H2M architects + engineers
2380 Route 9 South, Building C, Ste 1
Howell, NJ 07731 | tel 732.414.2661

# ADDENDUM #1

**To:** **All Bidders**
**From:** **Brick Township MUA / H2M**
**Date:** **January 9, 2019**
**RE:** **GAC Improvements at William Miller WTP**
**BMUA1701 Addendum #1**

---

All Bidders are hereby advised of the following clarifications to the Work:

1. Please see attached for minutes of the pre-bid meeting. Information contained within the minutes in incorporated into the contract via this addendum.
2. Please see attached for Geotechnical Report regarding soil testing performed in the vicinity of the GAC Buildings' location.
3. Please remove Pages 12 – 41 of the Agreement. A project labor agreement is no longer required. The contractor shall pay not less than the prevailing wage rate to workers employed in the performance of any contract for the project, in accordance with the rate determined by the Commissioner of New Jersey Department of Labor and Workforce Development pursuant to N.J.S.A. 34:11-56.25 et seq. OR the United States Secretary of Labor pursuant to 29 CFR Part 5, whichever is greater.
4. Please note that Section 013233 was included in the specification book out of order. It can be found at the end of Division 1, just prior to the section on Concrete.
5. Please see attached for Section 221429 – Sump Pump
6. Pipe support materials shall be clarified per the below:
    a. All hardware used in the clearwell shall be 316SS, and in accordance with Detail 9, Sheet M2.8
    b. Pipe supports shall be installed as shown on the plans. Hanger material, sizing, and spacing for areas outside the clearwell shall be per Section 220529 2.02 A. Where Stainless Steel is specified in this section, it shall mean 316 SS.
7. As required by the General Conditions Section 4.2, the Contractor shall be required to coordinate their operations with those of other contractors. Please note that the Owner has another contract receiving bids no later than February 8, 2019 with a contract time of 180 days. The work under that contract is within the Chlorine Room and is expected to mobilize to construction during the GAC Improvements contract period. The work impacts the Chlorine Room, the loading dock area, and surrounding area exterior to same, including the grassy area near the flagpole. The Contractor shall be required to cooperate with the other contractors for the receiving and storage of materials, execution of the work, and required access.

Patrick K. Cole, P.E.
New Jersey Professional Engineer #24GE04587100

2380 Route 9 South, Building C, Ste 1
Howell, NJ 07731 | tel 732.414.2661

# MEETING MINUTES

| | |
|---|---|
| Subject: | Pre-Bid Meeting Minutes<br>Brick Township MUA<br>GAC Improvements at William Miller Jr. Water Treatment Plant |
| H2M Project No: | BMUA 1701 |
| Location: | Brick Township MUA Administrative Offices and WJM Treatment Plant |
| Date: | Thursday, January 3, 2019 - 10:00 AM |

---

1. Sign-In Sheet – See attached

2. Introduction & Roles

    a. Steve Specht, BTMUA – Deputy Ex. Director, Director of Engineering
    b. Alina Ferreira, BTMUA – BTMUA Project Manager
    c. Chris Theodos, BTMUA – Executive Director
    d. Joe Maggio, BTMUA – Director of Water Quality
    e. Rob Karl, BTMUA – Supervisor- Source Water/Watershed
    f. John Rouse, BTMUA – Supervisor- Water Treatment Plant O&M, Security & Emergency Management
    g. Dan Reilley, BTMUA - Supervisor Fleet, Buildings, Grounds, Reservoir
    h. Patrick Cole, H2M – Consulting Engineer
    i. Stephanie DeCotiis, H2M – Consulting Engineer, Project Manger
    j. H2M has design, permitting, and funding coordination responsibility, and will continue with Construction Administration and Observation during the construction phase.

3. Plans & Specifications – Available for purchase from H2M's office: 2380 Route 9 South, Bldg C, Suite 1, Howell, NJ 07731

4. Bids Due – Thursday, February 7, 2019 @ 2:00 PM to the Brick Township MUA Administrative Offices

5. Contractor Requirements – Please review the following:
    a. Special Conditions Section 23 – Additional Responsibilities of Contractors Contracting with the Owner
    b. Appendix I - Brick Utilities Contractor Safety Program - Training

6. Scope of Work

    a. Civil/Stormwater
        - Site clearing, drainage piping, infiltration trench, stormwater basin, site grading, concrete sidewalk, curb, stairs, aprons, and landings, pavement removal, repairs, restoration and striping, installation of chain-link fencing and gates, site restoration
    b. GAC Buildings (North and South)
        - Masonry construction with brick veneer and vinyl siding and asphalt shingle roof
        - Geotech Report will be attached to these meeting minutes – See also Note 2 on S1.0
        - Review Measurement and Payment item
    c. Filter / Pump Gallery Modifications
        - Existing backwash pump and High Service 4 are being removed and replaced with GAC Transfer Pumps A, B, C.

- Filter effluent piping can be reconfigured in a stepwise manner
- Suggested Filter Transfer Sequence provided to sequence work and maintain operations, however – onus is on General Contractor to review sequencing, submit a plant shutdown plan for review by Owner and Engineer, and assume full responsibility for all work associated with the transition from shutdown to re-start, and associated coordination with the Owner's licensed operational leadership

d. Clearwell Modifications
    - Confined space entry – Permit required, Contractor responsible
    - Review Work Restrictions Section 011400 for clearwell entry restrictions
    - Review Clearwell nomenclature – Clearwell A, B, C
    - Work must be sequenced with Owner's operations

e. Clearwell Overflow
    - Piping is deep, review inverts provided on the plans.
    - Ground water may be encountered, onus is on the General Contractor for any dewatering operation, owner facility coordination, associated permitting, and coordination for discharge. Review Geotechnical Report for reference to known groundwater level data, attached.

f. Electrical/Controls
    - Need to phase work to maintain operations with new MCC installation
    - Control integration/programming will be provided by the Owner. Contractor will provide all hardware and terminations

7. Permits
    a. NJDEP Water Systems Engineering – Permit to Construct/Modify Treatment Works
    b. CAFRA
    c. Soil Conservation
    d. Brick Township Planning Board
    e. Building Permits – Contractor responsible
        - No preliminary coordination has been performed with construction officials.

