



Municipal Planning Commission
City Service Center – 915 Quarrier Street – Suite 6
Wednesday, July 6, 2022
3:00 p.m.

Agenda

- 1. Call to Order**
- 2. Unfinished Business**
- 3. New Business**

Text Amendment: Bill No. 7961 - A Bill amending the Zoning Ordinance of the City of Charleston, West Virginia, adopted January 1, 2006, as amended, by adding two conditional use districts for "Personal Service Establishment", a notation of a supplemental regulation to the entry "Dwelling, Accessory" in the Land Use Table of Section 3-050, and a notation of Supplemental Regulation 31 pertaining to the entry "Livestock or Poultry, Keeping of (Non-Commercial)" in the Land Use Table of Section 3-050.

Development of Significant Impact: Considering an application for a DSI at Northgate Hotel Circle.

- 4. Minutes of the April 6, 2022 MPC meeting**
- 5. Announcements**
- 6. MPC Election**
- 7. Adjournment**

***Meetings may be recorded and broadcast via internet <https://charlestonwv.civicclerk.com>**

Bill No. 7962

Introduced in Council:

July 5, 2022

Introduced by:

Mary Beth Hoover

Adopted by Council:

Referred to:

Planning, Streets and Traffic

Municipal Planning Commission

Bill No. 7962 - A Bill amending the Zoning Ordinance of the City of Charleston, West Virginia, adopted January 1, 2006, as amended, by adding a notation to Supplemental Regulation 31 pertaining to the entry “Livestock or Poultry, Keeping of (Non-Commercial)” in the Supplemental Regulations Pertaining to Land Use Table contained of Section 3-060, two conditional use districts for “Personal Service Establishment” in the Land Use Table of Section 3-050, and a notation of a supplemental regulation to the entry “Dwelling, Accessory” in the Land Use Table of Section 3-050.

Be it Ordained by the Council of the City of Charleston, West Virginia:

The Zoning Ordinance for the City of Charleston, West Virginia, effective January 1, 2006, is hereby amended as follows:

1) In Article 3, Establishment of Zoning Districts and Map:

Sec. 3-060 Supplemental Regulations Pertaining to Land Use Table

31. **Livestock or poultry**, keeping of (non-commercial) shall comply with the following (except in such instances that comply with supplemental regulation 51 as it relates to Urban Agriculture and the keeping of 6 or less hens)\:

a. A minimum site of one acre shall be required.

b. Use shall not constitute a nuisance due to noise or odor.

2) In Article 3, Establishment of Zoning Districts and Map:

Sec. 3-050 Permitted Land Uses

Land Use	R-2	R-4	R-6	R-8	R-10	R-O	C-4	C-8	C-10	C-12	CBD	UCD	CVD	PMC	I-2	I-4	PUD	Supp.
Personal Services Establishment					<u>C</u>	<u>C</u>	P	P	P	P	P	P	P					

1
2
3
4

3) In Article 3, Establishment of Zoning Districts and Map:

Sec. 3-050 Permitted Land Uses

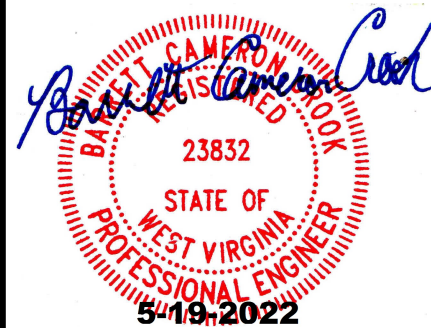
Land Use	R- 2	R- 4	R- 6	R- 8	R- 10	R- O	C- 4	C- 8	C- 10	C- 12	CBD	UCD	CVD	PMC	I- 2	I- 4	PUD	Supp.
Dwelling, Accessory	P	P	P	P	P	P												<u>54</u>

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MAJOR DEVELOPMENT OF SIGNIFICANT IMPACT

RESIDENCE INN by MARRIOTT
@ HOTEL CIRCLE

CITY OF CHARLESTON
KANAWHA COUNTY, WEST VIRGINIA



SITE DATA

- DEVELOPER/PROPERTY OWNER:
SINA 22, LLC
15820 WOODS EDGE ROAD
SOUTH CHESTERFIELD, VA 23834
TELE: 804.687.9958
EMAIL: ravi.patel@sinahospitality.com
CONTACT : RAVI PATEL
- 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 ID: 10 50003100000000 (10-50-31)
TAX ID: TM 50, TP 31
ADDRESS: 300 HOTEL CIRCLE
SOURCE OF TITLE: D.B. 2402, PG. 69
PARCEL AREA: 3.83± ACRES
- DISTURBED AREA: 3.60 ± ACRES
- ZONING: C - COMMERCIAL
- USE
EXISTING: VACANT
PROPOSED: HOTEL / RESTAURANT
- BUILDING INFO:
HOTEL
BUILDING AREA: 100,661 SF
HEIGHT: 4-STORY, 48'-1" TO TOP OF TRUSS
- PARKING SUMMARY:
USE : 127 ROOM HOTEL
REQUIRED: 1 PARKING SPACE PER ROOM
TOTAL REQUIRED: 127 (INCLUDING 5 HANDICAP SPACES)
TOTAL PROVIDED: 134 (INCLUDING 7 HANDICAP SPACES)
- UTILITIES: PUBLIC WATER AND SEWER
- TOPOGRAPHICAL SURVEY:
PERFORMED JUNE 2021, REVISED MARCH 2022 BY WILKINSON SURVEYING, LLC
CONTACT: PHILIP L. LONGENECKER
PHONE: 304.768.5678
- DATUM REFERENCE:
HORIZONTAL: NAD83 WEST 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 54039C0426E, EFFECTIVE DATE FEBRUARY 6, 2008.
- COORDINATES: LAT: N 38.3531, LONG: W 81.6046
- HUC8: ELK (5050007)



VICINITY MAP

SCALE: 1"=400'

AS SURVEYED LEGAL DESCRIPTION

The Land is described as follows:
All the following described tract or parcel of real estate situate in Charleston North Taxing District, City of Charleston, Kanawha County, West Virginia:
Lot-2, Parcel-C of the NorthGate Commercial Development Park
Beginning at a 5/8" rebar (set) on the Southwest Right of Way line of Hotel Circle, and said point being S 37°10'32" E, a distance of 704.36 feet from permanent point No. 1 (an 1/8" hole in the leg of Appalachian Power's Steel Tower having a Y-Grid Coordinate of 494,123.287 and a X-Grid Coordinate of 1,826,381.103), said permanent point No. 1 having a backsite to permanent point No. 2 of N 78°56'16" E, a distance of 2,110.99 feet, (permanent point No. 2 is also an 1/8" hole in the leg of another Appalachian Power Steel Tower having a Y-Grid Coordinate of 494,528.332 and a X-Grid Coordinate of 1,828,452.865); thence from said point of beginning (a common corner to Lots 1 and 2) and with the Southern Hotel Circle Right of Way line and with a curve to the left through a central angle of 23°33'40", with an arc length of 154.21 feet, having a radius of 375.00 feet and a chord bearing of S 75°16'11" E and a chord length of 153.12 feet to a 5/8" rebar (set) on the Southern Right of Way line of Hotel Circle; thence with the Southern Right of Way line of Hotel Circle S 87°03'01" E, at a distance of 106.56 feet to a 5/8" rebar (set) on the Southern Right of Way line of Hotel Circle; thence leaving the Southern Right of Way line of Hotel Circle, S 14°39'34" W, a distance of 472.10' feet to a 1-1/4" iron pipe (found) on a proposed 20 foot Right of Way; thence running with a proposed 20 foot proposed Right of Way N 75°37'36" W, a distance of 91.14 feet to a 1-1/4" iron pipe (found); thence N 56°58'47" W, a distance of 186.37' feet to a Mag Nail (set) in rock; thence N 76°37'42" W, at a distance of 117.05' feet to a 1-1/4" iron pipe (found); thence S 83°44'12" W, at a distance of 179.20' feet to a 5/8" rebar (set); thence S 83°52'20" W, a distance of 5.88 feet to a 5/8" rebar (set) on a common corner to Lots 1 and 2; thence leaving said 20 foot Right of Way and with the line of Lots 1 and 2, N 47°44'50" E, a distance of 550.37 feet to point of beginning and containing 167,000.03 square feet (3.83 acres), and being more particularly described on the plat attached hereto and incorporated herein by reference, being known as Lot 2, Parcel-C of the NorthGate Commercial Development Park; said Lot 2 contains 167,000.03 square feet of useable land, as that term is described in the Declaration of Reservations and Restrictive Covenants for NorthGate, which is of record in the Office of the Clerk of the County Commission of Kanawha County, West Virginia, in Deed Book 2339, Page 1.

Notes:

- Survey is based upon permanent point No. 1 (an 1/8" hole in the leg of Appalachian Power's Steel Tower having a Y-Grid Coordinate of 494,123.287 and a X-Grid Coordinate of 1,826,381.103), said permanent point No. 1 having a call to permanent point No. 2 of N 78°56'16" E, a distance of 2,110.99 feet, (permanent point No. 2 is also an 1/0" hole in the leg of another Appalachian Power Steel Tower having a Y-Grid Coordinate of 494,528.332 and a X-Grid Coordinate of 1,828,452.865)
- Flood Hazard Area: Location is not within any identified flood hazard area. FEMA's Flood Map: 54039C0426E, Dated 02-06-2008
Flood Insurance Rate Map Panel 426E
- See Declaration of Reservations and Restrictive Covenants for NorthGate, which is of record in the Office of the Clerk of the County Commision of Kanawha County, West Virginia, in Deed Book 2329, Page 1.
- Airspace above 1250' is restricted.
- As Per Article VII of Restrictive Covenants in DB 2329, Page 1, there is a 20' Maintenance Easement along the Front Lines & 30' Easement along the Rear Lincs.
- As Per Article IV Easement of Enjoyment 40' Interior Lot Lines
20' Easement Each Side of Existing Utility Easement.
- Utilities were located by 811 Request & Visual Inspection, only without Excavation. The Exact Location of Underground Features Cannot be Accurately, Completely, and Reliably Depicted



WEST VIRGINIA 811

CONTRACTOR SHALL CALL THE "WEST VIRGINIA 811" 72 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 WEST VIRGINIA 811: 1-800-245-4848 (TOLL FREE) OR 811

SITE PLAN APPROVAL BLOCK

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 #: 20064

DATE : MAY 15, 2022

REVISION BLOCK

RESIDENCE INN by MARRIOTT

@ HOTEL CIRCLE

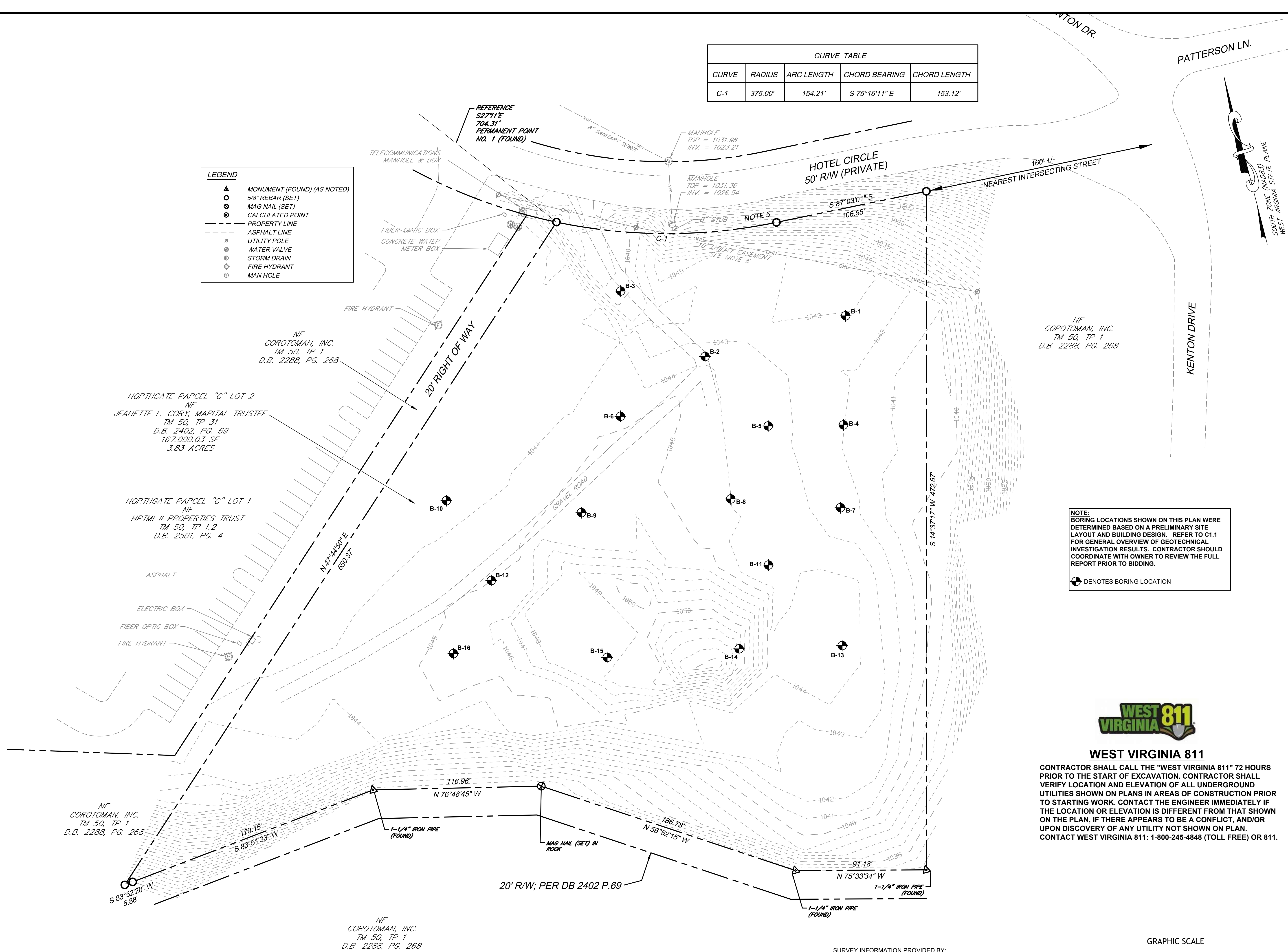
CITY OF CHARLESTON - KANAWHA COUNTY, WEST VIRGINIA

TITLE SHEET

SHEET NO.

C0.0

THESE DRAWINGS ARE THE EXCLUSIVE PROPERTY OF The Site Design Company AND SHALL NOT BE REPRODUCED OR UTILIZED FOR ANY PURPOSE WITHOUT THE EXPRESS WRITTEN CONSENT OF The Site Design Company.



CURVE TABLE				
CURVE	RADIUS	ARC LENGTH	CHORD BEARING	CHORD LENGTH
C-1	375.00'	154.21'	S 75°16'11" E	153.12'

- LEGEND**
- ▲ MONUMENT (FOUND) (AS NOTED)
 - 5/8" REBAR (SET)
 - ⊙ MAG NAIL (SET)
 - ⊙ CALCULATED POINT
 - - - PROPERTY LINE
 - - - ASPHALT LINE
 - ⊙ UTILITY POLE
 - ⊙ WATER VALVE
 - ⊙ STORM DRAIN
 - ⊙ FIRE HYDRANT
 - ⊙ MAN HOLE

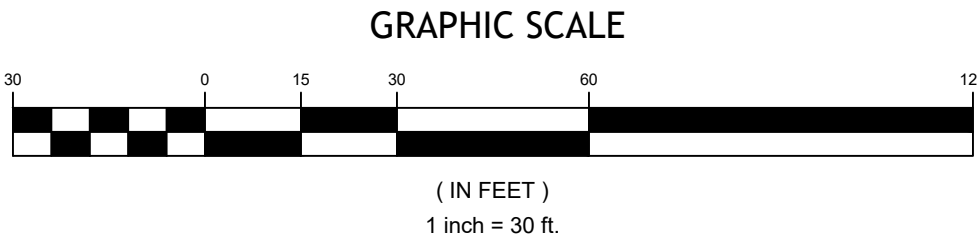
NOTE:
BORING LOCATIONS SHOWN ON THIS PLAN WERE DETERMINED BASED ON A PRELIMINARY SITE LAYOUT AND BUILDING DESIGN. REFER TO C1.1 FOR GENERAL OVERVIEW OF GEOTECHNICAL INVESTIGATION RESULTS. CONTRACTOR SHOULD COORDINATE WITH OWNER TO REVIEW THE FULL REPORT PRIOR TO BIDDING.

⊙ DENOTES BORING LOCATION



WEST VIRGINIA 811

CONTRACTOR SHALL CALL THE "WEST VIRGINIA 811" 72 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 WEST VIRGINIA 811: 1-800-245-4848 (TOLL FREE) OR 811.



SURVEY INFORMATION PROVIDED BY:
WILKINSON SURVEYING, LLC
CONTACT: PHILIP L. LONGENECKER
PHONE: 304-768-5678
PERFORMED JUNE 2021, REVISED MARCH 2022

The Site Design Company

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

PROJECT # : 20064

PHONE : 804-720-9040

EMAIL : thompson@sitedesignco.com

DATE : MAY 15, 2022

REVISION BLOCK	

RESIDENCE INN by MARRIOTT
@ HOTEL CIRCLE
CITY OF CHARLESTON - KANAWHA COUNTY, WEST VIRGINIA

EXISTING CONDITIONS PLAN

SHEET NO.
C1.0

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AMERICAN GEOTECH. INC.

GEOTECHNICAL, ENVIRONMENTAL AND TESTING ENGINEERS

601 OHIO AVENUE
CHARLESTON, WV 25302
(304) 340-4277
Fax (304) 340-4278

February 3, 2021

Mr. Ravi Patel, CEO
SINA Hospitality
15820 Woods Edge Road
South Chesterfield, VA 23834

Re: Preliminary Report of Geotechnical Exploration & Engineering Analysis
Proposed 4-Story Residence Inn by Marriott
200 Hotel Circle - Northgate
Charleston, West Virginia

Dear Mr. Patel:

Upon your request and authorization, American Geotech, Inc. (AGI) is pleased to present the results of our preliminary geotechnical exploration and engineering analysis for the proposed 4-story Residence Inn by Marriott, to be located in Charleston, West Virginia. The preliminary geotechnical report is attached herewith.

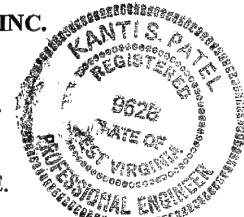
It is recommended that the contract documents must follow International Building Code (IBC) requirements, including a Schedule of Special Inspection Services for soils and foundations in the plans. The owner must employ an independent testing agency for quality assurance and special inspections as set forth in IBC requirements Chapter 17.0, Sections 1704.2 to 1704.14.

We appreciate the opportunity of providing these services to you. Please contact our office at 304-340-4277 if we can elaborate on any of the recommendations contained in this report, or provide additional information.

Respectfully Submitted,

AMERICAN GEOTECH, INC.

Kanti S. Patel, M.S.C.E., P.E.
Principal Engineer



ANALYSIS AND RECOMMENDATIONS

The controlling geotechnical concern with respect to this project is the foundation construction and utility installation, considering that the excavations will encounter existing residual soils and weathered bedrock throughout the building area. While being relatively firm when undisturbed, the encountered residual materials are dry and weathered to a degree where exposure to wet conditions will rapidly degrade the rock structure back to a clayey condition. Any predominantly "redbed" claystone or shale materials can exhibit plastic properties when degraded. The colors of these materials include maroon, brown, gray, and tan. Split spoon sampler refusal occurred within the described soft bedrock material strata at various depths at most test boring locations. The test borings were advanced to completion depths ranging from 10.0 to 10.9 feet below the existing surface.

Groundwater was not encountered, during drilling or at completion, in any of the test borings at the site. We should state that fluctuations in the location of the groundwater table, as well as perched or trapped groundwater, can occur as a result of seasonal variations in precipitation, evaporation, surface runoff, and other factors not immediately apparent at the time of our exploration.

Site Preparation

All structural areas, as defined by the proposed building footprint and all areas to receive fill, should be stripped of all surface vegetation, topsoil, existing soil and debris piles, old utilities, trees (including the rootballs and rootmat), and any other deleterious materials. All existing underground utility lines should be relocated outside of the new building area. Following the stripping and grading processes, all exposed subgrade areas should be proof-rolled using a rubber-tired, loaded, 20 ton dump truck or a smooth drum vibratory roller, under the supervision

PRELIMINARY GEOTECHNICAL EXPLORATION AND ENGINEERING ANALYSIS

PROPOSED 4-STORY RESIDENCE INN BY MARRIOTT
200 HOTEL CIRCLE
CHARLESTON, WEST VIRGINIA

EXECUTIVE SUMMARY

A brief summary of our preliminary recommendations for this project is presented below. This summary should be read in context with the entire report for proper interpretation.

Special Concerns

- It is recommended that the contract documents must follow International Building Code (IBC) requirements, including a Schedule of Special Inspection Services for soils and foundations in the plans. The owner must employ an independent testing agency for quality assurance and special inspections as set forth in IBC requirements Chapter 17.0, Sections 1704.2 to 1704.14.
- American Geotech should be given the opportunity to review the final building layout, site grading and utility plans once these items are prepared. Additional evaluation or exploration will be needed since the finished floor elevation is not known.
- The controlling geotechnical concerns at this site are the foundation construction and utility installation, considering that the excavations will encounter natural residual soils and shallow weathered bedrock across the site.
- While being relatively firm when undisturbed, the encountered residual materials are dry and weathered to a degree where exposure to wet conditions will rapidly degrade the rock structure back into soft clay. To prevent degradation of the bearing materials, foundation concrete should be placed on the same day excavation occurs. Otherwise, the bearing surface should be protected by placement of a minimum 3 inch thick lean concrete "mud mat".

Site Development

- All structural areas, as defined by the building footprint and areas to receive fill, should be stripped of all surface vegetation, topsoil, relict debris or soil piles, old utilities, and any other deleterious materials.
- Following the stripping and grading processes, all exposed soil subgrade areas should be proof-rolled by a rubber-tired, loaded, 20 ton dump truck or a smooth drum vibratory roller, under the supervision of a qualified geotechnical representative. A minimum of four passes should be made across the entire site area by the proof-rolling equipment, in each of two perpendicular directions.
- The surface soils consist of silty clays and decomposed claystone, which can be susceptible to significant shear strength loss and degradation when wet and disturbed. Significant rutting and muddy conditions may be common during construction in wet seasons. If possible, the construction activities should be conducted during the dry months of the year (June to November).
- In general, excavation through the bedrock at this site is possible up to our refusal

S-1

depths using conventional excavating equipment fitted with rock teeth. Excavation below our auger refusal depths will require hoe ramming.

Foundations

- The proposed building should be supported on a conventional spread footing foundation system bearing on firm residual soils or weathered bedrock. The spread footing foundation should be designed for a net allowable bearing capacity of 3,000 psf.
- Depending upon the planned floor elevation, the footings may need to step down across the site to penetrate fill deposits and follow the required bearing materials. Stepping down the foundation excavations may be required in approximately 40% of the footings to encounter residual soil or weathered shale materials.
- These sections can be constructed with foundation steps, or the required over-excavations below the bearing surface can be backfilled using 1,000 psi lean concrete to the final bearing elevation. An allowance of 200 c.y. of lean concrete should be made in the contract.
- The base of all exterior footings should be at least 36 inches below the final exterior grade for adequate frost protection.

Floor Slab Support

- All existing underground utilities, backfill materials, relict debris, and soil piles should be removed from the floor slab areas completely.
- After the subgrade has been prepared according to the guidelines in the Site Preparation section, the slab-on-grade sections can be designed based on a subgrade modulus of 120 PCL.

S-2

removed from the footing excavations. Any required minor over-excavations below the bearing surface to penetrate utility backfill, soil layers, etc.) can be backfilled using lean concrete to the final bearing elevation.

The weathered rock at this site can be removed using conventional excavators fitted with rock teeth. A hoe-ran may be need at some foundation areas if hard bedrock is encountered.

For a foundation system designed and constructed as recommended above, the estimated total and differential settlements should be approximately 0.25 and 0.125 inches respectively. The differential settlement will result in an angular distortion of approximately 0.0005 inches per inch across a distance of 20 feet. If masonry walls are used, the potential effects of the settlement on the structure can be minimized by providing control/construction joints at critical locations and every 20 feet along the masonry walls. The control/construction joints should be provided where changes in the wall height, bearing materials, or loading conditions occur.

Seismic Soils Classification and Seismic Hazard Evaluation

Site Class C is recommended for the seismic design considerations, based upon our test borings, our knowledge and understanding of the area geology, and Table 1613.5.2 of the 2012 International Building Code (IBC). The overburden soils at this site are identified as Site Class C. The depth of bedrock at this site varies from just below the surface to 9.5 feet below the present surface and belongs to Site Class B. Although the IBC site classification is based on the average soil conditions within the top 100 feet of the subsurface profile, the IBC permits the soil properties to be estimated by a geotechnical engineer based upon known regional geologic conditions where site-specific data is not available to the depth of 100 feet. A 100 foot deep test boring, possibly in conjunction with more sophisticated laboratory testing or field geophysical testing, would be required to more accurately determine the soil properties and soil site class. The actual seismic design should be performed by a structural engineer. The following potential seismic hazards resulting from earthquake motion have been evaluated.

- A slope stability analysis was not included in the scope of this exploration. The ground surface within the building area is level and appears to be stable. All fill slopes are recommended to be no steeper than 3H:1V, due to potential instability resulting from earthquake motion.
- The groundwater table was not encountered during our exploration and is unlikely to impact building elements. The bearing materials consist of residual materials and weathered bedrock materials. These strata, due to the consolidated nature of the materials, will not undergo liquefaction due to earthquake motions.
- As no minor surface undulations, ponds or low lying areas are present within the immediate vicinity of the proposed building footprint, lateral spreading is not likely due to the shallow depth to bedrock.
- As lateral spreading is unlikely and no faults are present within the site area, surface rupture is also unlikely.

**NOTE:
REFER TO FULL GEOTECHNICAL
ANALYSIS FOR ADDITIONAL SOIL
INFORMATION AND BORING LOGS.**

INTRODUCTION

This report presents the results of a preliminary geotechnical subsurface exploration and engineering analysis for the proposed 4-story Residence Inn in Charleston, West Virginia. The purpose of this exploration was to generally define the subsurface conditions at this site, and to characterize those conditions for the proposed building. The exploration included the drilling of sixteen (16) Standard Penetration Test soil borings, visual classification and laboratory testing of the representative material samples, and the report preparation. The exploration was authorized by Mr. Ravi Patel of SINA Hospitality, and the work was performed in accordance with our written proposal/agreement dated January 22, 2021.

PROJECT INFORMATION

It is proposed to construct a four-story hotel and associated parking lot at the previously referenced site. The generally L-shaped building will consist of mostly lightly-loaded wood/steel framing, although reinforced CMU walls will be used within the stairwells and elevator shaft. The ground floor will be constructed as an industry standard slab-on-grade. The finished floor elevation for the ground level will be set within a few feet of the existing surface elevations. As such, the existing ground surface within the addition area will require roughly 2 feet of balanced cut and fill. The proposed building loads will be supported on exterior load-bearing walls and interior walls and columns. Preliminary structural loads were not available at the time this report was prepared.

The proposed site is currently a vacant commercial lot within the Northgate Business Park. The existing surface profile at the site is described as a high winding ridge that has been cut to the present level to gently sloping ground. Numerous piles of excess soil materials or construction waste from other sites have been dumped at the site. Existing gas, electric, sanitary and storm sewer lines are present within the proposed site area along Hotel Circle.

SUBSURFACE EXPLORATION

Sixteen (16) Standard Penetration Test (SPT) soil borings were drilled at this site on January 27 and 28, 2021. The borings were drilled within the proposed building footprint and parking area at the approximate locations shown on the attached Test Boring Location Plan. The test borings were staked in the field by AGI personnel referencing existing site features. The test borings were drilled in accordance with ASTM D 1586 procedures using track-mounted drilling equipment. The test borings were advanced between samples and the bore holes were maintained using 2.25-inch interior diameter hollow-stem augers. Split spoon samplers were used to recover the soil samples from the undisturbed material below the bottom of the augers. The split spoon sampler, having an outside diameter of 2.0-inches and an inside diameter of 1½-inches, was driven into the soil with a 140-pound automatic hammer falling from a height of 30 inches. The soil samples were recovered at 2.5 foot intervals within the top 10 feet and at 5 foot intervals thereafter.

1

The following seismic design recommendations are offered based on seismic design maps prepared and provided by IBC 2015.

- Mapped Acceleration Parameters
S_g = 0.144
S₁ = 0.069
- Site Coefficients
F_a = 1.2
F_v = 1.7
- Seismic Design Parameters
S_{MS} = 0.173
S_{M1} = 0.118
S_{M2} = 0.116
S_{M3} = 0.079

Floor Slab Support

After the subgrade has been prepared according to the guidelines in the Site Preparation section, the slab-on-grade sections can be designed based on a subgrade modulus of 120 PCL. If consideration is given to constructing the floor slabs on the existing fill or natural soil materials, then these materials should be compacted to 98% of the Standard Proctor maximum density within the top 1 foot. If subgrade areas become disturbed during construction, then the soft areas should be undercut and replaced with compacted, structural fill or crushed stone. A minimum 4 inch thick, free-draining granular base course is recommended beneath slabs constructed on grade. A vapor barrier, conforming to ASTM E 1745, should also be incorporated into the floor slab design within the enclosed sections that will include floor coverings, such as carpet or tile. The slab should be isolated from the building foundation so that any differential settlements would not induce shear stresses on the slab. This can be accomplished through the proper use and placement of construction joints. As much as 0.25 inch of settlement below the floor slab should be anticipated.

Pavement Design Parameters

Any pavement section subgrade prepared as outlined in the Site Preparation section should be suitable for pavement support. If consideration is given to utilizing the existing materials for the direct support of the pavement sections, the materials should be moisture conditioned to within ±3% of their optimum moisture content and compacted in place to at least 98% of the maximum dry density per ASTM D-698 within the top foot utilizing a 20 ton vibratory smooth drum roller, making a minimum of two passes up and back in each of two perpendicular directions. The subgrade should then be proof-rolled under the supervision of the geotechnical engineer or his authorized representative, to identify any areas in need of additional compaction or undercutting and replacement with controlled, compacted, engineered fill. In the portions of the site where significant cut has taken place and bedrock materials are present at very shallow depths, minimal subgrade preparation will most likely be required.

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Upon completion of the drilling, the holes were backfilled with the auger cuttings and the samples were transported to our soil mechanics laboratory, where they were visually classified and grouped for laboratory testing by the project engineer. The laboratory testing program included natural moisture contents and pocket penetrometer readings on the representative soil samples. The final test boring logs were then prepared and are attached to this report, along with the laboratory testing data.

SUBSURFACE CONDITIONS

Below the existing topsoil or gravel layers, unengineered fill, colluvial soils, or natural residual soil materials were encountered. Existing unengineered fill materials were encountered to depths of 2.0 to 5.5 feet below the existing surface. Colluvial soils and residuum were encountered in most test borings to depths of 1.0 to 9.5 feet below the present site grades. In general, the subsurface profile is described as localized unengineered fill, colluvium, and dry natural residual soil deposits underlain by weathered bedrock.

Unengineered fill deposits encountered in B-1, B-2, B-4, B-5, B-7 to B-11, and B-16 were described as maroon, brown, reddish-brown, and grayish-brown silty clay and clay with varying amounts of rock fragments, gravel, organics/wood, or cobbles. The fill materials were noted as moist to very moist, with moisture contents of 7.6% to 22.5%. SPT N-values in the fill layer varied from 5 to 40 blows-per-foot (bpf), which are classified as medium stiff to hard in consistency. Pocket penetrometer readings of 0.25 and 4.5 tons-per-square-foot (tsf) were obtained on the samples.

The natural colluvial soils, encountered below the existing fill or topsoil layers in B-1 and B-13 are described as maroon, tan and gray clay and silty clay. This soil layer in B-1 was also noted as plastic. These materials were noted as moist to very moist with natural moisture contents of 13.0% and 21.1%. A pocket penetrometer reading of 2.75 tsf was obtained on the sample from B-1. The SPT N-values within this stratum ranged from 6 to 16 bpf, which are classified as medium stiff to very stiff in consistency. This colluvial soil layer extended to depths of 1.0 to 7.5 feet below the existing surface and was underlain by weathered bedrock.

Residual soil materials were encountered at most test boring locations at this site. Such materials, which formed from in-place weathering and resemble the parent bedrock in structure, are described as residual soil or decomposed rock. The residual soils were described as maroon, tan and gray silty clay, shaley clay, and claystone. In some borings, the residual soils retain thin layers of less weathered bedrock. These materials were classified as medium stiff to hard in consistency, having N-values ranging from 8 to 82 bpf. Those materials described as claystone encountered split spoon refusal at several locations and were classified as very soft to medium hard in relative rock hardness. Moisture contents in these strata ranged from 6.2% to 16.5%. Pocket penetrometer readings ranged from 3.5 to 4.5 tsf. B-2, B-3, and B-15 were extended to completion depths of 10.0 feet below the existing surface and terminated in residual claystone.

Weathered bedrock was encountered in most of the borings, below the described colluvial or residual soils, at depths ranging from 1.0 to 9.5 feet below the existing surface. The encountered

The following are our estimates of the thicknesses for standard and heavy duty pavement sections. The proper placement of the subsurface drainage layer is the most critical aspect necessary for the long-term performance of the pavement sections. An assumed CBR value of 4 was used for the design of the pavement sections.

Standard Duty Pavement - Automobile Parking Recommended Course

	Thickness
Hot-Mix Asphaltic Concrete Wearing Surface WVD0H 401	1.5 inches
Hot-Mix Asphaltic Concrete Base WVD0H 401	3.0 inches
Compacted Crushed Aggregate Subbase WVD0H 307	6.0 inches

Heavy Duty Pavement - Driveways and Truck Parking Recommended Course

	Thickness
Hot-Mix Asphaltic Concrete Wearing Surface WVD0H 401	1.5 inches
Hot-Mix Asphaltic Concrete Base WVD0H 401	3.5 inches
Compacted Crushed Aggregate Subbase WVD0H 307	6.0 inches

The above pavement thicknesses are based on a strict quality control program. Not only is the compaction and the stability of the subgrade important, but the compaction of all asphaltic layers and aggregate bases are of equal importance. Drainage should be maintained in both the granular base course and the finished pavement surface. The subgrade should be properly graded to facilitate positive drainage during construction, and any water above the subgrade should be allowed to drain prior to further material placement. We would also recommend that in any pavement areas such as dumpster pads and loading docks, a cementitious concrete pavement be utilized, to accommodate the atypical loading conditions with respect to the asphaltic pavement design. It is important to remember that pavement sections designed for automobile parking may be damaged by the transit and parking of larger delivery or service type vehicles.

Construction Considerations

The surface soils consist of silty clays and soft claystone, which can be susceptible to significant shear strength loss and degradation when wet and disturbed. Significant rutting and muddy conditions may be common during construction in wet seasons. If possible, the construction activities should be conducted during the dry months of the year. If conducted during wet weather, foot traffic should be minimized in and around the excavations. We recommend that the bearing surface in all open foundation trenches be protected using a 3 inch thick lean concrete "mud mat". Drainage should be maintained away from the foundations, both during and after construction. Each footing excavation should be inspected by geotechnical personnel to verify that the bearing conditions are consistent with the design assumptions.

Construction Monitoring

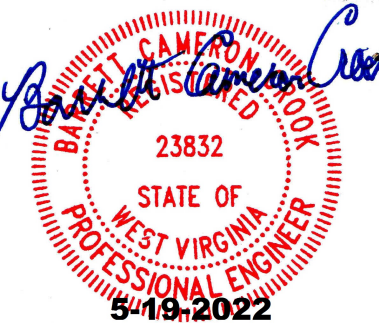
Close testing and monitoring by geotechnical personnel will be a critical aspect of this project. As a minimum, these services should be provided during site preparation, subgrade preparation, structural fill placement, the initial footing excavations, foundation construction, and floor slab construction.

LIMITATIONS

This report was prepared for use by SINA Hospitality, and their authorized consultants, to aid in the design of this project. The report has been prepared in accordance with accepted geotechnical engineering practices and no other warranties, either expressed or implied, are made. The recommendations stated herein are contingent on American Geotech observing and evaluating all geotechnical aspects of the required work. We cannot be held responsible for any misinterpretations or improper implementation of our recommendations by other firms providing quality control services.

The recommendations presented in this report are based on data obtained from test borings made at the approximate locations shown on the Test Boring Location Plan. Variations which may exist between the test borings may not become evident until during construction. If significant variations are noted, we should be contacted so that the field conditions can be examined and the applicable recommendations revised, if necessary. Similarly, in the event of changes in the nature, design or location of the structure, or if other developments are planned, we should be notified so that we may review such changes to verify or make appropriate modifications to our previous conclusions and recommendations, which may be invalidated by any such changes.

We recommend that this complete report be provided to the various design team members, the contractors and the project owner. Potential contractors should be informed of this report in the "Instructions to Bidders" section of the bid documents. The report should not be included or referenced in the actual contract documents.



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

SHEET NO.
C1.1

GEOTECHNICAL REPORT

PROJECT MANAGER : CHRIS THOMPSON

PROJECT #: 20064

DATE : MAY 15, 2022

REVISION BLOCK



**RESIDENCE INN by MARRIOTT
@ HOTEL CIRCLE**
CITY OF CHARLESTON - KANAWHA COUNTY, WEST VIRGINIA

EMAIL: thompson@sitesdesignco.com

PHONE: 804-720-9040

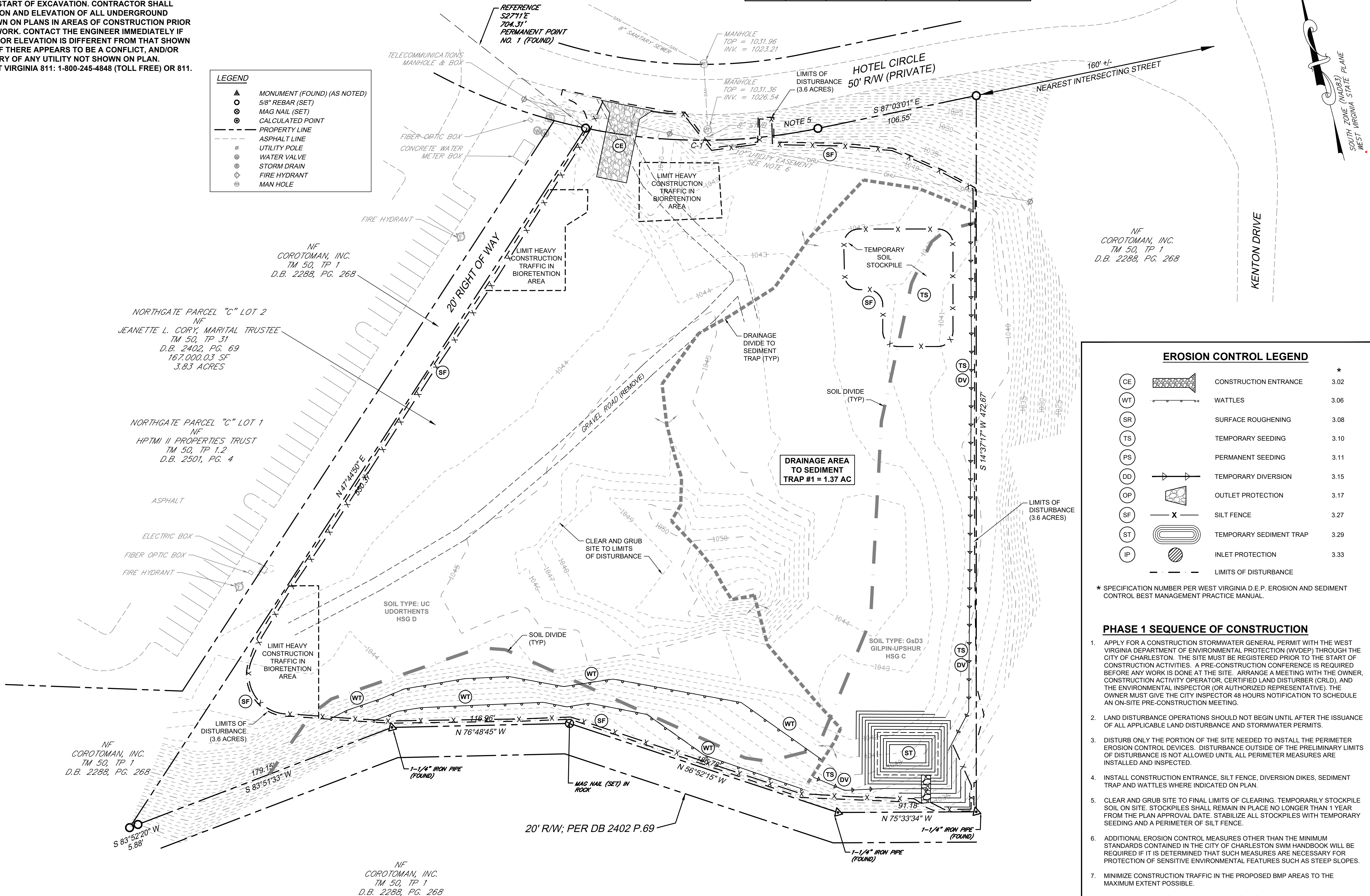


WEST VIRGINIA 811

CONTRACTOR SHALL CALL THE "WEST VIRGINIA 811" 72 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 WEST VIRGINIA 811: 1-800-245-4848 (TOLL FREE) OR 811.

LEGEND	
	MONUMENT (FOUND) (AS NOTED)
	5/8" REBAR (SET)
	MAG NAIL (SET)
	CALCULATED POINT
	PROPERTY LINE
	ASPHALT LINE
	UTILITY POLE
	WATER VALVE
	STORM DRAIN
	FIRE HYDRANT
	MAN HOLE

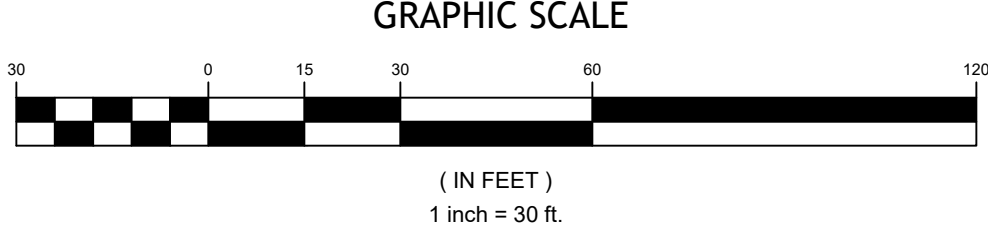
CURVE TABLE				
CURVE	RADIUS	ARC LENGTH	CHORD BEARING	CHORD LENGTH
C-1	375.00'	154.21'	S 75°16'11" E	153.12'



EROSION CONTROL LEGEND		
	CONSTRUCTION ENTRANCE	3.02
	WATTLES	3.06
	SURFACE ROUGHENING	3.08
	TEMPORARY SEEDING	3.10
	PERMANENT SEEDING	3.11
	TEMPORARY DIVERSION	3.15
	OUTLET PROTECTION	3.17
	SILT FENCE	3.27
	TEMPORARY SEDIMENT TRAP	3.29
	INLET PROTECTION	3.33
	LIMITS OF DISTURBANCE	

* SPECIFICATION NUMBER PER WEST VIRGINIA D.E.P. EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICE MANUAL.

- #### PHASE 1 SEQUENCE OF CONSTRUCTION
- APPLY FOR A CONSTRUCTION STORMWATER GENERAL PERMIT WITH THE WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION (WDPEP) THROUGH THE CITY OF CHARLESTON. THE SITE MUST BE REGISTERED PRIOR TO THE START OF CONSTRUCTION ACTIVITIES. A PRE-CONSTRUCTION CONFERENCE IS REQUIRED BEFORE ANY WORK IS DONE AT THE SITE. ARRANGE A MEETING WITH THE OWNER, CONSTRUCTION ACTIVITY OPERATOR, CERTIFIED LAND DISTURBER (CLD), AND THE ENVIRONMENTAL INSPECTOR (OR AUTHORIZED REPRESENTATIVE). THE OWNER MUST GIVE THE CITY INSPECTOR 48 HOURS NOTIFICATION TO SCHEDULE AN ON-SITE PRE-CONSTRUCTION MEETING.
 - LAND DISTURBANCE OPERATIONS SHOULD NOT BEGIN UNTIL AFTER THE ISSUANCE OF ALL APPLICABLE LAND DISTURBANCE AND STORMWATER PERMITS.
 - 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.
 - INSTALL CONSTRUCTION ENTRANCE, SILT FENCE, DIVERSION DIKES, SEDIMENT TRAP AND WATTLES WHERE INDICATED ON PLAN.
 - CLEAR AND GRUB SITE 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.
 - ADDITIONAL EROSION CONTROL MEASURES OTHER THAN THE MINIMUM STANDARDS CONTAINED IN THE CITY OF CHARLESTON SWM HANDBOOK WILL BE REQUIRED IF IT IS DETERMINED THAT SUCH MEASURES ARE NECESSARY FOR PROTECTION OF SENSITIVE ENVIRONMENTAL FEATURES SUCH AS STEEP SLOPES.
 - MINIMIZE CONSTRUCTION TRAFFIC IN THE PROPOSED BMP AREAS TO THE MAXIMUM EXTENT POSSIBLE.
 - 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.



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PROJECT # : 20064

PHONE : 804-720-9040

EMAIL : thompson@sitedesignco.com

PROJECT MANAGER : CHRIS THOMPSON

DATE : MAY 15, 2022	
REVISION BLOCK	

RESIDENCE INN by MARRIOTT @ HOTEL CIRCLE

CITY OF CHARLESTON - KANAWHA COUNTY, WEST VIRGINIA

PHASE 1 EROSION CONTROL AND DEMOLITION PLAN

THESE DRAWINGS ARE THE EXCLUSIVE PROPERTY OF The Site Design Company AND SHALL NOT BE REPRODUCED OR UTILIZED FOR ANY PURPOSE WITHOUT THE EXPRESS WRITTEN CONSENT OF The Site Design Company.

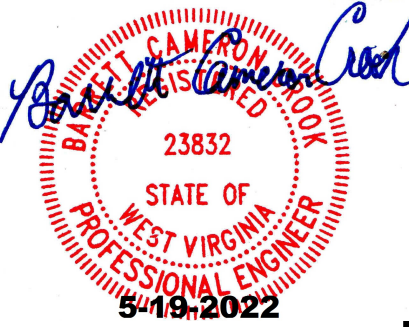
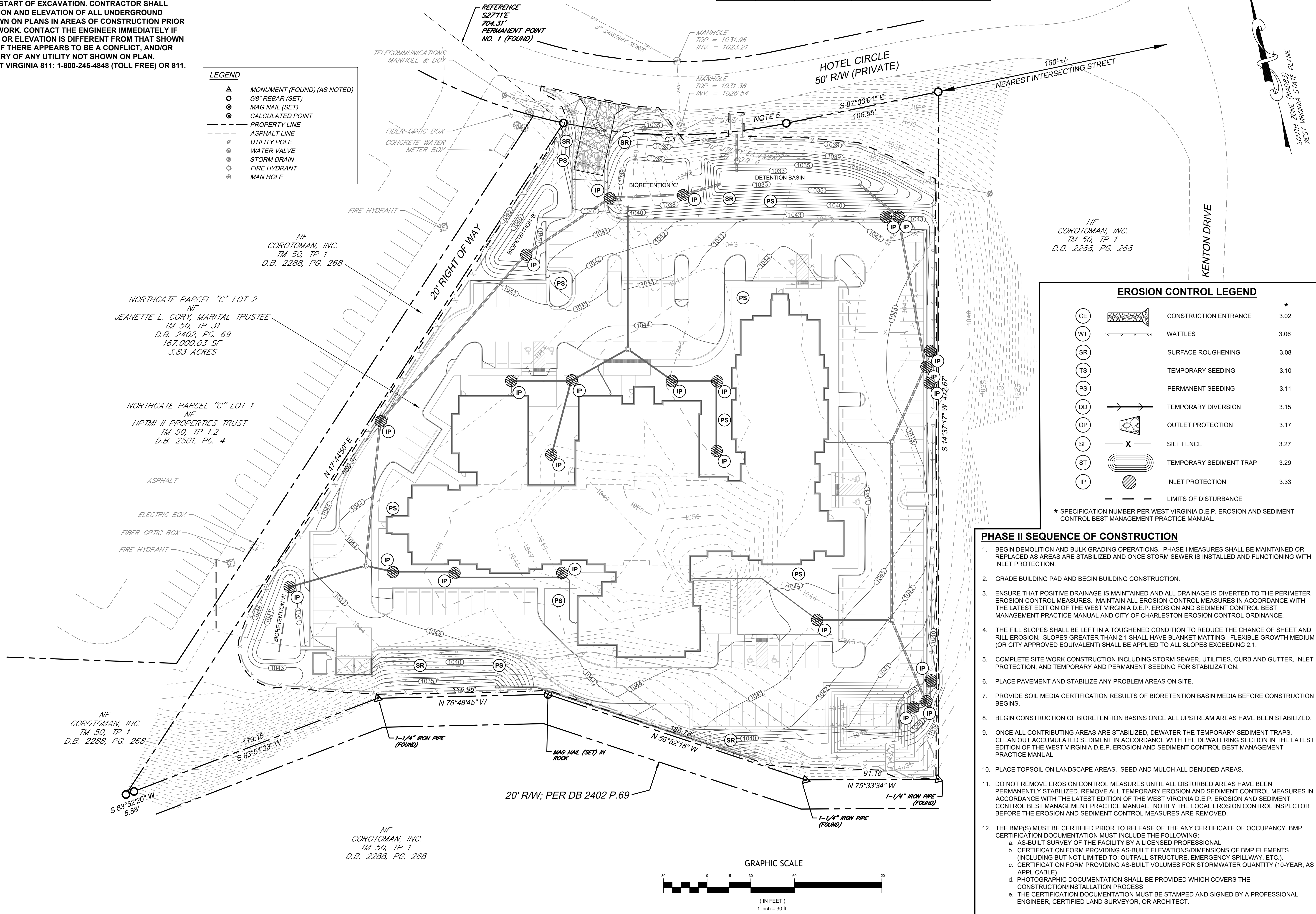


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LEGEND

	MONUMENT (FOUND) (AS NOTED)
	5/8" REBAR (SET)
	MAG NAIL (SET)
	CALCULATED POINT
---	PROPERTY LINE
---	ASPHALT LINE
	UTILITY POLE
	WATER VALVE
	STORM DRAIN
	FIRE HYDRANT
	MAN HOLE

CURVE TABLE				
CURVE	RADIUS	ARC LENGTH	CHORD BEARING	CHORD LENGTH
C-1	375.00'	154.21'	S 75°16'11" E	153.12'



The Site Design Company

CIVIL ENGINEERING AND LAND DEVELOPMENT CONSULTING
268 HIGH STREET - PETERSBURG, VIRGINIA 23803



DATE : MAY 15, 2022

REVISION BLOCK

PROJECT #: 20064	PROJECT MANAGER : CHRIS THOMPSON	PHONE: 804-720-9040	EMAIL: thompson@sitedesignco.com
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**RESIDENCE INN by MARRIOTT
@ HOTEL CIRCLE**
CITY OF CHARLESTON - KANAWHA COUNTY, WEST VIRGINIA

CITY OF CHARLESTON - KANAWHA COUNTY, WEST VIRGINIA

PHASE 2 EROSION CONTROL PLAN

SHEET NO.
C2.1

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E AND S NARRATIVE

A. PROJECT DESCRIPTION:

THIS PROJECT INVOLVES THE CONSTRUCTION OF A 127 ROOM HOTEL WITH ASSOCIATED PARKING AND SITE AMENITIES. THE DEVELOPMENT WILL BE CONSTRUCTED ON AN EXISTING VACANT PARCEL ADDRESSED AS 300 HOTEL CIRCLE. CONSTRUCTION ACTIVITIES ASSOCIATED WITH THIS PROJECT WILL RESULT IN APPROXIMATELY 3.6 ACRES OF TOTAL LAND DISTURBANCE. STORMWATER MANAGEMENT WILL BE ADDRESSED BY IMPLEMENTING BIORETENTION BASINS AND FILTERRA INLETS TO TREAT THE 1" STORM. A DETENTION BASIN WILL ALSO BE CONSTRUCTED TO REDUCE THE POST DEVELOPED 10 YEAR STORM EVENT TO LESS THAN PREDEVELOPED CONDITIONS.

