FRENCH & PARRELLO ASSOCIATES

Advancing Our Client's Vision
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Report of Subsurface Exploration & Geotechnical Engineering Evaluation

Hightstown Police Headquarters

Hightstown Borough
Mercer County, New Jersey

Submitted to:

Ms. Debra L. Sopronyi, RMC/QPA/CMR
Administrator/Borough Clerk
Hightstown Borough
156 Bank Street
Hightstown, NJ 08520

June 15, 2020
FPA No. 15305.001R1

1800 Route 34, Suite 101 • Wall, NJ • 07719 • T 732.312.9800 • F 732.312.9801
NEW JERSEY | NEW YORK | PENNSYLVANIA | GEORGIA
fpaengineers.com

FRENCH & PARRELLO ASSOCIATES

Corporate Office
1800 Route 34, Suite 101, Wall, New Jersey 07719
Regional Offices
King of Prussia, Pennsylvania
Bethlehem, Pennsylvania
Hackettstown, New Jersey
Camden, New Jersey
Newark, New Jersey
New York, New York
Atlanta, Georgia

June 15, 2020

Debra L. Sopronyi, RMC/QPA/CMR
Administrator/Borough Clerk
HIGHTSTOWN BOROUGH
156 Bank Street
Hightstown, NJ 08520

Re: Report of Subsurface Exploration &
Geotechnical Engineering Evaluation
Hightstown Police Headquarters
Hightstown Borough, Mercer County, New Jersey
FPA No. 15305.001R1

Dear Ms. Sopronyi:

INTRODUCTION

This report presents the results of our Subsurface Exploration and Geotechnical Engineering Assessment performed in connection with the proposed Hightstown Police Headquarters building to be constructed at 230 Mercer Street in Hightstown Borough, Mercer County, New Jersey. The regional location of the project area is presented on Drawing No. 1, "Regional Location Plan."

The proposed Police Headquarters project will include the renovation of the existing two-story building with a basement level as well as the construction of a new two-story, 10,660 square foot building addition in the rear parking lot area behind the existing building. The new building addition will occupy a plan area of approximately 2,500 square feet and will not have a basement level. The first-floor level will reportedly be situated approximately 5.25 feet below the existing first floor elevation, which is the approximate elevation of the existing parking area. Based upon the Schematic Site Plan SK-25A prepared by The Musial Group, the site grades range from approximately +114 feet to +115 feet in the vicinity of the proposed building addition. Since the building will be constructed at a similar elevation as the existing grade, it is anticipated that only minor cuts and fills will be required.

The purpose for our involvement on the project at this time was to perform a Subsurface Exploration and Geotechnical Engineering Assessment to facilitate the planning, design and construction of the proposed building addition. Our scope of services included the subcontracting and technical observation of 3 test borings, geotechnical engineering evaluation of the acquired

data and the preparation of this report. Our services were performed in general accordance with our proposal dated August 30, 2019.

SUBSURFACE EXPLORATION

The subsurface conditions in the vicinity of the proposed building addition were explored on April 3, 2020 with the performance of three test borings. The field work was performed by a test boring subcontractor while under the full-time technical observation by a representative of FPA. The test boring locations were field located by our representative through correlation with existing site features shown on the Schematic Site Plan SK-25A prepared by The Musial Group dated February 11, 2020. The approximate test boring locations are presented on Drawing No. 2, "Test Boring Location Plan."

The test borings, designated as B-1 through B-3, were advanced to depths ranging from approximately 32 feet to 52 feet below the existing grade using mud rotary drilling procedures. Soil samples were typically obtained by advancing a standard two-inch diameter split-spoon sampler in accordance with ASTM Test Method D-1586, The Standard Penetration Test. All soil samples were classified in the field using the Burmister Soil Classification System. The soil samples were returned to our in-house soils laboratory for further review. The samples will be stored for a period of 60 days from the date of this report.

The depth to groundwater was estimated based on the 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.