8. Contract Time – 360 days for substantial completion; 420 days for final completion.

9. Infrastructure Trust Funding
    a. SED Utilization Plan Compliance
    b. American Iron and Steel

10. Questions?
    a. Submit in writing to: Stephanie DeCotiis (732-414-2661 x2107; sdecotiis@h2m.com)
    b. Deadline for questions: January 22, 2019
    c. BTMUA will accept requests for additional visits to the plant. Requests shall be made to H2M.

11. Plant Walkthrough
    a. Walked site for GAC Buildings' location. Noted electrical duct banks and other utilities.
    b. Walked route of Clearwell Overflow, reviewed location of headwall
    c. Visited Control Room and Electrical Room to review MCC and panelboard placement
    d. Reviewed lower level Filter and Pump Galleries.
        - Noted access point to each clearwell area and Lower Level access hatch and loading dock area.
    e. Reviewed connection point for GAC effluent and Contractor laydown area.

2380 Route 9 South, Building C, Ste 1
Howell, NJ 07731 | tel 732.414.2661

# SIGN-IN SHEET: Brick Township MUA - GAC Improvements at William Miller WTP

| | Name | Organization | Phone | E-mail |
|---|---|---|---|---|
| 1. | John Purwin | Northeast Remsco | 732-557-6100 EXT 203 | John.Purwin@superna.com |
| 2. | Chuck Vollmer | Northeast Remsco | 732-557-6100 EXT 201 | chuck.Vollmer@superna.com |
| 3. | Chris Pedersen | Electro Maint Inc | 732-528-4148 | Chris@electromaint.com |
| 4. | Ross Hinkel | R-C-E | 856-768-7828 | Ross@R-celectric.com |
| 5. | Charles Carlson | Coppola Services | 973-475-7238 | ccarlson@coppolaservices.com |
| 6. | Lou Citisman | BAYCO | 201-563-4542 | lcitisman@baycoinc.com |
| 7. | Michael Ondic | George Harms Construction | 732-751-2075 | mondic@ghcci.com |
| 8. | MIKE DONAWAY | CALGON | 732 424 2089 | mdonaway@calgoncarbon.com |
| 9. | Ryan Booth | Godwin | 609-352-0060 | Ryan.booth@xylem.inc.com |
| 10. | Michael Ricca | IBEW LU 400 | 732-681-7111 | michael@ibew400.org |
| 11. | Pat Scharnitz | UA Local 9 | 609-937-3255 | PScharnitz@UALOCAL9.ORG |
| 12. | Bob Sobham | TOMAR CONSTRUCTION | 732-238-0700 | BOB@TOMARCONSTRUCTION.COM |
| 13. | PAUL KELLY | PKF MARK III | 215-968-5031 | PJK@PKFM.com |
| 14. | CHRIS DEANE | Allied | 732-257-0772 | cdeane@alliedconstructgroup.com |

Sign-In Sheet


| Name | Organization | Phone | E-mail |
|---|---|---|---|
| 15. ~~Eagle Construction~~ | | | |
| 16. Eric Van Cleaf | Eagle Construction | 609-332-9872 | evancleaf@eagleconstruction.com |
| 17. Philip Carlucci | Philip Ross Ind | 631 253-3077 | Philross@optonline.net |
| 18. Tim Martin | Brayco | 609.346.1374 | TIMMARTIN_BRAYCOINC@YAHOO.COM |
| 19. Dan Heimall | Brayco | 732-425-2059 | DHeimall@braycoinc.com |
| 20. Steven Wells | Spectraserv | 973-589-0277 | swells@spectraserv.com |
| 21. Scott Lattimer | Clyde Lattimer & Son | 856-768-3200 | SCOTTL@CNLCONST.COM. |
| 22. Robert Karl | BTMUA | 732-458-7000 x4271 | rkarl@brickmua.com |
| 23. Alina Ferreira | BTMUA | 732-458-7000x4289 | aferreira@brickmua.com |
| 24. Steve Specht | BTMUA | 732-458-7000x4247 | specht@brickmua.com |
| 25. Chris Theodos | BTMUA | 732-458-7000x | ctheodos@brickmua.com |
| 26. Joe Maggio | BTMUA | 732-458-7000 | jmaggio@brickmua.com |
| 27. John Rouse | BTMUA | 732-458-7000 | jrouse@brickmua.com |
| 28. Dan Reilley | BTMUA | 732-458-7000 | dreiley@brickmua.com |
| 29. Stephanie DeCotiis | H2M | 732-567-2247 | sdecotiis@h2m.com |
| 30. Pat Cole | H2M | 732-414-2641 | pcole@h2m.com |

X2104

FRENCH & PARRELLO ASSOCIATES

EXPERIENCE YOU CAN BUILD ON

# Report of Geotechnical Engineering Evaluation

## GAC Buildings at William J. Miller Water Treatment Plant

Township of Brick, Ocean County, New Jersey

Submitted to:

Ms. Stephanie DeCotiis, PE
**H2M Architects & Engineers**
2380 Route 9 South
Building C, Suite 1
Howell, NJ 07731

June 27, 2017
FPA NO. 12316.001R1

1800 ROUTE 34, SUITE 101 • WALL, NJ • 07719 • T 732.312.9800 • F 732.312.9801
HACKETTSTOWN, NJ • NEW YORK, NY
WWW.FPAENGINEERS.COM

FRENCH & PARRELLO ASSOCIATES

Corporate Office
1800 Route 34, Suite 101
Wall, NJ 07719

Regional Offices
Hackettstown, NJ
New York, NY

June 27, 2017

Ms. Stephanie DeCotiis, PE
**H2M ARCHITECTS & ENGINEERS**
2380 Route 9 South
Building C, Suite 1
Howell, NJ 07731

Re: Report of Geotechnical Engineering Evaluation
**GAC Buildings at William J. Miller Water Treatment Plant**
Brick Township, Ocean County, New Jersey
*FPA No. 12316.001R1*

Dear Ms. DeCotiis:

## INTRODUCTION

We are pleased to present the results of our subsurface exploration and Geotechnical Engineering Evaluation in connection with the proposed Granular Activated Carbon (GAC) Buildings planned for construction at the William J. Miller Water Treatment Plant located in Brick Township, Ocean County, New Jersey. The project site is located at 1551 Route 88 West and is designated as Block 755, Lot 40 on the Brick Township Tax Map. The regional location of the project site is presented on Drawing No. 1, "Regional Location Plan."