B. EXISTING SITE CONDITIONS:

THE SITE IS CURRENTLY CLEARED AND UNDEVELOPED. IT APPEARS THE PROPERTY WAS UTILIZED AS A CONSTRUCTION LAY-DOWN SITE FOR OTHER CONSTRUCTION PROJECTS IN THE AREA DUE TO EVIDENCE OF OLD DEBRIS. AN OLD STOCKPILE EXISTS ON THE SITE AND A PRELIMINARY GEOTECH REPORT DISCOVERED FILL DRD WAS PREVIOUSLY SPREAD ON THE SITE AS WELL. THE PROPERTY GENERALLY DRAINS FROM SOUTHWEST TO THE NORTHEAST WITH A SMALL PORTION OF THE PROPERTY SHEET-FLOWING OFF THE SOUTHERN PORTION OF THE SITE. DRAINAGE TO THE NORTHEAST FLOWS FROM THE SITE AND ENTERS A ROADSIDE DITCH ALONG HOTEL CIRCLE.

C. ADJACENT AREAS:

THE SUBJECT DEVELOPMENT SITE IS BORDERED BY HOTEL CIRCLE (PRIVATE ROADWAY) TO THE NORTH, A SMALL STRIP OF VACANT COMMERCIAL PROPERTY AND KENTON DRIVE TO THE EAST, UNDEVELOPED COMMERCIAL PROPERTY TO THE SOUTH AND AN EXISTING HOTEL TO THE WEST.

D. OFF SITE AREAS

THERE ARE NO OFFSITE AREAS ASSOCIATED WITH THIS PROJECT BEYOND CONNECTING TO THE EXISTING HOTEL CIRCLE ROADWAY AND SANITARY SEWER THAT ARE ALONG THE IMMEDIATE FRONTAGE OF THE HOTEL PARCEL.

E. CRITICAL AREAS

THERE ARE NO WETLANDS PRESENT ON THE SITE. STEEP SLOPES EXIST AROUND THE PERIMETER OF THE PROPERTY AND SHOULD BE APPROPRIATELY PROTECTED WITH EROSION CONTROL MEASURES THROUGHOUT CONSTRUCTION AND PROPERLY STABILIZED PRIOR TO REMOVAL OF THE PERIMETER PROTECTIVE MEASURES..

F. SOILS

SOIL INFORMATION WAS COMPILED FROM WEB SOIL SURVEYS. REFER TO THE SOIL MAPS LOCATED ON THIS SHEET FOR DETAILS.

G. EROSION AND SEDIMENT CONTROL MEASURES

THE IMPROVEMENTS WILL INCLUDE THE INSTALLATION OF EROSION AND SEDIMENT CONTROL MEASURES AS OUTLINED ON THE EROSION AND SEDIMENT CONTROL PLANS. THE DETAILS FOR THESE MEASURES ARE PROVIDED ON THIS DRAWING AND A PHASING PLAN IS PROVIDED ON THE PHASE 1 & PHASE 2 EROSION AND SEDIMENT CONTROL PLAN.

THE FOLLOWING MEASURES WILL BE USED TO CONTROL EROSION AND SEDIMENT-LADEN RUNOFF ON THIS PROJECT. SEE THE EROSION & SEDIMENT CONTROL PLANS FOR LOCATIONS OF SPECIFIC EROSION CONTROL MEASURES.

- 3.02 TEMPORARY STONE CONSTRUCTION ENTRANCE: A STONE PAD, LOCATED AT POINTS OF VEHICULAR INGRESS AND EGRESS ON A CONSTRUCTION SITE, TO REDUCE THE SOIL TRANSPORTED ONTO PUBLIC ROADS AND OTHER PAVED AREAS.
- 3.06 WATTLES: EROSION AND SEDIMENT CONTROL BARRIERS CONSISTING OF STRAW OR OTHER ORGANIC MATERIALS WRAPPED IN BIODEGRADABLE TUBULAR PLASTIC OR SIMILAR ENCASING MATERIAL. SOMETIMES REFERRED TO AS FIBER ROLLS. WATTLES ARE TYPICALLY 8 TO 20 INCHES IN DIAMETER AND 10 TO 30 FEET IN LENGTH. THE WATTLES ARE PLACED IN SHALLOW TRENCHES AND STAKED ALONG THE CONTOUR OF DISTURBED OR NEWLY CONSTRUCTED SLOPES OR IN LOW FLOW DITCHES WHERE THEY CAN FUNCTION AS CHECK DAMS.
- 3.08 SURFACE ROUGHENING: PROVIDING A ROUGH SOIL SURFACE WITH HORIZONTAL DEPRESSIONS CREATED BY OPERATING A TILLAGE OR OTHER SUITABLE IMPLEMENT ON THE CONTOUR, OR BY LEAVING SLOPES IN A ROUGHENED CONDITION BY NOT FINE-GRADING THEM. THIS WILL AID IN ESTABLISHMENT OF VEGETATIVE COVER WITH SEED, REDUCE RUNOFF VELOCITY, AND INCREASE INFILTRATION, AND REDUCE EROSION AND PROVIDE FOR SEDIMENT TRAPPING. SURFACE ROUGHENING IS ALSO A WAY TO PREPARE THE SEEDBED.
- 3.10 TEMPORARY SEEDING: ESTABLISHMENT OF TEMPORARY VEGETATIVE COVER ON DISTURBED AREAS THAT WILL NOT BE BROUGHT TO FINAL GRADE FOR PERIODS OF 21 DAYS TO ONE YEAR BY SEEDING WITH APPROPRIATE RAPIDLY-GROWING PLANTS.
- 3.11 PERMANENT SEEDING: ESTABLISHMENT OF PERENNIAL VEGETATIVE COVER BY PLANTING SEED ON ROUGH-GRADED AREAS THAT WILL NOT BE BROUGHT TO FINAL GRADE FOR A YEAR OR MORE OR WHERE PERMANENT, LONG-LIVED VEGETATIVE COVER IS NEEDED ON FINE-GRADED AREAS.
- 3.15 TEMPORARY DIVERSION: A TEMPORARY BERM OR EXCAVATED CHANNEL OR COMBINATION BERM AND CHANNEL CONSTRUCTED ACROSS SLOPING LAND ON A PREDETERMINED GRADE. THIS VARIABLE PRACTICE IS USED TO PROTECT WORK AREAS FROM UPSLOPE RUNOFF AND REDUCE THE SIZE OF THE DRAINAGE ARE GOING TO SEDIMENT TRAPPING STRUCTURES, TRANSPORT RUNOFF ACROSS A PROJECT TO MINIMIZE EROSION AND TO DIVERT SEDIMENT-LADEN WATER TO AN APPROPRIATE SEDIMENT TRAPPING FACILITY.
- 3.17 OUTLET PROTECTION: STRUCTURALLY LINED APRONS OR OTHER ACCEPTABLE ENERGY DISSIPATING DEVICES PLACED AT THE OUTLETS OF PIPES OR PAVED CHANNEL SECTIONS. PRIMARY PURPOSE IS TO PREVENT SCOUR AT STORMWATER OUTLETS, TO PROTECT THE OUTLET STRUCTURE, AND TO MINIMIZE THE POTENTIAL FOR DOWNSTREAM EROSION BY REDUCING THE VELOCITY AND ENERGY OF CONCENTRATED STORMWATER FLOWS.
- 3.27 SILT FENCE: A TEMPORARY SEDIMENT BARRIER CONSTRUCTED OF POSTS, FILTER FABRIC AND, IN SOME CASES, A WIRE SUPPORT FENCE, PLACED ACROSS OR AT THE TOE OF A SLOPE OR A MINOR DRAINAGE WAY TO INTERCEPT AND RETAIN SEDIMENT AND DECREASE FLOW VELOCITIES FROM DRAINAGE AREAS OF LIMITED SIZE; APPLICABLE WHERE SHEET AND RILL EROSION OR SMALL CONCENTRATED FLOWS MAY BE A PROBLEM.
- 3.29 TEMPORARY SEDIMENT TRAP: A TEMPORARY BARRIER OR DAM WITH A CONTROLLED STORMWATER RELEASE STRUCTURE FORMED BY CONSTRUCTING AN EMBANKMENT OF COMPACTED SOIL ACROSS A DRAINAGEWAY TO DETAIN SEDIMENT-LADEN RUNOFF FROM DISTURBED AREAS IN "WET" AND "DRY" STORAGE LONG ENOUGH FOR THE MAJORITY OF THE SEDIMENT TO SETTLE OUT.
- 3.33 STORM DRAIN INLET PROTECTION: THE INSTALLATION OF VARIOUS KINDS OF SEDIMENT TRAPPING MEASURES AROUND DROP INLETS OR CURB INLET STRUCTURES PRIOR TO PERMANENT STABILIZATION OF THE DISTURBED AREA: LIMITED TO DRAINAGE AREAS NOT EXCEEDING ONE ACRE, AND NOT INTENDED TO CONTROL LARGE, CONCENTRATED STORMWATER FLOWS.

MAINTENANCE

ALL EROSION AND SEDIMENT CONTROL STRUCTURES, SYSTEMS AND PRACTICES SHALL BE MAINTAINED, INSPECTED, AND REPAIRED AS NEEDED TO ENSURE CONTINUED PERFORMANCE OF THEIR INTENDED FUNCTION. REFER TO THE WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICE MANUAL FOR MAINTENANCE REQUIREMENTS ASSOCIATED WITH EACH PRACTICE.

INSPECTION

DISTURBED AREAS OF THE CONSTRUCTION SITE THAT HAVE NOT BEEN FINALLY STABILIZED, AREAS USED FOR STORAGE OF MATERIALS THAT ARE EXPOSED TO PRECIPITATION, STRUCTURAL CONTROL MEASURES, AND LOCATIONS WHERE VEHICLES ENTER OR EXIT THE SITE SHALL BE INSPECTED AT LEAST ONCE EVERY 14 CALENDAR DAYS AND WITHIN 48 HOURS OF THE END OF A STORM EVENT THAT IS 0.5 INCHES OR GREATER. IN THOSE AREAS THAT HAVE BEEN FINISHED, TEMPORARILY STABILIZED, OR RUNOFF IS UNLIKELY DUE TO WINTER CONDITIONS, INSPECTIONS SHALL TAKE PLACE AT LEAST ONCE A MONTH. DISTURBED AREAS AND AREAS USED FOR STORAGE OF MATERIALS THAT ARE EXPOSED TO PRECIPITATION SHALL BE INSPECTED FOR EVIDENCE OF, OR THE POTENTIAL FOR, POLLUTANTS ENTERING THE DRAINAGE SYSTEM. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE CHECKED TO SEE THEY ARE OPERATING CORRECTLY. AT ACCESSIBLE DISCHARGE POINTS, INSPECTION SHALL TAKE PLACE TO ENSURE THESE CONTROL MEASURES ARE EFFECTIVE AT PREVENTING SIGNIFICANT IMPACTS TO RECEIVING WATERS. NEARBY DOWNSTREAM LOCATIONS SHALL BE INSPECTED IF DISCHARGE POINTS ARE INACCESSIBLE. SITES OF VEHICLE ENTRANCE OR EXIT SHALL BE INSPECTED FOR EVIDENCE OF OFFSITE SEDIMENT TRACKING. IF EXISTING CONTROL MEASURES OR BEST MANAGEMENT PRACTICES (BMPS) REQUIRE MODIFICATION OR ADDITIONAL MEASURES, SUCH CHANGES SHALL BE MADE WITHIN 7 CALENDAR DAYS OF THE INSPECTION OR BEFORE THE NEXT ANTICIPATED STORM EVENT, AS IMPLEMENTATION IS PRACTICABLE. INCLUDE INSPECTION REPORTS OF ALL STORMWATER AND EROSION & SEDIMENT CONTROL MEASURES ALONG WITH ANY REQUIRED ACTIONS AS A RESULT OF INSPECTIONS, WITH THE STORMWATER POLLUTION PREVENTION PLAN. THESE REPORTS SHALL INCLUDE THE NAME AND QUALIFICATIONS OF THE INSPECTOR, DATES OF INSPECTION, MAJOR OBSERVATIONS AND ACTIONS TAKEN IN RESPONSE TO INSPECTIONS. MAJOR OBSERVATIONS INCLUDE THE LOCATION OF DISCHARGE OF SEDIMENT OR POLLUTANT FROM THE SITE. LOCATIONS OF BMPS THAT NEED TO BE MAINTAINED, LOCATIONS OF BMPS THAT FAILED TO OPERATE OR PROVED INADEQUATE, AND LOCATIONS WHERE ADDITIONAL BMPS ARE NEEDED THAT DIDN'T EXIST AT THE TIME OF INSPECTION. THESE REPORTS SHALL INCLUDE INCIDENTS OF NONCOMPLIANCE. IF THE REPORT DOES NOT INCLUDE ANY NONCOMPLIANCE INCIDENTS, THE REPORT SHALL CONTAIN A CERTIFICATION THAT THE FACILITY IS IN COMPLIANCE WITH THE STORMWATER POLLUTION PREVENTION PLAN AND PERMIT.

12 BASIC EROSION AND SEDIMENT CONTROL PLAN ELEMENTS

ELEMENT #1: MARK CLEARING LIMITS

- PRIOR TO BEGINNING LAND DISTURBING ACTIVITIES, CLEARLY MARK ALL CLEARING LIMITS, SENSITIVE AREAS AND THEIR BUFFERS, AND TREES THAT ARE TO BE PRESERVED WITHIN THE CONSTRUCTION AREA. THESE SHALL BE CLEARLY MARKED, BOTH IN THE FIELD AND ON THE PLANS, TO PREVENT COMPLIANCE AND OFF-SITE IMPACTS.
- NON-WOODED LIMITS OF DISTURBANCE CLEARLY MARKED ON EROSION CONTROL AND GRADING CONSTRUCTION PLAN SHEETS.
- PROPOSED BIORETENTION LOCATIONS HAVE BEEN MARKED ON THE EROSION CONTROL PLAN SHEET TO AVOID HEAVY EQUIPMENT IN THESE AREAS.

ELEMENT #2: ESTABLISH CONSTRUCTION ACCESS

- CONSTRUCTION VEHICLE ACCESS AND EXIT SHOULD BE LIMITED TO ONE ROUTE IF POSSIBLE.
 - ACCESS POINTS SHALL BE STABILIZED WITH CRUSHED AGGREGATE TO MINIMIZE THE TRACKING OF SEDIMENT ONTO PUBLIC AND PRIVATE ROADS.
 - WHEEL WASH OR TIRE BATHS SHOULD BE LOCATED ON SITE, IF APPLICABLE.
 - NO SEDIMENT TRACKING ON THE ROADWAY IS ALLOWED. IN THE EVENT THAT SEDIMENT IS INADVERTENTLY TRACKED ONTO THE ROAD, THE ROAD SHALL BE CLEANED THOROUGHLY BY THE END OF EACH DAY. SEDIMENT SHALL BE REMOVED FROM ROADS BY SHOVELING OR PICKUP SWEEPING AND SHALL BE TRANSPORTED TO A CONTROLLED SEDIMENT DISPOSAL AREA. STREET WASHING OF SEDIMENTS TO THE STORM DRAIN SYSTEM IS NOT ALLOWED. IF STREET WASH WASTEWATER CAN BE CONTROLLED FROM ENTERING THE STORM DRAINAGE SYSTEM, THEN IT SHALL BE PUMPED BACK ONTO THE SITE, CONTAINED, AND DISPOSED OF PROPERLY.
 - CONSTRUCTION ACCESS RESTORATION SHALL BE EQUAL TO OR BETTER THAN THE PRE-CONSTRUCTION CONDITION.
- COMPLIANCE METHOD: STABILIZED CONSTRUCTION ENTRANCE UTILIZED FOR SINGLE POINT OF ACCESS FROM HOTEL CIRCLE.

ELEMENT #3: INSTALL SEDIMENT CONTROLS

- THE DUFF LAYER, NATIVE TOPSOIL, AND NATURAL VEGETATION SHALL BE RETAINED IN AN UNDISTURBED STATE TO THE MAXIMUM EXTENT PRACTICABLE.
 - PRIOR TO LEAVING A CONSTRUCTION SITE, SURFACE WATER RUNOFF FROM DISTURBED AREAS SHALL PASS THROUGH A SEDIMENT BASIN/TRAP OR OTHER APPROPRIATE AND APPROVED SEDIMENT REMOVAL BMP.
 - BMPS INTENDED TO TRAP SEDIMENT ON SITE SHALL BE CONSTRUCTED AS ONE OF THE FIRST STEPS IN GRADING. THESE BMPS SHALL BE FUNCTIONAL BEFORE OTHER LAND DISTURBING ACTIVITIES TAKE PLACE.
 - EARTHEN STRUCTURES SUCH AS DAMS, DIKES, AND DIVERSIONS SHALL BE SEEDED AND MULCHED ACCORDING TO THE TIMING INDICATED IN ELEMENT #5.
- COMPLIANCE METHOD: PROPOSED EROSION AND SEDIMENT CONTROL PRACTICES ARE SHOWN ON THE PHASE 1 AND PHASE 2 EROSION CONTROL PLANS IN THE CONSTRUCTION DRAWINGS.

ELEMENT #4: STABILIZE SOILS

- EXPPOSED AND UNWORKED SOILS SHALL BE STABILIZED BY APPLICATION OF EFFECTIVE BMPS THAT PROTECT THE SOIL FROM THE EROSIIVE FORCES OF RAINDROPS, FLOWING WATER, AND WIND. THE GENERAL PERMIT REQUIRES THAT ALL GRADED AREAS THAT ARE AT FINAL GRADE MUST BE SEEDED AND MULCHED WITHIN 7 DAYS AND AREAS THAT WILL NOT BE WORKED AGAIN FOR 21 DAYS OR MORE MUST BE SEEDED AND MULCHED WITHIN 7 DAYS.
 - APPLICABLE PRACTICES INCLUDE, BUT ARE NOT LIMITED TO, TEMPORARY AND PERMANENT SEEDING, SODDING, MULCHING, EROSION CONTROL FABRICS AND MATTING, SOIL APPLICATION OF POLYACRYLAMIDE (PAM), THE EARLY APPLICATION OF GRAVEL BASE ON AREAS TO BE PAVED, AND DUST CONTROL.
 - SELECTED SOIL STABILIZATION MEASURES SHALL BE APPROPRIATE FOR THE TIME OF YEAR, SITE CONDITIONS, AND ESTIMATED DURATION OF USE.
 - SOIL STOCKPILES MUST BE STABILIZED AND PROTECTED WITH SEDIMENT TRAPPING MEASURES.
 - LINEAR CONSTRUCTION ACTIVITIES SUCH AS RIGHT-OF-WAY AND EASEMENT CLEARING, ROADWAY DEVELOPMENT, PIPELINES, AND TRENCHING FOR UTILITIES, SHALL BE CONDUCTED TO MEET THE SOIL STABILIZATION TIMEFRAME REQUIREMENTS. CONTRACTORS SHALL INSTALL THE BEDDING MATERIALS, ROADBEDS, STRUCTURES, PIPELINES, OR UTILITIES AND RE-STABILIZE THE DISTURBED SOILS SO THAT THE 7-DAY REQUIREMENTS ARE MET.
- COMPLIANCE METHOD: TEMPORARY SEEDING, PERMANENT SEEDING AND SURFACE ROUGHENING ARE PROPOSED AS PART OF THE EROSION CONTROL DESIGN.

ELEMENT #5: PROTECT SLOPES

- THE GENERAL PERMIT PROHIBITS UPSLOPE RUNOFF FROM FLOWING DOWN HILL SLOPES. CONTAIN FILL RUNOFF WITH TEMPORARY BERMS AND IN PIPES, SLOPE DRAINS, OR STABILIZED CHANNELS.
 - DESIGN, CONSTRUCT, AND PHASE CUT AND FILL SLOPES IN A MANNER THAT WILL MINIMIZE EROSION.
 - CONSIDER SOIL TYPE AND ITS POTENTIAL FOR EROSION.
 - REDUCE SLOPE RUNOFF VELOCITIES BY REDUCING CONTINUOUS LENGTH OF SLOPE WITH BENCHES AND DIVERSIONS, REDUCE SLOPE STEEPNESS, AND ROUGHEN SLOPE SURFACE.
 - DIVERT UPSLOPE DRAINAGE AND RUN-ON WATERS WITH INTERCEPTORS AT TOP OF SLOPE. SURFACE WATER FROM OFFSITE SHOULD BE HANDLED SEPARATELY FROM SURFACE WATER GENERATED ON THE SITE. DIVERSION OF OFFSITE SURFACE WATER AROUND THE SITE MAY BE A VIABLE OPTION. DIVERTED FLOWS MUST BE REDIRECTED TO THE NATURAL DRAINAGE LOCATION AT OR BEFORE THE PROPERTY BOUNDARY.
 - PROVIDE DRAINAGE TO REMOVE GROUND WATER INTERSECTING THE SLOPE SURFACE OF EXPOSED SOIL AREAS.
 - EXCAVATED MATERIAL SHALL BE PLACED ON THE UPHILL SIDE OF TRENCHES, CONSISTENT WITH SAFETY AND SPACE CONSIDERATIONS.
 - STABILIZE SOILS ON SLOPES, AS SPECIFIED IN ELEMENT #4.
- COMPLIANCE METHOD: TEMPORARY SEEDING, PERMANENT SEEDING, SURFACE ROUGHENING, DIVERSIONS AND WATTLES ARE PROPOSED AS PART OF THE EROSION CONTROL DESIGN.

ELEMENT #6: PROTECT DRAIN INLETS

- STORM DRAIN INLETS OPERABLE DURING CONSTRUCTION SHALL BE PROTECTED SO THAT SURFACE WATER RUNOFF DOES NOT ENTER THE CONVEYANCE SYSTEM WITHOUT FIRST BEING FILTERED OR TREATED TO REMOVE SEDIMENT.
 - APPROACH ROADS SHALL BE KEPT CLEAN.
 - INLETS SHOULD BE INSPECTED WEEKLY AT A MINIMUM AND DAILY DURING STORM EVENTS. INLET PROTECTION DEVICES SHOULD BE CLEANED OR REMOVED AND REPLACED AS NECESSARY. INCHES OF SEDIMENT CAN ACCUMULATE.
- COMPLIANCE METHOD: DROP AND CURB INLET PROTECTION ARE PROPOSED WITH THE PHASE 2 EROSION CONTROL PLAN.

ELEMENT #7: CONVEY STORMWATER IN A NON-EROSIVE MANNER

- POINTS OF DISCHARGE AND RECEIVING STREAMS SHALL BE PROTECTED FROM EROSION DUE TO INCREASES IN THE VOLUME, VELOCITY, AND PEAK FLOW RATE OF SURFACE WATER RUNOFF FROM THE PROJECT SITE.
 - DESIGN AND STABILIZE ANY STORMWATER CONVEYANCE FOR EXPECTED FLOWS.
 - CONSIDER ANY LOCAL GOVERNMENT REQUIREMENTS FOR STORMWATER MANAGEMENT.
- COMPLIANCE METHOD: POST DEVELOPED STORMWATER RUNOFF IS BEING DETAINED TO LESS THAN PREDEVELOPED CONDITIONS AND DISCHARGED TO A ROADSIDE DITCH ALONG HOTEL CIRCLE. OUTLET PROTECTION IS PROVIDED AT POND OUTFALL TO DISSIPATE ENERGY PRIOR TO ENTERING THE EXISTING DITCH.

ELEMENT #8: CONTROL OTHER POLLUTANTS

- ALL POLLUTANTS, INCLUDING WASTE MATERIALS AND DEMOLITION DEBRIS, THAT OCCUR ON SITE DURING CONSTRUCTION SHALL BE HANDLED AND DISPOSED OF IN A MANNER THAT DOES NOT CAUSE CONTAMINATION OF SURFACE WATER. WOODY DEBRIS MAY BE CHOPPED AND SPREAD ON SITE.
- COVER, CONTAINMENT, AND PROTECTION FROM VANDALISM SHALL BE PROVIDED FOR ALL CHEMICALS, LIQUID PRODUCTS, PETROLEUM PRODUCTS, AND NON-INERT WASTES PRESENT ON THE SITE.
- MAINTENANCE AND REPAIR OF HEAVY EQUIPMENT AND VEHICLES INVOLVING OIL CHANGES, HYDRAULIC SYSTEM DRAIN DOWN, SOLVENT AND DE-GREASING CLEANING OPERATIONS, FUEL TANK DRAIN DOWN AND REMOVAL, AND OTHER ACTIVITIES WHICH MAY RESULT IN DISCHARGE OR SPILLAGE OF POLLUTANTS TO

THE GROUND OR INTO SURFACE WATER RUNOFF MUST BE CONDUCTED USING SPILL PREVENTION MEASURES, SUCH AS DRIP PANS. CONTAMINATED SURFACES SHALL BE CLEANED IMMEDIATELY FOLLOWING ANY DISCHARGE OR SPILL INCIDENT. EMERGENCY REPAIRS MAY BE PERFORMED ON-SITE USING TEMPORARY PLASTIC PLACED BENEATH AND, IF RAINING, OVER THE VEHICLE.

- WHEEL WASH OR TIRE BATH WASTEWATER SHALL BE DISCHARGED TO A SEPARATE ON-SITE TREATMENT SYSTEM OR TO THE SANITARY SEWER.
- APPLICATION OF AGRICULTURAL CHEMICALS INCLUDING FERTILIZERS AND PESTICIDES SHALL BE CONDUCTED IN A MANNER AND AT APPLICATION RATES THAT WILL NOT RESULT IN LOSS OF CHEMICAL TO SURFACE WATER RUNOFF. MANUFACTURERS' RECOMMENDATIONS FOR APPLICATION RATES AND PROCEDURES SHALL BE FOLLOWED.
- BMPS SHALL BE USED TO PREVENT OR TREAT CONTAMINATION OF SURFACE WATER RUNOFF BY PH MODIFYING SOURCES. THESE SOURCES INCLUDE BULK CEMENT, CEMENT KILN DUST, FLY ASH, NEW CONCRETE WASHING AND CURING WATERS, WASTE STREAMS GENERATED FROM CONCRETE GRINDING AND SAWING, EXPOSED AGGREGATE PROCESSES, AND CONCRETE PUMPING AND MIXER WASHOUT WATERS.

COMPLIANCE METHOD: CONTRACTOR IS REQUIRED TO MONITOR CONSTRUCTION SITE FOR OTHER POTENTIAL POLLUTANTS. ENTIRE PERIMETER OF DISTURBED AREA IS ENCLOSED IN EROSION CONTROL TREATMENT PRACTICES.

ELEMENT #9: CONTROL DEWATERING

- FOUNDATION, VAULT, AND TRENCH DEWATERING WATER SHALL BE DISCHARGED INTO A CONTROLLED CONVEYANCE SYSTEM PRIOR TO DISCHARGE TO A SEDIMENT POND. CHANNELS MUST BE STABILIZED, AS SPECIFIED IN
- CLEAN, NON-TURBID DEWATERING WATER, SUCH AS WELL-POINT GROUND WATER, CAN BE DISCHARGED TO SYSTEMS TRIBUTARY TO STATE SURFACE WATERS, AS SPECIFIED IN ELEMENT #7. PROVIDED THE DEWATERING FLOW DOES NOT CAUSE EROSION OR FLOODING OF RECEIVING WATERS. THESE CLEAN WATERS SHOULD NOT BE ROUTED THROUGH SURFACE WATER SEDIMENT PONDS.
- HIGHLY TURBID OR CONTAMINATED DEWATERING WATER FROM CONSTRUCTION EQUIPMENT OPERATION, WORK INSIDE A COFFERDAM SHALL BE HANDLED SEPARATELY FROM SURFACE WATER.
- OTHER DISPOSAL OPTIONS, DEPENDING ON SITE CONSTRAINTS, MAY INCLUDE:
 - INFILTRATION;
 - TRANSPORT OFF-SITE IN VEHICLE, SUCH AS A VACUUM FLUSH TRUCK, FOR LEGAL DISPOSAL IN A MANNER THAT DOES NOT POLLUTE STATE WATERS;
 - ON-SITE TREATMENT USING CHEMICAL TREATMENT OR OTHER SUITABLE TREATMENT TECHNOLOGIES;
 - SANITARY SEWER DISCHARGE WITH LOCAL SEWER UTILITY APPROVAL; OR
 - USE OF A DEWATERING BAG WITH OUTFALL TO A DITCH OR SWALE FOR SMALL VOLUMES OF LOCALIZED DEWATERING.

COMPLIANCE METHOD: CONTRACTOR WILL UTILIZE APPROPRIATE DEWATERING TECHNIQUES PER THE PHASE 2 EROSION CONTROL NARRATIVE TO DEWATER THE PROPOSED SEDIMENT TRAPS.

ELEMENT #10: MAINTAIN BMPS

- TEMPORARY AND PERMANENT EROSION AND SEDIMENT CONTROL BMPS SHALL BE MAINTAINED AND REPAIRED AS NEEDED TO ASSURE CONTINUED PERFORMANCE OF THEIR INTENDED FUNCTION. MAINTENANCE AND REPAIR SHALL BE CONDUCTED IN ACCORDANCE WITH BMPS.
 - SEDIMENT CONTROL BMPS SHALL BE INSPECTED WEEKLY OR AFTER EACH STORM OF 0.5 INCHES OR MORE.
 - TEMPORARY EROSION AND SEDIMENT CONTROL BMPS SHOULD BE REMOVED WITHIN 30 DAYS AFTER FINAL SITE STABILIZATION IS ACHIEVED OR AFTER THE TEMPORARY BMPS ARE NO LONGER NEEDED. TRAPPED SEDIMENT SHALL BE REMOVED OR STABILIZED ON SITE. DISTURBED SOIL RESULTING FROM REMOVAL OF BMPS OR VEGETATION SHALL BE PERMANENTLY STABILIZED.
 - MAINTENANCE SHOULD BE INCLUDED AS A SEPARATE BID ITEM FOR EACH BMP, WHERE APPLICABLE.
- COMPLIANCE METHOD: EROSION CONTROL NOTES ON THIS PLAN INCLUDE MAINTENANCE REQUIREMENTS FOR THE VARIOUS PROPOSED TEMPORARY MEASURES. NOTES HAVE ALSO BEEN INCLUDED FOR PERMANENT MAINTENANCE REQUIREMENTS ASSOCIATED WITH THE BIORETENTION BASINS AND DETENTION FACILITY.

ELEMENT #11: MANAGE THE PROJECT

- PHASING OF CONSTRUCTION - DEVELOPMENT PROJECTS SHALL BE PHASED IN ORDER TO PREVENT THE TRANSPORT OF SEDIMENT FROM THE DEVELOPMENT SITE DURING CONSTRUCTION, UNLESS THE PROJECT ENGINEER CAN DEMONSTRATE THAT CONSTRUCTION PHASING IS INFEASIBLE. REVEGETATION OF EXPOSED AREAS AND MAINTENANCE OF THAT VEGETATION SHALL BE AN INTEGRAL PART OF THE CLEARING ACTIVITIES FOR ANY PHASE.
- CLEARING AND GRADING ACTIVITIES FOR DEVELOPMENTS SHALL BE PERMITTED ONLY IF CONDUCTED PURSUANT TO AN APPROVED SITE DEVELOPMENT PLAN (E.G., SUBDIVISION APPROVAL) THAT ESTABLISHES AREAS OF CLEARING, GRADING, CUTTING, AND FILLING. WHEN ESTABLISHING CLEARING AND GRADING AREAS, CONSIDERATION SHOULD BE GIVEN TO MINIMIZING REMOVAL OF EXISTING TREES AND DISTURBANCE AND COMPACTION OF NATIVE SOILS. ANY AREAS REQUIRED TO PRESERVE CRITICAL OR SENSITIVE AREAS, AND BUFFERS, SHALL BE DELINEATED ON BOTH THE PLANS AND THE SITE.
- COORDINATION WITH UTILITIES AND OTHER CONTRACTORS - THE PRIMARY PROJECT MANAGER SHALL EVALUATE, WITH INPUT FROM UTILITIES AND OTHER CONTRACTORS, THE SURFACE WATER MANAGEMENT REQUIREMENTS FOR THE ENTIRE PROJECT, INCLUDING THE UTILITIES, WHEN PREPARING THE SCP.
- INSPECTION AND MONITORING - ALL BMPS SHALL BE INSPECTED, MAINTAINED, AND REPAIRED AS NEEDED TO ASSURE CONTINUED PERFORMANCE OF THEIR INTENDED FUNCTION.
- WHENEVER INSPECTION AND/OR MONITORING REVEALS THAT THE BMPS IDENTIFIED IN THE SCP ARE INADEQUATE, THE SCP SHALL BE MODIFIED, AS APPROPRIATE, IN A TIMELY MANNER.
- REPORTING - REPORT SPILLAGE OR DISCHARGE OF POLLUTANTS WITHIN 24-HOURS.
- EQUIPMENT MAINTENANCE - MAINTENANCE AND REPAIR OF HEAVY EQUIPMENT AND VEHICLES INVOLVING OIL CHANGES, HYDRAULIC SYSTEM DRAIN DOWN, SOLVENT AND DE-GREASING CLEANING OPERATIONS, FUEL TANK DRAIN DOWN AND REMOVAL, AND OTHER ACTIVITIES WHICH MAY RESULT IN DISCHARGE OR SPILLAGE OF POLLUTANTS TO THE GROUND OR INTO SURFACE WATER RUNOFF MUST BE CONDUCTED USING SPILL PREVENTION MEASURES, SUCH AS DRIP PANS. CONTAMINATED SURFACES SHALL BE CLEANED IMMEDIATELY FOLLOWING ANY DISCHARGE OR SPILL INCIDENT. CONTAMINATED SOIL MUST BE DISPOSED OF PROPERLY. EMERGENCY REPAIRS MAY BE PERFORMED ON-SITE USING TEMPORARY PLASTIC PLACED BENEATH AND, IF RAINING, OVER THE VEHICLE.
- MAINTENANCE OF THE SCP - THE SCP SHALL BE RETAINED ON-SITE. THE SCP SHALL BE MODIFIED WHENEVER THERE IS A SIGNIFICANT CHANGE IN THE DESIGN, CONSTRUCTION, OPERATION, OR MAINTENANCE OF ANY BMP. THE DEP MUST BE NOTIFIED OF ANY CHANGES TO THE CONSTRUCTION SWPP. DEPENDING ON THE SIGNIFICANCE OF THE REVISION, A PERMIT MODIFICATION MAY NEED TO BE SUBMITTED TO THE DEP.

COMPLIANCE METHOD: PHASING OF CONSTRUCTION IS DETAILED WITHIN THE PHASE 1 AND PHASE 2 EROSION CONTROL NARRATIVES. CONTRACTOR WILL BE RESPONSIBLE FOR COORDINATION WITH OTHER TRADES, SITE INSPECTIONS AND MONITORING AS WELL AS IMMEDIATE REPORTING OF ANY POTENTIAL POLLUTANTS.

ELEMENT #12: STABILIZATION

THE CONSTRUCTION SITE SHOULD BE STABILIZED AS SOON AS POSSIBLE AFTER COMPLETION. ESTABLISHMENT OF FINAL COVER MUST BE INITIATED NO LATER THAN 7 DAYS AFTER REACHING FINAL GRADE. A NOTICE OF TERMINATION MUST BE FILED WITH THE DEP WHEN THE SITE REACHES FINAL STABILIZATION. FINAL STABILIZATION MEANS THAT ALL SOIL-DISTURBING ACTIVITIES ARE COMPLETED, AND THAT EITHER A PERMANENT VEGETATIVE COVER WITH A DENSITY OF 70% OR GREATER HAS BEEN ESTABLISHED OR THAT THE SURFACE HAS BEEN STABILIZED BY HARD COVER SUCH AS PAVEMENT OR BUILDINGS. IT SHOULD BE NOTED THAT THE 70% REQUIREMENT REFERS TO THE TOTAL AREA VEGETATED AND NOT JUST A PERCENT OF THE SITE.

COMPLIANCE METHOD: FINAL STABILIZATION SPECIFICATIONS ARE PROVIDED AS PART OF THE EROSION CONTROL PLAN. CONTRACTOR WILL FILE NOTICE OF TERMINATION UPON FINAL STABILIZATION ACCEPTANCE BY THE LOCALITY.

GENERAL EROSION AND SEDIMENT CONTROL NOTES

(FROM THE CITY OF CHARLESTON, WEST VIRGINIA - EROSION AND SEDIMENT CONTROL ORDINANCE)

(a) Grading, Erosion Control practices, Sediment Control practices, and Waterway crossings shall meet the design criteria set forth in the most recent version of the City's Stormwater Management Guidance Manual and shall be adequate to prevent transportation of Sediment from the Construction Site to the satisfaction of the City Engineer's Office.

(b) Clearing and Grading of natural resources, such as protected habitats and wetlands, shall not be permitted, except when in compliance with the Stormwater Management Guidance Manual.

(c) Clearing, except to the extent necessary to establish Sediment Control devices, shall not begin until all Sediment Control devices have been installed and have been stabilized.

(d) Minimum Erosion Control requirements shall include:

- Temporary seeding must be applied if the Construction Site is idle for more than 21 days.
- Special techniques that meet the design criteria outlined in the Stormwater Management Guidance Manual on steep slopes or in Drainage Ways shall be used to ensure Stabilization.
- Soil stockpiles must be stabilized or covered at all times.
- The entire Construction Site must be stabilized at the close of the Construction season, which may include but is not limited to, temporary seeding, mulching, and the use of Erosion Controls.
- Techniques shall be employed to prevent the transportation of dust or Sediment from the Construction Site.
- Techniques shall be employed to divert upstream runoff away from LDA without causing any additional Erosion.

(e) Minimum Sediment Control requirements shall include: Sediment basins, Sediment traps, and/or Perimeter controls.

(f) Minimum Waterway and Watercourse protection requirements shall include:

- Approval of a Waterway or Watercourse crossing by all applicable federal and state agencies having jurisdiction, which may include, but is not limited to, West Virginia Department of Natural Resources, United States Army Corps of Engineers, and the United States Environmental Protection Agency.
- Stabilization of a Watercourse before, during, and after any in-channel work.
- All on-site stormwater conveyance channels designed according to the criteria outlined in the Stormwater Management Guidance Manual.
- Stabilization adequate to prevent Erosion located at the outlets of all pipes and paved channels.

(g) Construction Site access requirements shall include: establishment and maintenance of a stabilized Construction Site entrance as outlined in the Stormwater Management Guidance Manual.



Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
GsD3	Glipin-Uplush complex, 20 to 30 percent slopes, severely eroded	0.9	22.4%
UC	Udorthents, smoothed-Urban land complex	3.0	77.6%
Totals for Area of Interest		3.8	100.0%

WEB SOIL SURVEY SOIL MAP



RESIDENCE INN by MARRIOTT
@ HOTEL CIRCLE
CITY OF CHARLESTON - KANAWHA COUNTY, WEST VIRGINIA

EROSION CONTROL NOTES AND DETAILS

SHEET NO.
C2.2

The Site Design Company
CIVIL ENGINEERING AND LAND DEVELOPMENT CONSULTING
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PROJECT MANAGER : CHRIS THOMPSON

PROJECT #: 20064

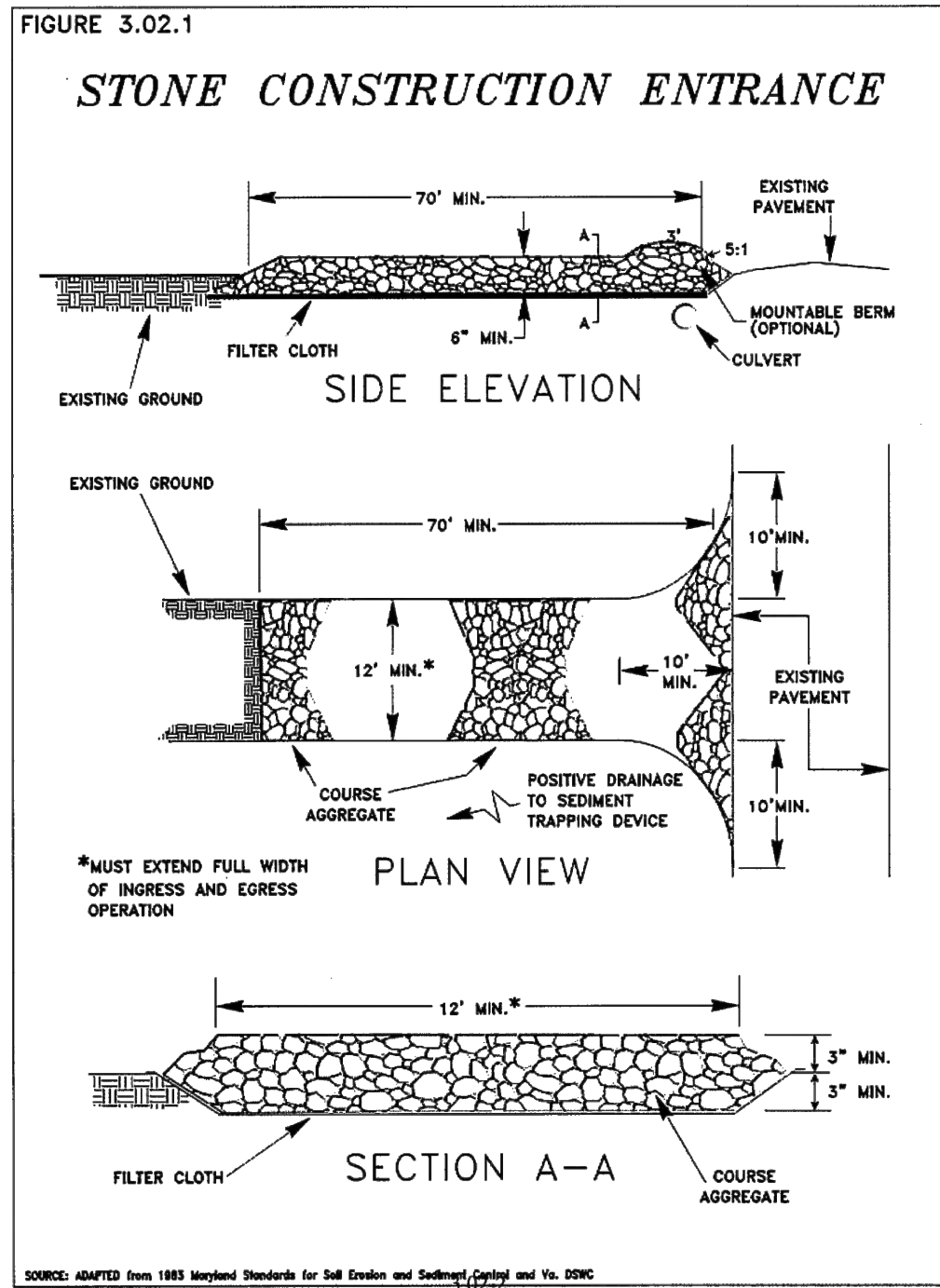
DATE : MAY 15, 2022

REVISION BLOCK

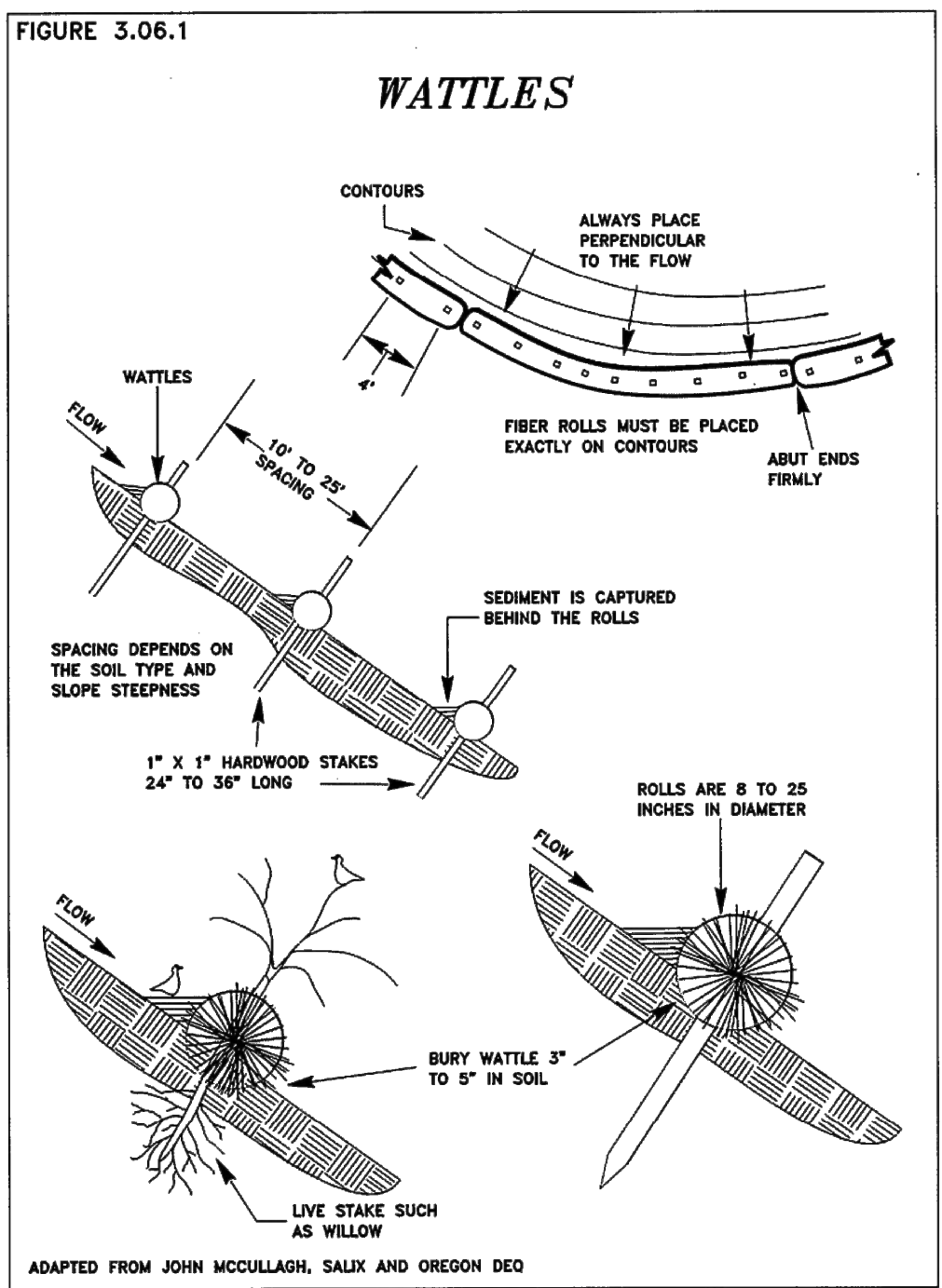
NO.	DESCRIPTION
1	Initial Issue
2	Revised
3	Revised
4	Revised
5	Revised
6	Revised
7	Revised
8	Revised
9	Revised
10	Revised

SHEET NO.
C2.2

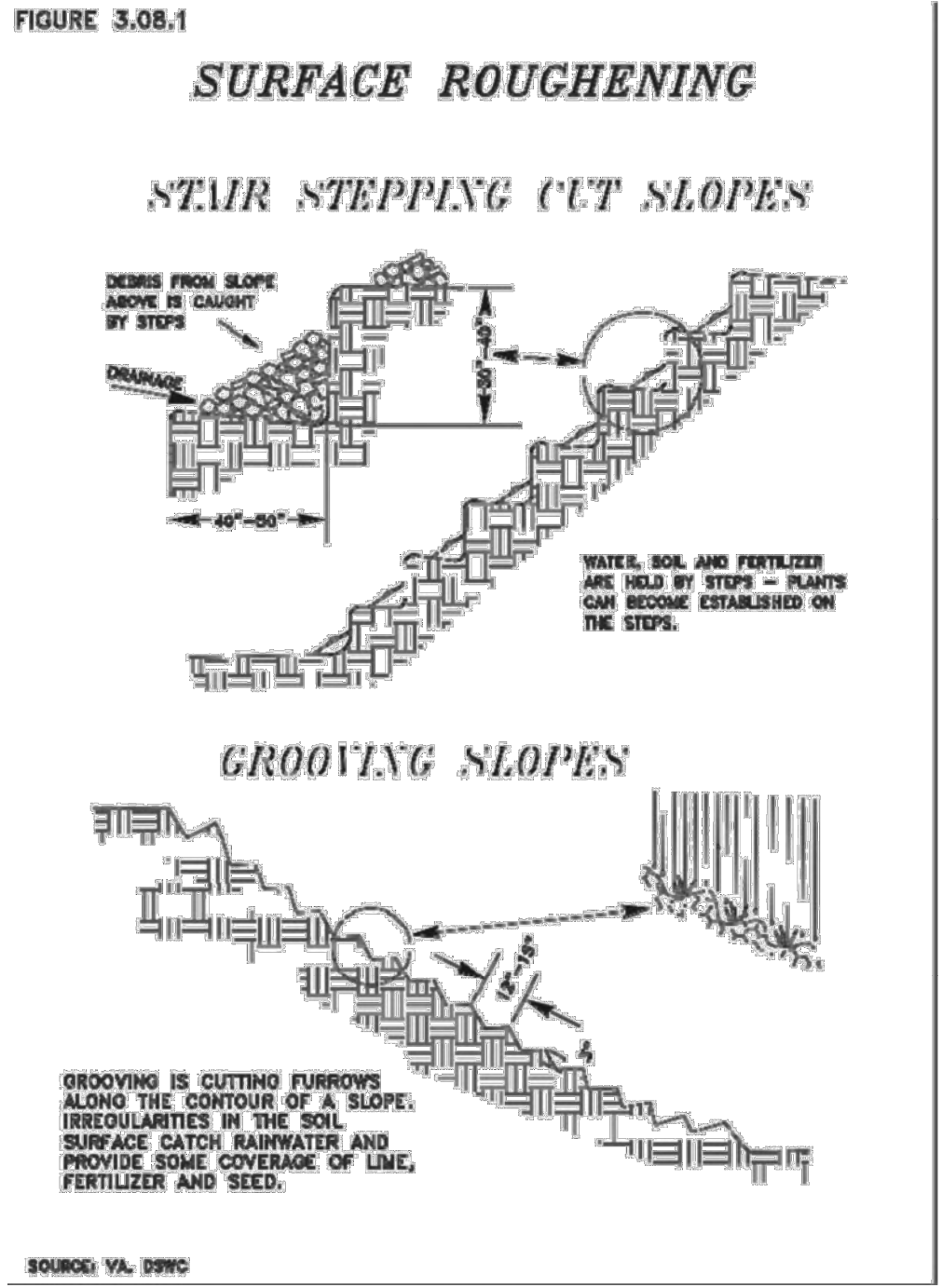
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CONSTRUCTION ENTRANCE DETAIL

