St.Francis Neighborhood Center-Phase Two (SNFC-PH2)

RM Sovich Architecture

PROJECT MEMBERS	COMPANY NAME	CODE
Architect	RM Sovich Architecture	**RMSA**
Construction Manager		
Civil Engineer	-	
Structural Engineer	Skarda & Associates, Inc.	**SKA**
MEP Engineer	Henry Adams Consulting Engineers	**HAC**
Kitchen Consultant	-	
Interior design		
Contractor	TBD	**TBD**

Item #	RFI#	Name	Date received	Generated by	Dwg / Spec #	Description/question	Conflicting Sheet/ Spec #	Date/ Forwarded to	Date/ Received from	Arch/Engineer Response Date	Arch/ Engineer Response Date	Arch / Engineer Response	Revised drawings/Spesc.	Responsibility	Status	ADDENDUM #
1	0		3/16/23		A503 and A504	We are missing A503 and A504 from the package. The cover sheet listed Sheet # A503 and A504 as part of the packaged drawing. Please advise					3/16/23	Drawings A503 and A504 are attached.		Architect	Closed	ADD#01
2	1	Michael Trionfo	3/17/23		S102	2. S102 calls for "RT-1 Prefab Wood & Metal". The on center spacing and image representing the trusses would suggest a metal-webbed bar joist similar to a RedBuilt Open Web Truss, rather than a standard metal plate connected wood truss. Please confirm the Structural Engineer of Records intent for this project.					3/23/23	**We concur. Red-Built Open Webbed trusses are acceptable or equal. The load requirements are on the structural drawings. The truss is to be engineered by the manufacturer. Stamped engineered drawings are required.**		Structural	Closed	ADD#01
3	1	Michael Trionfo	3/17/23			2. Will the building be occupied during construction?					3/23/23	**Yes. The portion of the building to be renovated will be unoccupied. But the L shaped recent addition will be occupied. The users will need access via the courtyard and emergency egress through the Linden avenue exit. A meeting with the users will need to take place to coordinate the access when the Linden Ave porch is being replaced.**		Owner	Closed	ADD#01
4	1	Michael Trionfo	3/17/23			3. The luminaire schedule shows type PC fixtures with and without battery backup, but the type designations are the same. Please provide the battery backup fixture locations.								MEP	**Pending**	ADD#01
5	1	Michael Trionfo	3/17/23			4. Are the C-1 type fixtures shown on the luminaire schedule the type C fixtures shown on the E drawings?					3/23/23	**Yes.**		MEP	Closed	ADD#01
6	1	Michael Trionfo	3/17/23		E202	5. There is 1 type WS-4 light fixtures shown on drawing E202 but it is not listed on the luminaire schedule. Please provide light fixture information.					3/23/23	**Light fixture to match existing outside light fixture on the last addition. AP-LED-X47-NFL-SAP12-C + RM- D42-SAP-MT. Use SAP finish.**		MEP	Closed	ADD#01
7.0	1	Michael Trionfo	3/17/23			6. Please see attached Substitution Request from Secure Door and Hardware.					3/23/23	**The submitted substation will be considered but pricing shall be submitted as an alternate to be reviewed by client for both specified modern fold and for the requested substitute.**		Owner	Closed	ADD#01
8	1	Michael Trionfo	3/17/23			7. Is there a spec for the metal canopy on the new addition?					3/23/23	**It is not a product, it is to be custom framed with the building framing. The fascia is Hardi board and the flashing is white metal flashing.**		Architect	Closed	ADD#01
9.0	1	Michael Trionfo	3/17/23		SIT-2 and A100/ A101	8. There is a difference on how much of the white iron fence and gate should be relocated between drawing SIT-2 and A100/A101. Which drawing should we use for pricing?					3/23/23	**We would like to enclose it from three sides. Use the site plan- SIT-2**		Architect	Closed	ADD#01
10	1	Michael Trionfo	3/17/23			9. On the drawings at the trash pad, there is fence and a note that the new fence is to match the existing fence on site, but there are two types of fence on site – the white iron and wood. Which one should be installed at the trash pad?					3/23/23	**Please use six foot white iron fence as manufactured by LongFence. A cut sheet of a section is attached.**	Spec	Architect	Closed	ADD#01
11	2	Kim Boyd	3/21/23		A602.	1. Please refer to the snip from Plan Page 14 - A602. The flooring as indicated, shows the RF-7 walk off mat in Classroom 222. However, the pattern indicates the Kinetex carpet tile. The carpet tile seems more likely. Should we assume this to be a labeling error?					3/23/23	**We concur. Please use the Kinetex carpet tile pattern.**		Architect	Closed	ADD#01
12	2	Kim Boyd	3/21/23			2. Also, there is a round "medallion" shape in the center of Rm 222 and in Rm 223, that seems to indicate a small piece of RF-2 Forbo sheet vinyl, inset into the Kinetex carpet tile. Should we quote it this way? This just seems like a very odd design idea, but if you think that is what they want, we will quote it as is indicated.					3/23/23	**No medallion shape insert. That is a circle indicating the start point of the Kinetex carpet. Replace the note that refers to RF2 to read as "start pattern here".**		Architect	Closed	ADD#01
13	2	Kim Boyd	3/21/23			3. Lastly – There is a Johnsonite Millwork type base in the finish legend, but no indication of it on the finish plan. Should we assume that the new millwork base is to go in all areas of new flooring?					3/23/23	**Yes. All walls to receive Johnsonite wall base with the exception of the renovation of the existing building where it has to receive wood base.**		Architect	Closed	ADD#01
14	3	Michael Trionfo	3/21/23		Spec	1. Please provide a spec for the window blinds.					3/23/23	**See the attached spec.**	Spec	Architect	Closed	ADD#01

15	3	Michael Trionfo	3/21/23			2. Please provide more detail on the retaining wall.Drawings says (Rebar found 8" wide retaining wall")					3/23/23	**8" CMU wall reinforced w/ #4 @ 2'-8" OC in grout filled cells on 2'-0"x1'-0" deep concrete footing reinforced w/ 2-#5 continuous bottom. Refer to S104.**		Structural	Closed	ADD#01
16	3	Michael Trionfo	3/21/23			3. Is the IT/Data by the owners vendor or contractor?					3/23/23	**Ring and string in all concealed area to be by Contractor. IT/Data by the Owners vendor.**		Architect	Closed	ADD#01
17	3	Michael Trionfo	3/21/23			I'm unclear as to whether the surfacing is only the area shaped like the "number 9", or if it's the entire area. See below:					3/23/23	**The entire area. The color of the surface will changed based on the shape.**		Architect	Closed	ADD#01
18	4	Kim Boyd	3/21/23			1. Confirm existing part of the building will be unoccupied.					3/23/23	**The existing brick structure to be renovated will be unoccupied. The last addition will remain occupied.**		Architect	Closed	ADD#01
19	4	Kim Boyd	3/21/23		Spec	2. Please provide material Specs for Exterior hardi siding, wood & metals.					3/23/23	**See attached specification.**	Spec	Architect	Closed	ADD#01
20	4	Kim Boyd	3/21/23		A0.6 , A201 & A202	3. Please clarify extent of Exterior painting. Notes on images A0.6 show existing painted masonry wall on South Elevation, and existing signage panel scheduled for new finishes, however Elevations A201 & A202 do not. Please advise.					3/23/23	**Remove the paint instruction from existing masonry. Include painting the signage panel.**		Architect	Closed	ADD#01
21	4	Kim Boyd	3/21/23			4. Please clarify extent of refinish related to existing stained wood trim, stair railing and wall panels @ main circulation stair (Keynote 14/a101, notes on A102, A601 & A602) and stained doors & door frames/casing on 1st & 2nd floors of existing renovation.					3/23/23	**All the wood inside shall be sanded and re-stained - refer to the wood restoration specification for materials.**		Architect	Closed	ADD#01
22	4	Kim Boyd	3/21/23			5. Please clarify extent of refinish related to existing Wall Base EX-B1 & finish on new Wall Base WD-1.					3/23/23	**All the inside existing brick structure to be renovated shall be refinished as Wall Base EX-B1. Provide new Wall Base WD-1 in rooms per finish schedule.**		Architect	Closed	ADD#01
23	4	Kim Boyd	3/21/23		A004	6. Please clarify finish on Ceilings with "Stain" call-out on Finish Schedule A004.					3/23/23	**Wood deck at the specified rooms shall be clear or translucent stained wood ceiling including the underside of the porch.**		Architect	Closed	ADD#01
24	5	Kim Boyd	3/23/23		Spec	1. The new front porch, roof plan calls for TPO, elevations show a sloped standing seam metal roof, which is it?					3/23/23	**The porch roof is standing seam roof. Find the spec for standing seam metal. Contractor to provide roof underlayment over plywood and Ice and Water Shield 36" at the edge of roofing.**	Spec	Architect	Closed	ADD#01
25	5	Kim Boyd	3/23/23		Spec	2. The specs call for the TPO to be a heavy-duty vapor barrier, but the drawings do not. Do they want the VB or no?					3/23/23	**Provide heavy-duty vapor barrier per the spec.**		Architect	Closed	ADD#01
26	5	Kim Boyd	3/23/23		AD001.	3. The specs talk about demo, but there is no roof demo that I saw. Is that correct?					3/23/23	**There is a porch roof demolition. The existing porch roof has to be removed. See note number 21 on AD001.**		Architect	Closed	ADD#01
27	5	Kim Boyd	3/23/23		Spec	4. The specs call for this "Edge Accu Fit Guard Rail system" the plans look like it would go on the new section of flat roof. Is that something they still want installed there?					3/23/23	**Provide Edge Accu Fit Guard Rail system per the spec- locate it around the new HVAC unit.**		Architect	Closed	ADD#01
28	5	Kim Boyd	3/23/23			5. TPO spec calls for R30, plans show both R30 & R38, which thickness of insulation do they want? R30 is code.					3/23/23	**For continuous insulation use R30.**		Architect	Closed	ADD#01
29	5	Kim Boyd	3/23/23		Spec	6. Specs talk about "Gravity Vents," but I see no details or notes showing them on the plans.					3/24/23	**Contractor's RFI does not indicate specification section. It is assumed contractor is asking, "Are there gravity relief or intake ventilators?" There are no gravity relief nor intake ventilators within this project.**		MEP	**Closed**	ADD#01
30	5	Kim Boyd	3/23/23			7. Spec Calls for Firestone TPO. Firestone was just bought out and is now called "Elevate" and the company is in flux right now, so I'd like to use GAF TPO in lieu of the Firestone. Is that OK?					3/23/23	**Yes.**		Architect	Closed	ADD#01
31	5	Kim Boyd	3/23/23			8. Who is the existing control contractor in the building?					3/24/23	**The subcontractor who worked on the last phase of the HVAC control is Calvert Mechanical Solutions. Below is the contact information. 8801 Mylander lane Towson MD 21286 Phone: (410)323-5400 Fax: (410)433-5850 Project Manager: Kevin Sparwasser**		Owner	**Closed**	ADD#01
32	6	Kim Boyd	3/23/23			1. There are no specifications on the airflow measuring station AFM-3 and the D-1 damper @ AHU-3.					3/24/23	**Control damper requirements are indicated in "230923 HVAC Instrumentation and Controls" section 2.4. Airflow Measuring Station requirement are indicated in "233300 Air Duct Accessories" section 2.15 (especially 2.15.J and 2.15.K).**		MEP	**Closed**	ADD#01
33	6	Kim Boyd	3/23/23		E101 and A601	2. Drawing E101 says motor operated window shades mounted, but drawing A601 says manually operated pull string shades. Please clarify which one is being installed.					3/24/23	**Provide manually operated pull string shades as called out on A601.**		Architect	**Closed**	ADD#01
34	7	Kim Boyd	3/24/23			1. Can we use Petersen Snap Clad Panels as a substitute for Fabral? Info attached. They are local and it is easier and faster to get materials from them instead of Fabral. No cost difference.					3/27/23	**Yes. Substitution is acceptable.**		Architect	**New Item**	ADD#01
35	7	Kim Boyd	3/24/23			2. Were there any site borings taken?					3/27/23	**Yes. See the attached soil borings from the last phase.**		Architect	**New Item**	ADD#01
36	7	Kim Boyd	3/24/23			3. Are the fence modifications at the Paver area to be included in the alternate or Base bid?					3/27/23	**It should be in the base bid.**		Architect	**New Item**	ADD#01
37	7	Kim Boyd	3/24/23			4. Will testing for Lead Paint or asbestos be conducted before the project begins? Will this be done by someone other than the General Contractor?					3/27/23	**It will be done before project begins by someone other than the contractor.**		Architect	**New Item**	ADD#01
38	7	Kim Boyd	3/24/23			5. Does the landscape Allowance provided in the specifications include Topsoil, Seeding, Mulch, Plantings? Or just Plantings?					3/27/23	**Provide a bid number for Topsoil, Seeding, Mulch, Plantings. The Allowance for the trees.**		Architect	**New Item**	ADD#01
39	7	Kim Boyd	3/24/23			6. Is the allowance identified in the specifications $12,000 for the (4 trees) identified in Specification 012100? or in addition to?					3/27/23	**See item # 38.**		Architect	**New Item**	ADD#01

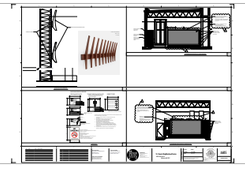
40	7	Kim Boyd	3/24/23			7. E101 has a detail for motor operated projection screen. Please confirm if this is on the project, and provide a spec.					3/27/23	**Find the attached spec.**		Architect	**New Item**	ADD#01
41	7	Michael Trionfo	3/24/23			Plesae provide the spec on the MDF Stained/Color Scored Wall Panel.					3/27/23	**In lieu of the stained/color MDF scored wall panel, provide through-color wood fiber panels as manufactured by Fores or Valchromat with a clear finish. Below is the link to the manufacturer web site.** https://www.forescolorusa.com/ https://www.atlanticplywood.com/brand/valchromat/		Architect	**New Item**	ADD#01

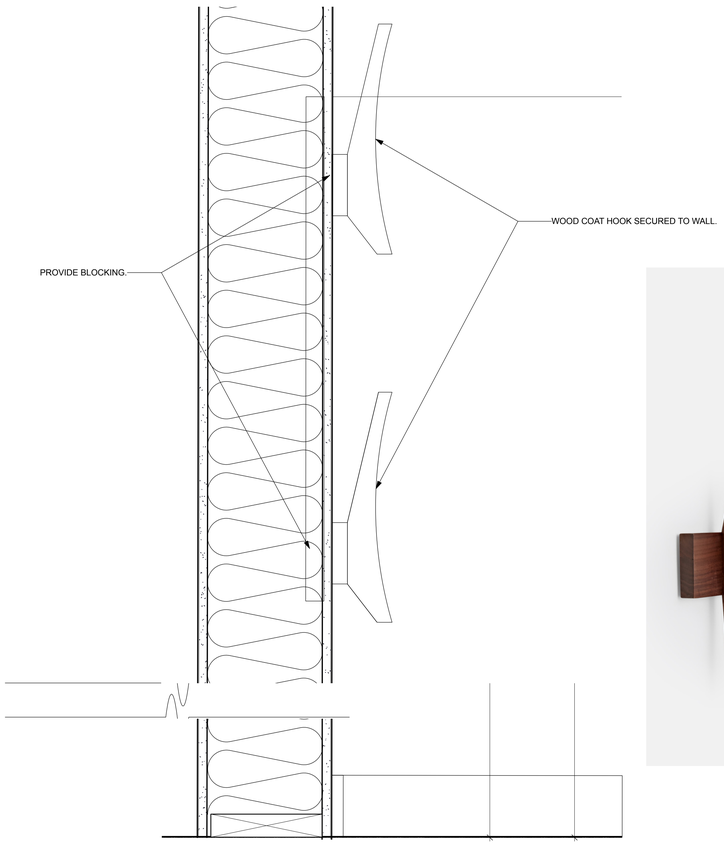
RFI ATTACHMENTS

RFI ATTACHMENTS

PROJECT : SNFC - PHASE-2
PROJECT# : #21005
DATE: 3/23/23
FROM: RM Sovich Architecture RMSOVICH@RMSARCHITECTURE.COM, Ftemelisso@rmsarchitecture.com

These attachments address questions by contractors, clarifications and revisions made after the drawings have been issued for bid and shall become part of the bid package for the above referenced project.

