on page 3)
 - Warranty
 - LSI LED Fixtures carry a 5-year warranty
- Listings**
- Listed to UL 1598 and UL 8750.
 - Meets Bay Area Green Act requirements
 - IP66 compliant with 3000K color temperature selection.
 - File 24 Compliant: see local ordinance for qualification information.
 - Suitable for wet Locations
 - IP66 rated Luminaire per IEC 60598
 - 30 rated for ANSI C136.31 high vibration applications are qualified.

Mirada Medium Outdoor LED Area Light

ORDERING GUIDE

Typical Order Example: **MRM LED 36L SIL FTA UNV DIM 50 70CRI ALSC04 BRZ IL**

Luminaire Package	Light Distribution	Lumen Package	Light Output	Beam Angle	Mounting Height	Grid Spacing	Color Temp	Color Rendering	Finish	Options
36L	2	36,000	4278W	112	25'	5' x 5'	5000K	93	Black - Short	None

OPTICS ROTATION

Top View

ACCESSORIES/OPTIONS

Integral Louver (IL) and House-Side Shield (HS)
 Accessory louver and shield available for improved backlight control without sacrificing street side performance. LSI's Integral Louver (L) and Integral House-Side Shield (HS) options deliver backlight control that significantly reduces spill light behind the poles for applications with pole locations close to adjacent properties. The design maximizes forward reflected light while reducing glare, maintaining the optical distribution selected, and most importantly eliminating light trespass. Both options rotate with the optical distribution.

Luminaire Shown with Integral Louver (L)

Luminaire Shown with HSMT Option

7 Pin Photoelectric Control
 7-pin ANSI C136.41-2013 control receptacle option available for twist lock photocontrols or wireless control modules. Control accessories sold separately. Dimming leads from the receptacle will be connected to the driver dimming leads (consult factory for alternate wiring).

Luminaire Shown with PCR 7P

Mirada Medium Outdoor LED Area Light

PERFORMANCE

Luminaire Package	Distribution	CR	5000 CCT		4000 CCT		3000 CCT		Weight
Delivered Lumens	Efficiency	IES Type	Delivered Lumens	Efficiency	Delivered Lumens	Efficiency	Delivered Lumens	Efficiency	Wattage
36L	2	70	36000	123	36000	123	36000	123	36000

PHOTOMETRICS (CONT)

MRM-LED-30L-SIL-FT-40-70CRI

LUMINAIRE DATA

Type FT Distribution
 Description: 4000 Kelvin, 70 CRI
 Delivered Lumens: 31,847
 Watts: 247
 Efficacy: 129
 IES Type: Type IV - Short
 BUG Rating: BS-UD-G4

Zonal Lumen Summary

Zone	Lumens	%Luminaire
Low (0-30°)	4126	13%
Medium (30-60°)	13479	42%
High (60-90°)	13768	43%
Very High (90-180°)	614	2%
Uplight (90-180°)	0	0%
Total Flux	31987	100%

ISO FOOTCANDLE

POLAR CURVE

25' Mounting Height/ 25' Grid Spacing
 5 FC 2 FC 1 FC 0.5 FC

Mirada Medium Outdoor LED Area Light

PHOTOMETRICS (CONT)

MRM-LED-30L-SIL-FTA-40-70CRI

LUMINAIRE DATA

Type FTA Distribution
 Description: 4000 Kelvin, 70 CRI
 Delivered Lumens: 31,810
 Watts: 247
 Efficacy: 129
 IES Type: Type II - Short
 BUG Rating: BS-UD-G3

Zonal Lumen Summary

Zone	Lumens	%Luminaire
Low (0-30°)	6758	21%
Medium (30-60°)	18845	59%
High (60-90°)	5872	18%
Very High (90-180°)	341	1%
Uplight (90-180°)	0	0%
Total Flux	31816	100%

ISO FOOTCANDLE

POLAR CURVE

25' Mounting Height/ 25' Grid Spacing
 5 FC 2 FC 1 FC 0.5 FC

PHOTOMETRICS (CONT)

