GOVERNMENT OF THE DISTRICT OF COLUMBIA
DEPARTMENT OF GENERAL SERVICES

Addendum No. 03
To
Invitation for Bid ("IFB") No. DCAM-20-CS-IFB-0004

MPD Blue Plains Impound Lot Modernization

Issued: June 25, 2020

This Addendum No. 03 is issued on June 25, 2020. Except as modified hereby, the Invitation for Bid ("IFB") remains unmodified.

Item No. 01: The questions and answers spreadsheet is hereby attached as **Exhibit 1.**

Item No. 02: The bids due date is hereby extended to **July 10, 2020 at 2:00 P.M. EST.**

Item No. 03: Section L.16 (of the IFB) - Bids Opening is hereby updated as follows:

As all bids shall be submitted electronically, the Department will hold a conference call in lieu of the Bids Opening on July 10, 2020 at 3:00 p.m., EST to read the bids prices.

Conference call
July 10, 2020 at 3:00 P.M.
Conference Call Number: **866-878-9842**
Participants Code: **5966404**

Item No. 04: The numbering of Section C (of the IFB) is hereby corrected and attached as **Exhibit 2**.

By: _____ **Date:** 6.25.2020
Franklin Austin, CPPB, CPM
Contracting Officer

- End of Addendum No. 03

Exhibit 1
Questions and Answers Spreadsheet
(See following page)

Invitation for Bids ("IFB") No. DCAM-20-CS-IFB-0004

Blue Plains Impound Lot Modernization

Questions & Answers Spreadsheet

No.	Questions	Department Responses
1	In regards the drawings, we would like to ask about profiles of: a) 1.5" Domestic Water Line b) 4" Sanitary Sewer Line	If the water line less than 2", DC Water does not require profile. Water line now is 1", and ¾" for the guard booth. See attached update plans (C-300 & C-305).
2	Please provide light pole and pole base details, there is none provided in the drawing.	Intent is for the foundation design to be delegated to the contractor's engineer. See specification sections 26 56 00 Exterior Lighting Cast-In-Place and 03 30 00 Concrete.
3	Can you provide the GeoTechnical report to verify if the soil conditions.	Yes, it is contained at the front of the specification book. The separate document is also available.
4	Modular office building per bid documents o Note 1 – the roof design will not allow it to be transported down the road. It's too tall. o Note 2 – Our supplier, Modular Genius can provide a modular roof to be set on top of the admin office. This would be (4) modular pieces. o Note 3 – Our supplier can also provide an alternate to reduce the pitch of the roof so it will ship as one unit. This would be (2) modular pieces.	The design intent was for the roof to be shipped separately. The roof slope shall be as designed.
5	For Phase I, the site work can be done in five months. Can we install the offices and other modular structures in phase II after the site work is completed?	Yes, main building and security booth should be included in your Add Alternate Pricing on bid form.

6	Are we providing security for the site after the construction is completed?	No, MPD will be moving back to site.
7	Should we install additional dumpsters more than what is shown on contract documents?	No additional dumpsters are required for MPD, only for GC during construction.
8	Existing office must be abated before its demolished/removed. Should we include a cost for building abatement?	Yes, include abatement for existing office.
9	Should we include a cost for commissioning?	No.
10	Are we responsible for compaction and material testing?	No, do not include in bid.
11	Relocating the PEPCO Pole takes a long time. Is DGS Coordinating this, are we paying the relocation fee?	DGS will assist, yes bidder is paying ALL PEPCO fees.
12	Which building needs to be abated?	Yes, include abatement for existing office only.
13	What's the specs for aluminum fence?	Match the existing 8' high black metal picket fence.
14	Section C.2 of Section A, Invitation for Bids Solicitation Number: DCAM-20-CS-IFB-0004 is missing. Section C.3 refers to it.	The numbering is corrected. See updated Section C attached.
15	Is Office Trailer needed for DGS Personnel?	No MPD/DGS will not be onsite during construction.
15	Would you please elaborate on the bid bond. Are you looking for special form of letter?	No. The Form of Bid Bond is provided as Attachment J.9.
16	Can we have a second site visit on the subject IFB?	Yes. The 2nd site visit is scheduled on ***Monday, 29 June 2020 at 9:00 A.M.***

17	Reference is made to the Guard Booth on plan sheet A 101. The manufacturer was listed as below "GUARD BOOTH BASIS OF DESIGN: PORTA-KING BUILDING SYSTEMS (MODEL: DURASTEEL PC-DAR157SL POC: MATT McNAMEE PHONE: 636-549-3605, EMAIL: MATT@RACKANDSHELF.COM, WEB: WWW.RACKANDSHELF.COM)." We have contacted them but they are not fabricating that type structure any longer. Does DGS/MPD recommend another alternative?	There is an error on our construction documents, Matt McNamee is with Rack and Shelf. The correct information for the guardbooth is below Matt w / Portaking 800.456.5464 ext 261 mhodges@portaking.com
18	Is the guard shack part of the bid package?	Yes.
19	There's no striping plan provided either. Please make sure the engineer or architect provides that to us	See sheets C-300 & C-301.
20	I respectfully request to extend the bid's due date at least another week please.	The bids due date is hereby extended to ***July 10, 2020 at 2:00 pm***.
21	Can the bid due date be extended? The time frame is too short for some of my subcontractors.	See answer #20.
22	Is this job tax exempt?	Yes.
23	The supplier advised regarding lack of structural steel plan(s) for the Vehicle Shed	General configuration of structural framing for the Guard Booth is to be per Sheet A102; General configuration of structural framing for the Vehicle Shed is to be per Sheet A103. Final steel framing design is to be by supplier. Material specification is to be per Specification Section "Metal Building Systems."

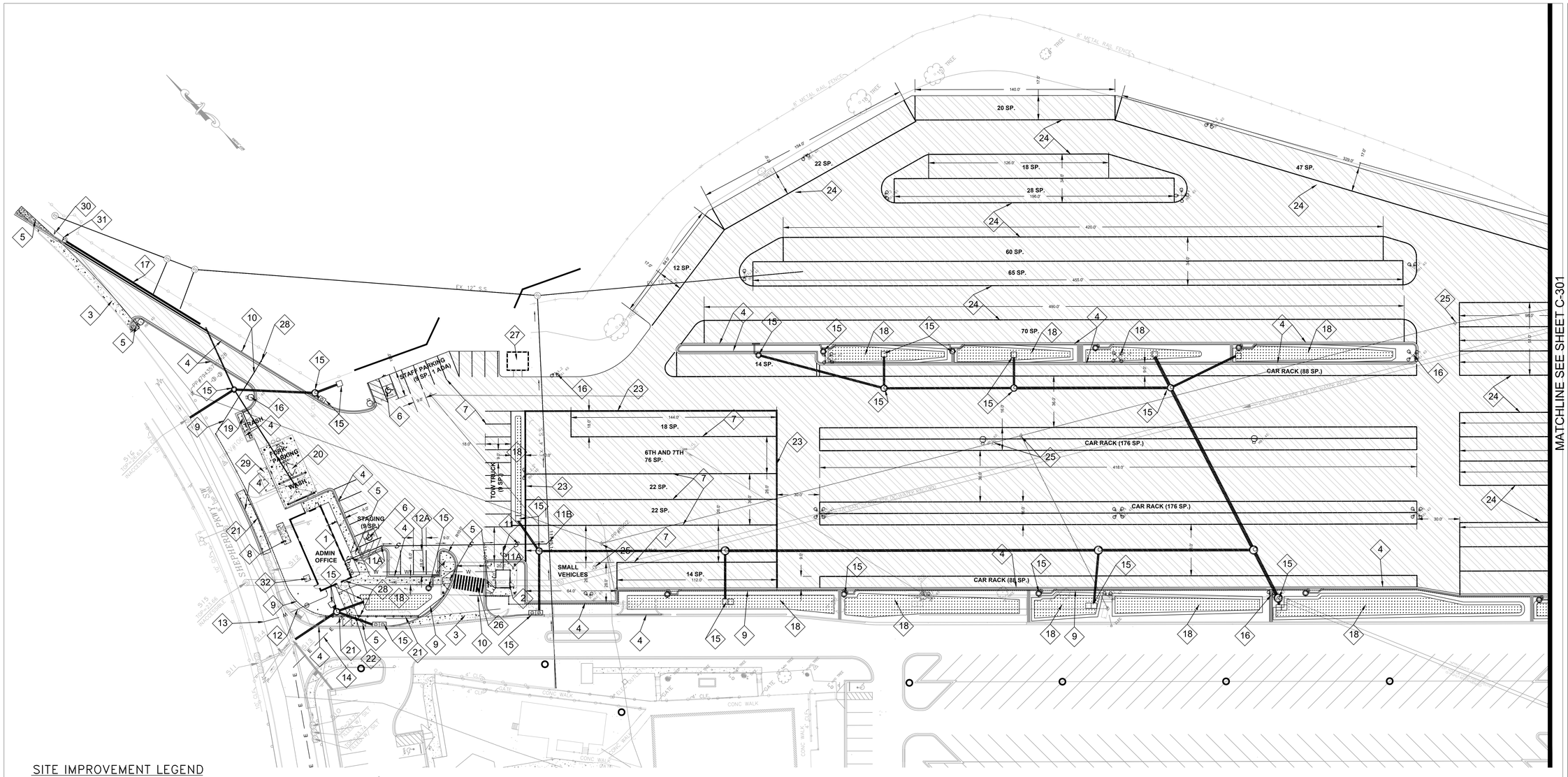
24	The specifications spell out chain link fence, the drawing note #9 on drawing C-300 mentions match existing metal fence. On this lot they have galvanized chain link, Black vinyl coated chain link and 2 different types of black tubular iron picket fence? Can you clarify which one you wanted quoted for this bid?	The two new gates are chain link fence gate as shown on C303, all new surrounding fence shall match existing 8' high black metal picket fence.
25	Please confirm Commissioning, Otto IT are excluded in scope of work for this project	Commissioning and OCTO is excluded from this SOW and should not be included in bid.
26	Please confirm that permit fee is excluded in this proposal and Projectdocs was completed by other.	Permit fee is paid for by AE, GC to pick up permit only.
27	Please confirm that FF&E and computers stations are not included in scope of work of this bid.	FF&E to be included as indicated on A101. Also see specification Division 10. Computer systems by OCTO.
28	Do we have any allowance for site security for the project?	In bid, 100K allowance included for Security Cost.
29	Please verify contractor will able to bid this project even though they do not have experience in either of 1. Parking lot projects nor 2. Metropolitan Police Department projects	Yes, Please submit bid. Please also review the special standards of responsibility.
30	Please provide missing specification items of structural steel, metal decking, miscellaneous steel, etc. from structural Division 5 and HVAC from division 23.	Structural steel for pre-engineered metal buildings is specified in Section 13 34 19 Metal Building Systems, also see notes on S101. MEP specification are found on the drawings, see sheets, M002, P001, & E002.

	We request more time to get price from subcontractor for the proposal if possible.	
31	Please confirm the proposal submission will be in electronic/email with less than 25MB attachment but not in form of hard copies submission.	See Addendum No. 02 issued on June 18, 2020. Pursuant to the current District of Columbia Government, State of Emergency executive order signed by Mayor Muriel Bowser on March 11, 2020 in response to the current SARS-CoV-2 (COVID-19) Coronavirus-19 Pandemic, all bids ***shall be submitted electronically*** with less than 25 MB attachment on the bids submission due date.
32	Project Construction Duration – Some of the structures specified on this project will require a materials lead time of 12-14 weeks after approval of submittals. Kindly provide owner require project duration.	We will wait for project schedule for recommended completion date, but due to swing space lease project will need to start immediately after contract is awarded and permit received. Parking lot area is starting location.
33	Vehicle Storage Rack specification and manufacture recommendation is missing from bid documents?	PORTA-KING BUILDING SYSTEMS (MODEL: DURASTEEL PC-DAR157SL POC: MATT McNAMEE PHONE: 636-549-3605, EMAIL: MATT@RACKANDSHELF.COM, WEB: WWW.RACKANDSHELF.COM
34	We need the Geotechnical report?	Yes, it is contained at the front of the specification book. The separate document is also available.
35	Does the dirt from trenches consider suitable to backfill or it is contaminated?	Provide unit pricing for both suitable and unsuitable soil conditions. It shall be determined by geotechnical testing during construction.
36	When is the start date of this project?	Anticipated award date is on/about July 20, 2020.
37	How will utility location be handled? Miss Utility or Private Locater?	Private Locater

38	Confirm that the light posts in the impound lot will be cut / made safe by Pepco and the contractor will be responsible for removal?	These poles and lighting on the site are under MPD control, the contractor is responsible to removal.
39	Also need to confirm the same for the light posts that are not shown in the plans and coincide with new bio retention areas?	These poles and lighting on the site are under MPD control, the contractor is responsible for removal.
40	Sewer and Water Profiles?	Sewer profile is provided, water line is less than 2", no profile is required.
41	We will need the paving specifications?	Spec 321216 is for asphalt paving, and 321313 is for concrete paving.
42	Are there any sequences of work specified?	Parking lot area is the priority an should be completed first. So MPD can bring back vehicles. See C501.
43	I just received another inquiry about the retaining wall on the northwest corner of the impound lot. The height of the retaining wall is not clear. The section elevations vary from 6ft or less to 22ft. Which one of these height applies to the project. Please advise at your convenience.	Refer to Sheet C304, retaining wall profile, and a plan review will be added as well.
44	Item 2002 on the bid sheet breakdown calls for removal of existing 5" Asphalt while on the boring logs it shows the surface of the lot as 2" of Gravel. Please clarify the thickness and type of the existing pavement.	The asphalt paving is in bad condition, and thickness of the asphalt varies. It is assumed to be 5" averagely.
45	What is the difference between item 6000 (6 Inch PVC for Subsurface Drain) and item 6002 (6 Inch PVC Pipe)?	Subsurface drain is perforate, regular PVC is not perforate.

46	Who is responsible for removing the vehicles in this parking lot?	MPD will be moving their own vehicles currently on Blue Plains site to Swing Space upon contract award.
47	Is LEED commissioning required?	No.
48	If LEED commissioning is required, whose responsibility is it to commission?	No.
49	Who is responsible for BMP certifications?	The contractor shall provide all BMP as-built information and plans. The engineer of record for this project will review the as-built plans and certify the BMP plans.
50	Per C-200, Note 14, please clarify an approximate linear footage for the 21" SWM pipe removal.	Updated survey was not conducted. We are not able to provide exact linear footage of the pipe.
51	Who will pay for the tap fees for the new water service?	The GC to pay water fees
52	There are references in the drawings to a security package, but no security drawings (for an example, please see A101, note 16). Please clarify if a security scope applies for this project.	OCTO is to provide IT and Security.
53	Where does finish UP-1 apply?	Furniture.
54	A601, detail 4 – please provide additional details for the transaction ledge – materials, structure, etc.	Use CT-1 for countertop with concealed supports, see specification section 12 36 61.16
55	For items like the car racks, do the supplied structural details apply or will the manufacturer's detail ultimately apply?	Use the details generated by the structural engineer. Standard details would need to be reviewed and approved by the engineer of record during the submittal process.
56	The bid form breakdown is confusing- it has an Add Alternate column but there are no add alts mentioned in the specifications or in the IFB. Please clarify.	Bid base pricing you don't include bold areas in your pricing. ADD alternative pricing, you are to price the entire project.

57	Can you please send the excel sheet for the requested breakdown?	Bid Base pricing and Add Alternative Pricing excel sheet is included.
58	There is no site conduit plan for the light poles showing conduit sizes or desired layout.	See answer #2 for light poles info.
59	There is no detail for the light pole foundation.	See answer #2 for light poles info.



SITE IMPROVEMENT LEGEND

- NEW BIO-RETENTION AREA FOR STORMWATER MANAGEMENT
- INSTALL HEAVY DUTY PARKING ASPHALT PAVEMENT
- INSTALL NEW CONCRETE SIDEWALK, PAD, APRON AND BASE
- STORM DRAIN INLET
- NEW STORM DRAIN MANHOLE
- NEW STORM DRAIN PIPE

1. NEW ADMIN. BUILDING, SEE ARCH. PLANS FOR DETAILS
2. NEW GUARD BOOTH W/REST ROOM AND UTILITY CONNECTIONS (SEE ARCH. PLANS)
3. NEW DC TYPE 'A' DRIVEWAY
4. NEW CONCRETE CURB AND GUTTER
5. NEW ADA STANDARD HC CURB RAMP
6. NEW ADA VAN PARKING SIGN AND PAVEMENT MARKINGS
7. 4" SOLID WHITE PARKING LINE (TYP.)
8. NEW CONC. PAD AND ENCLOSURE FOR GENERATOR
9. NEW 8' HIGH METAL FENCE MATCHING WITH EXISTING TYPE
10. NEW GATE AND SECURITY CONTROL SYSTEM
11. NEW 4" SANITARY SEWER LINE
11A. NEW SEWER CLEANOUT
11B. CONNECT TO EX. 4" SAN. SEWER PER DC WATER STANDARD
12. NEW 1.0" DOMESTIC WATER LINE PER W-80.01 W/O FIRE SERVICE LINE
12A. NEW 3/4" DOMESTIC WATER LINE
13. TAP 1.0" WATER SERVICE TO EX. 8" WATER MAIN PER DC WATER STANDARD
14. NEW ELEC. POWER LINE, FOR REFERENCE ONLY, SEE SITE ELEC. PLANS FOR DETAILS.
15. NEW STORM DRAIN STRUCTURE AND ASSOCIATED PIPES, SEE STORMWATER MANAGEMENT PLAN FOR DETAILS (TYP.)
16. NEW SITE LIGHT (TYP.), SEE ELEC. PLANS FOR DETAILS
17. LOW HEIGHT CONC. RETAINING WALL
18. NEW BIO-RETENTION
19. DUMPSTER, RECYCLING BINS, & 55 GAL. DRUM STORAGE
20. FORK LIFT PARKING AND TRUCK WASH
21. NEW GUARDRAIL CONNECTED WITH EXISTING GUARDRAIL.
22. PEDESTRIAN METAL SWING GATE W/ CALL BUTTON, MATCH W/ EX. FENCE
23. 12" SOLID RED PARKING LINE (TYP.)
24. 6" SOLID YELLOW PARKING LINE (TYP.)
25. RELOCATED PEPCO UTILITY POLE, SEE ELECTRICAL PLANS FOR DETAILS.
26. 12" CROSSWALK WHITE LINE WITH 12" CLEAR GAP.
27. 12'X14' SHED, SEE ARCH. PLANS FOR DETAIL.
28. NO PHOTO, NO CELL SIGN, SEE DETAIL ON SHEET C-3.02
29. 7.5'X16' CONC. PAD FOR AIR COMPRESSOR AND SHED
30. MPD IMPOUNDMENT LOT SIGN, SEE SHEET C-3.03
31. DO NOT ENTER, AUTHORIZED VEHICLE ONLY SIGN
32. CONC. PAD FOR MECHANICAL EQUIPMENT, SEE MECH. PLANS.

SITE IMPROVEMENT NOTES:

1. TIES TO EXISTING PAVEMENT AREAS SHOULD BE SMOOTH CONSISTENT TRANSITIONS. NO ABRUPT CHANGE IN LINE AND/OR GRADE WILL BE PERMITTED.
2. POSITIVE DRAINAGE SHALL BE MAINTAINED DURING ALL PHASES OF CONSTRUCTION. PONDING OR STANDING WATER WILL NOT BE PERMITTED.
3. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO NOTIFY THE ENGINEER OF ANY DEVIATION FROM THIS PLAN PRIOR TO ANY CHANGE BEING MADE. ANY DEVIATION FROM THIS PLAN WITHOUT WRITTEN CONSENT FROM THE OWNER WILL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
4. SURFACED STREETS AND PARKING AREAS SHALL BE MAINTAINED IN A CLEAN CONDITION, MUD AND DUST FREE AT ALL TIMES. ADEQUATE MEANS SHALL BE PROVIDED TO CLEAN TRUCKS AND OTHER EQUIPMENT USING SURFACED STREETS AND PARKING AREAS.
5. THE EXISTING SURROUNDING FACILITIES ARE TO REMAIN IN AN EXPEDITIOUS MANNER.
6. THE CONTRACTOR SHALL TAKE PROPER PRECAUTIONS SO AS NOT TO DAMAGE EXISTING ADJACENT FACILITIES AND STRUCTURES. THE CONTRACTOR SHALL RESTORE DISTURBED AREAS TO THEIR ORIGINAL CONDITION OR BETTER UNLESS NOTED OTHERWISE.
7. THE CONTRACTOR SHALL MAKE EVERY ATTEMPT TO MINIMIZE DAMAGE TO EXISTING TREES/PLANTINGS THAT ARE TO REMAIN.
8. ALL UTILITY VALVES, MANHOLES, AND THE LIKE WHETHER OR NOT INDICATED ON THESE PLANS SHALL BE ADJUSTED TO THE NEW GRADE BY THE CONTRACTOR.
9. ALL DIMENSIONS ARE MEASURED FROM FACE OF CURB OR WALL.
10. SEE ELECTRICAL PLANS FOR SITE LIGHTING IMPROVEMENT
11. SEE LANDSCAPE PLANS FOR SITE LANDSCAPE IMPROVEMENTS.
12. SEE ARCHITECTURAL PLANS FOR BUILDING DETAILS.
13. AFTER REMOVAL OF REDUNDANT FENCE AND INSTALLING NEW FENCE, THE CONTRACTOR SHALL INSPECT THE FENCE AROUND THE SITE TO ENSURE THE SITE IS SECURED WITH NO GAPS.

UTILITY NOTE:

1. THE ELECTRICAL POWER CONNECTION SHOWN ON THIS PLAN IS FOR REFERENCE ONLY. THE CONTRACTOR SHALL COORDINATE WITH PEPCO FOR THE SITE ELECTRICAL CONNECTIONS AND PEPCO POLE RELOCATIONS ON THE SITE.
2. THE CONTRACTOR SHALL COORDINATE WITH ALL UTILITY COMPANIES FOR ALL UTILITY CONNECTIONS AND REMOVALS THAT ARE REQUIRED FOR THE SITE.