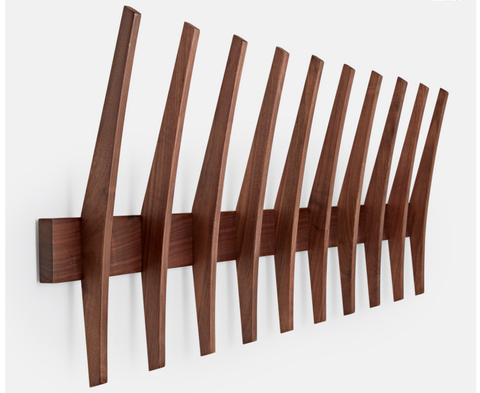
Item #	RFI ##	Attachments	Issued date	
1	0	A503 and A504	3/23/23	
10	1	A cut sheet of a section is attached.	3/23/23	
14	3	Window blinds and roller shader spec	3/23/23	
19	4	Exterior hardi siding, wood & metals spec	3/23/23	
24	5	Standing seam metal Spec for	3/23/23	
35	7	Soil borings report.	3/27/23	 ECS Mid-Atlantic, LLC Report of Subsurface Exploration, Laboratory Testing, and Geotechnical Engineering Analyses St. Francis Neighborhood Center Addition 2405 Linden Avenue Baltimore, Maryland ECS Project Number 02-8695-A May 10, 2018
40	7	Motor operated projection screen	3/27/23	 Tensioned Contour® Electrol® Automatic Electric Projection Screens
41	7	Revised A605.	3/27/23	



Brendon Farrell Fin Hook Rack

Walnut - 10 Fin

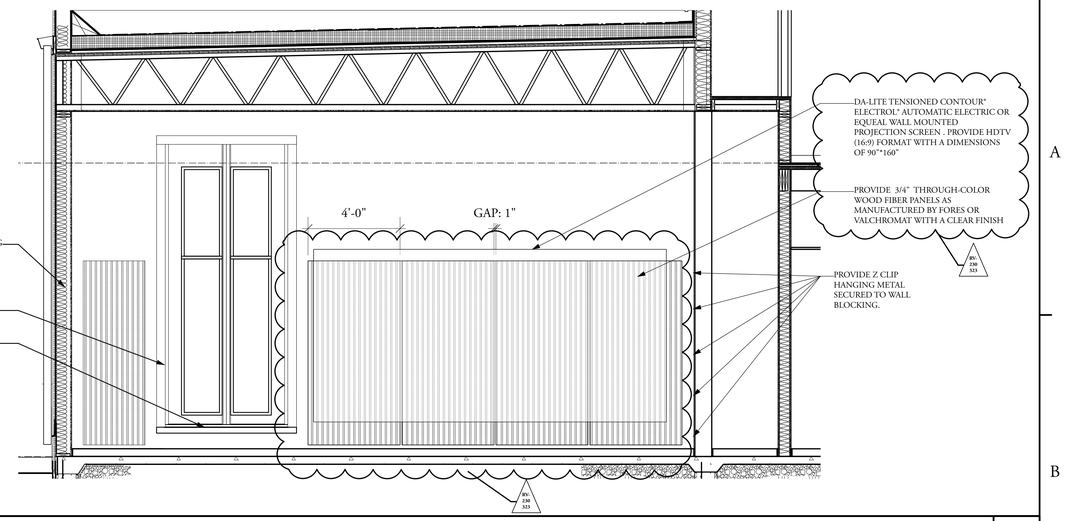
Item #E3099



COAT HOOK PROFILE

Scale: 3" = 1'-0"

C3



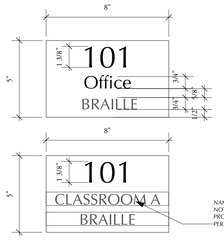
INTERIOR ELEVATION @ MP ROOM

Scale: 3/8" = 1'-0"

B6

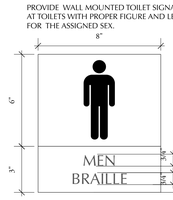
SIGNANGE BY OWNER.

ROOM SIGNAGE

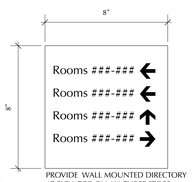


TOILET ROOM SIGNAGE

PROVIDE WALL MOUNTED TOILET SIGNAGE AT TOILETS WITH PROPER FIGURE AND LETTER FOR THE ASSIGNED SEX.



DIRECTORY



PROVIDE WALL MOUNTED DIRECTORY AT ELEVATOR ON ALL THREE STOPS. CONFIRM TEXT AND LOCATION W/ OWNER.

FURNISH AND INSTALL ADA APPROVED SIGNAGE FOR ALL ROOMS IDENTIFIED ON THE ROOM FINISH SCHEDULE AS FOLLOWS:

1. MOUNTING: SILASTIC CEMENT & 3M VHB WHITE FOAM TAPE FOUR SIDES
2. TOP LAYER: CLEAR MATTE .080" POLYCAST ACRYLIC
3. BACK LAYER: 1/8" RECYCLED PLASTIC SHEET BUFF EDGES SMOOTH+ COLOR TO BE SELECTED FROM MANUFACTURERS' STANDARD COLORS.
4. PERMANENT ROOM NAMES AND NUMBERS: TACTILE WHITE 1/32" THICK BRAILLE ROUTED INTO FIRST SURFACE OF ACRYLIC TOP LAYER. BRAILLE SHALL BE SMOOTH AND COMPLY WITH ADA STANDARDS FOR LEGIBILITY AND FEEL. OTHER TEXT AND SYMBOLS WHITE SCREENED SECOND SURFACE OF TOP LAYER
6. PROVIDE MATERIAL SAMPLES AND FULL SIZE SHOP DRAWINGS SHOWING GRAPHIC LAYOUT AND TEXT FOR APPROVAL.

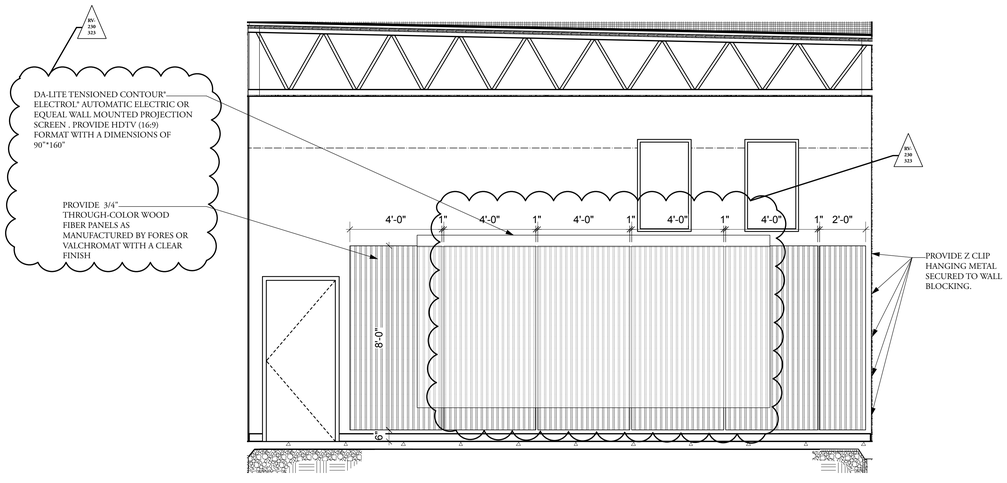
Maryland No Smoking Sign
COMAR 10.19.04 TO BE POSTED WITH IN 10' OF THE BUILDING ENTRANCE.

MOUNT AT 48" AFF
LOCATIONS TO BE APPROVED
BY ARCHITECT/OWNER
Sign Reads
No Smoking For Information On Quitting Smoking, Call 1-800-Quit Now (1800-784-8669)
Sign Design: International No Smoking Symbol
Compliance: Code of Maryland Regulations

SIGNAGE

Scale: 3" = 1'-0"

E3



INTERIOR ELEVATION @ MP ROOM

Scale: 3/8" = 1'-0"

E6

No.	Date	Appr	Revision Notes

No.	Date	Issue Notes

MEP ENGINEER:
Henry Adams Consulting Engineers
600 Baltimore Ave,
Towson, MD 21204

STRUCTURAL ENGINEER:
SKARDA & ASSOCIATES, INC.
2439 North Charles Street
Baltimore, MD 21218-5110

CIVIL ENGINEER:
Colbert Matz Rosenfelt, Inc.
2835 Smith Avenue, Suite G
Baltimore, MD 21209

RM SOVICH ARCHITECTURE

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St. Francis Neighborhood Center
2405 Linden Avenue
Baltimore, MD 21217

PROJECT # 21005

Issued for: Bidding

Issued date: 01/10/2023

PRINT DATE March 27, 2023

NOTE: DO NOT SCALE DRAWINGS. CONTRACTORS SHALL VERIFY ALL DIMENSIONS BEFORE INSTALLATION.

ARCHITECT 6171-A RANDY MICHAEL SOVICH STATE OF MARYLAND

I CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED ARCHITECT UNDER THE LAWS OF THE STATE OF MARYLAND.
LICENSE NO. 6171-A
EXPIRATION DATE: 9-18-2024

A605

INTERIOR ELEVATION

21005 221104 Drawing.vwx

Tensioned Contour® Electrol®

Automatic Electric Projection Screen

SPECIFICATION DATA

SUGGESTED SPECIFICATIONS: HDTV (16:9) Format projection screen(s), 90 (H) x 160 (W), electrically operated 120 volt (60 Hz) not more than 2.4 amp. Shall have specially designed motor mounted inside the roller, to be three wire with ground, quick reversal type, oiled for life, with automatic thermal overload cutout, integral gears, capacitor and an electric brake to prevent coasting. To have preset but adjustable limit switches to automatically stop the picture surface in the "up" and "down" positions. Junction box shall be integrated into the housing making it possible to install the housing and wire to the building's electrical system during construction. The junction box shall contain a quick connect connector that is mounted in the housing for easy plug-in connection to the motorized fabric and roller assembly. The motorized fabric and roller assembly may be installed in the case at the factory or at a later time at the job site. The roller to be of rigid metal. Roller mounting brackets to be adjustable to allow centering or offsetting of the screen within the case. Screen case to be a two piece design made of extruded aluminum. Case to be finished in white, lightly textured powder coat. Screen fabric to be mildew resistant vinyl with black masking borders standard. Each side of fabric to have a tab guide cable system to maintain even lateral tension and hold surface flat. Bottom of fabric to be inserted into a custom aluminum slat bar with added weight to provide vertical tension on the screen surface. The ends of the slat to be protected by heavy duty plastic caps enclosing a preset adjustable mechanism for screen tensioning. To be complete with integrated low voltage control unit and three position control switch and cover plate. Screen to be listed by Underwriters' Laboratories.

HDTV (16:9) Format Dimensions

Viewing Area (H x W)		Nominal Diagonal		Overall Length of Case For Vinyl Surfaces*		Overall Length of Case For Parallax Surface		Approx. Ship. Wt.	
In.	Cm	In.	Cm	In.	Cm	In.	Cm	Lbs.	Kg
45" x 80"	114 x 203	92"	234	100¼"	255	99¼"	252	79	35.8
52" x 92"	132 x 234	106"	269	113¼"	288	111¼"	284	83	37.6
54" x 96"	137 x 244	110"	279	117¼"	298	116¼"	295	86	39
58" x 104"	147 x 264	119"	302	125¾"	319	124¾"	317	95	43.1
65" x 116"	165 x 295	133"	338	138¾"	352	-	-	114	51.7
78" x 139"	198 x 353	159"	404	159¾"	406	-	-	134	60.8
90" x 160"	229 x 406	184"	467	181¾"	462	-	-	148	67.3

Wide (16:10) Format Dimensions

Viewing Area (H x W)		Nominal Diagonal		Overall Length of Case For Vinyl Surfaces*		Overall Length of Case For Parallax Surface		Approx. Ship. Wt.	
In.	Cm	In.	Cm	In.	Cm	In.	Cm	Lbs.	Kg
50" x 80"	127 x 203	94"	239	100¾"	256	99¾"	253	77	34.9
57½" x 92"	146 x 234	109"	277	112¾"	286	112¼"	285	83	37.6
60" x 96"	152 x 244	113"	287	118¾"	302	-	-	92	41.7
65" x 104"	165 x 264	123"	312	126¾"	322	-	-	95	43.1
69" x 110"	175 x 279	130"	330	133¼"	338	-	-	104	47.2
72½" x 116"	184 x 295	137"	348	138¾"	352	-	-	114	51.7
87" x 139"	221 x 353	164"	417	160¾"	408	-	-	126	57.2
100" x 160"	254 x 406	189"	480	181¾"	462	-	-	148	67.1

Video (NTSC 4:3) Format Dimensions

Viewing Area (H x W)		Nominal Diagonal		Overall Length of Case For Vinyl Surfaces*		Approx. Ship. Wt.	
In.	Cm	In.	Cm	In.	Cm	Lbs.	Kg
43" x 57"	109 x 145	72"	183	77¼"	196	66	29.9
50" x 67"	127 x 170	84"	213	87¾"	223	73	33.1
60" x 80"	152 x 203	100"	254	102¼"	260	84	38.1
69" x 92"	175 x 234	120"	305	111¾"	284	94	42.6
87" x 116"	221 x 295	150"	381	137¼"	349	114	51.7
108" x 144"	274 x 366	180"	457	167¾"	426	135	61.2
120" x 160"	305 x 406	200"	508	184¼"	468	148	67.1

*Vinyl surfaces include all HD Progressive, Da-Mat, Da-Tex and Dual Vision surfaces

PRODUCT NOTES

- **All screens except Parallax standard with 12" black drop at the top. Screens with Parallax surface standard with 2" of black drop at the top.**
- Extra drop may alter case dimensions. Contact Da-Lite for details.
- Overall case length dimensions +/- ¼" (6mm).
- Detail dimensional drawings, wiring diagrams and installation instructions available upon request.
- Specifications subject to change without notice.
- Custom formats and sizes available upon request.