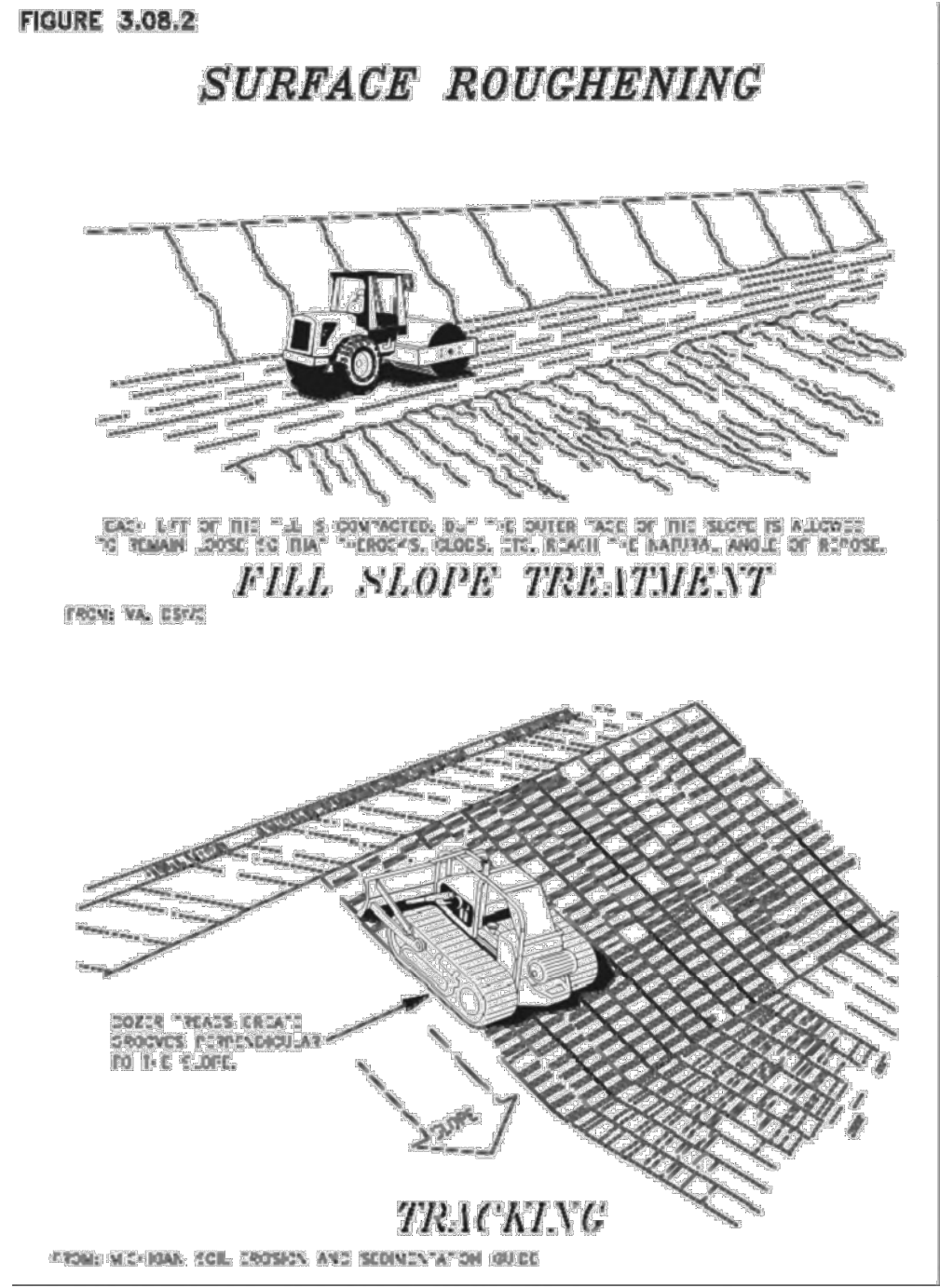


WATTLES

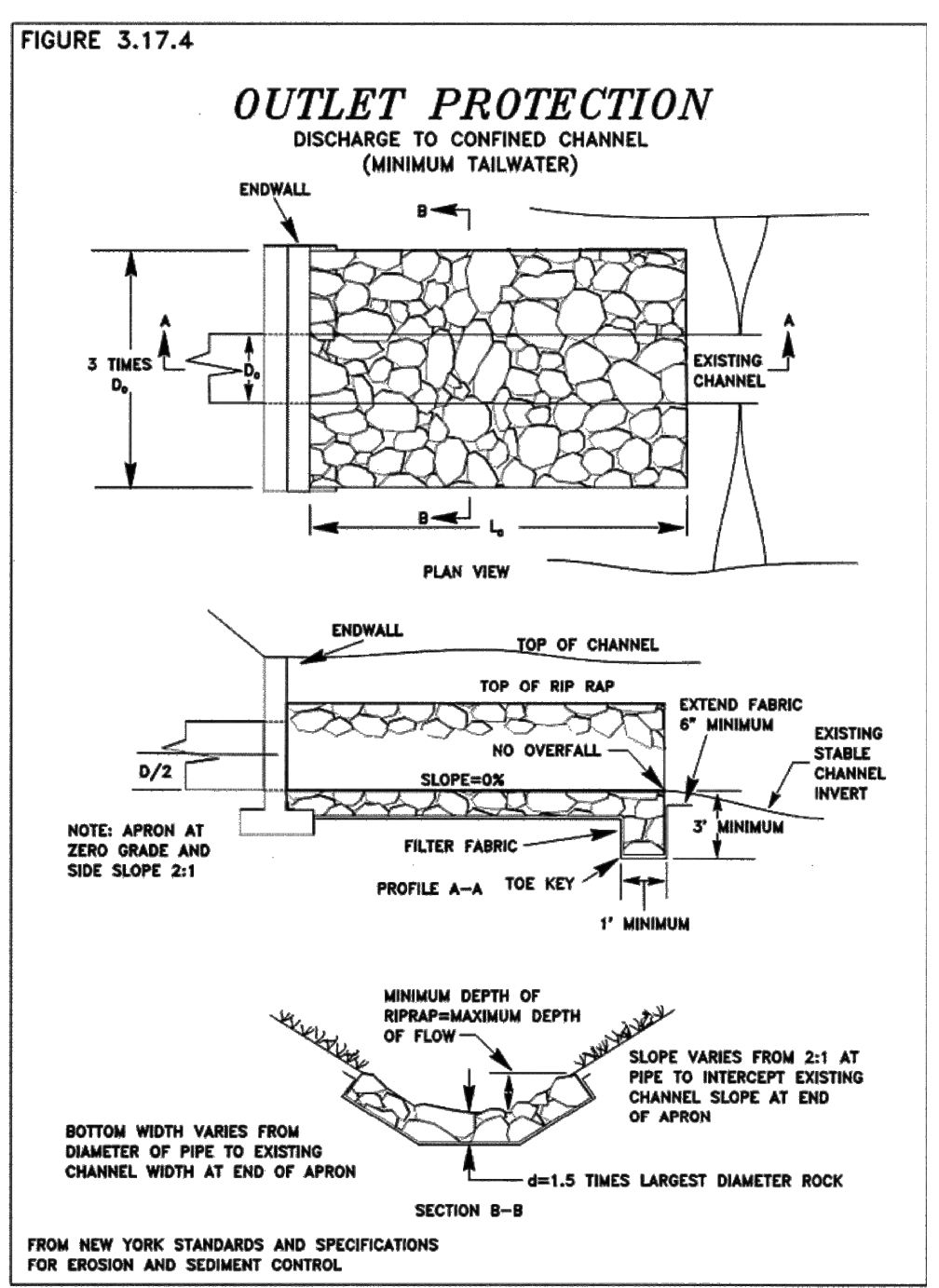


3.08-3

SURFACE ROUGHENING DETAIL



3.08-4



OUTLET PROTECTION DETAIL

Table 3.10.1 Temporary seed chart

PLANT NAMES		PLANTING DATES	APPLICATION RATE LBS/ACRE
COMMON	SCIENTIFIC		
Annual Ryegrass	<i>Lolium multiflorum</i>	2/16 - 5/15 8/1 - 11/1	40
Field Bromegrass	<i>Bromus ciliatus</i>	3/1 - 6/15 8/1 - 9/15	40
Spring Oats	<i>Avena sativa</i>	3/1 - 6/15	100
Winter Rye	<i>Secale cereale</i>	8/15 - 2/28	170
Winter Wheat	<i>Triticum aestivum</i>	8/15 - 2/28	180
Japanese Millet	<i>Echinochloa crusgalli</i>	5/15 - 8/15	30
Redtop	<i>Agrostis alba</i>	3/1 - 6/15	10
Annual Ryegrass and Spring Oats	<i>Lolium multiflorum</i> <i>Avena sativa</i>	3/1 - 6/15	30 70
German/Foxtail Millet	<i>Setaria italica</i>	5/1 - 8/1	40
Hairy Vetch	<i>Vicia villosa</i>	8/15 - 4/1	60

*Inoculation is required. If a hydroseeder is utilized, the application rate is 5 times the recommended rate.

TEMPORARY SEEDING SCHEDULE

Table 3.11.3 Permanent seeding requirements

SEED MIX	FINE LAWN	COARSE LAWN	LOW MAINT.	NO MAINT.	PASTURE	SENSITIVE NATURAL AREAS	pH RANGE	DRAINAGE	SHADE TOLERANCE	PREFERRED PLANTING DATES
A			✓ 1				6.0 - 7.5	MOD - WELL	FULL SUN	3/1 - 6/15
B				✓			5.0 - 7.5	MOD - WELL	FULL SUN	6/16 - 8/14
C	✓ 1						6.0 - 7.5	MOD - WELL	FULL SUN	8/15 - 9/15
D		✓ 1					6.0 - 7.5	MOD - WELL	FULL SUN	9/16 - 2/28
E				✓ 1			6.0 - 7.5	MOD - WELL	FULL SUN	
F			✓		✓		5.5 - 7.5	MOD - WELL	TOLERANT	
G				✓	✓		5.0 - 7.5	MOD - WELL	FULL SUN	
H			✓	✓ 1	✓		5.0 - 7.5	MOD - WELL	TOLERANT	
I			✓	✓ 1	✓		5.0 - 7.5	MOD - WELL	FULL SUN	
J			✓	✓ 1	✓		4.0 - 8.0	MOD - WELL	TOLERANT	
K				✓ 1	✓		4.0 - 7.0	MOD - WELL	FULL SUN	
L				✓	✓		4.5 - 7.5	MOD - WELL	TOLERANT	
M			✓	✓	✓		5.0 - 7.5	MOD - WELL	TOLERANT	
N			✓	✓ 1	✓		5.0 - 7.5	MOD - WELL	TOLERANT	
O			✓	✓	✓		5.0 - 7.5	MOD - WELL	FULL SUN	
P			✓	✓	✓		4.5 - 7.5	MOD - WELL	TOLERANT	
Q			✓	✓	✓		4.5 - 7.5	POOR - WELL	TOLERANT	
R			✓	✓	✓		5.5 - 7.5	MOD - WELL	FULL SUN	
S			✓	✓	✓		4.5 - 7.5	POOR - WELL	FULL SUN	
T				✓	✓		5.5 - 7.5	POOR - WELL	FULL SUN	
U				✓	✓		6.5 - 8.0	MOD - WELL	FULL SUN	
V				✓	✓		5.5 - 7.5	POOR - WELL	FULL SUN	
W			✓	✓	✓		5.0 - 7.5	MOD - WELL	TOLERANT	
X				✓	✓		5.5 - 7.5	POOR - WELL	FULL SUN	
Y			✓	✓	✓		5.0 - 7.5	MOD - WELL	FULL SUN	
Z			✓	✓	✓		5.0 - 7.5	MOD - WELL	FULL SUN	
A-1				✓	✓		4.5 - 7.5	MOD - WELL	TOLERANT	
A-2				✓	✓		5.0 - 7.5	MOD - WELL	FULL SUN	
A-3				✓	✓		5.0 - 7.5	POOR - WELL	FULL SUN	

♦ Nurse crop required - See Table B
1 Urban areas only

Table 3.11.1 Permanent seeding

SEED MIX	PLANT NAMES		APPLICATION RATE LBS/ACRE
	COMMON	SCIENTIFIC	
A	Kentucky 31 Fescue	<i>Festuca arundinacea</i>	65
	Red Fescue	<i>Festuca rubra</i>	20
	Birdsfoot Trefoil	<i>Lotus corniculatus</i>	5
B	Switchgrass	<i>Panicum virgatum</i>	15
	Perennial Ryegrass	<i>Lolium perenne</i>	20
	Redtop	<i>Agrostis alba</i>	5
	Birdsfoot Trefoil	<i>Lotus corniculatus</i>	15
C	Red Fescue	<i>Festuca rubra</i>	20
	Kentucky Bluegrass	<i>Poa pratensis</i>	40
	Merion Bluegrass	<i>Poa pratensis</i>	30
D	Kentucky 31 Fescue	<i>Festuca arundinacea</i>	45
	Red Fescue	<i>Festuca rubra</i>	20
	Kentucky Bluegrass	<i>Poa pratensis</i>	25
	White Dutch Clover	<i>Trifolium repens</i>	5
E	Perennial Ryegrass	<i>Lolium perenne</i>	30
	Switchgrass	<i>Panicum virgatum</i>	15
	Crownvetch or Perennial Pea	<i>Coronilla varia</i>	20
		<i>Lathyrus latifolius</i>	30
F	Orchardgrass	<i>Dactylis glomerata</i>	20
	Ladino Clover	<i>Trifolium repens</i>	5
	Redtop	<i>Agrostis alba</i>	5
G	Birdsfoot Trefoil	<i>Lotus corniculatus</i>	15
	Weeping Lovegrass	<i>Eragrostis curvula</i>	45
	Perennial Ryegrass	<i>Lolium perenne</i>	10
H	Crownvetch	<i>Coronilla varia</i>	25
	Orchardgrass	<i>Dactylis glomerata</i>	40
I	Crownvetch	<i>Coronilla varia</i>	25
	Perennial Ryegrass	<i>Lolium perenne</i>	30
J	Perennial Pea	<i>Lathyrus latifolius</i>	30
	Orchardgrass	<i>Dactylis glomerata</i>	30
K	Deertongue	<i>Panicum clandestinum</i>	30
	Birdsfoot Trefoil	<i>Lotus corniculatus</i>	15
	Weeping Lovegrass	<i>Eragrostis curvula</i>	5
L	Orchardgrass	<i>Dactylis glomerata</i>	30
	Serecia Lespedeza	<i>Lespedeza cunata</i>	40
	Ladino Clover	<i>Trifolium repens</i>	5
M	Perennial Ryegrass Ladino Clover	<i>Lolium perenne</i>	50
	Redtop	<i>Trifolium repens</i>	5
		<i>Agrostis alba</i>	5
N	Crownvetch	<i>Coronilla varia</i>	15
	Orchardgrass	<i>Dactylis glomerata</i>	30
	Redtop	<i>Agrostis alba</i>	5

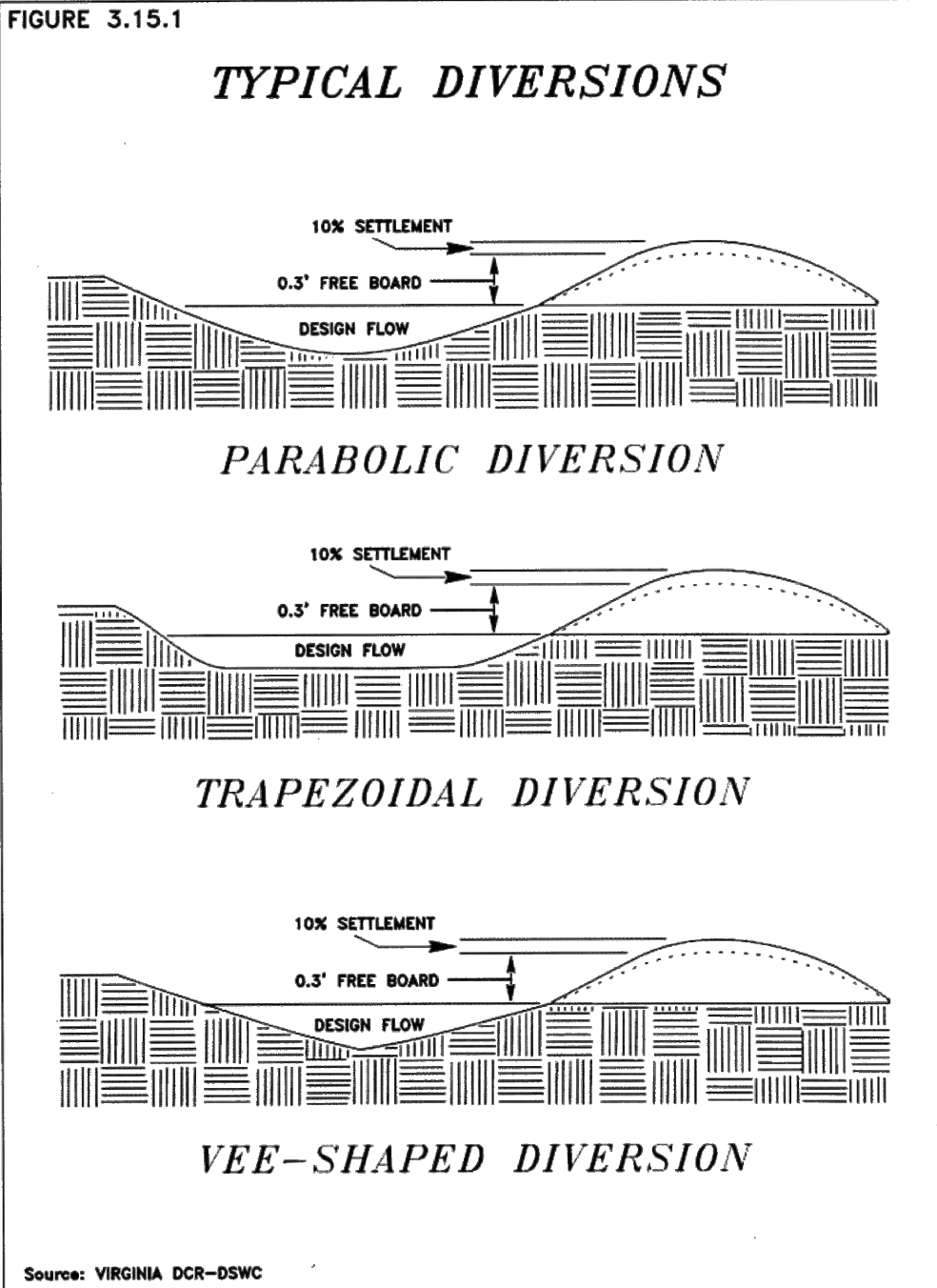
O	Perennial Ryegrass	<i>Lolium perenne</i>	40
	Birdsfoot Trefoil	<i>Lotus corniculatus</i>	15
	Redtop	<i>Agrostis alba</i>	5
P	Serecia Lespedeza	<i>Lespedeza cunata</i>	40
	Orchardgrass	<i>Dactylis glomerata</i>	30
	Redtop	<i>Agrostis alba</i>	5
Q	Orchardgrass	<i>Dactylis glomerata</i>	25
	Reed Canarygrass ¹	<i>Phalaris arundinacea</i>	30
	Redtop	<i>Agrostis alba</i>	5
	Ladino Clover	<i>Trifolium repens</i>	5
R	Kentucky Bluegrass	<i>Poa pratensis</i>	40
	Redtop	<i>Agrostis alba</i>	5
	White Clover or Birdsfoot Trefoil	<i>Trifolium repens</i>	5
		<i>Lotus corniculatus</i>	15
S	Reed Canarygrass ¹	<i>Phalaris arundinacea</i>	40
	Weeping Lovegrass	<i>Eragrostis curvula</i>	5
T	Perennial Ryegrass	<i>Lolium perenne</i>	30
	Reed Canarygrass ¹	<i>Phalaris arundinacea</i>	15
	Birdsfoot Trefoil	<i>Lotus corniculatus</i>	5
U	Timothy	<i>Phleum pratense</i>	10
	Alfalfa	<i>Medicago sativa</i>	18
V	Timothy	<i>Phleum pratense</i>	10
	Birdsfoot Trefoil	<i>Lotus corniculatus</i>	15
W	Redtop	<i>Agrostis alba</i>	5
	Perennial Ryegrass	<i>Lolium perenne</i>	30
	Orchardgrass	<i>Dactylis glomerata</i>	25
X	Reed Canarygrass ¹	<i>Phalaris arundinacea</i>	30
	Birdsfoot Trefoil	<i>Lotus corniculatus</i>	20
	Redtop	<i>Agrostis alba</i>	5
Y	Switchgrass	<i>Panicum virgatum</i>	30
	Birdsfoot Trefoil	<i>Lotus corniculatus</i>	20
Z	Switchgrass	<i>Panicum virgatum</i>	15
	Serecia Lespedeza	<i>Lespedeza cunata</i>	30
A-1	Orchardgrass	<i>Dactylis glomerata</i>	30
	Red Clover	<i>Trifolium pratense</i>	10
	Switchgrass	<i>Panicum virgatum</i>	15
	Big Bluestem	<i>Andropogon gerardi</i>	5
	Indiangrass	<i>Sorghastrum nutans</i>	5
	Little Bluestem	<i>Andropogon scoparius</i>	5
	Sideoats Grama ²	<i>Bouteloua curtipendula</i>	5
A-2	Switchgrass	<i>Panicum virgatum</i>	20
	Orchardgrass	<i>Dactylis glomerata</i>	15
A-3	Eastern Gamagrass ³	<i>Tripsacum dasyloides</i>	15

NOTE: When utilizing a properly prepared seedbed, the rates of application can be reduced by 30 percent except for seed mixes A-2 & A-3.

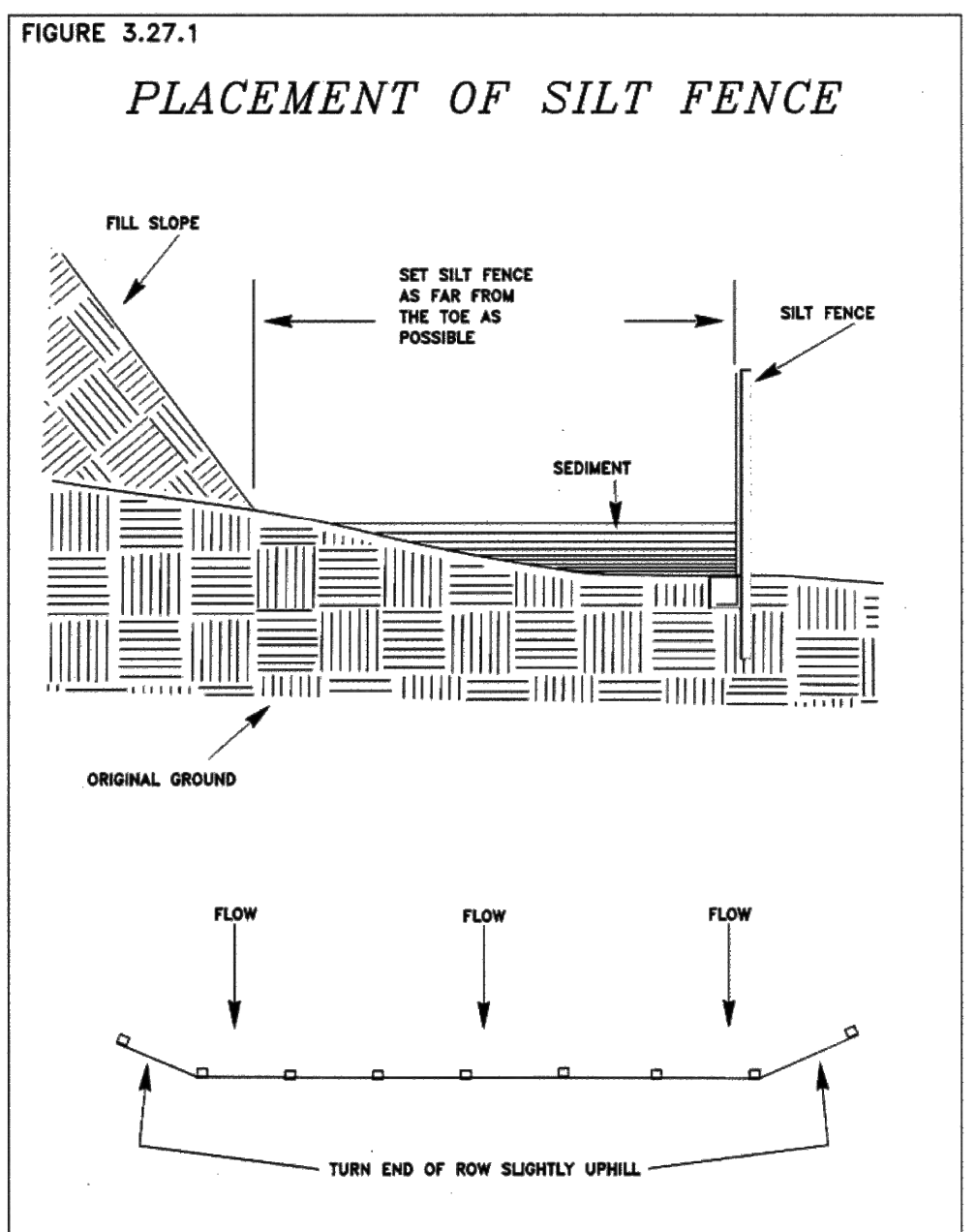
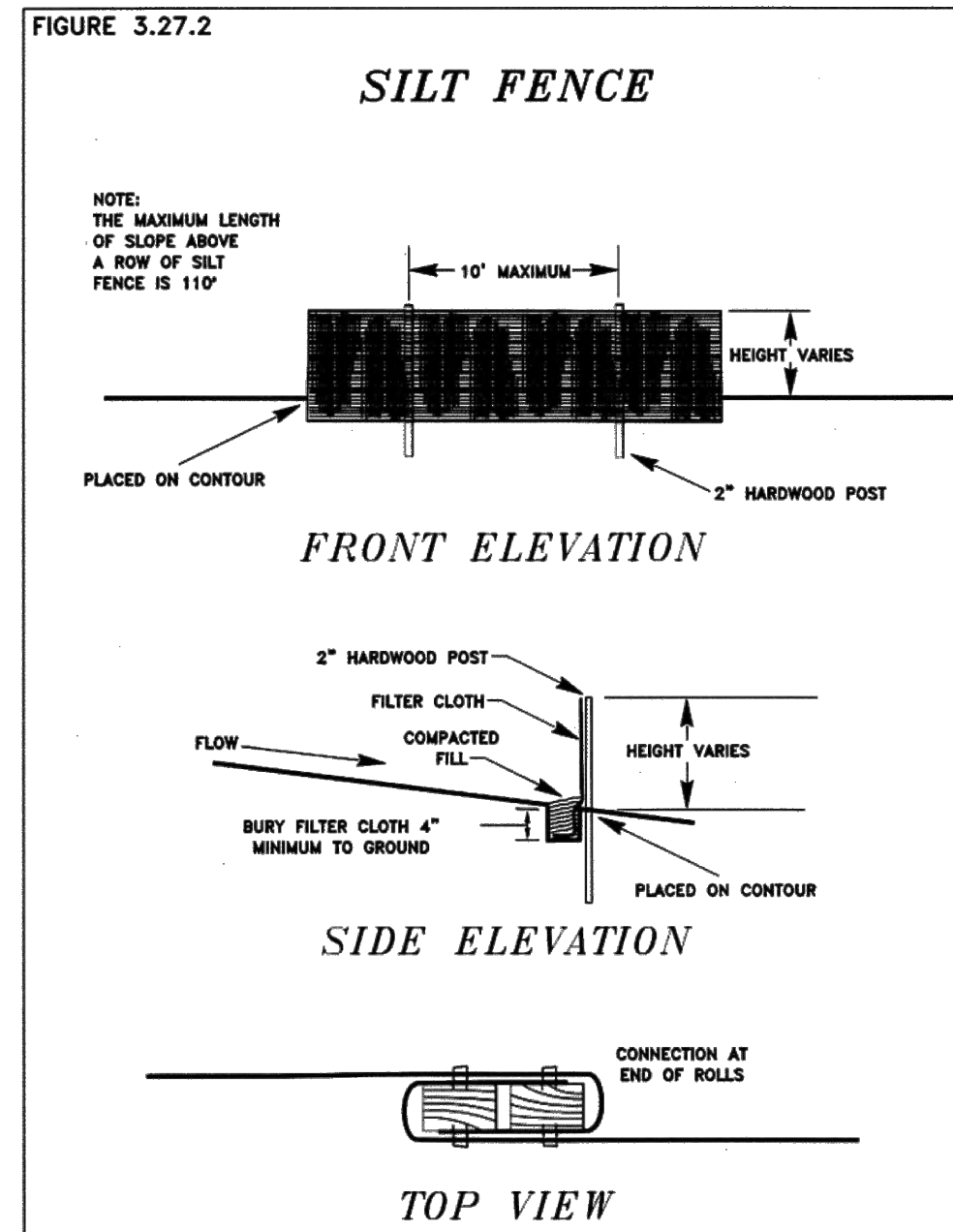
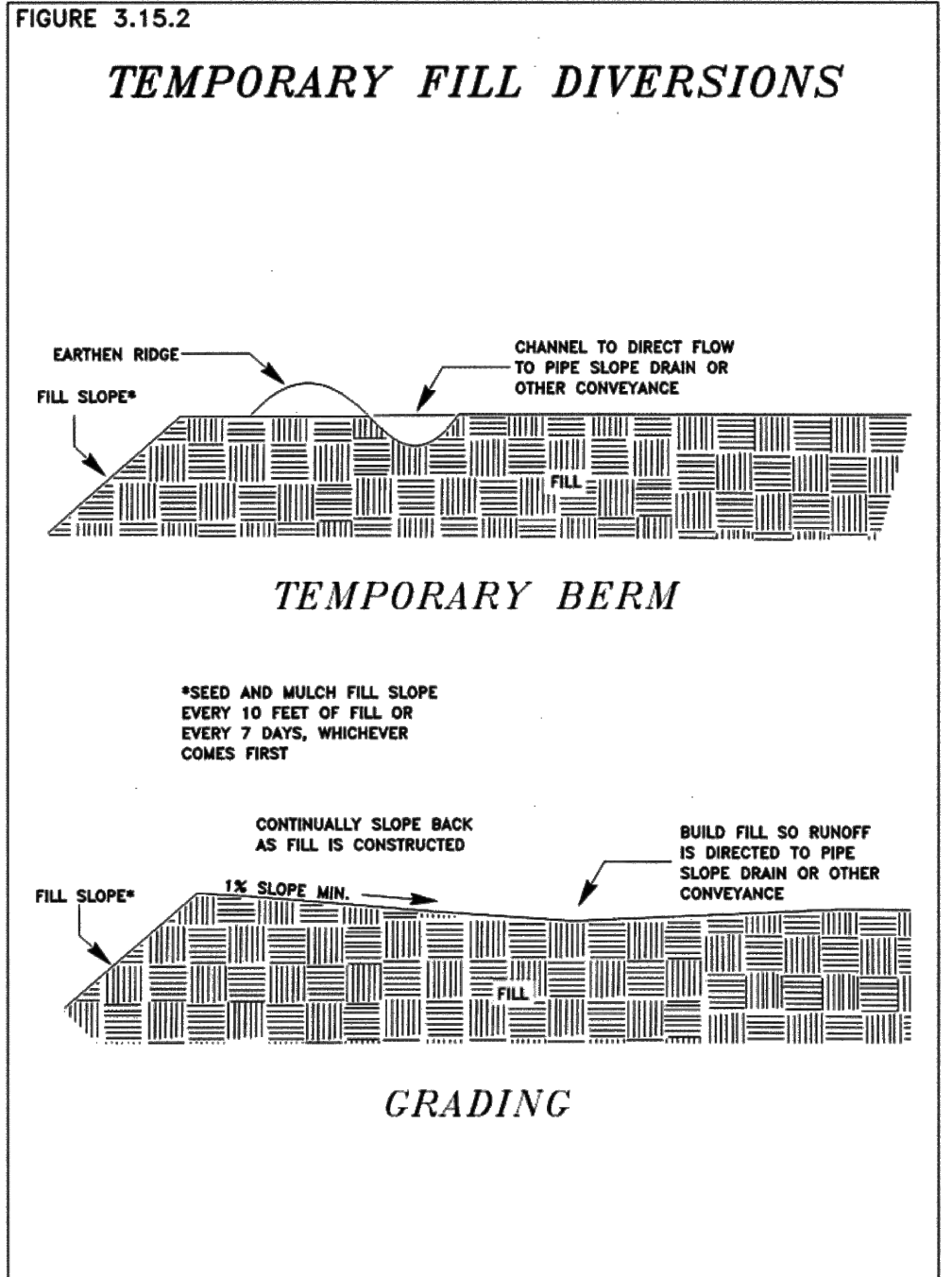
¹ Reed Canarygrass shall not be used east of I-79 and/or south of Charleston.

² Use north and east of I-64 and I-79.

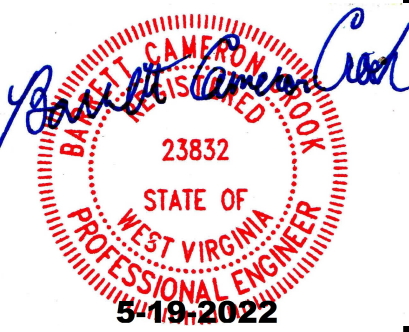
³ Use south and west of I-64 and I-79.



DIVERSION DETAIL



SILT FENCE DETAIL



The Site Design Company



DATE : MAY 15, 2022

REVISION BLOCK

RESIDENCE INN by MARRIOTT
@ HOTEL CIRCLE

CITY OF CHARLESTON - KANAWHA COUNTY, WEST VIRGINIA

EROSION CONTROL NOTES AND DETAILS

SHEET NO.
C2.3

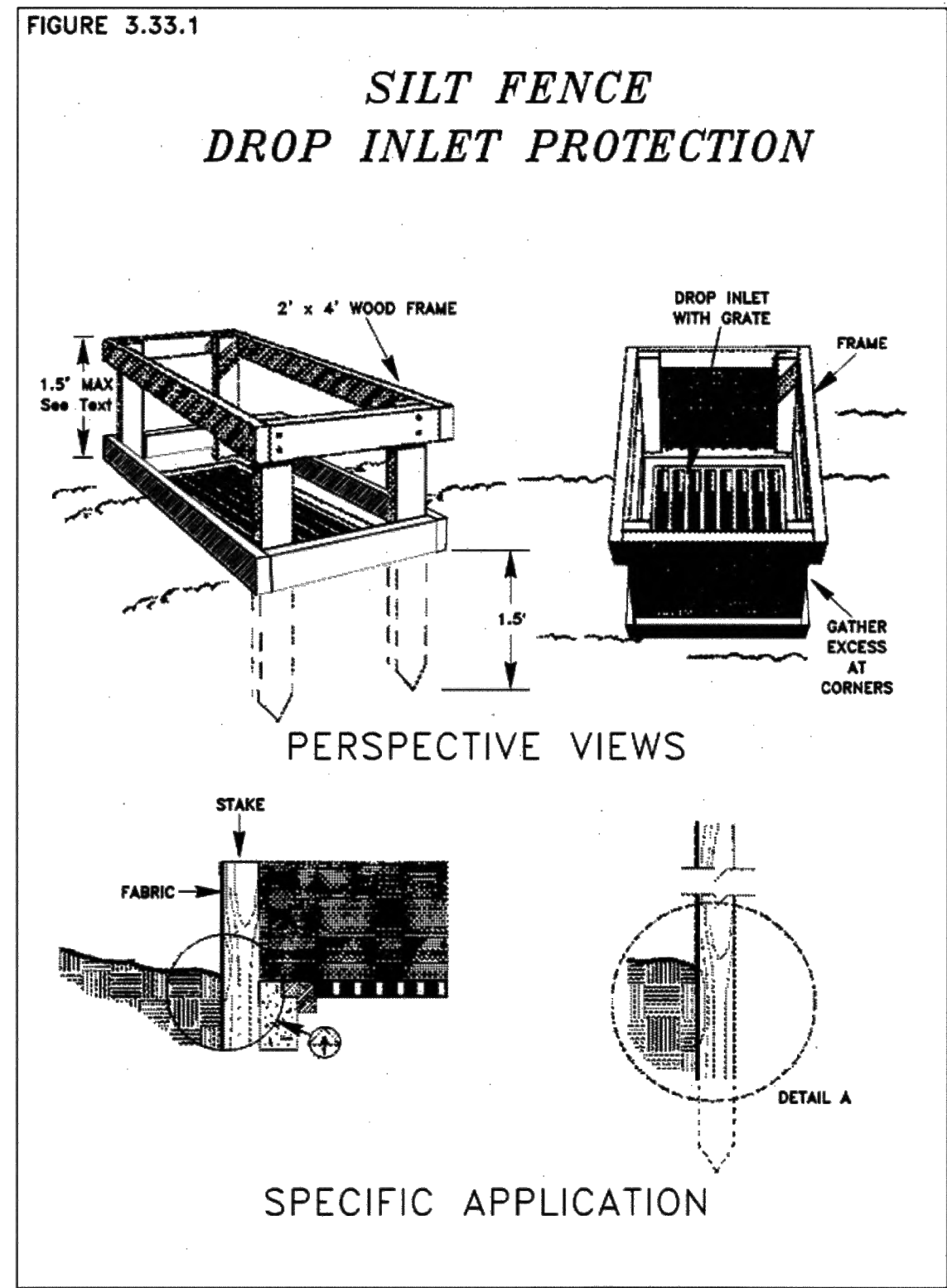
EMAIL: thompson@stedesignco.com

PHONE: 804-720-9040

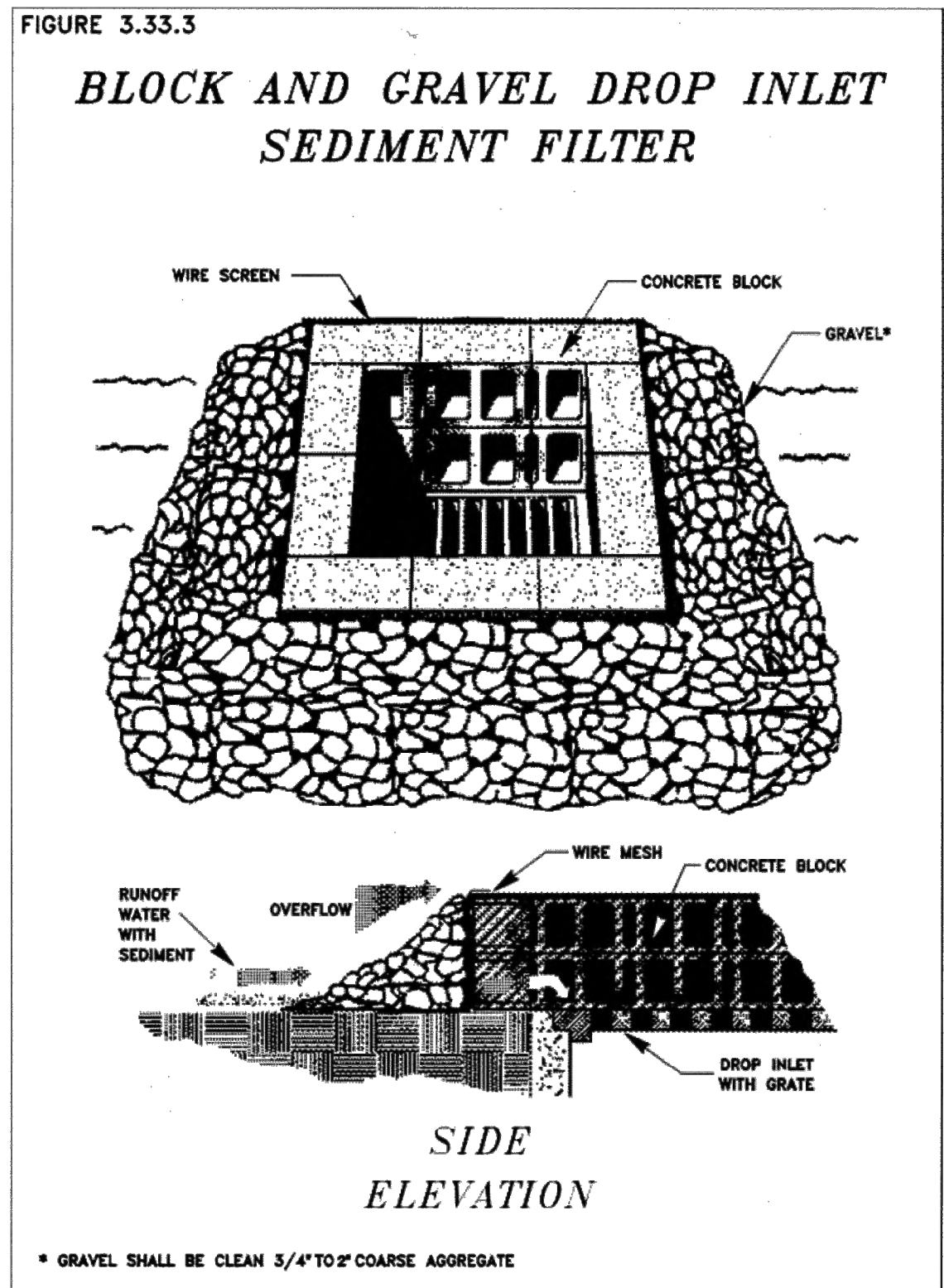
PROJECT MANAGER : CHRIS THOMPSON

PROJECT #: 20064

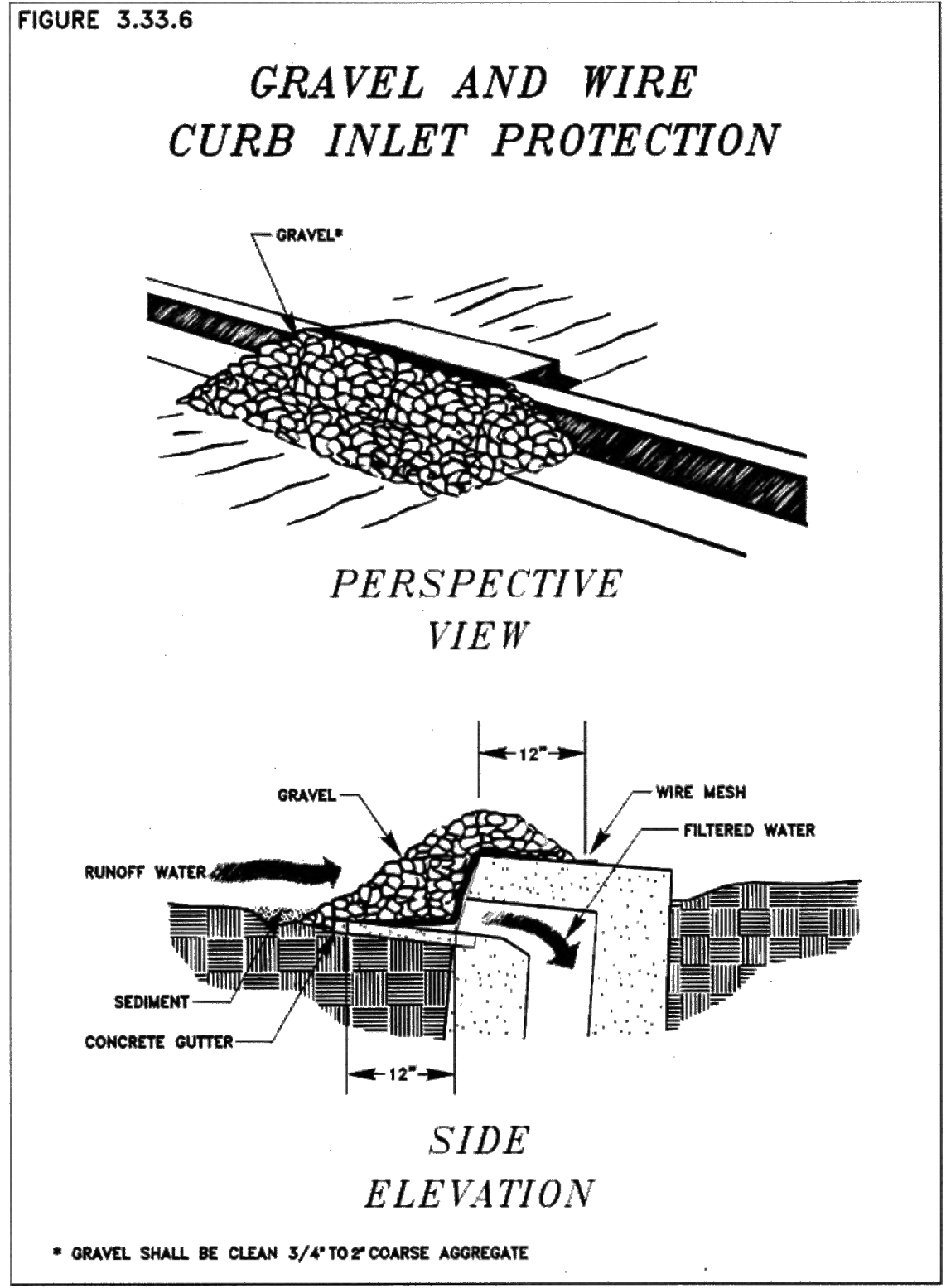
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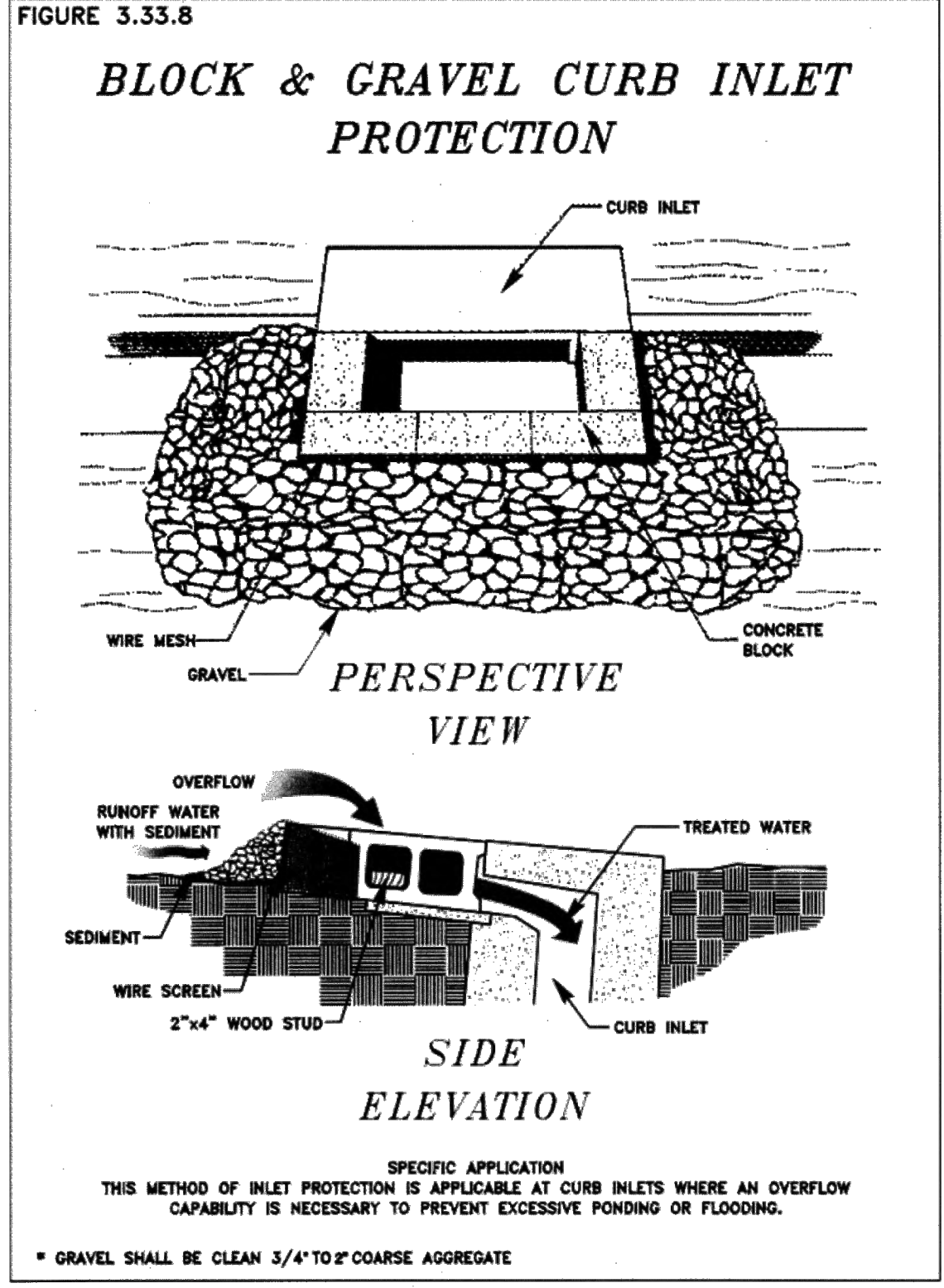
3.33-7



3.33-9



3.33-12



3.33-14

INLET PROTECTION DETAILS

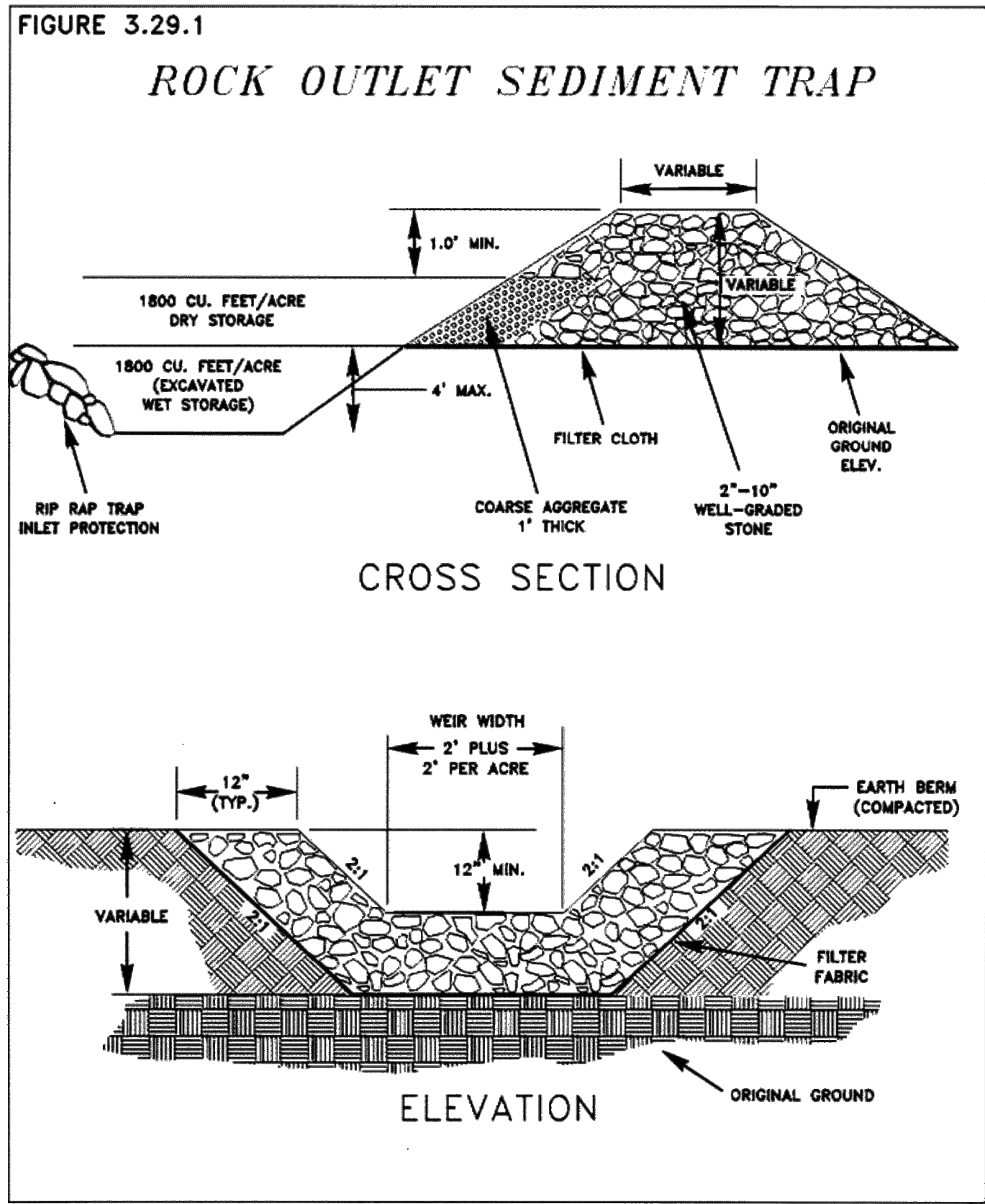
SEDIMENT TRAP SCHEDULE												
Trap #	Drainage Area (acres)	Wet Storage			Total Wet/Dry Storage			Outlet Length (Feet)	Bottom Elevation	Top of Berm Elevation	Top of Berm Width	Bottom Dimensions (L x W)
		Volume Required (Cu. Ft.)	Volume Provided (Cu. Ft.)	Elevation	Volume Required (Cu. Ft.)	Volume Provided (Cu. Ft.)	Elevation					
1	1.37	2,466	2,656	1035.00	4,932	5,488	1,037.00	8	1,031.00	1,038.00	3	24x12

Project: Residence Inn - Charleston WV
Date: 5/14/2022

Sediment Trap #1 Stage / Storage Table

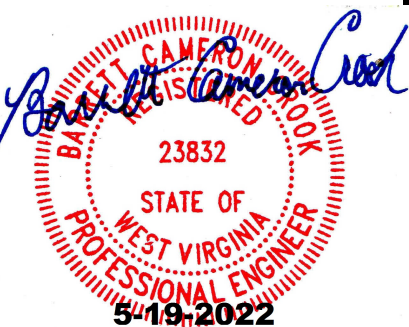
D.A.= 1.37 AC.