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

0 1" 2" 3" 4" 5" 6" 1'-0" 3"=1'-0"
0 2" 4" 6" 1'-0" 2' 1 1/2"=1'-0"
0 6" 1'-0" 2' 3' 1"=1'-0"
0 1' 2' 4' 3/4"=1'-0"
0 1' 2' 4' 1/2"=1'-0"
0 1' 2' 4' 6' 3/8"=1'-0"
0 2' 4' 8' 1/4"=1'-0"
0 2' 4' 8' 12' 3/16"=1'-0"
0 4' 8' 16' 1/8"=1'-0"
0 4' 8' 16' 24' 3/32"=1'-0"
0' 4' 8' 16' 32' 1/16"=1'-0"

APPROVALS

BELL architects
1228 9th street, nw washington dc 20001
tel: 202.548.7570
www.bellarchitects.com

CIVIL ENGINEER
DELON HAMPTON AND ASSOCIATES, CHARTERED
8403 COLESVILLE ROAD, SUITE 1525
SILVER SPRING, MD 20910
TEL: 301.585.0100

STRUCTURAL ENGINEER
DELON HAMPTON AND ASSOCIATES, CHARTERED
8403 COLESVILLE ROAD, SUITE 1525
SILVER SPRING, MD 20910
TEL: 301.585.0100

MEP ENGINEER
XYZ CONSULTNATS. INC.
123 MAIN ST, NW, WASHINGTON DC 20111
TEL: 202.212.1234

DISTRICT OF COLUMBIA
SAOZHU WEI
No. 900317
LICENSED
PROFESSIONAL ENGINEER
06/09/2020

NO.	DESCRIPTION	DATE
3	100% Construction Documents	02/07/2020
2	90% Construction Documents	12/05/2019
1	50% Design Developments	10/04/2019

Metropolitan Police Department of the District of Columbia

PROJECT

Blue Plains Impound Lot Modernization

5001 SHEPHERD PARKWAY SW
WASHINGTON, DC 20032

SHEET TITLE

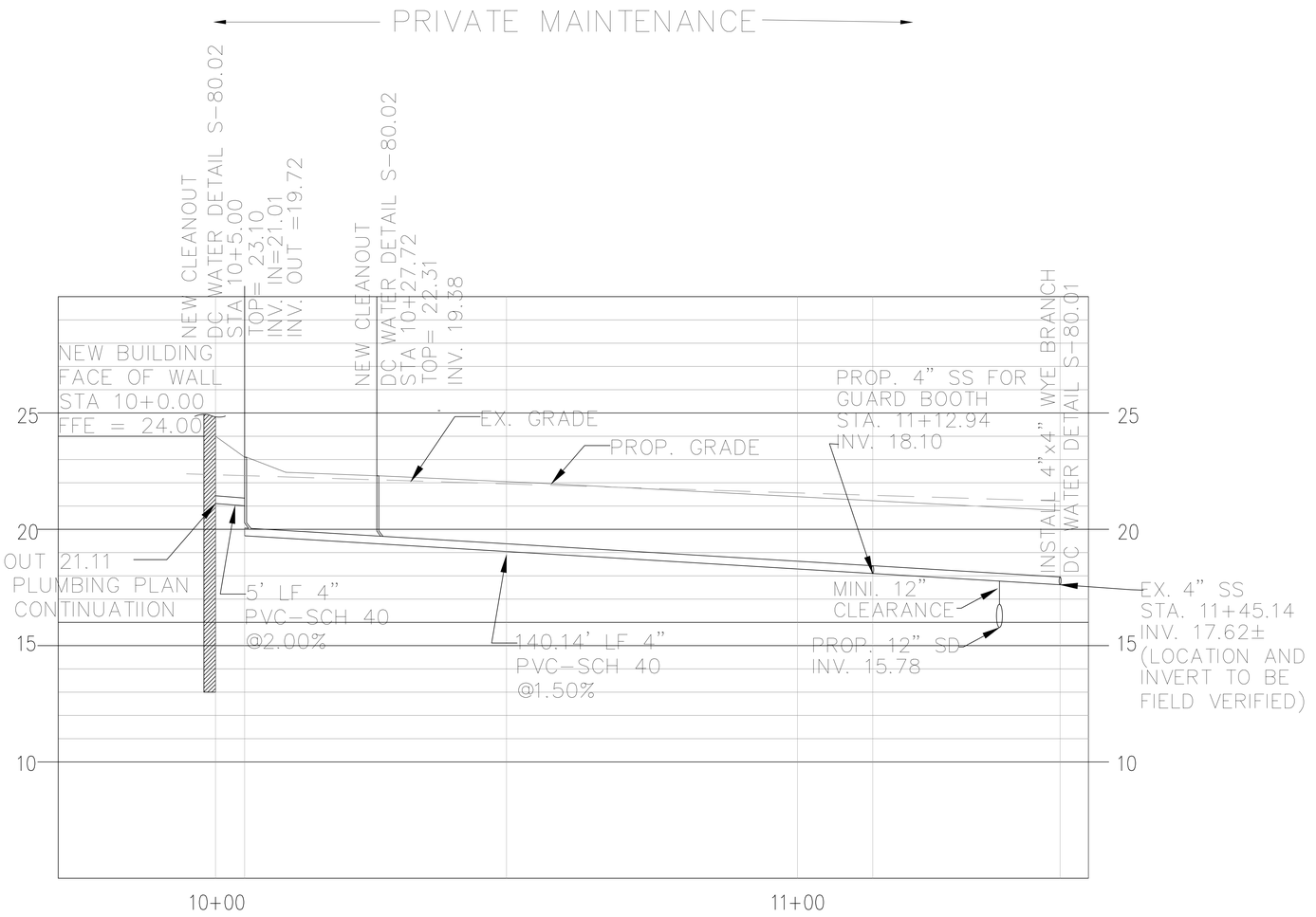
SITE IMPROVEMENT PLAN

SHEET INFORMATION

DATE: 06/9/2020 JOB#: 2114310
DRAWN: WD CHECKED: BW
SCALE: 1" = 30' BLDG: N/A

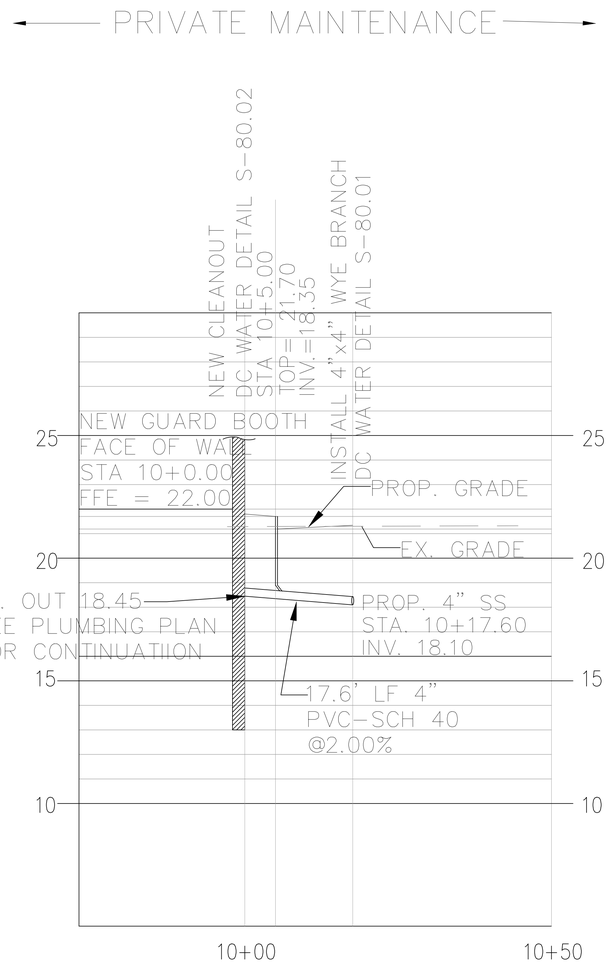
SHEET NUMBER

C - 300



SANITARY SEWER PROFILE

SCALE: HORIZ. 1" = 10'
VERT. 1" = 2.5'



SANITARY SEWER PROFILE FOR GUARD BOOTH

SCALE: HORIZ. 1" = 10'
VERT. 1" = 2.5'

APPROVALS

BELL architects
1228 9th street, nw washington dc 20001
tel: 202.548.7570
www.bellarchitects.com

CIVIL ENGINEER
DELON HAMPTON AND ASSOCIATES, CHARTERED
8403 COLESVILLE ROAD, SUITE 1525
SILVER SPRING, MD 20910
TEL: 301.585.0100

STRUCTURAL ENGINEER
DELON HAMPTON AND ASSOCIATES, CHARTERED
8403 COLESVILLE ROAD, SUITE 1525
SILVER SPRING, MD 20910
TEL: 301.585.0100

MEP ENGINEER
XYZ CONSULTNATS. INC.
123 MAIN ST, NW, WASHINGTON DC 20111
TEL: 202.212.1234

DISTRICT OF COLUMBIA
SAOZHU WEI
No. 900317
LICENSED
PROFESSIONAL ENGINEER
06/09/2020

NO.	DESCRIPTION	DATE
3	100% Construction Documents	02/07/2020
2	90% Construction Documents	12/05/2019
1	50% Design Developments	10/04/2019

Metropolitan Police Department of the District of Columbia

PROJECT

Blue Plains Impound Lot Modernization
5001 SHEPHERD PARKWAY SW
WASHINGTON, DC 20032

SHEET TITLE

SANITARY SEWER PROFILE

SHEET INFORMATION

DATE:	06/9/2020	JOB#:	2114310
DRAWN:	WD	CHECKED:	BW
SCALE:	1" = 30'	BLDG:	N/A

SHEET NUMBER

C - 305

ECS Capitol Services, PLLC

Subsurface Exploration and Geotechnical Engineering Report

Blue Plains Impound Lot Upgrades

5001 Shepherd Parkway SW
Washington, DC 20032

ECS Project Number 37:2659

October 30, 2019

ECS CAPITOL SERVICES, PLLC "Setting the Standard for Service"
Geotechnical • Construction Materials • Environmental • Facilities
CBE No LZ26807012022

October 30, 2019

Mr. Daniel Blair
Bell Architects, PC
1228 9th Street, NW
Washington, DC 20001

ECS Project No. 37:2659

Reference: Subsurface Exploration and Geotechnical Engineering Report
Blue Plains Impound Lot Upgrades
5001 Shepherd Parkway SW Washington, DC 20032

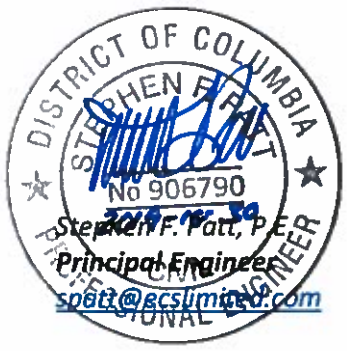
Dear Mr. Blair:

ECS Capitol Services, PLLC (ECS) has completed the subsurface exploration, laboratory testing, and geotechnical engineering analyses for the above-referenced project. Our services were performed in general accordance with our Proposal No. 37:2407-GP most recently revised September 27, 2019. This report presents our understanding of the geotechnical aspects of the project along with the results of the field exploration and laboratory testing conducted. Please note the results of the environmental testing associated with the above proposal will be provided under separate cover.

It has been our pleasure to be of service to Bell during the design phase of this project. We would appreciate the opportunity to remain involved during the continuation of the design phase, and we would like to provide our services during construction phase operations as well to verify the assumptions of subsurface conditions made for this report. Should you have any questions concerning the information contained in this report, or if we can be of further assistance to you, please contact us.

Respectfully submitted,

ECS Capitol Services, PLLC,



Kevin Hurley, P.E.
Project Engineer
khurley@ecslimited.com

Stephen F. Patt, P.E.
Principal Engineer
spatt@ecslimited.com

X:\Geotechnical_e-projects\2600-2699\2659 - Blue Plains Impound Lot\e-Report Prep

TABLE OF CONTENTS

APPENDICES

Appendix A – Drawings & Reports

- Site Location Diagram
- Boring Location Diagram
- Cross Section A-A

Appendix B – Field Operations

- Reference Notes for Boring Logs
- Boring Logs B-1 through B-12

Appendix C – Laboratory Testing

- Laboratory Test Results Summary
- Plasticity Chart
- Grain Size Analysis

Appendix D – Supplemental Report Documents and Calculations

- French Drain Installation Procedure
- Limited Undercut and Replacement Diagram

EXECUTIVE SUMMARY

The following summarizes the main findings of the subsurface exploration recently completed at the project site, particularly those that may have a cost impact on the design and construction of the proposed structures and 4 vertical bay car racks planned as part of the project. Further, our principal foundation recommendations are summarized. Information gleaned from the executive summary should not be utilized in lieu of reading the entire geotechnical report.

We understand construction will involve the demolition of the existing parking lot and redevelopment of the project site including the construction of three at-grade structures (footprint size ranging from 150 to 1,400 square feet) and car storage racks. The geotechnical exploration performed for the planned construction included the following:

- Eight soil test borings drilled to depths on the order of 20 to 40 feet below existing grades for the proposed new at-grade structures (ref. borings B-1 to B-8)

Additionally, four soil test borings were drilled to depths on the order of 10 feet below existing grades for the purposes of environmental testing/screening; the associated results/findings will be provided under separate cover.

In general, beneath the surficial gravel materials, the subsurface explorations encountered existing fills generally consisting of CLAYEY SAND (SC FILL) and SILTY SAND (SM FILL) with varying amounts of gravel and construction debris (e.g. brick, asphalt, and glass fragments). The existing fills were encountered within each of the soil borings and appeared to extend to depths ranging from 7.5 to 22 feet below existing grades and one must likely placed in a concentrated manner. Natural alluvial soils generally consisting of CLAY (CL), FAT CLAY (CH), and SILTY SAND (SM) were encountered below the existing fills and extended to the boring termination depths.

Based on the subsurface conditions encountered, specifically the horizontal and vertical extents of the existing fill materials as well as the nature of the proposed structures/car racks, several foundation options for the support the structures/car racks are provided for the owner/design team's consideration in subsequent sections of this report. The first option (higher risk, applies to structures only) includes a modified undercut and replacement method and supporting the structures on traditional shallow footings designed with a low bearing pressure (ref. *Section 5.1.2*). Due to the nature of the existing fill materials (e.g. varying blow counts and heterogeneous makeup) there are some risks associated with settlement of the structure should option 1 be chosen; however, given the use of the structures and the light loads, it is most likely not economical or practical to support the structures on systems of deep/intermediate foundations. This option is not recommended for the support of the proposed car racks as larger undercuts would be required due to their relatively large foundation sizes, which would likely not be economical.

Additional lower risk foundation options are presented for the support of both the car racks and structures, which involves utilizing helical anchors (option 2, ref. *Section 5.1.3*) or ground improvement techniques (option 3, ref. *section 5.1.4*). Should a deep foundation option be requested, ECS can provide alternate recommendations upon your request.

1.0 INTRODUCTION

1.1 GENERAL

The purpose of this study was to provide geotechnical information to assist with the design of foundations of the proposed structures. The recommendations developed for this report are based on project information supplied by the design team. This report contains the results of the recent subsurface exploration and laboratory testing programs, site characterization, engineering analyses, and recommendations for the design and construction of the planned structures.

1.2 SCOPE OF SERVICES

To obtain geotechnical information for design of the proposed structures, the following subsurface exploration was performed:

- Eight soil test borings drilled to depths on the order of 20 to 40 feet below existing grades for the proposed new at-grade structures (ref. borings B-1 to B-8)

Additionally, four soil test borings were drilled to depths on the order of 10 feet below existing grades for the purposes of environmental testing/screening; the associated results/findings will be provided under separate cover.

The soil test borings for the proposed structures were performed at locations suggested by ECS and approved by your office. However, please note boring B-1 was offset from its original proposed location due to existing physical site conflicts. Specifically, fencing/permanent guard rails prevented rig access to the proposed location; therefore, the boring was offset east of its original proposed location.

Each of the borings were located in the field by measuring from existing reference points. A laboratory-testing program was also implemented to characterize the physical and engineering properties of the subsurface soils. This report discusses our exploratory and testing procedures, presents our findings and evaluations and includes the following.

- Observations from our site reconnaissance including current site conditions, surface drainage features, and surface topographic conditions.
- A review of the published geologic conditions and their relevance to the planned development.
- A subsurface characterization and a description of the field exploration and laboratory tests performed. Ground water concerns relative to the planned construction, if any, will be summarized.
- Final logs of the soil borings and records of the field exploration prepared in accordance with the standard practice for geotechnical engineering. A boring location plan is included, and the results of the laboratory tests are plotted on the final boring logs as well as included on a separate test report sheet.
- Recommended allowable soil bearing pressures for conventional shallow foundations, estimates of predicted foundation settlement, and recommendations for intermediate/deep foundations.

- Recommendations for slab-on-grade construction, including recommendations for subgrade improvements.
- Evaluation of the on-site soil characteristics encountered in the soil borings. Specifically, we discussed the suitability of the on-site materials for reuse as engineered fill to support grade slabs. We included compaction requirements and suitable material guidelines.
- Recommendations for seismic site classification in accordance with the International Building Code (IBC 2012).

1.3 AUTHORIZATION

Our services were provided in accordance with our Proposal No. 37:2407-GP most recently revised September 27, 2019, as authorized by your office.

2.0 PROJECT INFORMATION

2.1 CURRENT SITE CONDITIONS

The project site is located at the existing Blue Plains Impound Lot at the physical address of 5001 Shepherd Parkway, SW in Washington, D.C. The current impound lot is a gravel-covered parking lot with an approximate footprint of 820,000 square feet which contains an office building and currently houses a significant amount of vehicles. The impound lot is bound to the north by a parking lot, to the east and south by undeveloped forested land, and to the west by an asphalt/gravel/soil distribution center. Based on publically available mapping information, the site slopes from an approximate topographical high of EL +36.0 feet in the northeast portion of the site to an approximate topographical low of EL +20.0 feet in the southwest portion.

Figure 2.1.1. Site Location

2.2 HISTORICAL SITE CONDITIONS

As part of this report ECS has reviewed publically available historical topographic mapping of the site and other miscellaneous historical information to understand previous site grading and changes on the site over time. Figure 2.2.1 on the following page illustrates general site topographical details from the year 1900 (ref. United States Geological Survey, Washington – Topographical Quadrangle Map 1900). The subject property appears to have been undeveloped land until approximately 1949 when several roads appeared to be developed on the subject property.

Tributaries of the Potomac River appeared to run through the property until the early 1960s. From the early 1960s through the 1970s, the subject property appeared to be used for construction staging. By 1981, the subject property was developed with an asphalt parking lot, and by 2005 the current office building appeared to be constructed on the northwestern portion of the subject property. Based on this information, the historic topographical changes at the site area, and the tributaries previously identified on historical topographical mapping but no longer appearing to be present, the site appears to have been filled in over time to raise grades to the current levels. This filling in of the site over time is significant to future development at the site due to the unknown makeup and nature in which the fills were placed, which make them generally problematic for the support of new structures.

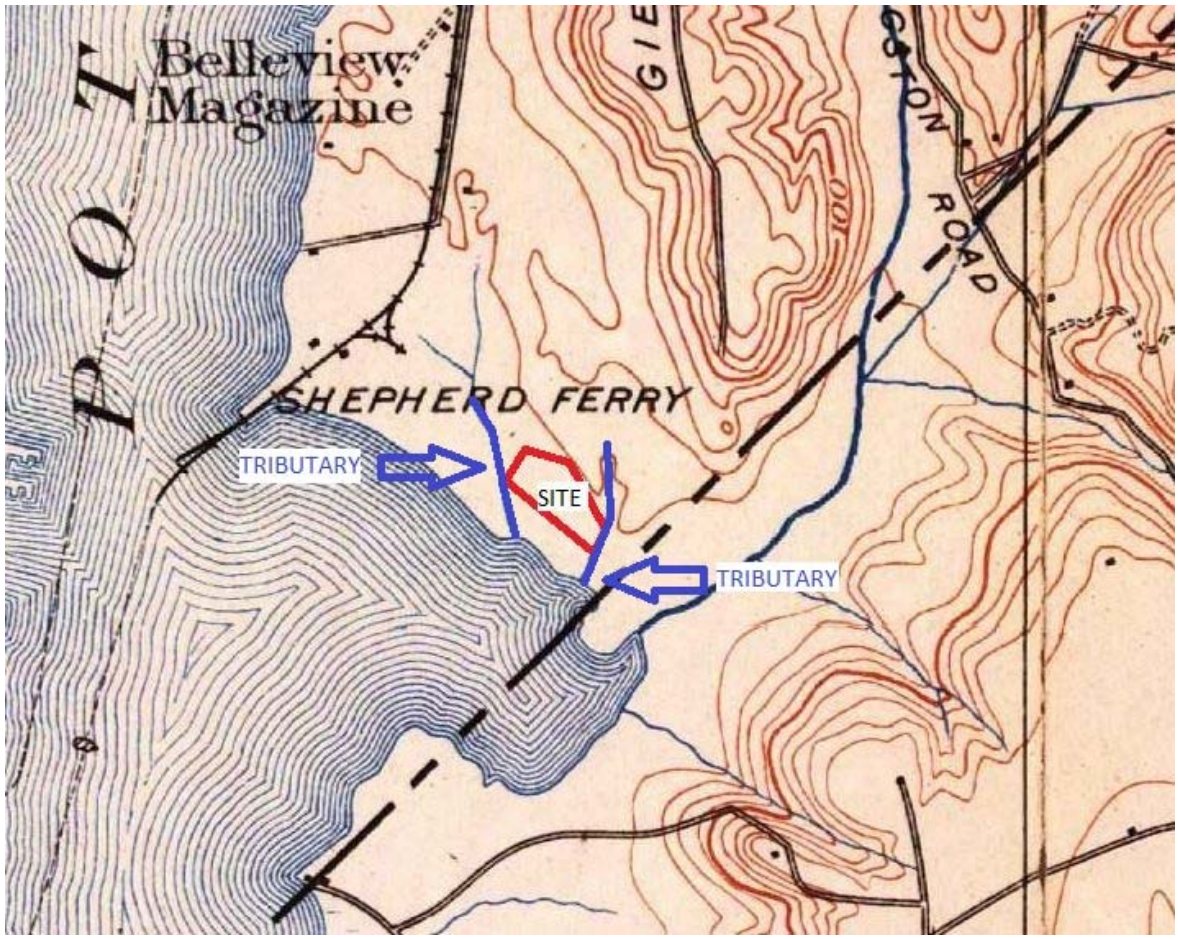


Figure 2.2.1. Site Location With Historical Topography (yr. 1900)

2.3 PROPOSED CONSTRUCTION/STRUCTURAL INFORMATION

Based on our correspondence and our review of the available project drawings, we understand the proposed development will include the construction of new covered parking and wash stall, building, administrative building, and guard booth in the northwestern portion of the site, as well as the installation of new car storage racks (up to four cars in height) in the central portion of the site.

The proposed structures in the northwest portion of the site have been labelled 1 through 3 on the *Boring Location Diagram* in Appendix A of this report for reference. The relevant information regarding the new structures is summarized in the table below (as interpreted from the 50% Design Development drawings dated October 3rd, 2019). Please note the anticipated bottom of foundation elevations for structures 1 through 3 are assumed based on the proposed finished floor elevations/site grades in the vicinity of the structures.

Table 2.3.1 Building Descriptions

Structure Identification Number	Structure Description	Approximate Footprint Plan View (ft^2)	Anticipated Bottom of Foundation Elevation (EL)
1	Covered Parking and Wash Stall	970	+21.0
2	Administrative Building	1,400	+21.0
3	Guard Booth	150	+17.0
-	Car Racks	65,000	+17.0 to +23.0*

*Bottom of foundations to be approximately three feet below proposed site grades (ref. detail 4/A104 in 50% DD drawings).

Per our email correspondence with your office in October 2019 and our review of the car rack design details (ref. detail 4/A104 in the 50% DD drawings), we understand maximum service loading for the car racks is on the order of 48 kips (six kips per tier, up to four tiers planned). Loading for the proposed structures 1 through 3 was not available at the time this report was prepared; however, based on the available design information we anticipate these structures will be relatively lightly loaded.

Additionally, we understand the installation of new bioretention facilities is planned as part of the overall site improvements; however, ECS has not been requested to provide infiltration testing services at this time.

3.0 FIELD EXPLORATION

3.1 FIELD EXPLORATION PROGRAM

The field exploration was planned with the objective of characterizing the project site in general geotechnical and geological terms and to evaluate subsequent field and laboratory data to assist in the determination of geotechnical recommendations.

3.1.1 Test Borings

The subsurface conditions were explored by drilling eight soil test borings drilled to depths on the order of 20 to 40 feet below existing grades for the proposed new at-grade structures and car racks (ref. borings B-1 to B-8). Additionally, four soil test borings were drilled to depths on the order of 10 feet below existing grades for the purposes of environmental testing/screening; the associated environmental results/findings will be provided under separate cover.

The soil test borings for the proposed structures were performed at locations suggested by ECS and approved by your office. However, please note boring B-1 was offset from its original proposed location due to existing physical site conflicts. Specifically, fencing/permanent guard rails prevented rig access to the proposed location; therefore, the boring was offset east of its original proposed location.

Boring B-7 was planned (and initially performed) to be drilled to 20 feet below existing grades; however, based on the visual classifications performed on soil samples provided by our subcontractor, the existing fills appeared to extend to the planned boring termination depth of 20 feet below existing grades. Therefore, ECS directed our subcontractor to extend the boring until natural soils were encountered (boring performed to 30 feet below existing grades). An ATV-mounted drill rig was utilized to drill the soil test borings, and the subsurface explorations were completed under the general supervision of an ECS geotechnical engineer.

Boring locations were identified in the field by ECS personnel using pacing and taping methods from existing features prior to mobilization of our drilling equipment. The approximate as-drilled boring locations are shown on the *Boring Location Diagram* in Appendix A. Ground surface elevations noted on our boring logs were interpolated from the existing conditions plan provided in the 50% DD set drawings dated October 3, 2019.

Standard penetration tests (SPTs) were conducted in the borings at regular intervals in general accordance with ASTM D 1586 to boring completion. Small representative samples were obtained during these tests and were used to classify the soils encountered. The standard penetration resistances obtained provide a general indication of soil shear strength and compressibility. Additionally, water was added into the boreholes by the ECS subcontractor after groundwater was encountered.

3.2 REGIONAL/SITE GEOLOGY

The proposed site is located in the Coastal Plain Physiographic Province of Washington, D.C. The near surface soils in the Washington, D.C. area typically consist of man-placed fill soils or natural

soils which have been disturbed by previous construction. Based on publically available geologic mapping materials and the historical information referenced previously in this report, the surface of the site appears to be comprised of reclaimed land materials, including man-placed fill soils. In many cases, the thickness of existing fill corresponds to grading that was performed to establish street grades many years ago. Based on the historic topographic mapping of the project site, two river tributaries passed in close proximity to the site which appear to have been filled in over time. Existing man-made fill can be quite variable in depth, composition and consistency, making the engineering properties of such material difficult to assess. An overview of the general site geology is illustrated in Figure 3.2.1 below.