SURFACE INFORMATION

- All viewing surfaces are standard with black backing except Da-Tex® and Dual Vision.
- Parallax available in sizes up to 58" x 104" in HDTV format and 57½" x 92" in Wide format.
- HD Progressive 1.1 Perf and HD Progressive 1.1 Contrast Perf available in sizes up to 87" x 116" in Video format and 78" x 139" in HDTV format.
- All surfaces will be seamless in the image area.
- All HD Progressive, Da-Mat, Da-Tex and Dual Vision surfaces are fire retardant.

WHEN ORDERING, MARK APPROPRIATE SELECTIONS

1. Select size from charts on the other side..
2. Select viewing surface (All Da-Lite surfaces are GREENGUARD GOLD Certified.):

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- ○ Dual Vision

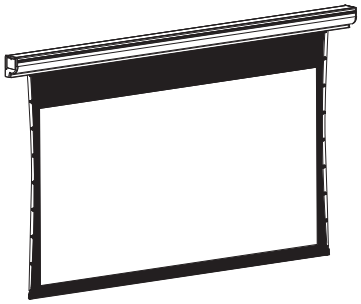
3. Options:

- ☐ 220 Volt (50 Hz) Motor.
- ☐ Video Projector Interface Control – built-in (adds 3¾" to case length of 220V motor version).
- ☐ SCB-100 RS-232 Serial Control Board – built in (adds 3¾" to length of case).
  - ☐ NET-100 Ethernet-Serial Adapter
- ■ SCB-200 RS-232 Serial Control Board – built-in (adds 3¾" to length of case).
  - ■ WC-200 Wall Controller.
  - ■ IR-200 Infrared Remote.
- ☐ Black case (white standard).

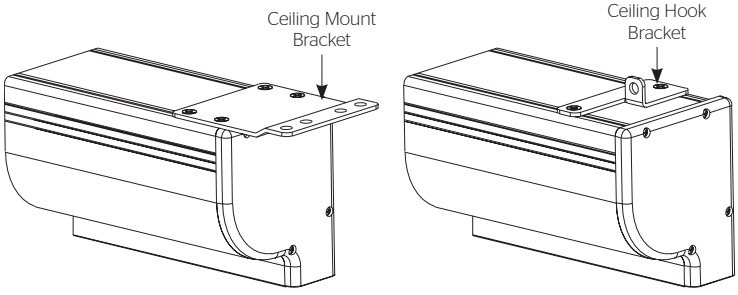
4. Optional accessories:

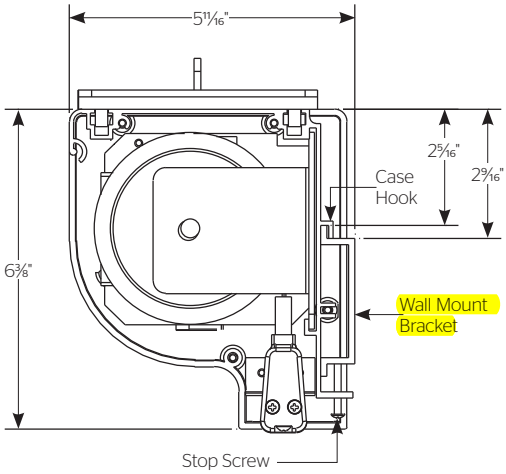
- ■ Wireless Remote Control for LVC.
  - ☐ Radio Frequency Remote.
    - ☐ Radio Frequency Range Extender available.
  - ■ Infrared Remote.
- ☐ Key Locking Cover Plate for LVC Switch.

PRODUCT VIEW



SUGGESTED METHODS OF INSTALLATION





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Contractor: _____ Phone: _____

Date: _____ Revised: _____

ECS Mid-Atlantic, LLC

Report of Subsurface Exploration, Laboratory Testing, and Geotechnical Engineering Analyses

St. Francis Neighborhood Center Addition

2405 Linden Avenue
Baltimore, Maryland

ECS Project Number 02-8695-A

May 10, 2018

May 10, 2018

Ms. Shannon Snow
Episcopal Housing Corporation
3986 Roland Avenue
Baltimore, MD 21211

ECS Project No. 02-8695-A

Reference: Geotechnical Engineering Report
St. Francis Neighborhood Center Addition
2405 Linden Avenue
Baltimore, Maryland

Dear Ms. Snow:

ECS Mid-Atlantic, LLC (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. 02-18001-P, dated February 16, 2018. This report presents our understanding of the geotechnical aspects of the project, the results of the field exploration and laboratory testing conducted, and our design and construction recommendations.

It has been our pleasure to be of service Episcopal Housing Corporation 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 Mid-Atlantic, LLC

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STATE OF MARYLAND
HASAN M. ABOUMATAR
No. 29553
PROFESSIONAL ENGINEER

Professional Certification I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.

License No *29553*. Expiration Date: *12/31/2019*

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EXECUTIVE SUMMARY

The following summarizes the main findings of the field exploration, particularly those that may have a cost impact on the planned development. Further, our principal foundation recommendations are summarized for each building. Information gleaned from the executive summary should not be utilized in lieu of reading the entire geotechnical report.

The project site for the currently proposed building addition is located at 2405 Linden Lane in Baltimore, Maryland. The site currently has a three-story building.

- The geotechnical exploration performed for the planned construction of the building addition consisted of four (4) soil borings drilled to depths of 20 ft below the existing ground surface and three (3) test pits excavated to depths ranging from 5 ft to 9 ft below the existing ground surface.

- The subsurface exploration revealed natural sediments that were classified as SAND with Gravel (SP), SAND with Silt (SP-SM), Silty SAND (SM), Clayey SAND (SC), Sandy Clayey SILT (ML/CL), Clayey SILT (ML/CL), Silty CLAY (CL/ML), and Sandy Lean CLAY (CL) soil types. Groundwater was not encountered in any of the borings to the depths explored.

- Existing fill was encountered in Borings B-1 and B-2 and Test Pits TP-1 and TP-2. The existing fill consisted of firm to hard cohesive soil with trace amounts of brick and wood and extended to depths of 3 ft to 5.5 ft below existing grade. The existing fill appears to be suitable to remain in place.

- The planned building can be supported by conventional shallow foundations consisting of spread or continuous wall footings bearing in natural soils, approved existing fill, or new fill placed on firm ground or approved existing fill. Details of the assumed foundation subgrade elevations and loads are contained in the body of the report.

- The preparation of the project site, as related to any new fill materials needed to prepare the exposed subgrade soils for slab-on-grade and new pavement construction, will be important to observe and document during construction.

1.0 INTRODUCTION

1.1 GENERAL

The recommendations developed for this geotechnical report are based on project information supplied by Episcopal Housing Corporation. This report contains the results of our subsurface explorations and laboratory testing programs, site characterization, engineering analyses, and recommendations for the design and construction of the building foundations, slabs-on-grade, pavement design and construction, earthwork operations, and other pertinent geotechnical considerations for the proposed building addition.

1.2 SCOPE OF SERVICES

To obtain the necessary geotechnical information required for design of the building addition, four (4) soil test borings and three (3) test pits were performed at locations selected by ECS. The borings were located at regular intervals along the building, and test pits were located at areas were fill was found in the borings. 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.

- A brief review and description of our field and laboratory test procedures and the results of testing conducted.
- A review of surface topographical features and site conditions.
- A review of area and site geologic conditions.
- A review of subsurface soil stratigraphy with pertinent available physical properties.
- Final copies of our soil exploration/test boring logs.
- Recommendations for site preparation and construction of compacted fills, including an evaluation of on-site soils for use as compacted fills and delineation of potentially unsuitable soils and/or soils exhibiting excessive moisture at the time of sampling.
- Recommended foundation type.
- General recommendations for pavement design, including a recommended design CBR value.
- Evaluation and recommendations relative to groundwater control, including recommendations for pavement underdrains, if required.
- Recommendations for design and construction of drainage structures and stormwater management facilities.

1.3 AUTHORIZATION

Our services were provided in accordance with our Proposal No. 02-18001-P, dated February 16, 2018 and Proposal No. 02-18131-P, dated April 11, 2018, as authorized by Episcopal Housing Corporation, and includes the Terms and Conditions of Service outlined with our Proposals.

2.0 PROJECT INFORMATION

2.1 PROJECT LOCATION

The project site for the proposed new building addition is located at 2405 Linden Avenue in the Baltimore area of Maryland. The approximate location of the project site with respect to surrounding streets is depicted on Figure 2.1.1 below and on the Site Location Diagram in APPENDIX A.

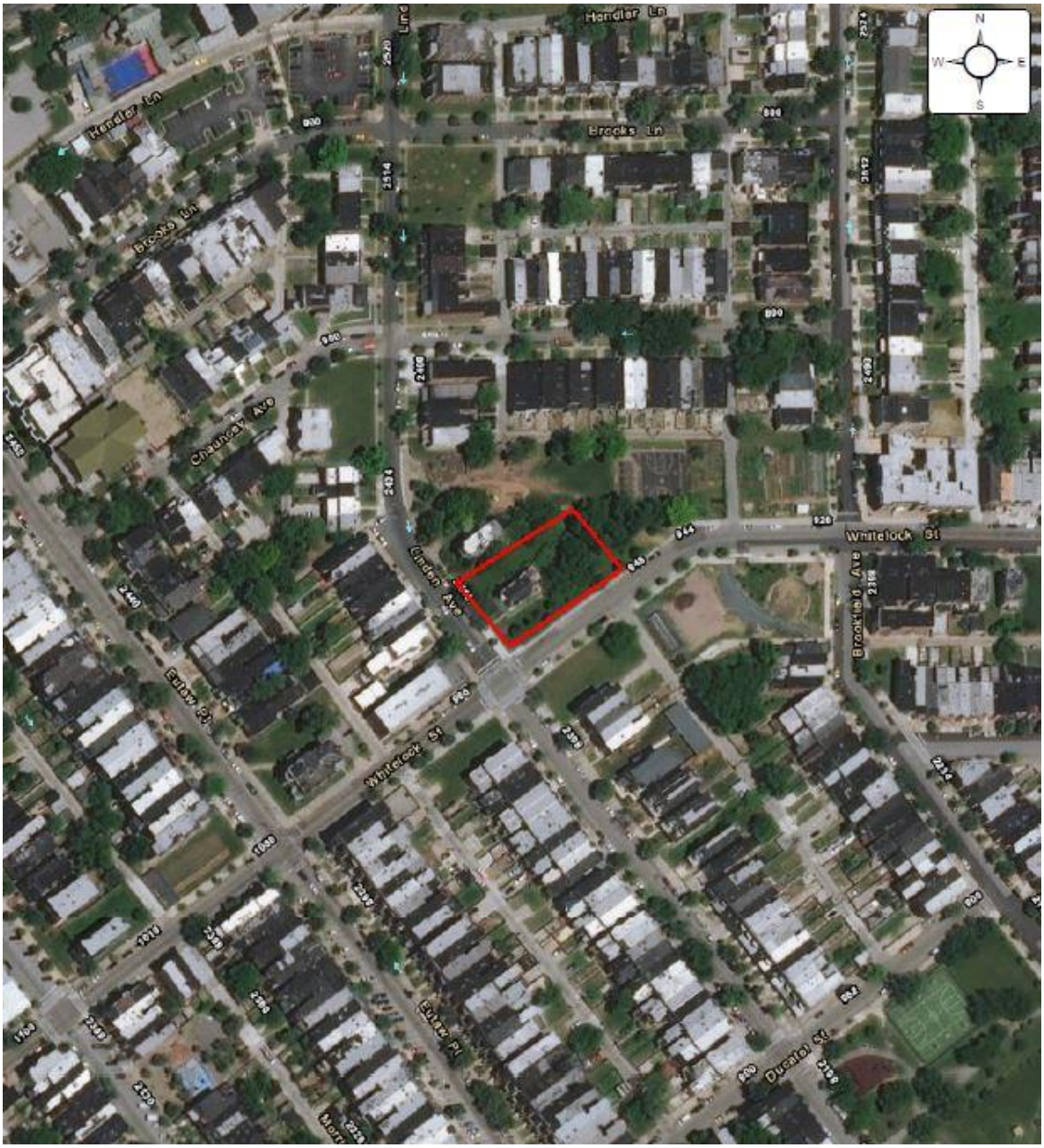


Figure 2.1.1 Site Location

2.2 CURRENT SITE CONDITIONS

The site has one three-story building, and the building addition is planned to the north and east of the existing building. We understand the addition will be constructed at grade (i.e., no basement or below grade levels) with a finished floor level planned at EL 225.8. Existing grades appear to range from approximately EL 222 to EL 225 within the planned addition area; therefore, fills up to 3 ft or less will be required to establish planned grades.

2.3 PROPOSED CONSTRUCTION

Based on the provided information, we understand that the scope of geotechnical subsurface exploration is for a two-story wood-framed addition to the existing building. No other construction, such as retaining walls or stormwater management facilities, was indicated on the provided plan.