Based on our review of the Soil Borings Location Plan prepared by H2M, the proposed construction will consist of two slab-on-grade buildings occupying a total plan area of approximately 11,000 square feet. The buildings will house up to twenty-four granular activated carbon vessels. The proposed project site is situated within the existing wooded area located to the east of the existing office and water treatment building. The existing site grades within the proposed building footprint vary from approximately elevation +30 feet to elevation +33 feet. The proposed site grades and building elevations were unavailable at the time this report was prepared. However, we anticipate only minor site regrading will be required to achieve the design finished floor elevation and final site grades.

The purpose of our participation on the project at this time was to explore the subsurface conditions in the vicinity of the proposed GAC Buildings and to develop geotechnical engineering recommendations to facilitate the planning, design and construction of the proposed foundations. Our scope of services included the advancement of two test borings, engineering evaluation of the

encountered subsurface conditions and the preparation of this report. Our geotechnical services were completed in accordance with our written proposal dated March 21, 2017.

## SUBSURFACE EXPLORATION

FPA observed the performance of two test borings on June 16, 2017 to characterize the subsurface conditions in the vicinity of the proposed GAC Buildings. The field work was accomplished by a test boring subcontractor while under the full-time technical observation by a representative of FPA. The approximate as-drilled test boring locations are presented on Drawing No. 2, "Test Boring Location Plan."

The test borings, designated as B-1 and B-2, were each advanced to a depth of approximately 32 feet below the existing grade utilizing mud-rotary drilling procedures. Soil samples were obtained from within the borehole by advancing a standard two-inch diameter split-spoon sampler in accordance with ASTM Test Method D-1586, The Standard Penetration Test. The soil samples were classified in the field using the Burmister Soil Classification System. The soil samples were returned to our soils laboratory for further review and laboratory testing and will be stored for a period of 60 days from the date of this report.

The depth to groundwater was determined based upon the relative moisture content of the retrieved soil samples. Details of the drilling procedures, soil classifications, groundwater depths and Standard Penetration Test results are presented on the boring logs in Appendix A.

## LABORATORY TESTING

Laboratory testing was performed on two soil samples obtained from the subsurface exploration to assess the permeability of the soils in the immediate area of the proposed construction. The soil samples were obtained from test borings B-1 and B-2 at depths of approximately 5 to 7 feet and 4 to 6 feet below the ground surface, respectively. Rigid wall permeability tests were performed on the recovered soil samples in accordance with ASTM D-2434, Standard Test Method for Permeability of Granular Soils, to estimate the in-situ permeability of the encountered soil. The permeability test results indicated a soil permeability of approximately 20 inches per hour. A summary of the individual laboratory test results is presented in Appendix B.

## SITE CONDITIONS

### Regional Geology

Based on our review of published geologic literature pertaining to the project region, and our prior experience in the area, the native soils consist of a surficial layer of stratified alluvial materials underlain by marine deposits. The alluvial soils were deposited during the Quaternary period and are referred to as the Cape May formation on the Geologic Map of New Jersey. The alluvial material typically consists of uniformly graded medium to coarse sand with varying amounts of

silt and gravel scattered throughout the profile. The underlying marine soils were deposited during the Tertiary period and are known as the Cohansey Sands on the Geologic Map of New Jersey. The marine soils typically consist of medium to coarse sand with small amounts of silt and clay. The depth to bedrock is generally greater than 100 feet throughout Ocean County.

### Subsurface Conditions

The soils encountered within the test borings were generally consistent with those reported in the published geologic literature. The test borings generally encountered a surficial layer of alluvial sands underlain by more compact marine deposits of sand. The alluvial soils were encountered from the existing grade to a depth of approximately 14 feet and consisted predominantly of coarse to fine sand intermixed with varying amounts of medium to fine gravel and minor to moderate amounts of silt. The marine soils were encountered below the alluvial soils and typically consisted of coarse to fine sand with appreciable amounts of medium to fine gravel in the upper portion of the stratum and minor amounts of silt. Based upon the results of the Standard Penetration Tests, the relative density of the alluvial soils varied from very loose to loose to a depth of approximately 8 feet grading to medium-dense conditions and extending to depth of approximately 14 feet. The relative density of the underlying marine soils encountered below a depth of approximately 14 feet can be described as dense to very dense.

The groundwater table was encountered at depths ranging from approximately 25 feet to 27 feet below the existing ground surface, corresponding to approximate elevations +5.5 feet to +6 feet. Seasonal and storm related fluctuations in the groundwater level should be anticipated. For specific details pertaining to the Burmister Classifications of the soil samples and estimated depth to groundwater, please refer to the test boring logs in Appendix A.

### Seismicity

We have reviewed the guidelines presented in the New Jersey Edition of the 2015 International Building Code (IBC) regarding seismic design. Based upon our review, we offer the following site characterization parameters:

Short Period Spectral Acceleration ($S_s$) .....0.199g
Spectral Acceleration @ 1 Second ($S_1$) .....0.059g
Site Class.....D

## DISCUSSION & RECOMMENDATIONS

### General

Based on the results of our subsurface exploration and subsequent geotechnical engineering evaluation, it is our opinion that the proposed GAC buildings may be founded on conventional shallow foundations established within the native alluvial soils. The on-site native soils are also suitable for support of slabs on-grade. However, we note that very loose to loose granular soil

conditions were encountered within the test borings from the ground surface and extending to depths of approximately 8 feet below the existing grade. As such, proposed foundation and slab subgrades will require recompaction to densify the loose subgrade soils prior to placement of any reinforcing steel for footings or slabs. Detailed recommendations for subgrade preparation, recompaction requirements and foundation design criteria are provided in the subsequent sections of this report.