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 should consist of alluvial material deposited during the Quaternary period underlain by marine soils. The alluvial soils are known as the Pensauken formation on the Geologic Map of New Jersey and typically consist of sandy silt, silt and clayey silt with some intermixed gravel. The underlying stratified deposits of marine origin are known as the Englishtown sand formation on the Geologic Map of New Jersey. The marine soils typically consist of silty sand grading to uniform sand with small amounts of intermixed gravel. The depth to bedrock is usually greater than 50 feet in the project vicinity.

Subsurface Conditions

The test borings encountered primarily surficial cohesive alluvial soils underlain by granular and cohesive marine deposits. The alluvial soils were encountered from the existing ground surface to depths ranging from approximately 4 feet to 6 feet and consisted of silt and clay intermixed with moderate to significant amounts of coarse to fine sand as well as varying amounts of coarse to fine gravel. We note that test boring B-3 encountered fill material above the alluvial soils, including minor amounts of brick fragments, to a depth of approximately 2 feet below the

existing grade. The alluvial soils were underlain by granular and cohesive marine deposits to the terminating depths of the test borings. The granular marine soils typically consisted of coarse to fine sand intermixed with varying amounts of silt and clay and minor amounts of coarse to fine gravel. The amount of silt and clay typically decreased with depth. Test borings B-1 and B-2 encountered stratified cohesive marine deposits consisting of silt and clay intermixed with minor amounts of fine sand and coarse to fine gravels at depth ranging from approximately 35 feet to 40 feet below the existing grade to the terminating depths of the test borings.

Based on the results of the Standard Penetration Testing, the consistency of the cohesive alluvial soils varied from firm to stiff. The relative density of the underlying granular soils varied from loose to medium dense. The consistency of the cohesive marine deposits varied from stiff to very stiff.

The static groundwater level was encountered within the test borings at a depth of approximately 12 feet below the existing ground surface, corresponding to approximate elevations +102 feet to +103 feet. Seasonal and storm related fluctuations in the groundwater level, as well as the presence of perched groundwater, should be anticipated. For a more detailed description of the subsurface conditions encountered, 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).....0.231g
Spectral Acceleration @ 1 Second (S_1) 0.065g
Site Class .....D

DISCUSSION & RECOMMENDATIONS

General

Based on the results our subsurface exploration and subsequent geotechnical engineering evaluation, it is our opinion that the proposed building addition may be founded on conventional shallow foundations provided the recommendations presented herein are incorporated into the foundation design.

The static groundwater level was encountered within the test borings at a depth of approximately 12 feet below the existing ground surface, corresponding to approximate elevations +102 feet to +103 feet. We do not anticipate groundwater will be encountered within foundation excavations provided they do not advance beyond elevation +104 feet. In the event that perched groundwater is encountered within the unsaturated zone, it is our opinion that the associated dewatering may be accomplished using in-trench sump pumps, placed within crushed stone.

It is our understanding the proposed improvements include the construction of a new two-story, 10,660 square foot building addition which will not have a basement level. Based upon the Schematic First Floor Plan SK-22A prepared by The Musial Group Architecture and dated February 11, 2020, the existing first floor elevation is approximately +120.4 feet, and the existing basement elevation is approximately elevation +112 feet. The proposed first floor elevation of the building addition is approximately +115 feet. We note that if the proposed building addition footings are located above the existing footing elevations, additional load will be applied onto the adjacent existing basement wall. As the existing basement walls may have not been designed to support these additional loads, we recommend that the new footings should be situated at the same elevation as the existing buildings basement footings. We recommend that, if the design team needs the elevation of the existing footings, that additional test pits may be performed to confirm the bottom of the existing footing elevation.

Shallow Foundations

Shallow foundations bearing within the granular in-situ soils or on compacted structural fills may designed for a net allowable bearing pressure of 3,000 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. As outlined above, the proposed building addition footings should be situated at the existing basement footing elevation, so they will likely extend deeper than 36 inches below outside grade.

We estimate that footings loaded to the recommended allowable static bearing pressure will undergo approximately one inch of total settlement. We anticipate that post construction differential settlements will be less than ½ inch over a horizontal distance of 40 feet.

Foundation Excavation & Subgrade Preparation

We anticipate that the Contractor may utilize conventional earth excavating equipment for performing excavations for the foundations. We recommend that all excavations be hand trimmed, in a workmanlike manner, and that the subgrade be compacted with a walk-behind smooth drum, vibratory roller 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.

