REPORT OF SUBSURFACE EXPLORATION

AND

GEOTECHNICAL ENGINEERING SERVICES

Mary Jackson Neighborhood Center

Hampton, Virginia

GET Project No: WM20-117G

May 5, 2020

PREPARED FOR:

Work Program Architects
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GET Solutions, Inc.
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May 5, 2020

TO: **Work Program Architects**
208 E. Plume Street
Monticello Arcade, Suite 2
Norfolk, VA 23510

Attn: Mr. Sam Bowling, AIA, NCARB

RE: Report of Subsurface Exploration and Geotechnical Engineering Services
Mary Jackson Neighborhood Center
Hampton, Virginia
G E T Project No: WM20-117G

Dear Mr. Bowling:

In compliance with your instructions, we have completed our Subsurface Exploration and Geotechnical Engineering Services for the above referenced project. The results of this study, together with our recommendations, are presented in this report.

Often, because of design and construction details that occur on a project, questions arise concerning subsurface conditions. **G E T Solutions, Inc.** would be pleased to continue its role as Geotechnical Engineer during the project implementation.

Thank you for the opportunity to work with you on this project. We trust that the information contained herein meets your immediate need, and should you have any questions or if we could be of further assistance, please do not hesitate to contact us.

Respectfully Submitted,
G E T Solutions, Inc.

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EXECUTIVE SUMMARY

The proposed development will consist of constructing a 1-story community center structure approximately 12,500 square feet in plan area. The western portion of the structure will include various rooms/offices such as activity rooms, a multipurpose room, a kitchen, locker rooms, restrooms, etc., and the eastern portion of the structure will be a gymnasium. The western portion of the structure will include wood framing with CMU stem walls and the ground floor slab constructed on-grade. Whereas the gymnasium will be a pre-engineered metal building with structural steel framing and the ground floor slab constructed on-grade. As indicated by the structural engineer, the maximum column and wall loads associated with this structure are not expected to exceed about 50 kips and 2 kips per linear foot, respectively and floor loads on the order of 150 PSF or less. Fills required to establish finish grades within the building footprint are expected to be limited to about 1 foot or less. The proposed development will also include asphalt pavement areas, sidewalks, and other associated infrastructure.

Our field exploration program included six (6) 10- to 25-foot deep Standard Penetration Test (SPT) borings located within the footprint of the proposed structure and pavement areas. The initial groundwater table was generally determined to occur at depths ranging from 5 to 6 feet below existing site grades. These depths correspond to an approximate elevation of 4 feet MSL per elevations obtained on the civil schematic site plan provided by the client. Boreholes were backfilled upon completion for safety considerations. As such, the reported groundwater levels may not be indicative of the static groundwater level. A summary of the subsurface conditions encountered at the SPT soil test borings is presented in Section 3 of this report.

The following evaluations and recommendations were developed based on our field exploration and laboratory-testing program.

- A field-testing program during construction is recommended, which should include subgrade proofrolling, test pits, compaction testing and foundation excavation observations for bearing capacity verification.

- **Uncontrolled FILL materials were encountered at this site that extended to a depth of 2 feet below existing grades at most of our boring locations. These Uncontrolled FILL materials must be undercut and removed from beneath all shallow foundations (where applicable) but may be suitable for slab and pavement support pending a further investigation at the time of construction.**

- Some of the subsurface Silty SAND (SM) soils encountered at the boring locations may meet the criteria recommended in this report for reuse as structural fill. However, moisture manipulation will likely be required due to shallow groundwater conditions encountered at this site.

- The project's budget should include an allowance for subgrade improvements (undercut and backfill with structural fill and/or additional aggregate base material).

- The proposed structure can be supported by means of shallow spread footings designed using an allowable bearing capacity of 2,000 pounds per square foot (psf) (with a minimum 18-inch embedment and a minimum 24-inch width). Isolated square pier footings are recommended to be a minimum of 3 feet by 3 feet in area for bearing capacity consideration. Estimated post-construction total and differential settlements may range up to 1-inch and ½-inch, respectively.

- Provided the recommended earthwork activities and evaluations are carried out properly, the ground floor slabs may be constructed as on-grade members.

- Based on California Bearing Ratio (CBR) testing, a design CBR value of 10.5 was used in evaluating the pavement sections. Detailed pavement design recommendations are presented in Section 4.9.

- Based on our experience in the vicinity of the project site and the composition of the soils recovered within the upper 25 feet (maximum explored depth during feasibility study) at the boring locations, it is our opinion that the site characteristics are indicative of a Site Class “D” in accordance with Table 20.3-1 of ASCE 7-10 as referenced by the 2015 International Building Code (IBC);

This summary briefly discusses some of the major topics mentioned in the attached report. Accordingly, this report should be read in its entirety to thoroughly evaluate the contents.

1.0 PROJECT INFORMATION

1.1 Project Authorization

G E T Solutions, Inc. has completed our Subsurface Exploration and Geotechnical Engineering Services for the proposed Mary Jackson Neighborhood Center project located in Hampton, Virginia. The geotechnical engineering services were conducted in general accordance with **G E T** Proposal No. PWM18-157G&T dated March 22, 2018. Authorization to proceed with our services was received from the client in an email dated March 23, 2020.

1.2 Project Site Location and Description

The project site, which is the site of Olde Hampton Community Park, is located along the south side of Lincoln Street just east of North Armistead Avenue in Hampton, Virginia. The former Olde Hampton Community Center, which was a one-story structure, was closed during the fall of 2015 due to deteriorating conditions and has since been demolished and removed. Based on historical imagery obtained from Google Earth the former community center structure was actively being demolished in March 2016. The project site currently consists of an asphalt parking lot, grass covered areas with some isolated trees, a playground, and basketball courts. Based on the civil schematic site plan provided by the client, the current site elevations range from about 8 to 10-ft MSL. A site vicinity map is provided below.

Figure 1 – Site Vicinity Map (obtained via Google Earth)

1.3 Project Construction Description

The proposed development will consist of constructing a 1-story community center structure approximately 12,500 square feet in plan area. The western portion of the structure will include various rooms/offices such as activity rooms, a multipurpose room, a kitchen, locker rooms, restrooms, etc., and the eastern portion of the structure will be a gymnasium. The western portion of the structure will include wood framing with CMU stem walls and the ground floor slab constructed on-grade. Whereas the gymnasium will be a pre-engineered metal building with structural steel framing and the ground floor slab constructed on-grade. As indicated by the structural engineer, the maximum column and wall loads associated with this structure are not expected to exceed about 50 kips and 2 kips per linear foot, respectively and floor loads on the order of 150 PSF or less. Based on the provided civil schematic site plan, the finish floor elevation will be at 10.50-ft and the existing site grades within the structure's footprint range from 9.33-ft to 10.11-ft in elevation. Therefore, fills required to establish finish grades within the building footprint are expected to be limited to about 1 foot or less.

The proposed development will also include asphalt pavement areas, sidewalks, and other associated infrastructure. It is not known at this time if a storm water management facility will be required for this development.

If any of the noted information is incorrect or has changed, G E T Solutions, Inc. shall be informed so that we may amend the recommendations presented in this report, if appropriate.

1.4 Purpose and Scope of Services

The purpose of this study was to obtain information on the general subsurface conditions at the proposed project site. The subsurface conditions encountered were then evaluated with respect to the available project characteristics. In this regard, engineering assessments for the following items were formulated:

1. General assessment of the soils revealed by the borings performed at the proposed project site.

2. General location and description of potentially deleterious material encountered in the borings that may interfere with construction progress or structure and pavement performance, including existing fills or surficial/subsurface organics.

3. Construction considerations for soil subgrade preparation (stripping, grading and compaction). Engineering criteria for placement and compaction of approved structural fill material.

4. Evaluation of the on-site soils for re-use as structural fill.

5. Feasibility of utilizing a shallow foundation system for support of the proposed structure. Design parameters required for the foundation system, including foundation sizes, allowable bearing pressures, foundation levels, and expected total and differential settlements.

6. Feasibility of constructing ground floors as slab-on-grade members.

7. Assessment of the shallow subsurface soils' expansive properties.

8. Pavement design recommendations based on field exploration activities, California Bearing Ratio (CBR) tests, and our experience with similar soil conditions.

9. Seismic Site Class definition in accordance with the International Building Code (IBC) 2015 requirements, available soil data, and our local experience.

The scope of services did not include an environmental assessment for determining the presence or absence of wetlands or hazardous or toxic material in the soil, bedrock, surface water, groundwater or air, on or below or around this site.

2.0 FIELD AND LABORATORY PROCEDURES

2.1 Field Exploration

In order to explore the general subsurface soil types and to aid in developing associated design parameters and recommendations, the following exploration program was performed:

- Four (4) 25-foot deep Standard Penetration Test (SPT) borings (designated as B-1 through B-4) were drilled within the approximate footprint of the proposed structure.

- Two (2) 10-foot deep SPT boring (designated as CBR-1 and CBR-2) were drilled within proposed pavement areas.

- A bulk subgrade sample was collected at each of the borings (designated as CBR-1 and CBR-2) performed within the proposed pavement areas. The bulk subgrade samples were collected from approximately 0.7 to 2 feet below existing grades. The bulk soil samples were returned to our AASHTO re:source (formerly ARML) and US Army Corps of Engineers certified laboratory and subjected to CBR testing in accordance with ASTM standards.

The SPT borings were performed with the use of hollow stem auger and rotary wash "mud" drilling procedures in general accordance with ASTM D 1586. The tests were performed continuously from the existing ground surface to depths of 10 to 12 feet and at 5-foot intervals starting at a depth of 13 feet. The soil samples were obtained with a standard 1.4-inch inner diameter, 2-inch outer diameter, 30-inch long split-spoon sampler. The sampler was driven with blows of a 140 lb. automatic hammer falling 30 inches. The number of blows required to drive the sampler each 6-inch increment of penetration was recorded and is shown on the boring logs. The sum of the second and third penetration increments is termed the SPT N-value (uncorrected for automatic hammer and overburden pressure). A representative portion of each disturbed split-spoon sample was collected with each SPT, placed in a glass jar, sealed, labeled, and returned to our laboratory for review.

The boring locations were established and located by **G E T Solutions, Inc.** in the field by measuring distances from identifiable landmarks. Upon completion of the soil borings, the holes were backfilled with the soil clippings and the asphalt replaced with cold patch asphalt, where applicable. Approximate soil boring locations are shown on the attached "Boring Location Plan" (Appendix I) which was developed using the civil schematic site plan provided by the client.

2.2 Laboratory Testing

Soil testing provided by **G E T Solutions, Inc.** was performed in accordance with American Society for Testing and Materials (ASTM) standards. All soils and materials tests were performed in our AASHTO re:source (formally AMRL) and US Army Corps of Engineers certified Williamsburg laboratory.

2.2.1 Soil Classification and Index Testing

Representative portions of all soil samples collected during drilling operations were sealed in glass jars, labeled and transferred to our laboratory in accordance with ASTM D 4220 for classification and analysis. Soil descriptions on the boring logs are provided using visual-manual methods in general accordance with ASTM D 2488 using the Unified Soil Classification System (USCS). Soil samples that were selected for index testing were classified in general accordance with ASTM D 2487. It should be noted that some variation can be expected between samples classified using the visual-manual procedure (ASTM D 2488) and the USCS (ASTM D 2487). A summary of the soil classification system is provided in Appendix II.

Representative split-spoon soil samples were selected and subjected to natural moisture, #200 sieve wash, and Atterberg Limits testing in order to corroborate the visual classification. These test results are presented in Appendix III and on the soil test boring logs provided in Appendix IV. A generalized subsurface soil profile is provided in Appendix V.

2.2.2 Bulk Soil Sample Testing

The two (2) bulk soil samples were returned to our AASHTO re:source and US Army Corps of Engineers certified Williamsburg laboratory and subjected to Standard Proctor and CBR testing in accordance with ASTM procedures. A summary of the CBR test results is presented in Table I below; Proctor curves, CBR curves, and Particle Size Distribution curves are provided in Appendix VI.

Table I - CBR Test Results

CBR / Boring No.	Depth (feet)[1]	USCS Type	Natural Moisture (%)	% Passing #200 Sieve	Atterberg Limits (LL/PL/PI)	Max. Dry Density (pcf)	Optimum Moisture (%)	CBR Value	Swell (%)
CBR-1	0.8 - 2	SM *“FILL”*	18	41.5	Non-Plastic	101.2	17.5	16.0	0.1
CBR-2	0.7 - 2	SM *“FILL”*	16	37.5	Non-Plastic	113.7	12.3	15.6	0.1

Note: (1) Depth below existing site grades

3.0 SITE AND SUBSURFACE CONDITIONS

3.1 Site Geology

The project site is located within the Atlantic Coastal Plain physiographic province. Bedrock of the Late Mesozoic age is present at depths of greater than 2,000 ft, and is overlain by Lower and Upper Cretaceous, Tertiary, Pleistocene and Recent Sediments.

Across the outer Coastal Plain, the Pliocene age Yorktown Formation of the Tertiary Period is widespread, occurring from Maryland to North Carolina. Its age is estimated between 4.8 million and 2.8 million years and is estimated to have been deposited during three transgressive episodes. The depositional environment was shallow marine in nature, consisting of inner shelf, barrier-island, estuarine and lagoonal patterns. The Yorktown Formation is a glauconitic, fossiliferous, Silty to Clayey greenish-gray fine Sand. This material has been pre-consolidated by an increased effective overburden pressure generated due to a drop in the sea level at the end of the Tertiary Period, and by previously overlying sediments, which eroded away as the sea level subsequently lowered.