We do not anticipate that groundwater will be encountered within foundation excavations or utility trenches. If perched groundwater is encountered, we anticipate that temporary construction dewatering may be performed using sump pumps placed within crushed stone.

## Shallow Foundations

Shallow foundations bearing within the native alluvial soils that extend from the existing grade to a depth of approximately 8 feet may be designed for an allowable bearing pressure of 2,000 pounds per square foot (psf) provided the footing subgrade is recompacted as discussed further below. If greater bearing capacity is required, the footings for the GAC Building may be designed to either bear within the medium dense sands encountered at or below a depth of 8 feet or the loose upper soils overexcavated to the underlying medium dense sands and replaced with well graded compacted fill or lean concrete placed up to the desired subgrade elevation. Footings bearing within the medium dense sands or on compacted fill (or lean concrete) extending to the medium dense sands may be designed assuming an allowable soil bearing pressure of 4,000 psf. We recommend that continuous footings and isolated column footings be a minimum of 24 inches and 36 inches in width, respectively. In accordance with IBC regulations, the bottom of all reinforced concrete foundations exposed to outside ambient temperatures should extend to a minimum depth of 36 inches below the proposed grade for frost protection.

We estimate that footings loaded to the recommended allowable static bearing pressure will undergo less than one inch of total settlement. We anticipate that post construction differential settlements will be less than ½ inch over a horizontal distance of 50 feet. We anticipate that the majority of the estimated settlements will occur during construction as building and equipment loads are applied.

*Foundation Excavation & Subgrade Preparation*

We anticipate that the Contractor may utilize conventional earth excavating equipment for performing excavations for the foundations within the existing site soils. We recommend that all excavations be hand trimmed, in a workmanlike manner, and that the subgrade be recompacted with a walk-behind smooth drum, vibratory trench roller with a minimum dynamic compaction energy of 5-tons to further densify the subsoils and to identify soft areas. Any areas exhibiting excessive yielding should be over-excavated and backfilled using approved on-site granular soils or imported material meeting the gradational requirements of Type “G” fill.

Fills should be placed in maximum 12-inch thick lifts and compacted to a minimum of 95 percent of their maximum dry density as determined by ASTM Test Method D-1557, The Modified

Proctor Test. If foundations are left open overnight or performed during inclement weather, we recommend that the foundation subgrades be over-excavated to allow for the placement of 6 inches of NJDOT No. 57 Coarse Graded Aggregate. The Coarse Graded Aggregate will serve as a work mat to preclude disturbance of the subgrade due to construction and inclement weather and will facilitate in-trench dewatering, if necessary. The gradational requirements for NJDOT No. 57 Coarse Graded Aggregate and Type "G" fill are presented in Appendix C.

## Floor Slabs

As previously discussed, the upper 8 feet of the native alluvial soils are loose and will require recompaction to provide suitable support for floor slabs on-grade. The floor slab subgrade should be recompacted using a smooth drum vibratory roller capable of producing a minimum dynamic compaction load of 10-tons to further densify the subgrade soils. Any areas exhibiting excessive yielding should be over-excavated and backfilled using approved on-site granular soils or imported material meeting the gradational requirements of Type "G" fill. Provided that the slab subgrade is recompacted in accordance with these recommendations, it is our opinion that a modulus of subgrade reaction of 150 pounds per cubic inch (pci) will be suitable for use in the structural design of the concrete slabs. To aid in distributing localized heavy floor slab loads and provide a capillary break, we recommend a minimum 4-inch thick layer of NJDOT No. 57 Coarse Graded Aggregate be placed beneath the floor slab.

## Site Preparation & Earthwork

Prior to placing any fills to raise site grades, the ground surface should be stripped of all vegetation, topsoil, and surficial debris and compacted using a smooth drum, vibratory roller capable of producing a dynamic compaction load of 10-tons. Additionally, the subgrade compaction would identify any soft areas within the building footprint that should be removed and replaced with approved fill. We recommend that fills required under or in the vicinity of the proposed buildings or paved areas (if applicable) consist of readily compactable, on-site granular soils or imported Type "G" fill. Structural fills should be placed in maximum 12-inch thick lifts and compacted to a minimum of 95 percent of the maximum dry density as determined by ASTM Test Method D-1557, The Modified Proctor Test. Fill materials placed in non-structural areas for lawn, landscaping and general grading purposes should be compacted to a minimum of 90 percent of their maximum dry density per ASTM D-1557.

The on-site soils are generally suitable for reuse as compacted structural fill and grading fill. Imported well graded granular fill material (Type "G" Fill) may also be used for compacted structural fill and general grading fill placement and earthwork. The surface of all compacted fill subgrades should be graded or sloped to provide drainage of surface run-off. In addition, the surface of all prepared subgrades should be thoroughly compacted at the end of each day to seal the surface and minimize softening that may result from precipitation.

## Soil Parameters

To facilitate the design of the building foundations and below grade foundation walls (if required), we offer the following soil parameters:

| **Soil Stratum** | **Alluvial Sand w/ Gravel** | **Alluvial/Marine Sand** | **Marine Sand** |
|---|---|---|---|
| Depth (ft.) | 0 – 8’ | 8 – 14’ | 14 – 32’ |
| Relative Density | Very Loose to Loose | Medium Dense | Dense to Very Dense |
| Total Unit Weight ($\gamma_{total}$) | 110 pcf | 125 pcf | 130 pcf |
| Angle of Internal Friction ($\phi$) | 28º | 32º | 36º |
| Cohesion (C) | 0 psf | 0 psf | 0 psf |
| Coeff. of Active Earth Pressure ($k_a$) | 0.36 | 0.31 | 0.26 |
| Coeff. of At-Rest Earth Pressure ($k_o$) | 0.53 | 0.47 | 0.41 |
| Coeff. of Passive Earth Pressure ($k_p$) | 2.77 | 3.25 | 3.85 |
| Modulus of Sub Grade Reaction (k) | 150 psi/in | 300 psi/in | 400 psi/in |
| Allowable Bearing Pressure ($q_{all}$) | 2,000 psf | 4,000 psf | 6,000 psf |

Note: The above active and passive earth pressure coefficients assume level backfill placement behind the foundation wall.