We note that the surficial alluvial soils at the site contained moderate to significant amounts of fine-grained material, which is highly moisture sensitive. Any material containing moderate to significant amounts of fine-grained material, i.e. silt and clay, may require moisture conditioning in order to achieve proper compaction. We recommend that this material not be used in structural areas.

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. In the event that foundation excavations are conducted during inclement weather, or if the subgrades are left open overnight, we recommend that the foundation subgrades be over-excavated to allow for the placement of 6 inches of NJDOT No. 57 Stone. The crushed stone 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 B.

Concrete Floor Slabs

Provided that the required earthwork is accomplished in accordance with the recommendations contained in this report, it is our opinion that a modulus of subgrade reaction equal to 175 pci should be utilized in the structural design of concrete slabs. Due to the fine-grained nature of the surficial soils, we recommend a minimum 4-inch thick layer of NJDOT No. 57 Stone be placed under the concrete floor slab to provide a uniform subgrade for the slab and limit issues with moisture associated with fine grained soils.

Site Preparation & Earthwork

Prior to placing any structural fills or concrete slabs, the ground surface should be stripped of all asphalt, vegetation and surficial debris. The exposed subgrade should be compacted with a minimum of 5 passes using a minimum 10-ton, sheepsfoot vibrator roller to densify loose subgrade soils near the surface. Any soft areas that exhibit pumping or yielding should be removed and replaced with on-site granular soils or imported Type "G" fill. This material should also be utilized under any areas of the proposed building addition and parking areas that require the raising of site grades.

Compacted fill placed to raise site grades for support of footings, slabs or parking areas should be placed in horizontal loose lifts 12 inches or less in thickness. These fills should be compacted to a minimum of 95 percent of their maximum dry density as determined by ASTM Test Method D-1557, The Modified Proctor Test. Fill materials placed in non-structural areas for general grading purposes outside the limits of structural elements should be compacted to a minimum of 90 percent of their maximum dry density per ASTM D-1557. The surface of all compacted fill subgrades should be graded or sloped to provide gravity drainage of surface run-off. In addition, the surface of all prepared subgrades should be thoroughly compacted at the end of each work day to seal the surface and minimize softening that may result from precipitation.

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 foundation related aspects of construction, including stripping, controlled fill operation, foundation excavation 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, chemically hazardous, or biologically toxic materials in the soil, surface water, groundwater or air, on or below or around the site.

Services performed by FPA 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 or guarantee 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.