Beneath these near surface fill or disturbed soils, Pliocene and Pleistocene river terrace deposits are generally encountered. These deposits vary in their percentages of sand, silt, clay and gravel, both laterally and vertically, and contain localized areas of organics. Beneath the Coastal river terrace deposits, the area is typically underlain by lower and upper Cretaceous, or Potomac Formation soils. The Potomac formation is often the bearing stratum for highly loaded deep foundations or higher capacity spread foundations in the project vicinity. These materials generally consist of over consolidated sand and clay materials; however, were not encountered during this exploration and are generally encountered much deeper. An overview of the general site geology is illustrated in Figure 3.2.1 below:

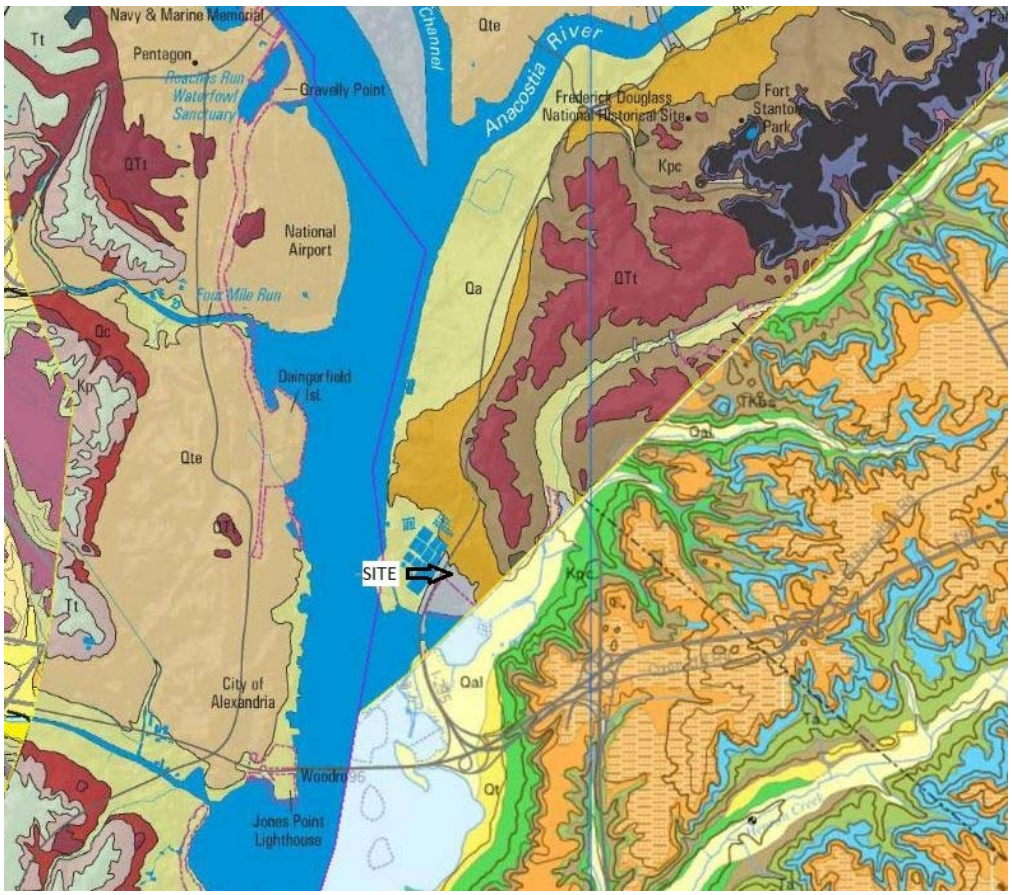


Figure 3.2.1 – Site Geology - Overall

Geologic map for Figure 3.2.1 obtained from the U.S. Geologic Service website, https://ngmdb.usgs.gov/maps/mapview/

3.3 SUBSURFACE CHARACTERIZATION

The report sections detail the soil and groundwater conditions encountered during the subsurface exploration.

3.3.1 Soil Borings

The subsurface conditions encountered were generally consistent with published geological mapping. The following sections provide generalized characterizations of the soil encountered during our subsurface exploration. For subsurface information at a specific location, refer to the Boring Logs in Appendix B.

Table 3.3.1.1 Subsurface Stratigraphy

Approximate Depth Range (ft)	Elevation (ft)	Stratum	Material Description	Ranges of SPT(1) N-values (bpf)
0-.17 ft (Surface cover)	EL. +28.83 to +19.83	n/a	**Surficial Materials** - Approximately 2 inches of gravel	N/A
0.17-22 ft	EL. +28.83 to -2.0	I	**Existing Fills** - Generally SILTY SAND (SM FILL) and CLAYEY SAND (SC FILL) - **Varying amounts of construction debris (glass, brick, and asphalt fragments)** - Very loose to very dense relative densities	Weight of Hammer (WOH)[2] to 50 blows per 2 inches of penetration
4.5-49 ft	EL. +21.5 to -17.0	II-A	**Alluvial Soils** - Generally LEAN CLAY (CL), CLAYEY SAND (SC), and SILTY SAND (SM) - Varying amounts of sand, gravel - Very loose to very dense relative densities - Very soft to hard consistencies	4 to 57

Notes: (1) Standard Penetration Test, blows per foot (bpf)
(2) WOH, "Weight of Hammer", meaning the weight of SPT hammer and rods advanced the sampler 18" (equating to 0 bpf)

3.4 GROUNDWATER OBSERVATIONS

Water levels were measured in the borings during drilling; a summary of the groundwater depths observed is provided below.

Table 3.4.1 Groundwater Observations

Boring #[2]	Groundwater depth (during drilling, ft)	Groundwater depth (during drilling, EL)
B-1	18.0	+4.0
B-2	36.2	-12.2
B-3	N/A[1]	N/A[1]
B -4	18.0	+4.0
B -5	N/A[1]	N/A[1]
B -6	18.0	+5.0
B -7	10.0	+10.0
B -8	13.0	+10.0
B -9	N/A[1]	N/A[1]
B -10	N/A[1]	N/A[1]
B -11	N/A[1]	N/A[1]
B -12	N/A[1]	N/A[1]

Notes: (1) N/A = not applicable, groundwater not observed

Many of the sites in the project vicinity have relatively complicated groundwater conditions due to the proximity to the Potomac River (can be influenced by the tidal changes) as well as perched conditions. In particular, there is a tendency for perched water to form in both existing urban fill deposits above residual soil layers. A “perched” water table trapped at a more shallow depth would be normal in this region. Variations in the long-term water table may occur as a result of changes in precipitation, evaporation, surface water runoff, construction activities, and other factors.

4.0 LABORATORY TESTING

The laboratory testing performed by ECS for this project consisted of selected tests performed on samples obtained during our field exploration operations. The laboratory testing program included visual classifications, natural moisture content tests, Atterberg Limits tests, and washed sieve analyses. The following paragraphs briefly discuss the results of the completed laboratory testing program. Classification and index property tests were performed on representative soil samples obtained from the test borings in order to aid in classifying soils according to the Unified Soil Classification System and to quantify and correlate engineering properties.

An experienced geotechnical engineer/engineering geologist visually classified each soil sample from the test borings on the basis of texture and plasticity in accordance with the Unified Soil Classification System (USCS) and ASTM D-2488 (Description and Identification of Soils-Visual/Manual Procedures). After classification, the geotechnical engineer/engineering geologist grouped the various soil types into the major zones noted on the boring logs in Appendix B. The group symbols for each soil type are indicated in parentheses following the soil descriptions on the boring logs. The stratification lines designating the interfaces between earth materials on the boring logs are approximate; in situ, the transitions may be gradual.

The soil samples collected from the borings were retained in our laboratory for a period of 60 days after the completion date of the borings.

5.0 DESIGN RECOMMENDATIONS

5.1 BUILDING DESIGN

Based on our review of the subsurface conditions encountered in the subsurface explorations and our experience in the project area, the site appears suited for the proposed development from a geotechnical perspective. The recommendations presented in this report should be incorporated in the design and construction planning of the project to reduce possible soil and/or foundation related problems during construction; ECS has been provided the following project documents at the time this report was written:

- Blue Plains Impound Lot Modernization – 50% Design Development Drawings (October 3, 2019)

Specific information regarding the bottom of foundation elevation for the proposed structures is as a result of our review of the above construction drawings, and is summarized below:

Bottom of Foundation Elevations

- Covered Parking and Wash Stall (ref. building No. 1 on *Boring Location Diagram*) – EL +21.0
- Administrative Building (ref. building No. 2 on *Boring Location Diagram*) – EL +21.0 feet
- Guard Booth (ref. building No. 3 on *Boring Location Diagram*) – EL +17.0 feet
- Car Racks – EL +17.0 to EL +23.0 feet (3 feet below final site grades)

Per our email correspondence with your office in October 2019 and our review of the car rack design details (ref. detail 4/A104 in the 50% DD drawings), we understand maximum services loading for the car racks is on the order of 48 kips (six kips per tier, up to four tiers planned). Loading for the proposed structures 1 through 3 was not available at the time this report was prepared; however, based on the available design information we anticipate these structures will be relatively lightly loaded.

If any of these assumptions are invalid, ECS should be notified so the recommendations contained herein can be revised (if necessary). The following sections present more specific recommendations with regard to the design of the proposed structures. These include various recommendations including but not limited to building foundations, earthwork, building slabs, and seismic design parameters. Discussion of the factors affecting the building foundations for the proposed construction, as well as additional recommendations regarding design and construction at the project site are included below.

We recommend ECS review the final design and specifications to check the earthwork and foundation recommendations presented in this report have been properly interpreted and implemented in the design and specifications.

5.1.1 Foundation Recommendations – General

The primary factors affecting the foundation recommendations included herein for the proposed structures and car racks are the following:

- Significant vertical extents of existing fills (Stratum I) encountered
- Relative size and loading of the proposed structures.
- Relative loading of the proposed car racks.

The existing fills (Stratum I) present in this area are significant with regards to foundation construction due to the unknown manner in which they were placed, which makes them typically prone to higher differential settlements and generally unsuitable for the support of structures.

As stated in the executive summary portion of this report, we are presenting several options for the support the structures/car racks for the owner/design team's consideration. Due to the lightly loaded nature and limited footprint sizes of the structures (ranging in footprint from 700 to 1,300 square feet), a modified undercut and replacement method and supporting the structures on traditional shallow footings designed with a low bearing pressure is included (option 1, ref. *Section 5.1.2)*. **This first option would apply to the structures only due to their relatively small foundation sizes and anticipated low loads.** This option is not recommended for the support of the proposed car racks as larger undercuts would be required due to their relatively large foundation sizes, which would likely not be economical.

Additional options (less risk, applicable to both structures and car racks) involves the support of the proposed structures/car racks utilizing helical anchors (option 2, ref. *Section 5.1.3*) or utilizing ground improvement techniques under prepared foundation elements (option 3, ref. *Section 5.1.4*). A general overview of the foundation options where they are applicable for the support of the proposed structures/car racks is presented in the table below.

Table 5.1.1.1 Foundation Overview

Recommended Foundation System Option #	Foundation System Option	Where Foundation System Option is Applicable
1	Shallow Foundations (Limited Over Excavation and Replacement)	Structures Only
2	Helical Anchors	Structures and Car Racks
3	Aggregate Piers	Structures and Car Racks

Although this report does not contain additional recommendations for deep foundations (e.g. micropiles, augercast piles, etc.) other options are feasible; however, would likely be a higher cost to the project. ECS can provide additional recommendations for these options should the owner/design team want to consider them further.

5.1.2 Foundation Recommendation Option 1 – Shallow Foundations (Structures Only, Higher Risk)

One option is to support the structures with traditional shallow foundations designed with a low bearing pressure (1,500 psf). A 1,500 psf bearing pressure could be used for the design of the proposed foundation elements while also incorporating a limited undercut and replacement under the foundation elements. Although this option has some risk associated with total settlement of the structures, considering their small footprints and the relatively light loading, significant differential settlements are not expected. Permanent structure's foundations typically do not bear in existing fill materials; however, considering the size and loading conditions of the proposed structures, it is not practical to undercut all of the existing fill materials underneath the foundation elements. Based on the information provided and the materials encountered, our primary foundation recommendations are summarized in the table below.

Table 5.1.2.1 Shallow Foundation Design

Recommended Foundation System	Design Comments
Shallow Foundations (Limited Over Excavation and Replacement)	• Over excavation required to one footing width below proposed bottom of footing (typically 2-3 feet), ref. *Limited Undercut and Replacement Diagram* in Appendix D. • Placement of reinforced crushed stone section below bottom of the footings. • Placement of geogrid mid-height of the crushed stone layer. • Allowable Bearing Pressure = 1,500 psf can be utilized for foundation sizing design purposes. • General/Earthwork contractor can install. • Lower overall installation costs when compared to complete removal/replacement or deep/intermediate foundations.

5.1.2.1 Foundation Recommendations – Shallow Foundations (With Limited Over Excavation and Replacement)

Shallow foundations (footings) for the proposed structures should be designed with a minimum width of 2.5 feet and bear at a minimum depth of 3.0 feet below the finished grade. Additionally the soils in the trapezoidal section to a depth of 2 feet (or the footing width whichever is greater) below the bottom of footing and at a 1H:1V slope off the edge of the footing should be removed and replaced with compacted crushed stone (AASHTO No. 21-A) reinforced with a geogrid (Tensar BX1100 or equivalent) placed mid-height of the crushed stone layer. A *Limited Foundation Undercut and Replacement with Engineered Fill* diagram providing a pictorial version of the undercut/replacement requirements is included in Appendix D of this report. This is a requirement (not optional) under each of the foundation elements and is being implemented to further reduce the pressures applied to the existing fill materials present as well as reduce the potential settlement of the structures.

5.1.3 Foundation Recommendation Option 2 – Helical Anchors (Structures/Car Racks, Less Risk)

Helical anchor foundations are typically installed by a design-build, turn-key contractor capable of both design and construction. The type and capacity of the intermediate foundations are highly dependent on the contractor's equipment and approach. Additionally, depending on the installation equipment and nature of the existing fill, installation may be problematic. As such, we recommend that you contact a specialty contractor and provide this report in order to establish price and feasibility estimates. Both the Geotechnical Engineer of Record (GER) and Structural Engineer of Record (SER) should be review the final design documents.

Helical anchors are galvanized steel foundation elements which are hydraulically screwed into the ground. The helical piers are comprised of a central steel shaft that is square or round and one or more helical shaped bearing plates. Each helical bearing plate is formed into a screw thread with a uniform defined pitch. The pile is installed into the ground until the helical plates are located in load bearing soil. Helical piers can be installed with portable hydraulic equipment and do not require the mobilization of a large piece of equipment or a crane. Again, we recommend a design-build contractor be consulted directly on the feasibility of helical piers for this site. Typical capacities for helical anchors are on the order of 15 to 30 kips per element.

The foundations should be designed and constructed by a specialty contractor with a minimum five years' experience working with the selected foundation system. The design-build contractor should prepare a design that is signed and sealed by a licensed Professional Engineer licensed in the District of Columbia. Installation of the anchors should be observed by the GER or qualified materials testing agency to ensure the anchors are installed in accordance with the approved design drawings.

5.1.4 Foundation Recommendation Option 3 - Aggregate Piers (Structures/Car Racks, Less Risk)

Another option for foundation support of the proposed structures/car racks is through the use of aggregate piers. Aggregate piers are a ground improvement technique in which a column of soil is replaced with open-graded crushed stone that is vibrated or compacted as it is put in place. Using this ground improvement technique, the proposed footings would bear directly on the improved subgrade. These piers are typically on the order of 24-inch to 30-inch minimum diameter excavations and are installed by drilling an open hole using an auger into the soil to the required depth (determined by the design/build contractor). Granular aggregate, such as AASHTO No. 57, 21A, or 21B, is placed in lifts and compacted or vibrated in place. These "Aggregate Piers" cause soil reinforcement with minimal spoils generated during construction as a result of the densification of soft unsuitable soils and addition of the vibrated or compacted dense granular aggregate. Due to the nature of the existing fill materials, open-hole installation construction methods may not be feasible. We recommend the contractor consider using a bottom fed method for granular aggregate placement. Without this bottom fed equipment, successful installation of the piers may be challenging.

Based on our experience with similar subsurface profiles, we anticipate an allowable bearing pressure on the order of 4,000 to 6,000 psf may be feasible after the installation of aggregate piers; however, this would be dependent on the design/builders specific system. In order to prevent disproportionately small footing sizes, we recommend isolated column footings have minimum lateral dimensions provided in Table 4. The minimum dimensions recommended in Table 4 help reduce the possibility of foundation bearing failure and excessive settlement due to local shear or "punching" action.

The aggregate pier system should be designed by a design-build contractor and the proposed soil improvement plan should be reviewed by the GER before construction begins. While design of this system would be performed by others, the design should be such that total and differential settlements would be limited to 1 inch and 0.5 inch, respectively considering the anticipated building loads. The prospective aggregate pier contractor should be aware of the existing fill materials and be provided with a copy of this report when evaluating the project site. The piers should extend through the existing fill materials and bear in the natural alluvial soil materials.

All pier locations should be staked using surveying techniques. Installation of aggregate piers is earthwork intensive and staked locations frequently become covered with soil and mud, or are destroyed by other means. Measuring from previously installed piers should not be performed.

5.1.5 Floor Slabs

Ground supported slabs appear to be feasible for this project; based on the assumed finished floor elevations, the slab subgrade will bear in the Stratum I – Existing Fill materials. For slabs bearing on these materials, the slabs can be designed assuming a modulus of subgrade reaction 75 kcf;

however, the slab thickness should not be less than 4 inches. Based on our findings during the subsurface exploration, the existing fills appear to be suitable for support of the proposed slabs; however, soft or yielding materials encountered during proofolling operations should be removed and replaced with engineered fill prior to subsequent slab construction operations. Further discussion is presented in subsequent sections.

The subgrade area should be observed by an experienced soil technician during the time of construction in order to identify any areas which may require undercutting. Some undercutting of the existing fills should be anticipated. The graphic on the following page depicts our soil-supported slab recommendations:

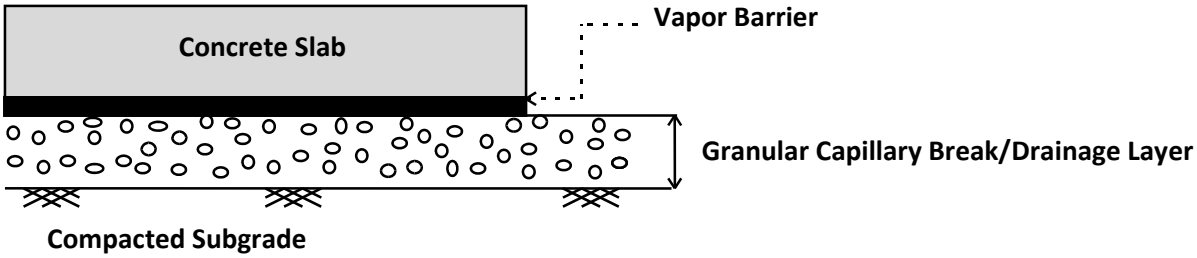


Figure 5.1.2.1

1. Drainage Layer Thickness: 4 inches
2. Drainage Layer Material: AASHTO No. 57 Stone
3. Subgrade compacted to ***95-98%*** maximum dry density per ASTM D698 and/or proofrolled soils

Slab Isolation: Ground-supported slabs should be isolated from the foundations and foundation-supported elements of the structure so differential movement between the foundations and slab will not induce excessive shear and bending stresses in the floor slab. Where the structural configuration prevents the use of a free-floating slab, the slab should be designed with suitable reinforcement and load transfer devices to preclude overstressing of the slab.

5.1.6 Foundation Drainage

At this time we understand the new structures will be constructed at about existing grades and will not contain below grade walls; however, a foundation drainage system should be incorporated into the project design. The building should be provided with a foundation drainage system to remove water from around the building. This system should consist of a 4-inch perforated, closed joint drain line located along the top of the footing. The drain line should be surrounded by a minimum of 6 inches of AASHTO Size No. 57 Stone wrapped with an approved non-woven filter fabric, such as Mirafi 140-N or equivalent.

5.1.7 Seismic Design Considerations

Seismic Site Classification: The International Building Code (IBC) 2012 requires site classification for seismic design based on the upper 100 feet of a soil profile. Three methods are utilized in classifying sites, namely the shear wave velocity (v_s) method; the unconfined compressive strength (s_u) method; and the Standard Penetration Resistance (N-value) method. The Standard Penetration Resistance method was used in classifying this site. Based on our interpretation of IBC 2012 and Section 1613.3.2, the project is defined as “Site Class D” for seismic design considerations. The Site Class definition should not be confused with the Seismic Design Category designation, which the

SER typically assesses. The seismic site class definitions for the weighted average of shear wave velocity or SPT N-value in the upper 100 feet of the soil profile are shown in the table on the following page:

Table 5.1.7.1: Seismic Site Classification

Site Class	Soil Profile Name	Shear Wave Velocity, Vs, (ft./s)	N value (bpf)
A	Hard Rock	Vs > 5,000 fps	N/A
B	Rock	2,500 < Vs ≤ 5,000 fps	N/A
C	Very dense soil and soft rock	1,200 < Vs ≤ 2,500 fps	>50
D	Stiff Soil Profile	600 ≤ Vs ≤ 1,200 fps	15 to 50
E	Soft Soil Profile	Vs < 600 fps	<15

ECS has determined the design spectral response acceleration parameters following the IBC 2012 methodology. The Mapped Reponses were estimated from the USGS website (https://hazards.atcouncil.org/). The design responses for the short (0.2 sec, S_{DS}) and 1-second period (S_{D1}) are noted in bold at the far right end of the following table.

Table 5.1.7.2: Ground Motion Parameters *(IBC 2012 Method)*

Period (sec)	Mapped Spectral Response Accelerations (g)		Values of Site Coefficient for Site Class		Maximum Spectral Response Acceleration Adjusted for Site Class (g)		Design Spectral Response Acceleration (g)	
Reference	Figures 1613.3.1 (1) & (2)		Tables 1613.3.3 (1) & (2)		Eqs. 16-37 & 16-38		Eqs. 16-39 & 16-40	
0.2	S_S	0.118	F_a	1.6	$S_{MS}=F_aS_s$	0.189	$S_{DS}=2/3\,S_{MS}$	0.126
1.0	S_1	0.051	F_v	2.4	$S_{M1}=F_vS_1$	0.122	$S_{D1}=2/3\,S_{M1}$	0.081

The Site Class definition should not be confused with the Seismic Design Category designation, which the Structural Engineer typically assesses. If a higher site classification is beneficial to the project, ECS would be pleased to discuss additional testing capabilities in this regard.

6.0 SITE CONSTRUCTION RECOMMENDATIONS

6.1 SUBGRADE PREPARATION

6.1.1 Stripping and Grubbing

The subgrade preparation should consist of stripping all existing building materials, removal of utilities, vegetation, rootmat, topsoil, and any other soft or unsuitable materials from the 10-foot expanded pavement limits and to 5 feet beyond structural fills (where feasible). The GER should be called on to verify that topsoil and unsuitable surficial materials have been completely removed prior to the placement of Structural Fill or construction of structures.

6.1.2 Proofrolling

After removing all unsuitable surface materials, cutting to the proposed grade, and prior to the placement of any structural fill or other construction materials, the exposed subgrade should be examined by the GER or authorized representative. The exposed subgrade should be thoroughly proofrolled (if feasible) with previously approved construction equipment having a minimum axle load of 10 tons (e.g. fully loaded tandem-axle dump truck). The areas subject to proofrolling should be traversed by the equipment in two perpendicular (orthogonal) directions with overlapping passes of the vehicle under the observation of the GER or authorized representative. This procedure is intended to assist in identifying any localized yielding materials. In the event that unstable or "pumping" subgrade is identified by the proofrolling, those areas should be marked for repair prior to the placement of any subsequent structural fill or other construction materials. Methods of repair of unstable subgrade, such as undercutting or moisture conditioning or chemical stabilization, should be discussed with the GER to determine the appropriate procedure with regard to the existing conditions causing the instability.

6.1.3 Site Temporary Dewatering

Although the static groundwater table appears to be below the development limits, perched groundwater and/or water related to weather events may be encountered in foundation and utility excavations and during initial demolition/grading operations, and the contractor should plan on providing some manner of dewatering during construction. We anticipate construction phase dewatering operations can be handled by the use of conventional sump pit and pump operations in conjunction with trenching as water is encountered. If necessary, temporary trenches or French Drains consisting of free draining granular stone wrapped in filter fabric to direct the flow of water and to remove water from the excavation. A French Drain installation detail is included in the Appendix of this report for reference. A perforated 55 gallon drum, or other temporary structures could be used to house the pump. Regardless of the water control techniques ultimately selected, it should be noted the soils at the design subgrade elevation will be both water and disturbance sensitive.

6.2 EARTHWORK OPERATIONS

6.2.1 Existing Man-Placed Fill

Existing fills were encountered within each of the borings and generally consisted of SILTY SAND (SM FILL) and CLAYEY SAND (SC FILL) with varying amounts of sand, gravel, and construction debris

(e.g. asphalt, brick, and glass fragments), and appeared to extend to approximately 22 feet below existing grades. The existing fill materials generally do NOT appear suitable for reuse from a geotechnical perspective due to the amount of construction debris encountered in the soil samples obtained during our subsurface exploration.

6.2.2 Structural Fill Materials

Product Submittals: Prior to placement of Structural Fill, representative bulk samples (about 50 pounds) of on-site and off-site borrow should be submitted to ECS for laboratory testing, which will include Atterberg limits, natural moisture content, grain-size distribution, and moisture-density relationships for compaction. Import materials should be tested prior to being hauled to the site to determine if they meet project specifications.

Satisfactory Structural Fill Materials: Materials satisfactory for use as Structural Fill should consist of inorganic soils classified as CL, ML, SM, SC, SW, SP, GW, GP, GM and GC, or a combination of these group symbols, per ASTM D 2487. The materials should be free of organic matter, debris, and should contain no particle sizes greater than 4 inches in the largest dimension. Open graded materials, such as Gravels (GW and GP), which contain void space in their mass should not be used in structural fills unless properly encapsulated with filter fabric. Suitable Structural Fill material should have the index properties shown in Table 6.2.1.1.

Table 6.2.1.1 Structural Fill Index Properties

Location with Respect to Final Grade	LL	PI
Building Areas, upper 4 feet	40 max	15 max
Building Areas, below upper 4 feet	45 max	20 max
Pavement Areas, upper 2 feet	40 max	15 max
Pavement Areas, below upper 2 feet	45 max	20 max

Unsatisfactory Materials: Unsatisfactory fill materials include materials which to not satisfy the requirements for suitable materials, as well as topsoil and organic materials (OH, OL), elastic Silt (MH), and high plasticity Clay (CH).

6.2.2 Compaction Operations

Subgrade Benching: Fill should not be placed on ground with a slope steeper than 5H:1V, unless the fill is confined by an opposing slope, such as in a ravine. Otherwise, where steeper slopes exist, the ground should be benched so as to allow for fill placement on a horizontal surface.

Subgrade Stabilization: In some areas, particularly low-lying, wet areas of the site, undercutting of excessively soft materials may be considered inefficient. In such areas the use of a reinforcing geotextile or geogrid might be employed, under the advisement of ECS. Suitable stabilization materials may include medium duty woven geotextile fabrics or geogrids. The suitability and employment of reinforcing or stabilization products should be determined in the field by ECS personnel, in accordance with project specifications.

