Project:	**P.S./I.S. 89 Playground Restoration and Modification – General Contractor ("GC") Services Project (the "Project")**	**Date:**	**May 10, 2019**
		RE:	**Addendum #1**
		# of Pages:	**20**

The following information is provided in response to questions received in writing by May 6, 2019 regarding the Request for Proposals ("RFP") associated with this Project.

The responses are provided in bold print immediately following the questions:

1) The small storage shed inside the fenced area in the south west corner, is it accessible for the GC to use during construction effort?
   There is some snow removal equipment in the shed, but the school custodial staff will allow the selected Proposer to use any available shed space.

2) Will the two entrance gates which are currently locked [sic], will keys be provided to the contractor, or will the contractor be able to supply their own locks?
   The selected Proposer is expected to provide its own locks and to furnish a key to school custodial personnel.

3) Are [sic] there any geotechnical information on the subject site with regard to soil or underground conditions?
   Please refer to the Cores Sampling Report, attached to this Addendum as Exhibit 1.

4) The Contractor requests more information on what areas of the brick wall need to be repointed?
   Proposers must provide a unit price for the cost per square foot for the brick repointing work. The necessary amount of required repointing work will be determined by BPCA, in concert with the selected Proposer and the Project Engineer, following commencement of construction. Such repointing work will be paid for through an allowance to be included in the Contract amount.

5) Is any qualified Arborist required for tree removal?
   No arborist is needed for tree removal. BPCA horticulture personnel will select trees and be present at the time of planting.

In addition, the following clarifications are hereby provided with respect to the RFP Scope of Work (Exhibit A):

- The selected Proposer shall remove and properly dispose of, in accordance with the Construction Documents, the eight (8) honey locust trees located within the Project site, each with a diameter at breast height (DBH) range of 8-12”; and
- The selected Proposer shall install three (3) sweetgum trees at locations and in the manner specified in the Construction Documents, each with a caliper range of 6-7”.

By signing below, I am acknowledging that all pages of this Addendum have been received, reviewed, and understood, and will be incorporated into the submitted Proposal. This document must be attached to the Proposal for its consideration.

_____	_____	_____
Print Name	Signature	Date

Number of pages received: _____ <fill in>

Distributed to: All prospective Proposers.

EXHIBIT 1:

CORE SAMPLE REPORT

[NO FURTHER TEXT ON THIS PAGE]

WHITESTONE
ASSOCIATES, INC.
Environmental & Geotechnical Engineers & Consultants

MT. BETHEL CORPORATE CENTER
35 TECHNOLOGY DRIVE
WARREN, NJ 07059
908.668.7777
whitestoneassoc.com

November 19, 2018

via email

H2M ARCHITECTS & ENGINEERS
538 Broad Hollow Road
Fourth Floor East
Melville, New York 11747

Attention: Danielle Drake, P.E.
Senior Project Engineer

Regarding: EXISTING PAVEMENT EVALUATION
P.S. 89 IMPROVEMENTS
201 WARREN STREET
BATTERY PARK CITY, NEW YORK, NEW YORK
WHITESTONE PROJECT NO.: GJ1815962.000

Dear Ms. Drake:

Whitestone Associates, Inc. (Whitestone) is pleased to submit this letter regarding the results of the existing pavement evaluation performed at the above-referenced site. The field evaluation was performed on November 6, 2018 and the results of field activities are presented below.

1.0 PROJECT DESCRIPTION & BACKGROUND

The subject site is located at 201 Warren Street in Battery Park City, New York, New York. The site currently is occupied by the P.S. 89 elementary school including a five-story building, exterior playground area and associated landscaping and utilities. The existing playground area surface cover currently consists of asphaltic concrete pavement within the center of the playground and asphalt pavers along the perimeter. The area of the proposed construction will be limited to pavement renovations for the existing playground area.

Based on information provided by H2M Architects & Engineers, the proposed renovations are anticipated to include milling and overlaying the existing asphaltic concrete pavement within the interior of the playground area and replacing the asphalt pavers along the perimeter. The proposed new pavement area will be utilized as a playground with lightly-loaded playground equipment. Vehicular traffic is not anticipated.