## CLOSING & LIMITATIONS

The recommendations contained herein are contingent upon subsurface conditions remaining consistent with those encountered during our subsurface exploration. They are also contingent upon the basis that all earthwork related aspects of construction, including controlled fill operations and subgrade preparation be observed by a representative of FPA. This is to observe compliance with the design concepts and specifications and to allow design changes in the event that subsurface conditions differ from those anticipated prior to construction.

The scope of our services did not include any environmental assessment or investigation for the presence or absence of wetlands or hazardous or biologically toxic materials in the soil, surface water, groundwater or air, on or below or around this site.

Services performed by French & Parrello Associates during this project have been conducted in a manner consistent with the level of care and skill ordinarily exercised by members of the profession currently practicing in the same locality under similar conditions. No other representation, expressed or implied, and no warranty, guarantee, or fiduciary responsibility is included or intended in the services provided.

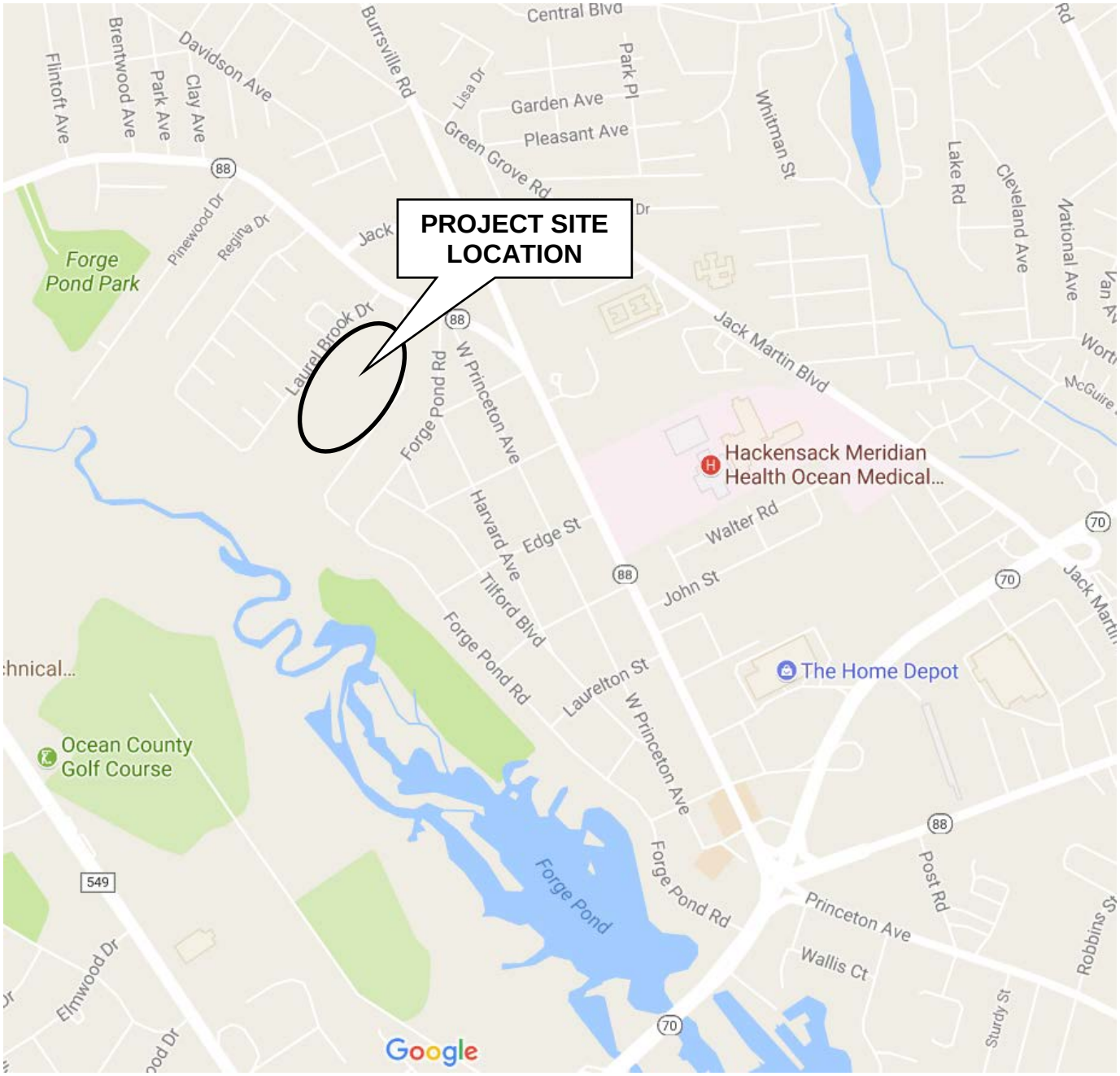
Should you have any questions or if we can be of service to you in the future, please feel free to contact us.