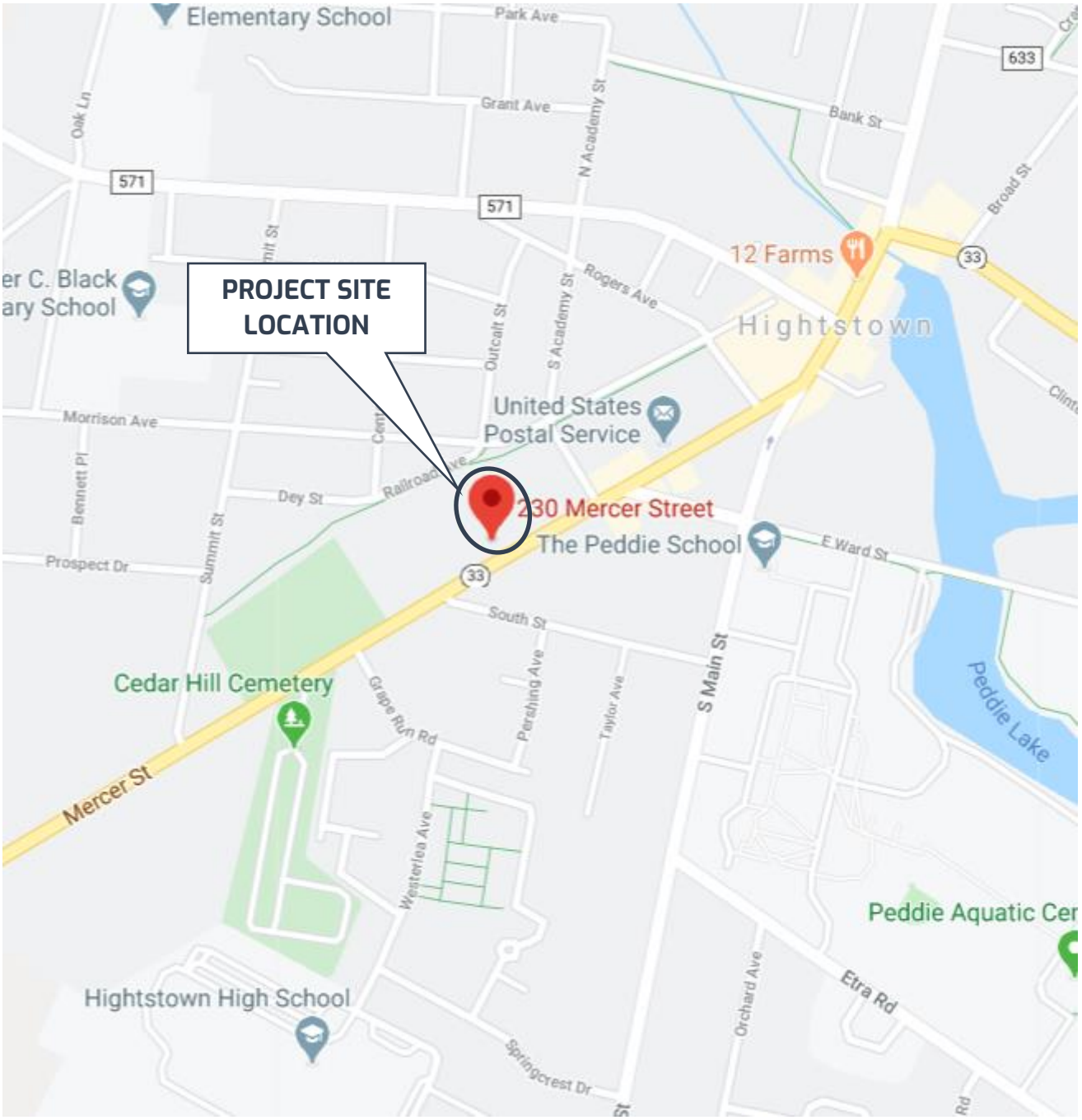
Sincerely,

FRENCH & PARRELLO ASSOCIATES

David M. Rohmeyer, PE
Project Engineer

Matthew S. Gizzi, PE
Senior Vice President

DMR/MSG

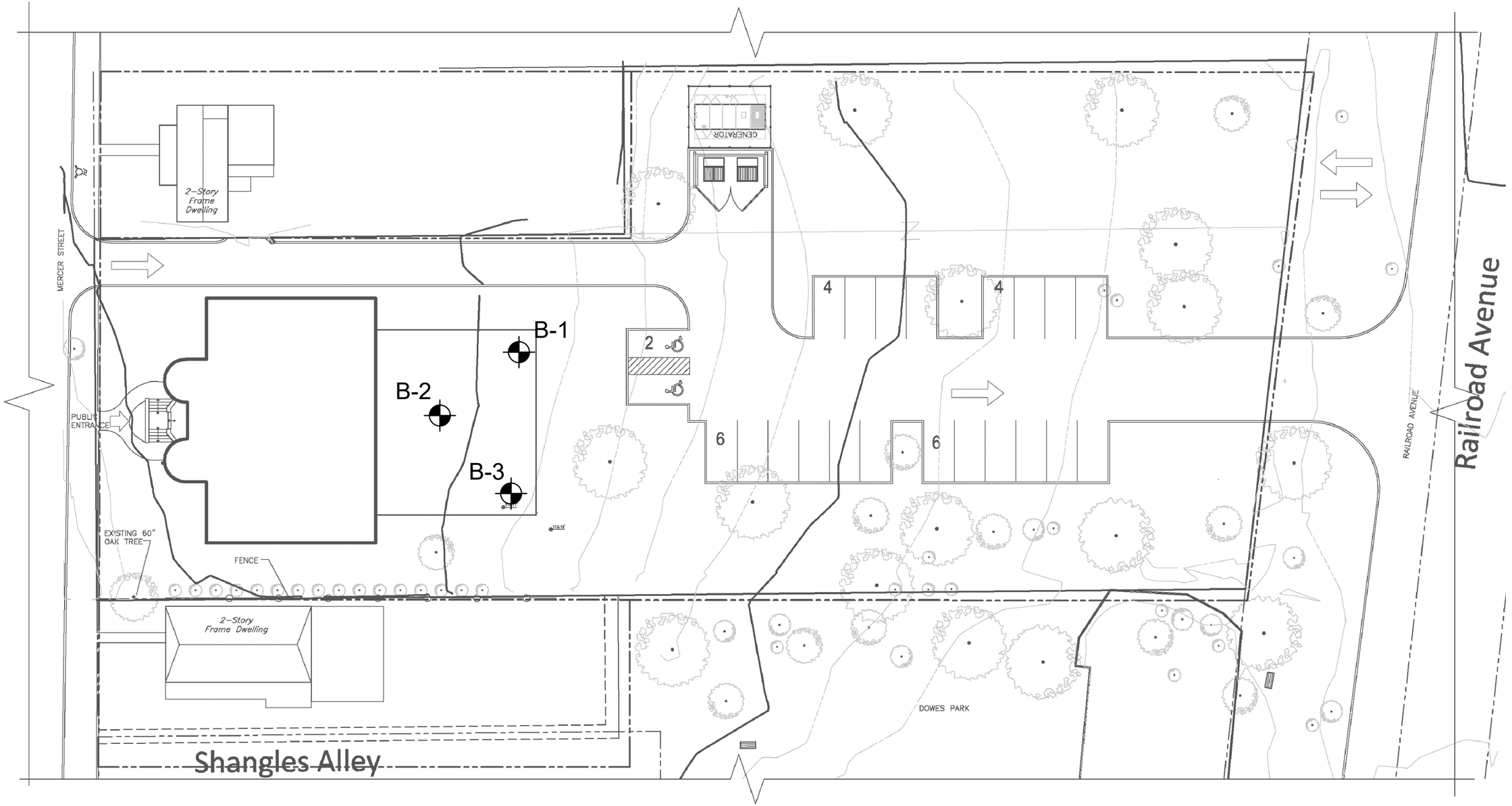


REGIONAL LOCATION PLAN

HIGHTSTOWN POLICE HEADQUARTERS

HIGHTSTOWN BOROUGH, MERCER COUNTY, NEW JERSEY

SCALE:	DATE:	JOB NO.:	DRAWING NO.:
NTS	MARCH 2020	15305.001	1



LEGEND:

TEST BORING LOCATION

PLAN NORTH

FRENCH & PARRELLO ASSOCIATES

Corporate Office:
1800 Route 34, Suite 101
Wall, New Jersey 07719
732.312.9800

FPAengineers.com

New Jersey ▲ New York ▲ Pennsylvania ▲ Georgia

TEST BORING LOCATION PLAN

FOR

HIGHTSTOWN POLICE HEADQUARTERS

HIGHTSTOWN BOROUGH
MERCER COUNTY, NEW JERSEY

DATE:	SCALE:	DRAWING #
MAY 2020	APPROX. 1"=30'	2
DRAWN BY: DMR	PROJECT NUMBER: 15305.001	

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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

HIGHTSTOWN POLICE HEADQUARTERS
HIGHTSTOWN BOROUGH, MERCER COUNTY, NEW JERSEY
(FPA PROJECT NO. 15305.001)

BORING NO.: B-1
SHEET 1 OF 2

DATE STARTED: 4/3/2020
DATE FINISHED: 4/3/2020
DEPTH OF WATER: 12'±
LOCATION: See Plan
GROUND ELEVATION: +114.5'±
GROUND WATER ELEV.: +102.5'±