ELEV	AREA (SF)	VOL (CFT)	SUM VOL (CFT)
1031.00	288	0	0
1032.00	448	368	368
1033.00	640	544	912
1034.00	864	752	1664
1035.00	1120	992	2656
1036.00	1408	1264	3920
1037.00	1728	1568	5488
1038.00	2080	1904	7392
Req'd wet storage		2466	cu. Ft.
Req'd dry storage		2466	cu. Ft.
Total vol. Req'd		4932	cu. Ft.



3.29-6

SEDIMENT TRAP DETAIL



The Site Design Company
CIVIL ENGINEERING AND LAND DEVELOPMENT CONSULTING
268 HIGH STREET - PETERSBURG, VIRGINIA 23803
www.sitedesignco.com
PROJECT # : 20064
PROJECT MANAGER : CHRIS THOMPSON
PHONE : 804-720-9040
EMAIL : thompson@sitedesignco.com

DATE : MAY 15, 2022	
REVISION BLOCK	

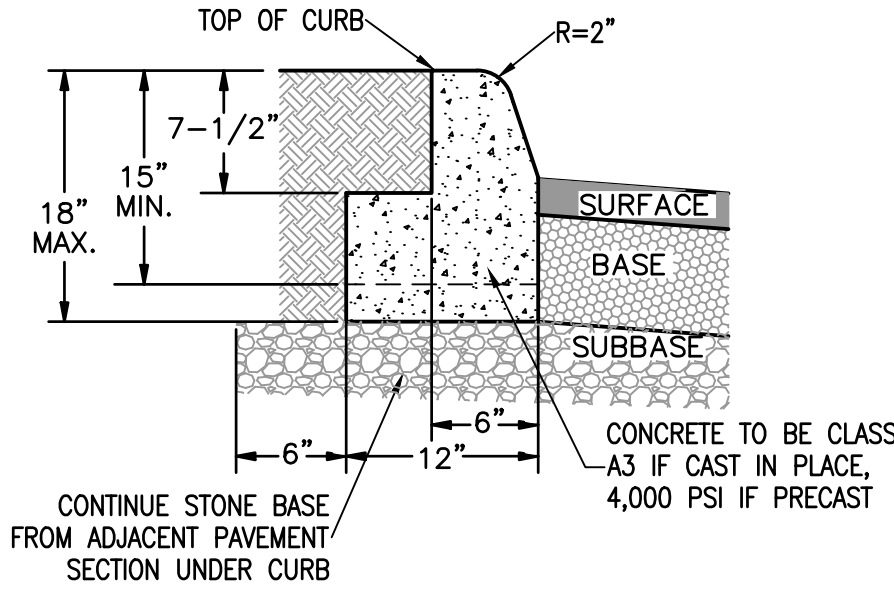
**RESIDENCE INN by MARRIOTT
@ HOTEL CIRCLE**
CITY OF CHARLESTON - KANAWHA COUNTY, WEST VIRGINIA
EROSION CONTROL NOTES AND DETAILS

THESE DRAWINGS ARE THE EXCLUSIVE PROPERTY OF The Site Design Company AND SHALL NOT BE REPRODUCED OR UTILIZED FOR ANY PURPOSE WITHOUT THE EXPRESS WRITTEN CONSENT OF The Site Design Company.

- EXISTING UTILITIES: WEST VIRGINIA LAW REQUIRES THAT THE CONTRACTOR NOTIFY WEST VIRGINIA 811 AT 1-800-245-4848 LEAST 72 HRS. PRIOR TO ANY LAND DISTURBANCE. THIS PLAN DOES NOT GUARANTEE THE EXISTENCE OR 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.
- MATERIALS AND WORKMANSHIP: ALL CONSTRUCTION MATERIALS AND WORKMANSHIP MUST CONFORM TO THE FOLLOWING STANDARDS AND SPECIFICATIONS: WEST VIRGINIA DEPARTMENT OF TRANSPORTATION, WEST VIRGINIA DEPARTMENT OF HEALTH, CITY OF CHARLESTON DEPARTMENT OF UTILITIES, AND CITY OF CHARLESTON OFFICE OF THE CITY ENGINEER, WEST VIRGINIA AMERICAN WATER AND CHARLESTON SANITARY BOARD. ALL WORK SHALL BE SUBJECT TO INSPECTION BY DESIGNATED CITY AND STATE OFFICIALS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFICATION OF THE PROPER AUTHORITIES 48 HOURS PRIOR TO START OF WORK.
- DEVIATION FROM PLANS: NO DEVIATION FROM THESE PLANS WILL BE ALLOWED WITHOUT PRIOR WRITTEN APPROVAL OF THE OWNER, ENGINEER AND AFFECTED GOVERNMENTAL AGENCIES.
- 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 CITY OF CHARLESTON.
- TOPSOIL STRIPPING: 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 $\pm 2\%$ 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.
- DRAINAGE STRUCTURES AND MINOR EXCAVATION: ALL PIPE CULVERTS AND STORM SEWER SYSTEMS SHALL HAVE A MINIMUM COVER OF 1 FOOT AND BE MADE OF THE MATERIAL SPECIFIED ON THE PLANS. ALL STORM SEWER SHALL HAVE A MINIMUM OF 4" AGGREGATE BEDDING MATERIAL.
- BASE AND PAVEMENT ITEMS:
 - SUBGRADE MUST BE CHECKED FOR GRADE AND COMPACTION BEFORE BASE IS APPLIED.
 - BASE AND PAVEMENT MATERIALS SHALL MEET ALL "VDOT" SPECIFICATIONS.
- VERTICAL DATUM IS BASED ON NAVD 88 (GEOID18). HORIZONTAL CONTROLS ARE BASED ON WEST VIRGINIA STATE PLANE COORDINATE GRID, SOUTH ZONE, NORTH AMERICAN DATUM OF 1983 (NAD 83).
- ALL CONSTRUCTION STAKING WILL BE AT THE CONTRACTOR'S EXPENSE UNLESS AGREED UPON BY THE OWNER IN WRITING.
- WATER AND SEWER: ALL MATERIALS FOR SEWER AND WATER SYSTEMS SHOWN SHALL BE SUPPLIED AND INSTALLED IN ACCORDANCE WITH THE LATEST SPECIFICATIONS OF WEST VIRGINIA AMERICAN WATER AND CHARLESTON SANITARY BOARD APPLICABLE AT THE TIME OF NOTICE TO PROCEED.
- INSTALL ALL PROPOSED UTILITIES UNDERGROUND INCLUDING ELECTRIC, TELEPHONE AND CATV.
- 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 ENCROACH ON THE REQUIRED THREE FOOT CLEAR RADIUS ON MATURITY OF THE LANDSCAPING.
- APPROVAL OF THE SITE PLAN DOES NOT INCLUDE THE DESIGN OF THE FIRE SPRINKLER SYSTEM UNDERGROUND PIPING FROM BACKFLOW PREVENTION DEVICE TO ONE FOOT ABOVE FINISHED FLOOR LEVEL. PRIOR TO INSTALLATION, SHOP DRAWINGS AND A SEPARATE PERMIT APPLICATION SHALL BE SUBMITTED THROUGH THE DEPARTMENT OF BUILDING INSPECTIONS FOR REVIEW AND APPROVAL.

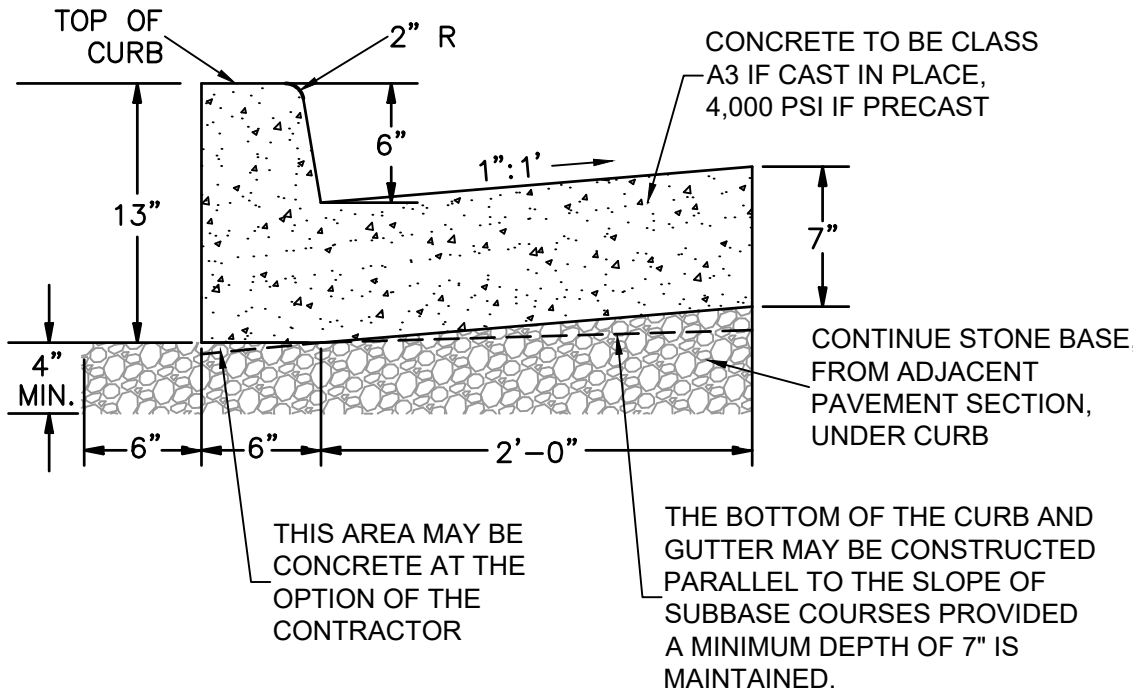
GENERAL NOTES

NO SCALE



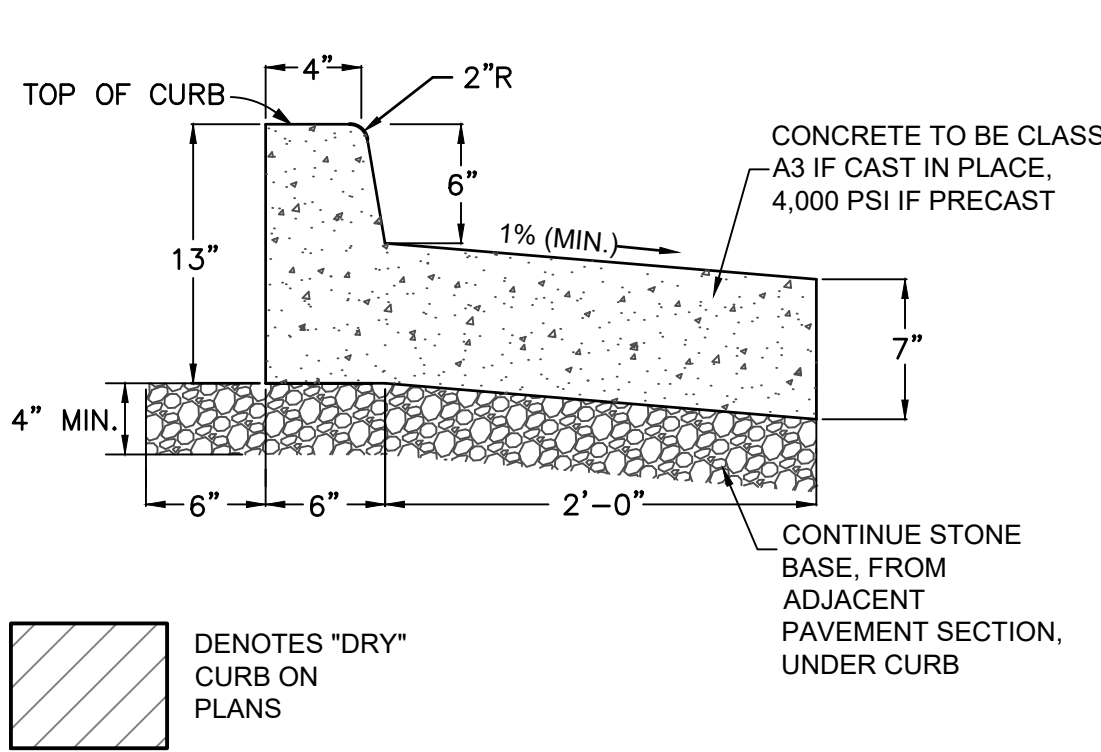
CONCRETE CURB DETAIL

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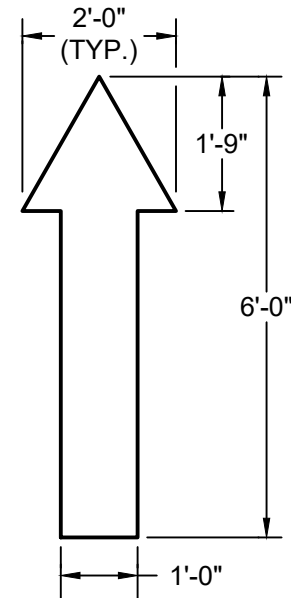
CONCRETE CURB AND GUTTER DETAIL

NO SCALE



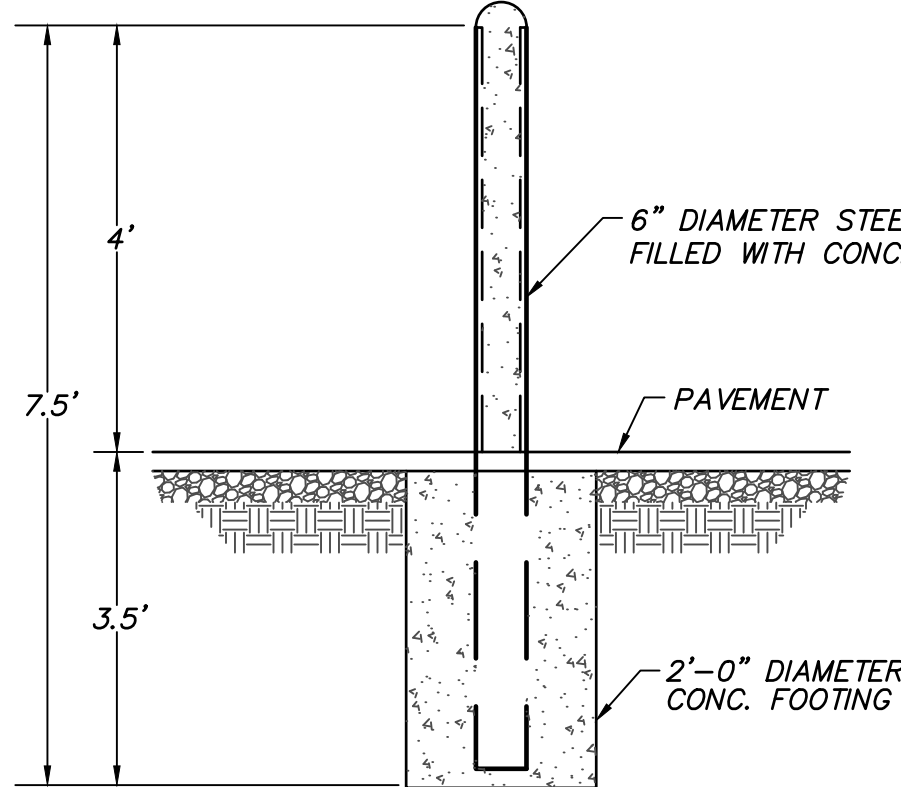
"DRY" CONCRETE CURB AND GUTTER DETAIL

NO SCALE



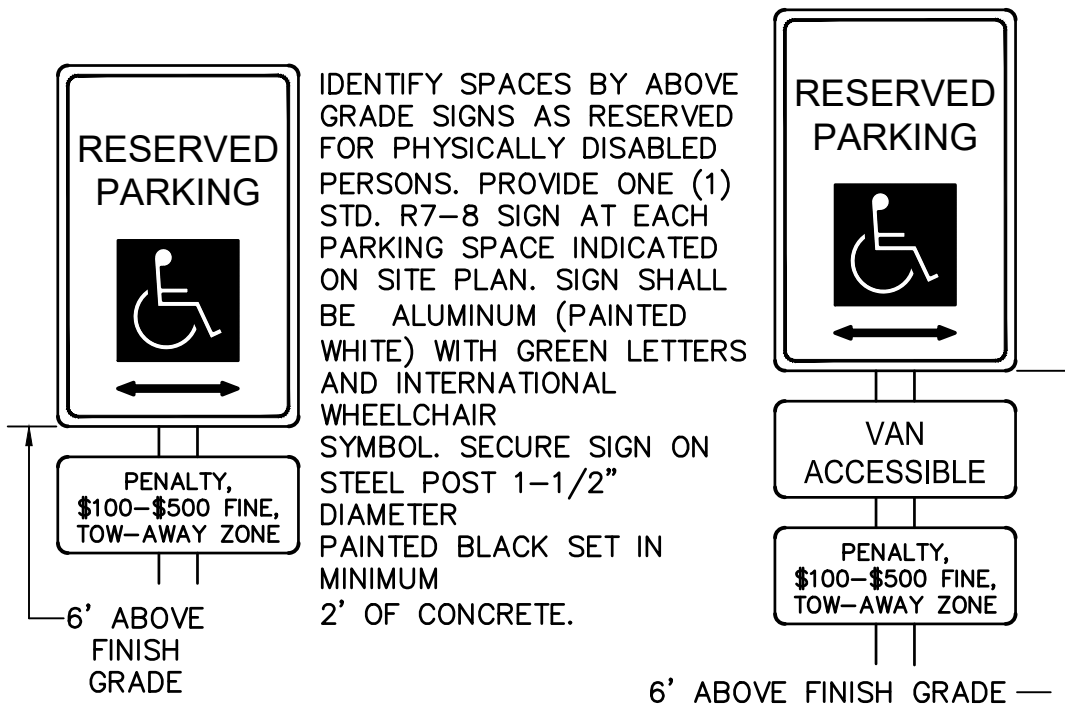
PAINTED DIRECTIONAL ARROW DETAIL

NO SCALE



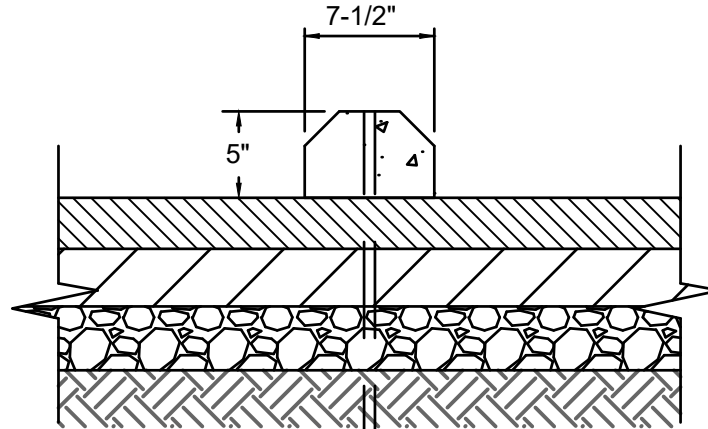
PIPE BOLLARD DETAIL

NO SCALE



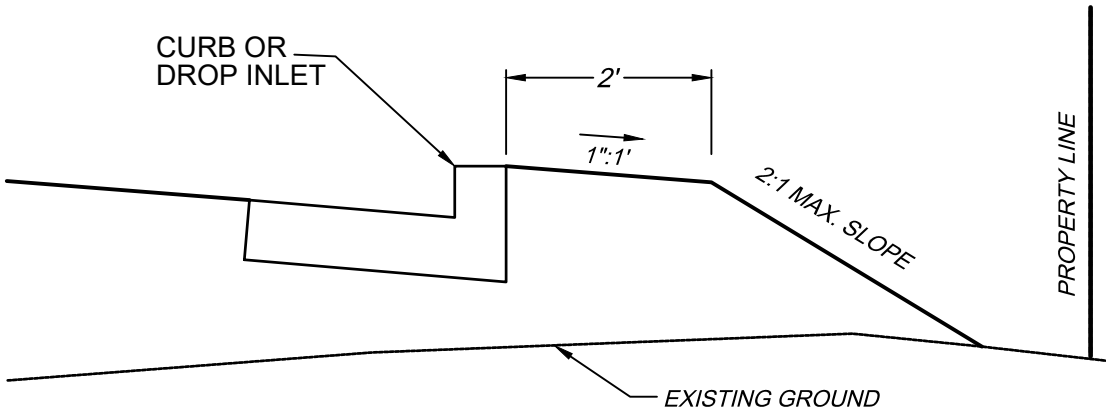
PARKING SIGNS FOR THE DISABLED

NO SCALE



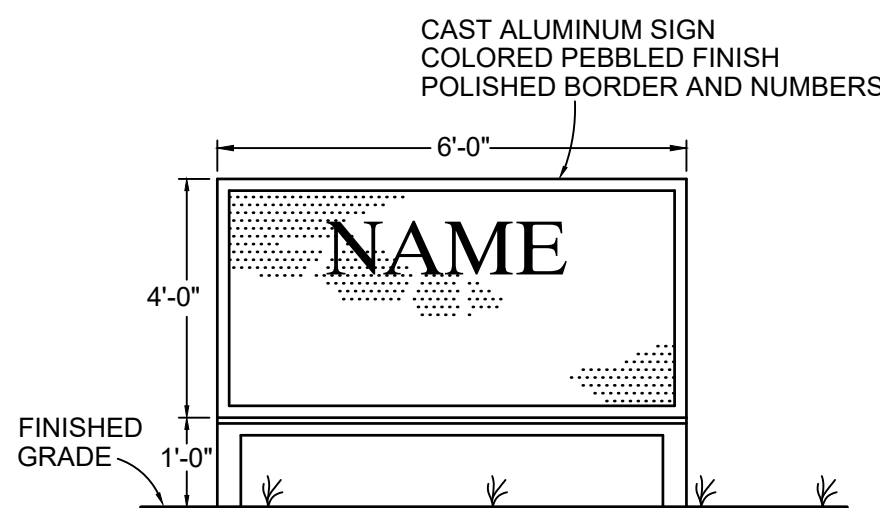
PRECAST BUMPER BLOCK DETAIL

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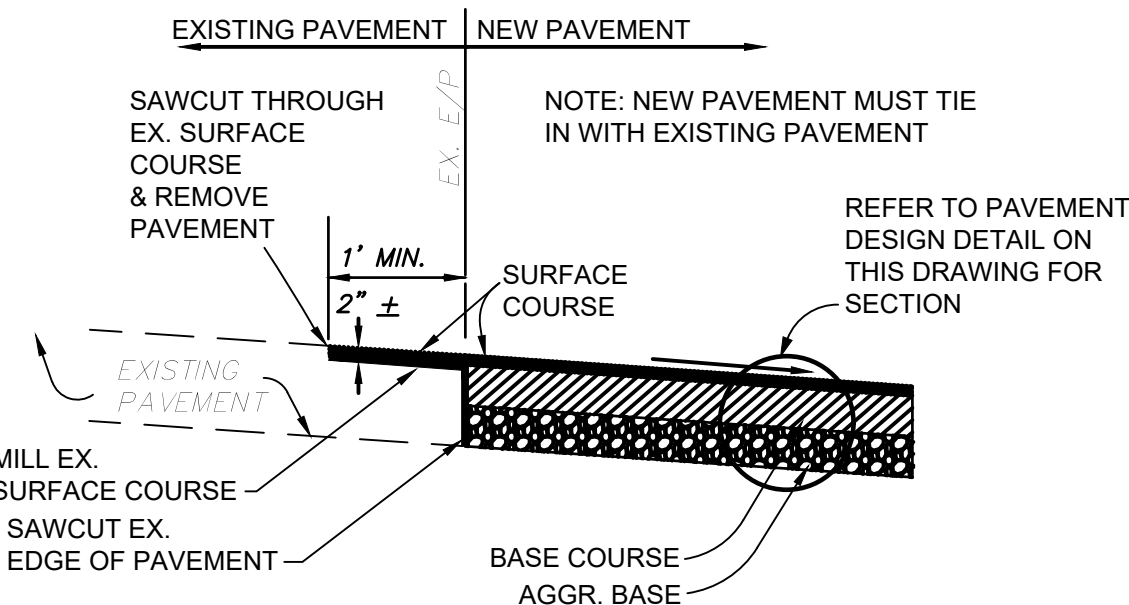
CURB & DROP INLET BACKFILL DETAIL

NO SCALE



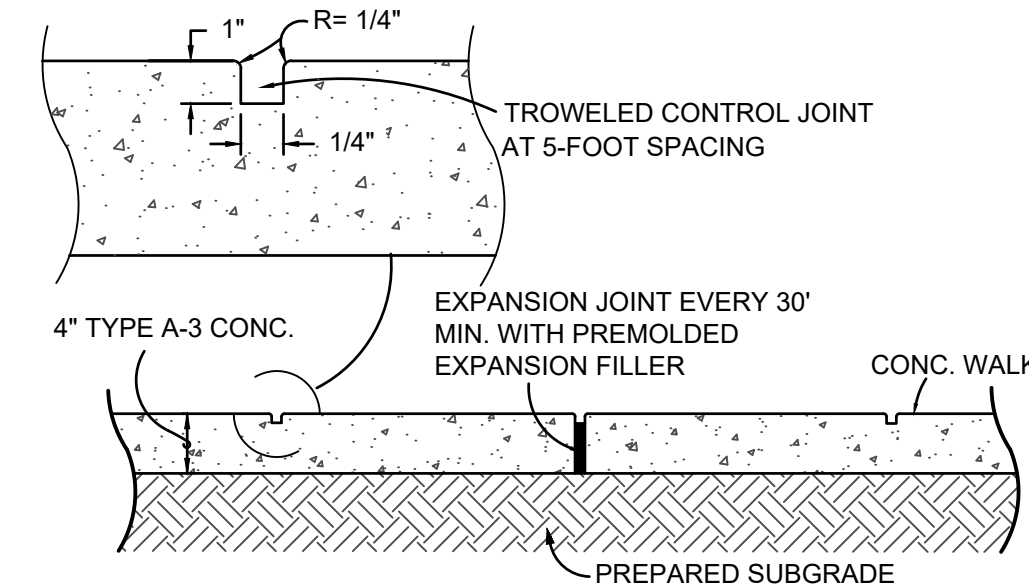
MONUMENT STYLE SIGN DETAIL

NO SCALE



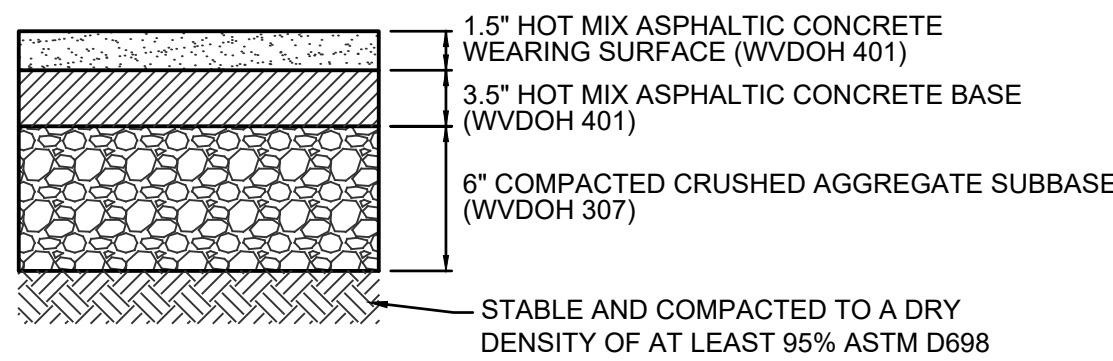
LAP JOINT DETAIL

NO SCALE

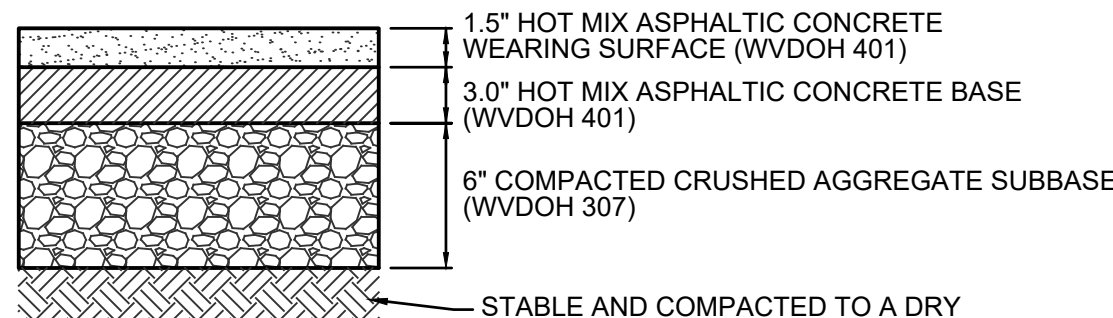


SIDEWALK CONTROL JOINT DETAIL

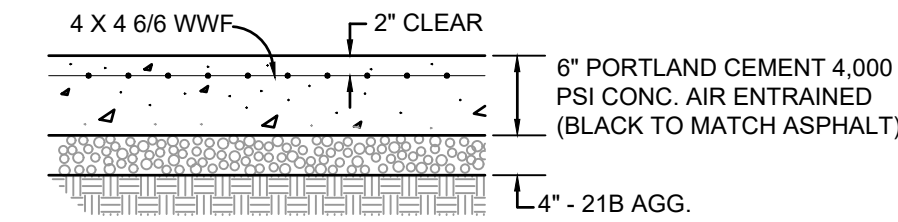
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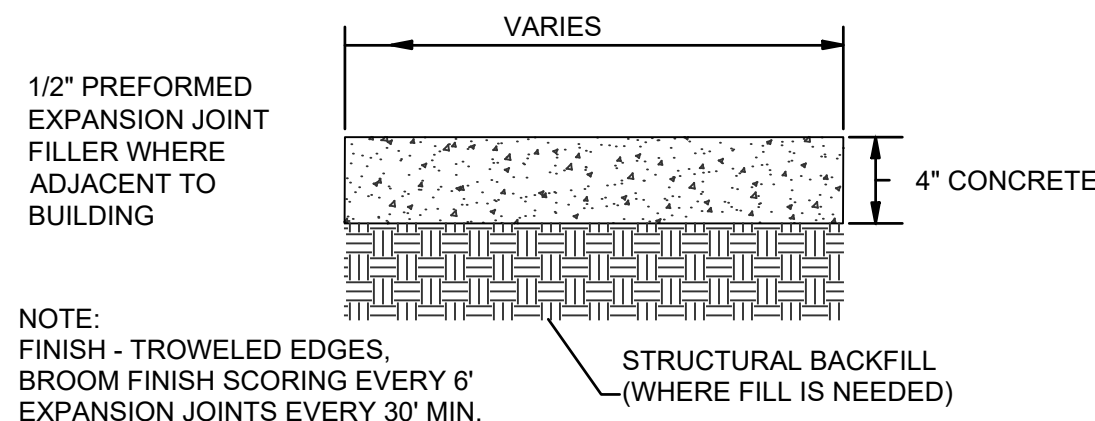
HEAVY DUTY ASPHALT PAVEMENT SECTION



LIGHT DUTY ASPHALT PAVEMENT SECTION

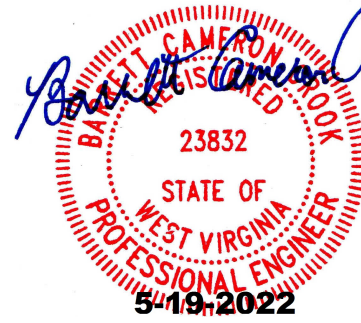


HEAVY DUTY CONCRETE PAVEMENT SECTION



CONCRETE SIDEWALK DETAIL

NO SCALE



The Site Design Company

CIVIL ENGINEERING AND LAND DEVELOPMENT CONSULTING
2688 HIGH STREET - PETERSBURG, VIRGINIA 23803
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DATE : MAY 15, 2022

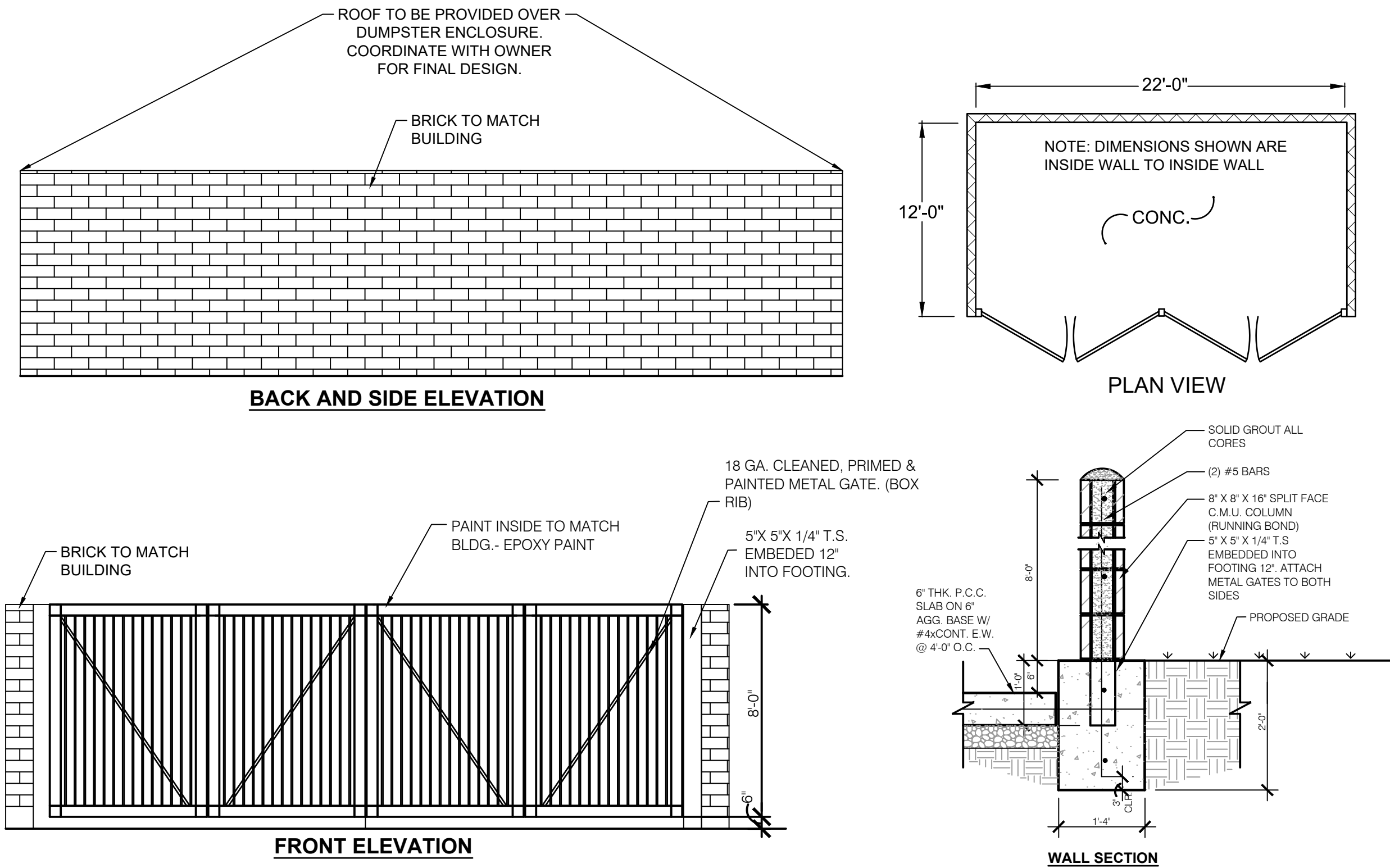
REVISION BLOCK

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@ HOTEL CIRCLE**
CITY OF CHARLESTON - KANAWHA COUNTY, WEST VIRGINIA

SITE NOTES AND DETAILS

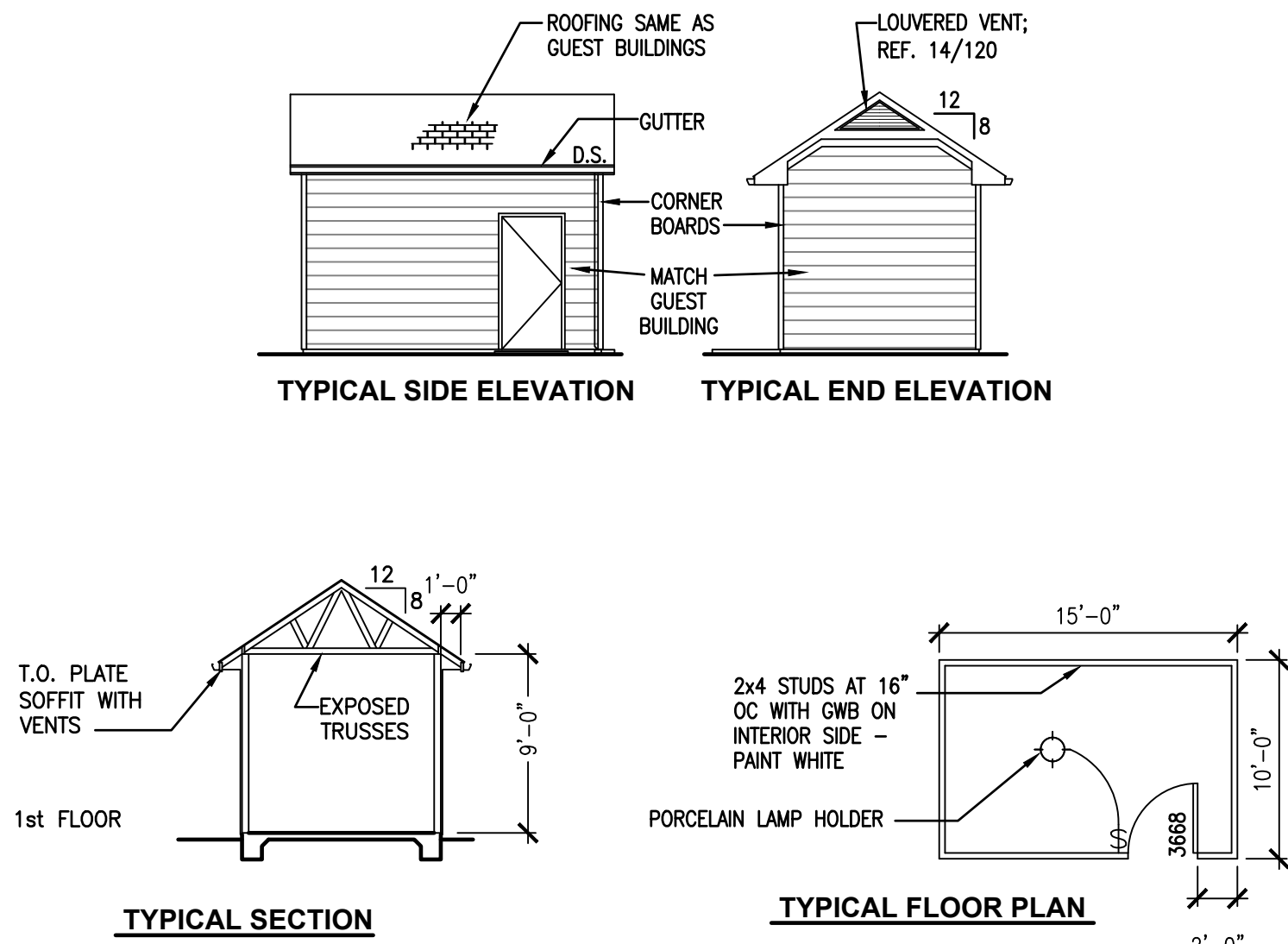
SHEET NO.
C3.1

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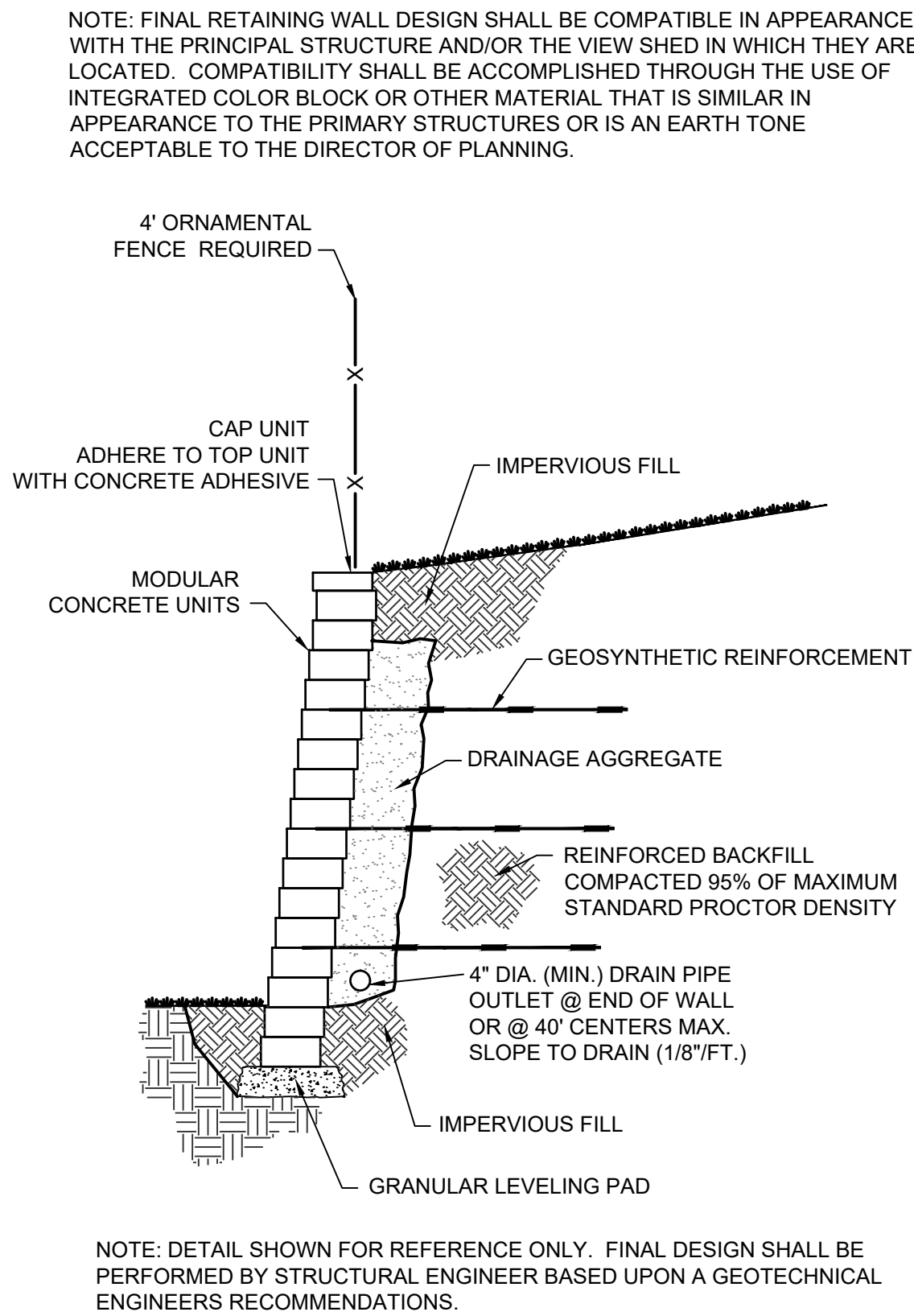


DUMPSTER ENCLOSURE DETAIL
NO SCALE

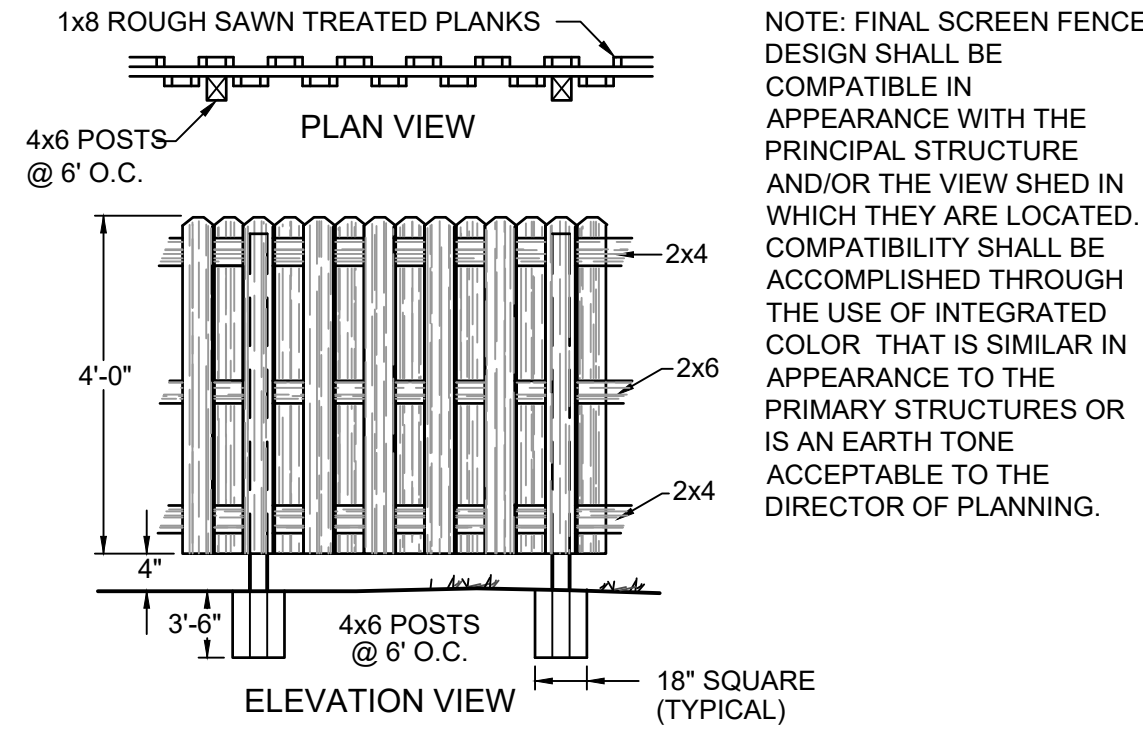
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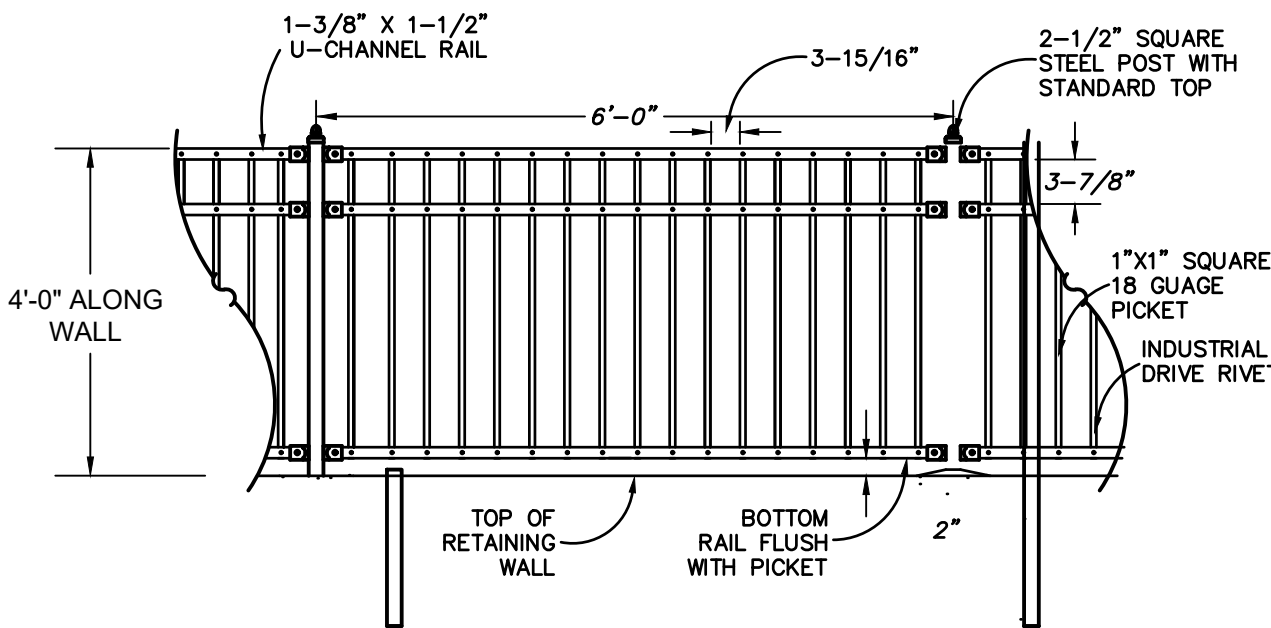
STORAGE SHED DETAIL
NO SCALE