Sincerely,

***FRENCH & PARRELLO ASSOCIATES***

Robert C. Swabsin, PE
Project Consultant, Geotechnical Services

RCS/DMR

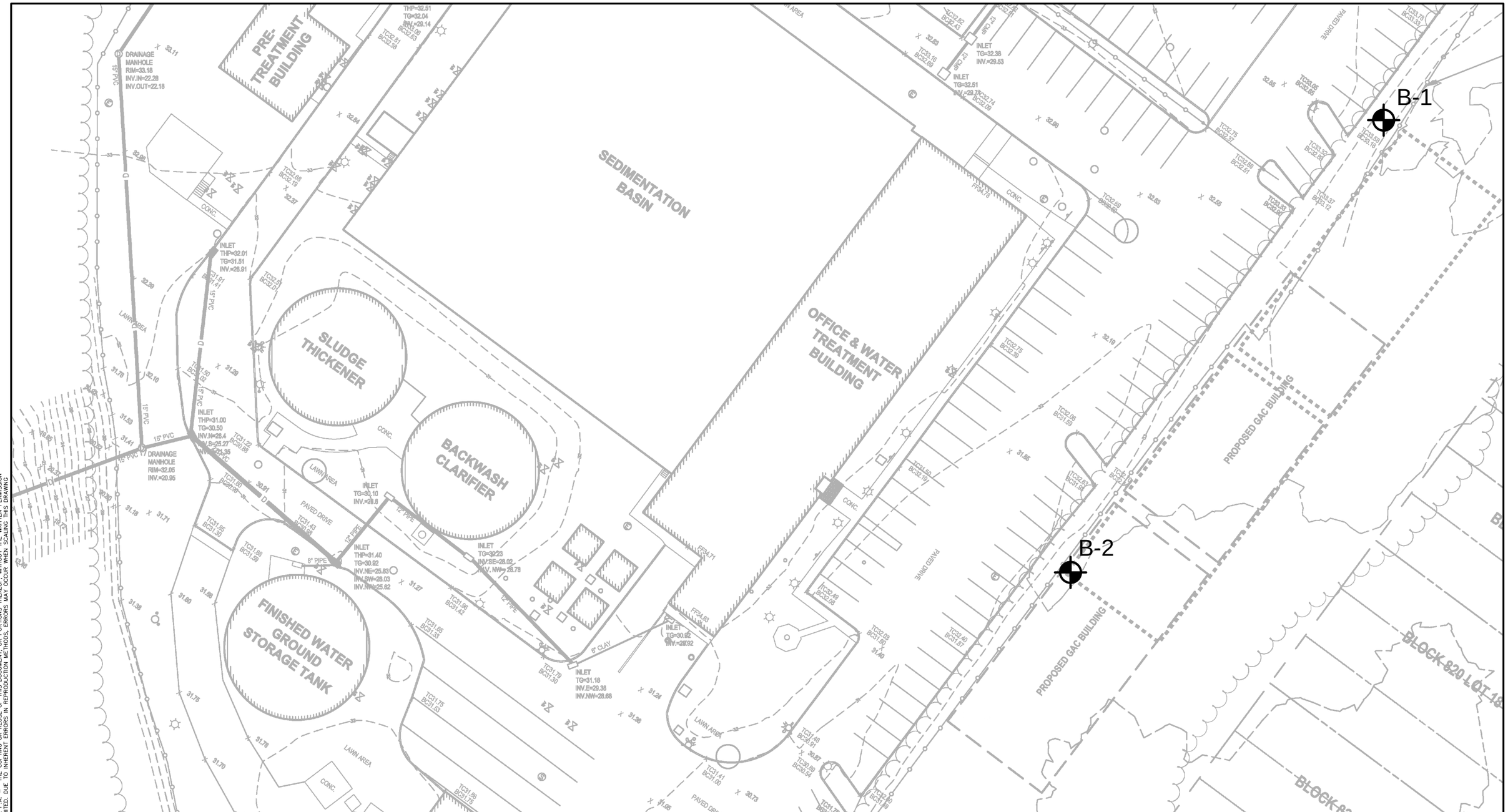



## REGIONAL LOCATION PLAN

Copyright Google Maps, 2017

GAC BUILDINGS AT WILLIAM J. MILLER WATER TREATMENT PLANT
BRICK TOWNSHIP, OCEAN COUNTY, NEW JERSEY

| SCALE: | DATE: | JOB NO.: | DRAWING NO.: |
|---|---|---|---|
| NTS | June 2017 | 12316.001 | 1 |




LEGEND:

TEST BORING LOCATION


FRENCH & PARRELLO ASSOCIATES

**Corporate Office**
1800 Route 34, Suite 101
Wall, NJ 07719
732.312.9800

**Regional Offices**
Hackettstown, NJ
New York, NY


**TEST BORING LOCATION PLAN**
**FOR**
**GAC BUILDINGS AT WATER TREATMENT PLANT**
BRICK TOWNSHIP
OCEAN COUNTY NEW JERSEY

| DATE: | SCALE: | DRAWING # |
|---|---|---|
| JUNE 2017 | APPROX. 1"=40' | 2 |
| DRAWN BY: DMR | PROJECT NUMBER: 12316.001 | |


O:\12K\12300\12316 – GAC Vessels At Water Treatment Plant\CADD\12316.001 – BLP 11x17.dwg 11x17
COPYRIGHT© 2015, FRENCH & PARRELLO ASSOCIATES, P.A. – THE COPYING OR REUSE OF THIS DOCUMENT, OR PORTIONS THEREOF, WITHOUT THE WRITTEN PERMISSION OF FRENCH & PARRELLO ASSOCIATES, P.A. IS PROHIBITED. DUE TO INHERENT ERRORS IN REPRODUCTION METHODS, ERRORS MAY OCCUR WHEN SCALING THIS DRAWING

# *APPENDIX A*
# *Test Boring Logs*

# BURMISTER SOIL CLASSIFICATION SYSTEM

## A. Cohesionless Soils: Particle Size Definitions

| Soil | Fraction | U.S. Standard Sieve | Actual Sizes |
|---|---|---|---|
| Gravel | coarse | 3 in. to 1 in. | 76 mm to 25 mm |
| | medium | 1 in. to 3/8 in. | 25 mm to 9.5 mm |
| | fine | 3/8 in. to No. 10 | 9.5 mm to 2.0 mm |
| Sand | coarse | No. 10 to No. 30 | 2.0 mm to 0.6 mm |
| | medium | No. 30 to No. 60 | 0.6 mm to 0.25 mm |
| | fine | No. 60 to No. 200 | 0.25 mm to 0.75 mm |
| Silt | | < No. 200 | < 0.075 mm |

## B. Terms Describing Gradation of Cohesionless Soils

| Written Description | Symbol/Designation | Defining Proportions |
|---|---|---|
| coarse, medium to fine | cmf | all fractions > 10% |
| coarse to medium | cm | < 10% fine |
| medium to fine | mf | < 10% coarse |
| coarse | c | < 10% medium and fine |
| medium | m | < 10% coarse and fine |
| fine | f | < 10% coarse and medium |

Note: Use (+) for upper limit and (-) for lower limit.