Structural Fill Compaction: Structural Fill within the expanded building limits, for the undercut and replacement under footings, for the turf fields, and embankment limits should be placed in maximum 8-inch loose lifts, moisture conditioned as necessary to within -1 and +3 % of the soil's optimum moisture content, and be compacted with suitable equipment to a dry density of at least 95% of the Standard Proctor maximum dry density (ASTM D698). In areas where the total compacted fill depth is greater than or equal to 8 feet (not anticipated) the soils should be compacted to a dry density of at least 98%. ECS should be called on to document that proper fill compaction has been achieved. Please note the turf manufacturer's requirements should be followed if different than those included herein.

Fill Compaction Control: The expanded limits of the proposed construction areas should be well defined, including the limits of the fill zones for buildings, pavements, and slopes, etc., at the time of fill placement. Grade controls should be maintained throughout the filling operations. All filling operations should be observed on a full-time basis by a qualified representative of the construction testing laboratory to determine that the minimum compaction requirements are being achieved. Field density testing of fills will be performed at the frequencies shown in Table 6.2.4.1 below, but not less than 1 test per lift.

Table 6.2.4.1 Frequency of Compaction Tests in Fill Areas

Location	Frequency of Tests
Expanded Building Limits	1 test per 2,500 sq. ft. per lift
Pavement Areas	1 test per 10,000 sq. ft. per lift
Utility Trenches	1 test per 200 linear ft. per lift
Outparcels/SWM Facilities	1 test per 5,000 sq. ft. per lift
All Other Non-Critical Areas	1 test per 10,000 sq. ft. per lift

Compaction Equipment: Compaction equipment suitable to the soil type being compacted should be used to compact the subgrades and fill materials. Sheepsfoot compaction equipment should be suitable for the fine-grained soils (Clays and Silts). A vibratory steel drum roller should be used for compaction of coarse-grained soils (Sands) as well as for sealing compacted surfaces.

Fill Placement Considerations: Fill materials should not be placed on frozen soils, on frost-heaved soils, and/or on excessively wet soils. Borrow fill materials should not contain frozen materials at the time of placement, and all frozen or frost-heaved soils should be removed prior to placement of Structural Fill or other fill soils and aggregates. Excessively wet soils or aggregates should be scarified, aerated, and moisture conditioned.

At the end of each work day, all fill areas should be graded to facilitate drainage of any precipitation and the surface should be sealed by use of a smooth-drum roller to limit infiltration of surface water. During placement and compaction of new fill at the beginning of each workday, the Contractor may need to scarify existing subgrades to a depth on the order of 4 inches so that a weak plane will not be formed between the new fill and the existing subgrade soils.

Drying and compaction of wet soils is typically difficult during the cold, winter months. Accordingly, earthwork should be performed during the warmer, drier times of the year, if practical. Proper drainage should be maintained during the earthwork phases of construction to prevent ponding of water which has a tendency to degrade subgrade soils. Alternatively, if these soils cannot be

stabilized by conventional methods as previously discussed, additional modifications to the subgrade soils such as lime or cement stabilization may be utilized to adjust the moisture content. If lime or cement are utilized to control moisture contents and/or for stabilization, Quick Lime, Calciment® or regular Type 1 cement can be used. The construction testing laboratory should evaluate proposed lime or cement soil modification procedures, such as quantity of additive and mixing and curing procedures, before implementation. The contractor should be required to minimize dusting or implement dust control measures, as required.

We recommend the grading contractor have equipment on site during earthwork for both drying and wetting fill soils. We do not anticipate significant problems in controlling moisture within the fill during dry weather, but moisture control may be difficult during winter months or extended periods of rain. The control of moisture content of higher plasticity soils is difficult when these soils become wet. Further, such soils are easily degraded by construction traffic when the moisture content is elevated.

6.3 FOUNDATION AND SLAB OBSERVATIONS

Protection of Foundation/Overexcavation Excavations: Exposure to the environment may weaken the soils at the footing/overexcavation level if the foundation excavations remain open for too long a time. If the bearing soils are softened by surface water intrusion or exposure, the softened soils must be removed from the foundation excavation bottom immediately prior to placement of concrete. If the excavation must remain open overnight, or if rainfall becomes imminent while the bearing soils are exposed, a 1 to 3-inch thick "mud mat" of "lean" concrete should be placed on the bearing soils before the placement of reinforcing steel.

Overexcavation Subgrade Observations: It will be important to have the geotechnical engineer of record observe the foundation/overexcavation subgrade prior to placing the reinforced stone mat below the proposed footings. **Any excessively soft soils observed at the foundation/overexcavation bearing elevations should be undercut and removed; however, we anticipate any undercuts below the recommended overecavation depths will be minor in nature as the soft materials have been taken into account for the recommendations provided herein.**

Should the aggregate pier foundation option be deemed more economical, the installation and location of the aggregate piers would need to be confirmed by GER or authorized representative. Additionally, the recommendations below should be followed for aggregate pier observations.

Aggregate Pier Observations: Aggregate pier installation shall be observed by the GER or his authorized representative. The representative should observe the excavation soils while drilling, the volume of aggregate placed, and the compaction (number of lifts) to determine that the pier is being constructed in accordance with the approved submittal(s). In addition, the pier depths and any abnormalities encountered during drilling should be recorded.

Aggregate Pier Test Program (Modulus Test): We recommend the installation of one pre-production aggregate pier adjacent to the permanent aggregate pier locations. The test/indicator pier should be statically loaded under the observation of the design engineer of record and the GER to determine the adequate modulus. The test load shall be a minimum of 1.5 the design stress capacity to confirm the design load with sufficient safety factors. The test pier shall be installed prior to installation of the production piers. The purpose of the test pier program is to determine

the production length and diameters, confirm the assumption of the design modulus (which is related to our design safety factor), and to allow observation of the subsurface conditions encountered by the augers during drilling.

Slab Subgrade Verification: A representative of ECS should be called on to observe exposed subgrades within the expanded limits of the structures, pavements, and turf fields prior to the placement of subsequent construction materials to assure that adequate subgrade preparation has been achieved. Proofrolling using a drum roller or loaded dump truck should be performed in their presence at that time. As discussed in previous sections of this report, we anticipate areas of minor pumping and rutting will be encountered during initial proofrolling operations; we recommend the GER be consulted regarding these areas prior to the performance of any remediation/repair operations. Once subgrades have been prepared to the satisfaction of ECS, subgrades should be properly compacted and new Structural Fill can be placed. Existing subgrades to a depth of at least 10 inches and all Structural Fill should be moisture conditioned to within -1/+3 percentage points of optimum moisture content then be compacted to the required density. If there will be a significant time lag between the site grading work and final grading of concrete slab areas prior to the placement of the subbase stone and concrete, a representative of ECS should be called on to verify the condition of the prepared subgrade.

6.4 GENERAL CONSTRUCTION CONSIDERATIONS

Moisture Conditioning: During the cooler and wetter periods of the year, delays and additional costs should be anticipated. At these times, reduction of soil moisture may need to be accomplished by a combination of mechanical manipulation and the use of chemical additives, such as lime or cement, in order to lower moisture contents to levels appropriate for compaction. Alternatively, during the drier times of the year, such as the summer months, moisture may need to be added to the soil to provide adequate moisture for successful compaction according to the project requirements.

Subgrade Protection: Measures should also be taken to limit site disturbance, especially from heavy rubber-tired construction equipment, and to control and remove surface water from development areas, including structural and pavement areas. It would be advisable to designate a haul road and construction staging area to limit the areas of disturbance and to prevent construction traffic from excessively degrading sensitive subgrade soils and existing pavement areas. Haul roads and construction staging areas could be covered with excess depths of aggregate to protect those subgrades. The aggregate can later be removed and used in pavement areas.

Surface Drainage: Surface drainage conditions should be properly maintained. Surface water should be directed away from the construction area, and the work area should be sloped away from the construction area at a gradient of 1 percent or greater to reduce the potential of ponding water and the subsequent saturation of the surface soils. At the end of each work day, the subgrade soils should be sealed by rolling the surface with a smooth drum roller to minimize infiltration of surface water.

Excavation Safety: Cuts or excavations associated with utility excavations may require forming or bracing, slope flattening, or other physical measures to control sloughing and/or prevent slope failures. Contractors should be familiar with applicable OSHA codes to ensure that adequate protection of the excavations and trench walls is provided.

Erosion Control: The surface soils may be erodible. Therefore, the Contractor should provide and maintain good site drainage during earthwork operations to maintain the integrity of the surface soils. All erosion and sedimentation controls should be in accordance with sound engineering practices and local requirements.

7.0 CLOSING

ECS has prepared this report of findings, evaluations, and recommendations to guide geotechnical-related design and construction aspects of the project.

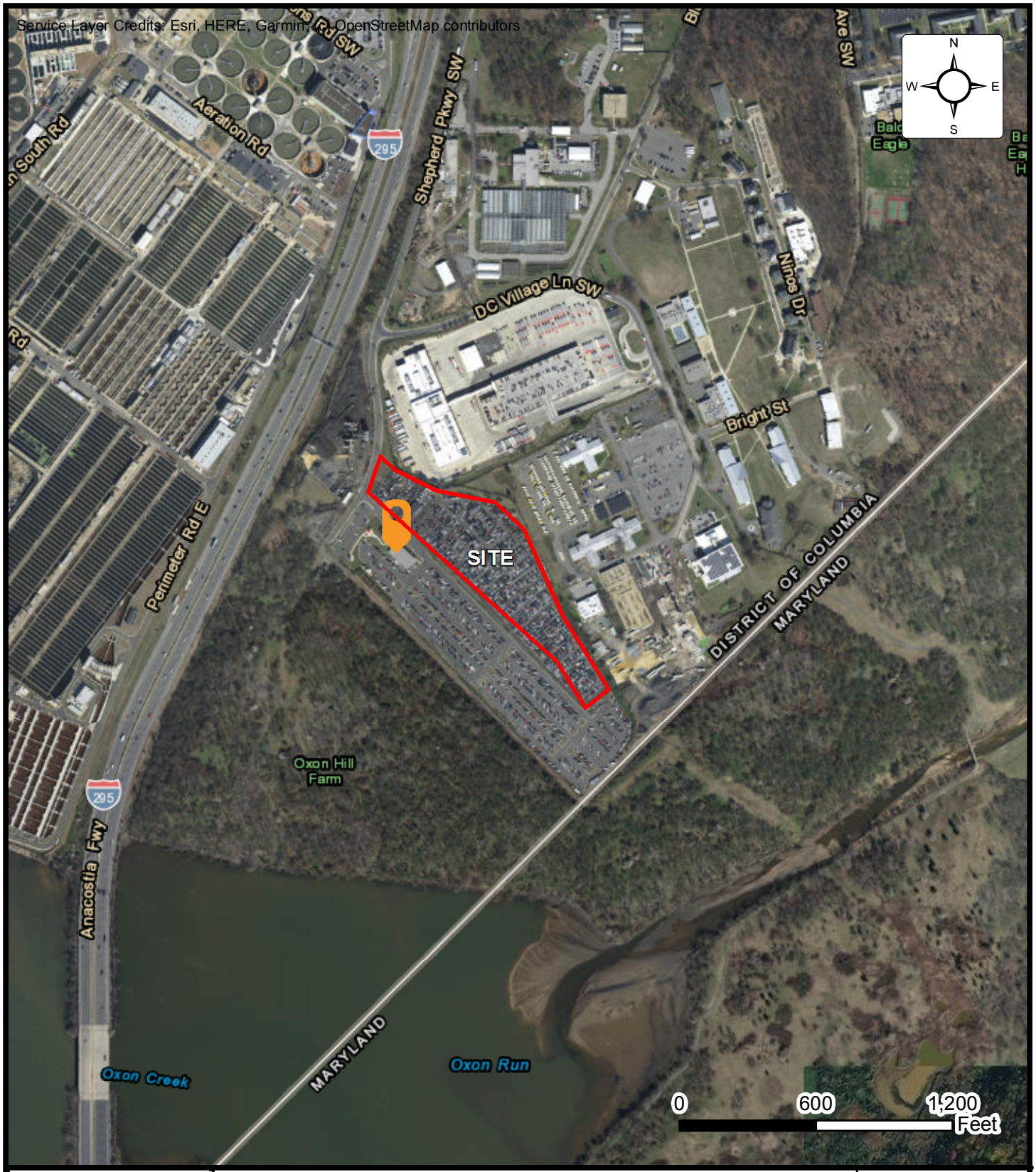
The description of the proposed project is based on information provided to ECS by the design team. If any of this information is inaccurate, either due to our interpretation of the documents provided or site or design changes that may occur later, ECS should be contacted immediately in order that we can review the report in light of the changes and provide additional or alternate recommendations as may be required to reflect the proposed construction.

We recommend that ECS be allowed to review the project's plans and specifications pertaining to our work so that we may ascertain consistency of those plans/specifications with the intent of the geotechnical report.

Field observations, monitoring, and quality assurance testing during earthwork and foundation installation are an extension of and integral to the geotechnical design recommendation. We recommend that the owner retain these quality assurance services and that ECS be allowed to continue our involvement throughout these critical phases of construction to provide general consultation as issues arise. ECS is not responsible for the conclusions, opinions, or recommendations of others based on the data in this report.

APPENDIX A – Drawings & Reports

Site Location Diagram
Boring Location Diagram
Cross Section A-A

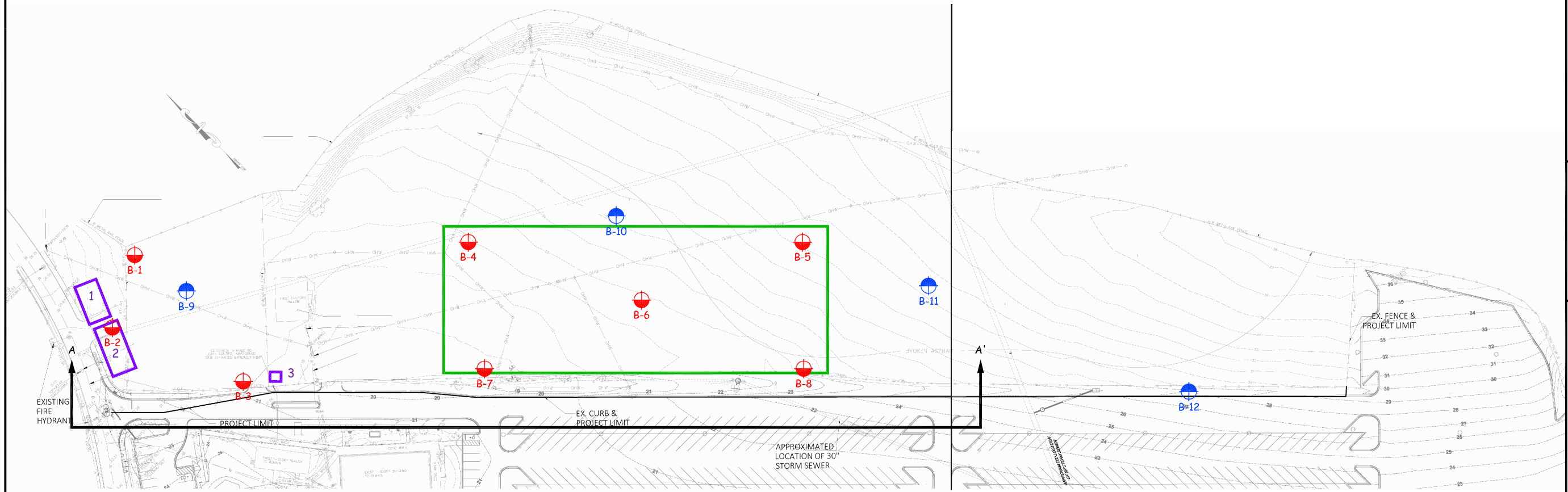


Site Location Diagram
DGS BLUE PLAINS IMPOUND LOT

5001 SHEPHERD PARKWAY SW, WASHINGTON,

BELL ARCHITECTS, PC

ENGINEER	SFP
SCALE	1 " = 600 '
PROJECT NO.	37:2659
SHEET	1 OF 4
DATE	10/14/2019



LEGEND

- APPROX. GEOTECHNICAL BORING LOCATION
- APPROX. ENVIRONMENTAL BORING LOCATION
- PROPOSED CAR RACKS
- PROPOSED STRUCTURES
  - 1 - COVERED PARKING AND WASH STALL
  - 2 - ADMINISTRATIVE BUILDING
  - 3 - GUARD BOOTH

SCALE (IN FEET)

60 120

120 0

DGS BLUE PLAINS
IMPOUND LOT UPGRADES
WASHINGTON, DC

ECS

BORING LOCATION DIAGRAM
BELL ARCHITECTS, PC

ECS REVISIONS

ENGINEER	DRAFTING
KMH	RAC

SCALE 1"=120'

PROJECT NO. 37:2659

SHEET 1

DATE 10/16/19

W:\Geotechnical_e-projects\2600-2699\2659 - Blue Plains Impound Lot\a-Drafting\37-2659_BLD.dwg, bld_11x17_landscape_clr, 10/16/2019 4:22:04 PM

SOIL CLASSIFICATION LEGEND

- FILL - FILL (POSS/PROB) OF ALL TYPES.
- GW - WELL GRADED GRAVEL
- GM - SILTY GRAVEL
- GP - POORLY GRADED GRAVEL
- GC - CLAYEY GRAVEL
- SW - WELL GRADED SAND

ST - SHELBY TUBE

- ML - LOW PLASTICITY SILT
- CL - LOW PLASTICITY CLAY
- MH - HIGH PLASTICITY SILT

RC - ROCK CORE

- SM - SILTY SAND
- SP - POORLY GRADED SAND
- SC - CLAYEY SAND

PM - PRESSURE METER

- CH - HIGH PLASTICITY CLAY
- OH - HIGH PLASTICITY ORGANIC SILTS AND CLAYS
- OL - LOW PLASTICITY ORGANIC SILTS AND CLAY
- PT - PEAT
- WR - WEATHERED ROCK

SURFACE MATERIALS

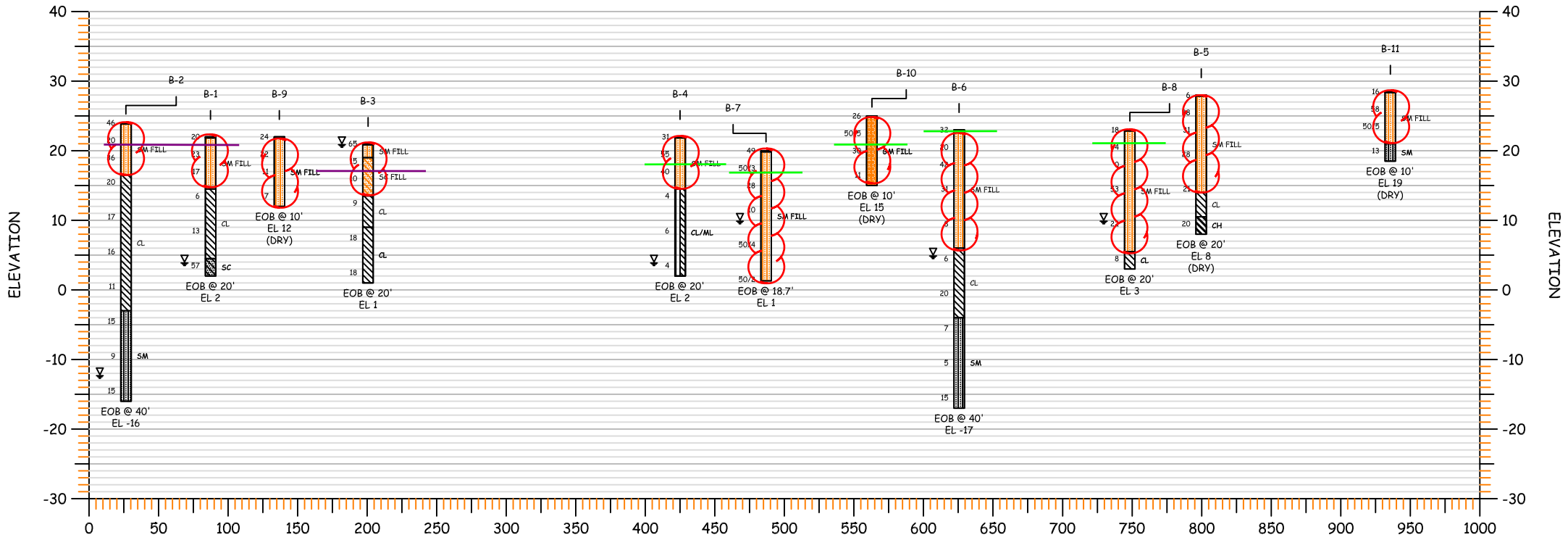
- TOPSOIL
- ASPHALT
- GRAVEL
- CONCRETE
- VOID

ROCK TYPES

- IGNEOUS
- METAMORPHIC
- SEDIMENTARY

SYMBOL LEGEND

- WATER LEVEL - DURING DRILLING/SAMPLING
- WATER LEVEL - BEFORE CASING REMOVAL
- WATER LEVEL - AFTER CASING REMOVAL
- WATER LEVEL - AFTER 24 HOURS



EXISTING FILLS

BOF FOR STRUCTURES = EL +17 TO +21 FEET (3 FEET BELOW FINISHED SITE GRADES)

BOF FOR CAR RACKS = EL +17 TO +23 FEET (3 FEET BELOW FINISHED SITE GRADES)

SCALE
VERTICAL SCALE 1"=20'
HORIZONTAL SCALE 1"=100'

DGS BLUE PLAINS IMPOUND LOT UPGRADES
WASHINGTON, DC

CROSS SECTION A-A'

BELL ARCHITECTS, PC

ECS REVISIONS

ENGINEER	DRAFTING
KMH	RAC

SCALE: AS NOTED

PROJECT NO.: 37:2659

SHEET: 2

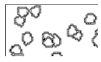
DATE: 10/17/19

W:\Geotechnical_e-projects\2600-2699\2659 - Blue Plains Impound Lot\a-Drafting\37;2659_CSA.dwg, bld_11x17_landscape_clr, 10/17/2019 3:25:18 PM

APPENDIX B – Field Operations

Reference Notes for Boring Logs
Boring Logs B-1 to B-12

REFERENCE NOTES FOR BORING LOGS

MATERIAL [1,2]		
		**ASPHALT**
		**CONCRETE**
		**GRAVEL**
		**TOPSOIL**
		**VOID**
		**BRICK**
		**AGGREGATE BASE COURSE**
		**FILL [3] MAN-PLACED SOILS**
	**GW**	**WELL-GRADED GRAVEL** gravel-sand mixtures, little or no fines
	**GP**	**POORLY-GRADED GRAVEL** gravel-sand mixtures, little or no fines
	**GM**	**SILTY GRAVEL** gravel-sand-silt mixtures
	**GC**	**CLAYEY GRAVEL** gravel-sand-clay mixtures
	**SW**	**WELL-GRADED SAND** gravelly sand, little or no fines
	**SP**	**POORLY-GRADED SAND** gravelly sand, little or no fines
	**SM**	**SILTY SAND** sand-silt mixtures
	**SC**	**CLAYEY SAND** sand-clay mixtures
	**ML**	**SILT** non-plastic to medium plasticity
	**MH**	**ELASTIC SILT** high plasticity
	**CL**	**LEAN CLAY** low to medium plasticity
	**CH**	**FAT CLAY** high plasticity
	**OL**	**ORGANIC SILT or CLAY** non-plastic to low plasticity
	**OH**	**ORGANIC SILT or CLAY** high plasticity
	**PT**	**PEAT** highly organic soils

DRILLING SAMPLING SYMBOLS & ABBREVIATIONS			
SS	Split Spoon Sampler	PM	Pressuremeter Test
ST	Shelby Tube Sampler	RD	Rock Bit Drilling
WS	Wash Sample	RC	Rock Core, NX, BX, AX
BS	Bulk Sample of Cuttings	REC	Rock Sample Recovery %
PA	Power Auger (no sample)	RQD	Rock Quality Designation %
HSA	Hollow Stem Auger		

PARTICLE SIZE IDENTIFICATION		
DESIGNATION		**PARTICLE SIZES**
Boulders		12 inches (300 mm) or larger
Cobbles		3 inches to 12 inches (75 mm to 300 mm)
Gravel:	Coarse	¾ inch to 3 inches (19 mm to 75 mm)
	Fine	4.75 mm to 19 mm (No. 4 sieve to ¾ inch)
Sand:	Coarse	2.00 mm to 4.75 mm (No. 10 to No. 4 sieve)
	Medium	0.425 mm to 2.00 mm (No. 40 to No. 10 sieve)
	Fine	0.074 mm to 0.425 mm (No. 200 to No. 40 sieve)
Silt & Clay ("Fines")		<0.074 mm (smaller than a No. 200 sieve)

COHESIVE SILTS & CLAYS		
UNCONFINED COMPRESSIVE STRENGTH, Q_P [4]	**SPT [5] (BPF)**	**CONSISTENCY [7] (COHESIVE)**
<0.25	<3	Very Soft
0.25 - <0.50	3 - 4	Soft
0.50 - <1.00	5 - 8	Firm
1.00 - <2.00	9 - 15	Stiff
2.00 - <4.00	16 - 30	Very Stiff
4.00 - 8.00	31 - 50	Hard
>8.00	>50	Very Hard

GRAVELS, SANDS & NON-COHESIVE SILTS	
SPT [5]	**DENSITY**
<5	Very Loose
5 - 10	Loose
11 - 30	Medium Dense
31 - 50	Dense
>50	Very Dense