MRM-LED-30L-SIL-FT-40-70CRI

LUMINAIRE DATA

Type FT Distribution
 Description: 4000 Kelvin, 70 CRI
 Delivered Lumens: 31,847
 Watts: 247
 Efficacy: 129
 IES Type: Type IV - Short
 BUG Rating: BS-UD-G4

Zonal Lumen Summary

Zone	Lumens	%Luminaire
Low (0-30°)	4126	13%
Medium (30-60°)	13479	42%
High (60-90°)	13768	43%
Very High (90-180°)	614	2%
Uplight (90-180°)	0	0%
Total Flux	31987	100%

ISO FOOTCANDLE

POLAR CURVE

25' Mounting Height/ 25' Grid Spacing
 5 FC 2 FC 1 FC 0.5 FC

Mirada Medium Outdoor LED Area Light

PERFORMANCE (CONT)

Luminaire Package	Distribution	CR	5000 CCT		4000 CCT		3000 CCT		Weight
Delivered Lumens	Efficiency	IES Type	Delivered Lumens	Efficiency	Delivered Lumens	Efficiency	Delivered Lumens	Efficiency	Wattage
36L	2	70	36000	123	36000	123	36000	123	36000

ELECTRICAL DATA (AMPS)*

Lumens	Watts	120V	208V	240V	277V	347V	480V
36L	247	2.06	1.16	0.98	0.80	0.63	0.51

ELECTRICAL DATA - PHOSPHOR CONVERTED AMBER (AMPS)*

Lumens	Watts	120V	208V	240V	277V	347V	480V
36L	247	2.06	1.16	0.98	0.80	0.63	0.51

RECOMMENDED LUMEN MAINTENANCE* (70-18L)

Age (hrs)	100%	90%	80%	75%	70%	60%
1000	100%	98%	95%	92%	88%	82%

RECOMMENDED LUMEN MAINTENANCE* (24-48L)

Age (hrs)	100%	90%	80%	75%	70%	60%
1000	100%	98%	95%	92%	88%	82%

DELIVERED LUMENS*

Luminaire Package	Description	Delivered Lumens	Efficacy	BUG Rating	Weight
36L	2	36000	123	BS-UD-G4	30

*Electrical data at 20°C (70°F). Actual wattage may differ by +/-10%.
 *Lumen maintenance values at 25°C are calculated per 70% B3 based on LM-80 data and 100% binning.
 *In accordance with IESNA TM-21-01, Discontinued values represent interpolated values based on time durations that are within six times the IESNA LM-80-08 total test duration for the device under testing.
 *In accordance with IESNA TM-21-01, Calculated values represent time durations that exceed six times the IESNA LM-80-08 total test duration for the device under testing.

Mirada Medium Outdoor LED Area Light

PHOTOMETRICS

MRM-LED-30L-SIL-2-40-70CRI

LUMINAIRE DATA

Type 2 Distribution
 Description: 4000 Kelvin, 70 CRI
 Delivered Lumens: 30,305
 Watts: 247
 Efficacy: 125
 IES Type: Type II - Short
 BUG Rating: BS-UD-G3

Zonal Lumen Summary

Zone	Lumens	%Luminaire
Low (0-30°)	4302	14%
Medium (30-60°)	18894	61%
High (60-90°)	7259	24%
Very High (90-180°)	263	1%
Uplight (90-180°)	0	0%
Total Flux	30905	100%

ISO FOOTCANDLE

POLAR CURVE

25' Mounting Height/ 25' Grid Spacing
 5 FC 2 FC 1 FC 0.5 FC

PHOTOMETRICS

MRM-LED-30L-SIL-5-40-70CRI

LUMINAIRE DATA

Type 5 Distribution
 Description: 4000 Kelvin, 70 CRI
 Delivered Lumens: 32,176
 Watts: 247
 Efficacy: 130
 IES Type: Type III - Short
 BUG Rating: BS-UD-G4