As sea levels rose during the Pleistocene Epoch of the Quaternary Period, areas within the project limits were filled and overlain by soils of the Lynnhaven Member of the Tabb Formation, which is composed of fluvial and estuarine deposits. The geologic stratigraphy encountered in our subsurface explorations generally consisted of marine deposited Sands and Clays of this formation.

3.2 Existing Pavement Conditions

Portions of the project site contain an asphalt parking lot and drive lane. Based on our visual observations during our site reconnaissance the asphalt pavement appeared to be in poor to fair condition with evidence of severe weathering, alligator cracking, potholes, etc. A summary of the asphalt pavement section thicknesses at the borings located within the existing pavement areas is presented in Table II below.

Table II – Existing Pavement Conditions

Core/Boring Location	Asphalt Thickness (in)	Aggregate Base Thickness (in)	Subgrade USCS Classification
B-4	1.0	7.0	SM
CBR-1	2.5	7.0	SM *“FILL”*
CB-2	1.0	7.0	SM *“FILL”*

3.3 Subsurface Soil Conditions

A summary of the subsurface soil conditions encountered at the SPT boring locations is presented in Table III on the following page.

Table III – Subsurface Soil Conditions

Average Depth$^{(1)}$ (ft)	Stratum	Description	Ranges of SPT$^{(2)}$ N-Values
0 to 0.7 - 0.8	Pavement	*Borings B-4, CBR-1, and CBR-2* ➢ 1 to 2.5 inches of Asphalt underlain by 7 inches of Aggregate Base Material	-
0 to 0.5 - 0.7	Topsoil	*Borings B-1, B-2, and B-3* ➢ 6 to 8 inches of Topsoil	-
0.5 - 0.8 to 2.0	FILL	➢ SAND (SM and SC) with varying amounts of Gravel, Silt, Clay, fibrous organic material, and/or brick fragments *Uncontrolled FILL materials were not observed at boring locations B-3 and B-4.*	4 - 11
0.7 - 2.0 to 10.0 - 16.5	I	➢ SAND (SM and SC) with varying amounts of Gravel, Silt, Clay, and/or marine shell fragments ➢ An isolated deposit of Sandy Fat CLAY (CH) and Sandy Elastic SILT (MH) was encountered at boring location B-3 at a depth of 6 to 10 feet below existing grades *Borings CBR-1 and CBR-2 were terminated within this stratum.*	SAND WOH$^{(3)}$ - 10 CLAY/SILT 4 - 6
16.5 to 25.0	II	➢ Yorktown Formation classified as Silty SAND (SM) with varying amounts of marine shell fragments	6 - 9

Notes: (1) Depth below existing grades
(2) SPT=Standard Penetration Test, N-Values in Blows-per-foot (uncorrected)
(3) WOH = Weight of Hammer

The subsurface descriptions are of a generalized nature provided to highlight the major soil strata encountered. The records of the subsurface exploration are included in Appendix IV (Boring Log sheets) and in Appendix V (Generalized Soil Profile) which should be reviewed for specific information as to the individual borings. The stratifications shown on the records of the subsurface exploration represent the conditions only at the actual boring locations. Variations may occur and should be expected between boring locations. The stratifications represent the approximate boundary between subsurface materials and the transition may be gradual. It is noted that the "Topsoil" designation references the presence of surficial organic laden soil and does not represent any particular quality specification. It is recommended that this material be tested for approval prior to use as topsoil.

3.4 Groundwater Information

The groundwater level was recorded at the boring locations during drilling and as observed through the relative wetness of the recovered soil samples during the drilling operations. The initial groundwater table was generally determined to occur at depths ranging from 5 to 6 feet below existing site grades. These depths correspond to an approximate elevation of 4 feet MSL per elevations obtained on the civil schematic site plan provided by the client.

During drilling operations, fluid (clay-water slurry) is introduced into the bore hole generally impairing the ability to accurately determine groundwater levels. Additionally, as subsurface soils begin to dry, moisture moves upwards through the soil profile by means of capillary action. Based on the subsurface soil composition (soils containing more than 30% of fines by weight), the initial groundwater level reading (based on the relative wetness of the soils) could be in part attributed to the capillary action of the soils. As such, the reported initial groundwater level may not be indicative of the static groundwater level. The boreholes were backfilled upon completion for safety considerations.

Groundwater conditions will vary with environmental variations and seasonal conditions, such as the frequency and magnitude of rainfall patterns and man-made influences, such as existing swales, drainage ponds, underdrains and areas of covered soil (paved parking lots, sidewalks, etc.). In the project’s area, seasonal groundwater fluctuations of ±3 feet are common; however, greater fluctuations have been documented. We recommend that the contractor determine the actual groundwater levels at the time of the construction to determine groundwater impact on the construction procedures, if necessary.

3.5 Shrink-Swell Soils Discussion

The soils recovered during our field investigation were tested and evaluated for their potential to expand or contract with moisture changes (typically termed shrink-swell). Shallow foundations and other on-grade features constructed on expansive soils at certain depths may be subjected to detrimental uplift or horizontal forces caused by the swelling of these soils as a result of an increase in the moisture content. Conversely, as these Clays lose moisture they may shrink, adversely affecting the foundations. The depth to which soils are normally affected by moisture changes extends from the ground surface to approximately 30 inches below existing grades in this area, depending on site topography and drainage characteristics.

The predominant soils within the project site are mapped by the USDA web-based Soil Survey as 2-Augusta-Urban Land and 37-Urban Land Soil Series. The Urban Land designation indicates that “man-placed” fill materials are likely present at this site. Our soil borings revealed Uncontrolled FILL materials at most of the boring locations that extended to a depth of 2 feet below existing grades. The naturally occurring soils encountered in the borings appear to be consistent with the Augusta Soil Series. These soils are described by the Soil Survey as possessing low expansive (shrink-swell) potential.

Based on the visual and laboratory classification test results, the shallow (upper 6 feet) soils are generally indicative of possessing low shrink-swell potential.

4.0 EVALUATION AND RECOMMENDATIONS

Our recommendations are based on the previously discussed project information, our interpretation of the soil test borings and laboratory data, and our observations during our site reconnaissance. If the proposed construction should vary from what was described, we request the opportunity to review our recommendations and make any necessary changes.

4.1 Clearing and Grading

The proposed construction area should be cleared by means of removing the existing topsoil, root mat, trees, asphalt, curbs, abandoned utilities, unsuitable Fill, and any other unsuitable materials. It is estimated that an initial cut of up to 8 inches in depth will be required to remove the topsoil and asphalt materials. This cut is expected to extend deeper in isolated areas to remove thicker topsoil materials or unsuitable soils, which become evident during the grading operations. It is recommended that the clearing operations extend laterally at least 5 feet beyond the perimeter of the proposed construction areas.

Uncontrolled FILL materials were observed as deep as 2 feet below existing site grades at most of the boring locations and may occur deeper elsewhere on the site within unexplored locations. Some of this Uncontrolled FILL material may potentially remain in place under pavement and slabs if approved by the Geotechnical Engineer (to be determined following the completion of test pits, proofroll, and compaction testing). However, all Uncontrolled FILL materials must be removed from below the base of all foundation excavations. Uncontrolled FILL materials are often considered unreliable due to the variable content and uncertainty regarding means of placement. As such, Uncontrolled FILL material left in place can be susceptible to settlement as a result of internal compression of the soils contained within. With regard to pavement, these settlements would be minimal (about 1 inch or less) and have minimal impact on performance, if any.

To reduce the potential for subgrade improvements (undercutting due to saturated soils in conjunction with heavy construction traffic), it is recommended that the grading operations be performed during the drier months of the year (historically April through November as indicated by the NCDC *Climate Atlas of the United States*). This should minimize these potential problems, although they may not be eliminated. If grading is attempted during the winter months, stabilization of wet soils should be anticipated. Methods to address wet soils may include excavation-substitution (undercutting and backfilling with structural fill) or the introduction of chemical additives (cement, lime, etc.). However, during the drier months of the year, wet soils could be dried by discing or implementing other drying procedures (stockpiling or spreading in thin lifts) to achieve moisture contents necessary to achieve adequate degrees of compaction. The project’s budget should include an allowance for subgrade improvements as described above.

The site should be graded to enhance surface water runoff to reduce the ponding of water. Ponding of water often results in softening of the near-surface soils. In the event of heavy rainfall within areas to receive fill, we recommend that the grading operations cease until the site has had a chance to dry. If the subgrade becomes deteriorated due to the above-mentioned or other reasons, difficulty maneuvering construction equipment and machinery is likely.

The undercut and backfill should be performed under the observation of a representative of **G E T Solutions, Inc.** who will evaluate the composition of the recovered soils. Recommendations concerning the subgrade improvements (as necessary) will be provided in the field following the testing procedures.

4.2 Subgrade Preparation

Following the clearing operation, the newly exposed subgrade soils should be densified with a large static drum roller. After the subgrade soils have been densified, they should be evaluated by a qualified geotechnical inspector for stability. Accordingly, the subgrade soils should be proofrolled to check for pockets of loose material hidden beneath a crust of better soil. Several passes should be made by a large rubber-tired roller or loaded dump truck over the construction areas. The number of passes will be determined in the field by the Geotechnical Engineer depending on the soils conditions. Any pumping and unstable areas observed during proofrolling (beyond the initial cut) should be undercut and/or stabilized at the directions of the Geotechnical Engineer.

In addition to the proofroll, several 3 to 4-foot deep test pits should be excavated within the proposed construction areas. The test pits are considered necessary to determine the thickness and composition of the Uncontrolled FILL materials and thus the suitability for it to remain in-place (beneath the slabs and pavements). The test pits should be performed under the observation of a representative **G E T Solutions, Inc.**, who will evaluate the composition of the recovered soils. In addition to the test pits, several compaction tests should be performed on the Uncontrolled FILL materials within the proposed construction areas to further substantiate the suitability of the existing Uncontrolled FILL material to remain beneath the ground supported slabs and pavements. It is possible that some subgrade improvements will be required to provide suitable soils for slab and pavement support. **Regardless, all Uncontrolled FILL materials must be removed from the base of all footing excavations.**

The extent of the subgrade improvements will be evaluated in the field during construction based on the outcome of the field testing procedures (field assessments of subgrade stability). In this regard, and in order to reduce the potential for subgrade improvements, care should be exercised during the grading and construction operations at the site. The project's budget should include an allowance for subgrade improvements (undercut and backfill with structural fill or additional aggregate base material).

4.3 Structural Fill and Placement

Following the approval of the natural subgrade soils by the Geotechnical Engineer, the placement of the fill required to establish the design grades may begin. Any material to be used for structural fill should be evaluated and tested by an independent testing laboratory prior to placement to determine if they are suitable for the intended use. Suitable structural fill material should consist of sand or gravel containing less than 25% by weight of fines (SP, SM, SW, GP, GW - with dimensions not to exceed 2 inches in diameter), having a liquid limit less than 25 and plastic limit less than 6, and should be free of rubble, organics, clay, debris and other unsuitable material.

All structural fill should be compacted to a dry density of at least 98% of the Standard Proctor maximum dry density, in accordance with ASTM Specification D 698. The moisture content of the structural fill should be within ±2 percentage points of the optimum moisture content at the time of placement. In general, the compaction should be accomplished by placing the fill in maximum 8 to 10-inch loose lifts and mechanically compacting each lift to at least the specified minimum dry density. A qualified inspector should perform field density tests on each lift as necessary to assure that adequate compaction is achieved.

Backfill material in utility trenches within the construction areas should consist of structural fill (as previously described), and should be compacted to at least 98% of ASTM Specification D 698. This fill should be placed in 4 to 6 inch loose lifts when hand compaction equipment is used.

If applicable, care should be used when operating heavy compacting equipment near existing structures to avoid transmission of the vibrations that could cause settlement damage or disturb occupants. In this regard, it is recommended that the vibratory roller remain at least 25 feet away from existing structures; these areas should be compacted with small, hand-operated compaction equipment.

4.4 Suitability of On-site Soils

Based on our visual classification, some of the soils classified as Silty SAND (SM) may be suitable for reuse as structural fill material in accordance with Section 4.3 of this report. However, moisture manipulation will likely be required due to shallow groundwater conditions encountered at this site. This manipulation will likely require stockpiling of wet soils and/or placing the material in thin layers. Further classification testing (natural moisture content, gradation analysis, and Proctor testing) should be performed in the field during construction to evaluate/confirm the suitability of excavated soils for reuse as fill. **The project's budget should include an allowance for imported structural fill.**

4.5 Shallow Foundation Design Recommendations

Provided that the construction procedures contained herein are properly performed, the proposed building can be supported by shallow foundations bearing upon firm natural soil or well-compacted structural fill material. **Uncontrolled FILL materials are not considered suitable for foundation support and must be removed from below all footings.** Uncontrolled FILL materials were encountered to a depth of 2 feet below existing grades at most of the boring locations. The Uncontrolled FILL material thicknesses may vary at other unexplored locations across the project site.

The foundations can be designed using a net allowable soil pressure of 2,000 pounds per square foot (psf). In using net pressures, the weight of the foundations and backfill over the foundations, including the weight of the floor slab, need not be considered. Hence, only loads applied at or above the finished floor need to be used for dimensioning the foundations.