RELATIVE AMOUNT [7]	COARSE GRAINED (%) [8]	FINE GRAINED (%) [8]
Trace	≤5	≤5
Dual Symbol *(ex: SW-SM)*	10	10
With	15 - 20	15 - 25
Adjective *(ex: "Silty")*	≥25	≥30

WATER LEVELS [6]		
	WL	Water Level (WS)(WD)
		(WS) While Sampling
		(WD) While Drilling
	SHW	Seasonal High WT
	ACR	After Casing Removal
	SWT	Stabilized Water Table
	DCI	Dry Cave-In
	WCI	Wet Cave-In

[1] *Classifications and symbols per ASTM D 2488-09 (Visual-Manual Procedure) unless noted otherwise.*

[2] *To be consistent with general practice, "POORLY GRADED" has been removed from GP, GP-GM, GP-GC, SP, SP-SM, SP-SC soil types on the boring logs.*

[3] *Non-ASTM designations are included in soil descriptions and symbols along with ASTM symbol [Ex: (SM-**FILL**)].*

[4] *Typically estimated via pocket penetrometer or Torvane shear test and expressed in tons per square foot (tsf).*

[5] *Standard Penetration Test (SPT) refers to the number of hammer blows (blow count) of a 140 lb. hammer falling 30 inches on a 2 inch OD split spoon sampler required to drive the sampler 12 inches (ASTM D 1586). "N-value" is another term for "blow count" and is expressed in blows per foot (bpf).*

[6] *The water levels are those levels actually measured in the borehole at the times indicated by the symbol. The measurements are relatively reliable when augering, without adding fluids, in granular soils. In clay and cohesive silts, the determination of water levels may require several days for the water level to stabilize. In such cases, additional methods of measurement are generally employed.*

[7] *Minor deviation from ASTM D 2488-09 Note 16.*

[8] *Percentages are estimated to the nearest 5% per ASTM D 2488-09.*

CLIENT	Job #:	BORING #	SHEET
Bell Architects, PC	37:2659	B-1	1 OF 1

PROJECT NAME	ARCHITECT-ENGINEER
DGS Blue Plains Impound Lot Upgrades	Delon Hampton & Associates

SITE LOCATION: 5001 Shepherd Parkway SW, Washington, DC

NORTHING | EASTING | STATION

CALIBRATED PENETROMETER TONS/FT^2

ROCK QUALITY DESIGNATION & RECOVERY
RQD% - — - REC% ———

PLASTIC LIMIT% | WATER CONTENT% | LIQUID LIMIT%

STANDARD PENETRATION BLOWS/FT

DESCRIPTION OF MATERIAL — ENGLISH UNITS

BOTTOM OF CASING | LOSS OF CIRCULATION (100%)

SURFACE ELEVATION 22

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
0	S-1	SS	18	15		20	7, 12, 8
	S-2	SS	18	18			8, 8, 15
5	S-3	SS	18	16		15	13, 8, 9
	S-4	SS	18	12		10	8, 3, 3
10	S-5	SS	18	3		5	31, 8, 5
15	S-6	SS	18	7		0	32, 30, 27
20						-5	
25							
30							

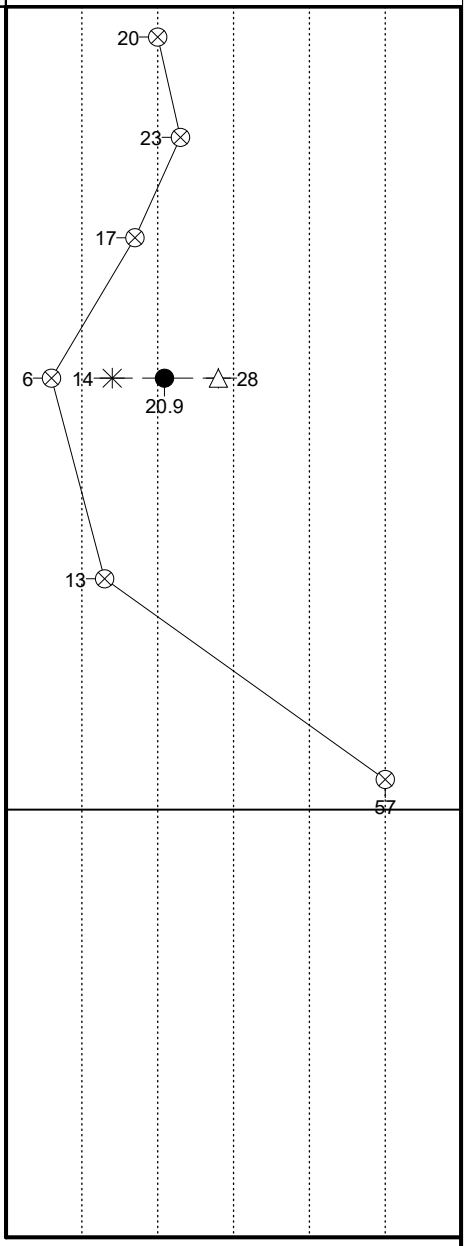
Gravel Thickness [2.00"]

(SM FILL) SILTY SAND WITH GRAVEL, contains construction debris, dark gray, moist, medium dense

(CL) SANDY LEAN CLAY, contains mica, light brown to grayish brown, moist, firm to stiff

(SC) CLAYEY SAND, grayish brown, moist, very dense

END OF BORING @ 20'



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

WL 18 WS ☒ WD ☐	BORING STARTED 10/04/19	CAVE IN DEPTH N/A
WL(SHW) WL(ACR) N/A	BORING COMPLETED 10/04/19	HAMMER TYPE Auto
WL	RIG T-6/D-50 FOREMAN Earl Newman	DRILLING METHOD 3.25 HSA

CLIENT	Job #:	BORING #	SHEET
Bell Architects, PC	37:2659	B-2	1 OF 2

PROJECT NAME	ARCHITECT-ENGINEER
DGS Blue Plains Impound Lot Upgrades	Delon Hampton & Associates

SITE LOCATION: 5001 Shepherd Parkway SW, Washington, DC

NORTHING | EASTING | STATION

CALIBRATED PENETROMETER TONS/FT^2

ROCK QUALITY DESIGNATION & RECOVERY
RQD% - - - REC%

PLASTIC LIMIT% | WATER CONTENT% | LIQUID LIMIT%

STANDARD PENETRATION BLOWS/FT

DESCRIPTION OF MATERIAL — ENGLISH UNITS

BOTTOM OF CASING | LOSS OF CIRCULATION 100%

SURFACE ELEVATION 24

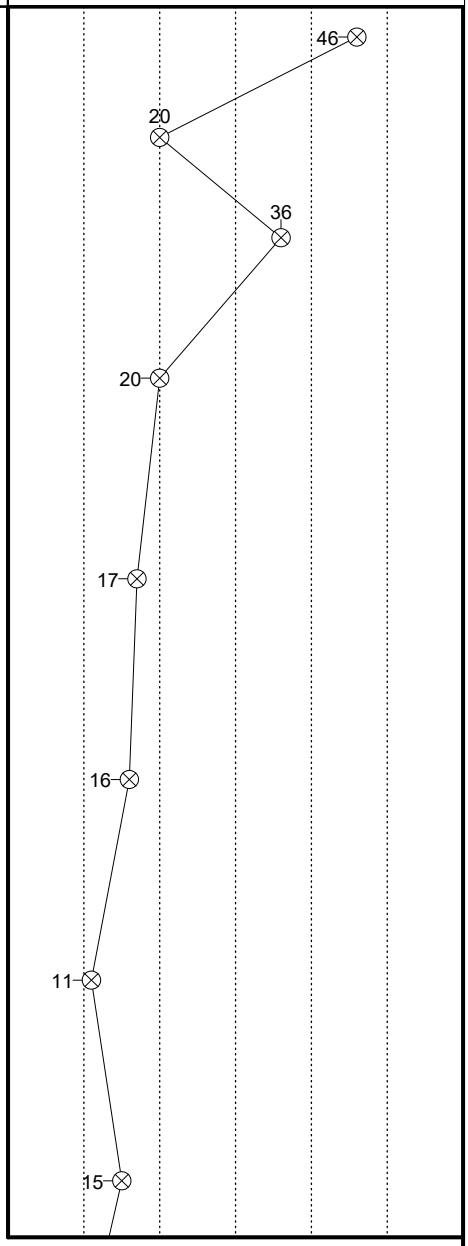
DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
0	S-1	SS	18	14		24	19 21 25
	S-2	SS	18	17		20	8 8 12
5	S-3	SS	18	18			9 16 20
	S-4	SS	18	12		15	7 7 13
10	S-5	SS	18	8		10	7 8 9
15	S-6	SS	18	11		5	14 9 7
20	S-7	SS	18	14		0	7 5 6
25	S-8	SS	18	13		-5	6 8 7
30							

Gravel Thickness [2.00"]

(SM FILL) SILTY SAND WITH GRAVEL, contains construction debris, dark gray, moist, medium dense to dense

(CL) SANDY LEAN CLAY, contains mica, brown, moist, stiff to very stiff

(SM) SILTY SAND, brown, moist, loose to medium dense



CONTINUED ON NEXT PAGE.

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

WL 36.2 WS ☒ WD ☐	BORING STARTED 10/04/19	CAVE IN DEPTH N/A
WL(SHW) WL(ACR) N/A	BORING COMPLETED 10/04/19	HAMMER TYPE Auto
WL	RIG T-6/D-50 FOREMAN Earl Newman	DRILLING METHOD 3.25 HSA

CLIENT	Job #:	BORING #	SHEET
Bell Architects, PC	37:2659	B-2	2 OF 2

PROJECT NAME	ARCHITECT-ENGINEER
DGS Blue Plains Impound Lot Upgrades	Delon Hampton & Associates

SITE LOCATION: 5001 Shepherd Parkway SW, Washington, DC

NORTHING | EASTING | STATION

CALIBRATED PENETROMETER TONS/FT²

ROCK QUALITY DESIGNATION & RECOVERY
RQD% - — - REC% ———

PLASTIC LIMIT% | WATER CONTENT% | LIQUID LIMIT%

STANDARD PENETRATION BLOWS/FT

DESCRIPTION OF MATERIAL — ENGLISH UNITS

BOTTOM OF CASING | LOSS OF CIRCULATION (100%)

SURFACE ELEVATION 24

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
35	S-9	SS	18	14		-10	7 5 4
40	S-10	SS	18	16		-15	6 8 7
45						-20	
50						-25	
55						-30	
60						-35	

(SM) SILTY SAND, brown, moist, loose to medium dense

END OF BORING @ 40'

9

15

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

WL 36.2 WS ☒ WD ☐	BORING STARTED 10/04/19	CAVE IN DEPTH N/A
WL(SHW) WL(ACR) N/A	BORING COMPLETED 10/04/19	HAMMER TYPE Auto
WL	RIG T-6/D-50 FOREMAN Earl Newman	DRILLING METHOD 3.25 HSA

CLIENT	Job #:	BORING #	SHEET
Bell Architects, PC	37:2659	B-3	1 OF 1

PROJECT NAME	ARCHITECT-ENGINEER
DGS Blue Plains Impound Lot Upgrades	Delon Hampton & Associates

SITE LOCATION: 5001 Shepherd Parkway SW, Washington, DC

NORTHING | EASTING | STATION

CALIBRATED PENETROMETER TONS/FT²

ROCK QUALITY DESIGNATION & RECOVERY
RQD% - — - REC% ———

PLASTIC LIMIT% | WATER CONTENT% | LIQUID LIMIT%

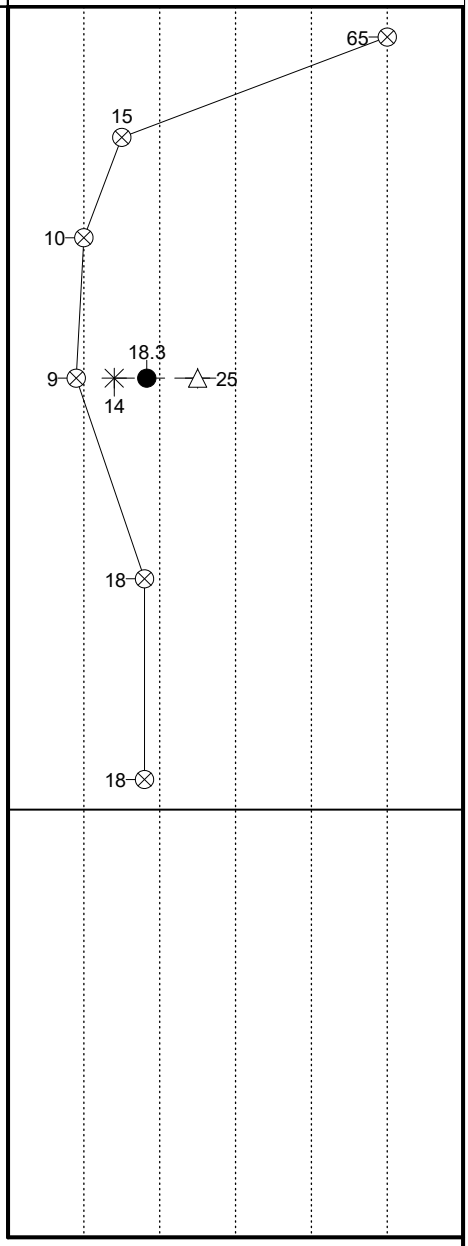
STANDARD PENETRATION BLOWS/FT

DESCRIPTION OF MATERIAL — ENGLISH UNITS

BOTTOM OF CASING | LOSS OF CIRCULATION (100%)

SURFACE ELEVATION 21

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
0	S-1	SS	18	18	Gravel Thickness [2.00"] (SM FILL) SILTY SAND WITH GRAVEL, contains construction debris, dark brown, moist, very dense		20	13 37 28
	S-2	SS	18	18	(SC FILL) CLAYEY SAND WITH GRAVEL, contains construction debris, dark gray, moist, medium dense			5 6 9
5	S-3	SS	18	17			15	6 5 5
					(CL) LEAN CLAY WITH SAND, contains mica, grayish brown, moist, stiff			
	S-4	SS	18	12				3 4 5
10							10	
					(CL) SANDY LEAN CLAY, brown, moist, very stiff			
	S-5	SS	18	11				5 8 10
15							5	
	S-6	SS	18	18				7 7 11
20					END OF BORING @ 20'		0	
							-5	
25								
30								



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

WL N/A WS ☒ WD ☐	BORING STARTED 10/04/19	CAVE IN DEPTH N/A
WL(SHW) WL(ACR) N/A	BORING COMPLETED 10/04/19	HAMMER TYPE Auto
WL	RIG T-6/D-50 FOREMAN Earl Newman	DRILLING METHOD 3.25 HSA

CLIENT	Job #:	BORING #	SHEET
Bell Architects, PC	37:2659	B-4	1 OF 1

PROJECT NAME	ARCHITECT-ENGINEER
DGS Blue Plains Impound Lot Upgrades	Delon Hampton & Associates

SITE LOCATION

5001 Shepherd Parkway SW, Washington, DC

NORTHING	EASTING	STATION

CALIBRATED PENETROMETER TONS/FT²

ROCK QUALITY DESIGNATION & RECOVERY
RQD% - — - REC% ———

PLASTIC LIMIT% | WATER CONTENT% | LIQUID LIMIT%

STANDARD PENETRATION BLOWS/FT

DESCRIPTION OF MATERIAL — ENGLISH UNITS

BOTTOM OF CASING | LOSS OF CIRCULATION 100%

SURFACE ELEVATION 22

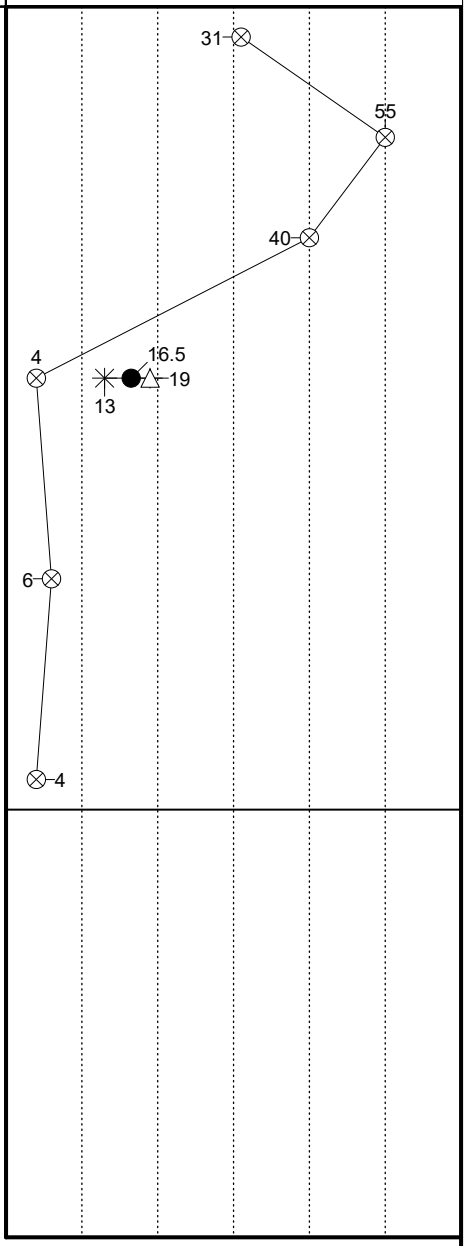
DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
0	S-1	SS	18	14		20	17 19 12
	S-2	SS	18	18			27 30 25
5	S-3	SS	18	18		15	22 22 18
	S-4	SS	18	16			2 2 2
10	S-5	SS	18	16		10 5	2 2 4
15	S-6	SS	18	18			2 2 2
20						0 -5	
25							
30							

Gravel Thickness [2.00"]

(SM FILL) SILTY SAND WITH GRAVEL, contains construction debris, dark gray, moist, dense to very dense

(CL-ML) SANDY SILTY CLAY, grayish brown, moist to wet, soft to firm

END OF BORING @ 20'



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

WL 18.0 WS ☒ WD ☐	BORING STARTED 10/02/19	CAVE IN DEPTH N/A
WL(SHW) WL(ACR) N/A	BORING COMPLETED 10/02/19	HAMMER TYPE Auto
WL	RIG T-6/D-50 FOREMAN Earl Newman	DRILLING METHOD 3.25 HSA

CLIENT	Job #:	BORING #	SHEET
Bell Architects, PC	37:2659	B-5	1 OF 1

PROJECT NAME	ARCHITECT-ENGINEER
DGS Blue Plains Impound Lot Upgrades	Delon Hampton & Associates

SITE LOCATION: 5001 Shepherd Parkway SW, Washington, DC

NORTHING | EASTING | STATION

CALIBRATED PENETROMETER TONS/FT²

ROCK QUALITY DESIGNATION & RECOVERY
RQD% - — - REC% ———

PLASTIC LIMIT% | WATER CONTENT% | LIQUID LIMIT%

STANDARD PENETRATION BLOWS/FT

DESCRIPTION OF MATERIAL — ENGLISH UNITS

BOTTOM OF CASING | LOSS OF CIRCULATION (100%)

SURFACE ELEVATION 28

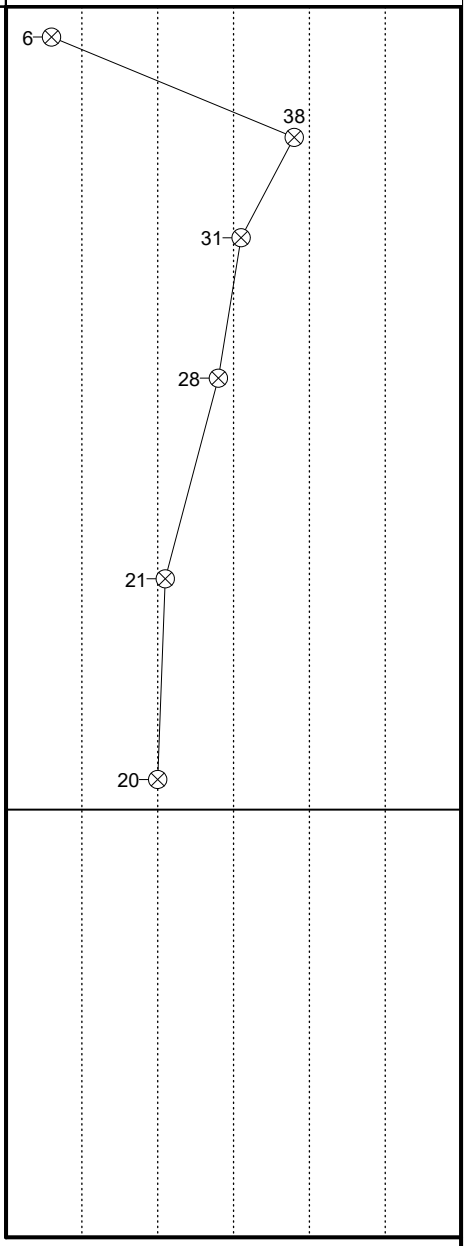
DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
0	S-1	SS	18	10		25	2 3 3
	S-2	SS	18	18			10 15 23
5	S-3	SS	18	18		20	8 18 13
	S-4	SS	18	9			8 13 15
10						15	
	S-5	SS	18	12			10 9 12
15						10	
	S-6	SS	18	18			6 8 12
20						5	
25						0	
30							

Gravel Thickness [2.00"]

(SM FILL) SILTY SAND WITH GRAVEL, contains construction debris, dark gray, moist, loose to dense

(CL) SANDY LEAN CLAY, light brown to brown, moist, very stiff

END OF BORING @ 20'



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

WL N/A WS ☒ WD ☐	BORING STARTED 10/03/19	CAVE IN DEPTH N/A
WL(SHW) WL(ACR) N/A	BORING COMPLETED 10/03/19	HAMMER TYPE Auto
WL	RIG T-6/D-50 FOREMAN Earl N	DRILLING METHOD 3.25 HSA

CLIENT	Job #:	BORING #	SHEET
Bell Architects, PC	37:2659	B-6	1 OF 2

PROJECT NAME	ARCHITECT-ENGINEER
DGS Blue Plains Impound Lot Upgrades	Delon Hampton & Associates

SITE LOCATION: 5001 Shepherd Parkway SW, Washington, DC

NORTHING | EASTING | STATION

CALIBRATED PENETROMETER TONS/FT²

ROCK QUALITY DESIGNATION & RECOVERY
RQD% - — - REC% ———

PLASTIC LIMIT% | WATER CONTENT% | LIQUID LIMIT%

STANDARD PENETRATION BLOWS/FT

DESCRIPTION OF MATERIAL — ENGLISH UNITS

BOTTOM OF CASING | LOSS OF CIRCULATION (100%)

SURFACE ELEVATION 23

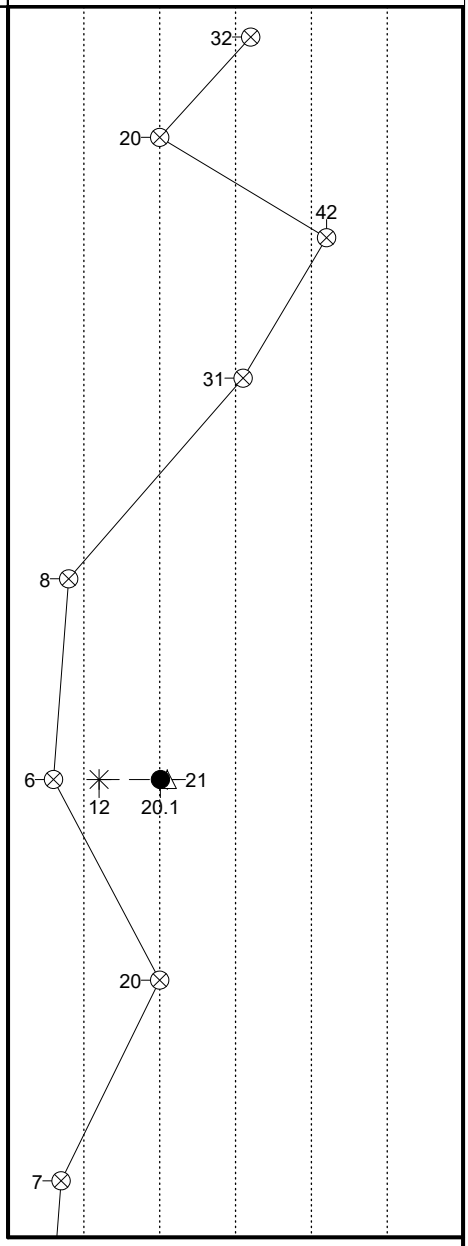
DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
0							
	S-1	SS	18	16			11 13 19
	S-2	SS	18	13		20	7 7 13
5	S-3	SS	18	18			6 14 28
	S-4	SS	18	13		15	10 13 18
10						10	
	S-5	SS	18	4			3 3 5
15						5	
	S-6	SS	18	18			3 3 3
20						0	
	S-7	SS	18	18			9 9 11
25						-5	
	S-8	SS	18	12			3 3 4
30							

Gravel Thickness [2.00"]

(SM FILL) SILTY SAND WITH GRAVEL, contains construction debris, dark gray, moist, loose to dense

(CL) LEAN CLAY WITH SAND, gray, moist, firm to very stiff

(SM) SILTY SAND, gray, moist, loose to medium dense



CONTINUED ON NEXT PAGE.