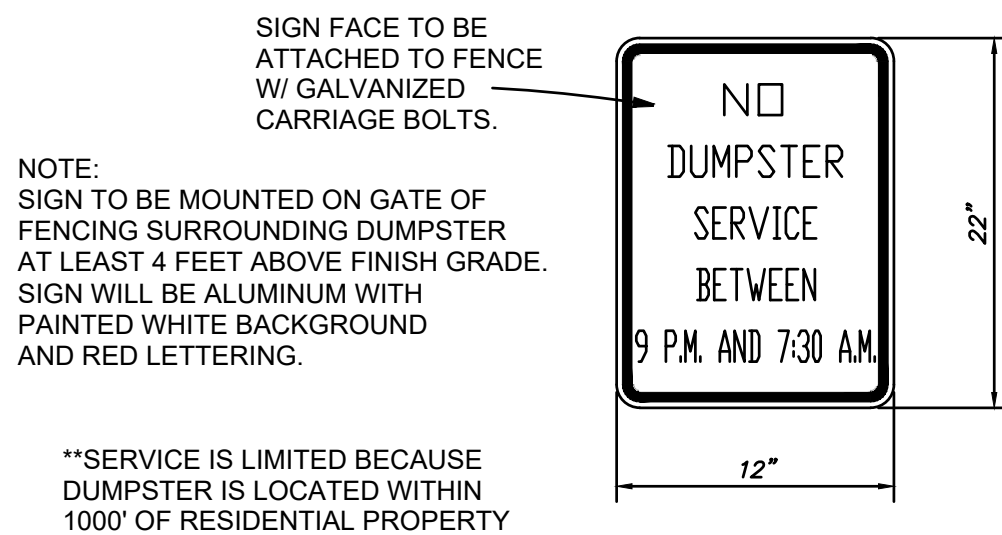
TYPICAL SEGMENTAL RETAINING WALL DETAIL
NO SCALE



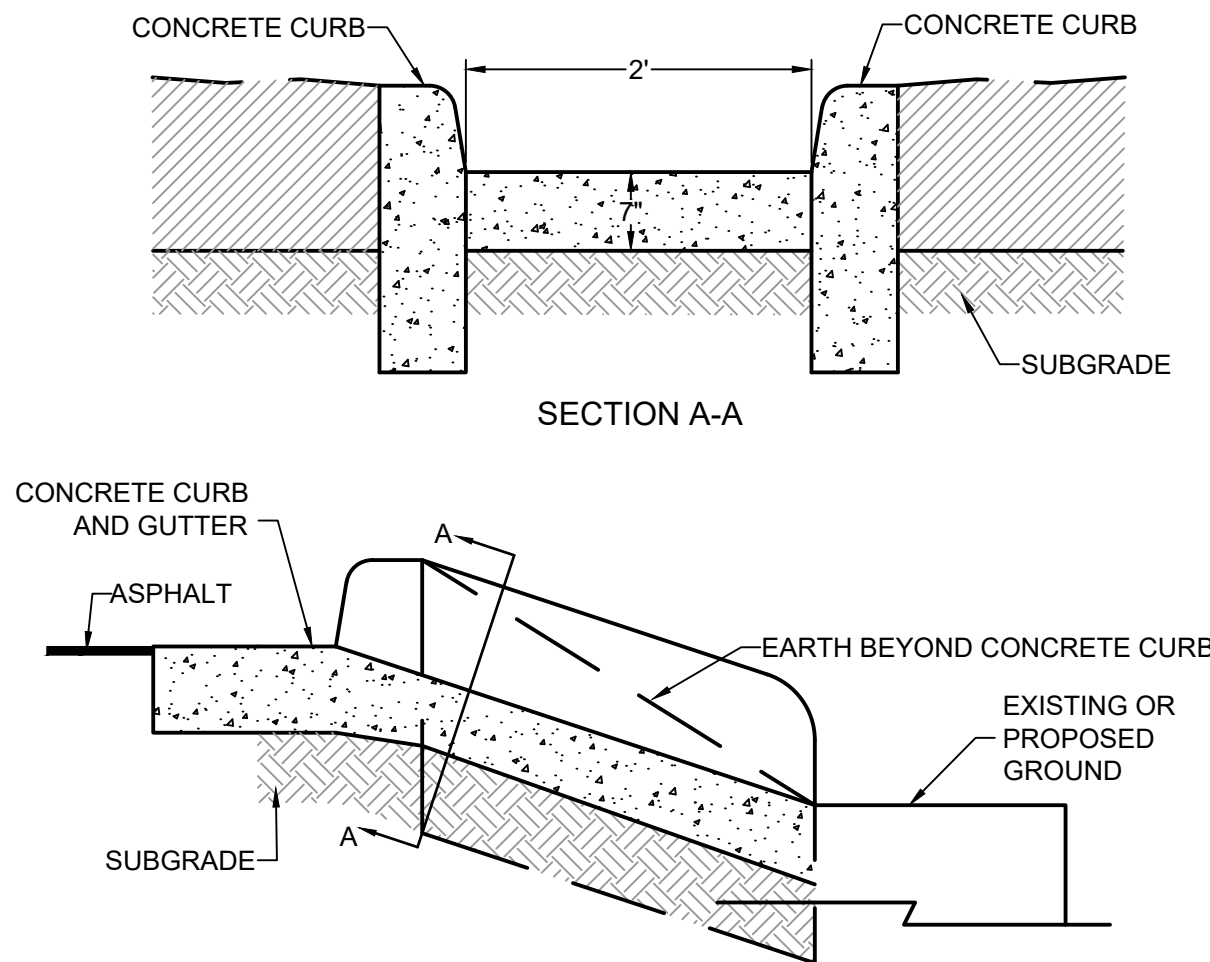
HVAC EQUIPMENT SCREEN DETAIL
NO SCALE



ORNAMENTAL FENCE DETAIL
NO SCALE



DUMPSTER SERVICE SIGN DETAIL
NO SCALE



2' CURB CUT AND FLUME DETAIL
NO SCALE



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



DATE : MAY 15, 2022

REVISION BLOCK

**RESIDENCE INN by MARRIOTT
@ HOTEL CIRCLE**
CITY OF CHARLESTON - KANAWHA COUNTY, WEST VIRGINIA

SITE NOTES AND DETAILS

SHEET NO.
C3.2

PROJECT #: 20064 PROJECT MANAGER : CHRIS THOMPSON PHONE : 804-720-9040 EMAIL : thompson@sitedesignco.com

DISCLAIMER NOTE:
UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT HORIZONTAL AND VERTICAL LOCATION OF ALL EXISTING UNDERGROUND OR OVERHEAD UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOWN OR UTILITIES NOT SHOWN IN THEIR PROPER LOCATION. CONTRACTOR TO NOTIFY ENGINEER OF ANY CHANGES OR DISCREPANCIES.
THE CONTRACTOR(S) SHALL CONTACT WEST VIRGINIA 811 AT 1-800-245-4848 FOR ASSISTANCE IN LOCATING EXISTING UTILITIES. CALL AT LEAST 48 HOURS PRIOR TO ANY DIGGING.



LEGEND	
	MONUMENT (FOUND) (AS NOTED)
	5/8" REBAR (SET)
	MAG NAIL (SET)
	CALCULATED POINT
	PROPERTY LINE
	ASPHALT LINE
	UTILITY POLE
	WATER VALVE
	STORM DRAIN
	FIRE HYDRANT
	MAN HOLE

APPROXIMATE LOCATION OF EX. 8\"/>

CURVE TABLE				
CURVE	RADIUS	ARC LENGTH	CHORD BEARING	CHORD LENGTH
C-1	375.00'	154.21'	S 75°16'11\"/>	153.12'

PATTERSON LN.

SOUTH ZONE (NAD83)
WEST VIRGINIA STATE PLANE

NORTHGATE PARCEL "C" LOT 2
NF
JEANETTE L. CORY, MARITAL TRUSTEE
TM 50, TP 31
D.B. 2402, PG. 69
167,000.03 SF
3.83 ACRES

NORTHGATE PARCEL "C" LOT 1
NF
HPTM II PROPERTIES TRUST
TM 50, TP 1.2
D.B. 2501, PG. 4

NF
COROTOMAN, INC.
TM 50, TP 1
D.B. 2288, PG. 268

12\"/>

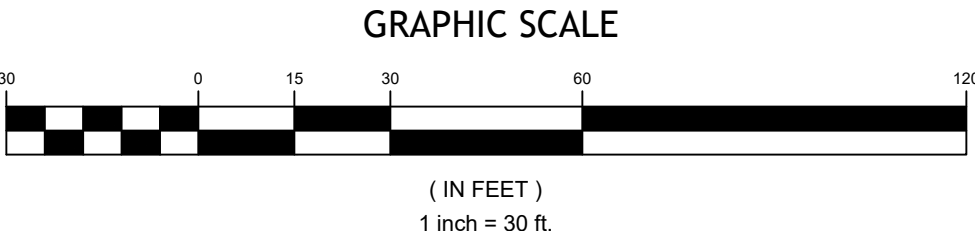
NF
COROTOMAN, INC.
TM 50, TP 1
D.B. 2288, PG. 268

UNDERGROUND POWER SUPPLY:
CONTRACTOR TO COORDINATE FINAL
ROUTING WITH APPALACHIAN POWER AND
INSTALL CONDUIT WITH PULL STRINGS
PRIOR TO PARKING LOT CONSTRUCTION

4 STORY HOTEL
127 GUEST ROOMS
134 PARKING SPACES

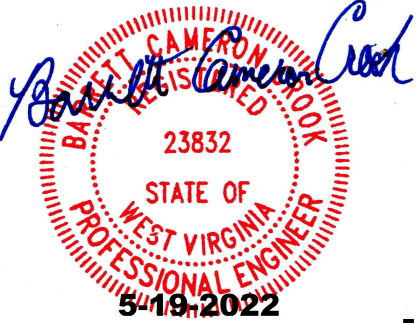
DOMESTIC LINE AND
FIRE LINE BACKFLOW
PREVENTION
DEVICES LOCATED
INSIDE BUILDING

PUBLIC WATER AND WASTEWATER PROVIDER INFO
• PUBLIC WATER:
WEST VIRGINIA AMERICAN WATER
1600 PENNSYLVANIA AVENUE
CHARLESTON, WV 25302
• PUBLIC SEWER:
CHARLESTON SANITARY BOARD
208 26TH STREET W
CHARLESTON, WV 25387



GENERAL UTILITY NOTES

- IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY THE EXACT HORIZONTAL AND VERTICAL LOCATIONS AND SIZES OF ALL EXISTING UTILITIES, WHETHER SHOWN OR NOT SHOWN IN THESE PLANS, PRIOR TO THE START OF ANY CONSTRUCTION. THE ENGINEER HAS NOT FIELD VERIFIED THE EXISTING UTILITIES. THE UTILITIES SHOWN ON THESE PLANS HAVE BEEN TAKEN FROM RECORDS AND UTILITY MAPS MADE AVAILABLE TO THE ENGINEER AND THE LOCATIONS AND SIZES SHALL BE CONSIDERED APPROXIMATE ONLY. OTHER UTILITIES, NOT SHOWN ON THIS PLAN, MAY EXIST ON OR NEAR THE PROJECT SITE.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING THE SCHEDULE FOR INSTALLATION WITH THE UTILITY COMPANIES AND THE OWNER/DEVELOPER'S CONSTRUCTION MANAGER. ALL EXISTING CONDITIONS THAT ARE REMOVED OR DISRUPTED DURING THE PLACEMENT OF NEW UTILITIES SHALL BE RESTORED OR REPAIRED TO MATCH ORIGINAL CONDITIONS. ANY EXISTING UTILITIES DISRUPTED DURING PLACEMENT OF NEW UTILITIES SHALL BE REPAIRED AND OPERATING NORMALLY THE SAME DAY OF DISRUPTION. ITEMS THAT NEED TO BE RESTORED OR REPAIRED INCLUDE, BUT ARE NOT LIMITED TO: EXISTING ASPHALT PAVING, EXISTING CONCRETE PAVING, WATER LINES, IRRIGATION LINES, GRASS AREAS, LANDSCAPING, AND SITE LIGHTING. THE CONTRACTOR SHALL FIELD VERIFY THE EXACT LOCATION OF ALL EXISTING ITEMS THAT WILL BE DISRUPTED DURING THE PLACEMENT OF NEW UTILITIES AND PROVIDE THE OWNER/DEVELOPER'S CONSTRUCTION MANAGER WITH A DETAILED SCHEDULE OUTLINING THE TIMELINE FOR INSTALLATION OF NEW UTILITIES INCLUDING THE PROPOSED TIMES THAT EXISTING UTILITIES WILL BE DISRUPTED.
- THE NEW UTILITY TRENCH WIDTHS AND DEPTHS SHALL MEET ALL LOCAL AND STATE REQUIREMENTS.
- PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL VERIFY THAT ANY "STUB OUTS" FOR POWER, TELEPHONE, FIBER OPTICS, WATER AND SEWER (IF APPLICABLE) HAVE BEEN PROVIDED BY OTHERS AT THE AREA ADJACENT TO THE SITE BUILDING. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FINAL CONNECTIONS AT THE BUILDING.
- PRIOR TO THE CONSTRUCTION OF OR CONNECTION TO ANY STORM DRAIN, SANITARY SEWER, WATER MAIN OR ANY OF THE DRY UTILITIES, THE CONTRACTOR SHALL EXCAVATE, VERIFY AND CALCULATE ALL POINTS OF CONNECTION AND ALL UTILITY CROSSINGS AND INFORM THE ENGINEER AND THE OWNER/DEVELOPER'S CONSTRUCTION MANAGER OF ANY CONFLICT OR REQUIRED DEVIATIONS FROM THE PLAN. NOTIFICATION SHALL BE GIVEN A MINIMUM OF 48 HOURS PRIOR TO CONSTRUCTION. THE ENGINEER AND ITS CLIENTS SHALL BE HELD HARMLESS IN THE EVENT THAT THE CONTRACTOR FAILS TO MAKE SUCH NOTIFICATION.
- CONSTRUCTION SHALL NOT START ON ANY PUBLIC UTILITY SYSTEM UNTIL WRITTEN APPROVAL HAS BEEN RECEIVED FROM THE APPROPRIATE AUTHORITY HAVING JURISDICTION.
- CONTRACTOR SHALL NOTIFY THE UTILITY AUTHORITIES INSPECTORS AT LEAST 72 HOURS BEFORE CONNECTING TO ANY EXISTING LINE.
- EXISTING DRAINAGE STRUCTURES AND STORM SEWER PIPES ARE TO BE INSPECTED, REPAIRED AS NEEDED, AND CLEANED OUT TO REMOVE ALL SILT AND DEBRIS.
- ALL UTILITY EXTENSIONS INCLUDING SERVICE LINES SHALL BE CONSTRUCTED TO THE APPROPRIATE UTILITY COMPANY SPECIFICATIONS. ALL UTILITY DISCONNECTIONS SHALL BE COORDINATED WITH THE DESIGNATED UTILITY COMPANIES.
- ALL FILL MATERIAL IS TO BE IN PLACE AND COMPACTED BEFORE INSTALLATION OF PROPOSED UTILITIES.
- CONTRACTOR SHALL REFER TO THE ARCHITECTURAL PLANS FOR EXACT LOCATIONS AND DIMENSIONS OF SLOPE PAVING, SIDEWALKS, PRECISE BUILDING DIMENSIONS AND EXACT BUILDING UTILITY ENTRANCE LOCATIONS.
- SANITARY SEWER PIPE SHALL BE AS FOLLOWS:
POLYVINYL CHLORIDE PIPE (PVC): SDR35 PER ASTM D3034 (FOR PIPES LESS THAN 12' DEEP)
POLYVINYL CHLORIDE PIPE (PVC): SDR26 PER ASTM D3034 (FOR PIPES MORE THAN 12' DEEP)
PIPE DIAMETER LESS THAN 1.5" TYPE K PER ASTM B88
PIPE DIAMETER 1.5" THROUGH 4" TYPE K PER ASTM B88
COPPER (CPR): SDR21 PER ASTM D2241
POLYVINYL CHLORIDE PIPE (PVC): SDR21 PER ASTM D2241
PIPE DIAMETER 4" AND LARGER
POLYVINYL CHLORIDE PIPE (PVC): SDR21 PER ASTM D2241
POLYVINYL CHLORIDE PIPE (PVC): DRYB PER AWWA C900
DUCTILE IRON PIPE (DIP): PER AWWA C151
- ALL WATER JOINTS ARE TO BE MECHANICAL JOINTS WITH THRUST BLOCKING.
- ALL CONCRETE FOR ENCASEMENTS SHALL HAVE A MINIMUM 28 DAY COMPRESSION STRENGTH AT 3000 P.S.I.
- UNDERGROUND UTILITY LINES SHALL BE INSTALLED, INSPECTED AND APPROVED BEFORE BACKFILLING.
- CONTRACTOR TO RELOCATE LIGHT POLES AND REPLACE LUMINAIRES AS INDICATED. CONTRACTOR TO BUILD NEW POLE BASES AND STUB WIRE AS NEEDED.
- CONTRACTOR SHALL START LAYING PIPE AT DOWNSTREAM STRUCTURE AND WORK UPSTREAM.
- CLEANOUTS SHALL BE LOCATED AT ALL HORIZONTAL AND VERTICAL CHANGES IN DIRECTION OF FLOW IN BUILDING LATERALS AND ANY SANITARY LATERAL OF 100 FEET OR LONGER.
- ALL TRENCHES UNDER AREAS TO BE PAVED, EXISTING PAVED AREAS, OR PUBLIC RIGHT-OF-WAY SHALL BE GRANULARLY BACKFILLED WITH 3/4 INCH MINUS CRUSHED WHITE ROCK.
- GAS, WATER AND OTHER UNDERGROUND UTILITIES SHALL NOT CONFLICT WITH THE DEPTH OR HORIZONTAL LOCATION OF EXISTING OR PROPOSED SANITARY AND STORM SEWERS.
- THE CONTRACTOR SHALL PREVENT ALL STORM WATER, SURFACE WATER, MUD AND CONSTRUCTION DEBRIS FROM ENTERING THE EXISTING SANITARY SEWER SYSTEM.
- THE EXISTING SANITARY SEWER SERVICE SHALL NOT BE INTERRUPTED.
- ALL SANITARY FLOW LINES AND TOPS BUILT WITHOUT ELEVATIONS FURNISHED BY THE ENGINEER SHALL BE THE RESPONSIBILITY OF THE SEWER CONTRACTOR.
- ALL SEWER PIPES SHALL HAVE POSITIVE DRAINAGE THROUGH STRUCTURES. NO FLAT INVERT STRUCTURES ARE ALLOWED.
- ANY ABANDONED SEWERS SHALL BE REMOVED OR COMPLETELY GROUT FILLED.



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DATE : MAY 15, 2022

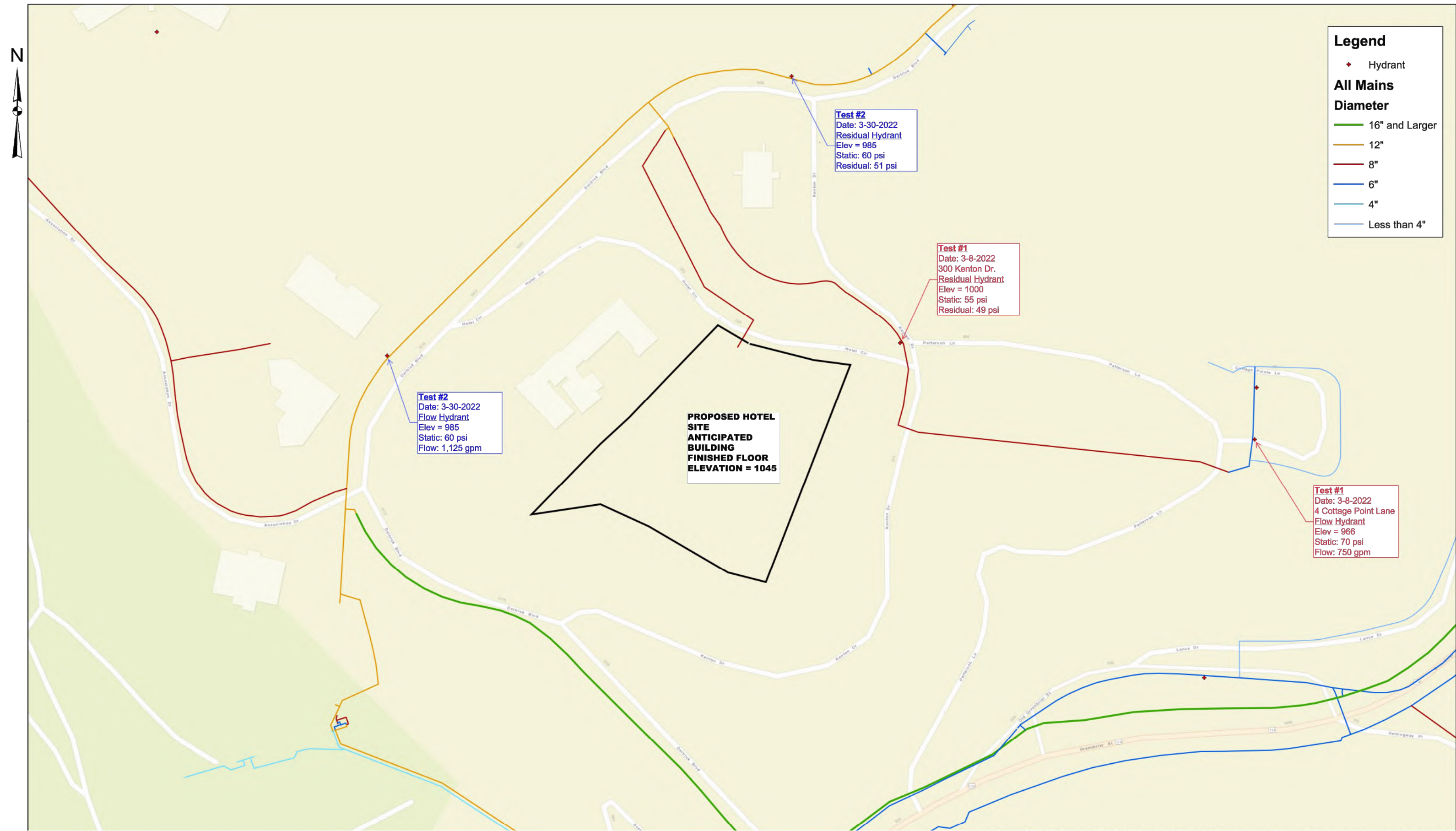
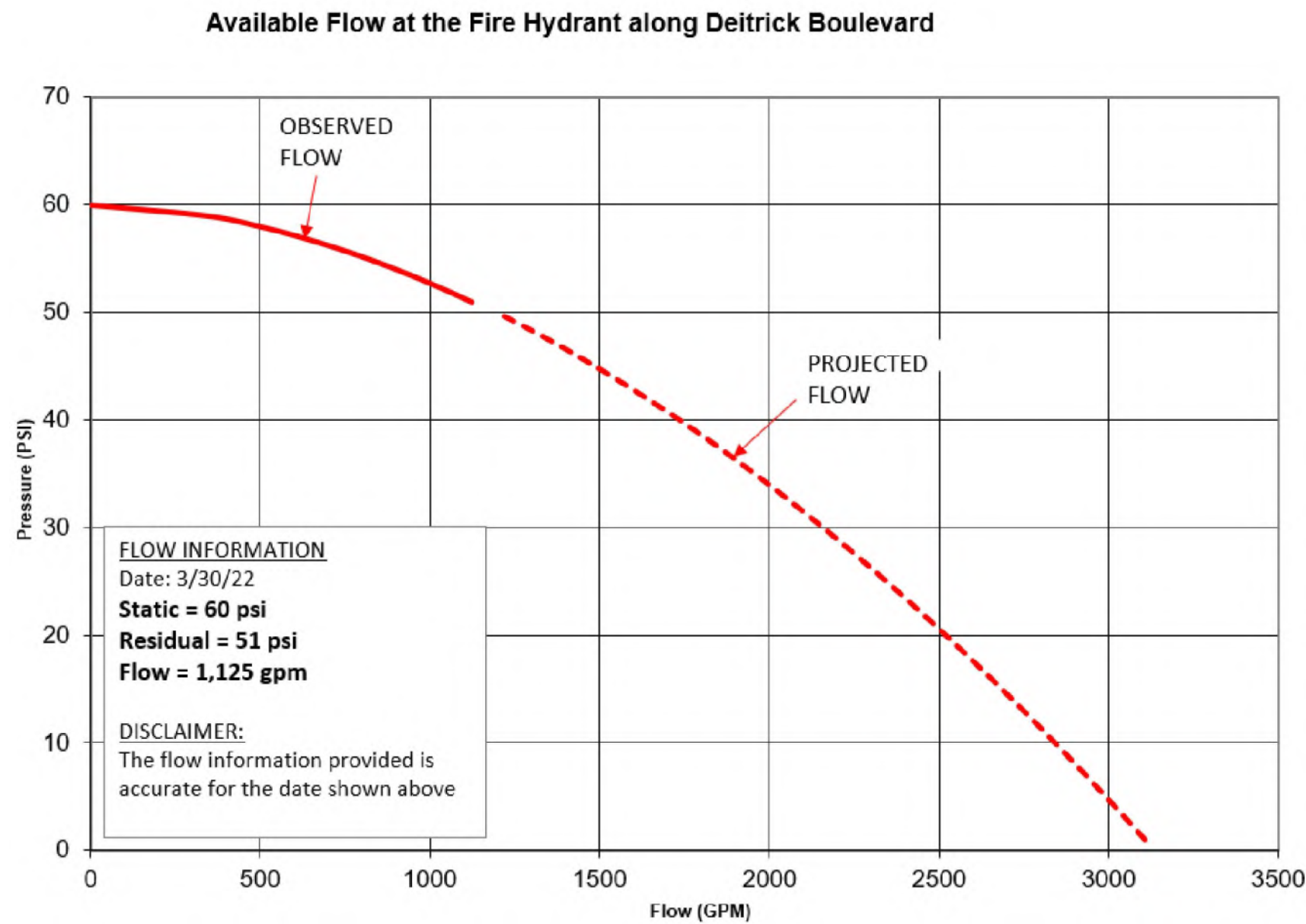
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@ HOTEL CIRCLE
CITY OF CHARLESTON - KANAWHA COUNTY, WEST VIRGINIA

UTILITY PLAN

SHEET NO.
C4.0

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WATER SYSTEM FLOW TEST DATA

METER SIZING FORM - DOMESTIC
WEST VIRGINIA AMERICAN WATER - CITY OF CHARLESTON, WEST VIRGINIA

Business Name	SINA 22 LLC	Address of Building	300 Hotel Circle
Development Name	RESIDENCE INN @ HOTEL CIRCLE	TM: TP: 50 31	

I certify the the information on this form is true and correct to the best of my knowledge

Applicant name (Print) Christopher Thompson - Civil Engineer Phone # 804-720-9040

(Signature) [Signature] Email thompson@sitedesignco.com

PART A

Fixture	Fixture Value 60 psi	No. of Fixtures	Fixture Value
Bathtub	8	X	127
Bedpan Washer	10	X	
Bidet	2	X	
Dental Unit	2	X	
Drinking Fountain - Public	2	X	2
Kitchen Sink	1.8	X	5
Lavatory (bathroom sink)	1.5	X	132
Showerhead (shower only)	2	X	127
Service Sink	4	X	2
Toilet - Flush Valve	24	X	4
Toilet - Tank Type	6	X	132
Urinal - Wall Flush Valve	10	X	4
Wash Sink (each set of faucets)	4	X	2
Dishwasher (residential)	2	X	
Washing Machine (residential)	6	X	
Hose (50 ft Wash Down)	8	X	
Other (Description) Ice Machine	12	X	6
Other (Description) Washing Machine (Commercial)	18	X	3
Other (Description) Eye wash	1.5	X	2
Other (Description) Pool	30	X	1
Combined Fixture Value Total (rounded to nearest whole number):			2,608

PART B

- Domestic Demand based on Fixture Value (see Attachment C) 153 gpm
- Fixed Demand (includes all demands except domestic and irrigation) gpm
- Irrigation Demand (From Engineer) gpm
- Total Demand (rounded) 153 gpm
- Actual Meter Size based on Total Demand 2 inch

CITY USE ONLY

Actual Meter Size Virtual Meter Size 1 1/2 inch

Sized by Date:

Treatment Plant

If service is an upgrade, enter existing service no.

WATER METER SIZING CALCULATIONS

IFC (International Fire Code) Method of Calculating NFF (Needed Fire Flow)

Project Name: Abilene Motor Express Truck Wash
Project No. 10199
Calc. By: Stuart Little
Date: 4/25/2016

IBC Construction Type: Type IV and V-A

Fire Factor: 1

Fire Area (SF): 33425

Minimum Required Fire Flow (GPM): 3250

Allowable Sprinkler Reduction: 0.75

Minimum Allowed Fire Flow (VV Fire Code 18.4.5.3.2): 1000

Calculated Fire Flow (GPM): 812.5

Adjusted Fire Flow (GPM): 1000

Flow Duration (hours): 2

Minimum Number of Hydrants: 1

Max Allowed Hose Lay to any point on Building (FT) 400

Based on Table 18.4.5.2.1, Minimum Required Fire Flow and Flow Duration for Buildings, Fire Code 2018 of West Virginia - NFPA 1, 2018

REQUIRED FIRE FLOW CALCULATIONS

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PROJECT # : 20064
PROJECT MANAGER : CHRIS THOMPSON
PHONE : 804-720-9040
EMAIL : thompson@sitedesignco.com

DATE : MAY 15, 2022

REVISION BLOCK

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UTILITY CALCULATIONS

SHEET NO.
C4.2

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Bioretention

6.6.10 Maintenance

Properly designed and installed bioretention systems require little maintenance. During periods of extended drought, bioretention systems may require watering approximately every 10 days. Table 6-6.4 provides recommended guidelines for inspection and maintenance activities.

Table 6-6.4: Bioinfiltration / Bioretention Maintenance Guidelines		
Activity		Schedule
- Water vegetation at the end of each day for two weeks after planting is completed. - Water vegetation regularly to ensure successful establishment. - Re-mulch void areas. - Treat diseased trees and shrubs. - Keep overflow free and clear of leaves.		First year after installation
- Inspect soil and repair eroded areas. - Remove litter and debris. - Clear leaves and debris from overflow.		Monthly
- Inspect trees and shrubs to evaluate health, replace if necessary. - Inspect underdrain cleanout. - Verify drained out time of system.		Biannually
- Add additional mulch. - Inspect for sediment buildup, erosion, vegetative conditions, etc.		Annually
Maintain records of all inspections and maintenance activity.		Ongoing

Design of bioretention systems is not limited to the examples shown within this manual. For more examples please refer to the bioretention section of the West Virginia DEP Stormwater Management and Design Guidance Manual at http://www.dep.wv.gov/WVE/Programs/stormwater/MS4/Documents/Specification_4.2.3_Bioreten-tion_WV-SWM-Manual-11-2012.pdf

Successful stormwater management plans will combine appropriate materials and designs specific to each site.

BIORETENTION GENERAL MAINTENANCE

CHAPTER 6 Post Construction Runoff Control

Bioretention

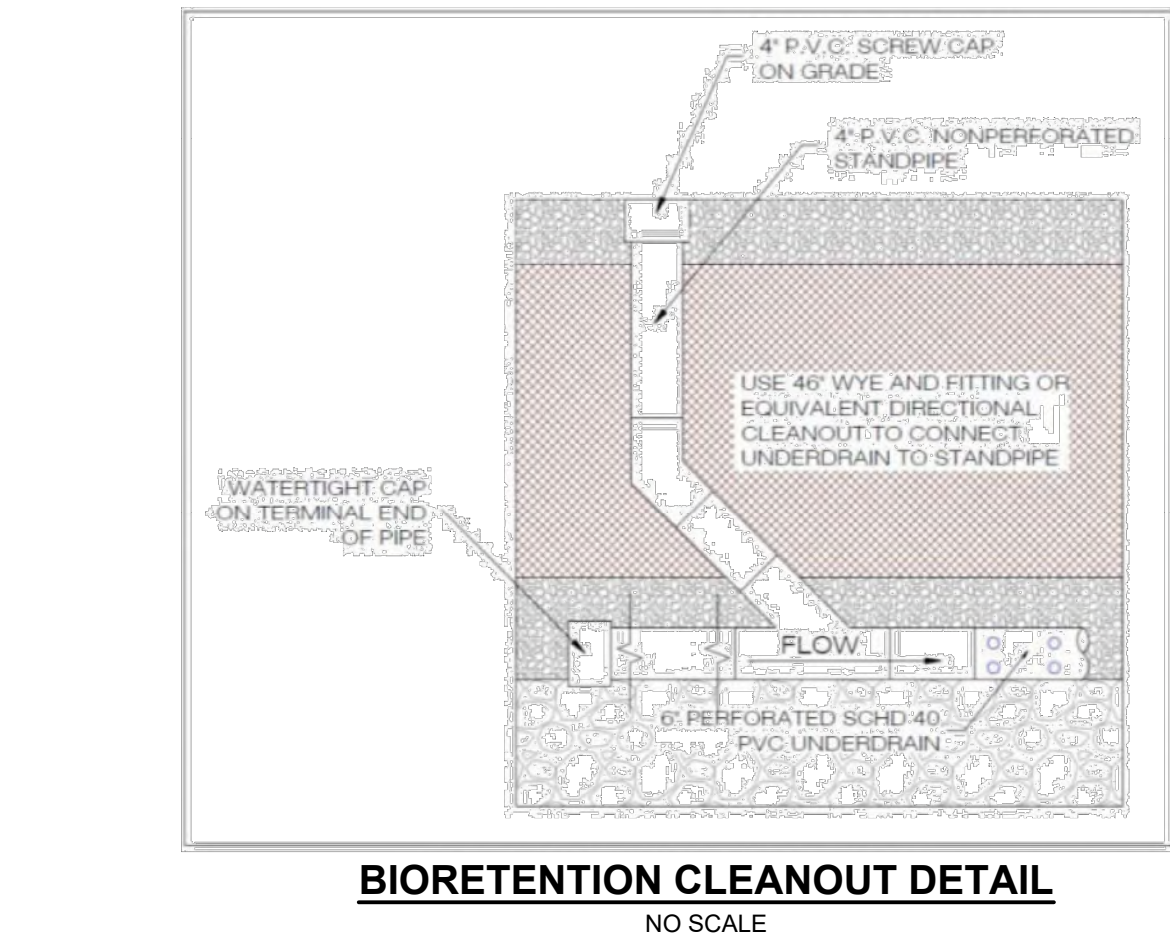
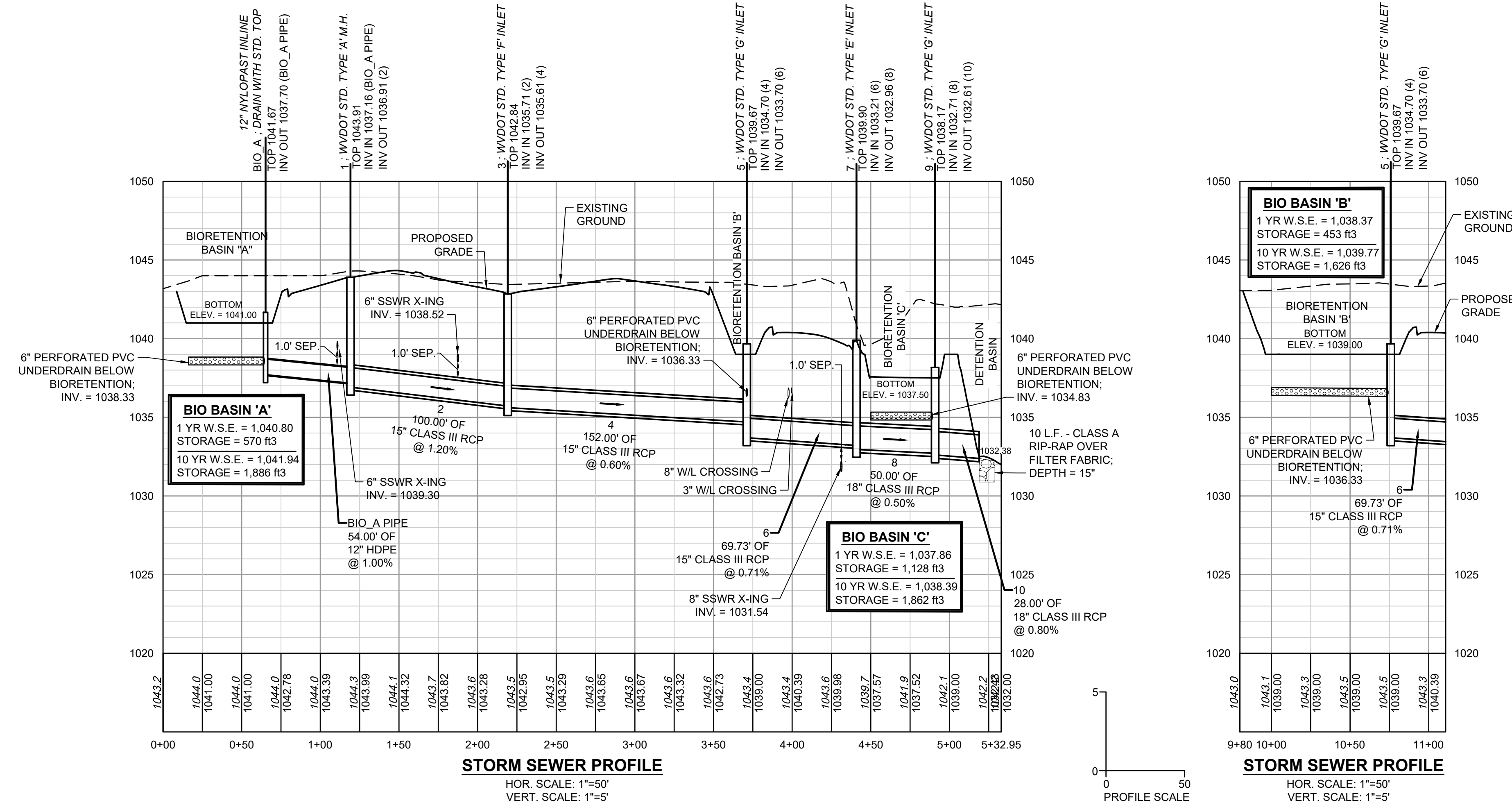
6.6.8 Materials

The following materials in Table 6-6.3 may be used to ensure the bioretention systems are efficient and effective.

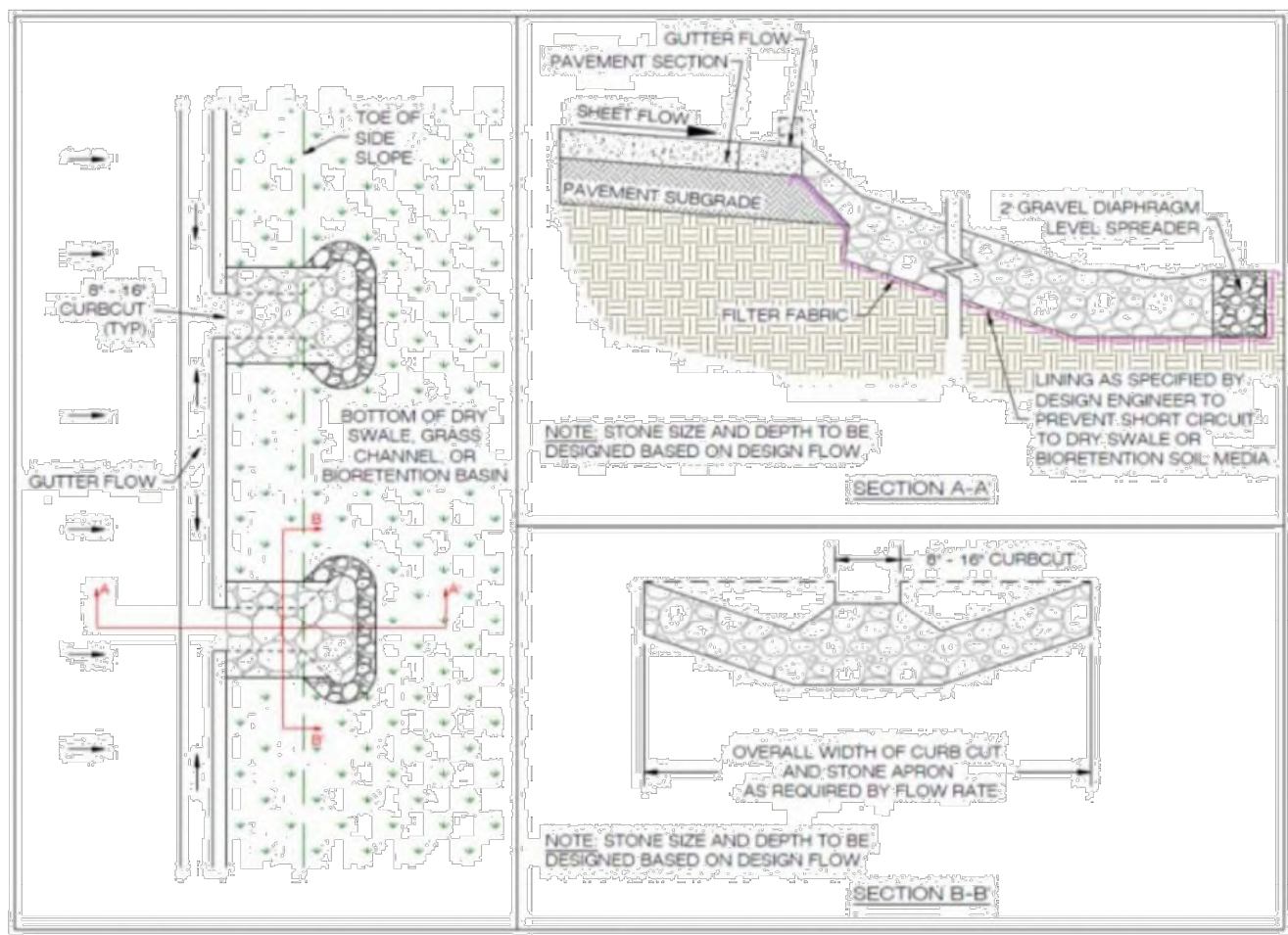
Table 6-6.3: Material Specifications		
Material	Specification	Notes
Filter Media	70%-88% sand • 8%-26% top soil • 3%-5% organic matter in the form of leaf compost.	Minimum depth of 24 in.; 36 in. recommended; (18 in. if an infiltration sump is used.) The volume of filter media used should be based on 110% of the plan volume, to account for settling or compaction.
Mulch Layer	Use aged, shredded hardwood bark mulch.	Lay a 2 to 3 in. layer on the surface of the filter bed.
Plant Materials	See Appendix C	Establish plant materials as specified in the landscaping plan and the recommended plant list.
Alternative Surface Cover	Use river stone or pea gravel, coir and jute matting, or turf cover.	Lay a 2 to 3 in. layer to suppress weed growth.
Filter Fabric (optional)	Woven monofilament fabric or non-woven geotextile as per AASHTO M-288 (do not use siltfence).	Apply only to the side slopes and, optionally, in a 2 ft. wide strip directly above the underdrain pipes.
Choking Layer	Layer of choker stone (typically No.8 or No.89 washed gravel), which is laid over the underdrain stone at a depth of 1 in. of choker stone for every 1 ft. of overlying soil media. An alternative is needle-punched, non-woven geotextile with the flow rate of > 110 gal/ min./sq. ft. (ONLY if stone choking layer cannot fit into the practice).	
Underdrain Stone	Between 7 and 21 mg./kg. of P in the soil media. CECs greater than 10.	12 in. depth
Infiltration Sump (As Needed)	1-in. diameter stone should be double-washed and clean and free of all fines (e.g., ASTM D448 No. 57 stone).	Designed to drain the sump design volume (gravel layer below underdrain or with an up-turned elbow) within 48 hours; can use standard 12 in. depth below the underdrain invert if soil at the infiltration sump elevation has a verified infiltration rate $\geq$ 0.25 in./hr.
Storage Layer (optional)	To increase storage for larger storm events, chambers, perforated pipe, stone, or other acceptable material can be incorporated below the filter media layer.	
Impermeable Liner (optional)	Use a thirty mil (minimum) PVC Geomembrane liner covered by 8 to 12 oz./sq. yd. non-woven geotextile. Note: This is used only for stormwater hotspots, and small practices near building foundations, or in fill soils as determined by a geotechnical investigation.	
Underdrains, Cleanouts, and Observation Wells	Use 4- or 6-in. rigid PVC pipe (or equivalent corrugated HDPE for small bioretention practices), with 3/8-in. perforations at 6 in. on center; each underdrain should be located no more than 20 feet from the next pipe.	Lay the perforated pipe under the length of the bioretention cell, and install non-perforated pipe as needed to connect with the storm drain system or to daylight in a stabilized conveyance. Install Ts and Ys as needed, depending on the underdrain configuration. Extend cleanout pipes to the surface with vented caps at the Ts and Ys.

City of Charleston Stormwater Manual v1.0 | 6-27

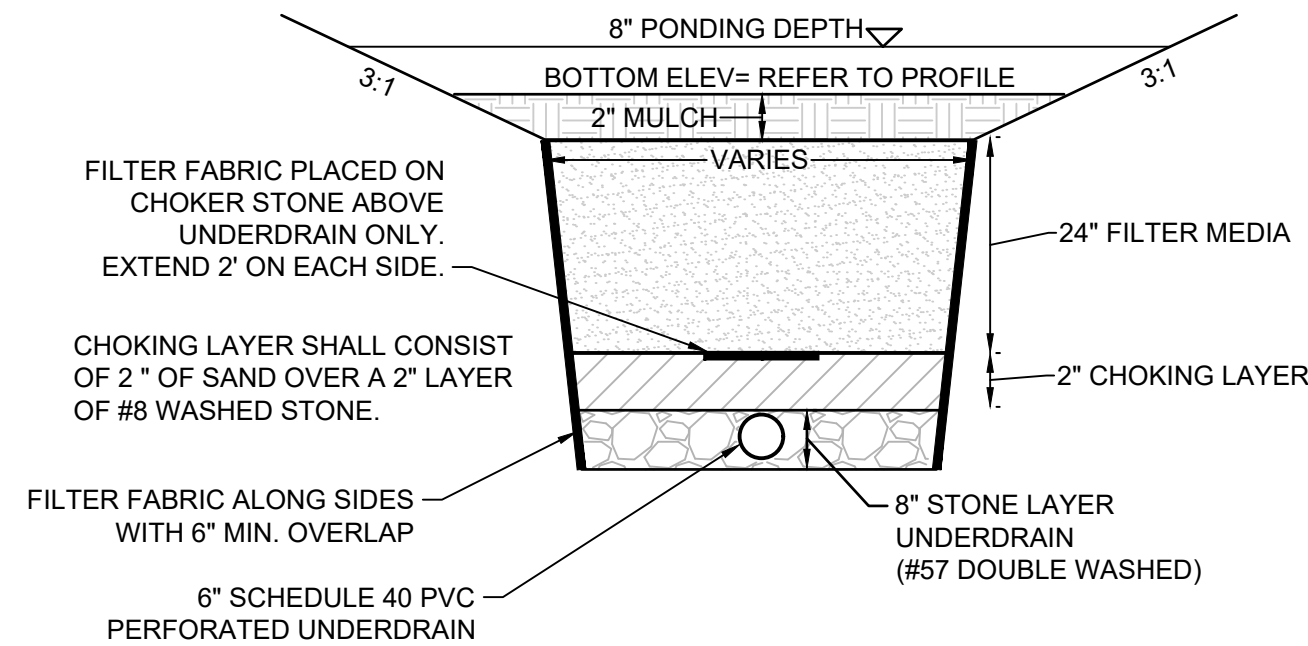
BIORETENTION MATERIAL SPECIFICATIONS



BIORETENTION CLEANOUT DETAIL
NO SCALE



BIORETENTION GRAVEL FLOW SPREADER DETAIL
NO SCALE



BIORETENTION BASIN TYPICAL SECTION
NO SCALE

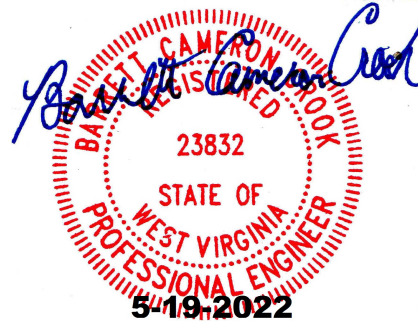
GEOTECHNICAL INSPECTION NOTE:

THE DESIGN AND CONSTRUCTION OF THE BMP WILL BE SUBJECT TO INDEPENDENTLY DOCUMENTED GEOTECHNICAL APPROVAL. THE SERVICES WHICH MUST BE PROVIDED BY THE INDEPENDENT GEOTECHNICAL ENGINEERING FIRM SHALL INCLUDE FULL TIME GEOTECHNICAL INSPECTION PAID FOR BY THE DEVELOPER. THAT FULL TIME INSPECTION SHALL INCLUDE BUT NOT BE LIMITED TO THE FOLLOWING:

- OBSERVATION, TESTING AND DOCUMENTATION OF:
 - SUITABLE SUBGRADES TO RECEIVE COMPACTED STRUCTURAL FILL FOR EARTH DAM CONSTRUCTION.
 - THE CUT OFF TRENCH, SPILLWAY PIPE, DRAINAGE BLANKET, RISER STRUCTURE AND CONCRETE CHUTE SPILLWAY SUBGRADES AS APPLICABLE TO EVALUATE WHETHER SUITABLE SOIL IS PRESENT AT BEARING GRADE TO VERIFY PROPER INSTALLATION.
 - FILL PLACEMENT AND FIELD DENSITY TESTING TO EVALUATE/VERIFY PROPER COMPACTION.
 - REINFORCING STEEL, IF REQUIRED, TO EVALUATE IT CONFORMANCE WITH THE PROJECT PLANS AND SPECIFICATIONS.