In order to develop the recommended bearing capacity of 2,000 psf, the base of the footings should have a minimum embedment of 18 inches beneath finished grades and should have a minimum width of 24 inches. In addition, isolated square column footings (if deemed necessary) are recommended to be a minimum of 3 feet by 3 feet in area for bearing capacity consideration. The recommended 18-inch footing embedment is considered sufficient to provide adequate cover against frost penetration to the bearing soils.

4.6 Settlements

It is estimated that, with proper site preparation, the maximum resulting post-construction total settlement of the proposed building foundations should be up to 1 inch. The maximum differential settlement magnitude is expected to be less than ½ -inch between adjacent footings (wall footings and column footings of widely varying loading conditions). The settlements were estimated on the basis of the results of the field penetration tests and laboratory testing. Careful field control will contribute substantially towards minimizing the settlements.

4.7 Foundation Excavations

In preparation for shallow foundation support, the footing excavations should extend into firm natural soil or well-compacted structural fill. **Again, Uncontrolled FILL materials are not considered suitable for foundation support and must be removed from below all footings.** Uncontrolled FILL materials were encountered to a depth of 2 feet below existing grades at the boring locations and may extend deeper at other unexplored locations across the project site (greater thicknesses may be encountered at the filled-in, previously existing pool). The foundation bearing capacities should be verified in the field during construction by means of performing a footing inspection for each foundation structure. At that time, the Geotechnical Engineer should also explore the extent of excessively loose, soft, or otherwise unsuitable material within the exposed excavations. Also, at the time of footing observations, the Geotechnical Engineer should advance hand auger borings or use a hand penetration device in the bases of the foundation excavations to verify that the recovered soils are consistent with those documented in this report. The necessary depth of penetration will be established during the subgrade observations.

If pockets of unsuitable soils requiring undercut are encountered in the footing excavations, the proposed footing elevation should be re-established by means of backfilling with “flowable fill” or a suitable structural fill material compacted to a dry density of at least 98% of the Standard Proctor maximum dry density (ASTM D 698), as described in Section 4.3 of this report, prior to concrete placement. This construction procedure will provide for a net allowable bearing capacity of 2,000 psf.

Immediately prior to reinforcing steel placement, it is suggested that the bearing surfaces of all footing and floor slab areas be compacted using hand operated mechanical tampers, to a dry density of at least 98% of the Standard Proctor maximum dry density (ASTM D 698) as tested to a depth of 12 inches, for bearing capacity considerations. In this manner, any localized areas, which have been loosened by excavation operations, should be adequately re-compacted. The compaction testing in the base of the footings may be waived by the Geotechnical Engineer, where firm bearing soils are observed during the footing inspections.

Soils exposed in the bases of all satisfactory foundation excavations should be protected against any detrimental change in condition such as from physical disturbance, rain or frost. Surface run-off water should be drained away from the excavations and not be allowed to pond. If possible, all footing concrete should be placed the same day the excavation is made. If this is not possible, the footing excavations should be adequately protected.

4.8 Slab-on-Grade Design Recommendations

Floor slabs (possibly with turn down edges around the perimeter) may be constructed as slab-on-grade members provided the previously recommended earthwork activities and evaluations are carried out properly. It is recommended that all ground floor slabs be directly supported by at least a 4-inch layer of relatively clean, compacted, poorly graded sand (SP) or gravel (GP) with less than 5% passing the No. 200 Sieve (0.074 mm). The purpose of the 4-inch layer is to act as a capillary barrier and equalize moisture conditions beneath the slab. A subgrade modulus of 125 pounds per square inch per inch (psi/in) should be used when analyzing the slabs under this construction procedure. Alternately, the concrete slabs may be directly supported by a 6 to 8-inch layer of well- compacted aggregate base stone (VDOT 21A or 21B); a subgrade modulus of 125 pounds per square inch per inch (psi/in) should be used when analyzing the slabs under this alternate construction procedure.

It is also recommended that the floor slab bearing soils be covered by a vapor barrier or retarder in order to minimize the potential for floor dampness, which can affect the performance of glued tile and carpet. Generally, use a vapor retarder for minimal vapor resistance protection below the slab on grade. When floor finishes, site conditions, or other considerations require greater vapor resistance protection; consideration should be given to using a vapor barrier. Selection of a vapor retarder or barrier should be made by the architect based on project requirements.

4.9 Pavement Design Recommendations

Based on the results of the laboratory test program, the collected bulk soil samples have an average soaked CBR value of 15.8. The average soaked CBR value was multiplied by a factor of two-thirds to determine a design CBR value. The two-thirds factor provides the necessary safety margins to compensate for the specified time of soaking not capturing the minimum CBR strength of some soils, for any non-uniformity of the soil, and for any low test results not considered when computing the average. As such, a design CBR value of 10.5 should be used for designing pavement sections. The comprehensive test results are provided in Appendix VI. A modulus of subgrade reaction (k) value of 125 pounds per square inch per inch (psi/in) can be used in structurally designing rigid pavement sections.

Table IV on the following page includes typical minimum pavement design recommendations for pavement areas that may be included with this project.

Table IV - Typical New Pavement Sections

Section	Hot Mix Asphalt		Concrete[(1)]	Aggregate Base[(2)]	Subgrade[(3)]
	Surface	Base			
Light Duty Flexible (Parking Bays)	2”	-	-	8”	Stable and Compacted
Heavy Duty Flexible (Access Road/Drive Isles)	2”	3”	-	8”	Stable and Compacted
Heavy Duty (Dumpster Pads)	-	-	6”	8”	Stable and Compacted

Notes: (1) Minimum flexural strength of 650 psi at 28 days.
(2) VDOT No. 21A or 21B stone compacted to a dry density of at least 100% of the Standard Proctor maximum dry density (ASTM D 698).
(3) Compacted to a dry density of at least 100% of the Standard Proctor maximum dry density (ASTM D 698)

Actual pavement section thicknesses should be provided by the design Civil Engineer based on traffic loads, volume, and the owners design life requirements. The above sections correspond to thickness representative of typical local construction practices and as such periodic maintenance should be anticipated. All pavement material and construction procedures should conform to VDOT requirements.

Following pavement rough grading operations, the exposed subgrade should be observed under proofrolling. This proofrolling should be accomplished with a fully loaded dump truck or 7 to 10 ton drum roller to check for pockets of soft material hidden beneath a thin crust of better soil. Any unsuitable materials thus exposed should be removed and replaced with a well-compacted material. The inspection of these phases should be performed by the Geotechnical Engineer or his representative. The subgrade soils are likely to be unstable at the time of construction and some ground improvements are likely. As such, the project’s budget should include a contingency to accommodate the potential ground improvements.

Where excessively unstable subgrade soils are observed during proofrolling and/or fill placement, it is expected that these weak areas can be stabilized by means of thickening the base course layer by 4 to 6 inches, adding 12 inches of Structural Fill subbase, or lining the exposed subgrade with geotextile fabric (Mirafi HP270 or equivalent). These alternatives are to be addressed by the Geotechnical Engineer during construction, if necessary, who will recommend the most economical approach at the time.

4.10 Seismic Evaluation

Based on our experience in the vicinity of the project site and the composition of the soils recovered within the upper 25 feet (maximum explored depth during feasibility study) at the boring locations, it is our opinion that the site characteristics are indicative of a Site Class “D” in accordance with Table 20.3-1 of ASCE 7-10 as referenced by the 2015 International Building Code (IBC); however, the seismic evaluation requires soils information associated with the upper 100 feet. If the site classification is critical to the structural design, it will be necessary to perform a 100-foot deep Cone Penetration Test (SCPTu) boring with shear wave velocity testing to substantiate this site classification.

5.0 CONSTRUCTION CONSIDERATIONS

5.1 Anticipated Excavation Characteristics

Based on the results of this exploration, varying soil conditions and compositions are expected to be encountered throughout the project limits. Open-cut excavations will extend through natural soils that are considered to be relatively “clean” (i.e. soil that is relatively free of deleterious debris that may hinder excavation or installation). Debris typically considered unsuitable consist of wood, glass, organics, plastics, coal, brick or any other material larger than 2 inches in diameter. Based on these characteristics it is anticipated that some of the shallow subsurface materials encountered within the project alignment may be reusable as backfill. Soils containing appreciable amounts of deleterious debris should be discarded; however, an effort should be made during excavation to segregate potentially suitable in-situ soils for reuse. Information pertaining to backfill criteria was provided previously in Section 4.3.

5.2 Excavation Stability

The shallow subsurface within the project limits is comprised of clayey and granular soils; however, the Contractor should anticipate these soils to have relatively little cohesion and have a high potential for caving. Additionally, water seepage at varying elevations should be expected within the side walls of the open cut areas, increasing the potential for caving. Based on these mentioned characteristics, it is recommended that all subsurface soils be considered Type C in accordance with Occupational Safety and Health Administration (OSHA) criteria.

Temporary Slopes

In Federal Register, Volume 54, No. 209 (October, 1989), the United States Department of Labor, Occupational Safety and Health Administration (OSHA) amended its “Construction Standards for Excavations, 29 CFR, part 1926, Subpart P”. This document was issued to better ensure the safety of workmen entering trenches or excavations. It is mandated by this federal regulation that all excavations, whether they be utility trenches, basement excavations, or footing excavations, be constructed in accordance with the new (OSHA) guidelines. It is our understanding that these regulations are being strictly enforced and if they are not closely followed, the owner and the Contractor could be liable for substantial penalties.

Temporary slopes may not be a feasible option. The Contractor is solely responsible for designing and constructing stable, temporary excavations and should shore, slope, or bench the sides of the excavations 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.

Where temporary slopes are not feasible, shoring by means of sheeting and/or trench shields may be appropriate. Where the stability of adjoining structures, pavements, or other improvements is endangered by excavation operations, support systems such as shoring, bracing, or underpinning may be required to provide structural stability. Shoring, bracing, or underpinning required for this project (if required) should be designed by a Professional Engineer.

Shoring

Shoring design and installation should be the responsibility of the Contractor. Shoring systems required for this project should be designed by a Professional Engineer. Shoring systems should be designed to provide positive restraint of trench walls in an effort to protect against lateral deformation that may result in ground cracks, settlement, and/or other ground movements that may affect adjacent underground utilities and pavements as well as surface improvements. The Contractor should be made aware of this potential condition in order that preventative measures can be implemented or repair measures provided for.

Depending on the shoring system used, the removal process may create voids along the walls of the excavations. If these voids are left in place and are significant, backfill and/or the retained soil may shift laterally resulting in settlement of overlying structures/pavements. As such, care should be taken to remove the shoring systems and backfill the trenches in a manner as to not create these voids.

In all cases, the Contractor should select an excavation and/or shoring scheme that will protect adjacent and overlying improvements, including below grade utilities.

We are providing this information solely as a service to our client. **G E T Solutions, Inc**. is not assuming responsibility for construction site safety or the Contractor's activities; such responsibility is not being implied and should not be inferred.

5.3 Dewatering

It is expected that dewatering will be required for excavations that extend near or below the existing groundwater table (approximate depth of 5 to 6 feet or shallower). Dewatering above the groundwater level could probably be accomplished by pumping from sumps. Dewatering at depths below the groundwater level will require well pointing and possibly shoring. Since temporary dewatering will impact construction and be dependent on construction methods and scheduling, we recommend the Contractor be solely responsible for the design, installation, maintenance, and performance of all temporary dewatering systems. Where shoring is employed, the dewatering system should be compatible with the type of shoring to be used. We recommend the Contractor verify groundwater conditions and evaluate dewatering requirements prior to construction.

Lowering the groundwater table during dewatering activities will result in an increase in effective stresses and may induce settlements of the soils underlying adjacent structures/pavements. Additionally, hydraulic compaction of predominately granular soils (e.g. SM soils) should be anticipated as a result of lowering the groundwater table. We recommend that the dewatering be performed such that the groundwater level is lowered no more than approximately 5 feet below the proposed excavation depth. It may be advantageous to install settlement monuments in areas where dewatering by means of well pointing is required.

It would be advantageous to construct all fills early in the construction. If this is not accomplished, disturbance of the existing site drainage could result in collection of surface water in some areas, thus rendering these areas wet and very loose. Temporary drainage ditches should be employed by the contractor to accentuate drainage during construction. If water collects in foundation excavations, it will be necessary to remove the water from the excavation, remove the saturated soils, and re-test the adequacy of the bearing surface soils to support the design bearing pressure prior to concrete placement.

Establishing a system of drainage ditches to carry surface and shallow groundwater away from the constructions areas should reduce grading costs. No permanent subsurface drainage systems are needed for this project.

5.4 Site Utility Installation

The base of the utility trenches should be observed by a qualified inspector prior to the pipe placement to verify the suitability of the bearing soils. It is expected that the utilities will be located above or near the groundwater level (at the time of this reporting 5 to 6 feet below the existing site grades), bearing in moist to wet cohesive and granular soils. In these instances, the bearing soils may require some stabilization to provide suitable bedding. This stabilization is commonly accomplished by adding 12 inches or more of bedding stone (Type VDOT No. 57). The resulting excavations should be backfilled with structural fill, as described in Section 4.3 of this report. As mentioned previously, some of the shallow subsurface materials encountered within the project site may be suitable for reuse as backfill. Soils containing appreciable amounts of fines or deleterious debris should be discarded. Imported fill should be included in the construction budget for backfilling the utility excavations within the construction areas.

6.0 REPORT LIMITATIONS

The recommendations submitted in this report are based on the available soil information obtained by **G E T Solutions, Inc.** and the information supplied by the client and their consultants for the proposed project. If there are any revisions to the plans for this project or if deviations from the subsurface conditions noted in this report are encountered during construction, **G E T Solutions, Inc.** should be notified immediately to determine if changes in our recommendations are required. If **G E T Solutions, Inc.** is not retained to perform these functions, **G E T Solutions, Inc.** cannot be responsible for the impact of those conditions on the geotechnical recommendations for the project.