2.0 FIELD & LABORATORY WORK

2.1 Fieldwork

Whitestone's services included conducting a limited visual evaluation, performing two pavement cores (identified as C-1 and C-2) to determine the approximate pavement thickness, and conducting hand auger

probes (identified as HA-1 and HA-2) at representative core locations to evaluate the composition, thickness, and consistency of the underlying subbase materials (although not encountered) and subgrade soils. The pavement cores were performed with a four-inch diameter core bit. The hand auger probes were terminated at depths of approximately three feet below ground surface (fbgs). The fieldwork also consisted of performing Dynamic Cone Penetrometer (DCP) testing within the existing subgrade soils at each hand auger probe location. The subsurface tests performed by Whitestone subsequently were backfilled to the surface with excavated soils from the investigation and surficially patched with asphaltic concrete cold patch. The locations of the tests are shown on the accompanying *Test Location Plan* included as Figure 1. *Records of Subsurface Exploration* are provided in Appendix A. DCP test results are provided in Appendix C.

The subsurface tests were conducted in the presence of a Whitestone engineer who performed field tests, recorded visual classifications, and collected samples of the various strata encountered. The tests were located in the field using normal taping procedures and estimated right angles. These locations are presumed to be accurate within a few feet.

Groundwater level observations, although not encountered, were recorded during and immediately after the completion of field operations prior to backfilling the tests. Seasonal variations, temperature effects, man-made effects, and recent rainfall conditions may influence the levels of the groundwater, and the observed levels will depend on the permeability of the soils. Groundwater elevations derived from sources other than seasonally observed groundwater monitor wells may not be representative of true groundwater levels.

2.2 Laboratory Testing Program

Representative samples of a selected stratum encountered were subjected to a laboratory testing program that included moisture content determinations (ASTM D-2216) and washed gradation analyses (ASTM D-422) in order to perform supplementary engineering soil classifications in general accordance with ASTM D-2487. The soil stratum tested was classified by the Unified Soil Classification System (USCS) and results of the laboratory testing are summarized in the following table. Quantitative test results are provided in Appendix B.

PHYSICAL/TEXTURAL ANALYSES SUMMARY

Test	Sample	Depth (fbgs)	Natural Moisture Content (%)	Percent Passing No. 200 Sieve	Liquid Limit (%)	Plastic Index (%)	USCS Classification
HA-1	S-3	1.5 - 3.0	3.8	6.0	Non-Plastic		GP-GM (FILL)
HA-2	S-4	2.5 - 3.0	4.1	1.7	Non-Plastic		SP (FILL)

3.0 SUMMARY OF FINDINGS

Limited Visual Evaluation: The results of the limited visual evaluation indicated that the existing asphaltic concrete pavement area generally is in fair structural condition with areas of minor cracking observed. The existing asphaltic pavers were generally in good structural condition.

Pavement Core Results: Core C-1 was performed within an existing asphaltic concrete pavement area. Core C-2 was performed within an existing asphaltic concrete paver area. The results obtained from the

coring efforts indicate that the thickness of the existing asphaltic pavement is approximately six inches within the asphaltic concrete pavement area. Within the existing paver area, the pavement was composed of approximately two inches of an asphaltic concrete paver followed by approximately one-half inch of leveling course (apparent bituminous bedding). The leveling course was underlain by approximately three inches of Portland cement concrete. Subbase materials were not encountered. The results of the pavement coring efforts are presented in the following table and provide general thicknesses of the individual courses of the existing pavement section:

SUMMARY OF PAVEMENT CORE RESULTS					
Core Location	Total Pavement Thickness (Inches)	Pavement Component Thickness (Inches)		Subbase Thickness (Inches)	Notes
		Surface Course	Base Course		
C-1	6.0	1.75	4.25	NE	--
C-2	2.0	2.0	--	NE	0.5" Leveling Course Followed by 3.0" PCC

NE - Not Encountered

The subsurface soil conditions encountered in the hand auger probes consisted of the following generalized strata in order of increasing depth. *Records of Subsurface Exploration* are provided in Appendix A.

Surface Materials: The hand auger probes were performed within the cored pavement areas. A summary of the surface cover and subbase thicknesses (although not encountered) is provided in the table above.

Existing Fill Materials (NYC Class 7): Underlying the surface materials, the hand auger probes encountered existing fill materials that generally consisted of either poorly graded gravel with silt and sand as well as trace debris and/or poorly graded sand. The debris encountered consisted of brick and concrete fragments. The hand auger probes were terminated within the existing fill materials at a depth of approximately three fbgs.