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'	X – X – 9 – 5		S-1 TOP 12": **Asphalt**. BOT 12": Yellow-Brown **CLAY & SILT**, some cm⁺f Gravel, some⁻ cm⁺f Sand.
	S-2 2-4'	6 – 5 – 4 – 7		S-2 Yellow-Brown **Clayey SILT**, and c⁺mf Sand, trace f Gravel.
--- 5'---	S-3 4-6'	6 – 5 – 5 – 5		S-3 Same as **S-2**.
	S-4 6-8'	4 – 3 – 4 – 4		S-4 Light Yellow-Brown c⁺mf **SAND**, some Clayey Silt, trace⁺ f Gravel.
---10'---	S-5 8-10'	6 – 5 – 5 – 5		S-5 Same as **S-4**.
	S-6 10-12'	6 – 7 – 7 – 7		S-6 Same as **S-4**.
---15'---	S-7 15-17'	4 – 3 – 4 – 7		S-7 Yellow Brown c⁺m **SAND**, trace⁺ Silt.
---20'---	S-8 20-22'	5 – 7 – 8 – 8		S-8 Yellow-Brown cm⁺f **SAND**, little⁺ Clayey Silt, little⁻ cm Gravel.
---25'---	S-9 25-27'	4 – 3 – 3 – 5		S-9 Yellow-Brown cm⁺f **SAND**, trace⁺ Silt.
---30'---	S-10 30-32'	6 – 8 – 8 – 10		S-10 Yellow-Brown cmf **SAND**, trace⁺ Silt, trace⁺ f Gravel.
---35'---	S-11 35-37'	5 – 6 – 6 – 7		S-11 Dark Orange-Brown & Red-Brown **CLAY & SILT**, some⁺ cmf⁺ Gravel, some cmf Sand.

SOILS ENGINEER: M. GIZZI, PE
DRILLING INSPECTOR: H. RIOS, PE

CONTRACTOR: CRAIG TEST BORING
DRILLER: M. TARTER

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

HIGHTSTOWN POLICE HEADQUARTERS
HIGHTSTOWN BOROUGH, MERCER COUNTY, NEW JERSEY
(FPA PROJECT NO. 15305.001

BORING NO.: B-1
SHEET 2 OF 2

DATE STARTED: 4/3/2020
DATE FINISHED: 4/3/2020
DEPTH OF WATER: 12'±
LOCATION: See Plan
GROUND ELEVATION: +114.5'±
GROUND WATER ELEV.: +102.5'±

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
---40'---				
	S-12 40-42'	11 – 6 – 11 – 9		S-12 TOP 6: Orange-Brown c^{+}mf **SAND**, and Clay & Silt, some^{-} mf^{+} Gravel. MID 6": Grey **Silty CLAY**, trace f Sand. BOT 12": Orange-Brown c^{+}mf **SAND**, and Clay & Silt, some^{-} mf^{+} Gravel.
--- 45'---				
	S-13 45-47'	4 – 5 – 6 – 10		S-13 Dark Grey **Silty CLAY**, trace^{-} f Sand.
---50'---				
	S-14 50-52'	8 – 11 – 15 – 20		S-14 Dark Grey **CLAY & SILT**, little cmf Gravel, trace^{+} f Sand.
				END OF BORING @ 52'
---55'---				
---60'---				
---65'---				
---70'---				
---75'---				

SOILS ENGINEER: M. GIZZI, PE
DRILLING INSPECTOR: H. RIOS, PE

CONTRACTOR: CRAIG TEST BORING
DRILLER: M. TARTER

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

HIGHTSTOWN POLICE HEADQUARTERS
HIGHTSTOWN BOROUGH, MERCER COUNTY, NEW JERSEY
(FPA PROJECT NO. 15305.001)

BORING NO.: B-2
SHEET 1 OF 1

DATE STARTED: 4/3/2020
DATE FINISHED: 4/3/2020
DEPTH OF WATER: 12'±
LOCATION: See Plan
GROUND ELEVATION: +115'±
GROUND WATER ELEV.: +103'±