Zonal Lumen Summary

Zone	Lumens	%Luminaire
Low (0-30°)	2670	9%
Medium (30-60°)	16127	50%
High (60-90°)	12779	40%
Very High (90-180°)	301	1%
Uplight (90-180°)	0	0%
Total Flux	32176	100%

ISO FOOTCANDLE

POLAR CURVE

25' Mounting Height/ 25' Grid Spacing
 5 FC 2 FC 1 FC 0.5 FC

Mirada Medium Outdoor LED Area Light

PHOTOMETRICS (CONT)

MRM-LED-30L-SIL-SW-40-70CRI

LUMINAIRE DATA

Type SW Distribution
 Description: 4000 Kelvin, 70 CRI
 Delivered Lumens: 30,538
 Watts: 247
 Efficacy: 124
 IES Type: Type VS - Short
 BUG Rating: BS-UD-G4

Zonal Lumen Summary

Zone	Lumens	%Luminaire
Low (0-30°)	2682	9%
Medium (30-60°)	12032	39%
High (60-90°)	15328	50%
Very High (90-180°)	315	1%
Uplight (90-180°)	0	0%
Total Flux	30538	100%

ISO FOOTCANDLE

POLAR CURVE

25' Mounting Height/ 25' Grid Spacing
 5 FC 2 FC 1 FC 0.5 FC

PHOTOMETRICS (CONT)

MRM-LED-30L-SIL-SW-40-70CRI

LUMINAIRE DATA

Type SW Distribution
 Description: 4000 Kelvin, 70 CRI
 Delivered Lumens: 32,221
 Watts: 247
 Efficacy: 134
 IES Type: Type III - Very Short
 BUG Rating: BS-UD-G3

Zonal Lumen Summary

Zone	Lumens	%Luminaire
Low (0-30°)	5500	17%
Medium (30-60°)	21354	64%
High (60-90°)	5881	18%
Very High (90-180°)	435	1%
Uplight (90-180°)	0	0%
Total Flux	32221	100%

ISO FOOTCANDLE

POLAR CURVE

25' Mounting Height/ 25' Grid Spacing
 5 FC 2 FC 1 FC 0.5 FC

Mirada Medium Outdoor LED Area Light

PHOTOMETRICS (CONT)

MRM-LED-30L-SIL-SW-40-70CRI

LUMINAIRE DATA

Type SW Distribution
 Description: 4000 Kelvin, 70 CRI
 Delivered Lumens: 32,221
 Watts: 247
 Efficacy: 134
 IES Type: Type III - Very Short
 BUG Rating: BS-UD-G3

Zonal Lumen Summary

Zone	Lumens	%Luminaire
Low (0-30°)	5500	17%
Medium (30-60°)	21354	64%
High (60-90°)	5881	18%
Very High (90-180°)	435	1%
Uplight (90-180°)	0	0%
Total Flux	32221	100%

ISO FOOTCANDLE

POLAR CURVE

25' Mounting Height/ 25' Grid Spacing
 5 FC 2 FC 1 FC 0.5 FC

PHOTOMETRICS (CONT)

MRM-LED-30L-SIL-SW-40-70CRI

LUMINAIRE DATA

Type SW Distribution
 Description: 4000 Kelvin, 70 CRI
 Delivered Lumens: 32,221
 Watts: 247
 Efficacy: 134
 IES Type: Type III - Very Short
 BUG Rating: BS-UD-G3