Groundwater: Static groundwater was not encountered within any of the hand auger probes performed as part of this investigation with the maximum depth explored of approximately three fbgs. Seasonal variations, temperature effects, man-made effects and recent rainfall conditions may influence the levels of the groundwater, and the observed level will depend on the permeability of the soils. Groundwater elevations derived from sources other than seasonally observed groundwater monitor wells may not be representative of true groundwater level.

4.0 CONCLUSIONS & RECOMMENDATIONS

The results of the pavement condition evaluation generally indicated that the existing asphaltic concrete pavement currently is in generally fair structural condition. Furthermore, the results indicated that the asphaltic concrete pavement has sufficient thickness and has retained some load-carrying capacity. The existing asphaltic pavers were observed to be in generally good structural condition. Apparent subbase materials were not encountered below the pavement surface cover. However, the underlying subgrade soils are generally coarse-grained and sufficient for non-vehicular pavements. As such, Whitestone anticipates that full-depth pavement repair/replacement will not be required for this site.

Mill and Overlay Recommendation

Whitestone recommends that the existing asphaltic concrete pavement areas may be milled and overlaid to extend the service life of the existing pavement. Based on a review of historic aerial photography, the existing pavement has been in place for a minimum of 15 years and has still retained some load-carrying capacity without areas of significant distress. As such, Whitestone anticipates that the mill and overlay will further extend the service life of the existing pavement.

Overlay Thickness: The recommended mill and overlay program includes milling the existing pavement surface at least 1.5 inches in thickness and placing a new overlay of hot-mix AC conforming to NYSDOT criteria presented in the following table:

RECOMMENDED FLEXIBLE PAVEMENT OVERLAY		
Layer	**Material**	**Pavement Thickness (Inches)**
Overlay	NYSDOT Type 7 of 7F Top	1.5

Asphalt Paver Recommendation

Whitestone understands the existing asphalt pavers may be removed and replaced. Within the area of the existing asphalt pavers, Whitestone anticipates that the removal of the asphalt pavers will also include the removal of the underlying leveling course. Therefore, Whitestone recommends replacement of the existing one-half inch leveling course with a minimum of three-quarter inch bituminous setting bed. The underlying existing Portland cement concrete may remain in place below the setting bed.

5.0 CLOSING

Whitestone appreciates the opportunity to be of continued service to H2M Architects & Engineers. Please contact us with any questions regarding this letter.

Sincerely,

WHITESTONE ASSOCIATES, INC.