The Geotechnical Engineer warrants that the findings, recommendations, specifications or professional advice contained herein have been made in accordance with generally accepted professional geotechnical engineering practices in the local area. No other warranties are implied or expressed.

As the plans and specifications are completed, the Geotechnical Engineer should be provided the opportunity to review the final design plans and specifications to assure our engineering recommendations have been properly incorporated into the design documents in order that the earthwork recommendations may be properly interpreted and implemented. At that time, it may be necessary to submit supplementary recommendations. This report has been prepared for the exclusive use of Work Program Architects and their consultants for the specific application to the proposed Mary Jackson Neighborhood Center project in Hampton, Virginia.

APPENDICES

I. BORING LOCATION PLAN

II. CLASSIFICATION SYSTEM FOR SOIL EXPLORATION

III. SUMMARY OF LABORATORY CLASSIFICATION RESULTS

IV. BORING LOGS

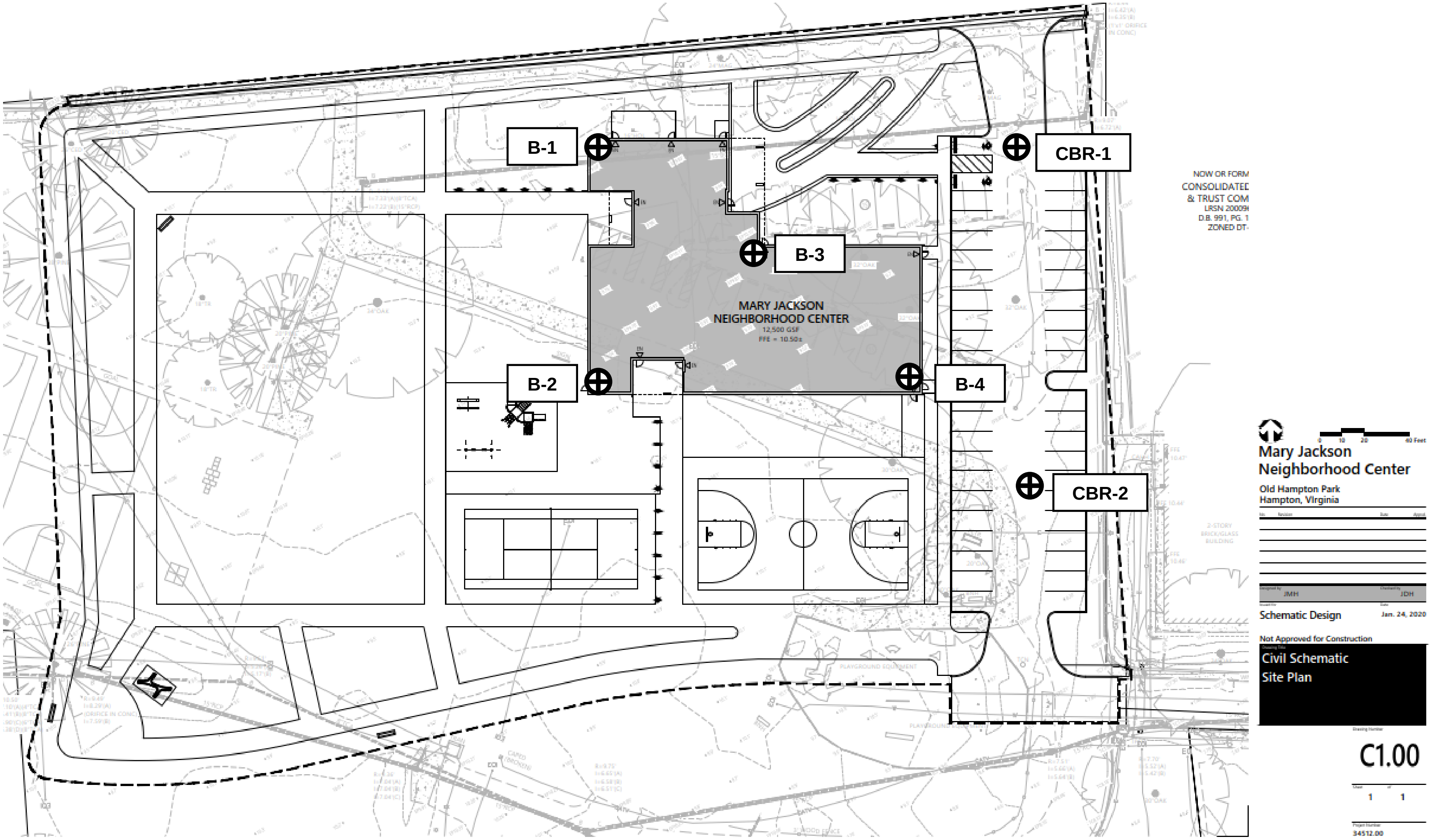
V. GENERALIZED SOIL PROFILE

VI. CBR TESTING RESULTS

APPENDIX I

BORING LOCATION PLAN

Locations are approximate



Boring Location Plan

GET Solutions, Inc.
Geotechnical • Environmental • Testing

Project: Mary Jackson Neighborhood Center
Hampton, Virginia
Project No: WM20-117G
Client: Work Program Architects

Scale: Not To Scale
Date: 5/1/2020
Plot By: JW

APPENDIX II

CLASSIFICATION SYSTEM FOR SOIL EXPLORATION

GET
Solutions, Inc.

Virginia Beach
5465 Greenwich Road
Virginia Beach, VA 23462
(757) 518-1703

Williamsburg
701 Alexander Lee Parkway
Williamsburg, Virginia 23185
(757) 564-6452

Elizabeth City
504 East Elizabeth St. Suite 2
Elizabeth City, NC 27909
(252) 335-9765

Jacksonville
415-A Western Boulevard
Jacksonville, NC 28546
(910) 478-9915

CLASSIFICATION SYSTEM FOR SOIL EXPLORATION

Standard Penetration Test (SPT), N-value

Standard Penetration Tests (SPT) were performed in the field in general accordance with ASTM D 1586. The soil samples were obtained with a standard 1.4" I.D., 2" O.D., 30" long split-spoon sampler. The sampler was driven with blows of a 140 lb. hammer falling 30 inches. The number of blows required to drive the sampler each 6-inch increment (4 increments for each soil sample) of penetration was recorded and is shown on the boring logs. The sum of the second and third penetration increments is termed the SPT N-value.

NON COHESIVE SOILS

(SILT, SAND, GRAVEL and Combinations)

Relative Density

Very Loose	4 blows/ft. or less
Loose	5 to 10 blows/ft.
Medium Dense	11 to 30 blows/ft.
Dense	31 to 50 blows/ft.
Very Dense	51 blows/ft. or more

Particle Size Identification

Boulders	8 inch diameter or more	
Cobbles	3 to 8 inch diameter	
Gravel	Coarse	1 to 3 inch diameter
	Medium	$^{1}/_{2}$ to 1 inch diameter
	Fine	$^{1}/_{4}$ to $^{1}/_{2}$ inch diameter
Sand	Coarse	2.00 mm to $^{1}/_{4}$ inch (diameter of pencil lead)
	Medium	0.42 to 2.00 mm (diameter of broom straw)
	Fine	0.074 to 0.42 mm (diameter of human hair)
Silt		0.002 to 0.074 mm (cannot see particles)

CLASSIFICATION SYMBOLS (ASTM D 2487 and D 2488)

Coarse Grained Soils

More than 50% retained on No. 200 sieve

GW - Well-graded Gravel
GP - Poorly graded Gravel
GW-GM - Well-graded Gravel w/Silt
GW-GC - Well-graded Gravel w/Clay
GP-GM - Poorly graded Gravel w/Silt
GP-GC - Poorly graded Gravel w/Clay
GM - Silty Gravel
GC - Clayey Gravel
GC-GM - Silty, Clayey Gravel
SW - Well-graded Sand
SP - Poorly graded Sand
SW-SM - Well-graded Sand w/Silt
SW-SC - Well-graded Sand w/Clay
SP-SM - Poorly graded Sand w/Silt
SP-SC - Poorly graded Sand w/Clay
SM - Silty Sand
SC - Clayey Sand
SC-SM - Silty, Clayey Sand

Fine-Grained Soils

50% or more passes the No. 200 sieve

CL - Lean Clay
CL-ML - Silty Clay
ML - Silt
OL - Organic Clay/Silt

Liquid Limit 50% or greater

CH - Fat Clay
MH - Elastic Silt
OH - Organic Clay/Silt

Highly Organic Soils

PT - Peat

COHESIVE SOILS

(CLAY, SILT and Combinations)

Consistency

Very Soft	2 blows/ft. or less
Soft	3 to 4 blows/ft.
Medium Stiff	5 to 8 blows/ft.
Stiff	9 to 15 blows/ft.
Very Stiff	16 to 30 blows/ft.
Hard	31 blows/ft. or more

Relative Proportions

Descriptive Term	Percent
Trace	0-5
Few	5-10
Little	15-25
Some	30-45
Mostly	50-100

Strata Changes

In the column "Description" on the boring log, the horizontal lines represent approximate strata changes.

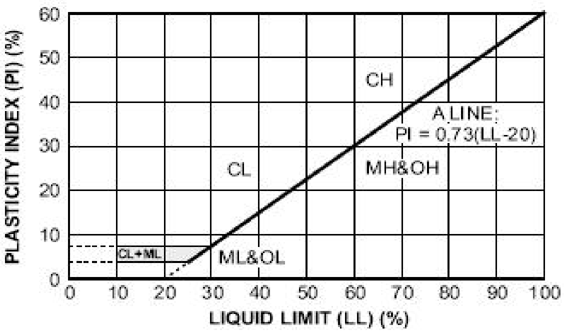
Groundwater Readings

Groundwater conditions will vary with environmental variations and seasonal conditions, such as the frequency and magnitude of rainfall patterns, as well as tidal influences and man-made influences, such as existing swales, drainage ponds, underdrains and areas of covered soil (paved parking lots, side walks, etc.).

Depending on percentage of fines (fraction smaller than No. 200 sieve size), coarse-grained soils are classified as follows:

Less than 5 percent	GW, GP, SW,SP
More than 12 percent	GM, GC, SM, SC
5 to 12 percent	Borderline cases requiring dual symbols

Plasticity Chart



APPENDIX III

SUMMARY OF LABORATORY CLASSIFICATION RESULTS

GET
Solutions, Inc.

SUMMARY OF LABORATORY RESULTS

GET Solutions, Inc.

CLIENT Work Program Architects

PROJECT NAME Mary Jackson Neighborhood Center

PROJECT NUMBER WM20-117G

PROJECT LOCATION Hampton, Virginia

Borehole	Depth	Liquid Limit	Plastic Limit	Plasticity Index	Maximum Size (mm)	%<#200 Sieve	Class-ification	Water Content (%)	Dry Density (pcf)	Satur-ation (%)	Void Ratio
B-2	3.0	23	15	8	0.075	49	SC	17.0			
B-2	9.0	51	30	21	0.075	40	SM	70.0			
B-3	7.0	53	28	25	0.075	65	CH	36.0			
B-3	9.0	65	39	26	0.075	59	MH	54.0			
CBR-1	3.0							17.0			
CBR-1	5.0							17.0			
CBR-1	7.0							15.0			
CBR-1	9.0							18.0			
CBR-2	3.0							15.0			
CBR-2	5.0							18.0			
CBR-2	7.0							25.0			
CBR-2	9.0							56.0			

APPENDIX IV

BORING LOGS

GET Solutions, Inc.
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RECORD OF SUBSURFACE EXPLORATION

Virginia Beach	Williamsburg	Elizabeth City	Jacksonville
5465 Greenwich Road	701 Alexander Lee Parkway	106 Capital Trace Unit E	415-A Western Blvd
Virginia Beach, VA 23642	Williamsburg, VA 23185	Elizabeth City, NC 27909	Jacksonville, NC 28546
757-518-1703	757-564-6452	252-335-9765	910-478-9915

BORING ID
B-1

PROJECT NAME: **Mary Jackson Neighborhood Center**
CLIENT: **Work Program Architects**
PROJECT LOCATION: **Hampton, Virginia**
BORING LOCATION: **See Attached Boring Location Plan**
DRILLING METHOD(S): **Rotary wash "mud"**
GROUNDWATER*: INITIAL (ft) ▽: **6** AFTER ____ HOURS (ft) ▼: ____ CAVE-IN (ft): ____
The initial groundwater readings are not intended to indicate the static groundwater level.