2.3.1 Site Civil Features

- Fills up to 3 ft required to establish final grades for site
- No pavement, stormwater management, or retaining walls

2.3.2 Structural Information/Loads

The following information explains our understanding of the structures and their loads:

Table 2.3.2.1 Design Values

SUBJECT	DESIGN INFORMATION / EXPECTATIONS
# of Stories	Two-stories, slab-on-grade
Usage	Neighborhood Center
Framing	Wood framing
Column Loads	50 kips (Gravity Loads)
Wall Loads	4 kips per linear foot (klf) (Gravity Loads)
Finish Floor Elevation	EL 225.8
Column Spacing	Approximately 30 x 30 ft
Slab-on-Grade	Slab-on-grade loading conditions are assumed to be on the order of 150-pounds per square foot.

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. The soil borings were drilled with an ATV mounted drill rig, using continuous-flight, hollow-stem augers to advance the boreholes. Drilling fluid was not used for this site. The holes were backfilled using the auger cuttings to the ground surface at the completion of the drilling operations.

Representative soil samples were obtained by means of the split-barrel sampling procedure conducted in accordance with the guidelines of ASTM Standard D 1586. In the split-barrel sampling procedure, a 2-inch O.D. split-barrel sampler is driven into the soil a distance of 18 inches by means of a 140 pound hammer falling 30 inches. The number of blows required to drive the sampler through the final 12 inch interval is termed the Standard Penetration Test (SPT) N-value and is indicated for each sample on the boring logs. The SPT N-values are reported as the number of blows per foot (bpf) of sampler penetration. N-values can be used to provide a qualitative indication of the in-place relative density of cohesionless soils and the consistency of cohesive soils.

A field log of the soils encountered in the borings was maintained by the drill crew. After recovery, each sample was removed from the sampler and visually classified. Representative portions of each sample were then sealed in glass jars and returned to ECS's laboratory for further visual examination and laboratory testing.

Water level and cave-in depths were measured during the drilling operations and at completion of each boring. The borings were backfilled at the completion of the drilling operations.

3.1.1 Test Borings and Test Pits

The subsurface conditions were explored by drilling four (4) soil borings within the building addition footprint. An all-terrain vehicle (ATV)-mounted drill rig was utilized to drill the soil borings. As a result of the anticipated grades across the project site and proposed site features, the borings were drilled to depths of 20 feet each, for a total footage of 80 feet. Additionally, three (3) test pits, designated as TP-1 through TP-3, were performed to depths ranging from 5 ft to 9 ft below existing grade to evaluate the encountered existing fill.

Boring and test pit locations were identified in the field by ECS personnel using GPS techniques or by taping 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 were not provided on the site plan.

Standard penetration tests (SPTs) were conducted in the borings at regular intervals in general accordance with ASTM D 1586. 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.

3.2 REGIONAL/SITE GEOLOGY

The project site is located within the Atlantic Coastal Plain Physiographic Province, which is characterized by marine and river sediments deposited during successive periods of fluctuating sea level and moving shorelines. Generally, the sediments thicken from west to east, towards the Atlantic Ocean. The uppermost sediments are often comprised of interbedded sands, gravels, clays, and silts.

On the basis of our visual examination of the subsoils recovered during the subsurface investigation and our review of the *Geologic Map of Maryland*, 1968, the project area is underlain by the Potomac Group, which is described as "Interbedded quartzose gravels; protoquartzitic to orthoquartzitic argillaceous sands; and white, dark gray and multicolored silts and clays; thickness 0 to 800 feet"

3.3 SUBSURFACE CHARACTERIZATION

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

Table 3.3.1 Subsurface Stratigraphy

Approximate Depth Range (ft)	Stratum	Description	Ranges of SPT[(1)] N-values (bpf)
0-0.33 ft (Surface cover)	n/a	Borings were drilled in topsoil with an average of 4 inches.	N/A
0.33-5 ft (Borings B-1 and B-2)	I	Fill, ranged in depth from 3 ft to 5.5 ft below grade, firm to hard, Clayey SILT (ML/CL), Sandy Lean CLAY (CL), contains trace brick and wood, moist	6-34
0.33-5 ft (Borings B-3 and B-4)	II	Natural soils, loose to medium dense, Silty SAND (SM), Clayey SAND (SC), moist	5-17
5-20 ft (all borings)	III	Natural soils, very loose to dense, SAND with gravel (SP), SAND with Silt (SP-SM), Silty SAND (SM), and firm to stiff, Sandy Clayey SILT (ML/CL), Sandy Lean CLAY (CL), Silty CLAY (CL/ML), most	4-32

Notes: (1) Standard Penetration Test

3.4 GROUNDWATER OBSERVATIONS

During the subsurface explorations, groundwater was not encountered in any of the borings to the depths explored.

It should be noted that fluctuations in the location of observed perched water conditions can occur as a result of seasonal variations in evaporation, precipitation, surface water run-off and where predominantly granular soils overlie less pervious materials, and at fill/natural soils contacts or adjacent to the existing remnant structures, which were not immediately apparent at the time the borings were performed.

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. Representative soil samples from the subsurface exploration program were selected and tested in our laboratory to verify field classifications and to determine pertinent engineering properties within the scope of our proposal. The laboratory testing program for the proposed buildings and associated site improvements included visual classifications for all soil borings, moisture contents (selected samples from soil borings B-2 and B-4), percentage of material passing the No. 200 sieve (selected samples from soil borings B-4), and Atterberg limits (selected samples from soil borings B-4). The data obtained from the laboratory tests are presented on the respective boring logs and provided with this report.

An experienced Engineering Geologist classified each soil sample on the basis of texture and plasticity in accordance with the Unified Soil Classification System (USCS). The group symbols for the soil types are indicated in parentheses following the soil descriptions on the boring logs. A brief explanation of the USCS System and ASTM D-2488 (Description and Identification of Soils-Visual/Manual Procedures) is provided in APPENDIX C of this report. The Engineering Geologist grouped the various soil types into the major strata noted 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 group symbols for each soil type are indicated in parentheses following the soil descriptions on the boring logs.

The soil samples will be retained in our laboratory for a period of 60 days, after which, they will be discarded unless other instructions are received as to their disposition.

5.0 DESIGN RECOMMENDATIONS

5.1 BUILDING DESIGN

The following sections provide recommendations for foundation design, soil supported slabs, pavements, seismic design parameters, and retaining walls.

5.1.1 Foundations

We understand the addition will be constructed at grade (i.e., no basement or below grade levels) with a finished floor level planned at EL 225.8. Existing grades appear to range from approximately EL 222 to EL 225 within the planned addition area; therefore, fills up to 3 ft or less will be required to establish planned grades.

Based on the boring results, existing fill was encountered in Borings B-1 and B-2. The existing fill generally consisted of firm to hard cohesive soils with trace amounts of brick and wood pieces and extended to depths of 3 ft to 5.5 ft below existing grades. The SPT N values in the fill range from 6 bpf to 34 bpf. However, the presence of gravel, brick, and debris likely influenced the blow counts. To further evaluate the existing fill conditions, ECS performed three (3) test pits as shown on the Boring Location Diagram. Based on the soil test borings and test pit results, the existing fill appears to be suitable to remain in place to support the building.

However during construction, the existing fill should be proofrolled and observed by a representative of the geotechnical engineer to identify soft and yielding areas. Encountered soft and yielding areas should be overexcavated as directed by the geotechnical engineer to firm subgrade and backfilled with approved structural fill.

Provided subgrades and structural fills are prepared as discussed herein, the proposed structure can be supported by conventional shallow foundations: individual column footings and continuous wall footings. The design of the foundation shall utilize the following parameters:

Table 5.1.1.1 Foundation Design

Design Parameter	Column Footing	Wall Footing
Net Allowable Bearing Pressure[1]	2,000 psf	2,000 psf
Acceptable Bearing Soil Material	Firm natural soil or approved existing fill	Firm natural soil or approved existing fill
Minimum Width	4 feet	24 inches
Minimum Footing Embedment Depth (below slab or finished grade)	30 inches	30 inches
Estimated Total Settlement	1 inch	1 inch
Estimated Differential Settlement	Less than 0.5 inches between columns	Less than 0.5 inches over 50 feet

1. Net allowable bearing pressure is the applied pressure in excess of the surrounding overburden soils above the base of the foundation.

Prior to the placement of reinforcement and concrete for footings, the bases of the footing excavations should be observed, tested, and approved by a qualified representative of the Geotechnical Engineer to verify that soil conditions at each footing location are suitable for the design bearing pressure. If unsuitable soils are encountered at planned subgrade levels for any footing, the unsuitable soils should be undercut to suitable bearing materials. The footing can be directly supported on the competent soils at greater depths or, alternatively, the design footing bearing level can be restored through placement of lean concrete or select engineered fill materials. If the design bearing level is restored using select engineered fill, then the excavation to remove the unsuitable soils should extend at least 0.5 ft laterally beyond the bottom edge of the footing for each 1 ft of vertical undercut below the footing bearing level. The select engineered fill materials should be placed and compacted as discussed in greater detail later in this report.

Because of the variable conditions observed across the planned building area, all continuous wall foundations should be suitably reinforced with longitudinal steel reinforcement. To provide continuity and minimize differential movements, the longitudinal steel reinforcement should extend through the building corners, and the foundation poured as a continuous unit. Where top and bottom steel is included in the continuous wall foundations, a minimum foundation thickness of 12-inches should be required.

Where stepping of the continuous wall foundations for the building are anticipated, the stepping should not exceed a slope of 2H:1V. The continuous reinforcing must conform to the stepping of the wall foundations.

It is imperative that the foundation bearing materials be observed and tested by the Geotechnical Engineer or an authorized representative in order to confirm the availability of the design bearing capacity. The testing should include dynamic cone penetrometer (DCP) testing and hand augering to verify competent bearing materials at the planned bearing levels and below. Also, prior to placing any foundation concrete, it is recommended the steel reinforcement be examined to verify that the bars are properly sized and positioned in accordance with the foundation plans and specifications.

New footings in areas adjacent to the existing structure require special consideration. Construction of footings adjacent to the existing building should be performed carefully so as not to undermine the existing footing or induce additional stress from the new footing. To minimize negative impacts between new and existing footings, the base of a new building footing should not be located below an imaginary line extending downward and outward from the bottom edge of an existing structure footing at a 45-degree angle. Similarly, the base of the existing structure footing should not be located below an imaginary line extending downward and outward from the bottom edge of the new footing at a 45-degree angle. If either of these conditions will be violated, it may be necessary to modify the foundation design for the structure or to provide appropriate underpinning of existing foundations. A sketch of footing adjacent to existing footing is included in APPENDIX A.

5.1.2 Floor Slabs

The proposed building floor slab and exterior concrete slabs may be ground-supported on subgrades prepared in accordance with the recommendations in the sections entitled **Subgrade Stabilization** and **Structural Fill Materials**. It is important that the slab subgrade be

firm and stable before the placement of the granular subbase materials, the moisture barrier, and the concrete.

The on-site natural soils are considered suitable for support of the lowest floor slabs, although moisture control during earthwork operations, including the use of discing or appropriate drying equipment, may be necessary. Based on a lowest finished floor elevation near existing grades, it appears that the slabs for the structure will bear on CLAYEY SAND (SC), SILTY SAND (SM), CLAYEY SILT (ML/CL), SANDY LEAN CLAY (CL), or new fill material. This material is likely suitable for the support of a slab-on-grade, however, there may be areas of soft or yielding soils that should be removed and replaced with compacted structural fill in accordance with the recommendations included in this report.

It is recommended that ground-supported slabs be underlain by a minimum of 4-inches of AASHTO No. 57 graded coarse aggregate, CR-6, or GASB dense-graded aggregate or approved equivalents. Acceptable granular subbase materials should have no aggregate size greater than 1.5-inches, 95 to 100 percent passing the 1-inch sieve, and less than 12 percent by total weight passing the Number 200 sieve. The granular subbase materials will provide a capillary break between the subgrade and the concrete slab, a higher modulus of subgrade reaction, and more uniform support conditions. All granular materials should be compacted; however, if the granular subbase materials have more than 10 percent fines, those materials should be compacted to a minimum of 95 percent of the maximum dry density as determined by the Standard Proctor compaction test method (ASTM D 698).

Where moisture seepage is a concern, a vapor barrier, such as 8-mil polyethylene sheeting, should be placed on top of the select granular materials before the placement of concrete, to provide additional moisture protection. However, with the use of a vapor barrier special attention should be given to the surface curing of the slab in order to reduce uneven drying of the slab and any associated cracking and curling.

Generally, there is a significant time lag between the site grading work and the fine grading of the slab area prior to the placement of select granular materials and concrete. Environmental conditions, utility installation and construction traffic may disturb a subgrade to a point where it is unacceptable. The Contractor should be careful to protect the prepared subgrade and should restore the subgrade to acceptable levels of moisture and density prior the placement of the aggregate layer. This process may require a reduction in the moisture content and recompaction to provide a firm and relatively unyielding subgrade.

Prior to placing the select granular materials, the floor subgrade soils should be properly compacted, proof rolled, and free of standing water, mud, and frozen soil. Proof rolling and/or close visual examination of the slab subgrade should be performed prior to placing any select granular materials and should be concentrated in those areas where previous wall and utility backfills have been placed and/or where existing utilities remain in-place.

It should be noted that although slab-on-grade construction may be completed within the warm months of the year, exposure of the interior slab-on-grade to freezing temperatures can result in frost heave. Consequently, to reduce any frost heave beneath any previously installed slab-on-grade, we recommend the following:

a) All foundation excavations and un-poured leave outs within the slab area must be covered and any water pumped out to reduce water flow into the select granular materials.

b) All joints must be sealed to reduce surface water flow into the granular materials.

In the event that interior partition walls are proposed to bear directly on the proposed concrete floor slab, it is important that the subgrade soils in the slab areas be proof rolled and densified to an unyielding surface, prior to placing any select granular materials. Consideration should also be given to thickening of the slab-on-grade in those areas.

Subgrade Modulus: Provided the placement of Structural Fill and Granular Drainage Layer per the recommendations discussed herein, the slab may be designed assuming a modulus of subgrade reaction, k_1 of 120 pci (pound/cubic inch). The modulus of subgrade reaction value is based on a 1 ft by 1 ft plate load test basis.

Slab Isolation: Ground-supported slabs should be isolated from the foundations and foundation-supported elements of the structure so that 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. Maximum differential settlement of soils supporting interior slabs is anticipated to be less than 0.96 inches in 40 feet.