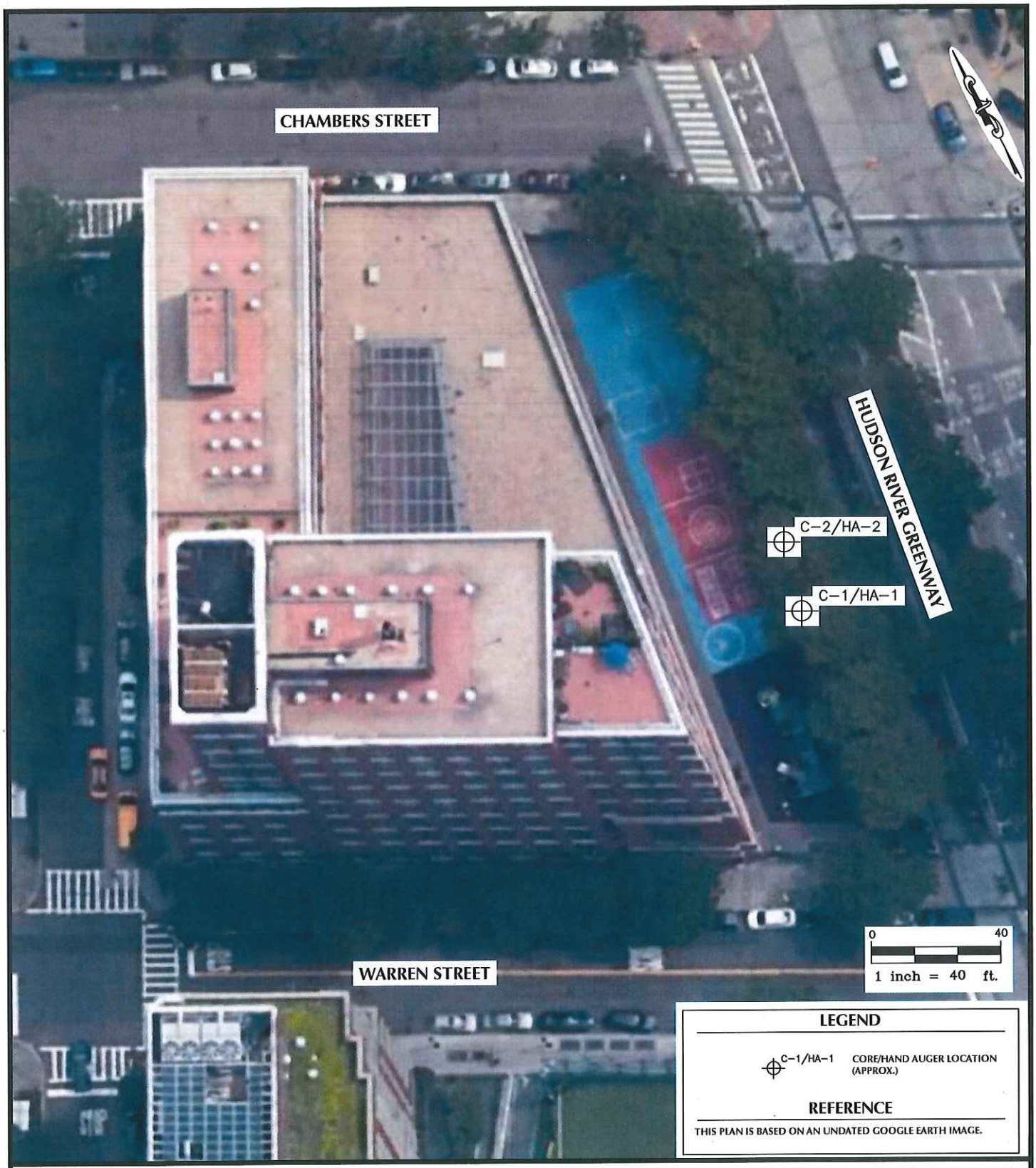
Mudar Khantamr, P.E.
Project Manager

Kevin A. Feath, P.E.
Senior Project Manager

MK/pwd L:\Job Folders\2018\1815962GJ\Reports and Submittals\15962 EPE.docx
Enclosures
Copy: Matthew R. Mohlin, P.E., H2M Architects & Engineers
Laurence W. Keller, P.E., Whitestone Associates, Inc.

WHITESTONE
ASSOCIATES, INC.

FIGURE 1
Test Location Plan



LEGEND

C-1/HA-1 CORE/HAND AUGER LOCATION (APPROX.)

REFERENCE

THIS PLAN IS BASED ON AN UNDATED GOOGLE EARTH IMAGE.

PROJECT #: GJ1815962.000	
DESIGNED BY: GR	PROJ. MGR.: KAF
DATE: 11/15/18	FIGURE: 1
SCALE: 1" = 40'	

DRAWING TITLE: TEST LOCATION PLAN

CLIENT: H2M ARCHITECTS & ENGINEERS

PROJECT: P.S. 89 IMPROVEMENTS
201 WARREN STREET
NEW YORK, NY

WHITESTONE ASSOCIATES, INC.
Environmental & Geotechnical Engineers & Consultants
35 TECHNOLOGY DRIVE, WARREN, NJ 07059
908.668.7777 WHITESTONEASSOC.COM

WHITESTONE
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APPENDIX A
Records of Subsurface Exploration

WHITESTONE ASSOCIATES, INC.

RECORD OF SUBSURFACE EXPLORATION

Boring No.: HA-1

Page 1 of 1

Project:	P.S. 89 Improvements	**WAI Project No.:**	GJ1815962.000
Location:	201 Warren Street; Battery Park City, New York, NY	**Client:**	H2M Architects & Engineers

				Water Depth (feet bgs) | Elevation (feet)	Cave-In Depth (feet bgs) | Elevation (feet)
Surface Elevation:	± NS feet	**Date Started:**	11/6/2018		
Termination Depth:	3.0 feet bgs	**Date Completed:**	11/6/2018		
Proposed Location:	Pavement	**Logged By:**	AV	**During:** NE | ---	
Excavating Method:	Hand Auger	**Contractor:**	Whitestone	**At Completion:** --- | ---	**At Completion:** 3.0 | —
Test Method:	Visual Observation	**Rig Type:**	Hand Auger	**24 Hours:** — | ---	

