

New York State Department of Environmental Conservation

Division of Environmental Permits, 4th Floor

625 Broadway, Albany, NY 12233-1750



Joe Martens
Commissioner

Website: www.dec.ny.gov

October 18, 2013

[REDACTED] Project Director

The New NY Bridge Project
NYS Thruway Authority
303 South Broadway, Suite 413
Tarrytown, NY 10591

Re: The New NY Bridge / DEC Permit 3-9903-00043/00012
Permit Modification / Approval of Armor Placement Plan Revision 3

Dear [REDACTED]

This responds to your October 9, 2013 letter requesting approval of the subject plan and modification of the subject permit to allow "profiling" of the river bottom prior to placement of armoring.

In accordance with condition 36 of the subject permit the Department hereby approves the subject Armor Placement Plan Revision 3 submitted via an October 11, 2013 email to me from [REDACTED] of your office. As permit condition 76 states, with this approval the plan and its terms, conditions, schedule and requirements become an enforceable condition of the permit.

In addition the Department hereby modifies the subject permit to allow the profiling of the river bottom as described in your letter.

Generally, a 35-ton steel beam will be dragged across the footprint of the dredged area prior to placement of armoring material. This modification approval is subject to the following condition:

This activity is subject to the water quality monitoring requirements of Water Quality Monitoring Plan (Revision 02 April 30, 2013), approved by a May 3, 2013 Department letter to Peter Sanderson.

If you have any questions please feel free to contact me.

Respectfully,

[REDACTED]
Chief Permit Administrator

ecc:



NYSDEC
NYSDEC
, NYSDOT

New York State Department of Environmental Conservation
Division of Environmental Planning & Policy
625 Broadway, 15th Floor
New York, NY 10012-1099
Tel: (516) 473-3200
Fax: (516) 473-3201
www.dec.ny.gov

Project Name: [Redacted]
Project Number: [Redacted]

Reference is made to your letter of [Redacted] 2013 regarding approval of the [Redacted] project. The project is located at [Redacted] in the [Redacted] area.

The project is subject to the Department's [Redacted] regulations. The project is subject to the Department's [Redacted] regulations. The project is subject to the Department's [Redacted] regulations.

The project is subject to the Department's [Redacted] regulations. The project is subject to the Department's [Redacted] regulations. The project is subject to the Department's [Redacted] regulations.

The project is subject to the Department's [Redacted] regulations. The project is subject to the Department's [Redacted] regulations. The project is subject to the Department's [Redacted] regulations.

The project is subject to the Department's [Redacted] regulations. The project is subject to the Department's [Redacted] regulations. The project is subject to the Department's [Redacted] regulations.

For more information, please contact [Redacted] at [Redacted].

[Redacted]
[Redacted]
[Redacted]



October 4th, 2013

Ref: [REDACTED]

[REDACTED]
New NY Bridge Project
c/o Document Management Center
303 S. Broadway, 4th Floor
Tarrytown, NY 10591
[REDACTED]

Re: [REDACTED] D214134
DOC Ref.: [REDACTED]

Subject: Tappan Zee Hudson River Crossing Armor Placement Plan, Revision 3

Dear [REDACTED]

Attached is Revision 3 of the Tappan Zee Hudson River Crossing Armor Placement Plan which responds to New York State Thruway Authority (NYSTA) comments on prior revisions and provides a description of dredged area profiling to be conducted contemporary with armoring activities. As discussed with the New York State Department of Environmental Conservation (NYSDEC), U.S. Army Corps of Engineers (USACE) and Federal Highway Administration (FHWA), Tappan Zee Constructors LLC (TZC) subcontractor Weeks Marine Inc. (Weeks) intends to smooth the subsurface profile of the temporary access channel in areas where the environmental clamshell dredge has completed operations.

Bottom Profiling

As described in Revision 3 of the Tappan Zee Hudson River Crossing Armor Placement Plan, a specific-use drag barge will drag a 35-ton steel beam filled with concrete or "drag bar" across the dredge footprint to prepare a uniform bottom surface such that it will allow for a uniform layer of armor material. The drag barge will make passes in 0.5-ft increments. The estimated schedule to complete the profiling work is 1-2 days at the East Area channel and 5-6 days at the West Area channel. Work would be conducted commensurate with armoring activities, which are scheduled to occur beginning October 2013. Bottom profiling may occur during November and/or December depending on armoring activities.