5.1.3 Below Grade Basement Retaining Walls

Based upon the provided information, below grades basement walls will not be required; however, here are the general recommendations for below grade walls should such walls be needed. We recommend that all permanent below grade walls be designed to withstand lateral earth pressures and surcharge loads from soil, adjacent building foundations, or streets. We also assume the architect elects to design a “drained” basement condition, which will effectively eliminate hydrostatic pressures behind the walls. To accomplish a drained condition, the walls will need to incorporate appropriate drainage materials (often a geocomposite drainage panel), weep holes and an underslab sub-drainage system. We recommend that be designed for an equivalent fluid pressure of 60H.

Any surcharge loads imposed within a 45 degree slope of the base of the wall should be considered in the below grade wall design. The influence of these surcharge loads on the below grade walls should be based on an at-rest pressure coefficient, k_0, of 0.5 in the case of restrained walls.

5.1.4 Site Retaining Walls

Site retaining walls are often constructed from the “bottom-up” and therefore the type of soil used to backfill the wall is chosen or specified by contract. The lateral earth pressures developed behind site retaining walls is a function of the backfill soil type within an approximate 45-degree angle from the base of the wall upward.

Lateral Earth Pressures: Retaining walls should be designed to withstand the lateral earth pressures exerted by the backfill. The pressure diagram is triangular. It is anticipated that retaining walls associated with the building structure, such as for the unloading/loading dock situation, will be rigid walls restrained from rotation by the floor slab. For rigid walls, the "At Rest" (k_o) soil condition should be used in the wall design and evaluation. For walls that are free to deflect at their tops, the "Active" (k_a) soil condition should be used in the wall design and evaluation. In the design of these retaining wall structures, the following soil parameters can be utilized. These parameters assume that Granular Soils meeting the requirements recommended herein for Retaining Wall Backfill will comprise the backfill in the Critical Zone. The Critical Zone is defined as the area between the back of the retaining wall structure and an imaginary line projected upward and rearward from the bottom back edge of the wall footing at a 45-degree angle.

Table 5.1.4.1 Retaining Wall Backfill in the Critical Zone

Soil Parameter	Estimated value
Coefficient of Earth Pressure at Rest (K_o)	0.50
Coefficient of Active Earth Pressure (K_a)	0.34
Retained Soil Moist Unit Weight (γ)	120 pcf
Cohesion (C)	0 psf
Angle of Internal Friction (ϕ)	30°
Friction Coefficient [Concrete on Soil] (μ)	0.35
At-rest Equivalent Fluid Pressure	60H (psf)
Active Equivalent Fluid Pressure	40H (psf)

Table 5.1.4.2 Foundation Soils (Natural Subgrades or On-Site Borrow)

Soil Parameter	Estimated value
Allowable Net Soil Bearing Pressure	2,500 psf
Minimum Wall Embedment Below Grade	24 inches
Coefficient of Passive Earth Pressure (K_p)	2.0
Soil Moist Unit Weight (γ)	120 pcf
Cohesion (C)	0 psf
Interface Friction Angle [Concrete on Soil] (ϕ_f)	20°
Sliding Friction Coefficient [Concrete on Soil] (μ)	0.35
Passive equivalent fluid pressure	240H (psf)

Retaining Wall Backfill: All soils used as backfill within the Critical Zone behind retaining walls should have USCS classifications of Silty SAND (SM) or more granular with a maximum of 30% fines (i.e., % passing No. 200 Sieve size) and minimum angle of internal friction of 30 degrees when compacted to a minimum of 98% of its maximum dry density per ASTM D 698. Any existing soils not meeting these criteria should be removed from the Critical Zone of the walls, as determined by ECS personnel at the time of construction.

Foundation Drains: Retaining walls should be provided with a foundation drainage system to relieve hydrostatic pressures which may develop in the wall backfill. This system should consist of weepholes through the wall and/or a 4-inch perforated, closed joint drain line located along the backside of the walls above 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.

Wall Drains: All site retaining walls should be drained so that hydrostatic pressures do not build up behind the walls. Wall drains can consist of a 12-inch wide zone of free draining Gravel, such as AASHTO No. 57 Stone, employed directly behind the wall and separated from the soils beyond with a non-woven filter fabric. Alternatively, the wall drain can consist of a suitable geocomposite drainage board material. The wall drain should be hydraulically connected to the foundation drain.

5.1.5 Seismic Design Considerations

Seismic Site Classification: Section 1613.3.2 of the IBC 2015 refers to Chapter 20 of ASCE7 for seismic site classification, which is based on various criteria, one of which is the Standard Penetration Resistance, Nbar, derived from the Standard Penetration Test Procedure (ASTM D-1586). ASCE7 Table 20.3.1 provides correlations for Site Classes C, D, and E with various ranges of Nbar to be calculated for the top 100 feet of the subsurface materials at a site in accordance with procedures described in Section 20.4.2 of ASCE7. In addition, the table presents criteria related to various soil properties for Site Classes E and F. ECS has used Table 20.3.1 of ASCE7 and the procedures outlined in Section 20.4.2 of ASCE7 to evaluate the Site Class for this project site.

Based on our review of the soil test boring results, it appears that the average Nbar value should be in the range between 15 and 50 blows per foot over a depth of 100 ft. This Nbar places the project site within the Site Classification of D, according to Table 20.3.1 of ASCE7.

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.

5.2 SITE DESIGN CONSIDERATIONS

5.2.1 Temporary/Permanent Slopes

Temporary slopes created as part of the foundation or utility installation operations should be constructed no steeper than 1 horizontal to 1 vertical above any free water surface. The inclination of the slope should be reduced to 1.5 horizontal to 1 vertical if very loose silty sands and sands, soft silts or clays, or water seepage is observed in the faces of the slope. The temporary slopes should be maintained for no more than 60 days. Since some of the on-site soils are considered to be erodible, the exposed slopes should be protected from precipitation and surface run-off. Because of the occurrence of relatively clean granular soils and existing fill materials, any cuts associated with utility and/or foundation excavations may require bracing, slope flattening or other physical measures to prevent sloughing of the cut or a

slope failure. An examination of the applicable codes should be made by the appropriate contractor to document that adequate protection of the trench walls is provided. All below grade trench excavations must be in compliance with applicable OSHA and/or local regulations.

5.2.2 Pavement Sections

Subgrade Characteristics: The pavement design assumes subgrades consist of suitable materials evaluated by ECS and placed and compacted to at least 98 percent of the maximum dry density as determined by the Standard Proctor test (ASTM D 698) in accordance with the project specifications.

A California Bearing Ratio (CBR) test was not performed for this investigation for the design of flexible and/or rigid pavement sections. However, for planning purposes we have developed the following preliminary pavement sections for the planned pavement areas servicing the proposed building. As revealed by the soil boring data, the surface soils consist primarily of CLAYEY SAND (SC), SILTY SAND (SM), CLAYEY SILT (ML/CL), and SANDY LEAN CLAY (CL) material; therefore, based on previous experience with these soils, the CBR value is anticipated to on the order of 4. We recommend that representative samples of the anticipated pavement subgrade materials be obtained during the final grading operations and a CBR test be performed to verify the assumed CBR value and the preliminary pavement design provided in this report.

Because of the anticipated use of the planned pavement areas associated with the proposed building, we have assumed that light- and heavy-duty pavement sections will be required for the planned site improvements. The light-duty pavement section will be utilized in the parking areas that will support primarily passenger vehicle traffic and parking, while the heavy-duty section will be utilized for the planned truck path where traffic will consist of delivery, service vehicles, trash removal, and passenger vehicle traffic. The pavement design for the light- duty section and heavy-duty section will be based on assumed maximum traffic loads of 25,000 and 175,000 equivalent single axle loads (ESALs), respectively, initial serviceability of 4.2, terminal serviceability of 2.0, a reliability of 85 percent, a standard deviation of 0.45 for flexible pavements, and a design life of 20 years. The design analyses for pavements have been based on methodology from the American Association of State Highway and Transportation Officials' (AASHTO) *Guide of Design of Pavement Structures*, 1993.

Based on analyses using the assumed maximum traffic load and an assumed design CBR value of 4, we have developed the following preliminary pavement design for the pavement areas associated with the project site.

Table 5.2.2.1 Pavement Sections

Pavement Materials	Heavy-Duty Thickness (in.)	Light-Duty Thickness (in.)
Surface Course Asphalt 9.5 mm Surface Mix	1.5	1.5
Base Course Asphalt 19 mm Binder Course	3.5	2.5
Graded Aggregate Base Course GABC	6.0	4.0
Total Pavement Thickness (in.)	11.0	8.0

All pavement materials and construction should be in accordance with the most current version of the *Standard Specifications for Construction and Materials* of the Maryland Department of Transportation, State Highway Administration (SHA), and any applicable Baltimore City standards.

The above pavement sections have been developed for the anticipated post-construction design traffic conditions. It should be recognized that if the assumed traffic loading conditions are less than those anticipated for the project site the Geotechnical Engineer should be advised of any actual traffic loading conditions (i.e. ESALs) that differ from those ESALs presented above in order to modify the pavement section recommendations.

The partial construction of the design sections provided to facilitate construction traffic may result in subgrade and pavement failures due to the reduced support qualities of a partial section and the heavy and sometimes dynamic loads associated with construction traffic activity. In light of potential damage associated with construction traffic, we suggest that placement of the final surface course not occur until all the major construction has been completed for those particular pavement areas subjected to construction traffic. Should distressed areas be encountered subsequent to the use of the pavement areas by construction traffic, those areas should be undercut to firm ground, and returned to plan subgrade levels with approved controlled, compacted fill or bituminous concrete, as outlined above.

The flexible pavement sections provided are not suitable for the support of heavy concentrated static or wheel loads and/or dynamic (impact) loading conditions, such as those produced in the loading area and/or in front of the dumpster enclosure where we would recommend the use of a rigid concrete pavement. To provide uniform support beneath a rigid pavement, a minimum 6 inch thick select granular subbase should be utilized. Although we recommend that any exterior rigid pavement design be performed by a Structural Engineer knowledgeable of the specific static and dynamic loading conditions, for preliminary planning purposes and predicated on empirical information, a minimum 6-inch thick rigid pavement may be considered. It should be noted that the rigid pavement should be comprised of air-entrained Portland cement concrete with a minimum compressive strength of 4,000 psi. The rigid pavement must be properly reinforced and provided with adequate jointing and load transfer devices.

Immediately prior to any new pavement construction (flexible or rigid), the exposed subsoils throughout the proposed paved areas must be carefully and thoroughly proof rolled/compacted and visually examined in order to detect any yielding or soft soil conditions; particularly, in any disturbed areas such as along previously removed site features (e.g., utilities) and along over any recently installed utility lines, inlets and curbs. In the event that any unstable conditions are encountered, the yielding and loose areas must be densified, or undercut and returned to subgrade level with approved, controlled and compacted fill. All proof rolling should be accomplished with approved equipment and must be monitored by the Geotechnical Engineer or their authorized representative. Placement of the select granular materials and flexible and rigid pavement materials should not occur until the subgrade soils, particularly around previously installed utilities, have been evaluated and determined to be suitable for pavement construction.

Due to the anticipated supportive characteristics of the on-site subgrade materials and their susceptibility to changes in moisture content, the potential exists for considerable disturbance of these soils as a result of construction activities, particularly at the planned construction entrance.

Therefore, it is recommended that the contract documents include provisions for the use of approved construction fabrics and select granular materials that will likely be necessary in some areas to minimize any undercutting operations of the disturbed subgrade soils and/or where unsuitable subgrade soils are encountered.

Since the compacted subgrade soils will tend to minimize the downward migration of surface water, it is imperative that the subgrade soils in the paved areas be graded to facilitate surface drainage and provisions be made to remove any free water from the select granular materials, such as in the planned low points of the planned pavement areas. Discharge of any accumulated water may be accomplished by the use of stub drains or “Knock-outs”, properly covered with filter fabric, which will permit free water to discharge into the storm drain system.

5.2.3 Sidewalks

Although the performance of sidewalk installations at this site is not a structural component, it is recommended that the sidewalk areas be underlain by a minimum of 5-inches of select granular materials or approved equivalent. Prior to placing any granular materials, the compacted subgrade surface should be graded to facilitate drainage of any free water, which may enter the granular materials. Discharge of any accumulated moisture in the aggregate base course may be accomplished by the use of stub drains that discharge onto adjacent pavement, where possible.

6.0 SITE CONSTRUCTION RECOMMENDATIONS

6.1 SUBGRADE PREPARATION

6.1.1 Stripping and Grubbing

The subgrade preparation should consist of stripping all vegetation, rootmat, topsoil, and any other soft or unsuitable materials from the 10-foot expanded building and 5-foot expanded pavement limits and to 5 feet beyond the toe of structural fills. The Geotechnical Engineer 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 Geotechnical Engineer or authorized representative. The exposed subgrade should be thoroughly proofrolled 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 Geotechnical Engineer 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 Geotechnical Engineer to determine the appropriate procedure with regard to the existing conditions causing the instability. A test pit(s) may be excavated to explore the shallow subsurface materials in the area of the instability to help in determined the cause of the observed unstable materials and to assist in the evaluation of the appropriate remedial action to stabilize the subgrade.

6.1.3 Site Temporary Dewatering

As previously noted, ground water was not encountered in any of the borings to the depths explored. Considering the anticipated levels of construction, ground water for the planned building should not be impacted by the observed water levels.

Even though ground water was not encountered at or near the anticipated levels of foundation construction, the potential exists for the presence of isolated perched, trapped water and/or perched surface water conditions to be present adjacent to existing foundations, utilities and/or other below-grade site features to be removed, and the stone subbase beneath the pavements. Should any free water be encountered due to a perched water condition, localized dewatering and the use of sumps and pumps will be required.

6.1.4 Subgrade Stabilization

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 Proofrolling: Upon completion of subgrade documentation, the exposed subgrade within the 10-foot expanded building and 5-foot expanded pavement and embankment limits should be proofrolled to identify soft and yielding area. If the subgrade was observed to be soft/yielding, the soft areas should be over-excavated and replaced with approved fill or if feasible, the subgrade be moisture conditioned to within -1 and +3 % of the soil's optimum moisture content and be compacted with suitable equipment (minimum 10-ton roller). Subgrade compaction within the expanded building, pavement, and embankment limits should be to a dry density of at least 95% of the Standard Proctor maximum dry density (ASTM D698).

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 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.