SAMPLE INFORMATION			DEPTH	STRATA		DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (ft.)	Number	Type	(feet)				
			0.0				
0 - 0.5	S-1	BAG	0.5	PAVEMENT		6" Asphalt Pavement, No Apparent Subbase	
0.5 - 1.5	S-2	BAG		FILL		Brown-Gray Poorly Graded Gravel with Silt and Sand, Trace Concrete Debris, Moist (FILL) (NYC Class 7)	
1.5 - 3	S-3	BAG				As Above (FILL) (NYC Class 7)	
			3.0			Boring Log HA-1 Terminated at a Depth of 3.0 Feet Below Ground Surface	
			5.0				
			10.0				
			15.0				

NOTES: bgs = below ground surface, DNC = Did Not Cave, NA = Not Applicable, NE = Not Encountered, NS = Not Surveyed, P = Perched

WHITESTONE ASSOCIATES, INC.

RECORD OF SUBSURFACE EXPLORATION

Boring No.: HA-2

Page 1 of 1

Project:	P.S. 89 Improvements	**WAI Project No.:**	GJ1815962.000
Location:	201 Warren Street; Battery Park City, New York, NY	**Client:**	H2M Architects & Engineers

Surface Elevation:	± NS feet	**Date Started:**	11/6/2018		**Water Depth (feet bgs)**	**Elevation (feet)**	**Cave-In Depth (feet bgs)** / **Elevation (feet)**
Termination Depth:	3.0 feet bgs	**Date Completed:**	11/6/2018	**During:**	NE	—	
Proposed Location:	Pavement	**Logged By:**	AV	**At Completion:**	---	---	**At Completion:** --- / ---
Excavating Method:	Hand Auger	**Contractor:**	Whitestone	**24 Hours:**	—	—	
Test Method:	Visual Observation	**Rig Type:**	Hand Auger				

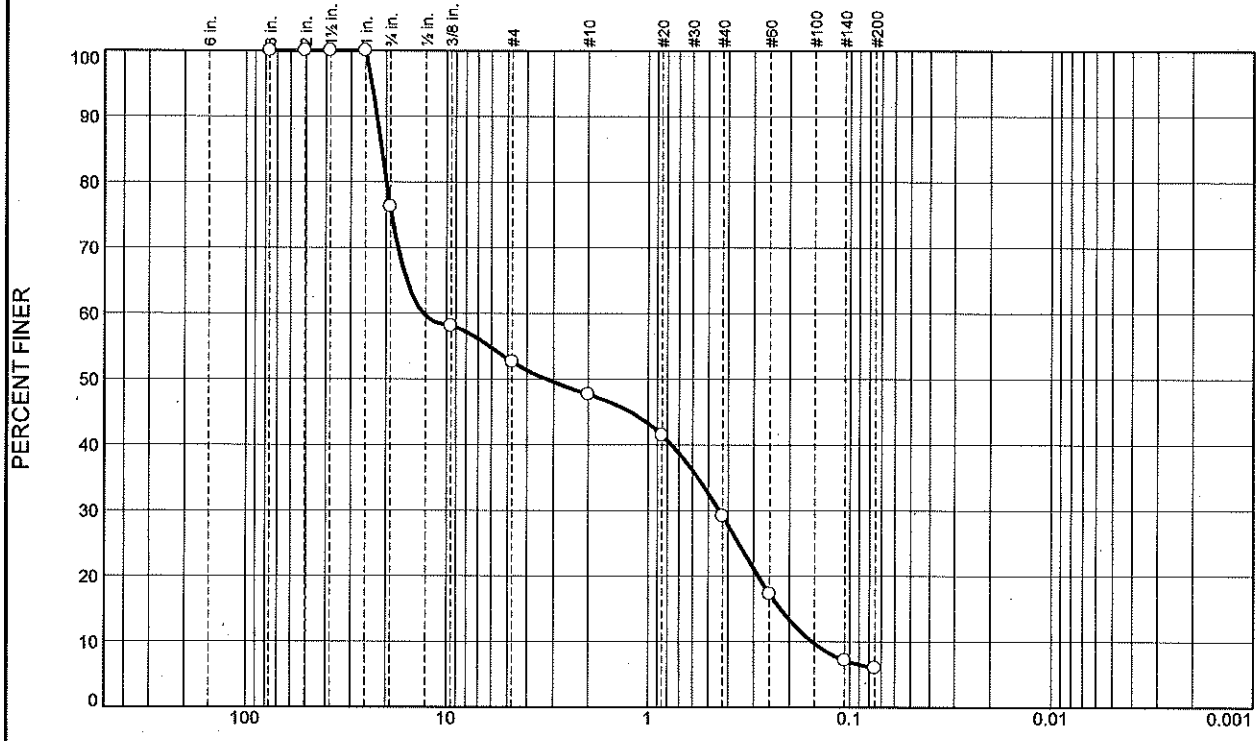
SAMPLE INFORMATION			DEPTH	STRATA		DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (ft.)	Number	Type	(feet)				
			0.0				
0 - 0.5	S-1	BAG	0.5	PAVEMENT		2" Asphalt Paver, 0.5" Leveling Course, 3" Portland Cement Concrete, No Apparent Subbase	
0.5 - 1.5	S-2	BAG		FILL		Brown Poorly Graded Gravel with Silt and Sand, Trace Fine Roots, Brick and Concrete Debris, Moist (FILL) (NYC Class 7)	
1.5 - 2.5	S-3	BAG				As Above, Medium Roots (FILL) (NYC Class 7)	
2.5 - 3	S-4	BAG	3.0			White Tan Poorly Graded Sand, Moist (FILL) (NYC Class 7)	
						Boring Log HA-2 Terminated at a Depth of 3.0 Feet Below Ground Surface	
			5.0				
			10.0				
			15.0				