While bottom profiling is not specifically described or referenced in existing NYSDEC or USACE permit conditions, the National Marine Fisheries Service (NMFS) Biological Opinion (BO), or the Final Environmental Impact Statement (FEIS; July 2012), the activity is commonly performed industry-wide to smooth channel bottoms post-dredging operations, prior to subaqueous material placement to ensure uniform coverage, and to reduce the heights of disposal mounds created during hydraulic placement



operations. Bottom profiling is not expected to result in any environmental impacts beyond those previously described during channel armoring. Work will be limited to areas to be armored and previously dredged; therefore there is no additional bottom disturbance or impacts to benthic resources. Potential increases in turbidity and suspended sediments will be largely confined within the dredged channel and controlled accordingly per NYSDEC permit conditions regarding channel armoring (e.g., all work will be performed only in the dredged access channel; see NYSDEC Permit Condition 36 through 39) and drag bar operations (e.g., passes in 0.5 ft increments to limit resuspension of sediments). In addition, profiling work will be monitored per the Water Quality Monitoring Plan (Rev. 2) for armoring activities.

Potential impacts to aquatic resources associated with bottom disturbance and resuspension of sediments, including potential impacts to essential fish habitat as defined under the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) and threatened and endangered species as required under Section 7 of the Endangered Species Act (ESA), were addressed in the Final Environmental Impact Statement (FEIS; July 2012), the Joint Record of Decision and State Environmental Quality review Act (SEQRA) Findings Statement (Joint ROD; September 2012), and National Marine Fisheries Service (NMFS) Biological Opinion (BO; April 2013) for the Tappan Zee Hudson River Crossing Project.

The potential effects associated with planned bottom profiling activities are similar to those previously evaluated for other activities that may cause resuspension of bottom sediments. These types of effects have already been considered in the FEIS and BO and were found to not pose significant negative effects on shortnose or Atlantic sturgeon and were not identified as a contributing source of incidental take (Note: Incidental take of sturgeon during dredging activities specifically identified capture of sturgeon in the dredge bucket as a potential source of incidental take); other types of bottom disturbance and causes for resuspension of sediments were not considered to pose a risk of effects.

The environmental effects of bottom-profiling (aka bed-leveling) has been considered in other channel dredging projects with similar results (NMFS BO 2012). Sturgeon are likely to be able to avoid being impacted by bottom profiling or bedleveling as these fish are mobile. The low rate of entrainment of this species in any type of dredge suggests an ability to avoid interactions with dredge gear, including drag bars or bed levelers. No reports of injured or dead sturgeon have been reported in association with any profiling or bed leveling activities (NMFS BO 2012).

Armor Placement Tolerance

Section 5 of the Armor Placement Plan Revision 3 has been revised to reflect anticipated material placement tolerances (depth of cover) based on the proposed equipment; specifically Section 5 has been revised from "the conveyor operator and armoring engineer will monitor the program to confirm that [REDACTED] is not exceeded during placement" to "the conveyor operator and armoring engineer will



monitor the program to confirm that an average thickness of [REDACTED] the final dredged contour is not exceeded during placement.”

The irregular bottom created by clamshell bucket dredging prevents the uniform placement (i.e., thickness) of armor material. While bottom profiling as described above will improve bottom uniformity (i.e., provide a smooth surface), some significant (>1 ft) irregularities are expected due to the cohesive nature of the sediment and clamshell dredging process. The purpose of this permit modification request to an average of [REDACTED] thickness is to provide a tolerance that can be practically achieved during armoring placement. Best efforts will be made to limit the placement of material to a thickness of [REDACTED] however, it is not realistic to expect such tight control given the field conditions (irregularities in the river bed, material placement from [REDACTED] river bed, and equipment limitations). As the plan states, if there is a condition where armor material exceeds the thickness criteria, measures will be implemented to correct the exceedance. In summary, the proposed armoring methodology will ensure sufficient material has been placed to provide sufficient coverage while avoiding excess material (i.e., > [REDACTED] on average) from being placed in the Hudson River.

TZC believes that these revisions do not constitute any material changes to the Armor Placement Plan and are within the terms and conditions of all permit and contract requirements. Should you have any questions or require additional information, please do not hesitate to contact [REDACTED] at [REDACTED]

Very truly yours,

[REDACTED]

Project Manager
Tappan Zee Constructors, LLC

[REDACTED]

References:

National Marine Fisheries Service (NMFS) Endangered Species Act Biological Opinion (BO) 2012. Maintenance of Chesapeake Bay Entrance Channels and use of sand borrow areas for beach nourishment F/NER/2012/01586. Date Issued: 10/16/12.