6.2 EARTHWORK OPERATIONS

6.2.1 Existing Man-Placed Fill

As previously noted, based on the boring results, existing fill was encountered in Borings B-1 and B-2. The existing fill generally consisted of firm to hard cohesive soils with trace amounts of brick and wood pieces and extended to depths of 3 ft to 5.5 ft below existing grades. The SPT N values in the fill range from 6 bpf to 34 bpf. However, the presence of gravel, brick, and debris likely influenced the blow counts. To further evaluate the existing fill conditions, ECS performed three (3) test pits as shown on the Boring Location Diagram. Based on the soil test borings and test pit results, the existing fill appears to be suitable to remain in place to support the building.

However during construction, the existing fill should be proofrolled and observed by a representative of the geotechnical engineer to identify soft and yielding areas. Encountered soft and yielding areas should be overexcavated as directed by the geotechnical engineer to firm subgrade and backfilled with approved structural fill.

6.2.2 High Plasticity Soils

Cuts: High plasticity soils are those soil materials classified as Elastic SILT (MH) and Fat CLAY (CH). Highly plastic soils were not encountered during the subsurface exploration program and are not anticipated to be present within the project site. However, if highly plastic soils are encountered, they must be evaluated by the geotechnical engineer to remain in-place as bearing materials and/or future subgrades, but may not be reused as controlled and compacted fill.

6.2.3 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 6.2.3.1.

Table 6.2.3.1 Structural Fill Index Properties

Location with Respect to Final Grade	LL	PI
Building Areas	40 max	15 max
Pavement Areas	40 max	15 max

Satisfactory Site Retaining Wall Backfill: All soils used as backfill within the Critical Zone behind retaining walls should have USCS classifications of Silty SAND (SM) or more granular with a maximum of 30% fines and minimum angle of internal friction of 30 degrees when compacted to a minimum of 95% of its maximum dry density per ASTM D 698. Any existing soils not meeting these criteria should be removed from the Critical Zone of the walls, as determined by ECS personnel at the time of construction.

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). The CEC can consider allowing soils with a maximum Liquid Limit of 65 and Plasticity Index of 30 to be used as Structural Fill at depths greater than 4 feet below pavement subgrades outside the expanded building limits and within non-structural areas.

6.2.4 Compaction

Structural Fill Compaction: Structural Fill within the expanded building, pavement, 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). Beyond these areas, compaction of at least 90% should be achieved.

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, 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.

Where fill materials will be placed to widen existing embankment fills, or placed up against sloping ground, the soil subgrade should be scarified and the new fill benched or keyed into the existing material. Fill material should be placed in horizontal lifts. In confined areas such as utility

trenches, portable compaction equipment and thin lifts of 3 inches to 4 inches may be required to achieve specified degrees of compaction.

We recommend that 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 Excavations: Exposure to the environment may weaken the soils at the footing bearing level if the foundation excavations remain open for too long a time. Therefore, foundation concrete should be placed the same day that excavations are made. 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.

Footing Subgrade Observations: Most of the soils at the foundation bearing elevation are anticipated to be suitable for support of the proposed structure. It will be important to have the geotechnical engineer of record observe the foundation subgrade prior to placing foundation concrete, to confirm the bearing soils are what was anticipated. If soft or unsuitable soils are observed at the footing bearing elevations, the unsuitable soils should be undercut and removed. Any undercut should be backfilled with lean concrete ($f'_c \geq 1{,}000$ psi at 28 days) up to the original design bottom of footing elevation; the original footing shall be constructed on top of the hardened lean concrete.

Slab Subgrade Verification: A representative of ECS should be called on to observe exposed subgrades within the expanded building limits prior to Structural Fill Placement to assure that adequate subgrade preparation has been achieved. A proofrolling using a drum roller or loaded dump truck should be performed in their presence at that time. 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. Prior to final slab construction, the subgrade may require scarification, moisture conditioning, and re-compaction to restore stable conditions.

6.4 UTILITY INSTALLATIONS

Utility Subgrades: The soils encountered in our exploration are expected to be generally suitable for support of utility pipes. The pipe subgrade should be observed and probed for stability by ECS to evaluate the suitability of the materials encountered. Any loose or unsuitable materials encountered at the utility pipe subgrade elevation should be removed and replaced with suitable compacted Structural Fill or pipe bedding material.

Utility Backfilling: The granular bedding material should be at least 4 inches thick, but not less than that specified by the project drawings and specifications. Fill placed for support of the utilities, as well as backfill over the utilities, should satisfy the requirements for Structural Fill given in this report. Compacted backfill should be free of topsoil, roots, ice, or any other material designated by ECS as unsuitable. The backfill should be moisture conditioned, placed, and compacted in accordance with the recommendations of this report.

Utility Excavation Dewatering: It is possible that perched water may be encountered by utility excavations which extend below existing grades. It is expected that removal of perched water which seeps into excavations could be accomplished by pumping from sumps excavated in the trench bottom and which are backfilled with DOT Size No. 57 Stone or open graded bedding material. Should water conditions beyond the capability of sump pumping be encountered, the contractor should submit a Dewatering Plan in accordance with project specifications.

Excavation Safety: All excavations and slopes should be made and maintained in accordance with OSHA excavation safety standards. The contractor is solely responsible for designing and constructing stable, temporary excavations and slopes and should shore, slope, or bench the sides of the excavations and slopes as required to maintain stability of both the excavation sides and bottom. The contractor's responsible person, as defined in 29 CFR Part 1926, should evaluate the soil exposed in the excavations as part of the contractor's safety procedures. In no case should slope height, slope inclination, or excavation depth, including utility trench excavation depth, exceed those specified in local, state, and federal safety regulations. ECS is providing this information solely as a service to our client. ECS is not assuming responsibility for construction site safety or the contractor's activities; such responsibility is not being implied and should not be inferred.

6.5 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 rubber-tired heavy 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.

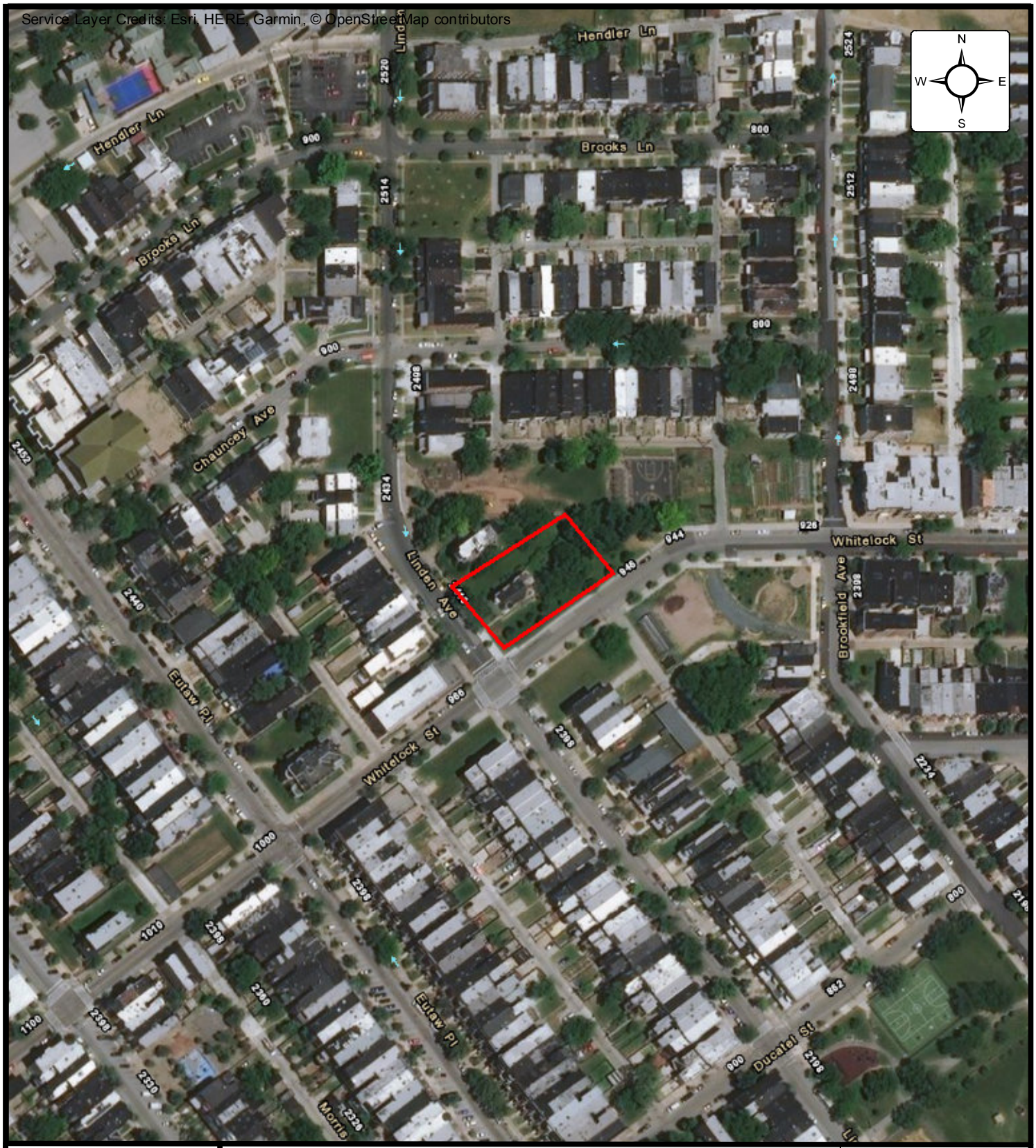
The description of the proposed project is based on information provided to ECS by Episcopal Housing Corporation. If any of this information is inaccurate, either due to our interpretation of the documents provided or site or design changes that may occur later, ECS should be contacted immediately in 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 and Test Pit Location Diagram
Future Footings Adjacent to Existing Footings



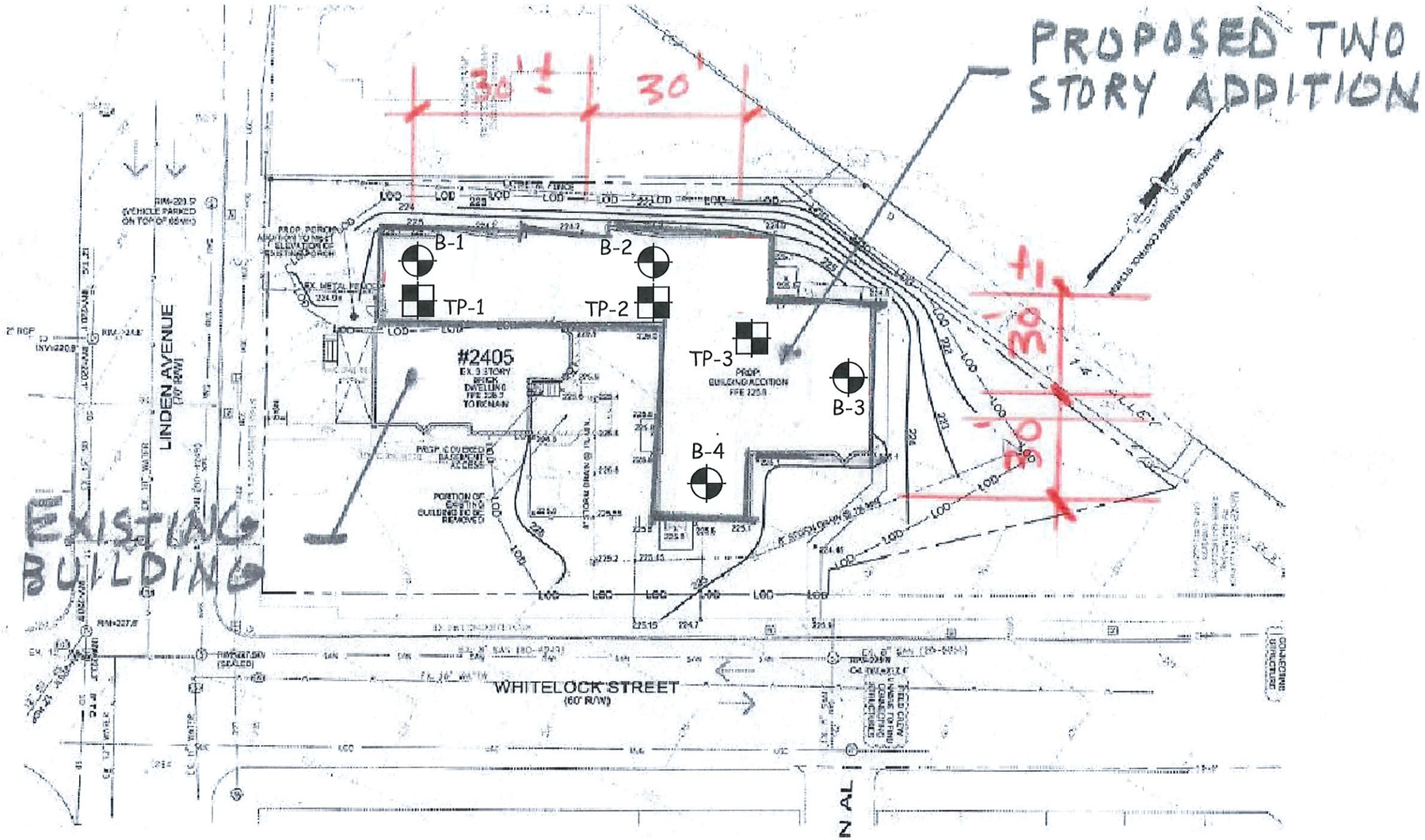
SITE LOCATION DIAGRAM

ST. FRANCIS NEIGHBORHOOD CENTER ADDITION

BALTIMORE MD 21217

EPISCOPAL HOUSING CORPORATION

ENGINEER	DMA
SCALE	NTS
PROJECT NO.	02:8695
SHEET	1 OF 1
DATE	3/27/2018



Site Plan provided by Mincin Patel Milano, Inc.