NOTES: bgs = below ground surface, DNC = Did Not Cave, NA = Not Applicable, NE = Not Encountered, NS = Not Surveyed, P = Perched

WHITESTONE
ASSOCIATES, INC.

APPENDIX B
Laboratory Test Results

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	23.8	23.6	4.9	18.5	23.2	6.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
2	100.0		
1.5	100.0		
1	100.0		
.75	76.2		
.375	58.1		
#4	52.6		
#10	47.7		
#20	41.5		
#40	29.2		
#60	17.3		
#140	7.2		
#200	6.0		

* (no specification provided)

Material Description

Poorly Graded Gravel with Silt and Sand (FILL)

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{90}= 22.2007 D_{85}= 21.0268 D_{60}= 13.0827
D_{50}= 3.2476 D_{30}= 0.4414 D_{15}= 0.2208
D_{10}= 0.1536 C_u= 85.19 C_c= 0.10

Classification

USCS= GP-GM (FILL) AASHTO= A-1-a

Remarks

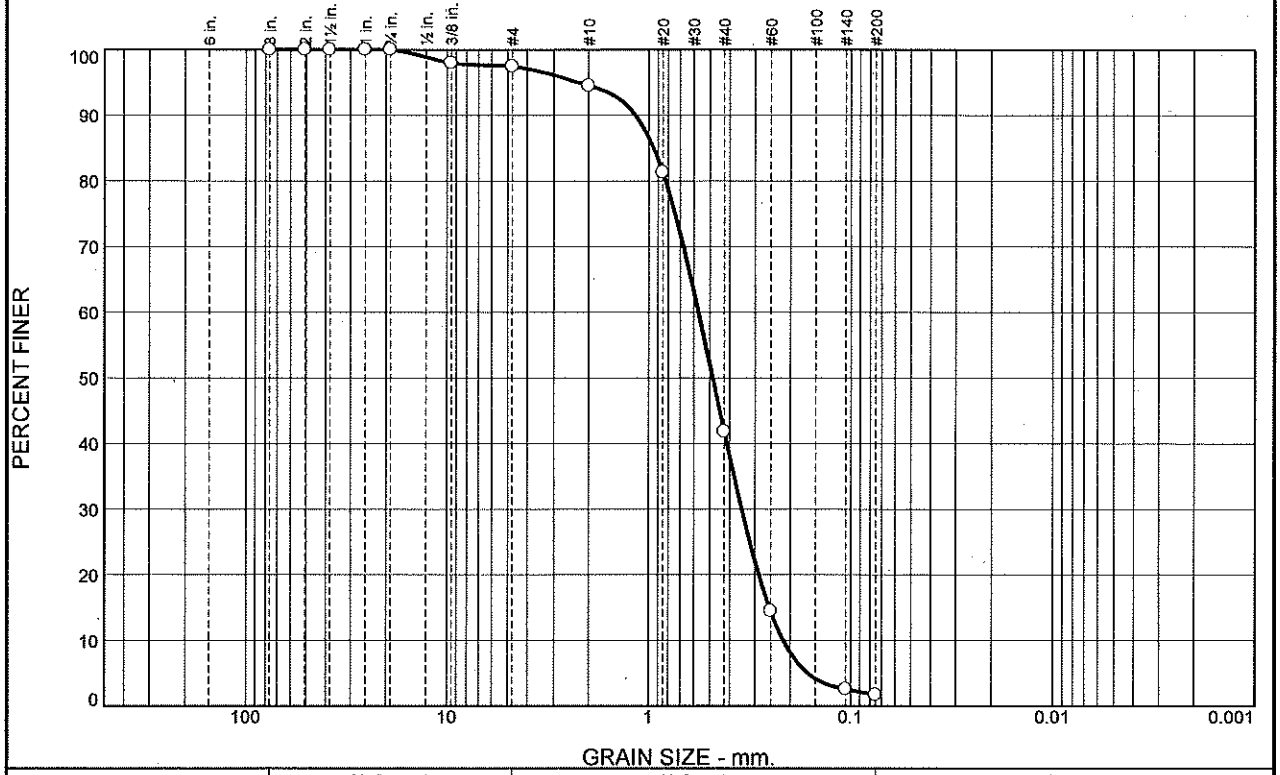
W_n = 3.8 %

Source of Sample: HA-1 **Depth:** 1.5' - 3.0'
Sample Number: S-3 **Date:** 11/08/18

WHITESTONE ASSOCIATES, INC.
Warren, New Jersey

Client: H2M Architects & Engineers
Project: Proposed P.S. 89 Improvements
201 Warren Street, Battery Park City, New York, NY
Project No: GJ1815962.000 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	2.6	2.9	52.7	40.1	1.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
2	100.0		
1.5	100.0		
1	100.0		
.75	100.0		
.375	98.0		
#4	97.4		
#10	94.5		
#20	81.3		