PROJECT NUMBER: **WM20-117G**
SURFACE ELEVATION (MSL) (ft): **10**
LOGGED BY: **T. Vaughn**
DATE STARTED: **4/3/2020**
DATE COMPLETED: **4/3/2020**
DRILLER: **GET Solutions, Inc.**

TEST RESULTS
Plastic Limit X———X Liquid Limit
Water Content - ●
Penetration - ▨
10 20 30 40 50 60 70

Elevation (ft)	Depth (ft)	STRATA DESCRIPTION	Sample ID	Sample Type	Sample Recovery (in.)	Blow Counts (N-Values)	%<#200
	0.5	6-in of Topsoil					
	2.0	Gray-brown, moist, Clayey fine to medium SAND (SC), contains fibrous organic material, very loose	1	⧗	24	2-2-2-3 (4)	
	4.0	Light brown, moist, Silty fine to medium SAND (SM), loose	2	⧗	24	2-4-4-6 (8)	
5	5						
▽	6.0	Brown and gray, moist, Silty fine to coarse SAND (SM) with trace Clay, loose	3	⧗	24	4-6-4-3 (10)	
	8.0	Mottled, gray and orange-brown, wet, Clayey fine to coarse SAND (SC), loose	4	⧗	24	3-3-3-3 (6)	
		Orange-brown, wet, Silty fine to medium SAND (SM) with trace Clay, contains marine shell fragments, very loose to loose	5	⧗	20	3-3-3-2 (6)	
0	10						
	12.5		6	⧗	24	2-2-2-3 (4)	
		Light brown and light gray, wet, Silty fine to coarse SAND (SM), contains marine shell fragments, loose	7	⧗	24	3-3-3-4 (6)	
-5	15						
	16.5						
		Dark gray, wet, Silty fine to coarse SAND (SM), contains marine shell fragments, loose, "Yorktown Formation"	8	⧗	24	4-5-4-6 (9)	
-10	20						
	21.5						
		Dark gray, wet, Silty fine to medium SAND (SM), contains marine shell fragments, loose, "Yorktown Formation"	9	⧗	24	3-3-4-5 (7)	
-15	25						
	25.0	Boring terminated at 25 feet below existing grade.					

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

Sample Type(s):
⧗ SPT - Standard Penetration Test

Notes: Boring elevation was estimated from elevations provided on the civil drawing.

RECORD OF SUBSURFACE EXPLORATION

GET Solutions, Inc.
Geotechnical • Environmental • Testing

Virginia Beach
5465 Greenwich Road
Virginia Beach, VA 23642
757-518-1703

Williamsburg
701 Alexander Lee Parkway
Williamsburg, VA 23185
757-564-6452

Elizabeth City
106 Capital Trace Unit E
Elizabeth City, NC 27909
252-335-9765

Jacksonville
415-A Western Blvd
Jacksonville, NC 28546
910-478-9915

BORING ID
B-2

PROJECT NAME: **Mary Jackson Neighborhood Center**
CLIENT: **Work Program Architects**
PROJECT LOCATION: **Hampton, Virginia**
BORING LOCATION: **See Attached Boring Location Plan**
DRILLING METHOD(S): **Rotary wash "mud"**
GROUNDWATER*: INITIAL (ft) ▽: **6** AFTER ____ HOURS (ft) ▼: ____ CAVE-IN (ft) ⊊: ____
The initial groundwater readings are not intended to indicate the static groundwater level.

PROJECT NUMBER: **WM20-117G**
SURFACE ELEVATION (MSL) (ft): **10**
LOGGED BY: **T. Vaughn**
DATE STARTED: **4/3/2020**
DATE COMPLETED: **4/3/2020**
DRILLER: **GET Solutions, Inc.**

Elevation (ft)	Depth (ft)	STRATA DESCRIPTION	Strata Legend	Sample ID	Sample Type	Sample Recovery (in.)	Blow Counts (N-Values)	%<#200	TEST RESULTS (Plastic Limit X—X Liquid Limit; Water Content - ●; Penetration - ▨) 10 20 30 40 50 60 70
	0.7	8-in of Topsoil							
	2.0	Dark brown, moist, Silty fine to medium SAND (SM), contains fibrous organic material and brick fragments, loose, "FILL"		1	⧗	22	3-4-2-2 (6)		
	4.0	Gray, moist, Clayey fine to medium SAND (SC), loose		2	⧗	17	2-3-4-4 (7)	49	17 15 23
5	5								
▽	6.0	Light brown, moist, Silty fine to medium SAND (SM) with trace fine Gravel, loose		3	⧗	24	2-3-3-4 (6)		
	8.0	Orange-brown, wet, Clayey fine to coarse SAND (SC) with trace fine Gravel, loose		4	⧗	24	3-3-3-3 (6)		
		Orange-brown, wet, Silty fine to coarse SAND (SM) with trace Clay, contains marine shell fragments, very loose		5	⧗	18	0-0-0-0 (0)	40	70 30 51
0	10								
	12.5			6	⧗	24	2-2-2-3 (4)		
		Light brown, wet, Silty fine to coarse SAND (SM), contains marine shell fragments, loose		7	⧗	24	2-3-3-3 (6)		
-5	15								
	16.5								
		Gray, wet, Silty fine to coarse SAND (SM), contains marine shell fragments, loose, "Yorktown Formation"		8	⧗	24	3-4-5-4 (9)		
-10	20								
	21.5								
		Dark gray, wet, Silty fine to medium SAND (SM), contains marine shell fragments, loose, "Yorktown Formation"		9	⧗	24	2-3-3-6 (6)		
-15	25	25.0							
		Boring terminated at 25 feet below existing grade.							

Sample Type(s):
⧗ SPT - Standard Penetration Test

Notes: Boring elevation was estimated from elevations provided on the civil drawing.

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

RECORD OF SUBSURFACE EXPLORATION

Virginia Beach	Williamsburg	Elizabeth City	Jacksonville
5465 Greenwich Road	701 Alexander Lee Parkway	106 Capital Trace Unit E	415-A Western Blvd
Virginia Beach, VA 23642	Williamsburg, VA 23185	Elizabeth City, NC 27909	Jacksonville, NC 28546
757-518-1703	757-564-6452	252-335-9765	910-478-9915

BORING ID
B-3

PROJECT NAME: **Mary Jackson Neighborhood Center**
CLIENT: **Work Program Architects**
PROJECT LOCATION: **Hampton, Virginia**
BORING LOCATION: **See Attached Boring Location Plan**
DRILLING METHOD(S): **Rotary wash "mud"**
GROUNDWATER*: INITIAL (ft) ▽: **6** AFTER ____ HOURS (ft) ▼: ____ CAVE-IN (ft): ____
The initial groundwater readings are not intended to indicate the static groundwater level.

PROJECT NUMBER: **WM20-117G**
SURFACE ELEVATION (MSL) (ft): **10**
LOGGED BY: **T. Vaughn**
DATE STARTED: **4/3/2020**
DATE COMPLETED: **4/3/2020**
DRILLER: **GET Solutions, Inc.**

Elevation (ft)	Depth (ft)	STRATA DESCRIPTION	Strata Legend	Sample ID	Sample Type	Sample Recovery (in.)	Blow Counts (N-Values)	%<#200	Plastic Limit	Water Content	Liquid Limit
	0.7	8-in of Topsoil									
	2.0	Brown, moist, Silty fine to medium SAND (SM), contains fibrous organic material, loose		1	⧗	24	2-3-4-4 (7)				
	4.0	Light brown, moist, Silty fine to medium SAND (SM), loose		2	⧗	20	2-3-3-4 (6)				
5	5 6.0	Light brown, moist, Silty fine to coarse SAND (SM) with trace fine Gravel, loose		3	⧗	19	2-3-4-2 (7)				
▽	8.0	Mottled, orange-brown and gray, wet, Sandy fat CLAY (CH), soft		4	⧗	24	2-2-2-2 (4)	65	28	36	53
0	10 10.0	Mottled, orange-brown and gray, wet, Sandy Elastic SILT (MH), medium stiff		5	⧗	16	3-3-3-3 (6)	59	39	54	65
	12.5	Orange-brown, wet, Silty fine to medium SAND (SM) with trace Clay, contains marine shell fragments, loose		6	⧗	24	2-3-2-2 (5)				
-5	15 16.5	Light brown and light gray, wet, Silty fine to coarse SAND (SM), contains marine shell fragments, loose		7	⧗	24	3-4-3-3 (7)				
-10	20 21.5	Dark gray, wet, Silty fine to coarse SAND (SM), contains marine shell fragments, loose, "Yorktown Formation"		8	⧗	24	4-4-4-5 (8)				
-15	25 25.0	Dark gray, wet, Silty fine to medium SAND (SM), contains marine shell fragments, loose, "Yorktown Formation"		9	⧗	24	3-3-5-7 (8)				
		Boring terminated at 25 feet below existing grade.									

TEST RESULTS
Plastic Limit X———X Liquid Limit
Water Content - ●
Penetration - ▨
10 20 30 40 50 60 70

Sample Type(s):
⧗ SPT - Standard Penetration Test

Notes: Boring elevation was estimated from elevations provided on the civil drawing.

This information pertains only to this boring and should not be interpreted as being indictive of the site.

PAGE 1 OF 1

RECORD OF SUBSURFACE EXPLORATION

Virginia Beach	Williamsburg	Elizabeth City	Jacksonville
5465 Greenwich Road	701 Alexander Lee Parkway	106 Capital Trace Unit E	415-A Western Blvd
Virginia Beach, VA 23642	Williamsburg, VA 23185	Elizabeth City, NC 27909	Jacksonville, NC 28546
757-518-1703	757-564-6452	252-335-9765	910-478-9915

BORING ID
B-4

PROJECT NAME: **Mary Jackson Neighborhood Center**

CLIENT: **Work Program Architects**

PROJECT LOCATION: **Hampton, Virginia**

BORING LOCATION: **See Attached Boring Location Plan**

DRILLING METHOD(S): **Rotary wash "mud"**

GROUNDWATER*: INITIAL (ft) ▽: **6** AFTER ____ HOURS (ft) ▼: ___ CAVE-IN (ft) ⊊: ___

The initial groundwater readings are not intended to indicate the static groundwater level.

PROJECT NUMBER: **WM20-117G**

SURFACE ELEVATION (MSL) (ft): **10**

LOGGED BY: **T. Vaughn**

DATE STARTED: **4/3/2020**

DATE COMPLETED: **4/3/2020**

DRILLER: **GET Solutions, Inc.**

TEST RESULTS

Plastic Limit X———X Liquid Limit

Water Content - ●

Penetration - ▨

10 20 30 40 50 60 70

Elevation (ft)	Depth (ft)	STRATA DESCRIPTION	Strata Legend	Sample ID	Sample Type	Sample Recovery (in.)	Blow Counts (N-Values)	%<#200
	0.1	1-in of Asphalt		1	⧗	14	3-3-3-4 (6)	
	0.7	7-in of Aggregate Base						
	2.0	Brown, moist, Silty fine to medium SAND (SM), loose						
		Brown, moist, Silty fine to coarse SAND (SM) with trace fine Gravel, loose		2	⧗	12	4-5-5-6 (10)	
5	5			3	⧗	16	3-4-3-4 (7)	
▽	6.0	Orange-brown, wet, Silty fine to coarse SAND (SM) with trace fine Gravel and trace Clay, loose		4	⧗	19	2-3-2-3 (5)	
	8.0	Orange-brown, wet, Silty fine to coarse SAND (SM), contains marine shell fragments, very loose to loose		5	⧗	24	2-2-2-2 (4)	
0	10			6	⧗	24	2-2-3-2 (5)	
	12.5	Light brown and light gray, wet, Silty fine to coarse SAND (SM), contains marine shell fragments, loose		7	⧗	24	2-3-4-4 (7)	
-5	15							
	16.5	Dark gray, wet, Silty fine to coarse SAND (SM), contains marine shell fragments, loose, "Yorktown Formation"		8	⧗	24	3-4-4-3 (8)	
-10	20							
	21.5	Dark gray, wet, Silty fine to medium SAND (SM), contains marine shell fragments, loose, "Yorktown Formation"		9	⧗	24	3-4-4-6 (8)	
-15	25							
	25.0	Boring terminated at 25 feet below existing grade.						

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

Sample Type(s):

⧗ SPT - Standard Penetration Test

Notes: Boring elevation was estimated from elevations provided on the civil drawing.

RECORD OF SUBSURFACE EXPLORATION

GET Solutions, Inc.
Geotechnical • Environmental • Testing

Virginia Beach
5465 Greenwich Road
Virginia Beach, VA 23642
757-518-1703

Williamsburg
701 Alexander Lee Parkway
Williamsburg, VA 23185
757-564-6452

Elizabeth City
106 Capital Trace Unit E
Elizabeth City, NC 27909
252-335-9765

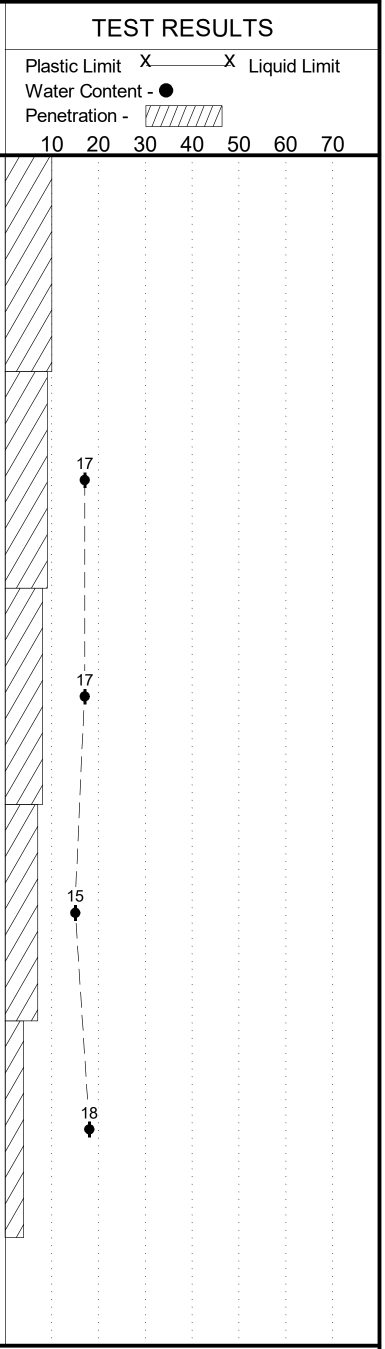
Jacksonville
415-A Western Blvd
Jacksonville, NC 28546
910-478-9915

BORING ID
CBR-1

PROJECT NAME: **Mary Jackson Neighborhood Center**
CLIENT: **Work Program Architects**
PROJECT LOCATION: **Hampton, Virginia**
BORING LOCATION: **See Attached Boring Location Plan**
DRILLING METHOD(S): **Rotary wash "mud"**
GROUNDWATER*: INITIAL (ft) ▽: **5** AFTER ____ HOURS (ft) ▼: ____ CAVE-IN (ft) ⊊: ____
The initial groundwater readings are not intended to indicate the static groundwater level.