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

WL 18 WS ☒ WD ☐	BORING STARTED 10/03/19	CAVE IN DEPTH N/A
WL(SHW) WL(ACR) N/A	BORING COMPLETED 10/03/19	HAMMER TYPE Auto
WL	RIG T-6/D-50 FOREMAN Earl N	DRILLING METHOD 3.25 HSA

CLIENT	Job #:	BORING #	SHEET
Bell Architects, PC	37:2659	B-6	2 OF 2

PROJECT NAME	ARCHITECT-ENGINEER
DGS Blue Plains Impound Lot Upgrades	Delon Hampton & Associates

SITE LOCATION: 5001 Shepherd Parkway SW, Washington, DC

NORTHING | EASTING | STATION

CALIBRATED PENETROMETER TONS/FT²

ROCK QUALITY DESIGNATION & RECOVERY
RQD% - — - REC% ———

PLASTIC LIMIT% | WATER CONTENT% | LIQUID LIMIT%

STANDARD PENETRATION BLOWS/FT

DESCRIPTION OF MATERIAL — ENGLISH UNITS

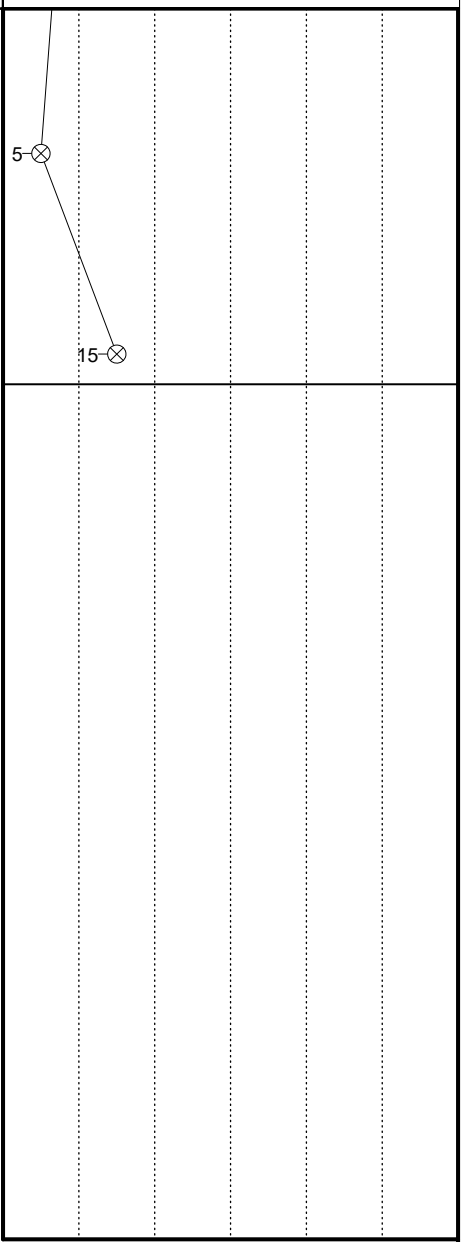
BOTTOM OF CASING | LOSS OF CIRCULATION 100%

SURFACE ELEVATION 23

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
35	S-9	SS	18	18		-10	2 2 3
40	S-10	SS	18	18		-15	6 6 9

(SM) SILTY SAND, gray, moist, loose to medium dense

END OF BORING @ 40'



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

WL 18 WS ☒ WD ☐	BORING STARTED 10/03/19	CAVE IN DEPTH N/A
WL(SHW) WL(ACR) N/A	BORING COMPLETED 10/03/19	HAMMER TYPE Auto
WL	RIG T-6/D-50 FOREMAN Earl N	DRILLING METHOD 3.25 HSA

CLIENT	Job #:	BORING #	SHEET
Bell Architects, PC	37:2659	B-7	1 OF 1

PROJECT NAME	ARCHITECT-ENGINEER
DGS Blue Plains Impound Lot Upgrades	Delon Hampton & Associates

SITE LOCATION

5001 Shepherd Parkway SW, Washington, DC

NORTHING	EASTING	STATION

CALIBRATED PENETROMETER TONS/FT^2

ROCK QUALITY DESIGNATION & RECOVERY
RQD% - — - REC% ———

PLASTIC LIMIT% | WATER CONTENT% | LIQUID LIMIT%

STANDARD PENETRATION BLOWS/FT

DESCRIPTION OF MATERIAL — ENGLISH UNITS

BOTTOM OF CASING ▰ — LOSS OF CIRCULATION (100%)

SURFACE ELEVATION 20

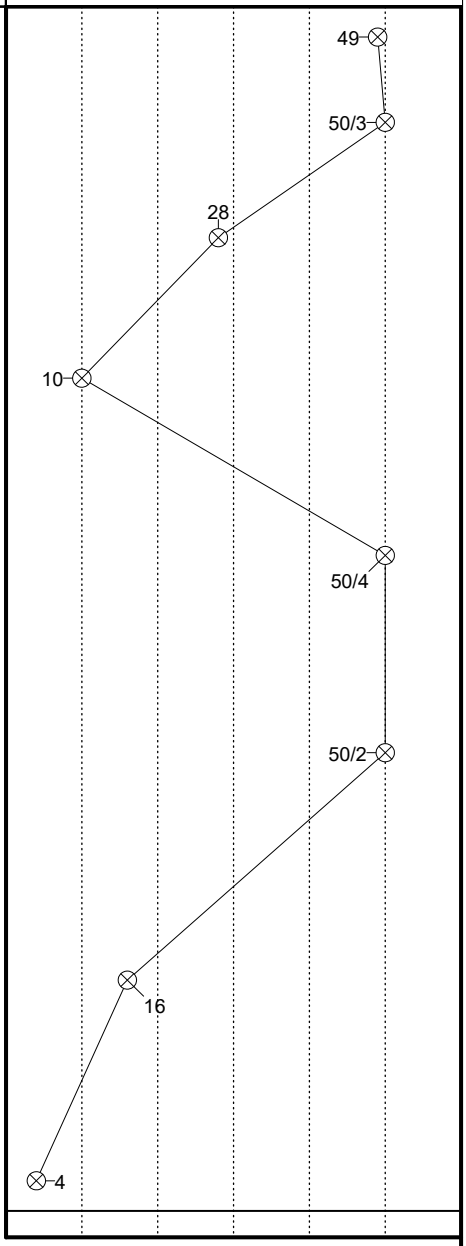
DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	ELEVATION (FT)	BLOWS/6"
0	S-1	SS	18	17	20	10 20 29
	S-2	SS	9	7		39 50/3
5	S-3	SS	18	16	15	38 16 12
	S-4	SS	18	5		7 4 6
10					10	
	S-5	SS	4	4		50/4
15					5	
	S-6	SS	2	2		50/2
20					0	
	S-7	SS	18	14	-5	6 8 8
25						
	S-8	SS	18	18		3 2 2
30					-10	

Gravel Thickness [2.00"]

(SM FILL) SILTY SAND WITH GRAVEL, contains construction debris, dark gray, moist, loose to very dense

(CL) SANDY LEAN CLAY, brown, moist, soft to very stiff

END OF BORING @ 30.0'



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

WL 10 WS ☒ WD ☐	BORING STARTED 10/03/19	CAVE IN DEPTH N/A
WL(SHW) WL(ACR) N/A	BORING COMPLETED 10/03/19	HAMMER TYPE Auto
WL	RIG T-6/D-50 FOREMAN Earl Newman	DRILLING METHOD 3.25 HSA

CLIENT	Job #:	BORING #	SHEET
Bell Architects, PC	37:2659	B-8	1 OF 1

PROJECT NAME	ARCHITECT-ENGINEER
DGS Blue Plains Impound Lot Upgrades	Delon Hampton & Associates

SITE LOCATION

5001 Shepherd Parkway SW, Washington, DC

NORTHING	EASTING	STATION

CALIBRATED PENETROMETER TONS/FT^2

ROCK QUALITY DESIGNATION & RECOVERY
RQD% - — - REC% ———

PLASTIC LIMIT% | WATER CONTENT% | LIQUID LIMIT%

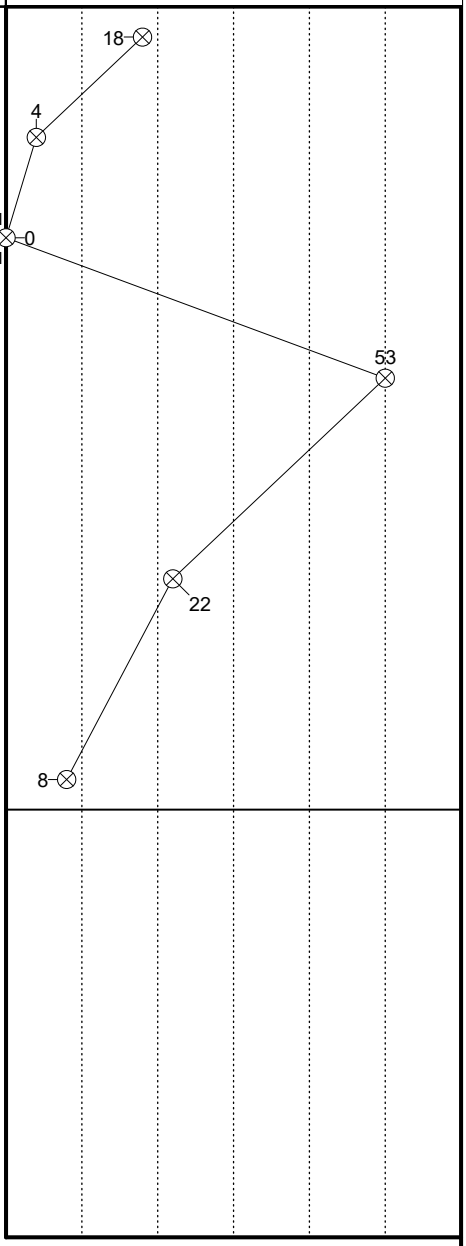
STANDARD PENETRATION BLOWS/FT

DESCRIPTION OF MATERIAL — ENGLISH UNITS

BOTTOM OF CASING ▰ LOSS OF CIRCULATION 100%

SURFACE ELEVATION 23

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
0	S-1	SS	18	15	Gravel Thickness [2.00"] (SM FILL) SILTY SAND WITH GRAVEL, contains construction debris, dark gray, moist, very loose to very dense		20	11 9 9
	S-2	SS	18	8				2 2 2
5	S-3	SS	18	6				WOH WOH WOH
	S-4	SS	18	15			15	10 25 28
10						▽	10	
	S-5	SS	18	4				10 10 12
15					(CL) SANDY LEAN CLAY, brown, moist, firm		5	
	S-6	SS	18	18				8 4 4
20					END OF BORING @ 20'		0	
25							-5	
30								



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

▽ WL 13 WS ☒ WD ☐	BORING STARTED 10/03/19	CAVE IN DEPTH N/A
▽ WL(SHW) ▼ WL(ACR) N/A	BORING COMPLETED 10/03/19	HAMMER TYPE Auto
▽ WL	RIG T-6/D-50 FOREMAN Earl N	DRILLING METHOD 3.25 HSA

CLIENT	Job #:	BORING #	SHEET
Bell Architects, PC	37:2659	B-9	1 OF 1

PROJECT NAME	ARCHITECT-ENGINEER
DGS Blue Plains Impound Lot Upgrades	Delon Hampton & Associates

SITE LOCATION

5001 Shepherd Parkway SW, Washington, DC

NORTHING	EASTING	STATION

CALIBRATED PENETROMETER TONS/FT^2

ROCK QUALITY DESIGNATION & RECOVERY
RQD% - — - REC% ———

PLASTIC LIMIT% | WATER CONTENT% | LIQUID LIMIT%

STANDARD PENETRATION BLOWS/FT

DESCRIPTION OF MATERIAL — ENGLISH UNITS

BOTTOM OF CASING | LOSS OF CIRCULATION 100%

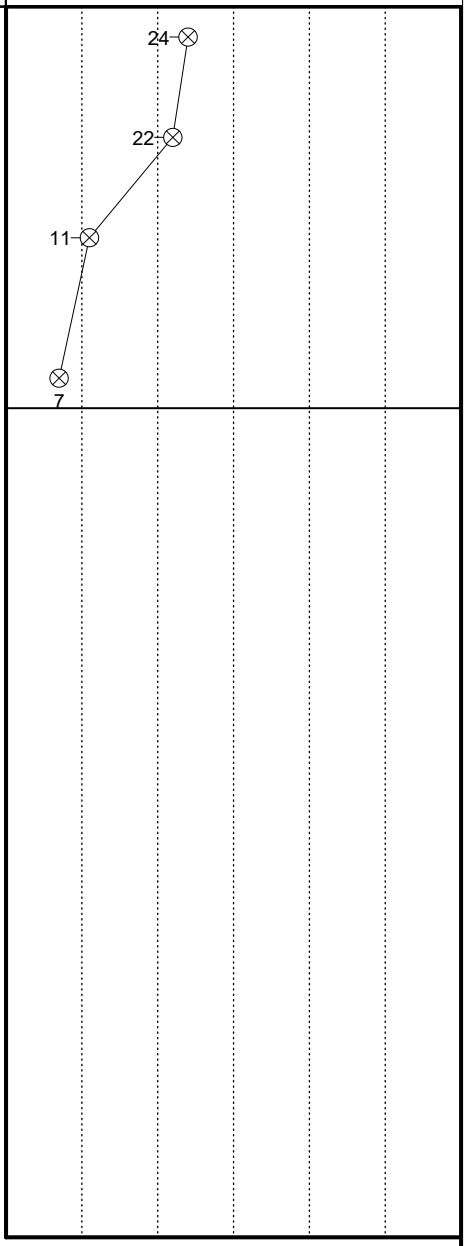
SURFACE ELEVATION 22

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
0	S-1	SS	18	12		20	12 16 8
	S-2	SS	18	13		15	12 16 6
5	S-3	SS	18	13		10	4 6 5
	S-4	SS	18	17		5	3 3 4
10						0	
15						-5	
20							
25							
30							

Gravel Thickness [2.00"]

(SM FILL) SILTY SAND WITH GRAVEL, contains construction debris, dark gray, moist, loose to medium dense

END OF BORING @ 10'



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

WL N/A WS ☒ WD ☐	BORING STARTED 10/02/19	CAVE IN DEPTH 7
WL(SHW) WL(ACR) N/A	BORING COMPLETED 10/02/19	HAMMER TYPE Auto
WL	RIG T-6/D-50 FOREMAN Earl Newman	DRILLING METHOD 3.25 HSA

CLIENT	Job #:	BORING #	SHEET
Bell Architects, PC	37:2659	B-10	1 OF 1

PROJECT NAME	ARCHITECT-ENGINEER
DGS Blue Plains Impound Lot Upgrades	Delon Hampton & Associates

SITE LOCATION: 5001 Shepherd Parkway SW, Washington, DC

NORTHING | EASTING | STATION

CALIBRATED PENETROMETER TONS/FT²

ROCK QUALITY DESIGNATION & RECOVERY
RQD% - - - REC% ———

PLASTIC LIMIT% | WATER CONTENT% | LIQUID LIMIT%

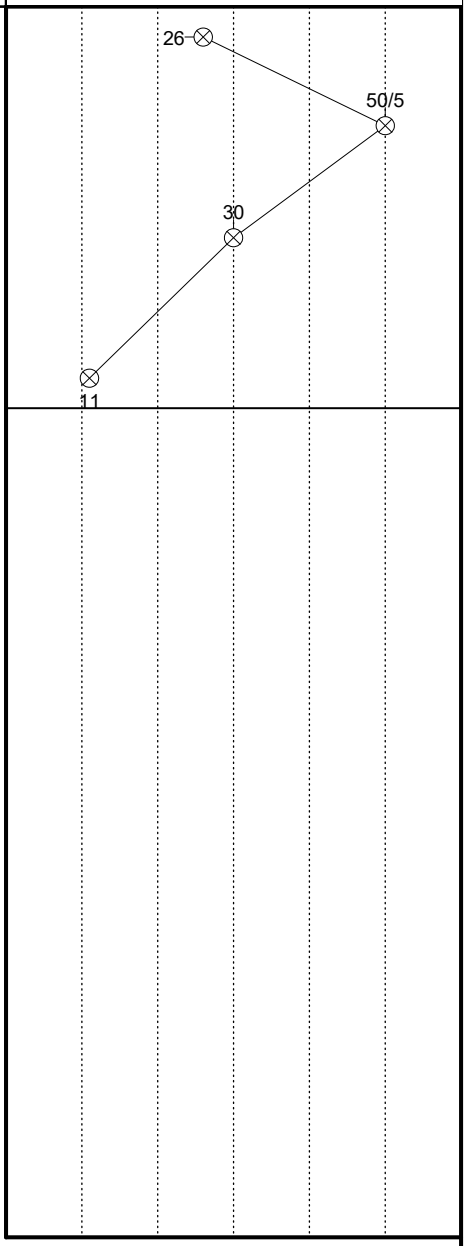
STANDARD PENETRATION BLOWS/FT

BOTTOM OF CASING | LOSS OF CIRCULATION 100%

SURFACE ELEVATION 25

ENGLISH UNITS

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
0	S-1	SS	18	17	Gravel Thickness [2.00"] (GM FILL) SILTY GRAVEL, contains construction debris, dark gray, moist, medium dense to very dense		25	13 12 14
	S-2	SS	11	11				13 50/5
5	S-3	SS	18	4			20	30 22 8
	S-4	SS	18	5				17 6 5
10					END OF BORING @ 10'		15	
15							10	
20							5	
25							0	
30							-5	



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

WL N/A WS ☒ WD ☐	BORING STARTED 10/02/19	CAVE IN DEPTH 8
WL(SHW) WL(ACR) N/A	BORING COMPLETED 10/02/19	HAMMER TYPE Auto
WL	RIG T-6/D-50 FOREMAN Earl Newman	DRILLING METHOD 3.25 HSA

CLIENT	Job #:	BORING #	SHEET
Bell Architects, PC	37:2659	B-11	1 OF 1

PROJECT NAME	ARCHITECT-ENGINEER
DGS Blue Plains Impound Lot Upgrades	Delon Hampton & Associates

SITE LOCATION: 5001 Shepherd Parkway SW, Washington, DC

NORTHING | EASTING | STATION

CALIBRATED PENETROMETER TONS/FT²

ROCK QUALITY DESIGNATION & RECOVERY
RQD% - - - REC% ———

PLASTIC LIMIT% | WATER CONTENT% | LIQUID LIMIT%

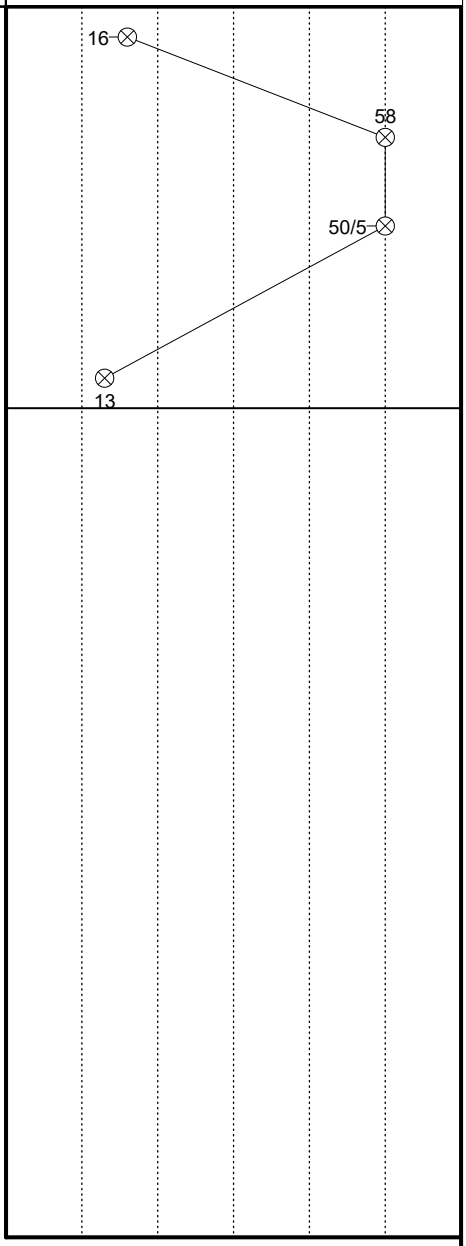
STANDARD PENETRATION BLOWS/FT

DESCRIPTION OF MATERIAL — ENGLISH UNITS

BOTTOM OF CASING | LOSS OF CIRCULATION 100%

SURFACE ELEVATION 28.5

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
0	S-1	SS	18	16	Gravel Thickness [2.00"] (SM FILL) SILTY SAND, contains construction debris, dark gray, moist, medium dense to very dense		25	11 10 6
	S-2	SS	18	7				21 25 33
5	S-3	SS	11	10				28 50/5
	S-4	SS	18	13	(SM) SILTY SAND WITH GRAVEL, gray, moist, medium dense		20	18 8 5
10					END OF BORING @ 10'		15	
15							10	
20							5	
25							0	
30								



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

WL N/A WS ☒ WD ☐	BORING STARTED 10/02/19	CAVE IN DEPTH 6.5
WL(SHW) WL(ACR) N/A	BORING COMPLETED 10/02/19	HAMMER TYPE Auto
WL	RIG T-6/D-50 FOREMAN Earl Newman	DRILLING METHOD 3.25 HSA

CLIENT	Job #:	BORING #	SHEET
Bell Architects, PC	37:2659	B-12	1 OF 1

PROJECT NAME	ARCHITECT-ENGINEER
DGS Blue Plains Impound Lot Upgrades	Delon Hampton & Associates

SITE LOCATION: 5001 Shepherd Parkway SW, Washington, DC

NORTHING | EASTING | STATION

CALIBRATED PENETROMETER TONS/FT^2

ROCK QUALITY DESIGNATION & RECOVERY
RQD% - — - REC% ———

PLASTIC LIMIT% | WATER CONTENT% | LIQUID LIMIT%

STANDARD PENETRATION BLOWS/FT

DESCRIPTION OF MATERIAL — ENGLISH UNITS

BOTTOM OF CASING | LOSS OF CIRCULATION (100%)

SURFACE ELEVATION 29

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
0	S-1	SS	18	18			12 12 17
	S-2	SS	18	13			14 15 13
5	S-3	SS	18	12			12 8 6
	S-4	SS	18	18			7 5 5
10							
15							
20							
25							
30							

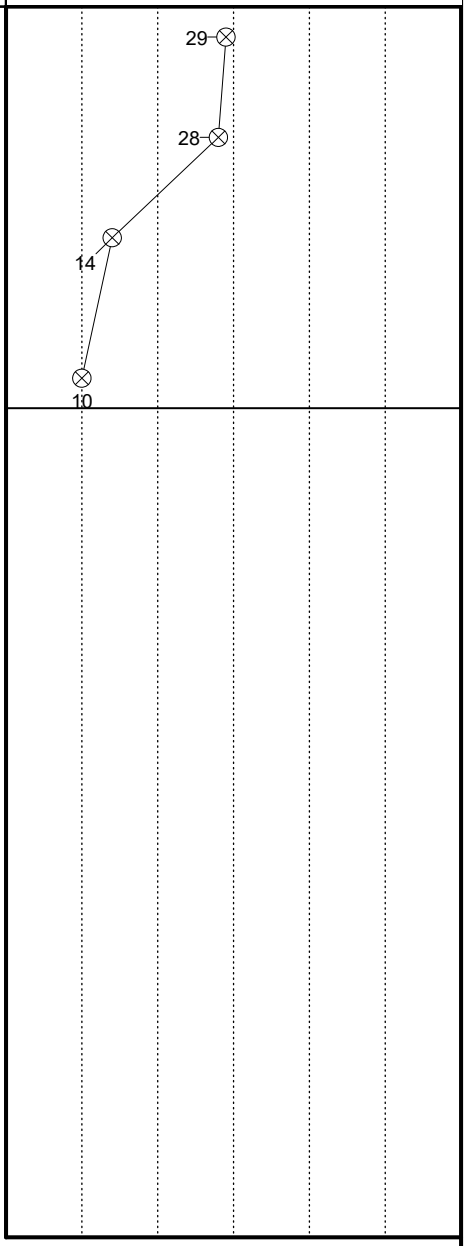
Gravel Thickness [2.00"]

(SM FILL) SILTY SAND, contains construction debris, dark gray, moist, medium dense

(SC) CLAYEY SAND, trace gravel, grayish brown, moist, loose

END OF BORING @ 10'

25 20 15 10 5 0



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

WL N/A WS ☒ WD ☐	BORING STARTED 10/02/19	CAVE IN DEPTH 7.6
WL(SHW) WL(ACR) N/A	BORING COMPLETED 10/02/19	HAMMER TYPE Auto
WL	RIG T-6/D-50 FOREMAN Earl Newman	DRILLING METHOD 3.25 HSA

APPENDIX C – Laboratory Testing

Laboratory Test Results Summary
Plasticity Chart
Grain Size Analysis

Laboratory Testing Summary

Boring Number	Sample Number	Depth (feet)	MC[1] (%)	Soil Type[2]	Atterberg Limits[3]			Percent Passing No. 200 Sieve[4]	Moisture - Density (Corr.)[5]		CBR Value[6]	Other
					LL	PL	PI		Maximum Density (pcf)	Optimum Moisture (%)		
B-1												
	S-4	8.50 - 10.00	20.9	CL	28	14	14	66.5				
B-3												
	S-4	8.50 - 10.00	18.3	CL	25	14	11	79.7				
B-4												
	S-4	8.50 - 10.00	16.5	CL-ML	19	13	6	61.4				
B-6												
	S-6	18.50 - 20.00	20.1	CL	21	12	9	70.5				

Notes: 1. ASTM D 2216, 2. ASTM D 2487, 3. ASTM D 4318, 4. ASTM D 1140, 5. See test reports for test method, 6. See test reports for test method