Tappan Zee Hudson River Crossing Armor Placement Plan

Revision 3
September 20, 2013

1. Background

The Tappan Zee Hudson River Crossing project will include the dredging of a channel to create an access way for tugboats and barges to be utilized during the construction of the new bridge. In order to minimize the adverse effects from the re-suspension of fine sediment material due to the movement of vessels within the vicinity of the dredged corridor, a layer of armoring material will be placed on the river bottom following the dredging operations.

The operations of dredging and armor placement will be closely coordinated to limit the amount of unprotected river bottom at any given time. The dredging operation will commence in August 2013. Due to the limit of space within the dredge zone, the armor placement operation will commence approximately four weeks after dredging begins, in September 2013, and the operation will have an approximate duration of 6 months. The following procedure will be utilized for the armor placement operation.

2. Armor Material

The primary armor materials to be utilized are as follows:

Layer 1: Stone Screenings

Supplier: Carver Sand and Gravel

Source: Stone Quarry

Layer 1 Material Limits

<u>Sieve Size</u>	<u>Percent Passing %</u>
	100%
	90-100%
	65-100%
	0-15%

Layer 2: ■ Stone

Supplier: Carver Sand and Gravel
Source: Stone Quarry

Layer 2 Material Limits

<u>Sieve Size</u>	<u>Percent Passing %</u>
■	100%
■	80-100%
■	0-20%
■	0-10%
■	0-5%

The following materials may be used as an alternate should the primary materials not be readily available:

Layer 1 Alt 1: Stone Screenings Supplier : Tilcon NY Inc.
Source: Stone Quarry

Please refer to Appendix A for material specifications and gradations.

Gradations will be performed and provided for the armor material, in addition to unit weight calculations at the frequency of two test samples for every 50,000 tons of armor material.

3. Armor Loadout

Armor material will be loaded onto Weeks barges from a dockside facility. Weeks Marine will utilize closed bottom hopper barges to transport armor material from the supplier's facility to the project site via tug.

4. Armor Placement

Prior to the commencement of armor placement, a Drag Barge will be used to smooth the subsurface profile in areas where the clamshell dredge has completed operations. See Attachment 1 for photographs of the drag barge. The Drag Barge drags a 35-ton steel beam filled with concrete or "drag bar" across the dredge footprint to prepare a uniform bottom surface that will allow for a uniform layer of armor material to be placed. The

drag barge will make passes in 0.5 ft increments starting at 0.5 ft. below lowest sounding. The estimated schedule to complete drag barging is 1-2 12-hour shifts at the east dredge cut and 5-6 12-hour shifts at west dredge cut.

Armor placement will be performed with a barge mounted armoring plant. The plant will be equipped with a conveyor, hopper, and material handler. The barge will utilize anchors and a four-point mooring system for positioning, as well as two spuds to secure it in place during material placement operations.

The armor material will be transloaded from the hopper barge to the conveyor via the materials handler. The conveyor will be capable of rotating about its base, and will also be equipped with a telescoping stinger, allowing the material to be placed over a footprint of approximately 136 ft x 45 ft for each individual setup. The belts on the conveyors will be set to a constant speed.