PROJECT NUMBER: **WM20-117G**
SURFACE ELEVATION (MSL) (ft): **9**
LOGGED BY: **T. Vaughn**
DATE STARTED: **4/3/2020**
DATE COMPLETED: **4/3/2020**
DRILLER: **GET Solutions, Inc.**

Elevation (ft)	Depth (ft)	STRATA DESCRIPTION	Strata Legend	Sample ID	Sample Type	Sample Recovery (in.)	Blow Counts (N-Values)	%<#200	TEST RESULTS
		0.2 2.5-in of Asphalt							
		7-in of Aggregate Base 0.8							
		Dark gray, moist, Silty fine to coarse SAND (SM) with trace fine Gravel and Clay, loose, "FILL" 2.0		1	SPT	14	3-5-5 (10)		
5		Brown, moist, Clayey fine to medium SAND (SC), loose 4.0		2	SPT	22	5-5-4-4 (9)		17
▽	5	Brown, moist to wet, Silty fine to medium SAND (SM), loose Wet below 5-ft 6.0		3	SPT	19	3-4-4-4 (8)		17
		Brown, wet, Silty fine to coarse SAND (SM) with trace fine to coarse Gravel, loose 8.0		4	SPT	20	2-3-4-3 (7)		15
0		Light gray and brown, wet, Silty fine to coarse SAND (SM) with trace fine Gravel, very loose		5	SPT	24	2-2-2-2 (4)		18
	10	10.0 Boring terminated at 10 feet below existing grade.							



Sample Type(s):
SPT - Standard Penetration Test

Notes: Boring elevation was estimated from elevations provided on the civil drawing.

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

GET Solutions, Inc.
Geotechnical • Environmental • Testing

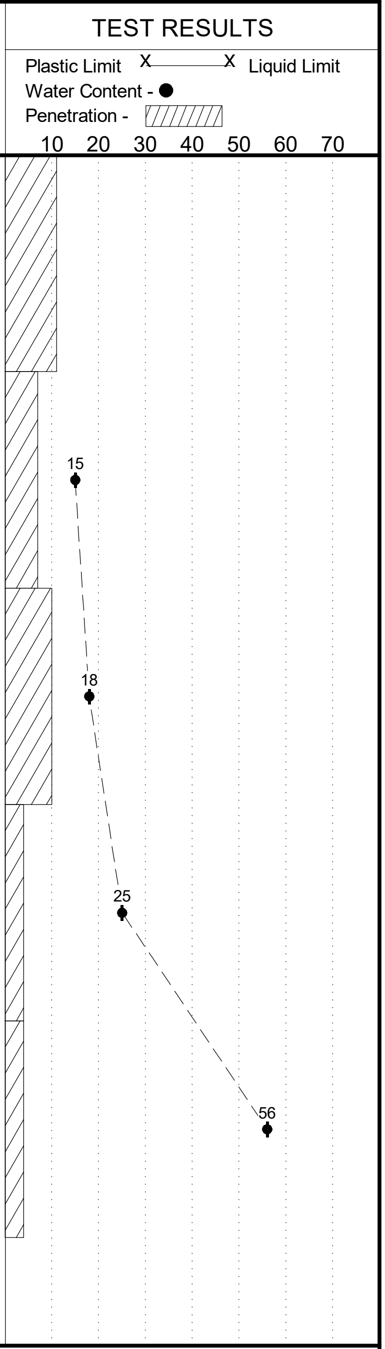
RECORD OF SUBSURFACE EXPLORATION

Virginia Beach	Williamsburg	Elizabeth City	Jacksonville
5465 Greenwich Road	701 Alexander Lee Parkway	106 Capital Trace Unit E	415-A Western Blvd
Virginia Beach, VA 23642	Williamsburg, VA 23185	Elizabeth City, NC 27909	Jacksonville, NC 28546
757-518-1703	757-564-6452	252-335-9765	910-478-9915

BORING ID
CBR-2

PROJECT NAME: **Mary Jackson Neighborhood Center**
CLIENT: **Work Program Architects**
PROJECT LOCATION: **Hampton, Virginia**
BORING LOCATION: **See Attached Boring Location Plan**
DRILLING METHOD(S): **Rotary wash "mud"**
GROUNDWATER*: INITIAL (ft) ▽: **5** AFTER ____ HOURS (ft) ▼: ____ CAVE-IN (ft) ⊊: ____
The initial groundwater readings are not intended to indicate the static groundwater level.

PROJECT NUMBER: **WM20-117G**
SURFACE ELEVATION (MSL) (ft): **9**
LOGGED BY: **T. Vaughn**
DATE STARTED: **4/3/2020**
DATE COMPLETED: **4/3/2020**
DRILLER: **GET Solutions, Inc.**



Elevation (ft)	Depth (ft)	STRATA DESCRIPTION	Sample ID	Sample Type	Sample Recovery (in.)	Blow Counts (N-Values)	%<#200	Water Content
	0.1	1-in of Asphalt						
	0.7	7-in of Aggregate Base						
	2.0	Gray, moist, Silty fine to coarse SAND (SM) with few fine Gravel, medium dense, "FILL"	1	⧗	10	3-4-7 (11)		
	4.0	Brown, moist, Clayey fine to medium SAND (SC), loose	2	⧗	12	5-4-3-4 (7)		15
5								
▽	5	Light brown, moist to wet, Silty fine to medium SAND (SM) with trace fine Gravel, loose Wet below 5-ft	3	⧗	16	3-5-5-3 (10)		18
	6.0							
	8.0	Orange-brown, wet, Clayey fine to coarse SAND (SC) with trace fine Gravel, very loose	4	⧗	24	2-2-2-2 (4)		25
0		Orange-brown, wet, Silty fine to coarse SAND (SM) with trace Clay, contains marine shell fragments, very loose	5	⧗	24	2-2-2-2 (4)		56
	10 / 10.0	Boring terminated at 10 feet below existing grade.						

Sample Type(s):
⧗ SPT - Standard Penetration Test

Notes: Boring elevation was estimated from elevations provided on the civil drawing.

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

APPENDIX V

GENERALIZED SOIL PROFILE

GET Solutions, Inc.
Geotechnical • Environmental • Testing

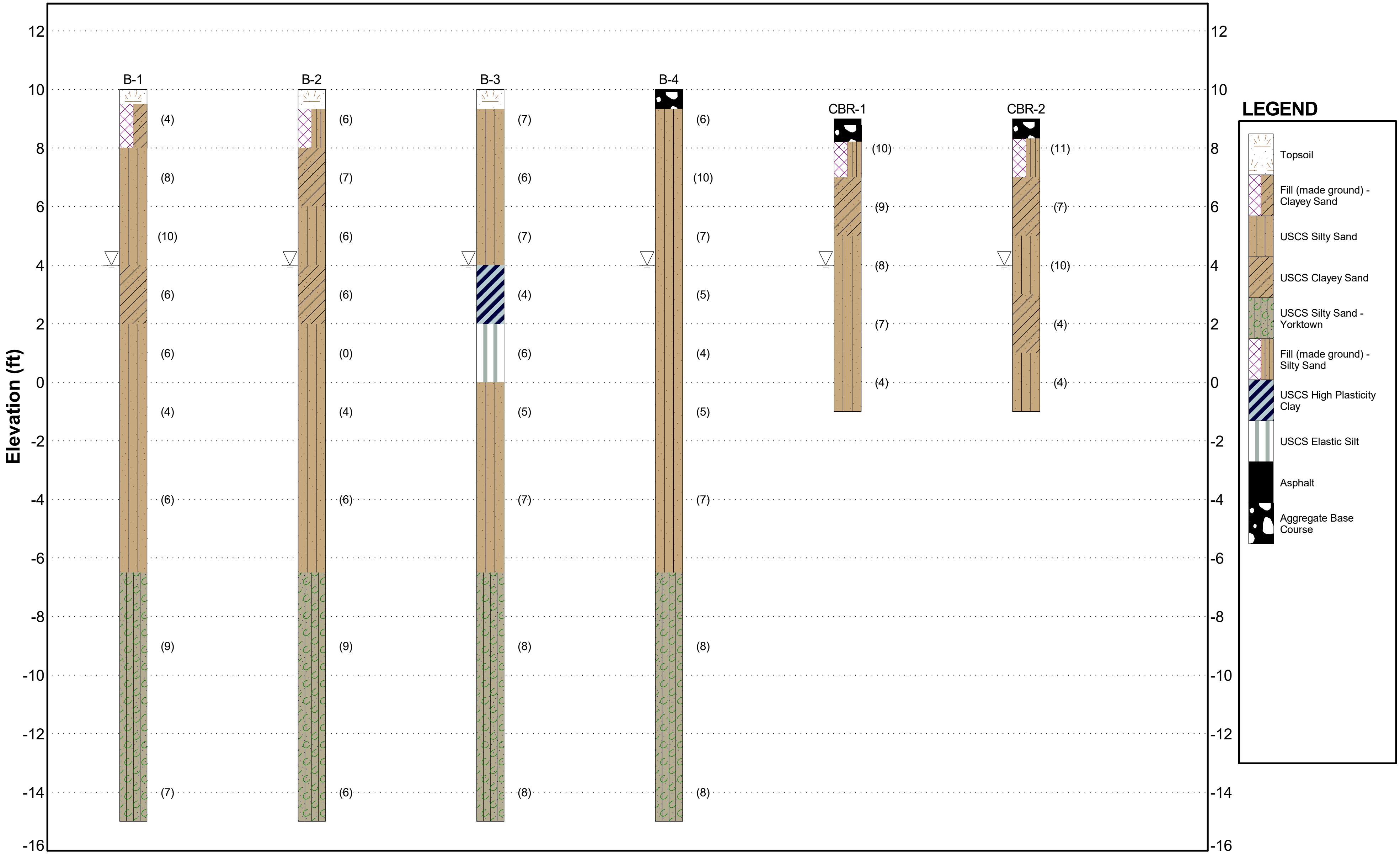
GENERALIZED SOIL PROFILE

PROJECT NAME: **Mary Jackson Neighborhood Center**

PROJECT NUMBER: **WM20-117G**

PROJECT LOCATION: **Hampton, Virginia**

CLIENT: **Work Program Architects**



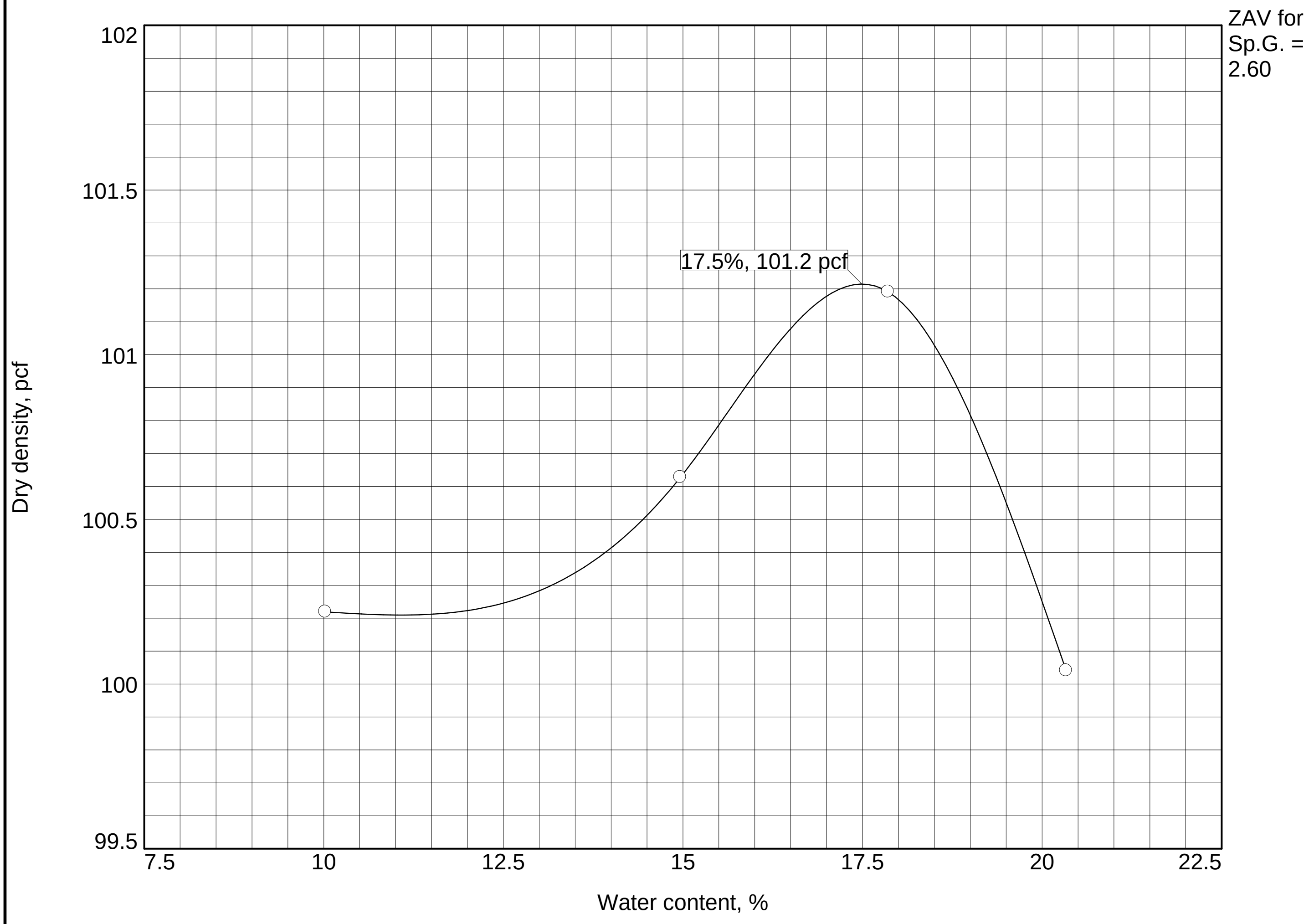
(Numerical Value) = Sample N-Value

APPENDIX VI

CBR TESTING RESULTS

GET Solutions, Inc.