LEGEND

- ECS Boring Location
- Test Pit Location

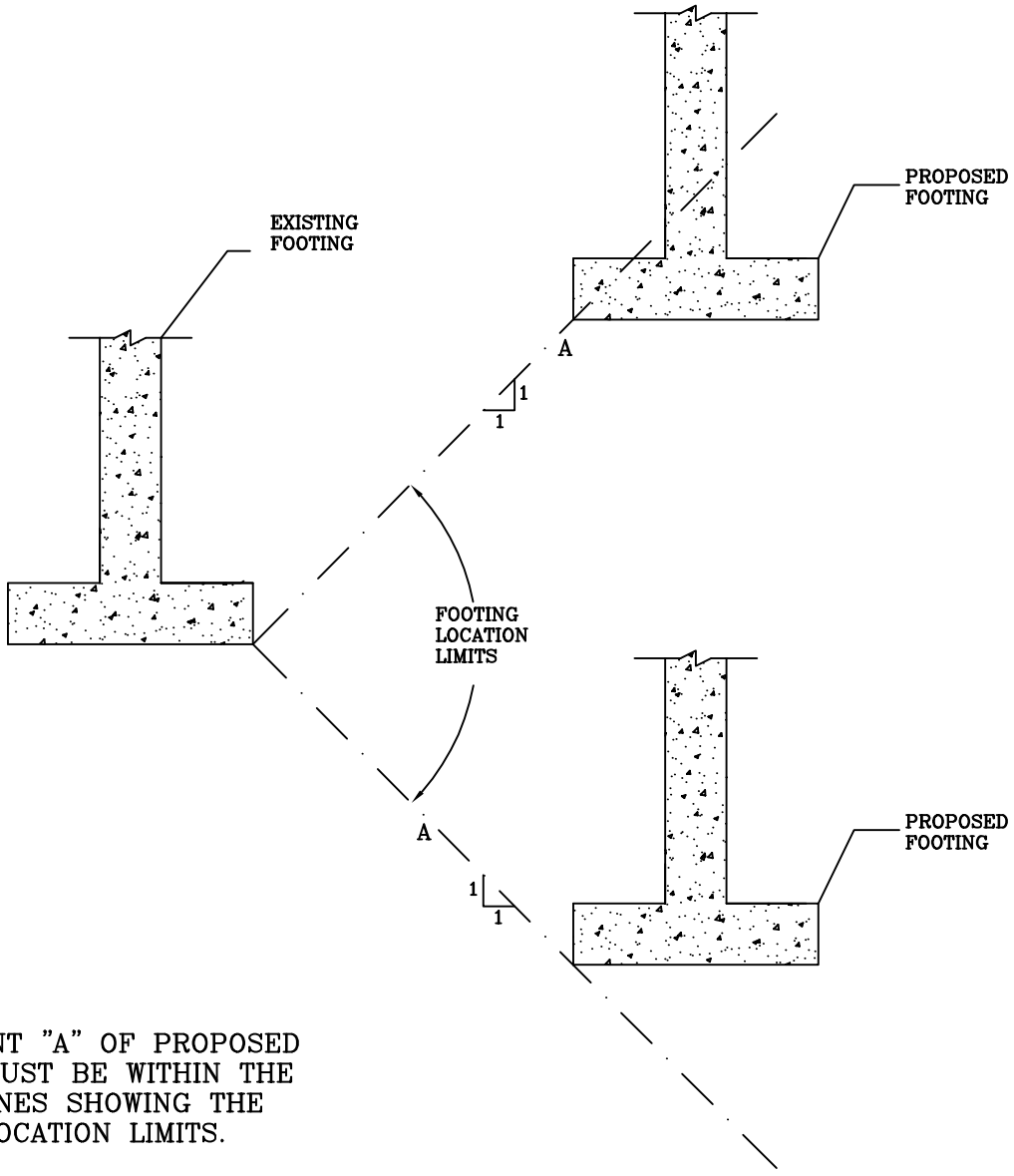
REVISIONS

Boring Location Diagram

St. Francis Neighborhood Center Addition

Episcopal Housing Corporation

KFB	HMA	05/09/18	NTS	8695-A	1 OF 1



NOTE: POINT "A" OF PROPOSED FOOTING MUST BE WITHIN THE DASHED LINES SHOWING THE FOOTING LOCATION LIMITS.

DESIGN OF FUTURE FOOTINGS ADJACENT TO EXISTING FOOTING

APPENDIX B – Field Operations

Reference Notes for Boring Logs
Boring Logs B-1 through B-4
Test Pit Logs TP-1 through TP-3
Subsurface Cross-Section

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	Medium Stiff
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 (%)	FINE GRAINED (%)
Trace	<5	<5
Dual Symbol *(ex: SW-SM)*	10	10
With	15 - 20	15-25
Adjective *(ex: "Silty")*	25 - <50	30 - <50

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.*

CLIENT	Job #:	BORING #	SHEET
Episcopal Housing Corporation	02:8695	B-1	1 OF 1

PROJECT NAME	ARCHITECT-ENGINEER
St. Francis Neighborhood Center Addition	Episcopal Housing Corporation

SITE LOCATION: 2405 Linden Avenue, Baltimore, City of Baltimore, MD

NORTHING | EASTING | STATION

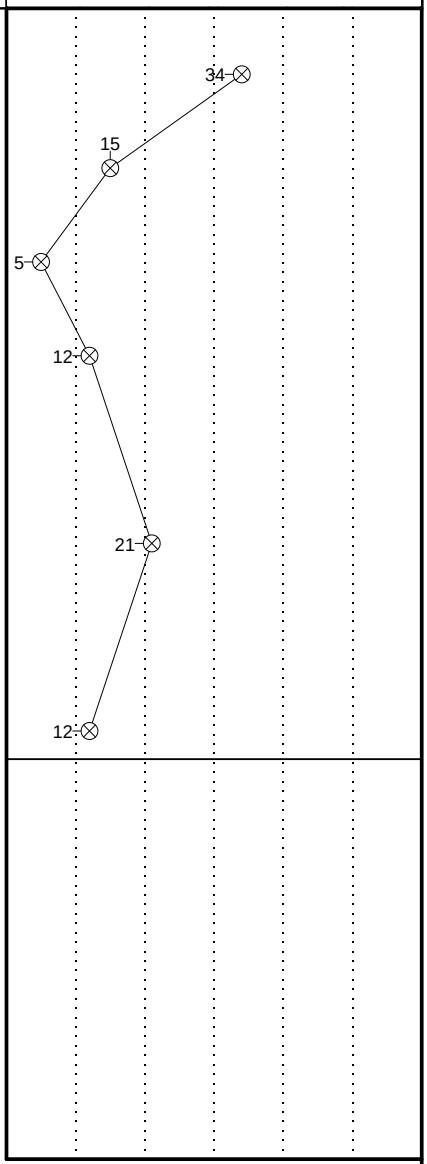
CALIBRATED PENETROMETER TONS/FT^2

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

PLASTIC LIMIT% | WATER CONTENT% | LIQUID LIMIT%

STANDARD PENETRATION BLOWS/FT

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL (ENGLISH UNITS)	WATER LEVELS ELEVATION (FT)	BLOWS/6"
					BOTTOM OF CASING ▶ LOSS OF CIRCULATION ⟩⟩⟩		
					SURFACE ELEVATION		
0					(ML/CL FILL) FILL, CLAYEY SILT WITH GRAVEL, trace brick and wood pieces, brown, moist, hard		1 14 20
	S-1	SS	18	5			
					(CL FILL) FILL, SANDY LEAN CLAY WITH GRAVEL, trace brick and wood pieces, grayish brown, moist, stiff		6 8 7
	S-2	SS	18	12			
5					(CL) SANDY LEAN CLAY WITH GRAVEL, tan and brown, moist, firm		3 2 3
	S-3	SS	18	4			
					(CL/ML) SILTY CLAY, tan, moist, stiff		5 6 6
	S-4	SS	18	18			
10							
					(SM) SILTY SAND, trace clay, orangish tan, moist, medium dense		6 10 11
	S-5	SS	18	16			
15							
	S-6	SS	18	18			3 5 7
20					END OF BORING @ 20'		
25							
30							



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

WL DRY WS ☐ WD ☒	BORING STARTED 03/05/18	CAVE IN DEPTH @ 13.1'
WL(SHW) WL(ACR) DRY	BORING COMPLETED 03/05/18	HAMMER TYPE Auto
WL	RIG ATV FOREMAN Dale Price	DRILLING METHOD HSA

CLIENT	Job #:	BORING #	SHEET
Episcopal Housing Corporation	02:8695	B-2	1 OF 1

PROJECT NAME	ARCHITECT-ENGINEER
St. Francis Neighborhood Center Addition	Episcopal Housing Corporation

SITE LOCATION: 2405 Linden Avenue, Baltimore, City of Baltimore, MD

NORTHING | EASTING | STATION

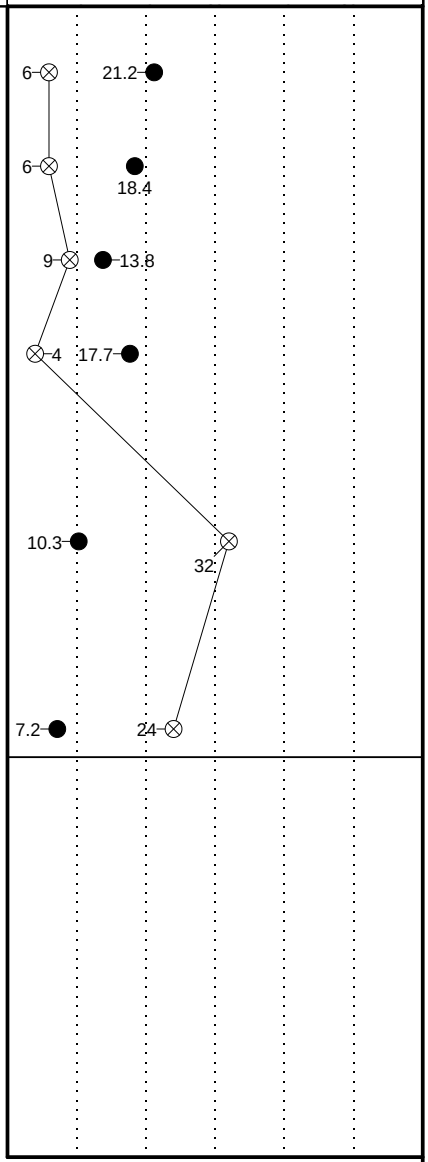
CALIBRATED PENETROMETER TONS/FT^2

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

PLASTIC LIMIT% | WATER CONTENT% | LIQUID LIMIT%

STANDARD PENETRATION BLOWS/FT

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL (ENGLISH UNITS)	WATER LEVELS ELEVATION (FT)	BLOWS/6"
0					Topsoil Depth [4.00"]		
	S-1	SS	18	14	(CL FILL) FILL, SANDY LEAN CLAY, trace gravel, trace wood pieces, reddish brown, moist, firm		2 2 4
	S-2	SS	18	16	(SC) CLAYEY SAND, tan, moist, loose		3 2 4
5	S-3	SS	18	12	(ML-CL) SANDY CLAYEY SILT, trace gravel, brown, moist, stiff		3 5 4
	S-4	SS	18	14	(SP) SAND WITH GRAVEL, dark brown and black, moist, very loose		3 2 2
10					(SP-SM) SAND WITH SILT, trace gravel, tan, moist, dense		12 15 17
	S-5	SS	18	5			
15					(SP-SM) SAND WITH SILT, light tan, moist, medium dense		7 11 13
	S-6	SS	18	16			
20					END OF BORING @ 20'		
25							
30							



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

WL DRY WS ☐ WD ☒	BORING STARTED 03/05/18	CAVE IN DEPTH @ 13.6'
WL(SHW) WL(ACR) DRY	BORING COMPLETED 03/05/18	HAMMER TYPE Auto
WL	RIG ATV FOREMAN Dale Price	DRILLING METHOD HSA

CLIENT	Job #:	BORING #	SHEET
Episcopal Housing Corporation	02:8695	B-3	1 OF 1

PROJECT NAME	ARCHITECT-ENGINEER
St. Francis Neighborhood Center Addition	Episcopal Housing Corporation

SITE LOCATION: 2405 Linden Avenue, Baltimore, City of Baltimore, MD

NORTHING | EASTING | STATION

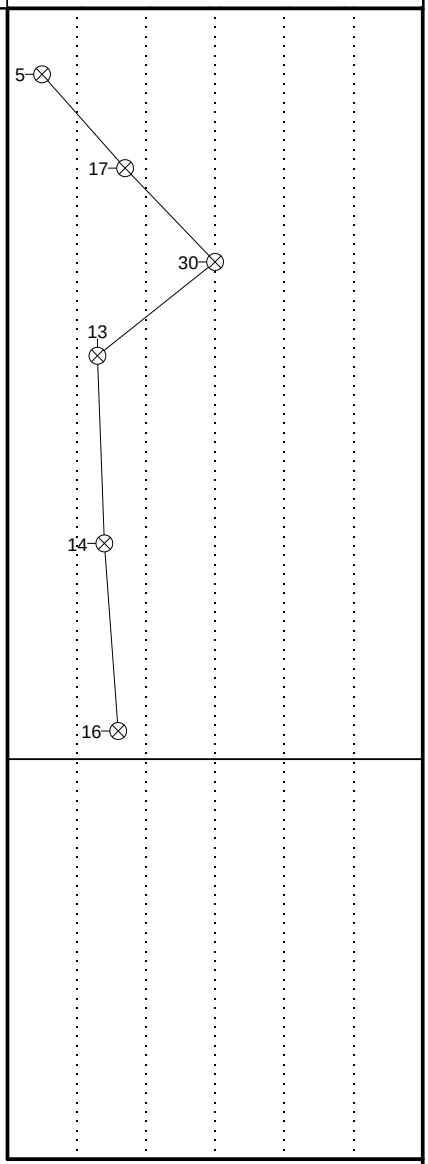
CALIBRATED PENETROMETER TONS/FT^2

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

PLASTIC LIMIT% | WATER CONTENT% | LIQUID LIMIT%

STANDARD PENETRATION BLOWS/FT

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL (ENGLISH UNITS)	WATER LEVELS ELEVATION (FT)	BLOWS/6"
0					Topsoil Depth [4.00"]		
	S-1	SS	18	12	(SC) CLAYEY SAND, trace gravel, tan, moist, loose		2 2 3
	S-2	SS	18	1	(SM) SILTY SAND WITH GRAVEL, trace gravel, dark brown, moist, medium dense		3 6 11
5	S-3	SS	18	16	(SM) SILTY SAND WITH GRAVEL, tan, moist, medium dense		23 15 15
	S-4	SS	18	18	(SP-SM) SAND WITH SILT, tan, moist, medium dense		6 7 6
10							
	S-5	SS	18	18			4 6 8
15							
	S-6	SS	18	18			5 7 9
20					END OF BORING @ 20'		
25							
30							