Zonal Lumen Summary

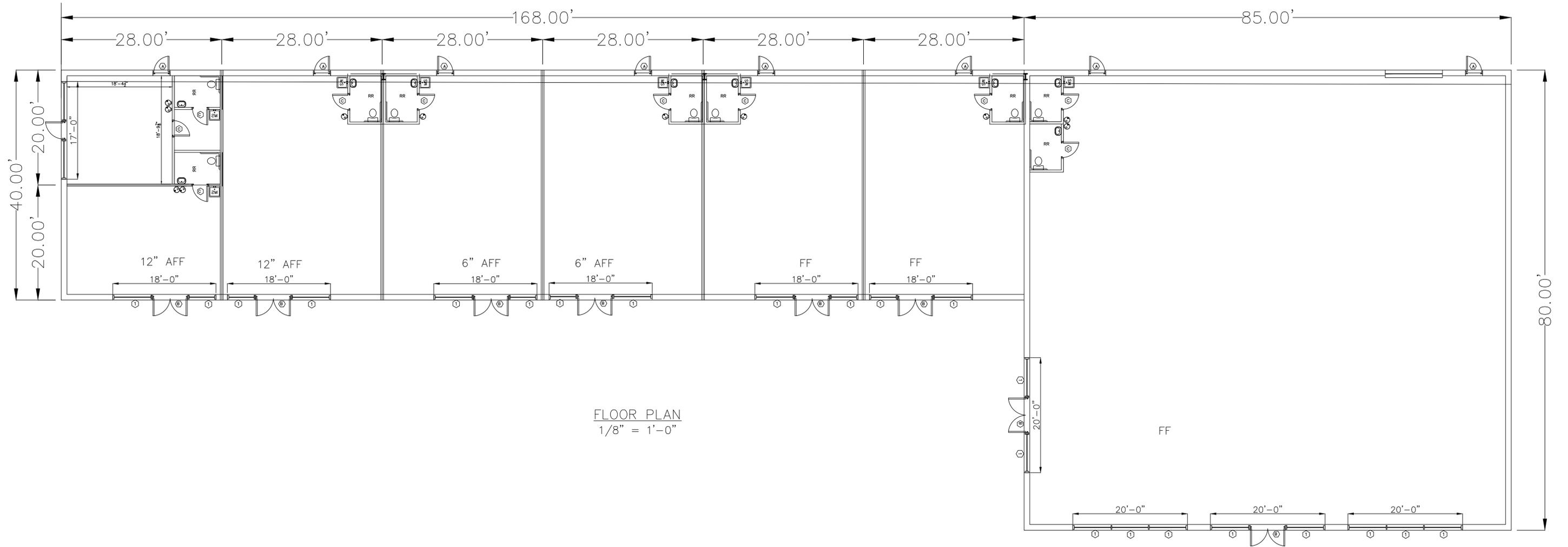
Zone	Lumens	%Luminaire
Low (0-30°)	5500	17%
Medium (30-60°)	21354	64%
High (60-90°)	5881	18%
Very High (90-180°)	435	1%
Uplight (90-180°)	0	0%
Total Flux	32221	100%

ISO FOOTCANDLE

POLAR CURVE

25' Mounting Height/ 25' Grid Spacing
 5 FC 2 FC 1 FC 0.5 FC

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FLOOR PLAN
 1/8" = 1'-0"