BIORETENTION SECTION NOTES AND DETAIL

NO SCALE



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DATE : MAY 15, 2022

REVISION BLOCK

NO.	DESCRIPTION
1	ISSUED FOR PERMIT
2	REVISED
3	REVISED
4	REVISED
5	REVISED
6	REVISED
7	REVISED
8	REVISED
9	REVISED
10	REVISED

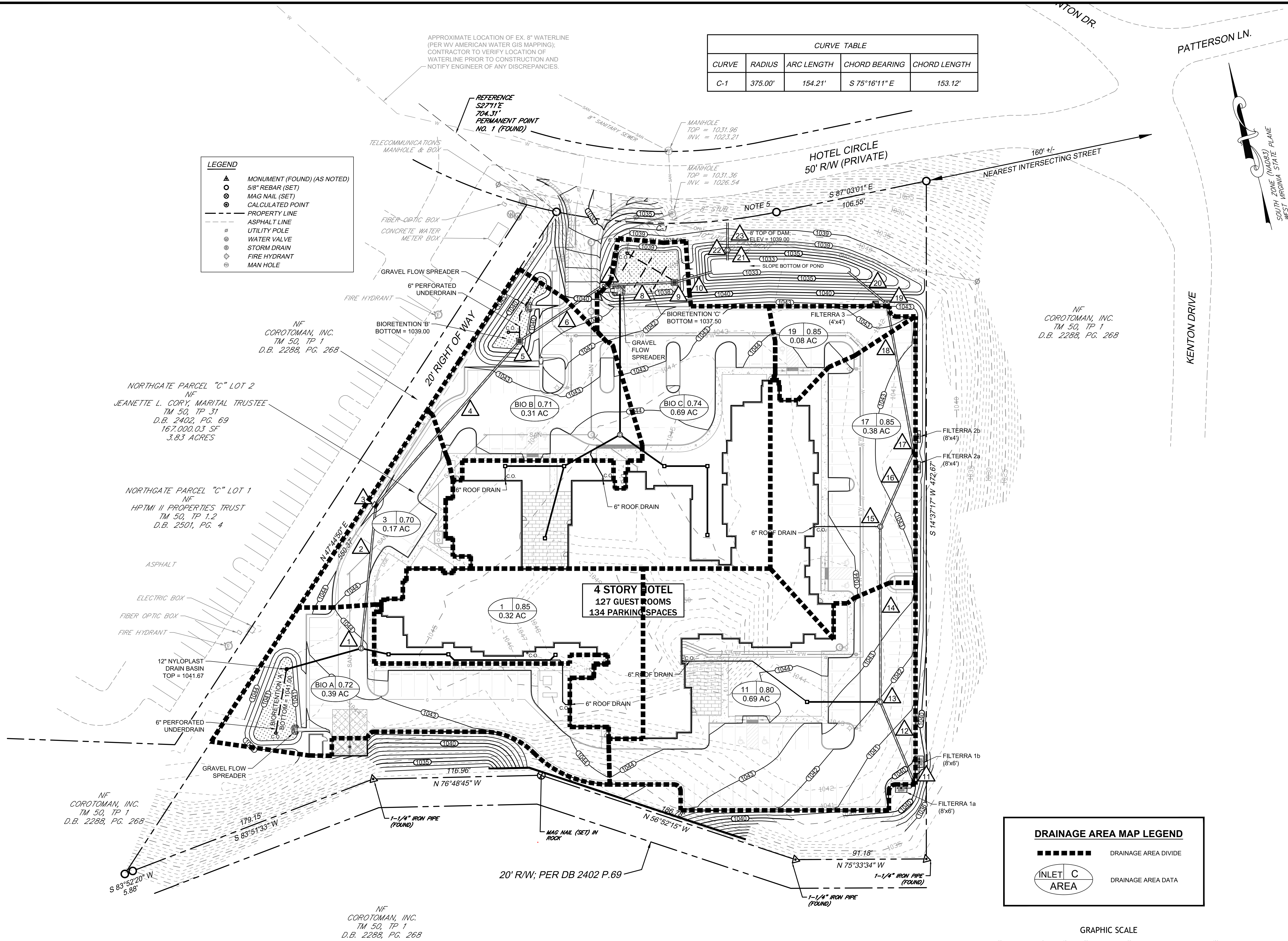
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CITY OF CHARLESTON - KANAWHA COUNTY, WEST VIRGINIA

PROFILES

SHEET NO.
C6.0

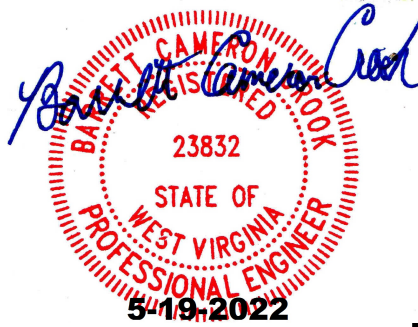
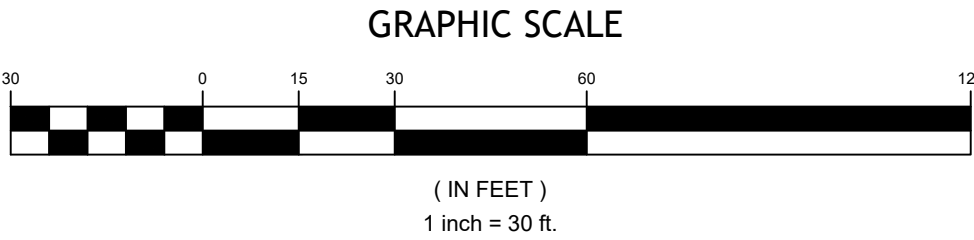
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CURVE TABLE				
CURVE	RADIUS	ARC LENGTH	CHORD BEARING	CHORD LENGTH
C-1	375.00'	154.21'	S 75°16'11" E	153.12'

LEGEND	
▲	MONUMENT (FOUND) (AS NOTED)
○	5/8" REBAR (SET)
⊙	MAG NAIL (SET)
⊙	CALCULATED POINT
---	PROPERTY LINE
---	ASPHALT LINE
⊙	UTILITY POLE
⊙	WATER VALVE
⊙	STORM DRAIN
⊙	FIRE HYDRANT
⊙	MAN HOLE

DRAINAGE AREA MAP LEGEND	
-----	DRAINAGE AREA DIVIDE
INLET C AREA	DRAINAGE AREA DATA



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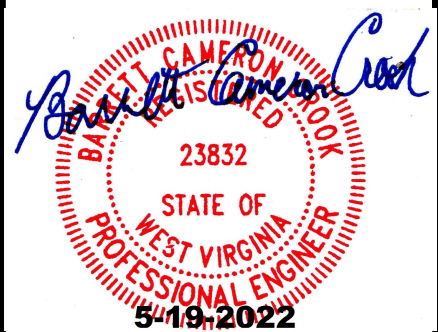
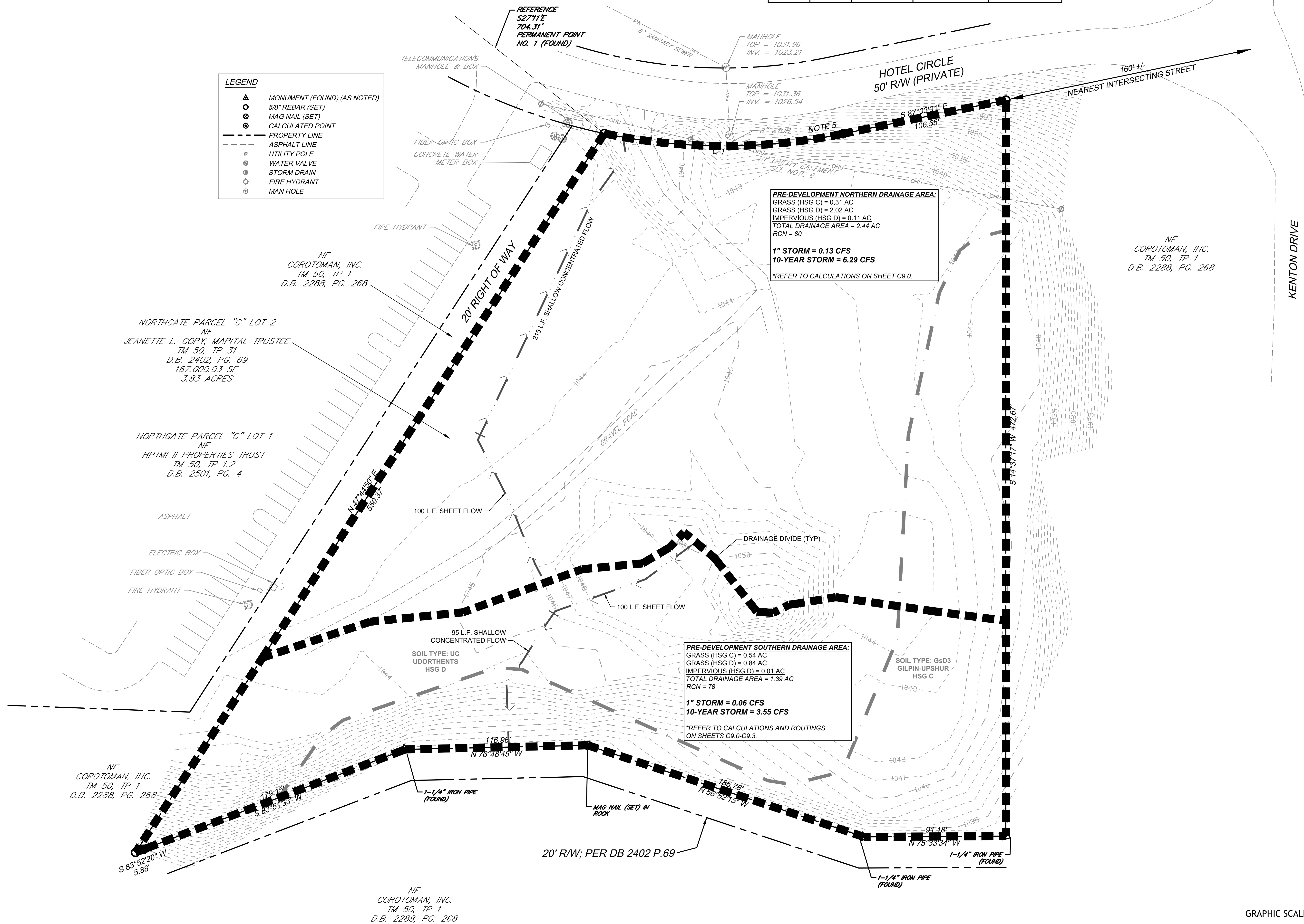
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DRAINAGE AREA TO INLETS

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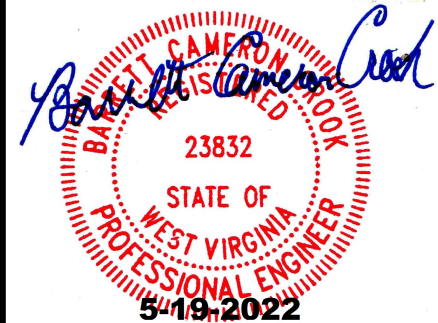
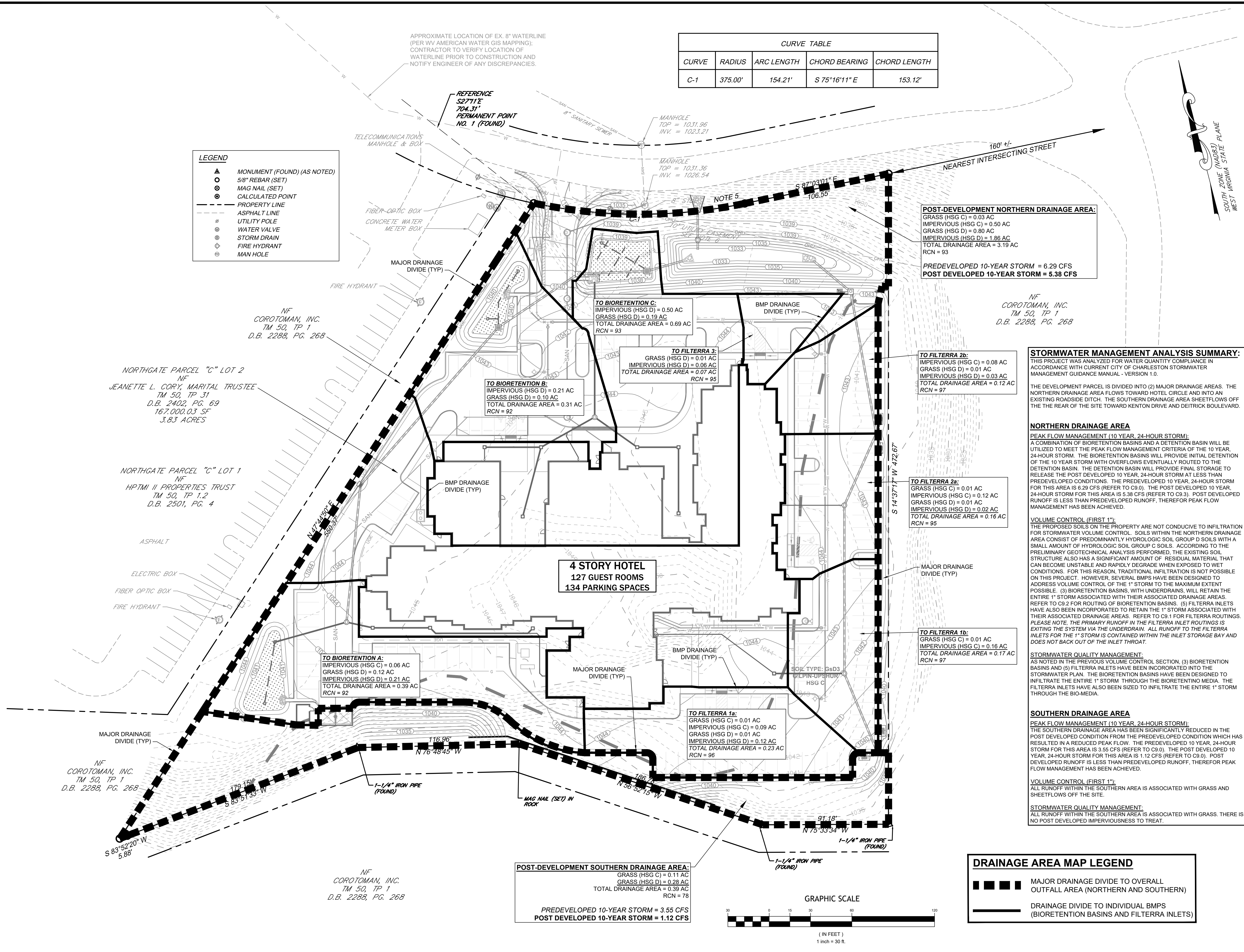


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CITY OF CHARLESTON - KANAWHA COUNTY, WEST VIRGINIA
**PRE-DEVELOPMENT STORMWATER
QUANTITY ANALYSIS**

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DATE : MAY 15, 2022
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CITY OF CHARLESTON - KANAWHA COUNTY, WEST VIRGINIA

**POST DEVELOPMENT STORMWATER
MANAGEMENT ANALYSIS**

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C8.1

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WORKSHEET FOR SCS HYDROLOGIC PARAMETERS

Site Conditions:	☒ Existing	Project: Residence Inn - Charleston WV
	☐ Proposed	Subarea Number: NORTH
Off-Site Land Use:	☒ Existing	By: Chris Thompson
	☐ Proposed	Date: 4/25/2022

RUNOFF CURVE NUMBER

Soil Group		Land Use or Zoning	Area (acres)	RCN	RCN x Area
C	Good	IMPERVIOUS		98	0
C	Good	GRASS > 75% (Similar to Pasture)	0.31	74	22.94
C	Good	WOODS		70	0
D	Good	IMPERVIOUS	0.11	98	10.78
D	Good	GRASS > 75% (Similar to Pasture)	2.02	80	161.6
D	Good	WOODS		77	0

Total Area 2.44 ac 0.004 sq. mi Weighted RCN = 80

TIME OF CONCENTRATION

ID	Type of Flow	n	Length (ft)	Slope (ft/ft)	Area (sf)	Wet P (ft)	Velocity (fps)	Tc (hrs)
Sheet Flow ($P_2 = 2.66$ in.)					$T_{10} = 0.007 (nL)^{0.58}$ $(P_2)^{0.5} S^{0.4}$			0.15
A	Grass	0.15	100	0.03				
Shallow Concentrated Flow						Fig. 3.1, TR-55	$T_1 = L/3600V$	
B	Unpaved		215	0.032			2.9	0.02
Channel Flow								$T_1 = L/3600V$
C							0.00	0.00
Total T_c								0.17

PREDEVELOPED (NORTHERN DRAINAGE AREA)

WORKSHEET FOR SCS GRAPHICAL PEAK DISCHARGE

Project:	Residence Inn - Charleston WV
Subarea Number:	NORTH
By:	Chris Thompson
Date:	4/25/2022

Existing Conditions

Existing Project Data Summary	2.44 acres	0.004 square mi
Drainage Area		
Runoff Curve Number	80	
Time of Concentration	0.17 hours	
Rainfall Distribution Assumed Type II		

	Storm 1	Storm 2	Storm 3	Storm 4
Frequency	yr	WQ	10	100
P, 24-hour rainfall	in	1.00	3.93	5.40
Initial Abstraction, I _a	in	0.498	0.498	0.498
Compute I _a /P		0.50	0.13	0.09
Unit Peak Discharge, q _u	csf/in	400	830	860
Runoff, q	in	0.08	1.99	3.25
Peak Discharge, Q	cfs	0.13	6.29	10.65

STORM SEWER DESIGN COMPUTATIONS

PROJECT:	Residence Inn by Marriott	JOB # 20064
COUNTY:	City of Charleston, WV	
DESCRIPTION:	Storm Sewer	
DATE:	5/18/2022	

Storm Frequency= 10 year
n = 0.013
* = Manual Input of Data

FROM POINT	PIPE NAME	TO POINT	DRAINAGE AREA (acres)	RUNOFF COEFFICIENT	CA INCRE.	CA ACCUM.	INLET TIME (min)	RAIN-FALL (in/hr)	RUNOFF Q (cfs)	TOP STR (elev)	HEIGHT STR (ft)	INV UPPER (ft)	INV. LOWER (ft)	LENGTH (ft)	SLOPE (ft/ft)	DIA (in)	CAPACITY (cfs)	VELOCITY (ft/s)	FLOW TIME (min)	FLAG				

FROM BIORETENTION A			REFER TO BIORETENTION A ROUTING; 1.47 cfs FOR 10 yr STORM							1.47														
1	2	3	0.32	0.85	0.27	0.27	5.00	6.50	3.24	1043.90	6.99	1036.91	1035.71	100.00	0.012	15	7.07	5.65	0.30	ok				
3	4	5	0.17	0.70	0.12	0.39	5.30	6.50	4.01	1042.84	7.23	1035.61	1034.70	152.00	0.006	15	5.00	4.54	0.56	ok				
5	6	7	REFER TO BIORETENTION B ROUTING; 1.17 cfs FOR 10 yr STORM							5.18 1039.67														
7	8	9	0.00 (adjacent cur opening captures run					5.53	6.50	5.18 1039.90					6.94	1032.96	1032.71	50.00	0.005	18	7.43	4.55	0.18	ok
9	10	BASIN	REFER TO BIORETENTION C ROUTING; 3.51 cfs FOR 10 yr STORM							8.69 1038.17														

11	12	13	0.69	0.80	0.55	0.55	5.00	6.50	3.59	1039.59	4.09	1035.50	1035.20	59.91	0.005	15	4.57	4.13	0.24	ok				
13	14	15	0.00	0.00	0.00	0.55	5.24	6.50	3.59	1041.95	6.85	1035.10	1034.49	122.10	0.005	15	4.57	4.13	0.49	ok				
15	16	17	0.00	0.00	0.00	0.55	5.74	6.50	3.59	1043.35	8.96	1034.39	1034.11	56.90	0.005	15	4.57	4.13	0.23	ok				
17	18	19	0.38	0.85	0.32	0.88	5.97	6.50	5.69	1042.20	8.34	1033.86	1033.33	104.53	0.005	18	7.50	4.68	0.37	ok				
19	20	BASIN	0.08	0.85	0.07	0.94	6.34	6.22	5.87	1043.00	9.77	1033.23	1033.00	36.00	0.006	18	8.27	5.09	0.12	ok				

STORM SEWER CAPACITY CALCULATIONS (10 YR STORM)

10 YEAR STORM																												
Mannings N Value: 0.013 Job #: 20064 Project: Residence Inn by Marriott Date: 5/18/2022																												
Initial Water Surface	Inlet Sta.	Inlet Q	Outfall Invert Elev.	Outlet Water Surf.	Do	Qo	Lo	Sfo %	Hf	Vo	Ho	Qi	Vi	Q/Vi	Junction Loss				Final H	Inlet Water Surf.	Rim Elev.	Fig. H	Fig. H delta	Sha Inlet	Comments			
															Vi sq. 2g	Hi	Ang.	H delta										
1036.62	9	3.51	1032.38	1036.62	18"	8.69	28.00	0.68%	0.19	6.08	0.14	5.18	4.55	23.6	0.32	0.11	30	0.09	0.35	0.45	0.64	1037.26	1038.17	y	y	N	OK	-0.91 Ft.
1037.26	7		1032.71	1037.26	18"	5.18	50.00	0.24%	0.12	4.55	0.08	5.18	5.03	26.1	0.39	0.14	90	0.28	0.50		0.62	1037.88	1039.90	y	y	N	OK	-2.02 Ft.
1037.88	5	1.17	1033.21	1037.88	15"	5.18	69.73	0.64%	0.45	5.03	0.10	4.01	4.54	18.2	0.32	0.11	75	0.21	0.42	0.55	1.00	1038.88	1039.67	y	y	N	OK	-0.79 Ft.
1038.88	3	0.77	1034.70	1038.88	15"	4.01	152.00	0.39%	0.59	4.54	0.08	3.24	5.65	18.3	0.50	0.17	90	0.35	0.61		1.19	1040.07	1042.84	y	y	N	OK	-2.77 Ft.
1040.07	1	1.77	1035.71	1040.07	15"	3.24	100.00	0.25%	0.25	5.65	0.12	0.00					90		0.12	0.16	0.41	1040.48	1043.90	y	y	N	OK	-3.42 Ft.
1036.62	19	0.42	1033.00	1036.62	18"	5.87	36.00	0.31%	0.11	5.09	0.10	5.69	4.68	26.6	0.34	0.12	30		0.22		0.33	1036.95	1043.00	y	y	N	OK	-6.05 Ft.
1036.95	17	2.10	1033.33	1036.95	18"	5.69	104.53	0.29%	0.31	4.68	0.08	3.59	4.13	14.8	0.26	0.09	30	0.07	0.25	0.33	0.63	1037.59	1042.20	y	y	N	OK	-4.61 Ft.
1037.59	15		1034.11	1037.59	15"	3.59	56.90	0.31%	0.18	4.13	0.07	3.59	4.13	14.8	0.26	0.09	30	0.07	0.23		0.41	1037.99	1043.35	y	y	N	OK	-5.36 Ft.
1037.99	13		1034.49	1037.99	15"	3.59	122.10	0.31%	0.38	4.13	0.07	3.59	4.13	14.8	0.26	0.09	30	0.07	0.23		0.61	1038.60	1041.95	y	y	N	OK	-3.35 Ft.
1038.60	11	3.59	1035.20	1038.60	15"	3.59	59.91	0.31%	0.18	4.13	0.07	0.00					30	0.07	0.09		0.27	1038.88	1039.59	y	y	N	OK	-0.71 Ft.

STORM SEWER HYDRAULIC GRADE LINE CALCULATIONS

WORKSHEET FOR SCS HYDROLOGIC PARAMETERS

Site Conditions:	☒ Existing	Project: Residence Inn - Charleston WV
	☐ Proposed	Subarea Number: SOUTH
Off-Site Land Use:	☒ Existing	By: Chris Thompson
	☐ Proposed	Date: 4/25/2022

RUNOFF CURVE NUMBER

Soil Group		Land Use or Zoning	Area (acres)	RCN	RCN x Area
C	Good	IMPERVIOUS		98	0
C	Good	GRASS > 75% (Similar to Pasture)	0.54	74	39.96
C	Good	WOODS		70	0
D	Good	IMPERVIOUS	0.01	98	0.98
D	Good	GRASS > 75% (Similar to Pasture)	0.84	80	67.2
D	Good	WOODS		77	0

Total Area 1.39 ac 0.002 sq. mi Weighted RCN = 78

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 = 2.66 in.)					$T_{10} = 0.007 (nL)^{0.58} / (P_2)^{0.5} S^{0.4}$			0.13
A	Grass	0.15	100	0.047				
Shallow Concentrated Flow					Fig. 3.1, TR-55			T ₁ =L/(3600V)
B	Paved		95	0.145			6	0.00
Channel Flow								T ₁ =L/(3600V)
C							0.00	0.00
							Total T _c	0.13

PREDEVELOPED (SOUTHERN DRAINAGE AREA)

WORKSHEET FOR SCS GRAPHICAL PEAK DISCHARGE

Project:	Residence Inn - Charleston WV
Subarea Number:	SOUTH
By:	Chris Thompson
Date:	4/25/2022

Existing Conditions

Existing Project Data Summary	1.39 acres	0.002 square mi
Drainage Area		
Runoff Curve Number	78	
Time of Concentration	0.13 hours	
Rainfall Distribution Assumed Type II		

	Storm 1	Storm 2	Storm 3	Storm 4
Frequency	yr	WQ	10	100
P, 24-hour rainfall	in	1.00	3.93	5.40
Initial Abstraction, I _a	in	0.571	0.571	0.571
Compute I _a /P		0.57	0.15	0.11
Unit Peak Discharge, q _u	csf/in	470	900	920
Runoff, q	in	0.06	1.82	3.04
Peak Discharge, Q	cfs	0.06	3.55	6.07

WORKSHEET FOR SCS HYDROLOGIC PARAMETERS

Site Conditions:	☒ Existing	Project: Residence Inn - Charleston WV
	☐ Proposed	Subarea Number: SOUTH
Off-Site Land Use:	☒ Existing	By: Chris Thompson
	☐ Proposed	Date: 4/25/2022

RUNOFF CURVE NUMBER

Soil Group		Land Use or Zoning	Area (acres)	RCN	RCN x Area
C	Good	IMPERVIOUS		98	0
C	Good	GRASS > 75% (Similar to Pasture)	0.11	74	8.14
C	Good	WOODS		70	0
D	Good	IMPERVIOUS		98	0
D	Good	GRASS > 75% (Similar to Pasture)	0.28	80	22.4
D	Good	WOODS		77	0

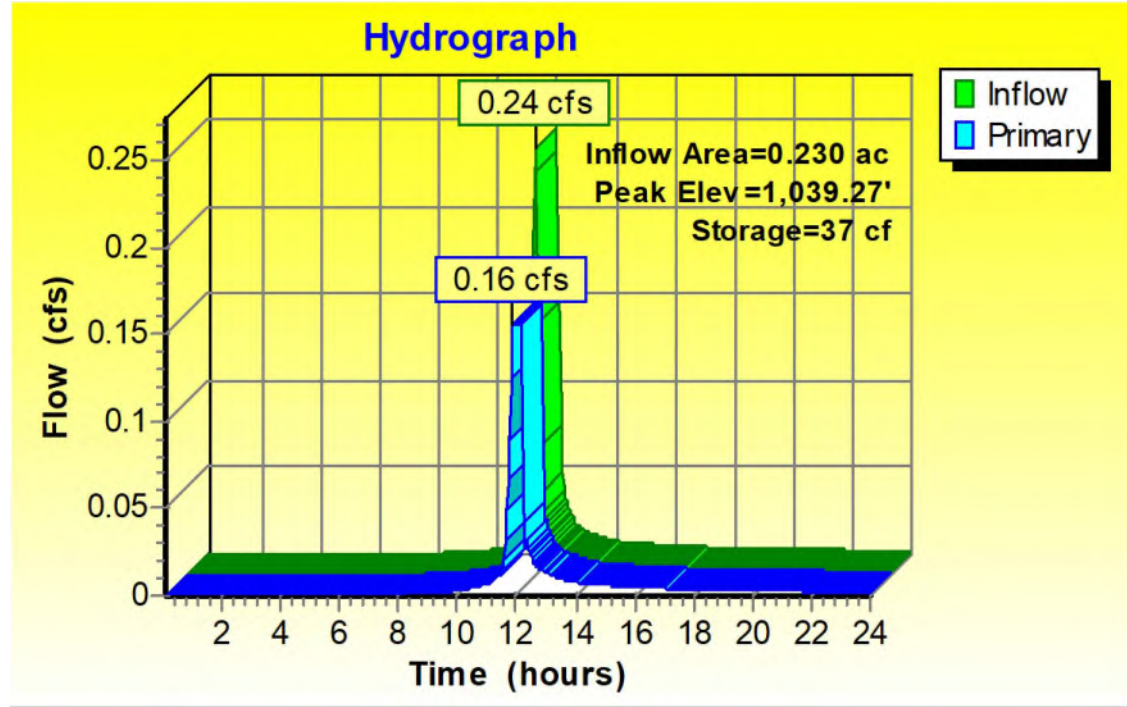
Total Area 0.39 ac 0.001 sq. mi Weighted RCN = 78

TIME OF CONCENTRATION

ID	Type of Flow	n	Length (ft)	Slope (ft/ft)	Area (sf)	Wet P (ft)	Velocity (fps)	Tc (hrs)
Sheet Flow ($P_2 = 2.66$ in.)					$T_{10} = 0.007 (nL)^{0.58} / (P_2)^{0.5} S^{0.4}$			0.05
A	Grass	0.15	70	0.2				
Shallow Concentrated Flow					Fig. 3.1, TR-55			$T_1 = L/3600V$
B	Paved		95	0.145			6	0.00
Channel Flow								$T_1 = L/3600V$
C							0.00	0.00
							Total T_c	0.10

POST DEVELOPED (SOUTHERN DRAIN

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FILTERRA 1a ROUTING (1" STORM)

Summary for Pond F1a: Filterra 1a (8'x6')

Inflow Area = 0.230 ac, 0.00% Impervious, Inflow Depth > 0.63" for Custom event
Inflow = 0.24 cfs @ 11.97 hrs, Volume= 0.012 af
Outflow = 0.16 cfs @ 11.90 hrs, Volume= 0.012 af, Atten= 36%, Lag= 0.0 min
Primary = 0.16 cfs @ 11.90 hrs, Volume= 0.012 af

Routing by Stor-Ind method, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
Peak Elev= 1,039.27' @ 12.04 hrs Surf.Area= 48 sf Storage= 37 cf

Plug-Flow detention time= 1.8 min calculated for 0.012 af (100% of inflow)
Center-of-Mass det. time= 1.3 min (811.7 - 810.4)

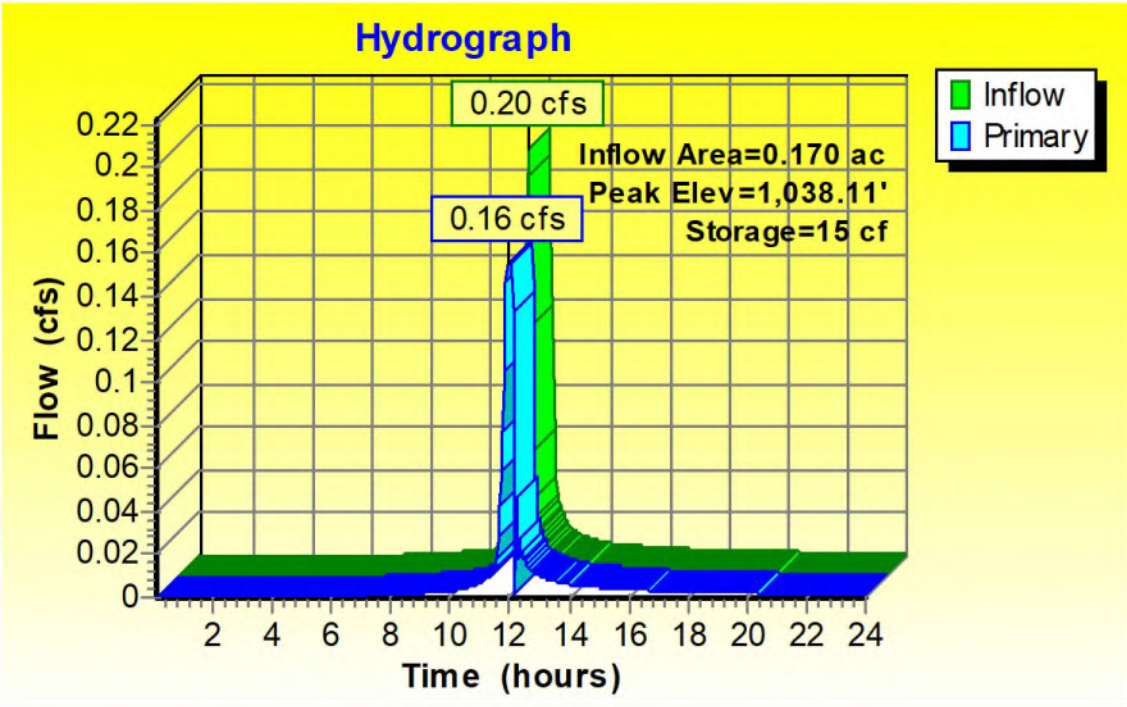
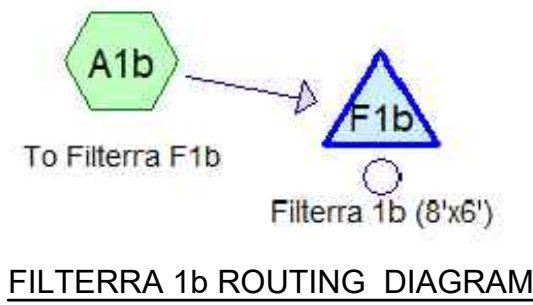
Volume	Invert	Avail. Storage	Storage Description		
#1	1,036.61'	48 cf	Custom Stage Data (Prismatic) Listed below (Recalc)		
Elevation (feet)	Surf Area (sq-ft)	Voids (%)	Inc. Store (cubic-feet)	Cum. Store (cubic-feet)	
1,036.61	48	0.0	0	0	
1,039.11	48	25.0	30	30	
1,039.48	48	100.0	18	48	

Device	Routing	Invert	Outlet Devices
#1	Primary	1,036.61'	4.0" Round Culvert L= 4.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,036.61' / 1,036.57" S= 0.0100' / Cc= 0.900 n= 0.010 P.V.C. smooth interior, Flow Area= 0.09 sf
#2	Device 1	1,036.61'	140.000 in/hr Exfiltration over Surface area

Primary Outflow Max= 0.16 cfs @ 11.90 hrs HW= 1,037.16' (Free Discharge)
1= Culvert (Passes 0.16 cfs of 0.26 cfs potential flow)
2= Exfiltration (Exfiltration Controls 0.16 cfs)

FILTERRA 1a SUMMARY (1" STORM)

FILTERRA 1a ROUTING



FILTERRA 1b ROUTING (1" STORM)

Summary for Pond F1b: Filterra 1b (8'x6')

[85] Warning: Oscillations may require smaller dt or Finer Routing (severity=1)

Inflow Area = 0.170 ac, 0.00% Impervious, Inflow Depth > 0.70" for Custom event
Inflow = 0.20 cfs @ 11.97 hrs, Volume= 0.010 af
Outflow = 0.16 cfs @ 11.95 hrs, Volume= 0.010 af, Atten= 22%, Lag= 0.0 min
Primary = 0.16 cfs @ 11.95 hrs, Volume= 0.010 af

Routing by Stor-Ind method, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
Peak Elev= 1,038.11' @ 12.02 hrs Surf.Area= 48 sf Storage= 15 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 1.0 min (799.7 - 798.7)

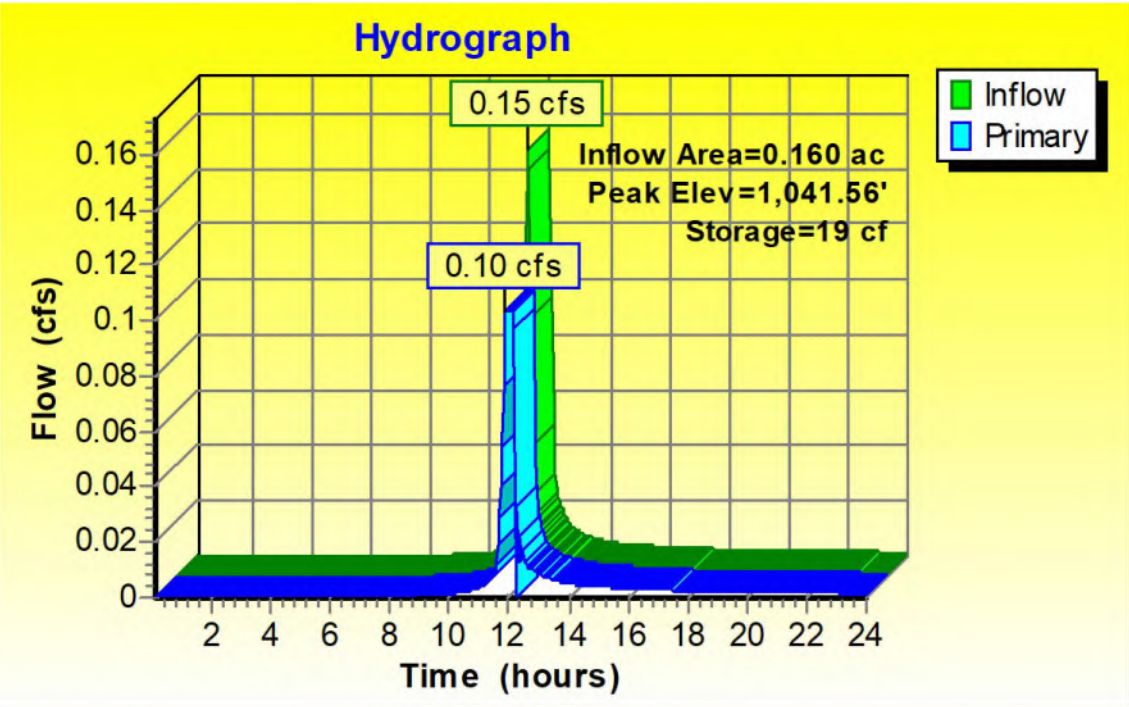
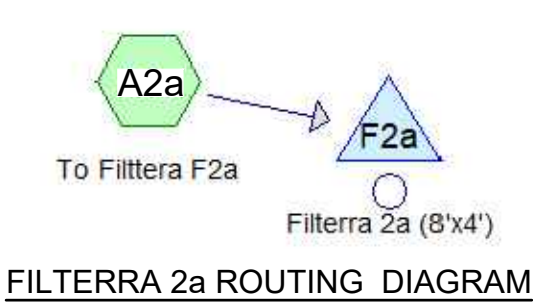
Volume	Invert	Avail.Storage	Storage Description		
#1	1,036.86'	48 cf	Custom Stage Data (Prismatic) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
1,036.86	48	0.0	0	0	
1,039.36	48	25.0	30	30	
1,039.73	48	100.0	18	48	

Device	Routing	Invert	Outlet Devices
#1	Primary	1,036.86'	4.0" Round Culvert L= 4.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,036.86' / 1,036.82" S= 0.0100' / Cc= 0.900 n= 0.010 P.V.C. smooth interior, Flow Area= 0.09 sf
#2	Device 1	1,036.86'	140.000 in/hr Exfiltration over Surface area

Primary Outflow Max= 0.16 cfs @ 11.95 hrs HW= 1,037.53' (Free Discharge)
1= Culvert (Passes 0.16 cfs of 0.30 cfs potential flow)
2= Exfiltration (Exfiltration Controls 0.16 cfs)

FILTERRA 1b SUMMARY (1" STORM)

FILTERRA 1b ROUTING



FILTERRA 2a ROUTING (1" STORM)

Summary for Pond F2a: Filterra 2a (8'x4')

[85] Warning: Oscillations may require smaller dt or Finer Routing (severity=1)

Inflow Area = 0.160 ac, 0.00% Impervious, Inflow Depth > 0.56" for Custom event
Inflow = 0.15 cfs @ 11.97 hrs, Volume= 0.008 af
Outflow = 0.10 cfs @ 11.90 hrs, Volume= 0.008 af, Atten= 33%, Lag= 0.0 min
Primary = 0.10 cfs @ 11.90 hrs, Volume= 0.008 af

Routing by Stor-Ind method, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
Peak Elev= 1,041.56' @ 12.04 hrs Surf.Area= 32 sf Storage= 19 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.5 min (820.7 - 820.2)

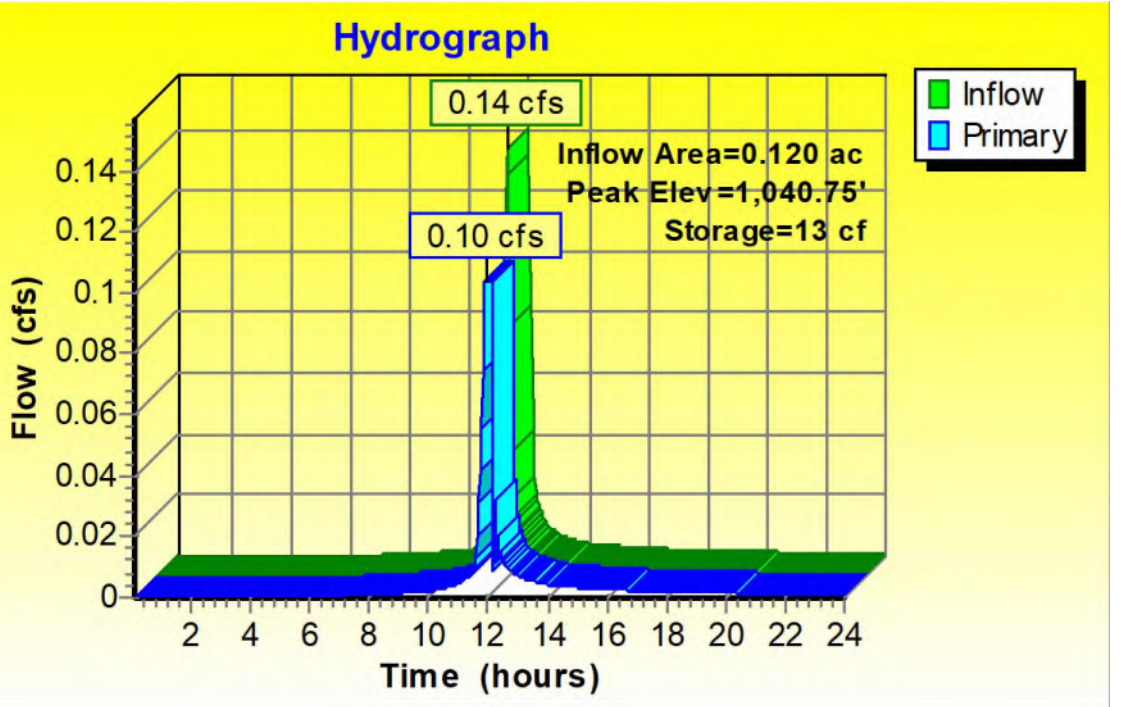
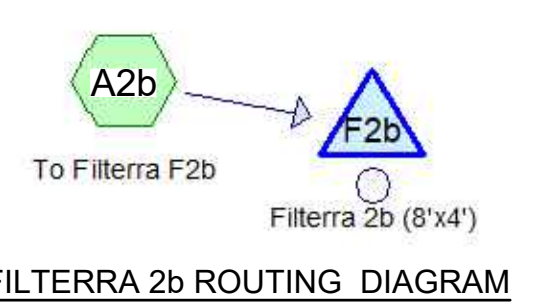
Volume	Invert	Avail. Storage	Storage Description		
#1	1,039.16'	32 cf	Custom Stage Data (Prismatic) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
1,039.16	32	0.0	0	0	
1,041.66	32	25.0	20	20	
1,042.03	32	100.0	12	32	

Device	Routing	Invert	Outlet Devices
#1	Primary	1,039.16'	4.0" Round Culvert L= 4.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,039.16' / 1,039.12" S= 0.0100' / Cc= 0.900 n= 0.010 P.V.C. smooth interior, Flow Area= 0.09 sf
#2	Device 1	1,039.16'	140.000 in/hr Exfiltration over Surface area

Primary Outflow Max= 0.10 cfs @ 11.90 hrs HW= 1,039.51' (Free Discharge)
1= Culvert (Passes 0.10 cfs of 0.16 cfs potential flow)
2= Exfiltration (Exfiltration Controls 0.10 cfs)

FILTERRA 2a SUMMARY (1" STORM)

FILTERRA 2a ROUTING



FILTERRA 2b ROUTING (1" STORM)

Summary for Pond F2b: Filterra 2b (8'x4')

[85] Warning: Oscillations may require smaller dt or Finer Routing (severity=1)

Inflow Area = 0.120 ac, 0.00% Impervious, Inflow Depth > 0.70" for Custom event
Inflow = 0.14 cfs @ 11.97 hrs, Volume= 0.007 af
Outflow = 0.10 cfs @ 11.95 hrs, Volume= 0.007 af, Atten= 26%, Lag= 0.0 min
Primary = 0.10 cfs @ 11.95 hrs, Volume= 0.007 af

Routing by Stor-Ind method, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
Peak Elev= 1,040.75' @ 12.03 hrs Surf.Area= 32 sf Storage= 13 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.9 min (799.6 - 798.7)

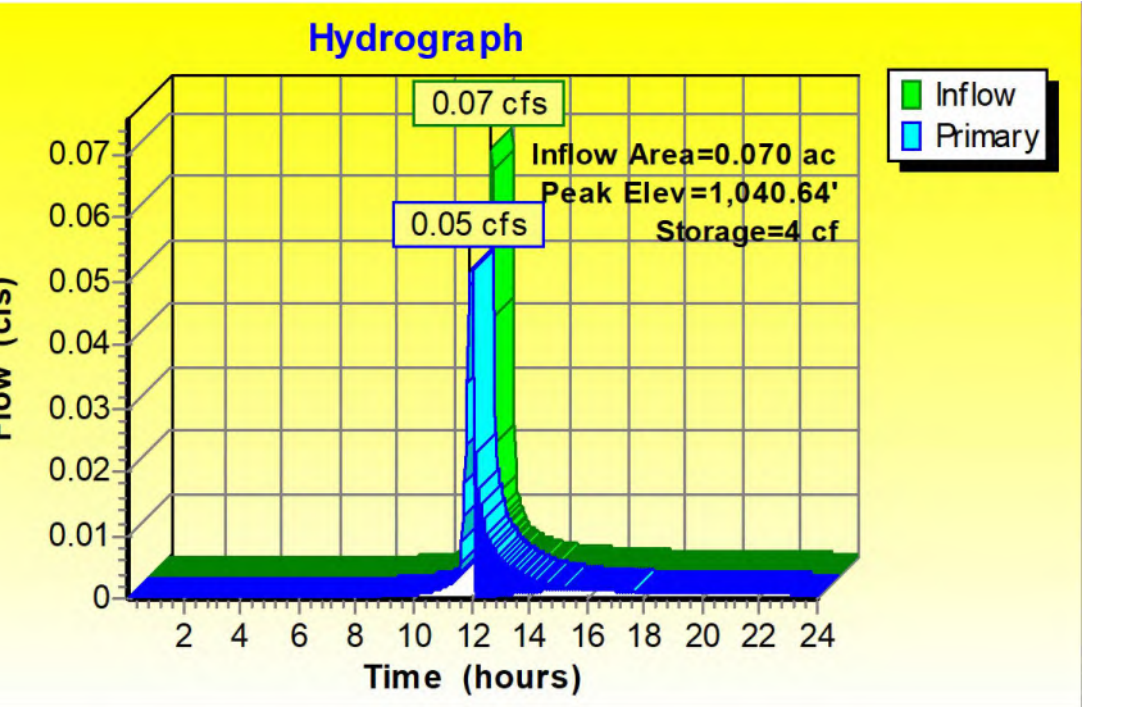
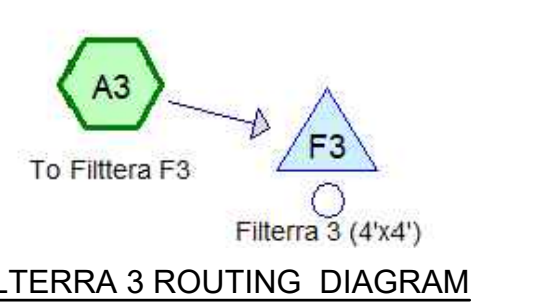
Volume	Invert	Avail. Storage	Storage Description	
#1	1,039.16'	32 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,039.16	32	0.0	0	0
1,041.66	32	25.0	20	20
1,042.03	32	100.0	12	32

Device	Routing	Invert	Outlet Devices
#1	Primary	1,039.16'	4.0" Round Culvert L= 4.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,039.16' / 1,039.12" S= 0.0100' / Cc= 0.900 n= 0.010 P.V.C. smooth interior, Flow Area= 0.09 sf
#2	Device 1	1,039.16'	140.000 in/hr Exfiltration over Surface area

Primary Outflow Max= 0.10 cfs @ 11.95 hrs HW= 1,039.88' (Free Discharge)
1= Culvert (Passes 0.10 cfs of 0.31 cfs potential flow)
2= Exfiltration (Exfiltration Controls 0.10 cfs)

FILTERRA 2b SUMMARY (1" STORM)

FILTERRA 2b ROUTING



FILTERRA 3 ROUTING (1" STORM)

Summary for Pond F3: Filterra 3 (4'x4')

[85] Warning: Oscillations may require smaller dt or Finer Routing (severity=40)

Inflow Area = 0.070 ac, 0.00% Impervious, Inflow Depth > 0.56" for Custom event
Inflow = 0.07 cfs @ 11.97 hrs, Volume= 0.003 af
Outflow = 0.05 cfs @ 11.95 hrs, Volume= 0.003 af, Atten= 23%, Lag= 0.0 min
Primary = 0.05 cfs @ 11.95 hrs, Volume= 0.003 af

Routing by Stor-Ind method, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
Peak Elev= 1,040.64' @ 12.03 hrs Surf.Area= 16 sf Storage= 4 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= (not calculated: outflow precedes inflow)