## C. Cohesive Soils: Terms Describing Plasticity

| Soil | Plasticity Index | Workability | Plasticity Description |
|---|---|---|---|
| SILT | 0 | -- | Non-Plastic |
| Clayey SILT | 1 to 5 | 1/4 in. thread | Slightly Plastic |
| SILT & CLAY | 5 to 10 | 1/8 in. thread | Low Plasticity |
| CLAY & SILT | 10 to 20 | 1/16 in. thread | Medium Plasticity |
| Silty CLAY | 20 to 40 | 1/32 in. thread | High Plasticity |
| CLAY | >40 | 1/64 in. thread | Very High Plasticity |

## D. Terms Describing Overall Composition of Soil

| Written Proportion | Proportion Symbol | Proportion Percent by Weight |
|---|---|---|
| and | a | 35 to 50 |
| some | s | 20 to 35 |
| little | l | 10 to 20 |
| trace | t | 1 to 10 |

Note: Use (+) for upper limit and (-) for lower limit.

# TEST BORING LOG

**GAC BUILDINGS AT WILLIAM J. MILLER WATER TREATMENT PLANT**
**BRICK TOWNSHIP, OCEAN COUNTY, NJ (FPA NO. 12316.001)**

**BORING NO.:** B-1
**SHEET** 1 OF 1

**DATE STARTED:** 6/16/2017
**DATE FINISHED:** 6/16/2017

**DEPTH OF WATER:** 27'±
**LOCATION:** See Plan

**GROUND ELEVATION:** +32.5'±
**GROUND WATER ELEV.:** +5.5'±

**DRILLING TECHNIQUE:** Mud Rotary
**HAMMER TYPE:** 140 lb. Automatic Trip Hammer, 30 Inch Drop

| DEPTH FEET | SAMPLE DEPTH | SPT BLOW COUNTS (PER 6") | STRATA | DESCRIPTION OF SOIL | |
|---|---|---|---|---|---|
| | S-1 0-2' | 2 – 2 – 1 – 1 | | S-1 | TOP 12": Dark Brown **SILT**, little$^+$ f Sand. (w/ few roots) BOT 12": Dark Grey-Brown f **SAND**, and$^-$ Silt, trace$^+$ f Gravel. (w/ few roots) |
| | S-2 2-4' | 2 – 3 – 3 – 3 | | | |
| --- 5'--- | S-3 4-6' | 4 – 3 – 4 – 4 | | S-2 | TOP 6": Same as **S-1 BOT 12"**. BOT 18": Orange-Brown mf$^+$ **SAND**, little$^+$ Silt, little f Gravel. |
| | S-4 6-8' | 4 – 4 – 7 – 10 | | S-3 | Tan-Brown mf **SAND**, trace$^+$ mf$^+$ Gravel, trace Silt. |
| | S-5 8-10' | 9 – 10 – 11 – 13 | | S-4 | Tan-Brown m$^+$f **SAND**, trace Silt, trace$^-$ f Gravel. |
| ---10'--- | S-6 10-12' | 10 – 9 – 15 – 16 | | S-5 | Tan-Brown & Yellow-Brown mf **SAND**, trace$^+$ f Gravel, trace$^+$ Silt. |
| | | | | S-6 | Yellow-Brown cm$^+$f **SAND**, some mf$^+$ Gravel, trace$^+$ Silt. |
| ---15'--- | S-7 15-17' | 9 – 13 – 23 – 22 | | S-7 | Yellow-Brown cmf **SAND**, some$^-$ mf$^+$ Gravel, trace Silt. |
| ---20'--- | S-8 20-22' | 8 – 18 – 28 – 41 | | S-8 | Tan-Brown & Orange-Brown m$^+$f **SAND**, trace$^+$ Silt. |
| ---25'--- | S-9 25-27' | 12 – 18 – 27 – 37 | | S-9 | Orange-Brown mf **SAND**, trace$^+$ Silt. |
| ---30'--- | S-10 30-32' | 22 – 28 – 27 – 34 | | S-10 | Light Red-Brown & Orange-Brown m **SAND**, trace Silt. |
| | | | | | END OF BORING @ 32' |
| ---35'--- | | | | | |
| ---40'--- | | | | | |

**SOILS ENGINEER:** R. SWABSIN, PE
**DRILLING INSPECTOR:** D. ROHMEYER, PE

**CONTRACTOR:** CRAIG TEST BORING
**DRILLER:** T. WARD

The information shown hereon indicates the subsurface conditions encountered at the specific boring location on the date(s) of drilling. Subsurface conditions are likely to vary across the project site. Interpretation of the subsurface data shall be at the discretion of the user.