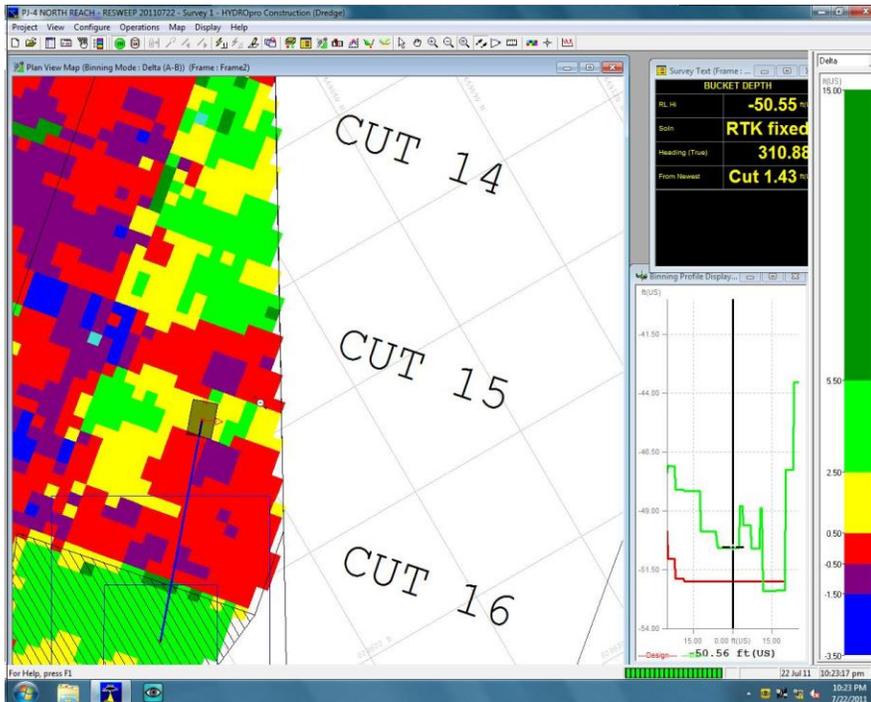
The positioning of the conveyor will be monitored with a dual antenna Real Time Kinematic Differential Global Positioning System (RTK DGPS) fixed to the conveyor. The RTK system will be coupled with a computer program running on the operator's computer which will display the real time positioning of the conveyor tip on a plan view map.



Conveyer with GPS Antenna Layout

The plan view map on the operator's display will be color coded to reflect the stages of armor placement. The colors on the map will be updated in real time by the program to reflect the amount of armor material placed in each zone.

The computer program will monitor and record the material coverage locations and depths for the armor placement. The data gathered from the program will be used to confirm final armor stone placement and depths. The data will be made readily available and will be transmitted periodically to the project team.



Example of Operator's Display Screen

The conveyor will be working off of the bow of the armoring plant barge. The barge will be secured with anchors and the operation will progress from west to east across the river. The armor material will be placed in two layers. The first layer consisting [REDACTED] will be placed to an average thickness of [REDACTED]. A second layer consisting [REDACTED] will be placed to an average thickness of [REDACTED] over the first layer. Both layers will be placed in succession from a single anchor setup. When complete, the anchors will be relocated further east and the process will be repeated.

Material output and the thickness of material placed will be monitored with the computer program.

A chute will be installed at the material discharge end of the conveyor. The chute will be a 36" diameter rubber hose that will extend from the top of the discharge point to a minimum of 4 ft submerged under the water surface. The chute will control the location of the material output in addition to mitigating turbidity.

The adjacent waterways will be monitored by the Tappan Zee Constructors in accordance with the Water Quality Monitoring Plan. If a situation arises where the turbidity is observed outside the 500 foot mixing zone, Weeks Marine will extend the chute deeper into the water column accordingly such that the discharge elevation reduces the effects of turbidity to within an acceptable water quality level.

Tappan Zee Constructors will perform hydrographic surveys at the completion of armored areas to verify acceptable armor placement. If a condition arises where armor material exceeds the thickness criteria, the area will be tamped down with a clamshell bucket from the material handler located on the armoring plant or from a clamshell bucket rig. Confirmation soundings will be performed with a lead line. In the event that excess material remains, the material handler or bucket rig will dig out the excess material, or a Drag Barge will be utilized to move the excess material. Confirmation soundings will be performed with a lead line.

5. Adherence to Permit Conditions

The following conditions are taken from the Armoring Permit Conditions section of the New York State Department of Environmental Conservation's Permit for the Tappan Zee Bridge:

Condition 36 – “At least 45 days before dredging starts the Permittee must submit to the Department an armoring plan that describes the source and size of the armoring materials and layering/placement methods. Armoring may begin when the Department has given written approval of the armoring plan.”

This document details the Armor Placement Plan. The armoring material source is outlined under Section 2 “Armor Material” of this document. Please refer to Appendix A for material specifications.

Condition 37 – “Armoring material must be placed using methods designed to minimize resuspension of newly exposed sediment (as described in FEIS). Armoring activities may not cause turbidity that results in substantial visible contrast to the Hudson River outside the 500 foot mixing zone as set forth in the Water Quality Monitoring section (below).”

Weeks Marine plans to use a conveyor with a 36” diameter chute extending from the top discharge point of the conveyor to a minimum of 4 ft submerged under the water surface. The chute will effectively control the location of the material output in addition to mitigating turbidity. If a situation is encountered where turbidity is observed outside the 500 foot mixing zone, Weeks Marine will extend the chute deeper into the water column

accordingly such that the discharge elevation reduces the effects of turbidity to within an acceptable water quality level.