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

WL DRY WS ☐ WD ☒	BORING STARTED 03/05/18	CAVE IN DEPTH @ 14.4'
WL(SHW) WL(ACR) DRY	BORING COMPLETED 03/05/18	HAMMER TYPE Auto
WL	RIG ATV FOREMAN Dale Price	DRILLING METHOD HSA

CLIENT	Job #:	BORING #	SHEET
Episcopal Housing Corporation	02:8695	B-4	1 OF 1

PROJECT NAME	ARCHITECT-ENGINEER
St. Francis Neighborhood Center Addition	Episcopal Housing Corporation

SITE LOCATION: 2405 Linden Avenue, Baltimore, City of Baltimore, MD

NORTHING | EASTING | STATION

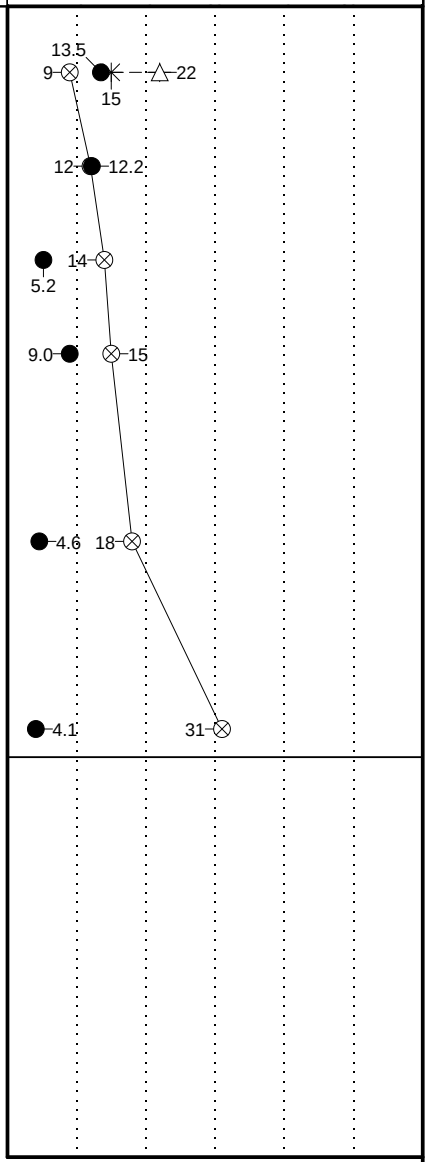
CALIBRATED PENETROMETER TONS/FT^2

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

PLASTIC LIMIT% | WATER CONTENT% | LIQUID LIMIT%

STANDARD PENETRATION BLOWS/FT

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL (ENGLISH UNITS; BOTTOM OF CASING; LOSS OF CIRCULATION; SURFACE ELEVATION)	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
0					Topsoil Depth [4.00"]			
	S-1	SS	18	14	(SC) CLAYEY SAND, trace gravel, orangish brown, moist, loose			3 4 5
	S-2	SS	18	18	(SC) CLAYEY SAND, orangish brown, moist, medium dense			4 6 6
5	S-3	SS	18	15	(SP-SM) SAND WITH SILT, tan, moist, medium dense			4 6 8
	S-4	SS	18	15	(SP-SM) SAND WITH SILT, trace gravel, tan, moist, medium dense			4 7 8
10								
	S-5	SS	18	18	(SP-SM) SAND WITH SILT, tan, moist, medium dense to dense			5 8 10
15								
	S-6	SS	18	18				9 14 17
20					END OF BORING @ 20'			
25								
30								



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

WL DRY WS ☐ WD ☒	BORING STARTED 03/05/18	CAVE IN DEPTH @ 13.9'
WL(SHW) WL(ACR) DRY	BORING COMPLETED 03/05/18	HAMMER TYPE Auto
WL	RIG ATV FOREMAN Dale Price	DRILLING METHOD HSA

PROJECT NAME: St. Francis Neighborhood Center Addition Test Pits

TEST PIT #: TP-1

CLIENT: Episcopal Housing Corporation

Job #: 02:8695-A

SURFACE ELEVATION

LOCATION: 2405 Linden Street, Baltimore, City of Baltimore, MD

ARCH/ENG: Hasan M. Aboumatar

DEPTH (FT.)	ELEV. (FT.)	DESCRIPTION OF MATERIAL	EXCAV. EFFORT	DCP	QP (TSF)	SAMPLE NO.	MOIST. CONT. (%)
0		Topsoil Depth [3.00"]					
		(ML/CL FILL) FILL, CLAYEY SILT, contains brick, brown, moist, hard				S-1	
2.5			E				
		(CL FILL) FILL, SANDY LEAN CLAY, contains brick wood, gray, moist, stiff				S-2	
5		(CL) SANDY LEAN CLAY, tan and brown, moist, firm					
		END OF TEST PIT @ 5.5'				S-3	
7.5							
10							
12.5							
15							

REMARKS:

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

GROUND WATER: FIRST CHECK ▽ SECOND CHECK ▼ | EXCAVATION EFFORT: E - EASY M - MEDIUM D - DIFFICULT VD - VERY DIFFICULT

CONTRACTOR:	OPERATOR:	MAKE:
Sam's Excavating		
MODEL:	**REACH:**	**CAPACITY:**

ECS REP.:	DATE:	UNITS:	Cave-in Depth:	Groundwater While Drilling:	Groundwater:
KFB	04/25/18	feet			

PROJECT NAME: St. Francis Neighborhood Center Addition Test Pits

TEST PIT #: TP-2

CLIENT: Episcopal Housing Corporation

Job #: 02:8695-A

SURFACE ELEVATION

LOCATION: 2405 Linden Street, Baltimore, City of Baltimore, MD

ARCH/ENG: Hasan M. Aboumatar

DEPTH (FT.)	ELEV. (FT.)	DESCRIPTION OF MATERIAL	EXCAV. EFFORT	DCP	QP (TSF)	SAMPLE NO.	MOIST. CONT. (%)
0		Topsoil Depth [3.00"]					
		(SC FILL) FILL, CLAYEY SAND, brown, moist, loose					
		(CL/ML) SILTY CLAY, light grayish tan, moist, firm					
2.5							
		(SC) CLAYEY SAND, orangish brown, moist, loose				S-1	
5			E				
7.5							
		(SM) SILTY SAND, brown, moist, very loose				S-2	
		END OF TEST PIT @ 9'					
10							
12.5							
15							

REMARKS:

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

GROUND WATER: FIRST CHECK ▽ SECOND CHECK ▼ EXCAVATION EFFORT: E - EASY M - MEDIUM D - DIFFICULT VD - VERY DIFFICULT

CONTRACTOR:	OPERATOR:	MAKE:
Sam's Excavating		
MODEL:	**REACH:**	**CAPACITY:**

ECS REP.:	DATE:	UNITS:	Cave-in Depth:	Groundwater While Drilling:	Groundwater:
KFB	04/25/18	feet			

PROJECT NAME:		TEST PIT #:
St. Francis Neighborhood Center Addition Test Pits		TP-3
CLIENT:	Job #:	SURFACE ELEVATION
Episcopal Housing Corporation	02:8695-A	

DEPTH (FT.)	ELEV. (FT.)	LOCATION: 2405 Linden Street, Baltimore, City of Baltimore, MD	ARCH/ENG: Hasan M. Aboumatar	EXCAV. EFFORT	DCP	QP (TSF)	SAMPLE NO.	MOIST. CONT. (%)
		DESCRIPTION OF MATERIAL						
0		Topsoil Depth [3.00"]						
		(ML/CL) CLAYEY SILT, orangish brown, moist, firm		E			S-1	
2.5		(SC) CLAYEY SAND, light orangish tan, moist, loose						
		(ML/CL) SANDY CLAYEY SILT, light gray, moist, stiff						
5		END OF TEST PIT @ 5'						
7.5								
10								
12.5								
15								

REMARKS:

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

GROUND WATER: FIRST CHECK ▽ *SECOND CHECK* ▼ | *EXCAVATION EFFORT: E - EASY M - MEDIUM D - DIFFICULT VD - VERY DIFFICULT*

CONTRACTOR:	OPERATOR:	MAKE:
Sam's Excavating		
MODEL:	**REACH:**	**CAPACITY:**

ECS REP.:	DATE:	UNITS:	Cave-in Depth:	Groundwater While Drilling:	Groundwater:
KFB	04/25/18	feet			

SOIL CLASSIFICATION LEGEND

GW - WELL GRADED GRAVEL
GM - SILTY GRAVEL
GP - POORLY GRADED GRAVEL
GC - CLAYEY GRAVEL
SW - WELL GRADED SAND
ML - LOW PLASTICITY SILT

ST - SHELBY TUBE
CL - LOW PLASTICITY CLAY
MH - HIGH PLASTICITY SILT
SM - SILTY SAND

RC - ROCK CORE
SP - POORLY GRADED SAND
SC - CLAYEY SAND
CH - HIGH PLASTICITY CLAY

PM - PRESSURE METER
OH - HIGH PLASTICITY ORGANIC SILTS AND CLAYS
OL - LOW PLASTICITY ORGANIC SILTS AND CLAY
PT - PEAT

WR - WEATHERED ROCK
PWR - PARTIALLY WEATHERED ROCK

-FILL
-POSSIBLE FILL
-PROBABLE FILL

SURFACE MATERIALS

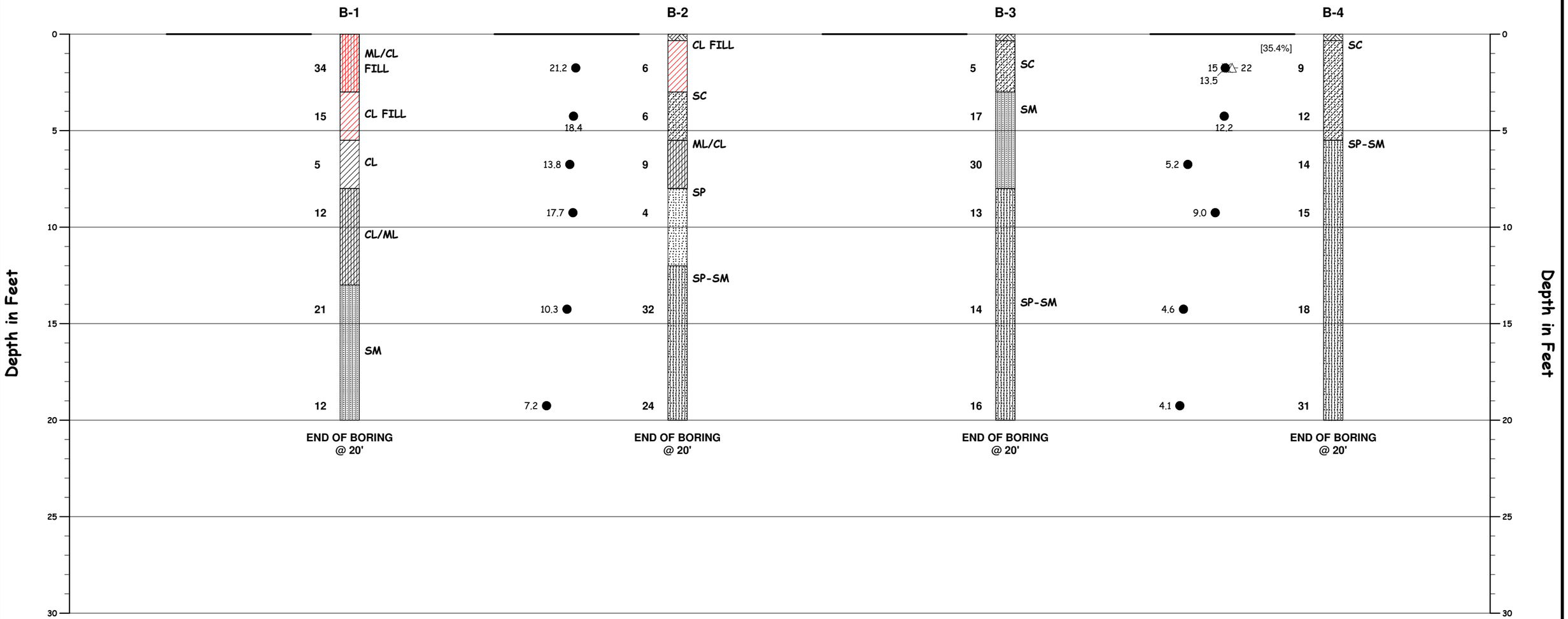
TOPSOIL
ASPHALT
GRAVEL
CONCRETE
VOID

ROCK TYPES

IGNEOUS
METAMORPHIC
SEDIMENTARY

SYMBOL LEGEND

WATER LEVEL - DURING DRILLING/SAMPLING
WATER LEVEL - SEASONAL, HIGH WATER
WATER LEVEL - AFTER CASING REMOVAL
WATER LEVEL - AFTER 24 HOURS
PLASTIC LIMIT% WATER CONTENT% % PASSING #200 SIEVE [68%] LIQUID LIMIT%



NOTES:
1 SEE INDIVIDUAL BORING LOG AND GEOTECHNICAL REPORT FOR ADDITIONAL INFORMATION.
2 PENETRATION TEST RESISTANCE IN BLOWS PER FOOT (ASTM D1586).
3 HORIZONTAL DISTANCES ARE NOT TO SCALE.

Subsurface Soil Profile

St. Francis Neighborhood Center Addition
Episcopal Housing Corporation
2405 Linden Avenue, Baltimore, City of Baltimore, MD

PROJECT NO.: 8695 | DATE: 5/9/2018 | VERTICAL SCALE: 1"=5'

APPENDIX C – Laboratory Testing

Laboratory Test Results Summary

Laboratory Testing Summary

Sample Source	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-2												
	S-1	1.00 - 2.50	21.2									
	S-2	3.50 - 5.00	18.4									
	S-3	6.00 - 7.50	13.8									
	S-4	8.50 - 10.00	17.7									
	S-5	13.50 - 15.00	10.3									
	S-6	18.50 - 20.00	7.2									
B-4												
	S-1	1.00 - 2.50	13.5	SC	22	15	7	35.4				
	S-2	3.50 - 5.00	12.2									
	S-3	6.00 - 7.50	5.2									
	S-4	8.50 - 10.00	9.0									
	S-5	13.50 - 15.00	4.6									
	S-6	18.50 - 20.00	4.1									

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. 02:8695
Project Name: St. Francis Neighborhood Center Addition
PM: Dawn M. Appelbaum
PE: Hasan M. Aboumatar
Printed On: Tuesday, March 27, 2018

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