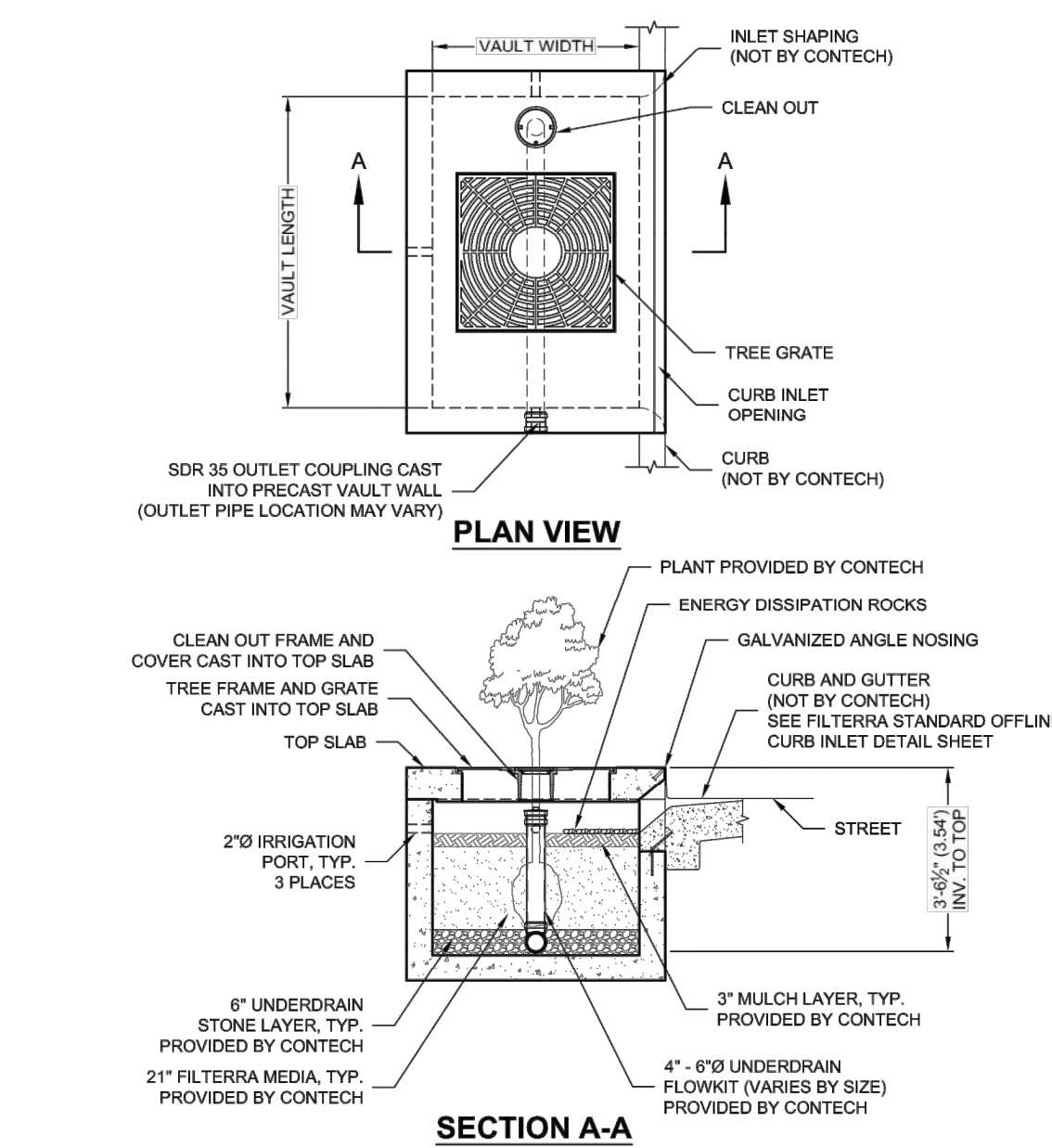
Time	Invert	Avail.Storage	Storage Description	
#1	1,039.56'	16 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1039.56	16	0.0	0	0
1042.06	16	25.0	10	10
1042.43	16	100.0	6	16

Device	Routing	Invert	Outlet Devices
#1	Primary	1,039.10'	6.0" Round Culvert L= 4.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,039.10' / 1,039.08" S= 0.0100' / Cc= 0.900 n= 0.010 P.V.C. smooth interior, Flow Area= 0.20 sf
#2	Device 1	1,039.56'	140.000 in/hr Exfiltration over Surface area

Primary Outflow Max= 0.05 cfs @ 11.95 hrs HW= 1,039.91' (Free Discharge)
1= Culvert (Passes 0.05 cfs of 0.71 cfs potential flow)
2= Exfiltration (Exfiltration Controls 0.05 cfs)

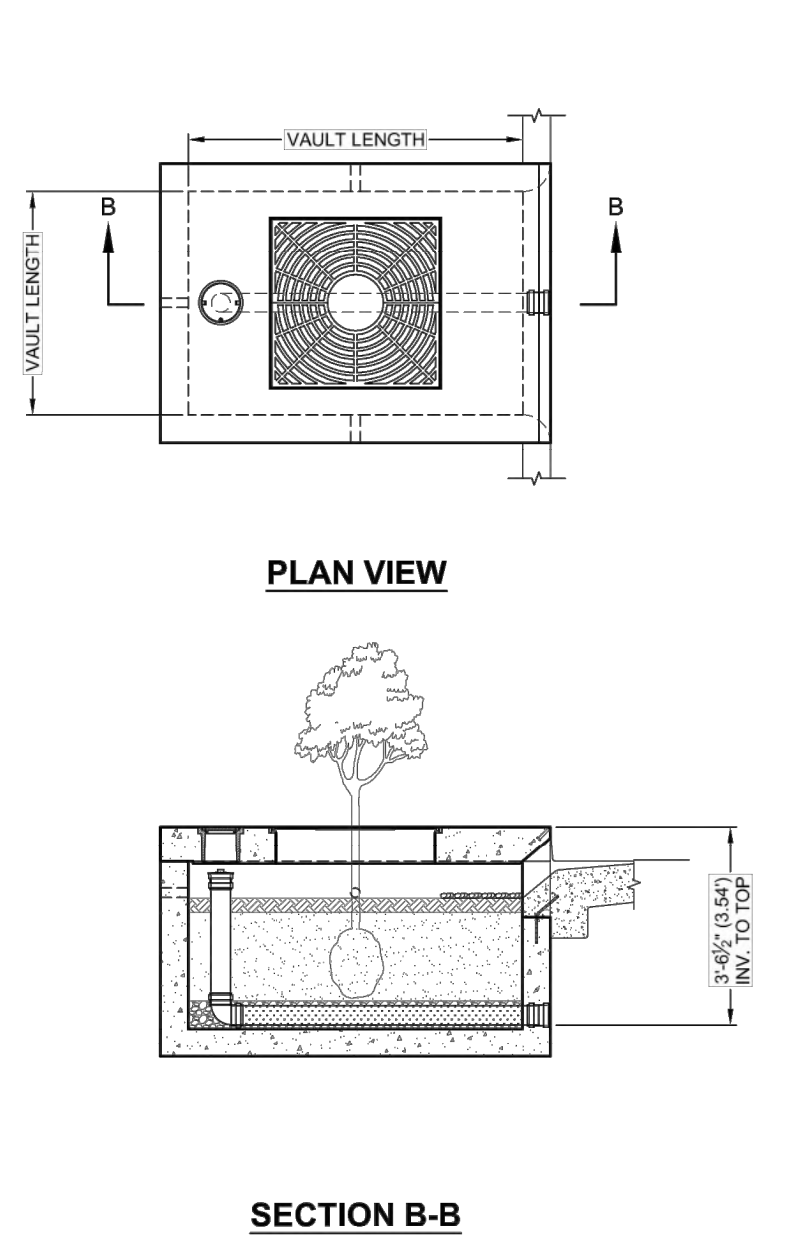
FILTERRA 3 SUMMARY (1" STORM)

FILTERRA 3 ROUTING



DESIGNATION	AVAILABILITY	MEDIA BAY SIZE	VAULT SIZE (L x W)	OUTLET PIPE DIA	TREE GRATE QTY & SIZE
FT0604	N/A CA	6 x 4	6 x 4	4" SDR 35	(1) 3' x 3'
FT0604	CA ONLY	6.5 x 4	6.5 x 4	4" SDR 35	(1) 3' x 3'
FT070405	MID-ATL ONLY	7.83 x 4.5	7.83 x 4.5	4" SDR 35	(1) 3' x 3'
FT0604	N/A MID-ATL	6 x 4	6 x 4	4" SDR 35	(1) 3' x 3'
FT0604	ALL	6 x 6	6 x 6	4" SDR 35	(1) 3' x 3'
FT1006	ALL	10 x 6	10 x 6	6" SDR 35	(1) 4' x 4'
FT1206	ALL	12 x 6	12 x 6	6" SDR 35	(2) 4' x 4'
FT1307	ALL	13 x 7	13 x 7	6" SDR 35	(2) 4' x 4'
FT1408	CALL CONTECH	14 x 8	14 x 8	6" SDR 35	(2) 4' x 4'
FT1608	CALL CONTECH	16 x 8	16 x 8	6" SDR 35	(2) 4' x 4'
FT1808	CALL CONTECH	18 x 8	18 x 8	6" SDR 35	(2) 4' x 4'
FT2008	CALL CONTECH	20 x 8	20 x 8	6" SDR 35	(3) 4' x 4'
FT2208	CALL CONTECH	22 x 8	22 x 8	6" SDR 35	(3) 4' x 4'

N/A = NOT AVAILABLE
INTERNAL PIPE CONFIGURATION MAY VARY DEPENDING UPON OUTLET LOCATION.

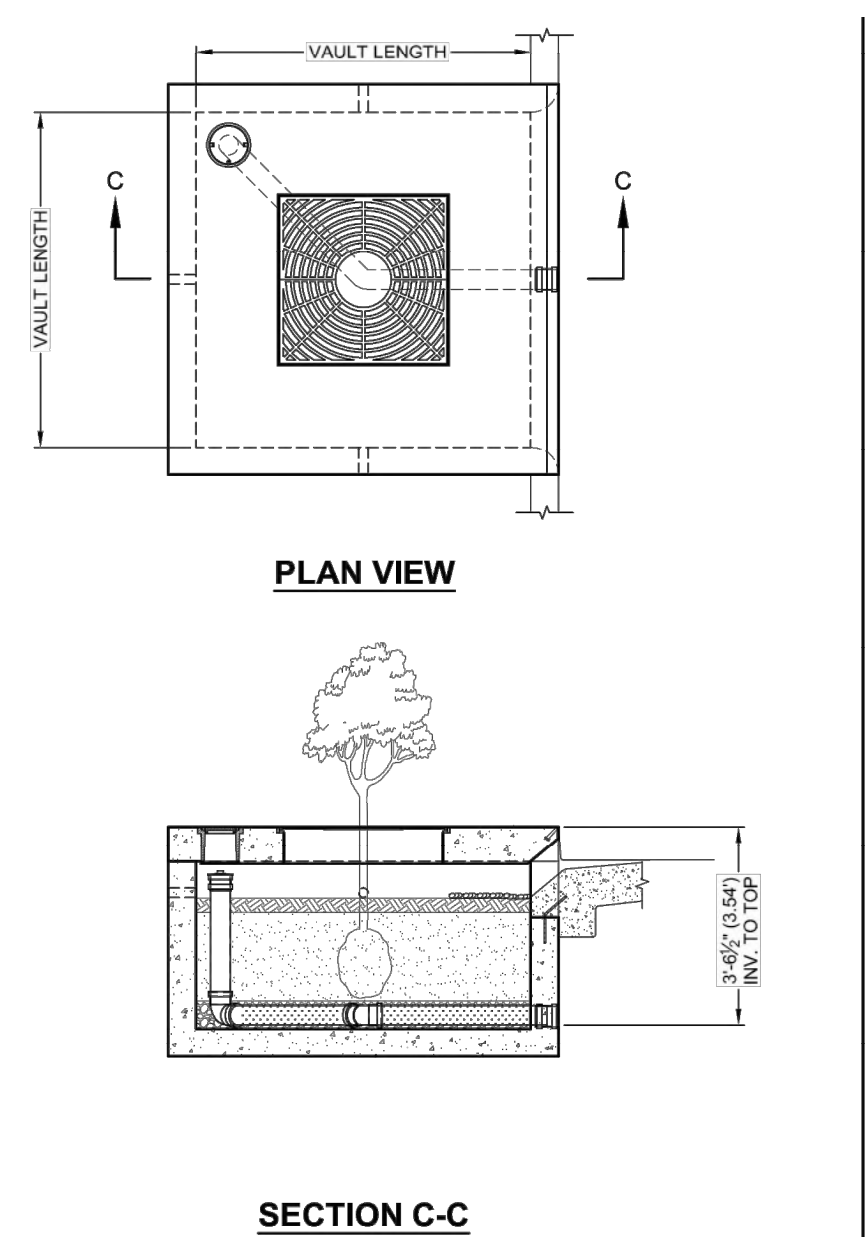


DESIGNATION	AVAILABILITY	MEDIA BAY SIZE	VAULT SIZE (W x L)	OUTLET PIPE DIA	TREE GRATE QTY & SIZE
FT0406	N/A CA	4 x 6	4 x 6	4" SDR 35	(1) 3' x 3'
FT0406	CA ONLY	4 x 6.5	4 x 6.5	4" SDR 35	(1) 3' x 3'
FT0408	N/A MID-ATL	4 x 8	4 x 8	4" SDR 35	(1) 3' x 3'
FT0405078	MID-ATL ONLY	4.5 x 7.83	4.5 x 7.83	4" SDR 35	(1) 3' x 3'
FT0608	ALL	6 x 8	6 x 8	4" SDR 35	(1) 4' x 4'
FT0610	ALL	6 x 10	6 x 10	6" SDR 35	(1) 4' x 4'
FT0912	ALL	6 x 12	6 x 12	6" SDR 35	(2) 4' x 4'
FT0713	ALL	7 x 13	7 x 13	6" SDR 35	(2) 4' x 4'

N/A = NOT AVAILABLE



CONTECH
ENGINEERED SOLUTIONS LLC
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DESIGNATION	AVAILABILITY	MEDIA BAY SIZE	VAULT SIZE (W x L)	OUTLET PIPE DIA	TREE GRATE QTY & SIZE
FT0406	ALL	4 x 4	4 x 4	4" SDR 35	(1) 3' x 3'
FT0606	ALL	6 x 6	6 x 6	4" SDR 35	(1) 3' x 3'

N/A = NOT AVAILABLE

FILTERRA OFFLINE (FT)
CONFIGURATION DETAIL

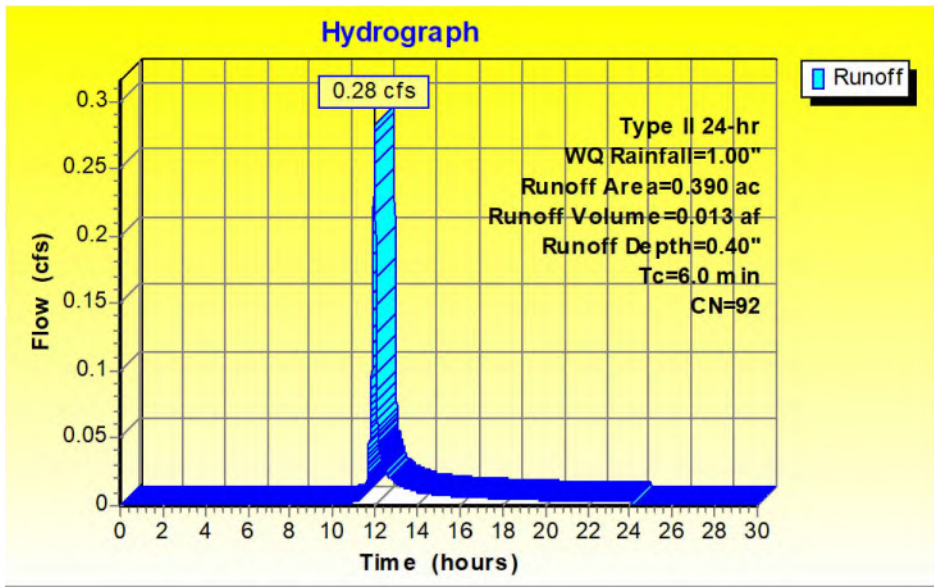


The Site Design Company
CIVIL ENGINEERING AND LAND DEVELOPMENT CONSULTING
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PROJECT # : 20604
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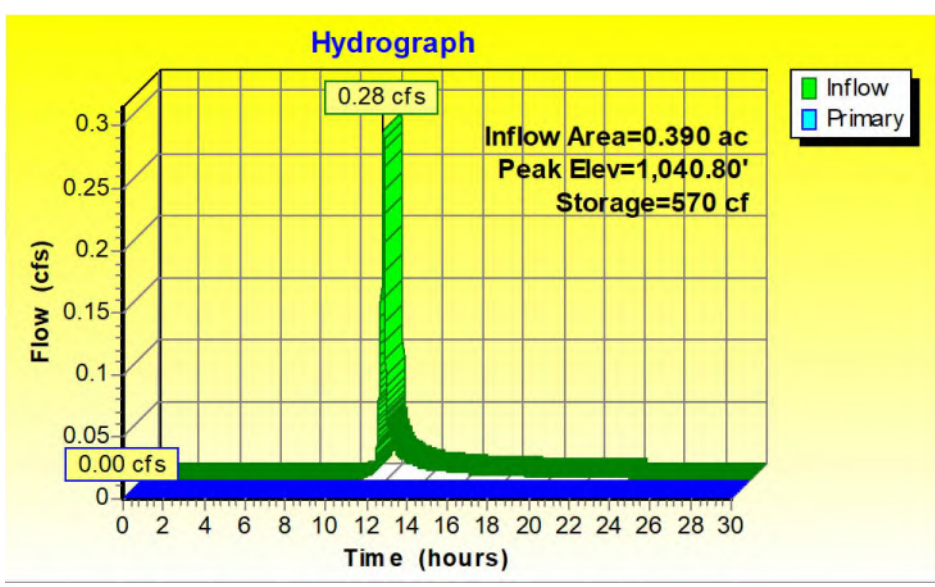
DATE	MAY 15, 2022
REVISION BLOCK	

**RESIDENCE INN by MARRIOTT
@ HOTEL CIRCLE**
CITY OF CHARLESTON - KANAWHA COUNTY, WEST VIRGINIA
**STORMWATER MANAGEMENT
CALCULATIONS AND ROUTINGS**

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1" STORM TO BIO 'A'



BIO 'A' ROUTING (1" STORM)

Summary for Pond BIO A: BIO A

Inflow Area = 0.390 ac, 69.23% Impervious, Inflow Depth = 0.40" for WQ event
Inflow = 0.28 cfs @ 11.98 hrs, Volume= 0.013 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to nonexistent node POND

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 1,040.80' @ 24.34 hrs Surf.Area= 1,100 sf Storage= 570 cf

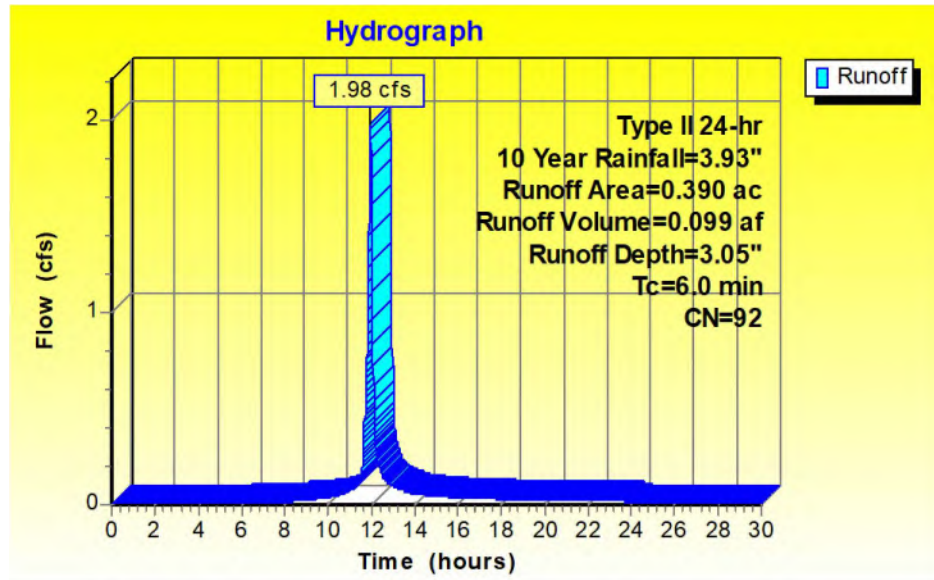
Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

Volume #1	Invert 1,038.83'	Avail.Storage 1,975 cf	Storage Description Custom Stage Data (Prismatic) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
1,038.83	1,100	0.0	0	0	
1,039.00	1,100	40.0	75	75	
1,041.00	1,100	25.0	550	625	
1,042.00	1,600	100.0	1,350	1,975	

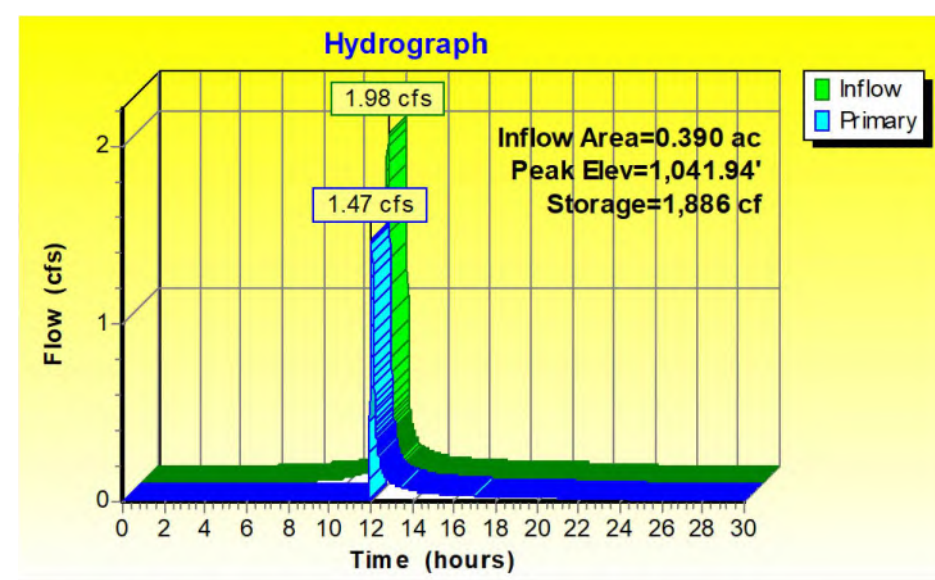
Device	Routing	Invert	Outlet Devices
#1	Primary	1,041.67'	12.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max= 0.00 cfs @ 0.00 hrs HW= 1,038.83' (Free Discharge)
1= Orifice/Grate (Controls 0.00 cfs)

BIO 'A' SUMMARY (1" STORM)



10 YR. STORM TO BIO 'A'



BIO 'A' ROUTING (10 YR. STORM)

Summary for Pond BIO A: BIO A

Inflow Area = 0.390 ac, 69.23% Impervious, Inflow Depth = 3.05" for 10 Year event
Inflow = 1.98 cfs @ 11.97 hrs, Volume= 0.099 af
Outflow = 1.47 cfs @ 12.03 hrs, Volume= 0.065 af, Atten= 26%, Lag= 3.5 min
Primary = 1.47 cfs @ 12.03 hrs, Volume= 0.065 af
Routed to nonexistent node POND

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 1,041.94' @ 12.03 hrs Surf.Area= 1,572 sf Storage= 1,886 cf

Plug-Flow detention time= 179.7 min calculated for 0.065 af (66% of inflow)
Center-of-Mass det. time= 79.5 min (866.9 - 787.3)

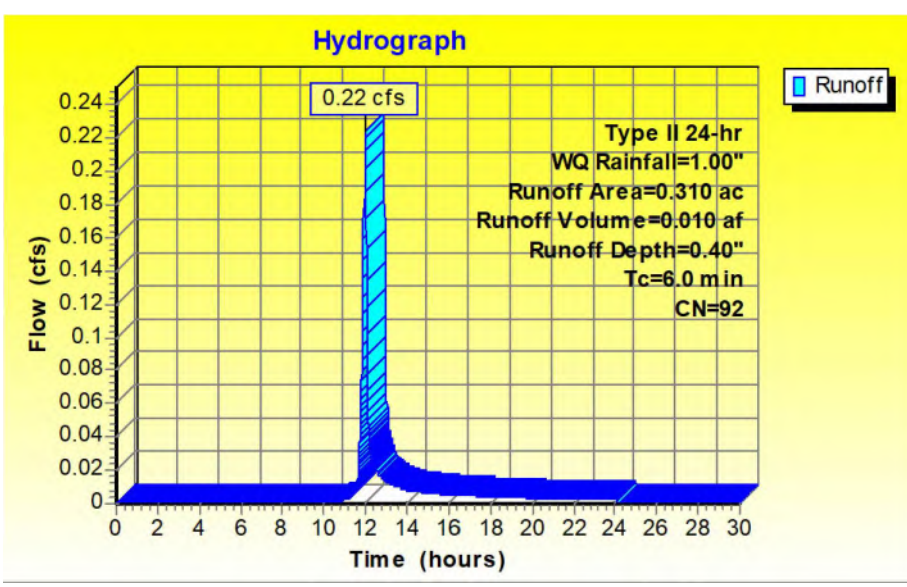
Volume #1	Invert 1,038.83'	Avail.Storage 1,975 cf	Storage Description Custom Stage Data (Prismatic) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
1,038.83	1,100	0.0	0	0	
1,039.00	1,100	40.0	75	75	
1,041.00	1,100	25.0	550	625	
1,042.00	1,600	100.0	1,350	1,975	

Device	Routing	Invert	Outlet Devices
#1	Primary	1,041.67'	12.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

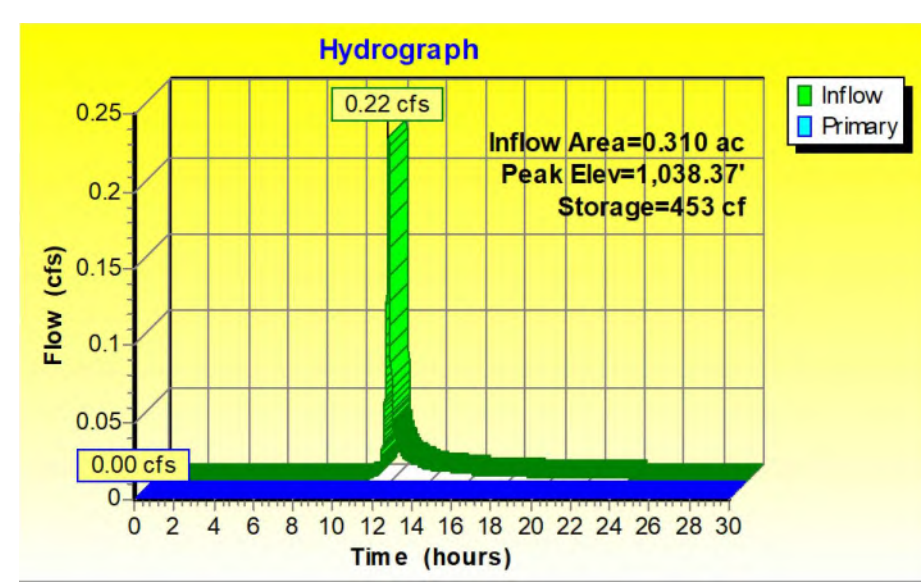
Primary OutFlow Max= 1.47 cfs @ 12.03 hrs HW= 1,041.94' (Free Discharge)
1= Orifice/Grate (Weir Controls 1.47 cfs @ 1.71 fps)

BIO 'A' SUMMARY (10 YR. STORM)

BIORETENTION 'A' ROUTING



1" STORM TO BIO 'B'



BIO 'B' HYDROGRAPH (1" STORM)

Summary for Pond BIO B: BIO B

Inflow Area = 0.310 ac, 67.74% Impervious, Inflow Depth = 0.40" for WQ event
Inflow = 0.22 cfs @ 11.98 hrs, Volume= 0.010 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to nonexistent node POND

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 1,038.37' @ 24.34 hrs Surf.Area= 1,100 sf Storage= 453 cf

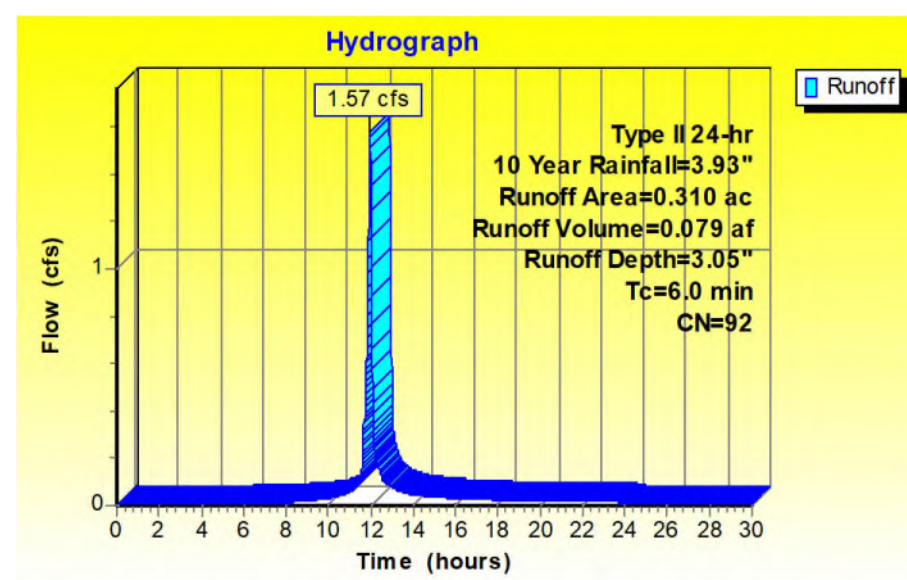
Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

Volume #1	Invert 1,036.83'	Avail.Storage 1,975 cf	Storage Description Custom Stage Data (Prismatic) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
1,036.83	1,100	0.0	0	0	
1,037.00	1,100	40.0	75	75	
1,039.00	1,100	25.0	550	625	
1,040.00	1,600	100.0	1,350	1,975	

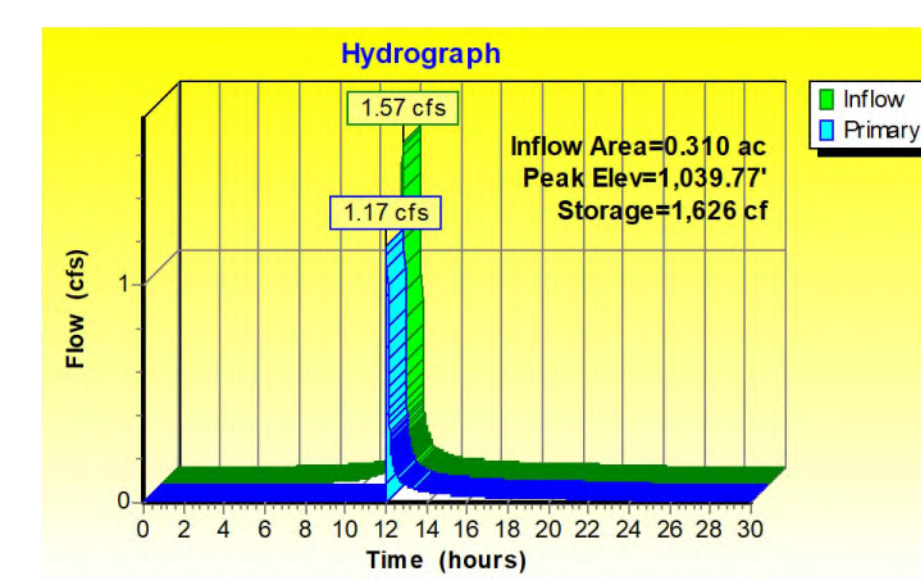
Device	Routing	Invert	Outlet Devices
#1	Primary	1,039.67'	3.0" x 32.0" Horiz. Orifice/Grate X 8.00 C= 0.600 in 32.0" x 32.0" Grate (75% open area) Limited to weir flow at low heads

Primary OutFlow Max= 0.00 cfs @ 0.00 hrs HW= 1,036.83' (Free Discharge)
1= Orifice/Grate (Controls 0.00 cfs)

BIO 'B' SUMMARY (1" STORM)



10 YR. STORM TO BIO 'B'



BIO 'B' HYDROGRAPH (10 YR. STORM)

Summary for Pond BIO B: BIO B

Inflow Area = 0.310 ac, 67.74% Impervious, Inflow Depth = 3.05" for 10 Year event
Inflow = 1.57 cfs @ 11.97 hrs, Volume= 0.079 af
Outflow = 1.17 cfs @ 12.03 hrs, Volume= 0.045 af, Atten= 25%, Lag= 3.5 min
Primary = 1.17 cfs @ 12.03 hrs, Volume= 0.045 af
Routed to nonexistent node POND

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 1,039.77' @ 12.03 hrs Surf.Area= 1,487 sf Storage= 1,626 cf

Plug-Flow detention time= 202.9 min calculated for 0.045 af (57% of inflow)
Center-of-Mass det. time= 95.5 min (882.9 - 787.3)

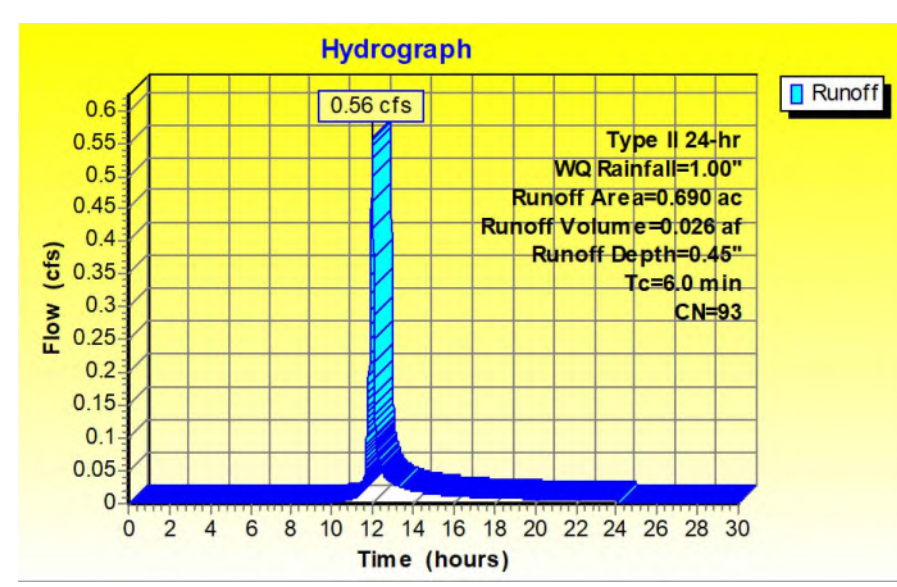
Volume #1	Invert 1,036.83'	Avail.Storage 1,975 cf	Storage Description Custom Stage Data (Prismatic) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
1,036.83	1,100	0.0	0	0	
1,037.00	1,100	40.0	75	75	
1,039.00	1,100	25.0	550	625	
1,040.00	1,600	100.0	1,350	1,975	

Device	Routing	Invert	Outlet Devices
#1	Primary	1,039.67'	3.0" x 32.0" Horiz. Orifice/Grate X 8.00 C= 0.600 in 32.0" x 32.0" Grate (75% open area) Limited to weir flow at low heads

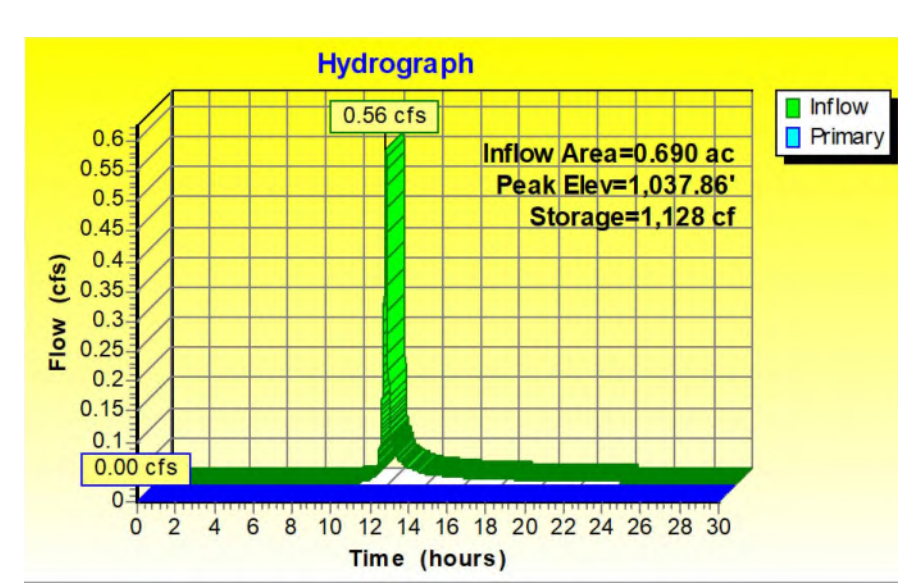
Primary OutFlow Max= 1.16 cfs @ 12.03 hrs HW= 1,039.77' (Free Discharge)
1= Orifice/Grate (Weir Controls 1.16 cfs @ 1.05 fps)

BIO 'B' SUMMARY (10 YR. STORM)

BIORETENTION 'B' ROUTING



1" STORM TO BIO 'C'



BIO 'C' HYDROGRAPH (1" STORM)

Summary for Pond BIO C: BIO C

Inflow Area = 0.690 ac, 72.46% Impervious, Inflow Depth = 0.45" for WQ event
Inflow = 0.56 cfs @ 11.98 hrs, Volume= 0.026 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to nonexistent node POND

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 1,037.86' @ 24.34 hrs Surf.Area= 1,307 sf Storage= 1,128 cf

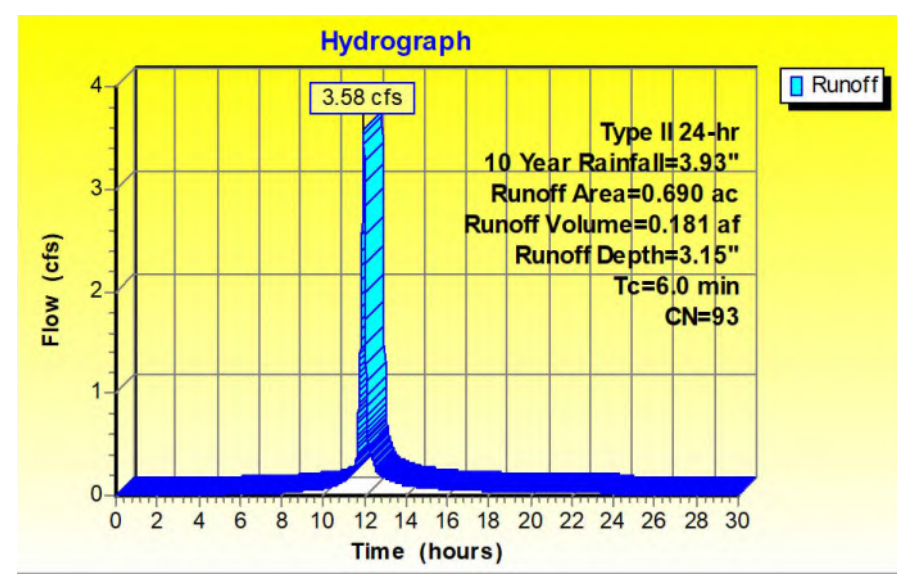
Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

Volume #1	Invert 1,035.33'	Avail.Storage 2,819 cf	Storage Description Custom Stage Data (Prismatic) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
1,035.33	1,200	0.0	0	0	
1,035.50	1,200	40.0	82	82	
1,037.50	1,200	25.0	600	682	
1,039.00	1,650	100.0	2,138	2,819	

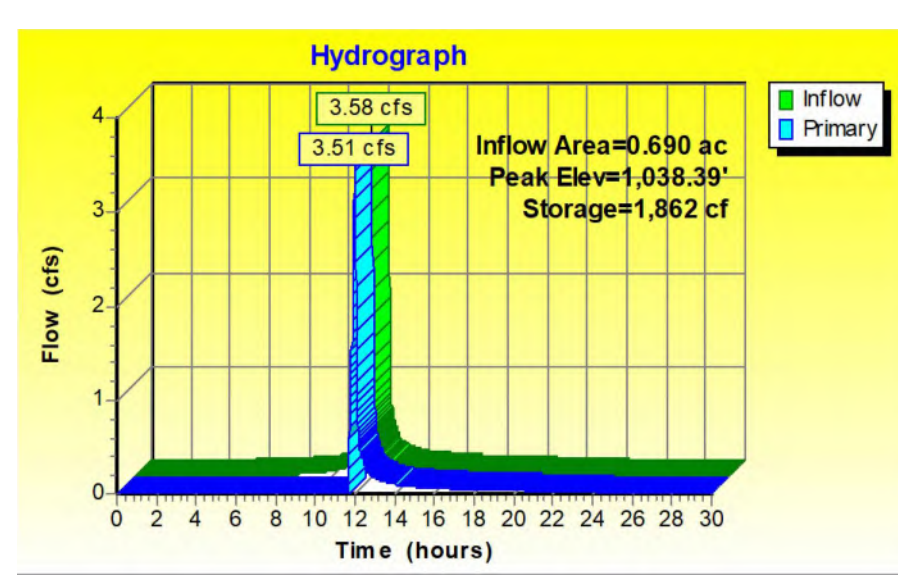
Device	Routing	Invert	Outlet Devices
#1	Primary	1,038.17'	3.0" x 32.0" Horiz. Orifice/Grate X 8.00 C= 0.600 in 32.0" x 32.0" Grate (75% open area) Limited to weir flow at low heads
#2	Primary	1,038.50'	Custom Weir/Orifice, Cv= 2.62 (C= 3.28) Head (feet) 0.00 0.50 Width (feet) 6.00 8.00

Primary OutFlow Max= 0.00 cfs @ 0.00 hrs HW= 1,035.33' (Free Discharge)
1= Orifice/Grate (Controls 0.00 cfs)
2= Custom Weir/Orifice (Controls 0.00 cfs)

BIO 'C' SUMMARY (1" STORM)



10 YR. STORM TO BIO 'C'



BIO 'C' HYDROGRAPH (10 YR. STORM)

Summary for Pond BIO C: BIO C

Inflow Area = 0.690 ac, 72.46% Impervious, Inflow Depth = 3.15" for 10 Year event
Inflow = 3.58 cfs @ 11.97 hrs, Volume= 0.181 af
Outflow = 3.51 cfs @ 11.98 hrs, Volume= 0.146 af, Atten= 2%, Lag= 0.9 min
Primary = 3.51 cfs @ 11.98 hrs, Volume= 0.146 af
Routed to nonexistent node POND

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 1,038.39' @ 11.98 hrs Surf.Area= 1,466 sf Storage= 1,862 cf

Plug-Flow detention time= 126.8 min calculated for 0.146 af (80% of inflow)
Center-of-Mass det. time= 47.7 min (830.2 - 782.5)

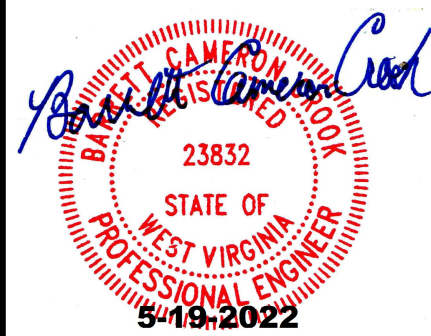
Volume #1	Invert 1,035.33'	Avail.Storage 2,819 cf	Storage Description Custom Stage Data (Prismatic) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
1,035.33	1,200	0.0	0	0	
1,035.50	1,200	40.0	82	82	
1,037.50	1,200	25.0	600	682	
1,039.00	1,650	100.0	2,138	2,819	

Device	Routing	Invert	Outlet Devices
#1	Primary	1,038.17'	3.0" x 32.0" Horiz. Orifice/Grate X 8.00 C= 0.600 in 32.0" x 32.0" Grate (75% open area) Limited to weir flow at low heads
#2	Primary	1,038.50'	Custom Weir/Orifice, Cv= 2.62 (C= 3.28) Head (feet) 0.00 0.50 Width (feet) 6.00 8.00

Primary OutFlow Max= 3.49 cfs @ 11.98 hrs HW= 1,038.39' (Free Discharge)
1= Orifice/Grate (Weir Controls 3.49 cfs @ 1.52 fps)
2= Custom Weir/Orifice (Controls 0.00 cfs)

BIO 'C' SUMMARY (10 YR. STORM)

BIORETENTION 'C' ROUTING



The Site Design Company

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PHONE: 804-720-9040

PROJECT # : 20064

PROJECT MANAGER : CHRIS THOMPSON



DATE : MAY 15, 2022

REVISION BLOCK

RESIDENCE INN by MARRIOTT

@ HOTEL CIRCLE

CITY OF CHARLESTON - KANAWHA COUNTY, WEST VIRGINIA

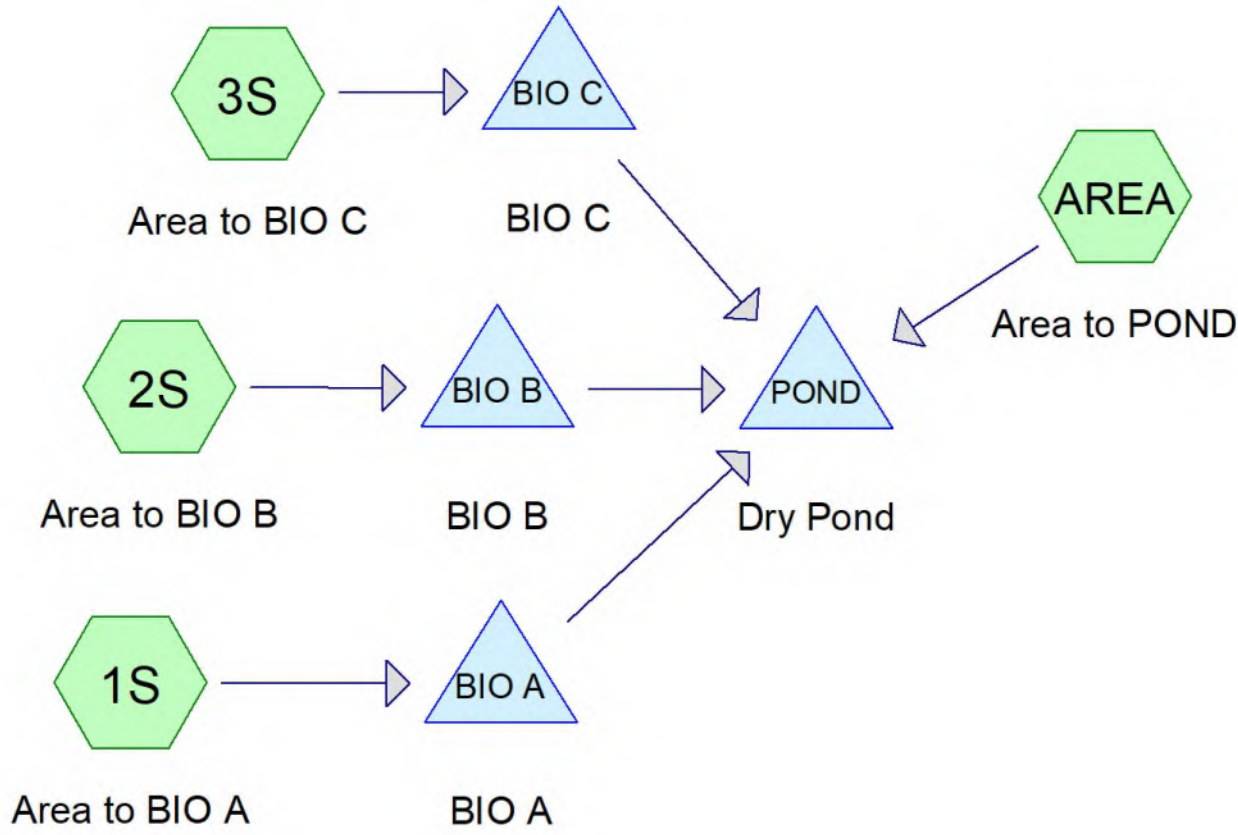
STORMWATER MANAGEMENT
CALCULATIONS AND ROUTINGS

SHEET NO.
C9.2

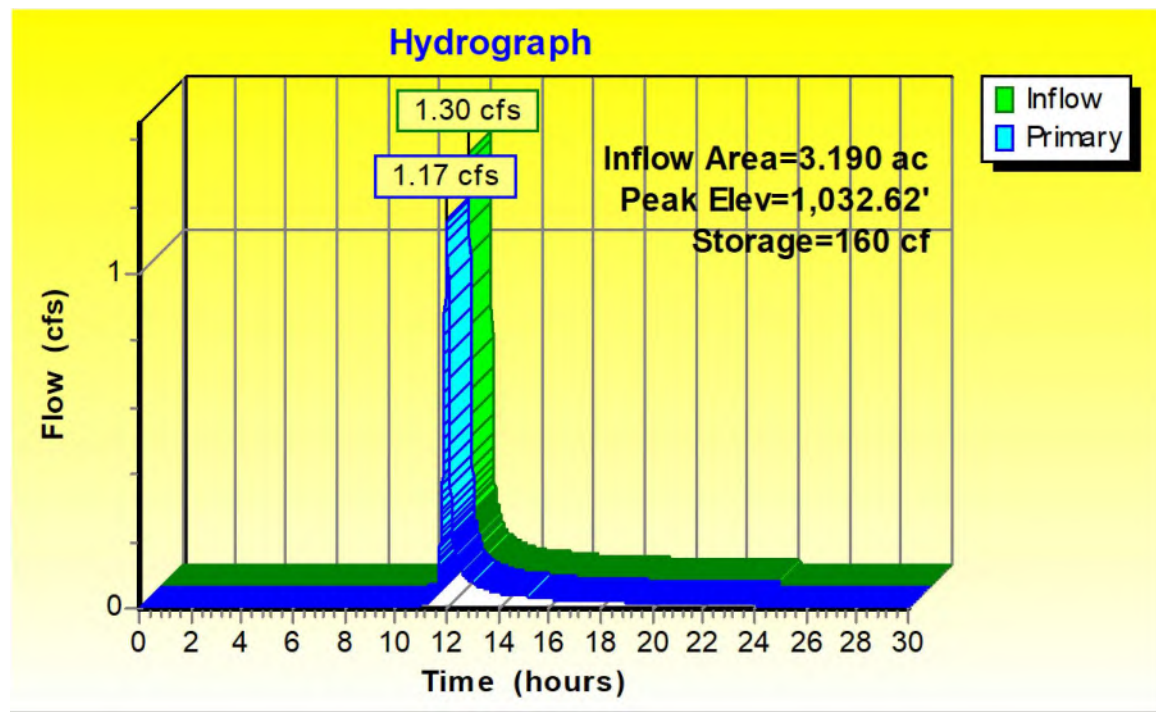
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WORKSHEET FOR SCS HYDROLOGIC PARAMETERS					
Site Conditions:		Existing	Project: Residence Inn - Charleston WV		
	X	Proposed	Subarea Number: POND (ALL)		
Off-Site Land Use:		Existing	By: Chris Thompson		
	X	Proposed	Date: 4/25/2022		
RUNOFF CURVE NUMBER					
Soil Group	Land Use or Zoning		Area (acres)	RCN	RCN x Area
C	Good	IMPERVIOUS	0.50	98	49
C	Good	GRASS > 75% (Similar to Pasture)	0.03	74	2.22
C	Good	WOODS		70	0
D	Good	IMPERVIOUS	1.86	98	182.28
D	Good	GRASS > 75% (Similar to Pasture)	0.80	80	64
D	Good	WOODS		77	0
Total Area			3.19 ac	0.005 sq. mi	Weighted RCN = 93