# TEST BORING LOG

**GAC BUILDINGS AT WILLIAM J. MILLER WATER TREATMENT PLANT**
**BRICK TOWNSHIP, OCEAN COUNTY, NJ (FPA NO. 12316.001)**

**BORING NO.:** B-2
**SHEET** 1 OF 1

**DATE STARTED:** 6/16/2017
**DATE FINISHED:** 6/16/2017

**DEPTH OF WATER:** 25'±
**LOCATION:** See Plan

**GROUND ELEVATION:** +31'±
**GROUND WATER ELEV.:** +6'±

**DRILLING TECHNIQUE:** Mud Rotary
**HAMMER TYPE:** 140 lb. Automatic Trip Hammer, 30 Inch Drop

| DEPTH FEET | SAMPLE DEPTH | SPT BLOW COUNTS (PER 6") | STRATA | DESCRIPTION OF SOIL |
|---|---|---|---|---|
| | S-1 0-2' | 1 – 3 – 3 – 2 | | S-1 Tan-Brown mf **SAND**, little f Gravel, little$^-$ Silt. |
| | S-2 2-4' | 3 – 4 – 3 – 3 | | S-2 Light Brown mf$^+$ **SAND**, little Silt, trace f Gravel. |
| --- 5'--- | S-3 4-6' | 3 – 2 – 2 – 3 | | S-3 Orange-Brown & Light Brown mf **SAND**, little f Gravel, trace$^+$ Silt. |
| | S-4 6-8' | 2 – 3 – 4 – 4 | | S-4 Tan-Brown m$^+$f **SAND**, trace$^+$ Silt. |
| | S-5 8-10' | 7 – 8 – 9 – 11 | | S-5 Tan-Brown mf **SAND**, trace Silt. |
| ---10'--- | S-6 10-12' | 10 – 13 – 17 – 19 | | S-6 Light Yellow-Brown cmf **SAND**, some mf$^+$ Gravel, trace$^-$ Silt. |
| ---15'--- | S-7 15-17' | 8 – 14 – 24 – 29 | | S-7 Yellow-Brown c$^+$mf **SAND**, and mf Gravel, trace Silt. |
| ---20'--- | S-8 20-22' | 10 – 12 – 15 – 19 | | S-8 Light Yellow-Brown mf$^+$ **SAND**, little Silt. |
| ---25'--- | S-9 25-27' | 13 – 28 – 33 – 30 | | S-9 Orange-Brown mf **SAND**, trace$^+$ Silt. |
| ---30'--- | S-10 30-32' | 24 – 31 – 37 – 38 | | S-10 Light Brown m$^+$f **SAND**, trace Silt. |
| | | | | END OF BORING @ 32' |
| ---35'--- | | | | |
| ---40'--- | | | | |

**SOILS ENGINEER:** R. SWABSIN, PE
**DRILLING INSPECTOR:** D. ROHMEYER, PE

**CONTRACTOR:** CRAIG TEST BORING
**DRILLER:** T. WARD

The information shown hereon indicates the subsurface conditions encountered at the specific boring location on the date(s) of drilling. Subsurface conditions are likely to vary across the project site. Interpretation of the subsurface data shall be at the discretion of the user.

# *APPENDIX B*
# *Laboratory Test Results*

FRENCH & PARRELLO ASSOCIATES

# SUMMARY OF LABORATORY TESTING

AASHTO Accreditated Laboratory

**PROJECT:** GAC Building @ WJM Water Treament Plant **PROJECT #:** 12316.001 **DATE:** 6/17

| Boring & Sample Number | Depth (ft) | Classification | Natural Water Content % | Atterberg Limits | | Unconfined Compression | | Unit Dry Weight PCF | Specific Gravity | Permeability inches / hour @ 20 deg C | Compaction | Grain Size | Consolidation | Triaxial | % Passing #200 | pH | Organic Content % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Liquid Limit | Plastic Limit | Stress TSF | Strain % | | | | | | | | | | |
| **B-1 S-1** | **5 - 7** | **Tan Brown mf SAND, trace f Gravel, trace Silt** | **7** | | | | | **102.0** | | **19.65** | | | | | | | |
| **B-2 S-1** | **4 - 6** | **Tan Brown mf SAND, trace f Gravel, trace Silt** | **5** | | | | | **102.2** | | **20.06** | | | | | | | |

* SEE TEST CURVES

# *APPENDIX C*
# *Gradational Requirements*

**Allowable Gradational Envelope**

**AASHTO M43**

**Standard Sizes of Coarse Aggregate Size No. 57**

---

| U.S. Standard Sieve Size | Percent Finer by Weight |
|---|---|
| 1 ½” | 100 |
| 1” | 95 - 100 |
| ½” | 25 - 60 |
| No. 4 | 0 - 10 |
| No. 8 | 0 - 5 |

**Allowable Gradational Envelope**

**Type "G" Fill**

**GRANULAR FILL**

---

| U.S. Standard Sieve Size | Percent Finer By Weight |
|---|---|
| 2" | 100 |
| 1" | 80 – 100 |
| 3/8" | 70 – 100 |
| No. 10 | 50 – 100 |
| No. 30 | 30 – 85 |
| No. 60 | 15 – 65 |
| No. 200 | 5 - 15 |

# PART 1 - GENERAL

## 1.01 SECTION INCLUDES

A. Submersible Sump Pump.

## 1.02 REFERENCES

A. NFPA 70 - National Electric Code.

## 1.03 SUBMITTALS

A. Submit under provisions of Section 013300.

B. Provide pump curves and descriptive literature for pumps.

C. Submit manufacturer's installation instructions.

D. Provide data for maintaining operating equipment, schedule of recommended maintenance, type and frequency of lubrication and parts list.

E. Submit performance curves.

## 1.04 EXTRA PARTS

A. Provide one (1) additional submersible sump pump and accessories.

# PART 2 - PRODUCTS

## 2.01 MANUFACTURERS

A. Dayton

B. Barnes

C. Approved equal.

## 2.02 EQUIPMENT

A. Design Criteria:
   1. Cast iron construction.
   2. Centrifugal submersible non-clog pump.
   3. Non-clogging, thermal overload protection.
   4. Performance Points: 30 GPM at 20 feet TDH.
   5. Continuous duty, permanently lubricated, 1/3 HP motor.
   6. Motor Speed: 3,450 RPM (nominal).
   7. Motor: 0.33 HP.
   8. Voltage: 120V, 1 phase, 60 Hz.
   9. Level Operation: On at approximately 7”, off at approximately 3”.
   10. Maximum diameter solids: 1/2”.
   11. Solids Handling: 1/2-inch sphere.

B. Pump Construction:
   1. Motor Housing - Cast Iron
   2. Body - Cast iron
   3. Impeller: Cast iron, 10 vane, open vortex

4. Shaft: Stainless steel.
5. Discharge Connection: 1-1/2", NPT, vertical.
6. Exposed Hardware: 300 Series stainless steel.
7. Motor End Bearing: single row ball design.
8. Pump End Bearing: Single row ball design.
9. Float - Vertical, PVC, snap action where required

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install pump in accordance with manufacturer's instructions.

B. Install piping to pump discharge connection.

C. Demonstrate operation of pump.

**END OF SECTION**