#40	41.8		
#60	14.5		
#140	2.6		
#200	1.7		

* (no specification provided)

Material Description

Poorly Graded Sand (FILL)

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{90}= 1.1625 D_{85}= 0.9443 D_{60}= 0.5673
D_{50}= 0.4839 D_{30}= 0.3481 D_{15}= 0.2536
D_{10}= 0.2161 C_u= 2.63 C_c= 0.99

Classification

USCS= SP (FILL) AASHTO= A-1-b

Remarks

W_n = 4.1 %

Source of Sample: HA-2 **Depth:** 2.5' - 3.0'
Sample Number: S-4

Date: 11/08/18

WHITESTONE ASSOCIATES, INC.
Warren, New Jersey

Client: H2M Architects & Engineers
Project: Proposed P.S. 89 Improvements
201 Warren Street, Battery Park City, New York, NY
Project No: GJ1815962.000 **Figure**

WHITESTONE
ASSOCIATES, INC.

APPENDIX C
DCP Test Results

DYNAMIC CONE PENETROMETER TEST RESULTS 201 WARREN STREET BATTERY PARK CITY, NEW YORK, NEW YORK WHITESTONE PROJECT NO.: GJ1815962.000			
Field Engineer:	A. Vadino		
Date:	November 6, 2018		
Hand Auger Location*	Depth Below Surface Cover (feet)	DCP-Blows per 1.75 inches	DCP-Average Blows per 5.25 inches
HA-1	0.5	10 - 11 - 26	15.7
	1.5	14 - 26 - 40	26.7
	3.0	3 - 9 - 10	7.3
HA-2	0.5	3 - 3 - 4	3.3
	1.5	3 - 3 - 2	2.7
	3.0	3 - 3 - 4	3.3

* Please refer to *Test Location Plan* prepared by Whitestone Associates, Inc. dated November 15, 2018.

L:\Job Folders\2018\1815962GJ\Field Documents and Logs\DCP Results.doc

WHITESTONE
ASSOCIATES, INC.