MOISTURE DENSITY TEST REPORT (PROCTOR CURVE)



Test specification: ASTM D 698-12 Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > #4	% < No.200
	USCS	AASHTO						
0.8-2 Ft.	SM	A-4(0)	18	Estimated 2.6	NV	NP	1.8	41.5

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 101.2 pcf Optimum moisture = 17.5 %	Dark gray, Silty fine to coarse SAND (SM) with trace fine Gravel and Clay

Project No. WM20-117G **Client:** Work Program Architects

Project: Mary Jackson Neighborhood Center

○**Location:** See Attached Boring Location Plan **Sample Number:** CBR #1

GET Solutions, Inc.

Williamsburg, VA

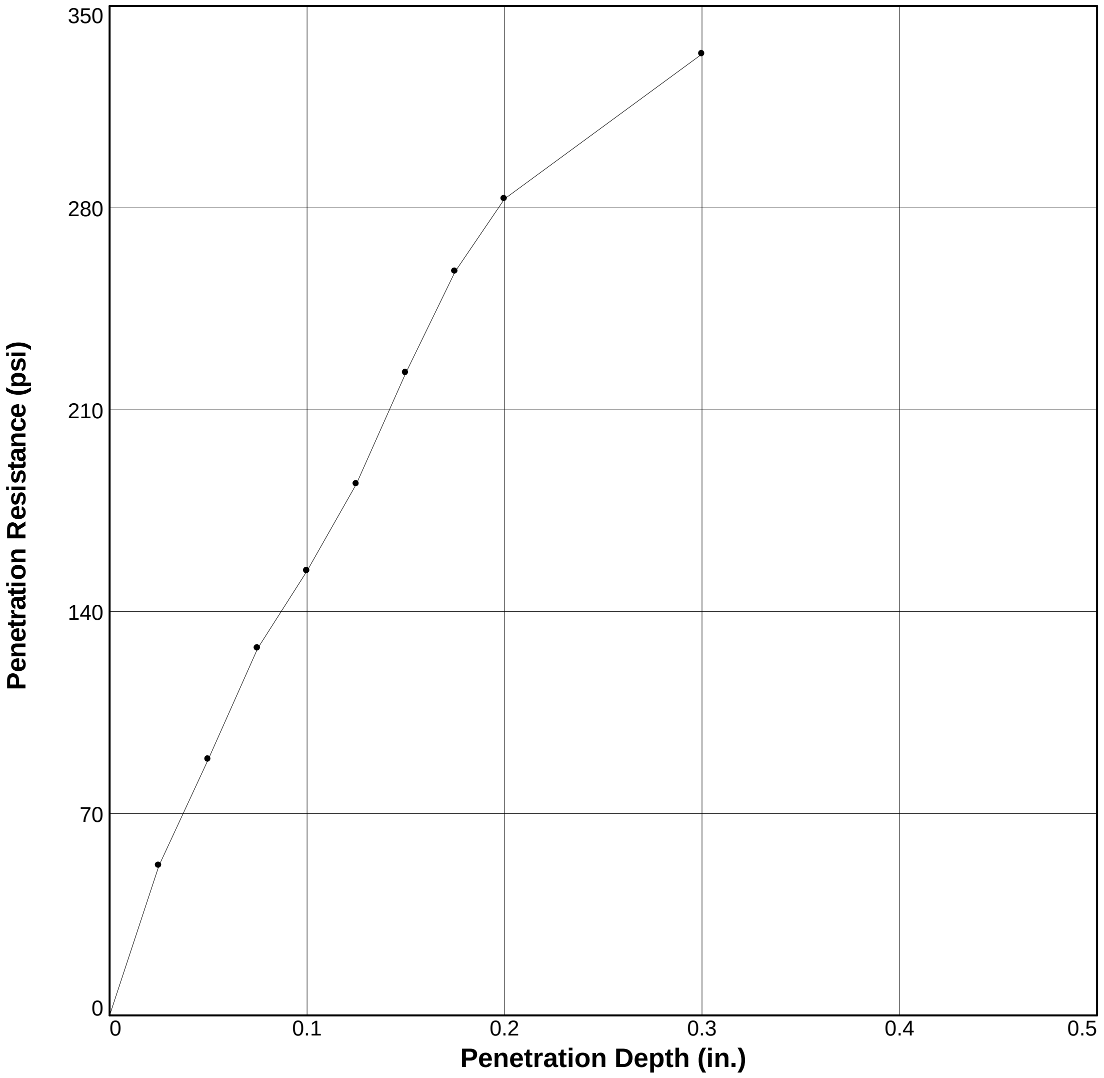
Remarks:

CBR #1
Sample Obtained: 4/4/2020
Sample Tested: 4/14/2020

Figure 1

Tested By: A. Kotyk **Checked By:** J. Wheeler

BEARING RATIO TEST REPORT
ASTM D1883-16



	Molded			Soaked			CBR (%)		Linearity Correction (in.)	Surcharge (lbs.)	Max. Swell (%)
	Density (pcf)	Percent of Max. Dens.	Moisture (%)	Density (pcf)	Percent of Max. Dens.	Moisture (%)	0.10 in.	0.20 in.			
1 ○	101.2	100	17.0	101.1	99.9	21.0	16.0	19.0	0.005	10	0.1
2 △											
3 □											

Material Description	USCS	Max. Dens. (pcf)	Optimum Moisture (%)	LL	PI
Dark gray, Silty fine to coarse SAND (SM) with trace fine Gravel and Clay	SM	101.2	17.5	NV	NP

Project No: WM20-117G

Project: Mary Jackson Neighborhood Center

Location: See Attached Boring Location Plan

Sample Number: CBR #1 **Depth:** 0.8-2 Ft.

Date: 4/4/2020

BEARING RATIO TEST REPORT

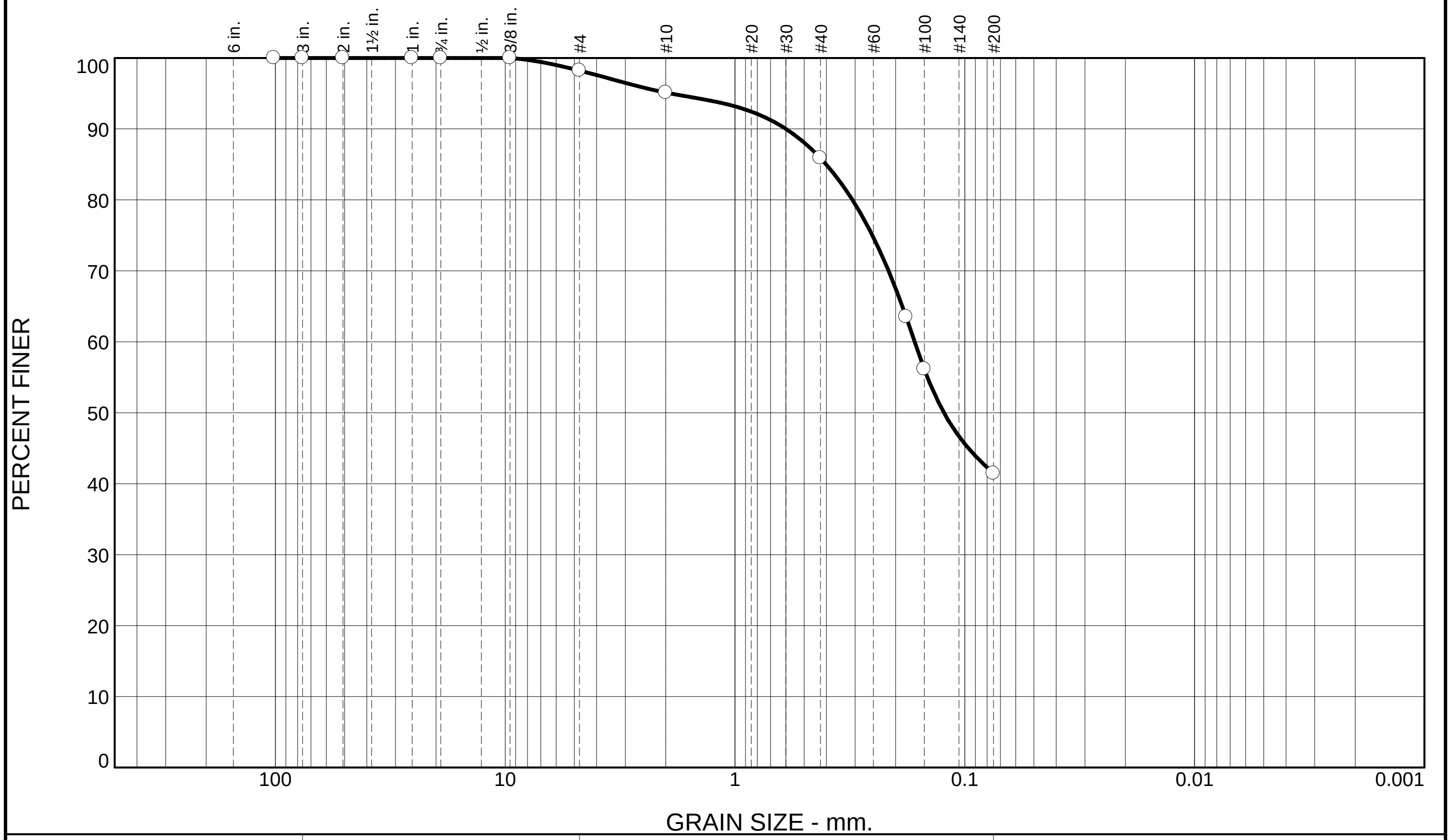
GET Solutions, Inc.

Test Description/Remarks:

CBR #1
Sample Obtained: 4/4/2020
Sample Tested: 4/14/2020
Resiliency Factor = 2.5

Figure 1a

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	1.8	3.1	9.2	44.4	41.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
4"	100.0		
3"	100.0		
2"	100.0		
1"	100.0		
0.75"	100.0		
0.375"	100.0		
#4	98.2		
#10	95.1		
#40	85.9		
#80	63.5		
#100	56.1		
#200	41.5		

* (no specification provided)

Soil Description

Dark gray, Silty fine to coarse SAND (SM) with trace fine Gravel and Clay

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{90}= 0.6003 D_{85}= 0.4010 D_{60}= 0.1653
D_{50}= 0.1232 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO= A-4(0)

Remarks

CBR #1
Sample Obtained: 4/4/2020
Sample Tested: 4/14/2020

Location: See Attached Boring Location Plan
Sample Number: CBR #1 **Depth:** 0.8-2 Ft. **Date:** 4/4/2020