Definitions: MC: Moisture Content, Soil Type: USCS (Unified Soil Classification System), LL: Liquid Limit, PL: Plastic Limit, PI: Plasticity Index, CBR: California Bearing Ratio, OC: Organic Content (ASTM D 2974)

Project No. 37:2659

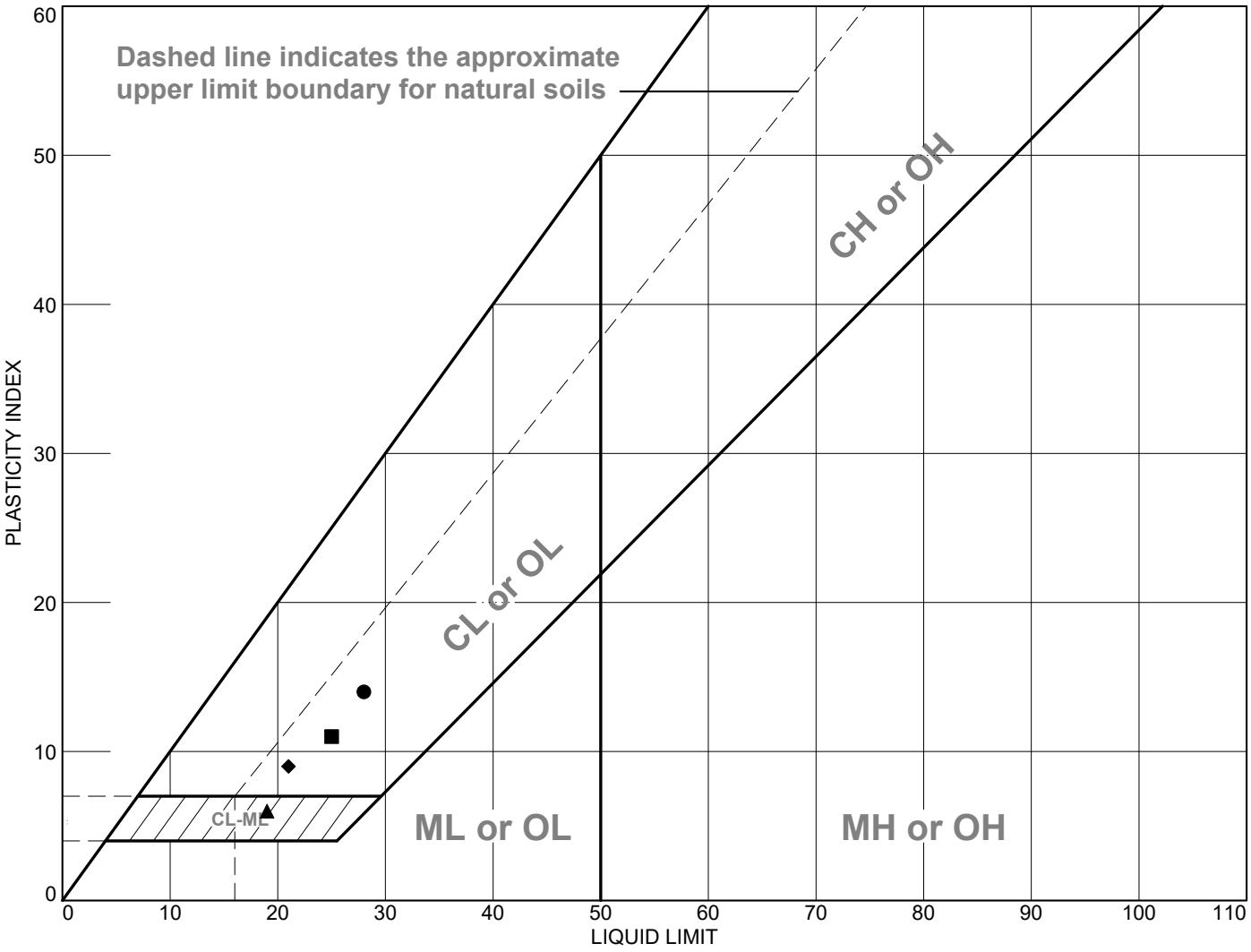
Project Name: DGS Blue Plains Impound Lot Upgrades

Client: Bell Architects, PC

Printed On: Thursday, October 17, 2019

ECS CAPITOL SERVICES, PLLC
1310 L Street, NW, Suite 425
Washington, DC 20005
Phone: (202) 400-2188
Fax: (202)-478-1831

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	(CL) SANDY LEAN CLAY, contains mica, light brown	28	14	14	89.1	66.5	CL
■	(CL) LEAN CLAY WITH SAND, contains mica, grayish brown	25	14	11	96.5	79.7	CL
▲	(CL-ML) SANDY SILTY CLAY, grayish brown	19	13	6	97.4	61.4	CL-ML
◆	(CL) LEAN CLAY WITH SAND, gray	21	12	9	97.1	70.5	CL

Project No. 2659 **Client:** Bell Architects, PC

Project: DGS Blue Plains Impound Lot Upgrades

● **Source of Sample:** B-1 **Depth:** 8.50-10.00 **Sample Number:** S-4

■ **Source of Sample:** B-3 **Depth:** 8.50-10.00 **Sample Number:** S-4

▲ **Source of Sample:** B-4 **Depth:** 8.50-10.00 **Sample Number:** S-4

◆ **Source of Sample:** B-6 **Depth:** 18.50-20.00 **Sample Number:** S-6

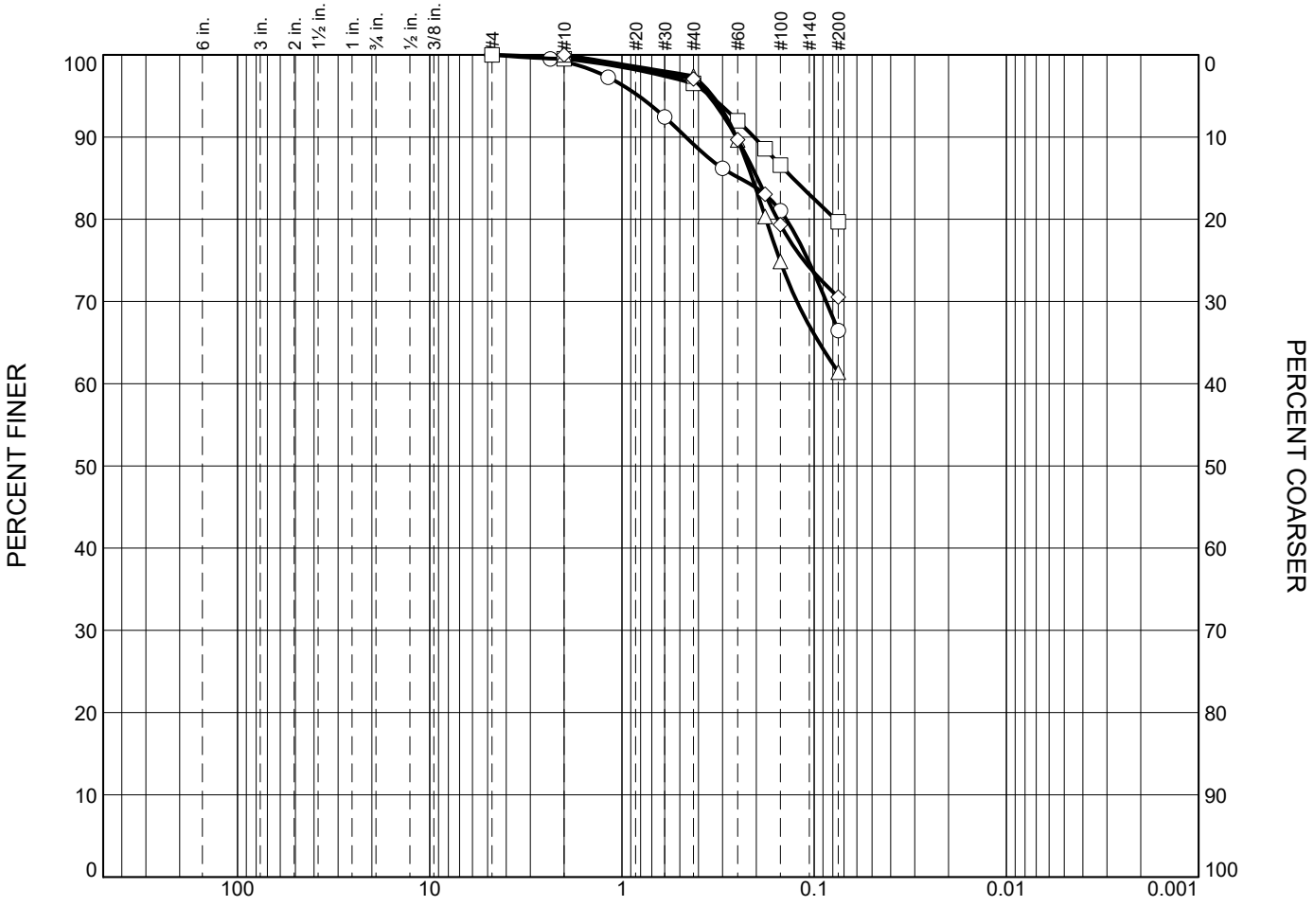
Remarks:

● Date Received: 10/14/19
Date Tested: 10/15/19

ECS CAPITOL SERVICES, PLLC
1310 L Street, NW, Suite 425
Washington, DC 20005
Phone: (202) 400-2188
Fax: (202)-478-1831

Tested By: HNT **Checked By:** DVT

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.8	10.1	22.6	66.5	
□	0.0	0.0	0.0	0.5	3.0	16.8	79.7	
△	0.0	0.0	0.0	0.0	2.6	36.0	61.4	
◇	0.0	0.0	0.0	0.0	2.9	26.6	70.5	

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	B-1	S-4	8.50-10.00	(CL) SANDY LEAN CLAY, contains mica, light brown	CL
□	B-3	S-4	8.50-10.00	(CL) LEAN CLAY WITH SAND, contains mica, grayish brown	CL
△	B-4	S-4	8.50-10.00	(CL-ML) SANDY SILTY CLAY, grayish brown	CL-ML
◇	B-6	S-6	18.50-20.00	(CL) LEAN CLAY WITH SAND, gray	CL

ECS CAPITOL SERVICES, PLLC
1310 L Street, NW, Suite 425
Washington, DC 20005
Phone: (202) 400-2188
Fax: (202)-478-1831

Client: Bell Architects, PC

Project: DGS Blue Plains Impound Lot Upgrades

Project No.: 2659

Tested By: KV **Checked By:** KMH

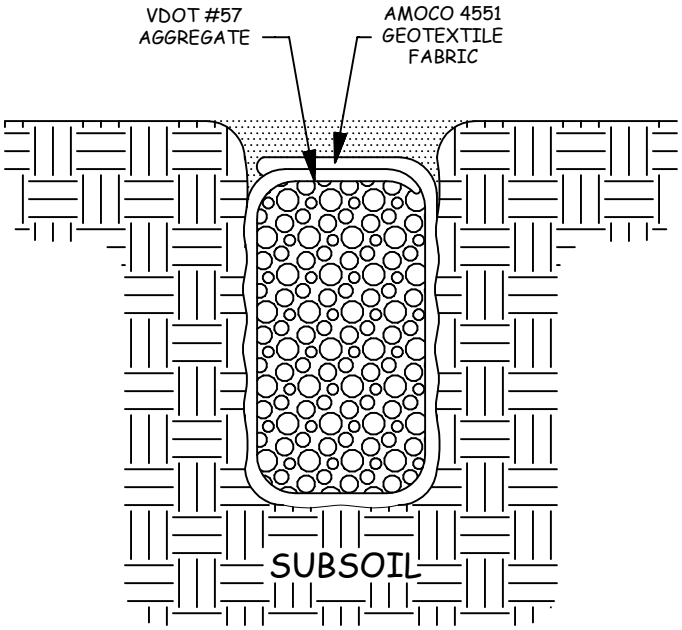
APPENDIX D – Supplemental Report Documents

French Drain Installation Procedure
Limited Undercut and Replacement Diagram

FRENCH DRAIN
INSTALLATION PROCEDURE

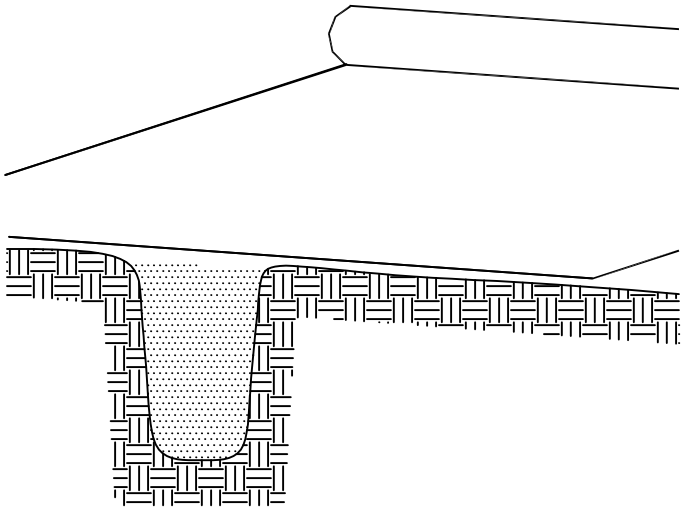
NOT TO SCALE

FINAL CONFIGURATION



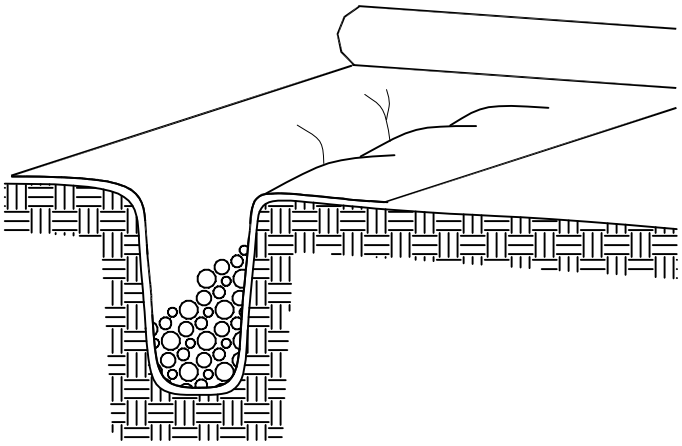
SUBDRAIN USING FILTER FABRIC

STEP 1



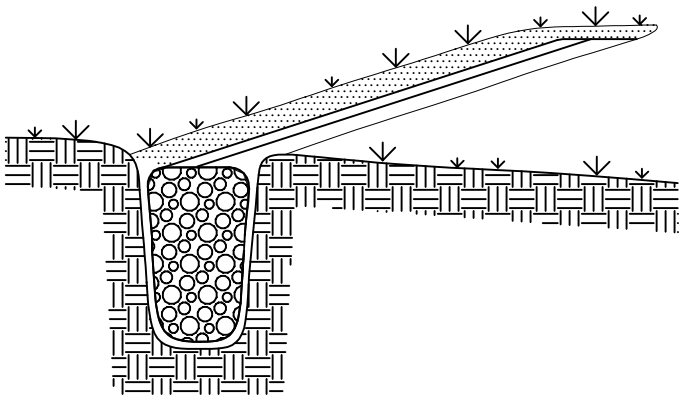
FABRIC IS UNROLLED DIRECTLY OVER TRENCH

STEP 2



THE TRENCH IS FILLED WITH AGGREGATE

STEP 3



THE FABRIC IS LAPPED CLOSED AND
COVERED WITH BASE STONE

LIMITED UNDERCUT AND REPLACEMENT DIAGRAM

(NOT TO SCALE)

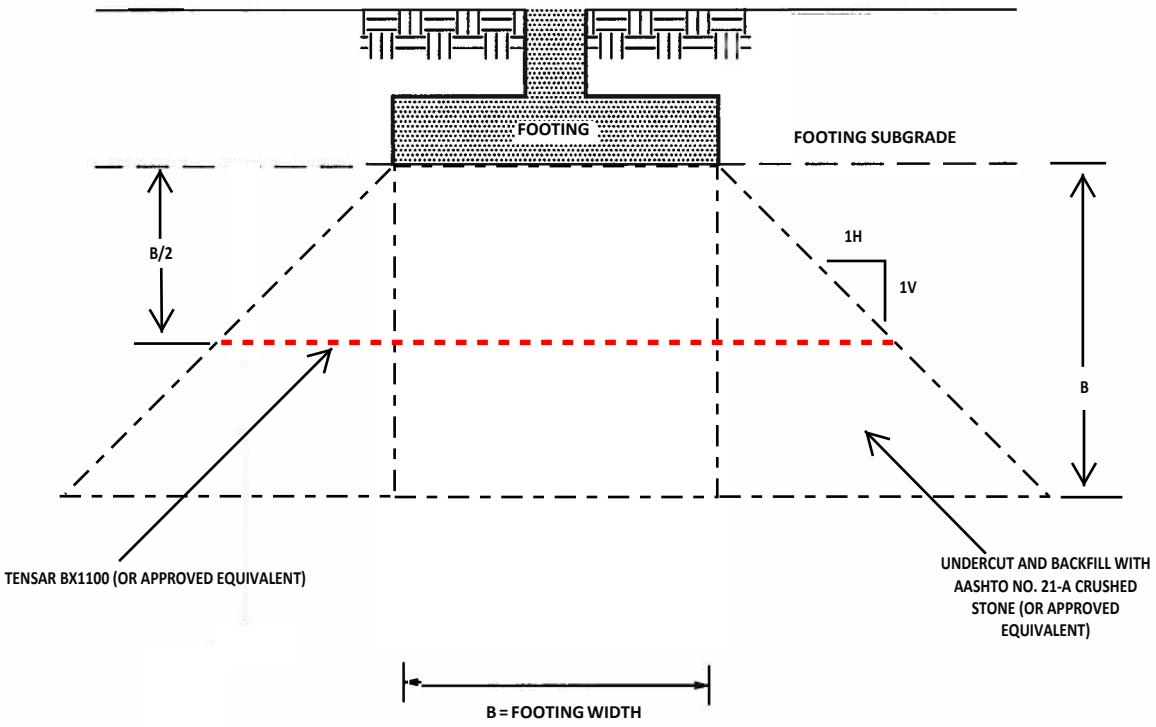


Exhibit 2
Section C of the IFB (with corrected Sections numbering)
(See following page)

GOVERNMENT OF THE DISTRICT OF COLUMBIA
DEPARTMENT OF GENERAL SERVICES

INVITATION FOR BIDS ("IFB")
Solicitation Number: DCAM-20-CS-IFB-0004

MPD Blue Plains Impound Lot Modernization

SECTION C
SPECIFICATIONS/SCOPE OF WORK STATEMENT

C.1 Background

The MPD Blue Plains Impound Lot Modernization Project will be located at 5000 Shepherd Parkway SW, Washington, DC 20032. The DC BPIL is responsible for evidence control and is legally required to store vehicles for as long as 75 years. After undergoing years of deferred maintenance and being placed under a consent order from the EPA for the site's Storm water management practices, BELL Architects was selected to oversee the modernization of the existing impound lot administrative office and site infrastructure. A new main entry and administrative and service area is being provided at the front of the lot to enhance workflows transferring and processing vehicles. Traffic through the site will be changed to one-way direction to allow for tractor trailers to navigate the site.

The secured facility's modernization includes, but is not limited to the following program elements:

- 1,200 sf prefabricated administrative office;
- Covered wash bay and electric car lifts;
- Prefabricated guard booth with overhead canopy;
- 4-tier cantilever storage racks to accommodate 528 vehicles;
- Parking for 876 vehicles stored on grade; 0
- 76 parking spaces for the MPD's 6th & 7th Districts' impounded vehicles; and space to store 90 small motor vehicles.

Site improvements included:

- New entrance drive;
- Heavy duty paving;
- Pre-treated bio-retention facilities;
- LED site lighting;
- Staff and MPD tow truck parking; and
- New perimeter fencing and remote gates

In general, the awarded Contractor shall provide all necessary construction services, supervision, permits, labor, supplies, equipment, materials and all other work necessary for the completion of the Project in accordance to the attached Drawings and Specifications documents **(Attachment J.1)**.

C.2 Scope of Work

The Contractor will be required to complete the construction of the MPD Blue Plains Impound Lot Modernization Project located at 5000 Shepherd Parkway, SW, Washington DC 20032 in accordance to the Drawings and Specifications, attached hereto as **Attachment J.1**. To the extent there is an inconsistency between the Drawings and the Specifications, the Contractor shall be required to provide the more expensive requirement. Prior to submitting its bid, each Offeror shall carefully review the Drawings and Specifications and shall bring any inconsistency or error in the drawings and specifications to the attention of the Department in writing. To the extent that a competent Contractor could have identified any such inconsistency or error, such inconsistency or error shall not serve as the basis for a change order and the Contractor shall assume the risk of such inconsistency or error.

C.3 Preconstruction Activities

Prior to mobilizing to the Project site and commencing work, the Contractor shall be required to complete those activities set forth in this **Section C.2**. Unless a delay in completing the preconstruction activities is the result of a delay beyond the timeframes set forth herein by the Department, the Program Manager, the Code Official or the Architect or an event of force majeure, delays in completing the preconstruction activities shall not be considered excusable and shall not justify an extension of the substantial completion date.

C.3.1 Detailed Schedule. Within seven (7) days of the issuance of a Notice to Proceed, the Contractor shall submit to the Department for its approval a schedule of Project. Such schedule shall include a schedule for submittals that is reasonably acceptable to the Program Manager. The Program Manager shall have five (5) business days to review such submittal.

C.3.2 Preconstruction Submittals. On or before the dates specified in the approved detailed schedule, the Contractor shall submit any necessary preconstruction phase information to the Program Manager for his review and approval. Unless a different timeframe is established in the approved baseline schedule, the Program Manager shall have five (5) business days to review such documents. In the event the Program Manager finds such documents to be unacceptable, the Contractor shall be required to revise and resubmit such documents. The Contractor shall not commence construction activities unless and until the deliverables listed in Section B.7 have been approved by the Program Manager. Any delays that result from any preconstruction submittal resubmissions shall be considered Non-Excusable.

C.3.3 Safety Plan. Prior to the start of construction activities, the Contractor shall prepare a safety plan for the construction phase conforming to OSHA 29 CFR 1926 (such plan, the "**Safety Plan**"). The Safety Plan shall be submitted to the Department, and the Contractor shall

incorporate such comments as the Department may reasonably request. Safety Plan shall address, among other things, all safety requirements related to working in the current COVID-19 environment.

C.3.3.1 Safety Barriers/Fences. As part of its responsibility for Project safety, the Contractor shall install such fences and barriers as may be necessary. The Contractor shall develop a plan that describes the proposed separation and the specific nature of the fences and barriers that will be used. This plan will be submitted to the Department for their review and approval prior to the commencement of construction, and the Program Manager shall have five (5) business days to review such plan. Once such plan has been approved, the Contractor shall comply with it at all times during construction. The Contractor shall be required to revise the plan as may be reasonably requested by the Department. The cost of revising and complying with the revised plan shall not entitle the Contractor to an increase in the Lump Sum Price.

C.3.3.2 Site Security. The Contractor shall be responsible for site security and shall be required to provide such watchman as are necessary to protect the site from unwanted intrusion.

C.3.3.3 Exculpation. The right of the Department to comment on the Safety Plan and the nature and location of the required fences and barriers shall in no way absolve the Contractor from the obligation to maintain a safe site.

C.3.4 Site Logistics Plan. Prior to the start of construction activities, the Contractor shall prepare a Site Logistics Plan. The Site Logistics Plan shall address: (i) the manner in which the Contractor intends to organize the site; (ii) the location and description of site fences and other safety barricades intended to prevent the public from entering the site; (iii) the location of construction entrances and wheel washing stations; and (iv) parking restrictions and procedures that will apply to the employees of Contractor and its Subcontractors. The Contractor's storage/laydown area will be limited to the limits of disturbances shown on the Drawings and Specifications.

C.3.5 Potential Subcontractors and Suppliers. The Contractor shall include with its bid a list of the significant subcontractors that the Contractor intends to engage to perform the work. Within seven (7) days after the issuance of a Notice to Proceed, the Contractor shall furnish to the Department and its Program Manager a list of the subcontractors and suppliers that will work on this Project as well as a general description of each such subcontractor's scope of work. Within five (5) business days after such list is submitted, the Program Manager shall advise the Contractor if it has any objection to any of the listed subcontractors or suppliers. In the event the Program Manager has a reasonable objection to any such subcontractor or supplier, the Parties shall discuss such objection and agree on an appropriate course of action. To the extent the Department rejects a subcontractor that was disclosed in the bid, the Contractor shall be entitled to an appropriate equitable adjustment as a result of such disapproval.

C.3.6 Preconstruction Phase Deliverables. The following deliverables are required during the Preconstruction Phase.

.1 Detailed Schedule (C.3.1).
.2 Safety Plan (C.3.3).

.3 Site Logistics Plan (C.3.4).
.4 List of Subcontractors and Suppliers (C.3.5).

C.4 Construction Phase

The Construction Phase shall commence when the Department issues a written Notice to Proceed for Construction. The Contractor shall construct the work described on the Drawings and Specifications including any work that is that is that is not specifically shown thereon but is reasonably inferable therefrom or necessary for a fully functioning Project. The Work shall be carried out in a good and workmanlike, first-class manner, and in timely fashion. All materials and equipment to be incorporated into the Project shall be new and previously unused, unless otherwise specified, and shall be free of manufacturing or other defects. On or before the dates specified in the approved detailed schedule, the Contractor shall submit any necessary construction phase information (i.e. shop drawings, submittals, sketches, etc.) to the Architect and/or the Program Manager for his review and approval. Unless a different timeframe is established in the approved baseline schedule, the Architect/Engineer and/or the Program Manager shall have Twenty One (21) business days to review such documents. In the event the Program Manager finds such documents to be unacceptable, the Contractor shall be required to revise and resubmit such documents. Any delays that result from any construction phase submittal resubmissions shall be considered Non- Excusable.