Condition 38 – “The total depth of armor placed in the excavated access channel will be no more than [REDACTED] feet”

The computer program will monitor and record the amount of material being deposited in the access channel. The conveyor operator and armor engineer will monitor the program to confirm that an average thickness of [REDACTED] feet above the final dredged contour is not exceeded during placement.

Condition 39 – “[REDACTED] may be placed only in the dredged access channel and its side slopes.”

The computer program will have a plan map outlining the armor material placement areas. The real time location of the armor material discharge will also be displayed on the plan map. The conveyor operator and armor engineer will monitor the program to confirm that material is not placed outside of the allowable footprint.

APPENDIX A

Armor Material

Layer 1 – Stone Screenings

Supplier: Carver Sand and Gravel



STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
ALBANY, N.Y. 12232
www.dot.ny.gov

JOAN McDONALD
COMMISSIONER

ANDREW M. CUOMO
GOVERNOR

February 13, 2013

Geological Source Report Status: **Accepted**
Location: Lafarge Building Material, Inc.
Source No. [REDACTED]
Ravena, NY

[REDACTED]
Lafarge North America Cement Company
Northeast Region
P.O. Box 3, Route 9W
Ravena, NY 12143

This letter does not indicate the approval status of the source or the acceptability of the material derived therefrom.

Dear [REDACTED]

The 2013 Geologic Source Report Annual Module submitted for the proposed operating location noted above has been reviewed and accepted. The Geological Source Report Requirements for the 2013 season have been satisfied. However, if significant discrepancies between the report and the quarry operations are noted during field inspection, a revised report will be required. Please note there shall be no extension or alteration to the limits of the area of proposed operations without prior approval from this office.

Aggregate sources which satisfy all applicable requirements of Materials Method 29, issued July 2007 will appear on the Approved List of Sources of Fine and Coarse Aggregates. The Approved List is available on the Internet @

<https://www.dot.ny.gov/divisions/engineering/technical-services/materials-bureau/fine-coarse-aggregates>

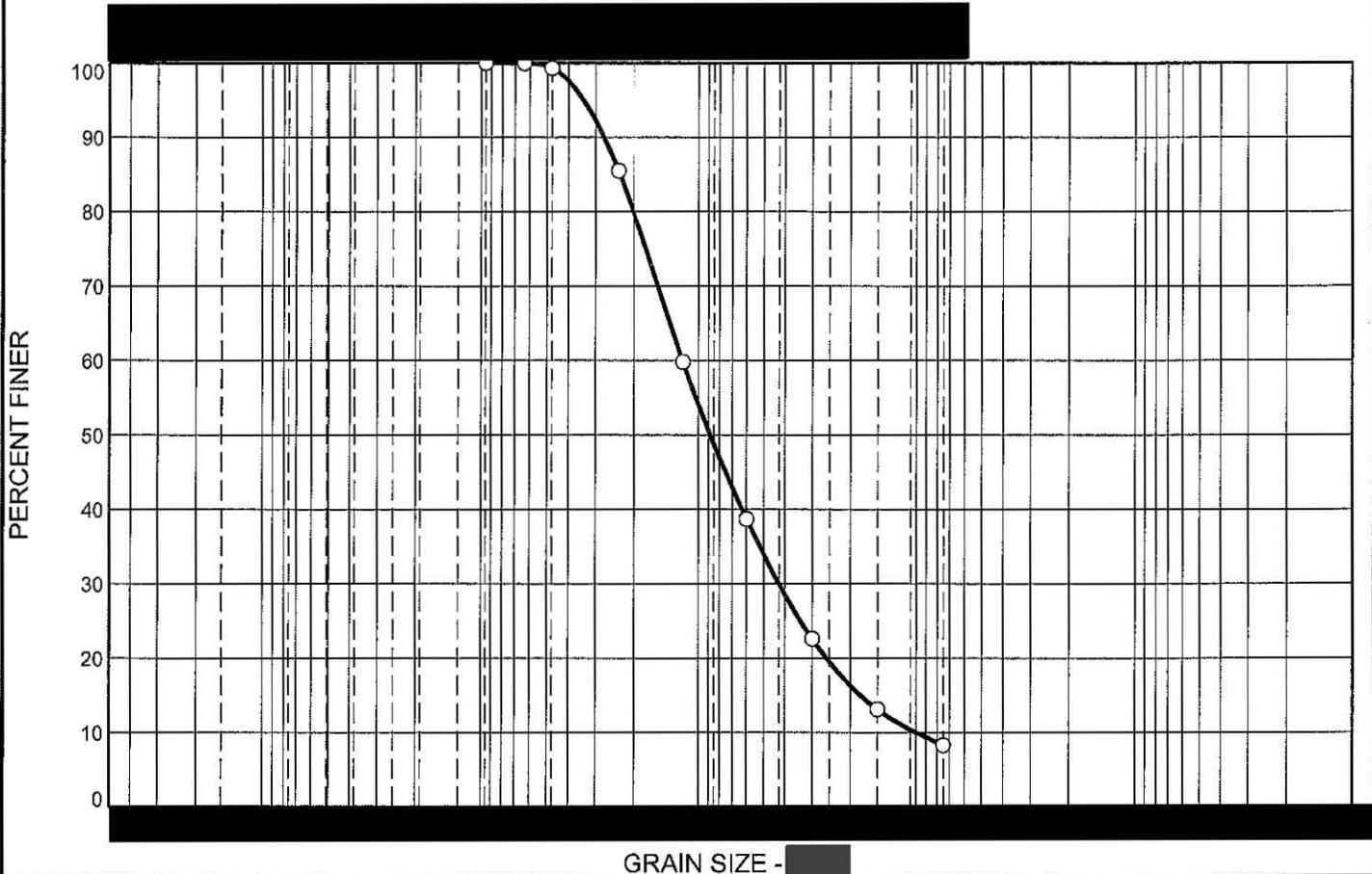
If the producer or the consulting geologist have any questions regarding these matters, they may call [REDACTED] or members of the staff in the Materials Bureau, Engineering Geology Section at [REDACTED]