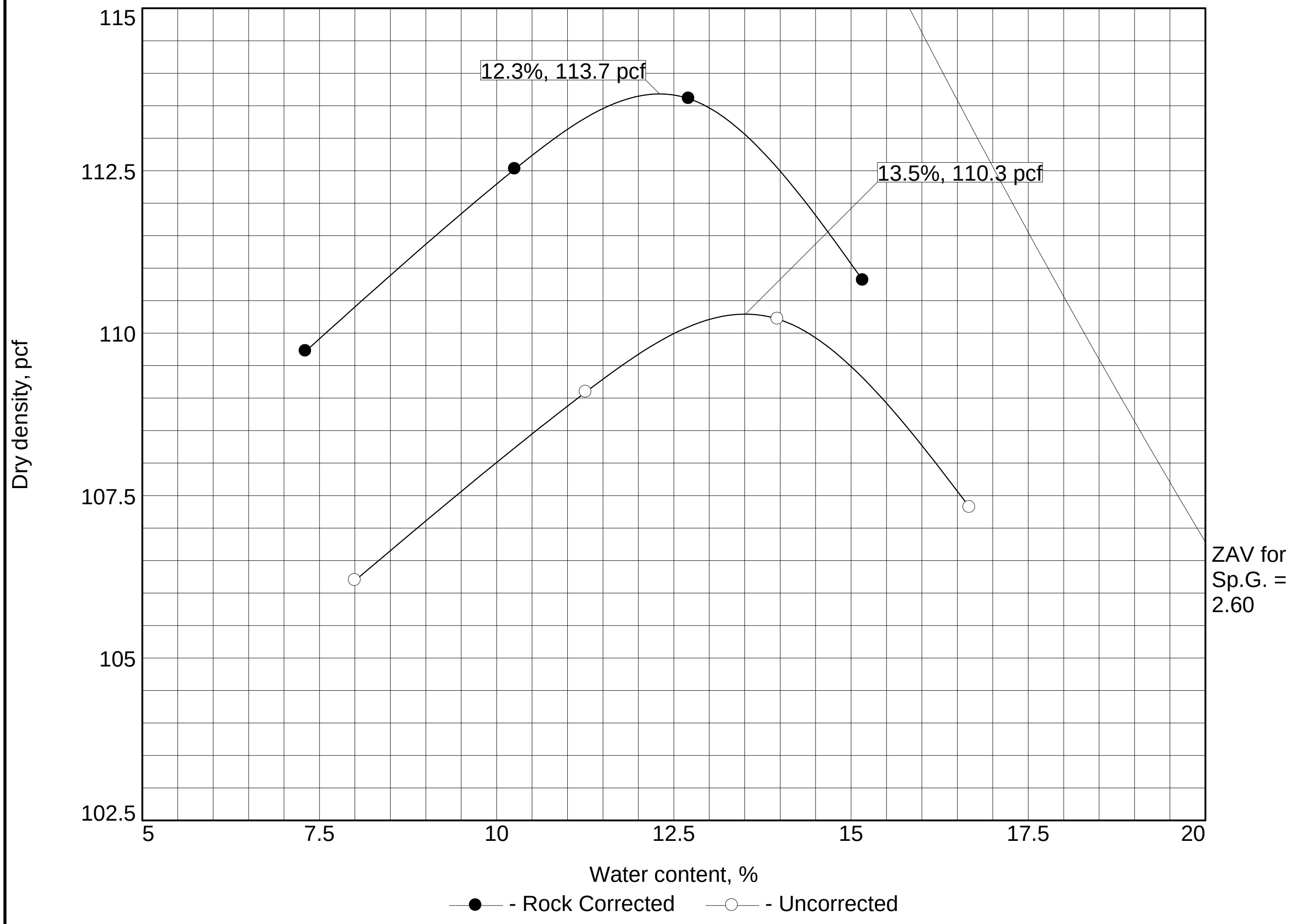
GET Solutions, Inc.

Williamsburg, VA

Client: Work Program Architects
Project: Mary Jackson Neighborhood Center
Project No: WM20-117G **Figure** 1b

Tested By: A. Kotyk **Checked By:** J. Wheeler

MOISTURE DENSITY TEST REPORT (PROCTOR CURVE)



Test specification: ASTM D 698-12 Method A Standard
ASTM D4718-15 Oversize Corr. Applied to Each Test Point

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > #4	% < No.200
	USCS	AASHTO						
0.7-2 Ft.	SM	A-4(0)	16	Estimated 2.6	NV	NP	9.3	37.5

ROCK CORRECTED TEST RESULTS	UNCORRECTED	MATERIAL DESCRIPTION
Maximum dry density = 113.7 pcf	110.3 pcf	Gray, Silty fine to coarse SAND (SM) with few fine Gravel
Optimum moisture = 12.3 %	13.5 %	

Project No. WM20-117G **Client:** Work Program Architects
Project: Mary Jackson Neighborhood Center

○**Location:** See Attached Boring Location Plan **Sample Number:** CBR #2

GET Solutions, Inc.

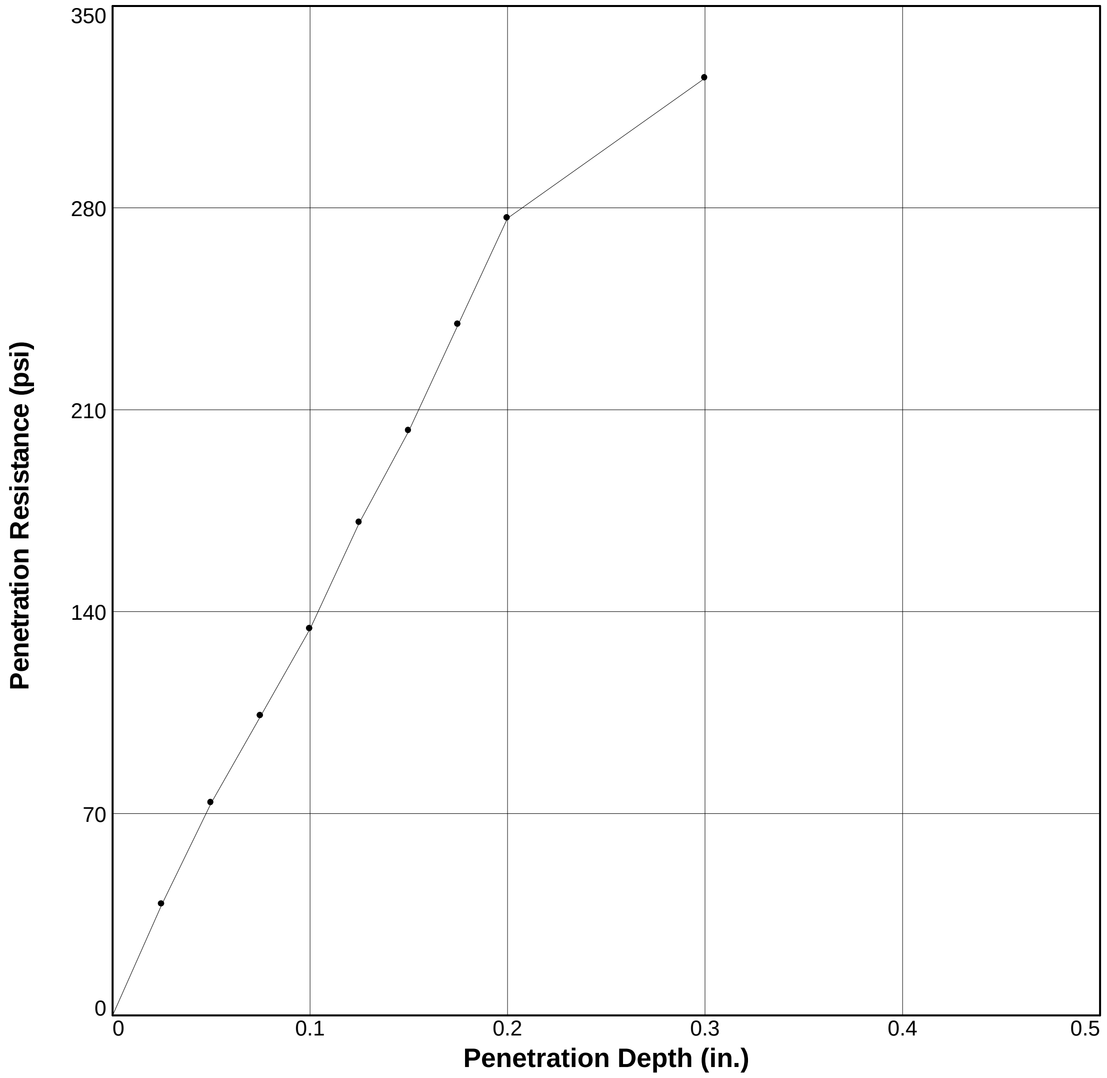
Williamsburg, VA

Remarks:
CBR #2
Sample Obtained: 4/4/2020
Sample Tested: 4/14/2020

Figure 2

Tested By: A. Kotyk **Checked By:** J. Wheeler

BEARING RATIO TEST REPORT
ASTM D1883-16



	Molded			Soaked			CBR (%)		Linearity Correction (in.)	Surcharge (lbs.)	Max. Swell (%)
	Density (pcf)	Percent of Max. Dens.	Moisture (%)	Density (pcf)	Percent of Max. Dens.	Moisture (%)	0.10 in.	0.20 in.			
1 ○	113.7	100	11.8	113.6	99.9	17.5	15.6	18.9	0.015	10	0.1
2 △											
3 □											

Material Description	USCS	Max. Dens. (pcf)	Optimum Moisture (%)	LL	PI
Gray, Silty fine to coarse SAND (SM) with few fine Gravel	SM	113.7	12.3	NV	NP

Project No: WM20-117G

Project: Mary Jackson Neighborhood Center

Location: See Attached Boring Location Plan

Sample Number: CBR #2 **Depth:** 0.7-2 Ft.

Date: 4/4/2020

BEARING RATIO TEST REPORT

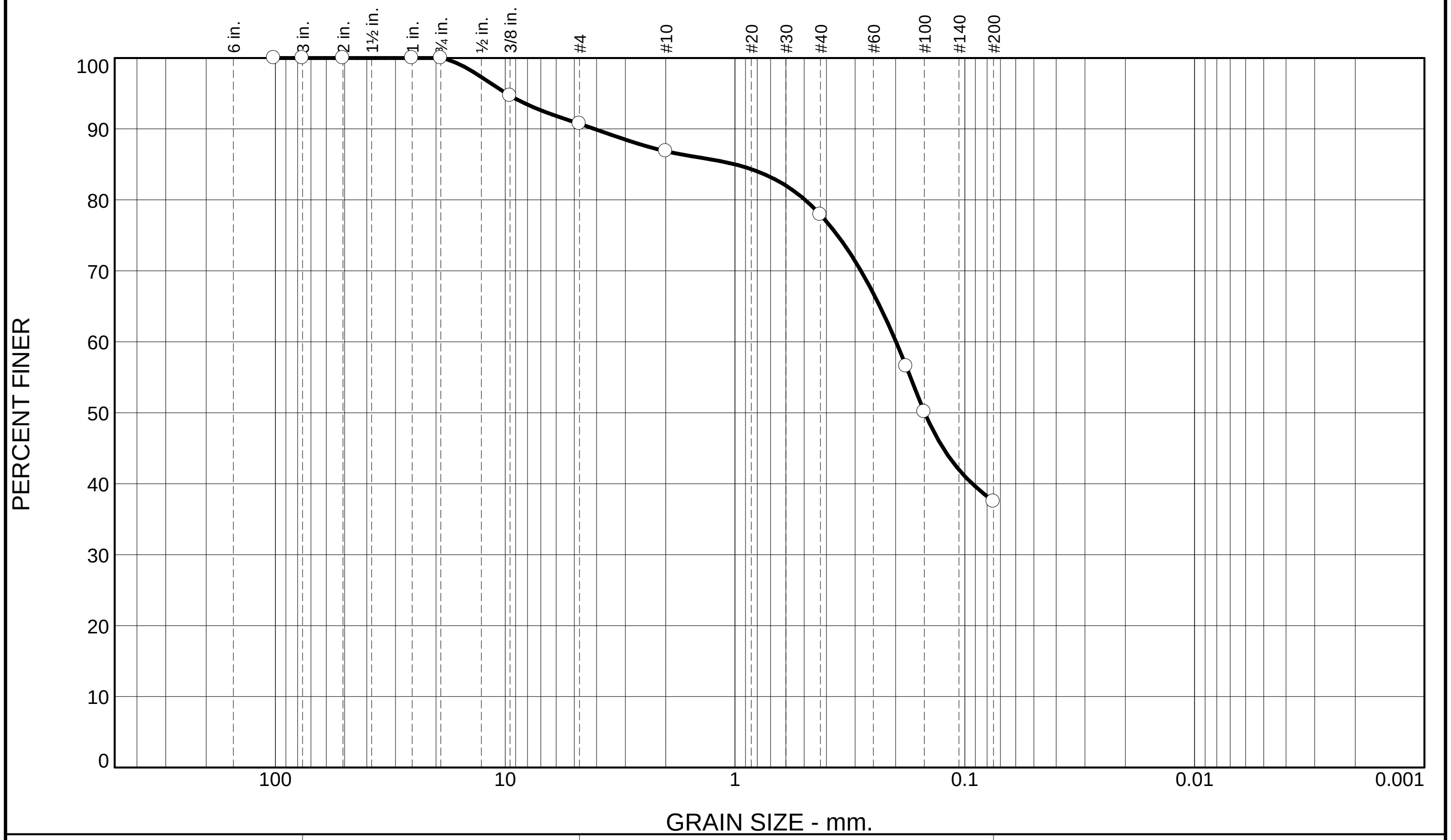
GET Solutions, Inc.

Test Description/Remarks:

CBR #2
Sample Obtained: 4/4/2020
Sample Tested: 4/14/2020
Resiliency Factor = 3.0

Figure 2a

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	9.3	3.8	9.0	40.4	37.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
4"	100.0		
3"	100.0		
2"	100.0		
1"	100.0		
0.75"	100.0		
0.375"	94.7		
#4	90.7		
#10	86.9		
#40	77.9		
#80	56.6		
#100	50.1		
#200	37.5		

* (no specification provided)

Soil Description

Gray, Silty fine to coarse SAND (SM) with few fine Gravel

Atterberg Limits

PL= NP
LL= NV
PI= NP

Coefficients

D_{90}= 4.0885
D_{85}= 0.9991
D_{60}= 0.1991
D_{50}= 0.1494
D_{30}=
D_{15}=
D_{10}=
C_u=
C_c=

Classification

USCS= SM
AASHTO= A-4(0)

Remarks

CBR #2
Sample Obtained: 4/4/2020
Sample Tested: 4/14/2020

Location: See Attached Boring Location Plan
Sample Number: CBR #2 **Depth:** 0.7-2 Ft. **Date:** 4/4/2020

GET Solutions, Inc.

Williamsburg, VA

Client: Work Program Architects
Project: Mary Jackson Neighborhood Center
Project No: WM20-117G **Figure** 2b

Tested By: A. Kotyk **Checked By:** J. Wheeler