C.4.1 Supervision & Coordination. The Contractor will be required to properly supervise and coordinate its work. At a minimum, it is envisioned that the Contractor will be required to undertake the following tasks:

.1 Participate and assist in Project/Planning meetings;
.2 Maintain full-time on-site construction supervision and provide daily inspections, quality control, monitoring, coordination of various trades, record drawings, and daily work log;
.3 Coordinate work with any on-site personnel so as to ensure that their activities are not adversely affected;
.4 Conduct periodic progress meetings following a Contractor generated agenda with the Program Manager;
.5 Provide general safety signage and posting for the project and see that each subcontractor prepares and submits adequate safety program and monitoring throughout the project;
.6 Obtain all job permits and approvals from the Department of Consumer and Regulatory Affairs that are required to perform and complete the Work, unless otherwise noted herein;
.7 Prepare payment requests verify accuracy and forward to Department for approval and payment;
.8 Assemble close-out documents required;
.9 Provide assistance to the Department through all applicable warranty periods.
.10 Coordinate its work with all third parties so as not to delay the critical path of the Project; and

.11 Prepare and submit to the Department construction meeting minutes, progress meeting minutes, daily logs, inspection reports, preliminary and baseline schedules, (Primavera format) and schedule updates demonstrating the critical path of the Project (Primavera format).

C.4.2 CBE Subcontractors. The Contractor shall not substitute or replace any Subcontractor or supplier certified by the District of Columbia Department of Small and Local Business Development without the Department's prior written consent.

C.4.3 Site Observations. The Contractor will be required to visit the site, become familiar with local conditions under which the work is to be performed and correlate personal observations with requirements of the Drawings and Specifications. The Contractor shall carefully study and compare the Drawings and Specifications with each other and with information furnished by the Department. Before commencing activities, the Contractor shall (1) take field measurements and verify field conditions; (2) carefully compare this and other information known to the Contractor with the Drawings and Specifications; and (3) promptly report errors, inconsistencies or omissions discovered to the Department. Once work is started, the Contractor assumes the responsibility and costs for the work and the cost of correcting work previously installed.

C.4.4 Warranty of the Construction Work. The Contractor warrants to the Department that materials and equipment furnished under the Contract will be of good quality and new unless otherwise expressly permitted in writing, and that for the one (1) year period following the Substantial Completion Date the construction work will be free from defects not inherent in the quality required or permitted, and that the Work will conform to the Construction Documents and/or any approved design documents. The Contractor's warranty excludes remedy for damage or defect caused by abuse, modifications not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. The Contractor and a representative of the Department shall walk the Project together eleven (11) months after the Substantial Completion Date to identify any necessary warranty work. In the event the Contractor fails to schedule such a walk, the Warranty period shall be extended until such time as the Contractor schedules such a walk.

C.4.5 Extent of Responsibility and Site Conditions. The Contractor shall be entitled to an equitable adjustment in accordance with the Standard Contract Provisions for differing site conditions only to the extent that: (i) such conditions could not have been discovered by a competent visual inspection of the site, are of unusual nature, and differ materially from those ordinarily encountered and generally recognized as inhering to work of the character provided for in the Contract; or (ii) with regard to subsurface conditions on or adjacent to the Project site, such subsurface conditions differ materially from those indicated in the geotechnical reports (such circumstances, "**Differing Site Conditions**"). Prior to commencing construction, the Contractor shall be required to conduct a thorough review of the Project site and the surrounding area and shall document its findings. In the event the Contractor fails to undertake and document such a thorough review, the Contractor shall be deemed to have known of those conditions which a thorough review would have detected. Any Change Request related to Differing Site Conditions shall be made pursuant to the Standard Contract Provisions.

C.4.6 Unsafe Materials and Hazardous Materials

C.4.6.1 The Contractor shall abate and legally dispose of any Hazardous Materials in the demolished facility, in accordance with EPA and all jurisdictional agencies' rules and regulations. The Contractor shall be responsible for all interior and exterior demolition, as required.

C.4.6.2 The Contractor shall not bring, spill or release onto the site asbestos, PCBs, or any other Hazardous Material that is not customarily used in a facility of the type and similar to the Project, and shall bring to the Department's attention any specification of such Hazardous Materials in the design documents. If the Contractor believes that anything in the Contract would require that it use or bring onto the site asbestos, PCBs, or any Hazardous Material that is not customarily used in a facility of the type and similar to the Project, it shall immediately inform the Department and seek direction before proceeding.

C.4.6.3 The Contractor's scope of work includes the abatement and removal of hazardous materials found within the existing building. In performing such work, the Contractor shall comply with all laws, including, without limitation, the requirements of the EPA and all jurisdictional agencies as well as all laws relating to safety, health welfare, and protection of the environment, in removing, treating, encapsulating, passivating, and/or disposing of hazardous materials, including, but not limited to, removal, treatment, encapsulation, passivation, and/or disposal of the hazardous materials. If any notices to governmental authorities are required, the Contractor shall also give those notices at the appropriate times. The Contractor shall ensure abatement subcontractors and disposal sites are appropriately licensed and qualified. In addition, the Contractor shall ensure that any subcontractors involved in the abatement of hazardous materials maintain a contractor's pollution legal liability insurance policy of at least Two Million Dollars ($2,000,000) for the duration of the Project and a period of three (3) years after Substantial Completion of the Project, and that any disposal site to which hazardous materials are taken carries environmental impairment liability insurance for the duration of the Project and a period of three (3) years after Substantial Completion of the Project. The Contractor's obligations under this paragraph shall include signing (as the agent for the Department) any manifests required for the disposal of hazardous materials.

C.4.6.4 If Hazardous Materials beyond those identified in the hazmat report are discovered on the site, the Contractor shall immediately inform the Program Manager and the Department of such discovery. In such an event, the Contractor shall be entitled to an equitable adjustment in accordance with the Standard Contract Provisions for any Hazardous Materials abatement and disposal work. The Contractor shall keep detailed records documenting Work done so that the Department may independently verify compliance with all laws, the number of units actually removed, treated, and/or disposed of, and the appropriate unit price(s) applicable to the Work.

C.4.7 Progress Meetings. The Contractor shall schedule and conduct at a minimum bi-weekly progress meetings at which the Department, the Program Manager, the Contractor and appropriate Subcontractors can discuss the status of the Work. The Contractor shall prepare and promptly distribute meeting minutes.

C.4.8 Written Reports. The Contractor shall provide written reports to the Program Manager on the progress of the entire Work in accordance at least every other week, including, but not limited to, a baseline schedule and schedule updates with narrative demonstrating the critical path of the Project in Primavera format. The Contractor shall also maintain a daily log containing a record of weather, Subcontractors working on the site, number of workers, major equipment on the site, Work accomplished, problems encountered and other similar relevant data as the Department may reasonably require. The log shall be available to the Department, the Architect/Engineer and the Program Manager and on a monthly basis a copy of the log shall be submitted to the Department.

C.4.9 Work by Separate Contractors. The Department reserves the right to perform construction or operations related to the Project with the Department's own forces, and to award separate contracts in connection with other portions of the Project or other construction or operations on the site.

C.4.10 Site Safety and Clean-Up. The Contractor will be required to: (i) provide a safe and efficient site, with controlled access, including the installation and provision of such safety barricades, enclosures and overhead protection as may reasonably be required by the Department and as may be necessary to ensure a safe workplace or as may be required by OSHA or other applicable law, including but not limited to any COVID-19 related laws, orders, or regulations and to remove such at the end of the Work and leave the site in broom clean condition; and (ii) be responsible for the security of its tools, equipment and materials that are stored at the site. The Contractor shall be responsible for the removal and legal disposal of all construction debris.

C.4.11 Close-out. The Contractor shall be required to prepare and submit at close-out a complete set of product files, including but not limited to: (i) QC/QA reports, daily reports, and test reports; (ii) a complete set of product manuals (O&M), training videos, and warranties; (iii) as-built record drawings; (iv) environmental, health, and safety documents; and (v) all applicable inspection certificates/permits. The Contractor shall also provide the Department with any shop drawings prepared by the Contractor or its subcontractors along with any other documentation that may reasonably be requested by the Department or its Program Manager.

C.4.12 Cutting and Patching. The Contractor shall be responsible for cutting, fitting or patching required to complete the Work or to make its parts fit together properly. All areas requiring cutting, fitting and patching shall be restored to the condition existing prior to the cutting, fitting and patching. The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Department or separate Contractors by cutting, patching or otherwise altering such construction, or by excavation.

C.4.13 Salvaging and Storing. The Contractor shall be responsible for salvaging and storing all items identified by the Department. The salvage value of any piece of equipment or material found within the buildings to be demolished that has a value in excess of Ten Thousand Dollars ($10,000) shall accrue to the benefit of the Department. The value of the salvaged materials (i.e. copper pipping, etc.) under the aforementioned threshold shall accrue to the benefit of the Contractor.

C.4.14 Correction of Work

C.4.14.1 The Department shall be at liberty to object and to require the Contractor to remove forthwith from the Project site and the Work and to promptly replace the Superintendent, any foreman, technical assistant, laborer, agent, representative, or other person used by the Contractor in or about the execution or maintenance of the Work, who in the sole opinion of the Department is misconducting himself or herself, or is incompetent or negligent in the proper performance of his or her duties, or whose performance in the Work is otherwise considered by the Department to be undesirable or unsatisfactory, and such person shall not be again employed upon the Project without the written permission of the Department.

C.4.14.2 The Contractor shall promptly correct Work rejected by Department for failing to conform to the requirements of the Construction Documents or any approved design document or applicable law or regulations whether observed before or after the Project's completion and whether or not fabricated, installed or completed, and shall correct any Work found to be not in accordance with the requirements within a period of one (1) year from the date of completion or by terms of an applicable special warranty required by the Contract.

C.4.14.3 If during the guarantee or warranty period, any material, equipment or system requires corrective Work because of defects in materials or workmanship, the Contractor shall commence corrective Work within forty-eight (48) hours after receiving the notice and work diligently until corrective Work is completed; provided, however, if such notice is received on the day before a weekend or a holiday, the Contractor will commence corrective Work on the next business day. If the Contractor does not, in accordance with the terms and provisions of the Contract Documents, commence all corrective Work within forty-eight (48) hours or if the Contractor commences such Work but does not pursue it in an expeditious manner, Department may either notify the bonding company (if any) to have such Work and/or obligations performed at no additional cost to Department or may perform such Work and/or obligations and charge the costs thereof to Contractor.

C.4.15 Manufacturers' Warranties

C.4.15.1 The Contractor warrants that all manufacturers' or other warranties on all labor, materials and equipment furnished by the Contractor or a Subcontractor or supplier shall run directly to or will be specifically assigned to Department on demand or upon Project completion without demand. In the event any issue or defect which would be covered by any warranty arises but is not addressed by the grantor of the warranty, the Contractor shall be required to act as the guarantor of the obligations under the warranty and to perform under the terms of the warranty.

C.4.15.2 The Contractor warrants that the installation of all materials and equipment shall be in strict accordance with the manufacturers' requirements or specifications.

C.4.16 Schedule Updates. The Contractor shall submit bi-weekly schedule updates which shall reflect actual conditions of Project progress as of the date of the update. The update shall

reflect the actual progress of construction, identify developing delays, regardless of their cause, and reflect the Contractor's best projection of the actual date by which Substantial Completion and Final Completion of the Project will be achieved. Via a narrative statement (not merely a critical path method schedule), the Contractor shall identify the causes of any potential delay and state what, in the Contractor's judgment, must be done to avoid or reduce that delay. The Contractor shall point out, in its narrative, changes that have occurred since the last update, including those related to major changes in the scope of work, activities modified since the last update, revised projections of durations, progress and completion, revisions to the schedule logic or assumptions, and other relevant changes. Any significant variance from the previous schedule or update shall also be identified in a narrative, together with the reasons for the variance and its impact on Project completion. All schedule updates shall be in Primavera 6 format. The Department may make reasonable requests during the Project for changes to the format or for further explanation of information provided. Submission of updates showing that Substantial Completion or Final Completion of the Project will be achieved later than the applicable scheduled completion date shall not constitute requests for extension of time and shall not operate to change the scheduled completion date. The Department's receipt of, and lack of objection to, any schedule update showing Substantial Completion or Final Completion later than the dates agreed upon in the Project Schedule shall not be regarded as the Department's agreement that the Contractor may have an extension of time, or as a waiver of any of the Department's rights, but merely as the Contractor's representation that, as a matter of fact, Substantial Completion or Final Completion of the Project may not be completed by the agreed upon date in the Project Schedule. Changes to the scheduled completion dates may be made only in the circumstances and only by the methods set forth in the Contract.

C.4.17 Acceleration. Subject to the terms of this Section, the Department shall have the right to direct the Contractor to accelerate the Work if, in the reasonable judgment of Department, the Contractor fails to: (i) supply a sufficiency of workers or to deliver the materials or equipment with such promptness as to prevent the delay in the progress of the Work; or (ii) the progress of the Work materially falls behind the projections contained in the then currently approved Project Schedule. In the event that the Department or its Program Manager determine that either of the events specified in the preceding sentence have occurred, the Department shall provide the Contractor with written notice of such event and the Contractor shall be required to provide the Department with a corrective action plan that is reasonably designed to address the concerns raised in such notice within three (3) days after receipt of such notice. If the Department and the Contractor are unable to agree on the terms of such corrective action plan within five (5) days after the issuance of the notice (i.e. with forty eight (48) hours after the receipt of the proposed corrective action plan), the Department shall have the right to direct such acceleration as the Department, in its reasonable judgment, deems necessary. Provided the notice provisions of this Section are complied with and the delay in the critical path is not the result of Excusable Delays, the cost of any acceleration directed under this Section shall not justify an adjustment to the Lump Sum Price or the Substantial Completion Date. The Contractor hereby acknowledges that this provision is a material inducement upon which the Department has relied in entering into the Contract; and represents and warrants that it has included sufficient funding in its Lump Sum Price in order to comply with the requirements of this Section.

C.5 Substantial Completion Date. The Project shall be substantially complete no later than **November 15, 2020**. For purposes of this requirement, the term "**Substantially Complete**"

shall mean that all of the following have occurred: (1) the work has been completed with only minor punch list items remaining to be completed; (2) any and all required permits or approvals related to the work have been obtained; (3) all operating and maintenance manuals, training videotapes and warranties required by the Contract have been delivered to the Department; (4) any supplemental training session required by the Contract for operating or maintenance personnel have been completed; (5) all clean-up required by the Contract has been completed; and (6) the Project is ready for the Department to use it for its intended purpose. "**Minor punch list items**" are defined for this purpose as items that, in the aggregate, can be completed within thirty (30) days without interfering with the Department's normal use of the Project. Final Completion shall mean the point at which Substantial Completion has been achieved, all punch list items noted at Substantial Completion have been completed and all documents the Contractor is required to deliver to the Department as a condition to receiving final payment have been received. Work is defined as the construction and services required by the Contract, whether completed or partially completed, and includes all other labor, materials, equipment, and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

C.6 Administrative Matters

C.6.1 Use of Department's Electronic Project Management Information System (PMIS). Awarded Contractor shall utilize the Department's PMIS to create, manage and/or submit any and all documentation required to be provided by the vendor during the course of the Project, including, but not limited to: (i) requests for information; (ii) submittals; (iii) potential change orders; (iv) meeting minutes; (v) pencil copy invoices; (vi) drawings and specifications; (vii) punchlist; and (viii) other documents as may be designated by the Department

C.6.2 Liquidated Damages. If the Contractor fails to achieve Substantial Completion by the Substantial Completion Date, the Parties acknowledge and agree that the actual damage to the Department for the delay will be impossible to determine, and in lieu thereof, the Contractor shall pay to the Department, as fixed, agreed and liquidated delay damages in the amount of One Thousand Two Hundred Fifty Dollars ($1,250.00) per day for each calendar day of delay for failure to meet the Substantial Completion Date. The Contractor and the Department agree that the liquidated damages do not constitute, and shall not be deemed, a penalty but represent a reasonable approximation of the damages to the Department associated with a delay in the Project.

C.6.3 Compensation. The Contractor shall be paid its compensation in a series of progress payments and a final payment. Progress payments shall be based on a Schedule of Values that is agreed upon by the Parties as well as the Program Manager's good faith estimate of the level of completion for each component of the Schedule of Values. Contractor shall prepare the Schedule of Values which breaks down the Lump Sum Price for the various parts of the Work. The Schedule of Values shall be maintained in such a manner to provide a breakdown of the Lump Sum Price in enough detail to facilitate continued evaluation of applications for payment and progress reports. Large subcontracts shall be broken into several line items where, in the reasonable opinion of the Program Manager, such detail is necessary to properly track the progress of the Work. The proposed schedule of values shall also include separate line items for each part of the Work if so required by the Program Manager. The Contractor and the Program

Manager shall meet as necessary to maintain the schedule of values for the Project in a manner acceptable to the Program Manager. No progress payments shall be made unless the then current Schedule of Values is acceptable to the Program Manager.

C.7 Key Personnel

The Offeror's personnel should have the necessary experience and licenses to perform the required work. Toward that end, Offerors should include within the bid a description of the staff available to perform this work and their qualifications.

Key personnel shall include, at a minimum, the following individuals: (i) the Project Executive; (ii) the Field Superintendent; and (iii) the Project Manager who will be responsible for the Project. The Contractor will not be permitted to reassign any of the key personnel unless the Department approves the proposed reassignment and the proposed replacement. A list of the key personnel shall be attached to the contract that results from this IFB.

C.8 Risks Assumed by the Contractor

By submitting a bid, the Offeror shall be deemed to have thoroughly examined the terms of this IFB, the Drawings and Specifications and shall constitute its acknowledgement that it has been provided with an opportunity to visit the Project site and that such Offeror has had the opportunity to become familiar with local conditions under which the work is to be performed. Further, in submitting any such bid, the Offeror shall be deemed to represent that it has satisfied itself that it can undertake the work for the state cost. Among other things, by submitting a bid, the Offeror assumes the following risks: (1) the nature of the land and subsoil unless such conditions constitute a Differing Site Condition; (2) the form and nature of the site and surrounding areas; (3) details and levels of existing pipe lines, conduits, sewers, drains, cables or other existing services; (4) the quantities, nature and availability of the materials, tools, equipment and labor necessary for the completion of the work; (5) the means of access to the site and any accommodation that may be required; (6) uncertainties of weather and physical conditions at the site; and in general to have itself obtained all necessary information as to risk contingencies, climatic, hydrological and natural conditions and other circumstances which may influence or affect his performance of the work.

C.9 Construction Phase Deliverables.

- **.1** Progress Meeting Minutes (C.4.7).
- **.2** Progress Reports (C.4.8).
- **.3** Close Out Documents (C.4.11).
- **.4** Copy of Manufacturer Warranties (C.4.15).
- **.5** Bi-Weekly Schedule Updates (C.4.16).

C.10 DEFINITIONS

C.10.1 Change Directive. A written directive signed and issued by the Department ordering the Contractor either to provide pricing and schedule impact information for a described change to the work or to proceed with a described change and provide pricing and schedule impact information after beginning the changed work.

C.10.2 Change Event. Any condition, event, act, omission or breach, other than the issuance of a Change Directive, which the Contractor believes entitles it to a change in the Lump Sum Price, or the Substantial or Final Completion date(s).

C.10.3 Change Order/Contract Modification. A written document, executed by the Department and the Contractor, setting forth the agreed terms upon which a change to the Contract has been made.

C.10.4 Contract. The entire, integrated agreement between the Department and the Contractor with respect to the Project, consisting of this IFB, the Attachments to the IFB, the Construction Documents released for the Contractor's use and any Change Directives or Change Orders that have been executed by the Department.

C.10.5 Contract Documents. The final documents comprising the Contract, as prepared in accordance with the law, including, but not limited to those documents requiring review and approval by the District Council.

C.10.6 Drawings. Graphic and pictorial portions of the Contract Documents, wherever located and wherever issued, showing the design, locations and dimensions of the work, generally including plans, elevations, sections, details, schedules and diagrams.

C.10.7 Final Completion. The point at which Substantial Completion has been achieved, all punch list items noted at Substantial Completion have been completed with the Department's approval and sign-off and all documents the Contractor is required to deliver to the Department as a condition to receiving final payment have been delivered. These may include, as applicable, but are not limited to, a final Certificate of Occupancy for the Project from the District of Columbia; and final lien releases from the Contractor and Subcontractors and material suppliers. Contractor shall cause all representations, warranties and guarantees to be honored, and otherwise fulfill all of the requirements set forth in the Contract.

C.10.8 Reserved.

C.10.9 Hazardous Material. Any toxic substance or hazardous chemical defined or regulated pursuant to federal, state or local laws relating to pollution, treatment, storage or disposal of waste, or protection of human health or the environment. Such laws include, without limitation, the Comprehensive Environmental Response, Compensation and Liability Act, the Resource Conservation and Recovery Act, the Clean Water Act, the Clean Air Act and laws relating to emission, spills, leaks, discharges, releases or threatened releases of toxic

material. The term Hazardous Materials shall also include petroleum and petroleum bi-products.

C.10.10 Hazardous Material Remediation. Hazardous material remediation shall mean the work performed to remove, treat and/or dispose of Hazardous Material.

C.10.11 Notice to Proceed. A written notice to proceed, signed by the Department, directing the Contractor to proceed with the Project or any portion of the Project.

C.10.12 Project Schedule. The schedule for the pproject agreed to by the Department and the Contractor herein. Such schedule shall not be changed except by a Change Order or Change Directive issued by the Department. The schedule shall be in a form and contain such detail as may be agreed upon by the Parties.

C.10.13 Specifications. The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, construction systems, standards and workmanship for the work, and performance of related services.

C.10.14 Subcontractor. Any person, natural or legal, to whom the Contractor delegates performance of any portion of the work required by the Contract. The term "Subcontractor," used without a qualifier, shall mean a subcontractor in direct privity with the Contractor. Subcontractors at all tiers" shall mean not only those Subcontractors in direct privity with the Contractor, but also those performing work pursuant to sub-subcontracts, sub-sub-subcontracts, and so on. "Subcontractors" shall include both those who are retained to perform labor only and those who are retained both to perform labor and to supply material or equipment. Subcontractors" shall also include design professionals who are not the Contractor's employees and to whom the Contractor delegates any part of its responsibilities under the Contract, except that references to "trade Subcontractors" shall exclude design professionals.

C.10.15 Substantial Completion Date. The date established herein by which the Contractor shall achieve Substantial Completion. In order for the Contractor to achieve Substantial Completion, the District must be able to receive a Certificate of Occupancy (C of O) the Substantial Completion Date may be modified only by Change Order or Change Directive in accordance with the Contract by Contracting Officers Only.

C.11 ACCELERATION

Subject to the terms of this Section, the Department shall have the right to direct the Contractor to accelerate the work if, in the reasonable judgment of Department, the Contractor fails to: (i) supply a sufficiency of workers or to deliver the materials or equipment with such promptness as to prevent the delay in the progress of the work; or (ii) the progress of the work materially falls behind the projections contained in the then currently approved Project Schedule. In the event that the Department or its Project Manager determine that either of the events specified in the preceding sentence have occurred, the Department shall provide the Contractor with written notice of such event and the Contractor shall be required to provide the Department with a corrective action

plan that is reasonably designed to address the concerns raised in such notice within three (3) days after receipt of such notice. If the Department and the Contractor are unable to agree on the terms of such corrective action plan within five (5) days after the issuance of the notice (i.e. with forty eight (48) hours after the receipt of the proposed corrective action plan), the Department shall have the right to direct such acceleration as the Department, in its reasonable judgment, deems necessary. Provided the notice provisions of this Section are complied with, the cost of any acceleration directed under this Section shall not justify an adjustment to the Lump Sum Price or the Substantial Completion Date. The Contractor hereby acknowledges that this provision is a material inducement upon which the Department has relied in entering into the Contract; and represents and warrants that it has included sufficient funding in its Lump Sum Price in order to comply with the requirements of this Section.

C.12 WALK-THROUGH INSPECTION

At the achievement of Substantial Completion, the DGS Program Manager shall perform a walk-through inspection in the presence of the Contractor. The Contractor shall prepare a written report stating any deficiencies found during the walk-through, identify the responsible parties, and ensure that all the deficiencies are corrected by the Contractor prior to demobilization. The Contractor shall not demobilize from the site until receiving written notice, in writing, from the DGS Project Manager the deficiencies have been corrected to the DGS Project Manager's satisfaction.

C.13 LICENSING, ACCREDITATION AND REGISTRATION

The Contractor and all its subcontractors and subconsultants (regardless of tier) shall comply with all applicable District of Columbia, state, and federal licensing, accreditation, and registration requirements and standards necessary for the performance of the Contract.

C.14 CONFORMANCE WITH LAWS

It shall be the responsibility of the Contractor to perform the Contract in conformance with the Department's Procurement Regulations (27 DCMR § 4700 *et seq.*) and all statutes, laws, codes, ordinances, regulations, rules, requirements and orders of governmental bodies, including, without limitation, the U.S. Government and the District of Columbia government; and it is the sole responsibility of the Contractor to determine the Department's procurement regulations, statutes, laws, codes, ordinances, regulations, rules, requirements and orders that apply and their effect on the Contractor's obligations thereunder.