Very truly yours,

[REDACTED]
Engineering Geology

File: [REDACTED]
cc: [REDACTED] Region 1 Materials Engineer
[REDACTED] Carver Stone Products
[REDACTED] H2H Associates, LLC

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
75	100.0		
150	100.0		
300	99.3		
600	85.5		
1200	59.8		
2500	38.7		
5000	22.6		
10000	13.1		
20000	8.3		

Soil Description
Stone Screenings Lafarge Pile@Ravena/ Bottom of pile

Atterberg Limits
PL= LL= PI=

Coefficients
[Redacted]

Classification
USCS= AASHTO=

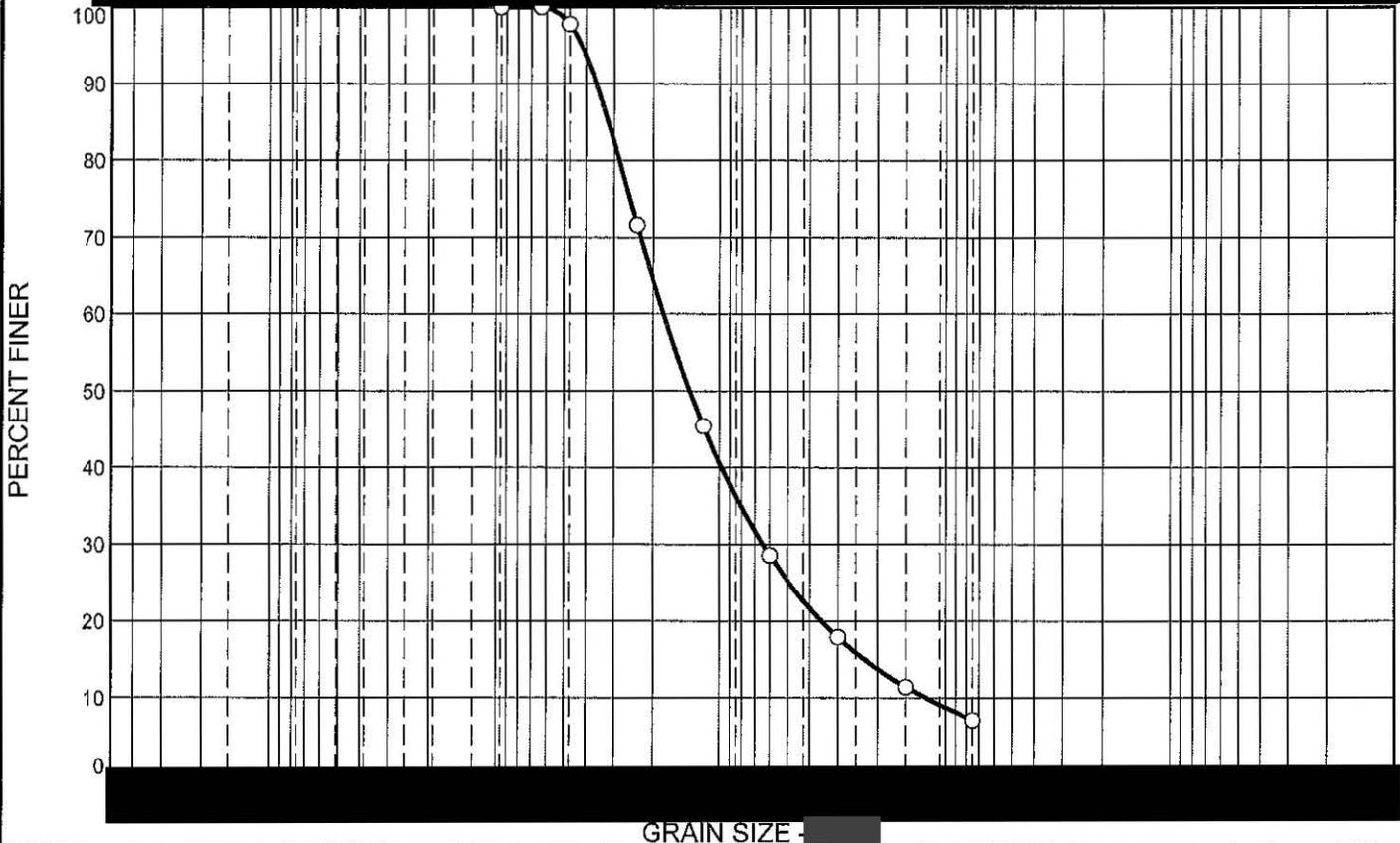
Remarks

* (no specification provided)

Source of Sample: [Redacted]

Date: 8-7-2013

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
	100.0		
	100.0		
	97.8		
	71.6		
	45.4		
	28.6		
	17.9		
	11.4		
	7.1		

Soil Description
Stone Screenings Lafarge Pile@Ravena/ Top of pile

Atterberg Limits
PL= LL= PI=

Coefficients

Classification
USCS= AASHTO=

Remarks

* (no specification provided)

Source of Sample: [REDACTED]

Date: 8-7-2013

QCQA Laboratories, Inc.

Schenectady, NY

Client: Carver Sand and Gravel
Project: Aggregate Testing Services - Carver

Project No: [REDACTED]