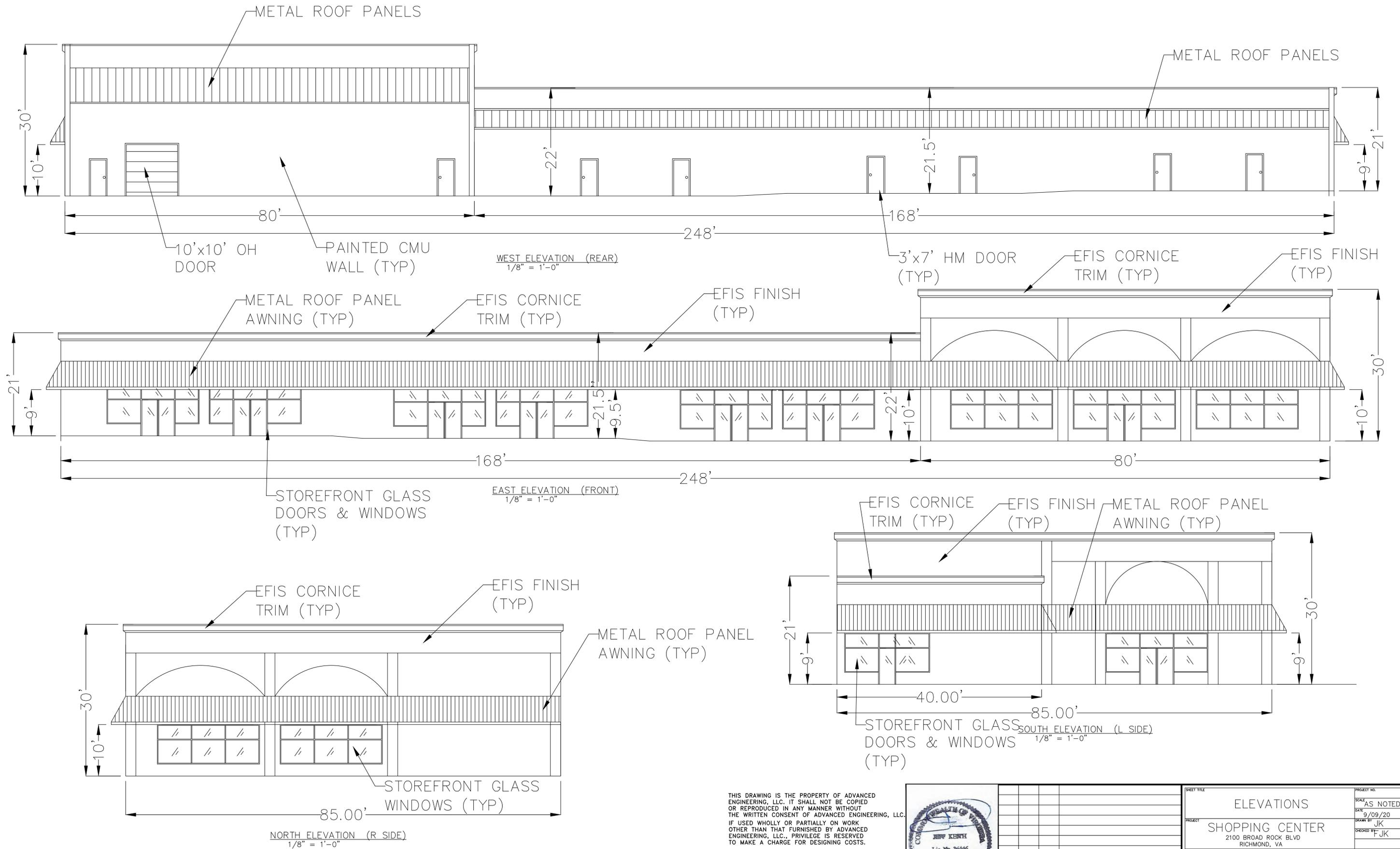
THE PURPOSE OF THIS PROJECT IS FOR THE CONSTRUCTION OF A SINGLE STORY 13,520 SF SHELL ONLY METAL BUILDING

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NO.	DATE	BY	REVISION
1	2-12-22	JK	REV PER GRADING PLAN

SHEET TITLE		PROJECT NO.	
FLOOR PLAN		AS NOTED	
DATE		9/09/20	
DRAWN BY		JK	
CHECKED BY		FJK	
DRAWING NO.		060	
PROJECT		A-1	
SHOPPING CENTER 2100 BROAD ROCK BLVD RICHMOND, VA			
Advanced Engineering, LLC P.O.Box 72692 Richmond, VA, 23235 (804) 909-3633 E-Mail: AdvEngrLLC@gmail.com			



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1	2-12-22	JK	REV PER GRADING PLAN

SHEET TITLE	ELEVATIONS	PROJECT NO.	
SCALE	AS NOTED	DATE	9/09/20
PROJECT	SHOPPING CENTER 2100 BROAD ROCK BLVD RICHMOND, VA	DRAWN BY	JK
		CHECKED BY	FJK
		DRAWING NO.	060
			A-2
Advanced Engineering, LLC		P.O.Box 72692 Richmond, VA, 23235 (804) 909-3633 E-Mail: AdvEngrLLC@gmail.com	