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'	X – X – 8 – 9		S-1 TOP 12": **Asphalt**. BOT 12": Yellow-Brown **CLAY & SILT**, and^{-} c^{+}mf Sand, little^{+} c^{+}mf Gravel.
	S-2 2-4'	11 – 5 – 7 – 7		S-2 Yellow-Brown **Clayey SILT**, and^{-} cm^{+}f Sand, trace f Gravel.
--- 5'---	S-3 4-6'	11 – 5 – 6 – 7		S-3 Light Yellow-Brown c^{+}mf **SAND**, some^{+} Clayey Silt, trace^{+} mf^{+} Gravel.
	S-4 6-8'	3 – 3 – 4 – 4		S-4 Light Yellow-Brown cm **SAND**, some^{-} Clayey Silt.
	S-5 8-10'	3 – 4 – 6 – 6		S-5 Same as **S-4**.
---10'---	S-6 10-12'	4 – 3 – 3 – 4		S-6 Yellow-Brown c^{+}m **SAND**, little^{+} Clayey Silt.
---15'---	S-7 15-17'	4 – 3 – 4 – 4		S-7 Dark Yellow-Brown c^{+}m **SAND**, trace^{+} Silt.
---20'---	S-8 20-22'	3 – 3 – 4 – 4		S-8 Same as **S-7**.
---25'---	S-9 25-27'	3 – 3 – 5 – 7		S-9 Dark Yellow-Brown c^{+}mf **SAND**, some^{-} Clayey Silt.
---30'---	S-10 30-32'	6 – 6 – 8 – 11		S-10 Dark Yellow-Brown c^{+}mf **SAND**, trace^{+} Silt, trace^{+} f Gravel.
---35'---	S-11 35-37'	4 – 3 – 8 – 12		S-11 Orange-Brown **Silty CLAY**, trace^{-} f Sand.
				END OF BORING @ 37'

SOILS ENGINEER: M. GIZZI, PE
DRILLING INSPECTOR: H. RIOS, PE

CONTRACTOR: CRAIG TEST BORING
DRILLER: M. TARTER

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

HIGHTSTOWN POLICE HEADQUARTERS
HIGHTSTOWN BOROUGH, MERCER COUNTY, NEW JERSEY
(FPA PROJECT NO. 15305.001)

BORING NO.: B-3
SHEET 1 OF 1

DATE STARTED: 4/3/2020
DATE FINISHED: 4/3/2020
DEPTH OF WATER: 12'±
LOCATION: See Plan
GROUND ELEVATION: +114'±
GROUND WATER ELEV.: +102'±

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'	X – X – 4 – 5		S-1 TOP 12": **Asphalt**. BOT 12': Tan-Brown & Red-Brown cmf **SAND**, little mf^{+} Gravel, little Silt w/ few pieces of brick. (fill)
	S-2 2-4'	5 – 3 – 5 – 9		S-2 Yellow-Brown **CLAY & SILT**, and^{-} c^{+}mf Sand, little cm^{+}f Gravel.
--- 5'---	S-3 4-6'	8 – 6 – 7 – 7		S-3 Light Yellow-Brown cm^{+}f **SAND**, trace^{+} f Gravel, trace^{+} Clayey Silt.
	S-4 6-8'	8 – 6 – 7 – 7		S-4 Light Yellow-Brown c^{+}mf **SAND**, little Clayey Silt.
---10'---	S-5 8-10'	3 – 5 – 5 – 4		S-5 Light Yellow-Brown cm^{+}f **SAND**, some^{+} Silt, trace f Gravel.
	S-6 10-12'	4 – 3 – 4 – 4		S-6 Light Yellow-Brown c^{+}m **SAND**, some Clayey Silt.
---15'---	S-7 15-17'	4 – 4 – 4 – 5		S-7 Yellow-Brown cmf **SAND**, trace^{+} f Gravel, trace^{+} Clayey Silt.
---20'---	S-8 20-22'	3 – 3 – 4 – 4		S-8 Dark Yellow-Brown c^{+}mf **SAND**, trace^{+} Silt.
---25'---	S-9 25-27'	5 – 6 – 7 – 8		S-9 Same as **S-8**.
---30'---	S-10 30-32'	6 – 5 – 7 – 9		S-10 Dark Yellow-Brown c^{+}m **SAND**, trace^{+} Silt.
				END OF BORING @ 32'
---35'---				

SOILS ENGINEER: M. GIZZI, PE
DRILLING INSPECTOR: H. RIOS, PE

CONTRACTOR: CRAIG TEST BORING
DRILLER: M. TARTER

APPENDIX B
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