Figure [REDACTED]

Layer 2 – [REDACTED] Stone
Supplier: Carver Sand and Gravel

Carver

Stone Products

STONE GRADATION

SOURCE: [REDACTED]

PRODUCER:	CARVER SAND & STONE
DATE:	6/21/2013
TIME:	PM
TECHNICIAN:	JC
WEATHER:	<input checked="" type="checkbox"/> SUNNY <input type="checkbox"/> CLOUDY <input type="checkbox"/> RAIN

TEST DATE:	6/24/2013	ID #	_____
TIME:	3:45		
TECHNICIAN:	WS		
STONE COND.:	<input type="checkbox"/> DRIER THAN SSD <input type="checkbox"/> AT SSD <input checked="" type="checkbox"/> WETTER THAN SSD <input type="checkbox"/> OTHER		

METHOD:	<input type="checkbox"/> FLOWING AGG. STREAM <input checked="" type="checkbox"/> RANDOM LOCATION <input type="checkbox"/> LOADER DIG <input type="checkbox"/> OTHER
LOCATION:	<input type="checkbox"/> MAIN STOCKPILE <input type="checkbox"/> UNDER BELT <input checked="" type="checkbox"/> PILE UNDER CONVEYOR

INFEED RATE:	<input type="checkbox"/> -	tph (to tunnel)
FEED RATE:	<input type="checkbox"/> -	tph (upper screens)
IMPACTOR:	<input type="checkbox"/> ON <input type="checkbox"/> OFF	- amps
RUBBLE	<input type="checkbox"/> IN <input type="checkbox"/> OUT	tph tph