DETENTION - OVERALL LAND COVER WORKSHEET



DETENTION BASIN ROUTING DIAGRAM



DETENTION HYDROGRAPH (1" STORM)

Summary for Pond POND: Dry Pond

Inflow Area = 3.190 ac, 69.91% Impervious, Inflow Depth = 0.23" for WQ event
Inflow = 1.30 cfs @ 11.98 hrs, Volume= 0.060 af
Outflow = 1.17 cfs @ 12.01 hrs, Volume= 0.060 af, Atten= 10%, Lag= 2.0 min
Primary = 1.17 cfs @ 12.01 hrs, Volume= 0.060 af
Routed to nonexistent node 7P

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 1,032.62' @ 12.01 hrs Surf.Area= 515 sf Storage= 160 cf

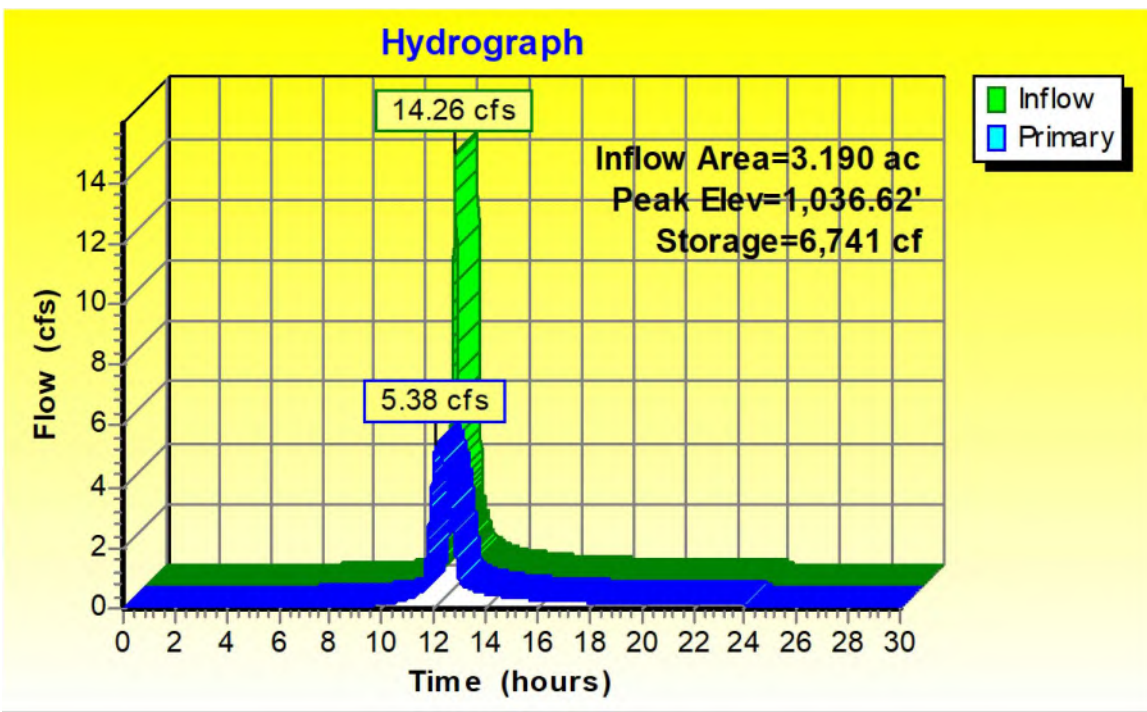
Plug-Flow detention time= 1.9 min calculated for 0.060 af (100% of inflow)
Center-of-Mass det. time= 1.9 min (847.0 - 845.1)

Volume	Invert	Avail.Storage	Storage Description	
#1	1,032.00'	15,265 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
1,032.00	0	0	0	
1,033.00	830	415	415	
1,034.00	1,290	1,060	1,475	
1,035.00	1,820	1,555	3,030	
1,036.00	2,400	2,110	5,140	
1,037.00	3,030	2,715	7,855	
1,038.00	3,700	3,365	11,220	
1,039.00	4,390	4,045	15,265	

Device	Routing	Invert	Outlet Devices
#1	Primary	1,030.40'	15.0" Round Riser Outlet, Round 15"
			L= 20.0' RCP, square edge headwall, Ke= 0.500
			Inlet / Outlet Invert= 1,030.40' / 1,030.00' S= 0.0200 7' Cc= 0.900
#2	Device 1	1,037.00'	24.0" Horiz. Riser C= 0.600 Limited to weir flow at low heads
			n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf
#3	Device 1	1,032.00'	15.0" Round RCP, Round 15"
			L= 8.0' RCP, square edge headwall, Ke= 0.500
#4	Device 3	1,032.00'	10.0" Vert. Orifice/Grate C= 0.600
			Limited to weir flow at low heads
#5	Primary	1,037.50'	Custom Weir/Orifice, Cv= 2.62 (C= 3.28)
			Head (feet) 0.00 1.50
			Width (feet) 6.00 12.00

Primary OutFlow Max= 1.17 cfs @ 12.01 hrs HW= 1,032.62' (Free Discharge)
1=Riser Outlet, Round 15" (Passes 1.17 cfs of 7.46 cfs potential flow)
2=Riser (Controls 0.00 cfs)
3=RCP, Round 15" (Passes 1.17 cfs of 1.63 cfs potential flow)
4=Orifice/Grate (Orifice Controls 1.17 cfs @ 2.68 fps)
5=Custom Weir/Orifice (Controls 0.00 cfs)

DETENTION SUMMARY (1" STORM)



DETENTION HYDROGRAPH (10 YR. STORM)

Summary for Pond POND: Dry Pond

Inflow Area = 3.190 ac, 69.91% Impervious, Inflow Depth = 2.68" for 10 Year event
Inflow = 14.26 cfs @ 11.99 hrs, Volume= 0.713 af
Outflow = 5.38 cfs @ 12.10 hrs, Volume= 0.713 af, Atten= 62%, Lag= 6.8 min
Primary = 5.38 cfs @ 12.10 hrs, Volume= 0.713 af
Routed to nonexistent node 7P

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 1,036.62' @ 12.10 hrs Surf.Area= 2,789 sf Storage= 6,741 cf

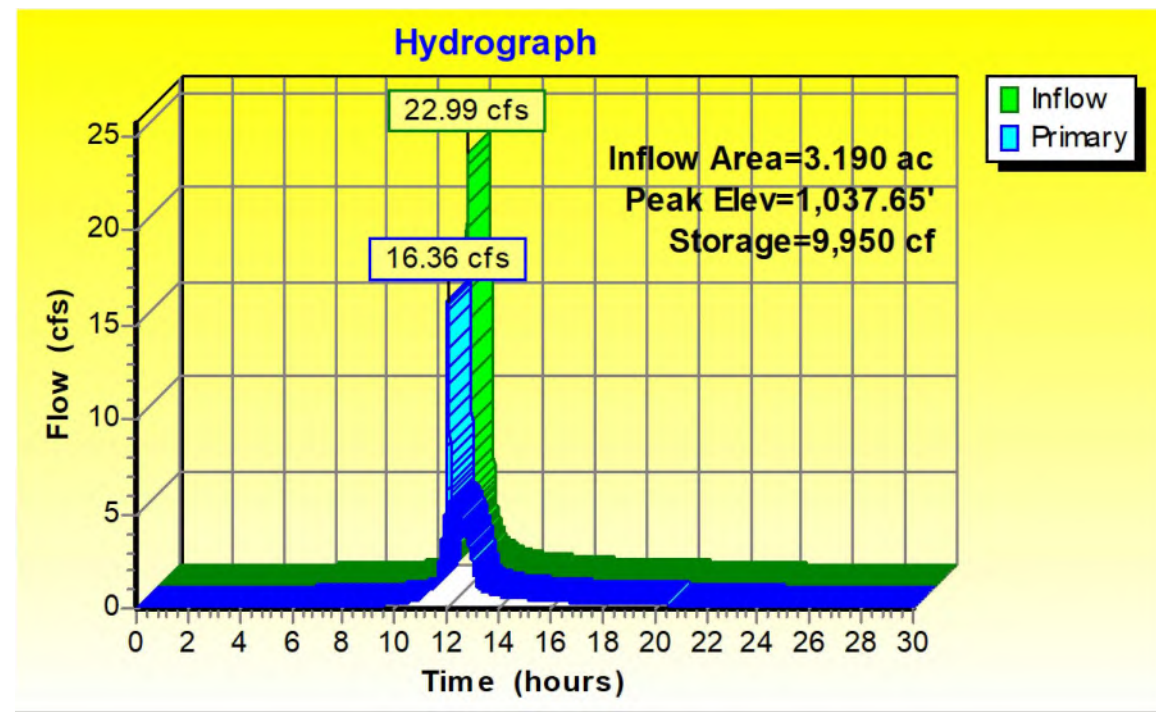
Plug-Flow detention time= 8.0 min calculated for 0.713 af (100% of inflow)
Center-of-Mass det. time= 8.0 min (817.4 - 809.4)

Volume	Invert	Avail.Storage	Storage Description	
#1	1,032.00'	15,265 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
1,032.00	0	0	0	
1,033.00	830	415	415	
1,034.00	1,290	1,060	1,475	
1,035.00	1,820	1,555	3,030	
1,036.00	2,400	2,110	5,140	
1,037.00	3,030	2,715	7,855	
1,038.00	3,700	3,365	11,220	
1,039.00	4,390	4,045	15,265	

Device	Routing	Invert	Outlet Devices
#1	Primary	1,030.40'	15.0" Round Riser Outlet, Round 15"
			L= 20.0' RCP, square edge headwall, Ke= 0.500
			Inlet / Outlet Invert= 1,030.40' / 1,030.00' S= 0.0200 7' Cc= 0.900
#2	Device 1	1,037.00'	24.0" Horiz. Riser C= 0.600 Limited to weir flow at low heads
			n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf
#3	Device 1	1,032.00'	15.0" Round RCP, Round 15"
			L= 8.0' RCP, square edge headwall, Ke= 0.500
#4	Device 3	1,032.00'	10.0" Vert. Orifice/Grate C= 0.600
			Limited to weir flow at low heads
#5	Primary	1,037.50'	Custom Weir/Orifice, Cv= 2.62 (C= 3.28)
			Head (feet) 0.00 1.50
			Width (feet) 6.00 12.00

Primary OutFlow Max= 5.38 cfs @ 12.10 hrs HW= 1,036.62' (Free Discharge)
1=Riser Outlet, Round 15" (Passes 5.38 cfs of 13.97 cfs potential flow)
2=Riser (Controls 0.00 cfs)
3=RCP, Round 15" (Passes 5.38 cfs of 11.80 cfs potential flow)
4=Orifice/Grate (Orifice Controls 5.38 cfs @ 9.87 fps)
5=Custom Weir/Orifice (Controls 0.00 cfs)

DETENTION SUMMARY (10 YR. STORM)



DETENTION HYDROGRAPH (100 YR. STORM)

Summary for Pond POND: Dry Pond

Inflow Area = 3.190 ac, 69.91% Impervious, Inflow Depth = 4.12" for 100 Year event
Inflow = 22.99 cfs @ 11.97 hrs, Volume= 1.094 af
Outflow = 16.36 cfs @ 12.04 hrs, Volume= 1.094 af, Atten= 29%, Lag= 3.8 min
Primary = 16.36 cfs @ 12.04 hrs, Volume= 1.094 af
Routed to nonexistent node 7P

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 1,037.65' @ 12.04 hrs Surf.Area= 3,462 sf Storage= 9,950 cf

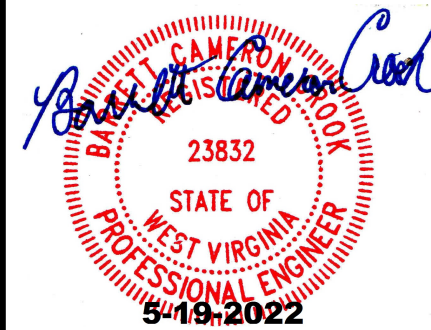
Plug-Flow detention time= 8.7 min calculated for 1.094 af (100% of inflow)
Center-of-Mass det. time= 8.7 min (804.8 - 796.0)

Volume	Invert	Avail.Storage	Storage Description	
#1	1,032.00'	15,265 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
1,032.00	0	0	0	
1,033.00	830	415	415	
1,034.00	1,290	1,060	1,475	
1,035.00	1,820	1,555	3,030	
1,036.00	2,400	2,110	5,140	
1,037.00	3,030	2,715	7,855	
1,038.00	3,700	3,365	11,220	
1,039.00	4,390	4,045	15,265	

Device	Routing	Invert	Outlet Devices
#1	Primary	1,030.40'	15.0" Round Riser Outlet, Round 15"
			L= 20.0' RCP, square edge headwall, Ke= 0.500
			Inlet / Outlet Invert= 1,030.40' / 1,030.00' S= 0.0200 7' Cc= 0.900
#2	Device 1	1,037.00'	24.0" Horiz. Riser C= 0.600 Limited to weir flow at low heads
			n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf
#3	Device 1	1,032.00'	15.0" Round RCP, Round 15"
			L= 8.0' RCP, square edge headwall, Ke= 0.500
#4	Device 3	1,032.00'	10.0" Vert. Orifice/Grate C= 0.600
			Limited to weir flow at low heads
#5	Primary	1,037.50'	Custom Weir/Orifice, Cv= 2.62 (C= 3.28)
			Head (feet) 0.00 1.50
			Width (feet) 6.00 12.00

Primary OutFlow Max= 16.31 cfs @ 12.04 hrs HW= 1,037.64' (Free Discharge)
1=Riser Outlet, Round 15" (Inlet Controls 15.20 cfs @ 12.39 fps)
2=Riser (Passes < 10.61 cfs potential flow)
3=RCP, Round 15" (Passes < 13.24 cfs potential flow)
4=Orifice/Grate (Passes < 6.00 cfs potential flow)
5=Custom Weir/Orifice (Weir Controls 1.11 cfs @ 1.23 fps)

DETENTION SUMMARY (100 YR. STORM)



The Site Design Company

CIVIL ENGINEERING AND LAND DEVELOPMENT CONSULTING

2888 HIGH STREET - PETERSBURG, VIRGINIA 23803

www.sitedesignco.com

PROJECT # : 20064

PROJECT MANAGER : CHRIS THOMPSON

PHONE : 804-720-9040

EMAIL : thompson@site-designco.com

DATE : MAY 15, 2022

REVISION BLOCK	
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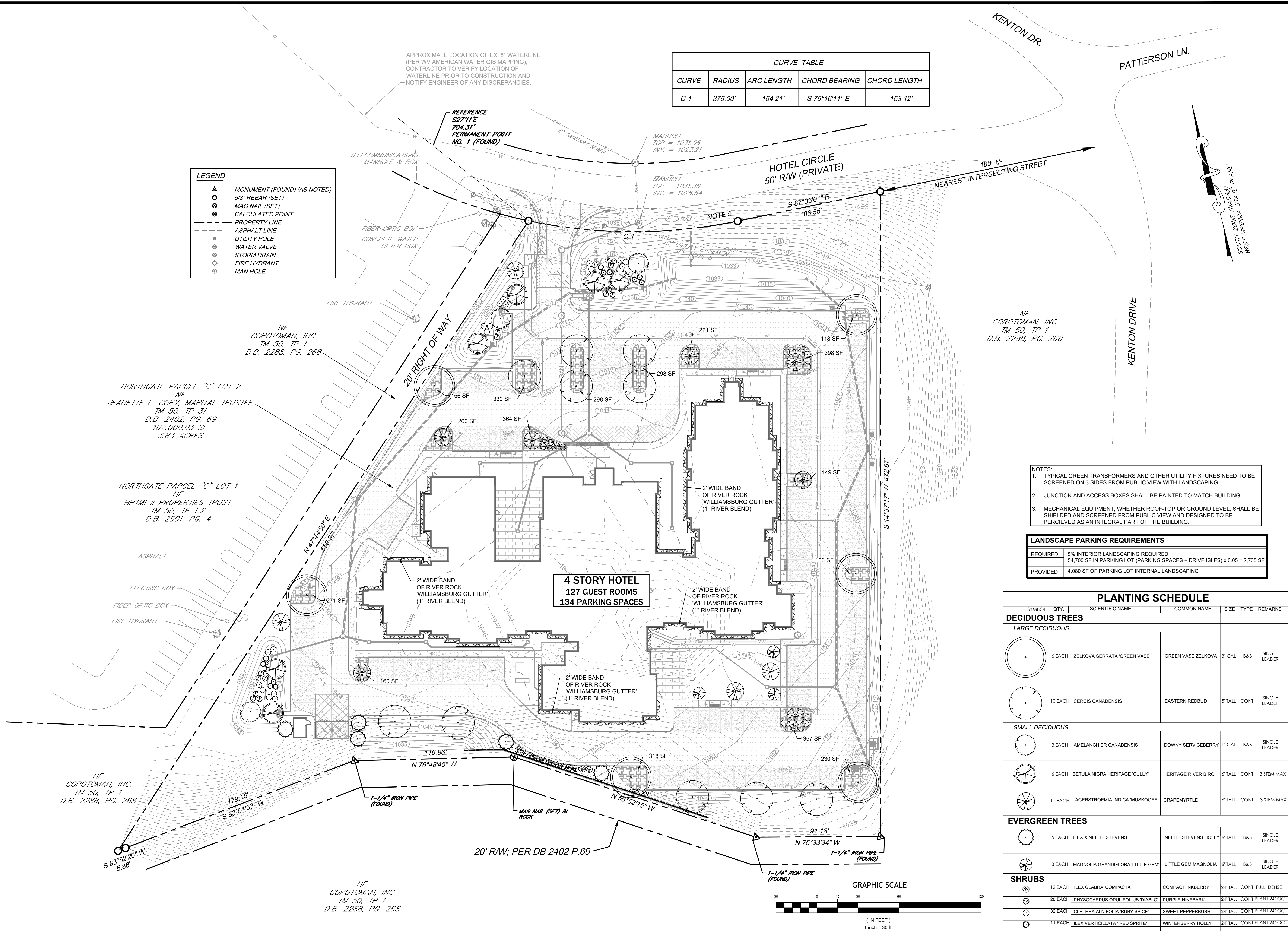
RESIDENCE INN by MARRIOTT

@ HOTEL CIRCLE

CITY OF CHARLESTON - KANAWHA COUNTY, WEST VIRGINIA

STORMWATER MANAGEMENT CALCULATIONS AND ROUTINGS

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DATE : MAY 15, 2022

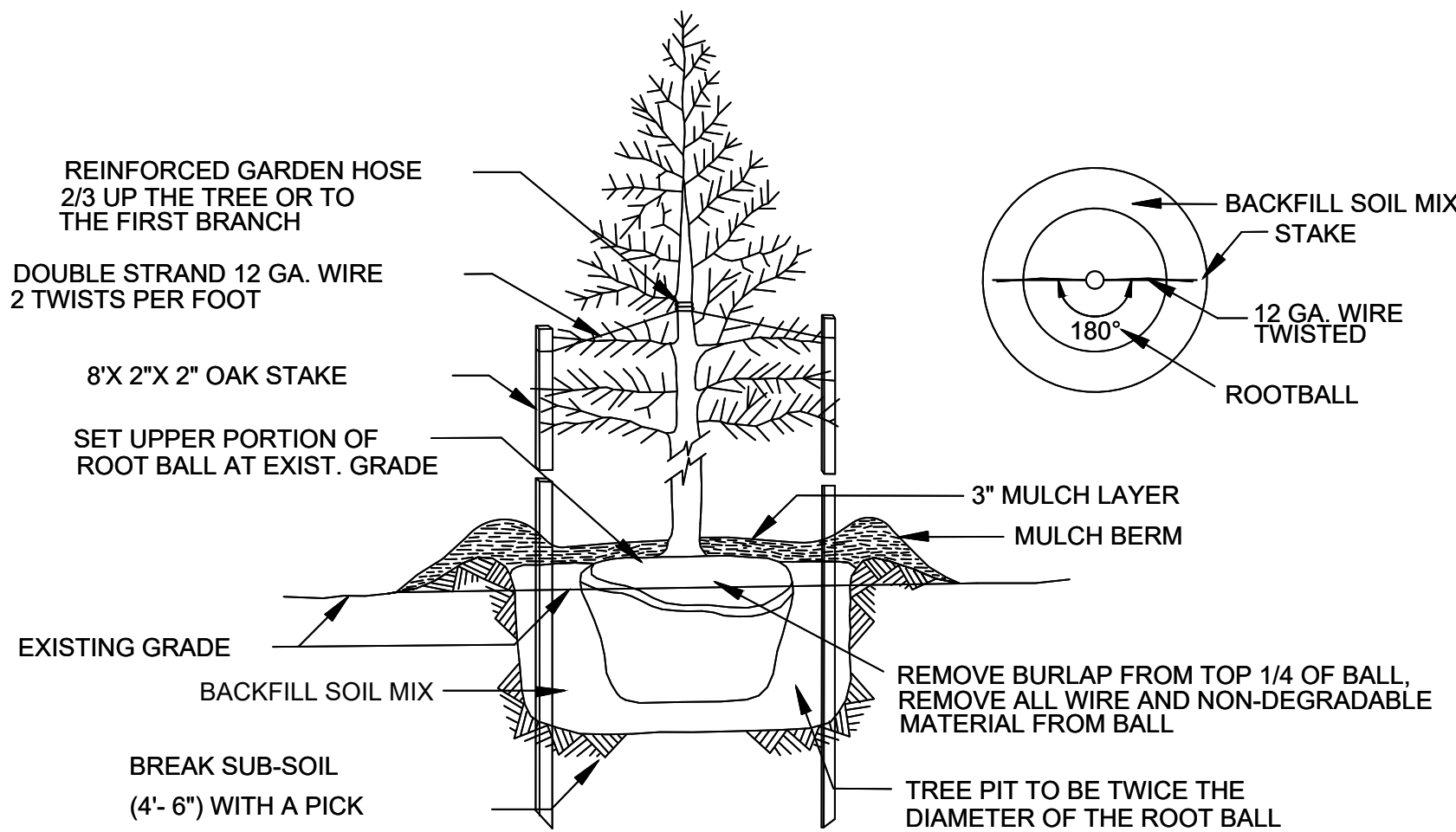
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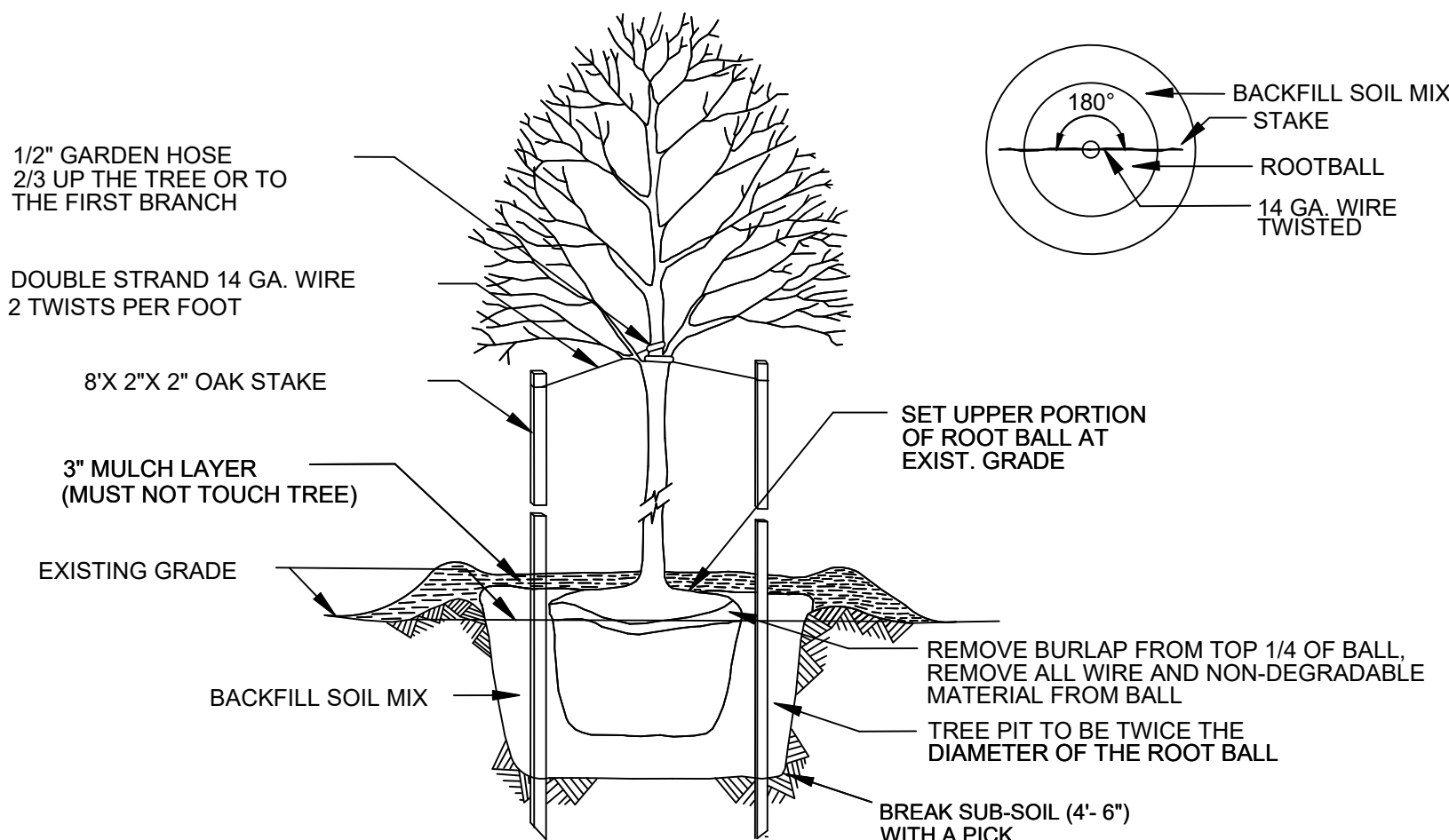
LANDSCAPE PLAN

SHEET NO.
L1.0

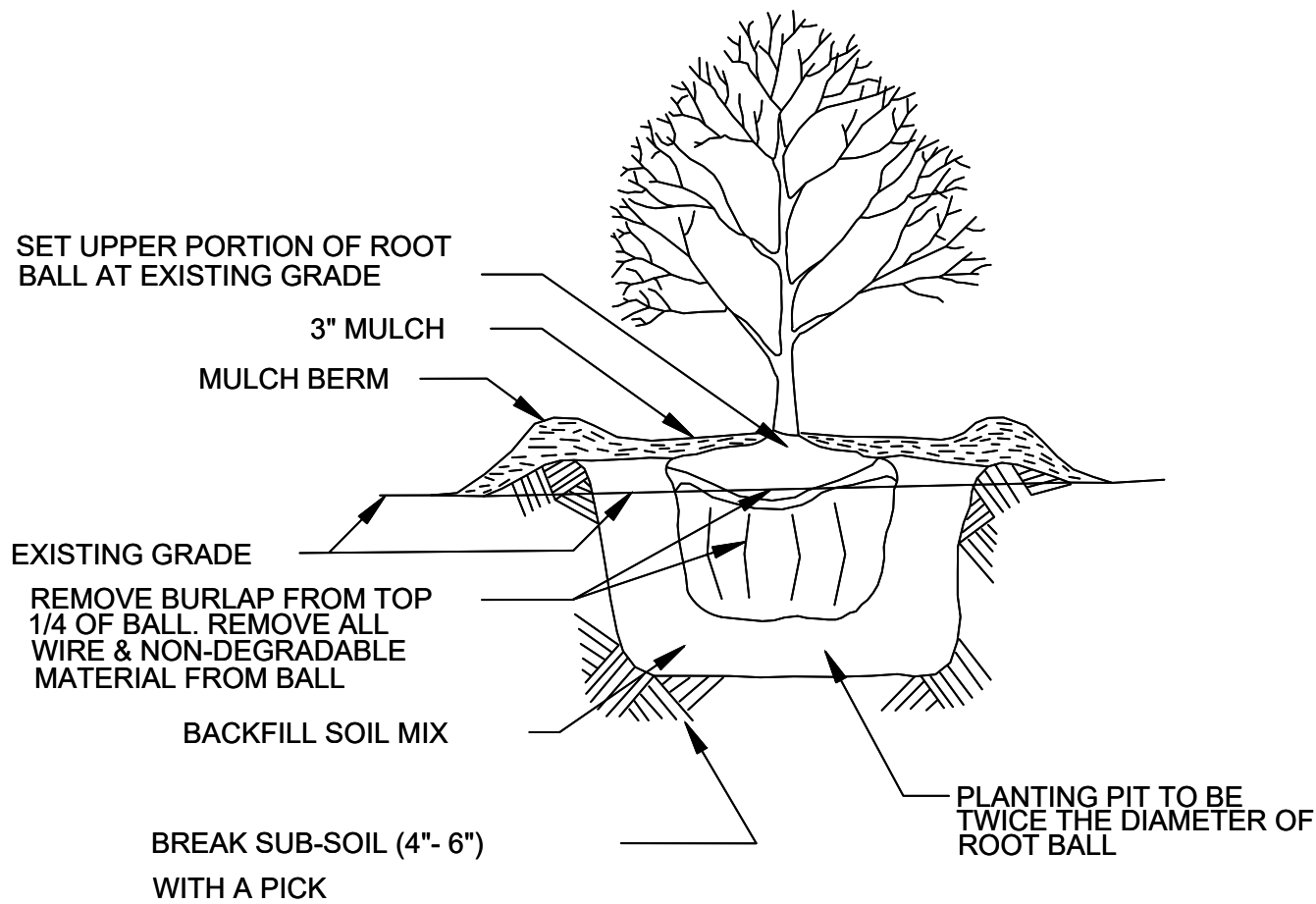
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EVERGREEN TREE PLANTING AND STAKING DETAIL
NOT TO SCALE



DECIDUOUS TREE PLANTING AND STAKING DETAIL
NOT TO SCALE



SHRUB PLANTING DETAIL
NOT TO SCALE

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. Installer 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.
 5. 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, phosphorous, 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 phosphorous, and 2 percent potassium, by weight.
 2. Composition: Nitrogen, phosphorous, 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 phosphorous, and 10 percent potassium, by weight.
 2. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified oil-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 (35-35-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 adsorption 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.

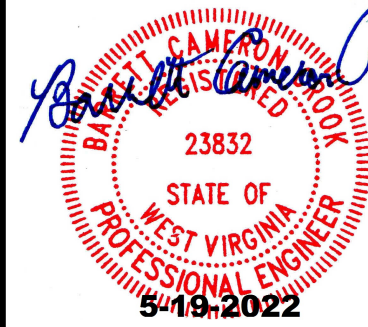
3.7 CLEANUP AND PROTECTION

- 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 legally dispose of them off Owner's property.

END OF SECTION 02930



The Site Design Company

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2688 HIGH STREET - PETERSBURG, VIRGINIA 23803
www.sitedesignco.com



DATE : MAY 15, 2022

REVISION BLOCK

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RESIDENCE INN by MARRIOTT @ HOTEL CIRCLE

CITY OF CHARLESTON - KANAWHA COUNTY, WEST VIRGINIA

LANDSCAPE SPECIFICATIONS

SHEET NO.

L1.1

EMAIL: thompson@stadesignco.com

PHONE: 804-720-9040

PROJECT MANAGER : CHRIS THOMPSON

PROJECT #: 20064

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- 1.Plant material sizes and grading are to comply with the latest edition of "American Standards of Nursery Stock," published by the American Nursery & Landscape Association.
- 2.Contractors shall ascertain location of all utilities prior to excavation. Prior to commencing any work, contact "West Virginia 811" at 1-800-245-4848 (toll free) or 811.
- 3.No changes to plant schedule unless first approved by the City of Charleston Planning Department Plans Review section.
- 4.Landscaping will be designed so as not to interfere with sight distance needs of drivers in the parking areas and at the entrance/exit locations.
- 5.Plant material quantities and sizes will be inspected for compliance with approved plans by a site plan review agent of the City of Charleston Planning Department prior to the release of the certificate of occupancy.
- 6.The owner is responsible for maintaining shrubs and trees that are required per approved landscaping plans. Dying or dead plant materials are to be replaced during the next planting season.
- 7.Plant materials shall have all strings or ropes at the base of the plant cut away from the trunk (including biodegradable brands of rope).
- 8.No landscaping shall be installed that obstructs access to fire hydrant or other Fire Department connections. A clear area of 5' shall be maintained around all Fire Department connections.

PRE-CONSTRUCTION

1. CONTRACTOR IS RESPONSIBLE FOR CONTACTING "WEST VIRGINIA 811" AT 1.800.245.4848 (TOLL FREE) OR 811 FOR LOCATION OF ALL UTILITY LINES. TREES SHALL BE LOCATED A MINIMUM OF 5 FEET FROM SEWER/WATER CONNECTIONS. NOTIFY LANDSCAPE ARCHITECT OF CONFLICTS.
2. VERIFY ALL PLANT MATERIAL QUANTITIES ON THE PLAN PRIOR TO BIDDING. PLANT LIST TOTALS ARE FOR CONVENIENCE ONLY AND SHALL BE VERIFIED PRIOR TO BIDDING.
3. PROVIDE PLANT MATERIALS OF QUANTITY, SIZE, GENUS, SPECIES, AND VARIETY INDICATED ON PLANS.
4. ALL PLANT MATERIALS AND INSTALLATION SHALL COMPLY WITH RECOMMENDATIONS AND REQUIREMENTS OF ANSI Z60.1 "AMERICAN STANDARD FOR NURSERY STOCK".
5. IF SPECIFIED PLANT MATERIAL IS NOT OBTAINABLE, SUBMIT PROOF OF NON AVAILABILITY TO THE ARCHITECTS, TOGETHER WITH PROPOSAL FOR USE OF EQUIVALENT MATERIAL.
6. PROVIDE AND INSTALL ALL PLANTS AS IN ACCORDANCE WITH DETAILS AND CONTRACT SPECIFICATIONS.

CONSTRUCTION/INSTALLATION

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

INSPECTIONS/GUARANTEE

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

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.
- 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.

1.5 QUALITY ASSURANCE

- 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, phosphorus, 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 (Poa <u>pratensis</u>)	80	85	0.50
90%	Tall Fescue (Festuca <u>arundinacea</u>)	85	98	0.50

2. General Slope (3:1 or less)-Refer to Erosion Control Requirements for location-150 lbs./acre	Proportion by Weight	Grass Species	Min. % Germination	Min. % Pure Seed	Max. % Weed Seed
	2%	Red Top Grass	85	85	0.50
	85%	Tall Fescue (Festuca arundinacea)	85	98	0.50
	13%	Tall Fescue (Festuca arundinacea)	85	85	0.50
3. Low-Maintenance Slope (Steeper than 3:1)-Refer to Erosion Control Requirements for location-150 lbs./acre.	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 Blue 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)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.
- 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 ½" 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 ¼ 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

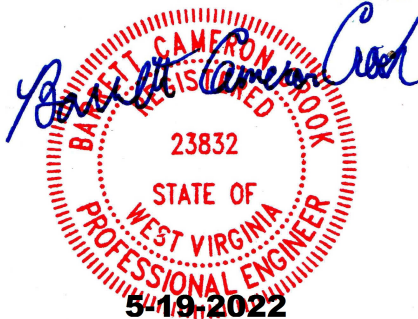
- A. Begin maintenance of lawns immediately after each area is planted and continue until acceptable lawn is established. Maintain seeded lawns until Substantial Completion. Maintain all grassed areas as necessary to ensure a satisfactory lawn is achieved at Substantial Completion.
- B. Maintain and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



The Site Design Company



DATE : MAY 15, 2022

REVISION BLOCK

NO.	REVISION
-	-

RESIDENCE INN by MARRIOTT

@ HOTEL CIRCLE

CITY OF CHARLESTON - KANAWHA COUNTY, WEST VIRGINIA

LANDSCAPE SPECIFICATIONS

SHEET NO.

L1.2

EMAIL: thompson@sitesdesignco.com

PHONE: 804-720-9040

PROJECT MANAGER : CHRIS THOMPSON

PROJECT #: 20064



Municipal Planning Commission
City Service Center – 915 Quarrier Street – Suite 6
Wednesday, April 6, 2022
3:00 P.M.

Members Present

Mary Beth Hoover
JoEllen Zacks – via phone
Adam Krason
Alice Hypes
Shannon Ferrari
Justin Marlow
Cory Stout
Terri Allen, Mayor's Designee
Lisa Fischer-Casto

Members Absent

Aric Margolis
Margo Teeter
Terry Pickett
Quintie Smith
Shawn Taylor
J. D. Stricklen, Kanawha Co Rep
Deanna McKinney

Staff Present

Dan Vriendt
Lori Brannon
Chad Webb

Call to Order – Mary Beth Hoover

1. Unfinished Business

2. New Business

Preliminary and Final Subdivision - Application of J.D. Stricklen, requesting preliminary and final subdivision approval and a variance to subdivision regulations to create seven (7) lots located at 1258-1268 Oakhurst Drive, Charleston, West Virginia

Applicant, J. D. Stricklen, presented his request for the preliminary and final subdivision approval and variance as the owner and developer of property located at 1258-1268 Oakhurst Drive. After this matter was heard, a motion taken, and the Commission voted on it, J. D. Stricklen left the meeting.

Chad Webb presented the Planning Department's staff notes.

STANDARD OF REVIEW: The Commission is to review the plat to ensure conformity with the subdivision regulations and the comprehensive plan. The Commission shall also review the infrastructure to ensure that it can handle the proposed development. The

City, at its discretion, may require a bond in lieu of any unfinished work. The Commission's quasi-judicial decision is final.

ANALYSIS:

The petitioner is requesting preliminary and final subdivision approval at the same time. The request is to divide an apartment development currently in construction into 7 lots in order to sell them as townhomes instead of renting them out as housing units. In addition, the petitioner is requesting a modification to the subdivision regulations relating to the minimum lot depth and depth to width ratio. The Commission is the only entity that can grant modifications, therefore the request must come before the Commission. The property is located on Oakhurst Drive, right after it splits off of Eureka Drive at the intersection with Corridor G. The lots will intersect with the public road. The petitioner has agreed to comply with all requirements set forth in the Subdivision Regulations and any further stipulations set forth by the relevant municipal authorities.

RECOMMENDATION AND FINDINGS:

Staff recommends **approval, including the modification request**, for the following reasons:

1. The new and existing infrastructure will be able to handle the development; and
2. The request meets the Subdivision Regulations with the exception of Sections 4-050(B)(5)(a)&(b), pending approval of the variance granted by the Board of Zoning Appeals.

No one from the public was in attendance to speak in favor of or in opposition to the request for preliminary and final subdivision approval and variance at 1258-1268 Oakhurst Drive.

Questions were taken from the Commission.

MOTION AND VOTE

On the motion of Adam Krason, seconded by Cory Stout, the Commission voted unanimously, 9-0, to approve the preliminary and final subdivision, including the modification request.

Rezoning: Bill No. 7951 amending the Zoning Ordinance of the City of Charleston, West Virginia, enacted the 1st day of January 2006, as amended, and the map made a part thereof, by rezoning from an I-2 district to a C-10 district, that certain lot of land situate at 306 MacCorkle Avenue SE, Charleston, WV 25314.

Matt Kingrey presented the request for the rezoning Bill No 7951 on behalf of the applicant, Shop-A-Minit Market Partnership.

Chad Webb presented the Planning Department's staff notes.

STANDARD OF REVIEW:

A rezoning is a change to the zoning map, which requires a legislative decision. Therefore, the Commission's role is to make a recommendation to Planning Committee with final action being at City Council. The Commission should determine if the request is spot zoning and if it is consistent with the Comprehensive Plan. A rezoning is considered spot zoning when all the following factors are present: A small parcel of land is singled out for special and privileged treatment; The singling out is not in the public interest but only for the benefit of the landowner; the action is not in accordance with the comprehensive plan. If a request is inconsistent with the comprehensive plan, the commission should consider if the original zoning classification was in error, or if the character of the area has changed significantly since the adoption of the comprehensive plan. Proposed uses should be treated with care, because once rezoned, any use that is permitted within the district would be permitted 'by right' with no review by the Commission.

ANALYSIS:

Existing Land Use and Zoning: The property is zoned both C-10 General Commercial District and I-2 Light Industrial District R-6 Medium Density Residential District and is a large empty commercial lot.

Surrounding Land Use and Zoning: The surrounding areas includes large commercial and industrial business and is a mixture C-10 and I-2 zoning designations.

Current Zoning: The property is currently zoned both C-10 and I-2. While a "Gasoline Service Station" and a "Gasoline Station and Mini-Mart" are both permitted uses in both zoning designations, "Convenience Store, Neighborhood" is neither a permitted nor conditional use in an I-2 zone.

Proposed Zoning: The uniform C-10 zoning of the property would allow a permitted use for both Gasoline Station uses while also allowing for "Convenience Store, Neighborhood".

Compliance with the Comprehensive Plan: The comprehensive plan's future land use map designates the property as being in a "Convenience Commercial", which is defined to be an area that is primarily auto-focused and is used to be a commercial area consisting of small to medium-sized businesses that are more sensitive to neighboring context. The industrial hub that the property is a part of is designated both as traditional "Industrial" and "Convenience Commercial." It has, through previous rezoning, been transistioning

from uniform I-2 zoning to its current mixture of C-10 and I-2 due to increased demand for commercial uses of the property and declining industrial demand.

Summary: This application to rezone the property is in pursuit of removing the conflict between the property's current C-10 and I-2 zoning. This is compliant with the comprehensive plan as it will allow more permitted uses under the land use table that are consistent with the property's current designation of "Convenience Commercial."

RECOMMENDATION AND FINDINGS:

Staff recommends **approval** for the following reasons:

- The rezoning is consistent with the future land use map which places this property in a "Convenience Commercial" area and the proposed uniform C-10 designation would further development in that direction.
- The rezoning will remove the bifurcation of the property between two zoning designations.
- Council has approved similar I-2 to C-10 rezoning in this area in the past.

No one present to speak in favor of or in opposition to the rezoning.

Questions were taken from the Commission.

MOTION AND VOTE

On the motion of Adam Krason, seconded by Shannon Ferrari, the Commission voted unanimously, 9-0, to approve Bill No. 7951.

Rezoning: Bill No. 7952 amending the Zoning Ordinance of the City of Charleston, West Virginia, enacted the 1st day of January 2006, as amended, and the map made a part thereof, by rezoning from an R-6 district to a C-10 district, that certain lot of land situate at 6600 MacCorkle Avenue SE, Charleston, WV 25304.

Applicant, Kevin Serrat, presented his request for the rezoning Bill No. 7952.

Chad Webb presented the Planning Department's staff notes.

STANDARD OF REVIEW:

A rezoning is a change to the zoning map, which requires a legislative decision. Therefore, the Commission's role is to make a recommendation to Planning Committee with final action being at City Council. The Commission should determine if the request is spot zoning and if it is consistent with the Comprehensive Plan. A rezoning is considered spot zoning when all the following factors are present: A small parcel of land is singled out for special and privileged treatment; The singling out is not in the public interest but only for the benefit of the landowner; the action is not in accordance with the comprehensive

plan. If a request is inconsistent with the comprehensive plan, the commission should consider if the original zoning classification was in error, or if the character of the area has changed significantly since the adoption of the comprehensive plan. Proposed uses should be treated with care, because once rezoned, any use that is permitted within the district would be permitted 'by right' with no review by the Commission.

ANALYSIS:

Existing Land Use and Zoning: The property is zoned R-6 Medium Density Residential District and is a multi-use commercial and rental residential structure.

Surrounding Land Use and Zoning: The surrounding areas are either zoned R-6 on the eastern side of MacCorkle Ave SE and C-10 on the opposite side.

Current Zoning: The R-6 district allows for single and multi-family housing and - as a conditional use - bed and breakfasts, educational institutions, community centers, museums, nursing homes, and restricted accessory parking, among others. It does not allow for any of the structure's past or present commercial uses either "by right" or by approved conditional use.

Proposed Zoning: The C-10 designation allows for the continued use of the property as rental housing but would allow for the current commercial use that owner has located there.

Compliance with the Comprehensive Plan: The comprehensive plan's future land use map designates the property as being in a "Traditional/Core Neighborhood", which is described as "predominantly single-family" in character with a focus on smaller lots developed in the 19th century to today. The description also includes flexibility for the inclusion of duplexes, triplexes, or smaller multi-family units, but strongly discourages larger multi-family development, except for townhomes in a transition area.

In its current state, the property does not conform to the future land use plan for "Traditional/Core Neighborhood." However, the area on both sides of MacCorkle Avenue SE, as it intersects with 66th Street, also incorporates an area of "Convenience Commercial", which is defined to be an area that is primarily auto-focused and is used to be a commercial area consisting of small to medium-sized businesses that are more sensitive to neighboring context. Being at the boundary of the two land use areas, this rezoning would effectively just moving the property from one side of the transition to the other.

However, there is the concern of future commercial development surrounded by residential homes, given that future permitted uses granted under a C-10 designation are "by right" unless further rezoning occurs.

Summary: This application to rezone the property is in pursuit of bringing the property into compliance with current zoning laws as it is being used as both rental property and a commercial business site by changing its zoning designation from R-6 to C-10. While this

does not strictly conform with the future “Traditional/Core Neighborhood” land use for the property, its being immediately adjacent to a large C-10 “Convenience Commercial” land use area would potentially allow it to be seen as a minor expansion that would allow the continued use of an existing non-residential structure. However, an argument for this being an example of spot rezoning could be made. Additionally, there are future concerns about the rezoning permitting further commercial development in an area that is traditionally residential.

RECOMMENDATION AND FINDINGS:

Staff recommends **approval** for the following reasons:

1. The rezoning is a minor expansion of the “Convenience Commercial” Land Use Designation.
2. The rezoning will allow the continued use of a long-existing, non-residential structure.
3. However, in the alternative, if the MPC weighs the concerns of future commercial uses allowed by right on the newly rezoned area more heavily than the basis for our recommendations, we would suggest considering a less broad rezoning to C-4. This would allow for the current tree/contracting business while greatly reducing future commercial development opportunities.

Pam Burka, a 34-year resident of this area, voiced concerns, not necessarily opposition, on behalf of herself and other residents regarding the rezoning. Basically, Ms. Burka and the other residents were in favor of the C-4 rezoning.

Billy Linville, a 28-year resident of the 6600 block of Roosevelt Avenue in Kanawha City, spoke in opposition to the rezoning, primarily due to the permitted sales of alcoholic beverages and medicinal marijuana.

Questions were taken from the Commission.

Councilman Bobby Brown voiced his concerns regarding this matter. He is satisfied with a C-4 rezoning, although he adamantly opposed the potential for the future sale of medicinal or legalized marijuana by another business, in the event Mr. Serrat would sale or move.

Common Grounds, an outreach program that provides meals, will remain located in the same building. Mr. Serrat would have his business on the top floor.

Ruth Mullons, a resident of this area, voiced her concerns in regard to the traffic generated by a C-4 rezoning and the impact it would have on the immediate neighborhood should Mr. Serrat sale, move or go out of business.

Mr. Serratt presented his rebuttal to the opposition voiced against the rezoning of Bill No. 7952.

MOTION AND VOTE

On the motion of Adam Krason, seconded by Shannon Ferrari, the Commission voted unanimously, 9-0, to approve Bill No. 7952 as a C-4 rezoning.

3. Other Items

Street Dedication: Bill No. 7953 accepting for dedication the entirety of Centre Court Road.

Applicant Larry Dennison, owner of Dennison Land and Development, presented his request for Bill No. 7953.

Dan Vriendt presented the Planning Department's staff notes.

STANDARD OF REVIEW:

The Commission is to review the dedication request to ensure compliance with the Subdivision Regulations. The City Engineer may require a street maintenance bond to cover areas of concern. City Council takes final action on the request.

HISTORY: The road was built by Dennison Land and Development, LLC as part of the 36 lot Centre Court Village subdivision and was approved for naming in 2000. The subdivision easternmost lots have remained undeveloped and there is no foreseeable plan for future development given current market conditions. Additionally, in the intervening 22 years, Dennison Land has invested over \$40,000 in addressing CSB concerns that have arisen since the road's initial construction.

ANALYSIS:

A street will not be considered for dedication until a minimum of eighty percent (80%) of all the approved parcels with frontage on the proposed street to be dedicated have been developed with structures approved by the City. The driveways connecting to the street to be dedicated shall have approved drainage facilities as required by the City Engineer. The street shall not exceed the maximum allowed street grade as specified in this Ordinance, shall met the minimum street width paving requirements as outlined in this Ordinance, shall connect to an existing city street or state road, shall be paved to specifications as outlined in this Ordinance, and dead-end streets shall have a turnaround as outlined in this Ordinance.

As mentioned above, Centre Court Road has been in a stable configuration with no major construction for a number of years and there are no further plans for development. The intent of the 80% occupancy requirement is to ensure that no further development that create significant wear and tear would occur after the dedication and, therefore, pass on substantial maintenance and repair costs to the city. While the development sits at roughly 61% occupancy, the long-concluded development of the subdivision would seemingly address the concerns addressed by the 80% requirement. Otherwise, Centre Court Road meets the other requirements necessary for dedication, absent any further objection or concern from the City Engineer or other municipal entity.

RECOMMENDATION AND FINDINGS:

The Planning Department recommends **approval** for the following reasons:

1. The Centre Court Subdivision that Centre Court Road runs through has long concluded development and has no future plans to restart, thus addressing the primary concern that is the primary policy motivation behind the 80% occupancy requirement;
2. Dennison Land has made substantial investments to address the concerns raised by the City that have arisen in the intervening 21 years since the road was named, which also addresses the concern for exposing the City to future maintenance costs after dedication; and
3. Centre Court Road conforms with all other requirements for dedication.

There was no one present at the meeting to speak in favor of or in opposition to Bill No. 953.

Questions from the Commission were addressed by the staff.

MOTION AND VOTE

On the motion of Cory Stout, seconded by Lisa-Ficher-Casto, the Commission voted unanimously, 9-0, to approve Bill No. 7953.

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4. Approval of Minutes of the February 9, 2022 MPC meeting

MOTION AND VOTE

Motion was made and seconded and the Commission voted unanimously, 9-0, to approve the Minutes of the February 9, 2022 MPC meeting.

5. Announcements

6. Adjournment