APPENDIX D
Supplemental Information (USCS, Terms & Symbols)

WHITESTONE
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Environmental & Geotechnical Engineers & Consultants

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UNIFIED SOIL CLASSIFICATION SYSTEM

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			LETTER SYMBOL	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS (LITTLE OR NO FINES)	GW	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
			GP	POORLY-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)	GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES
			GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
	SAND AND SANDY SOILS	CLEAN SAND (LITTLE OR NO FINES)	SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
			SP	POORLY-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	MORE THAN 50% OF COARSE FRACTION PASSING NO. 4 SIEVE	SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)	SM	SILTY SANDS, SAND-SILT MIXTURES
			SC	CLAYEY SANDS, SAND-CLAY MIXTURES
FINE GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMITS LESS THAN 50	ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
			CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
			OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMITS GREATER THAN 50	MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
			CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
			OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS			PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS FOR SAMPLES WITH 5% TO 12% FINES

GRADATION*

% FINER BY WEIGHT

TRACE..... 1% TO 10%
LITTLE..... 10% TO 20%
SOME..... 20% TO 35%
AND..... 35% TO 50%

COMPACTNESS*
Sand and/or Gravel

RELATIVE DENSITY

LOOSE. ..... 0% TO 40%
MEDIUM DENSE.... 40% TO 70%
DENSE..... 70% TO 90%
VERY DENSE..... 90% TO 100%

CONSISTENCY*
Clay and/or Silt

RANGE OF SHEARING STRENGTH IN POUNDS PER SQUARE FOOT

VERY SOFT..... LESS THAN 250
SOFT..... 250 TO 500
MEDIUM..... 500 TO 1000
STIFF..... 1000 TO 2000
VERY STIFF..... 2000 TO 4000
HARD..... GREATER THAN 4000

** VALUES ARE FROM LABORATORY OR FIELD TEST DATA, WHERE APPLICABLE. WHEN NO TESTING WAS PERFORMED, VALUES ARE ESTIMATED.*

L:\Geotechnical Forms and References\Reports\USCSTRMSSYM NJ.docx

Other Office Locations:

CHALFONT, PA 215.712.2700
SOUTHBOROUGH, MA 508.485.0755
ROCKY HILL, CT 860.726.7889
WALL, NJ 732.592-2101
STERLING, VA 703.464.5858
EVERGREEN, CO 303.670.6905

WHITESTONE
ASSOCIATES, INC.
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MT. BETHEL CORPORATE CENTER
35 TECHNOLOGY DRIVE
WARREN, NJ 07059
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whitestoneassoc.com

GEOTECHNICAL TERMS AND SYMBOLS

SAMPLE IDENTIFICATION

The Unified Soil Classification System is used to identify the soil unless otherwise noted.

SOIL PROPERTY SYMBOLS

N: Standard Penetration Value: Blows per ft. of a 140 lb. hammer falling 30" on a 2" O.D. split-spoon.
Qu: Unconfined compressive strength, TSF.
Qp: Penetrometer value, unconfined compressive strength, TSF.
Mc: Moisture content, %.
LL: Liquid limit, %.
PI: Plasticity index, %.
δd: Natural dry density, PCF.
▼: Apparent groundwater level at time noted after completion of boring.

DRILLING AND SAMPLING SYMBOLS

NE: Not Encountered (Groundwater was not encountered).
SS: Split-Spoon - 1 ⅜" I.D., 2" O.D., except where noted.
ST: Shelby Tube - 3" O.D., except where noted.
AU: Auger Sample.
OB: Diamond Bit.
CB: Carbide Bit
WS: Washed Sample.

RELATIVE DENSITY AND CONSISTENCY CLASSIFICATION

Term (Non-Cohesive Soils)	Standard Penetration Resistance
Very Loose	0-4
Loose	4-10
Medium Dense	10-30
Dense	30-50
Very Dense	Over 50

Term (Cohesive Soils)	Qu (TSF)
Very Soft	0 - 0.25
Soft	0.25 - 0.50
Firm (Medium)	0.50 - 1.00
Stiff	1.00 - 2.00
Very Stiff	2.00 - 4.00
Hard	4.00+

PARTICLE SIZE

Boulders	8 in.+	Coarse Sand	5mm-0.6mm	Silt	0.074mm-0.005mm
Cobbles	8 in.-3 in.	Medium Sand	0.6mm-0.2mm	Clay	-0.005mm
Gravel	3 in.-5mm	Fine Sand	0.2mm-0.074mm		

Other Office Locations:

CHALFONT, PA 215.712.2700 | SOUTHBOROUGH, MA 508.485.0755 | ROCKY HILL, CT 860.726.7889 | WALL, NJ 732.592-2101 | STERLING, VA 703.464.5858 | EVERGREEN, CO 303.670.6905