NOTES:	<input checked="" type="checkbox"/> WATER <input type="checkbox"/> ON <input type="checkbox"/> OFF	NOTES: production P&M <input type="checkbox"/> SHOT ROCK <input type="checkbox"/> DIRT <input type="checkbox"/> HIGH FRICTION
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SIEVE SIZE	WEIGHT	% RETAINED	% PASSING	SPECS
		0.0	100.0	100%
		4.6	95.4	90-100%
		83.5	12.0	0-15%
		11.0	1.0	
		1.0	0.0	
TOTAL		100.0		

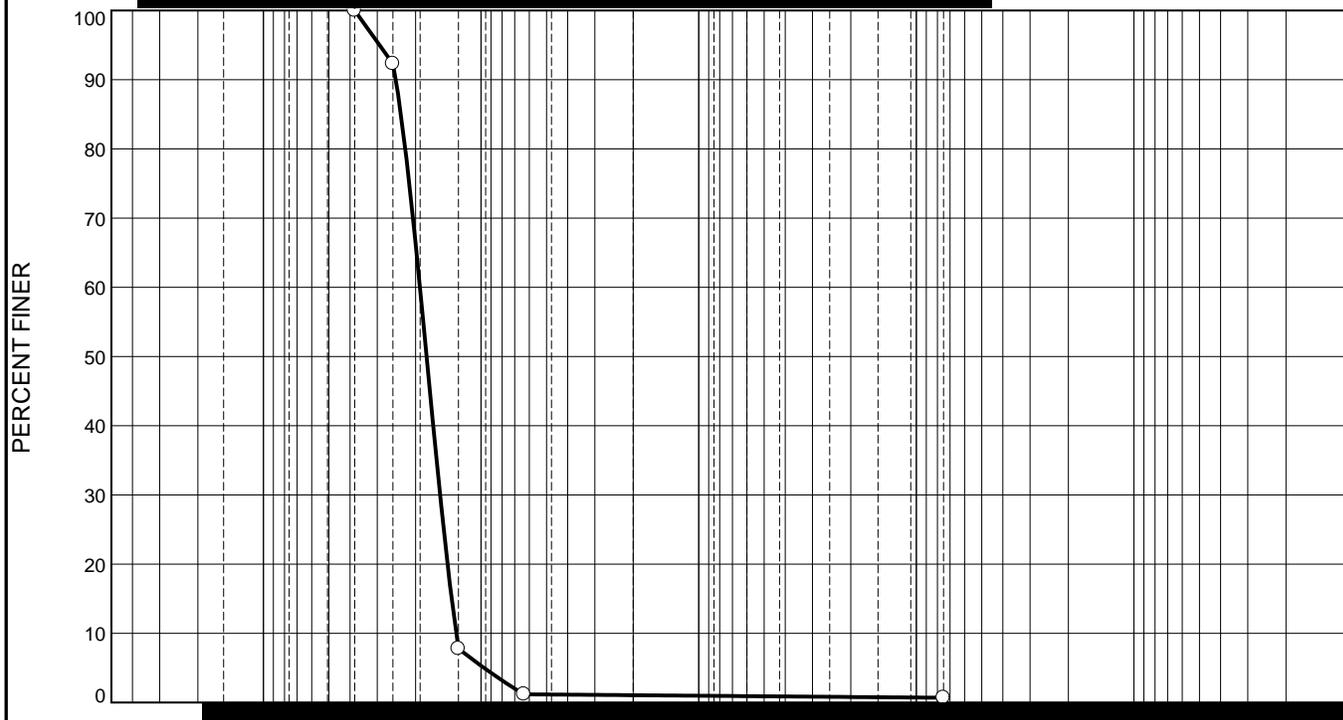
MOISTURE CONTENT

INITIAL WEIGHT	0.0
DRY WEIGHT	0.0
MOISTURE WT.	0.0
% MOISTURE	#DIV/0!

WASH TEST

INITIAL WEIGHT	0.0
DRY WEIGHT	0.0
WEIGHT -200	0.0
% -200	#DIV/0!

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
	100.0		
	92.3		
	7.8		
	1.2		
	0.7		

Soil Description

Tappan Zee Armor Stone

Atterberg Limits

PL= LL= PI=

Coefficients

[REDACTED]

Classification

USCS= GP AASHTO=

Remarks

* (no specification provided)

Location: [REDACTED]
 Sample Number: [REDACTED]

Date: 9/19/13

QCQA Laboratories, Inc.

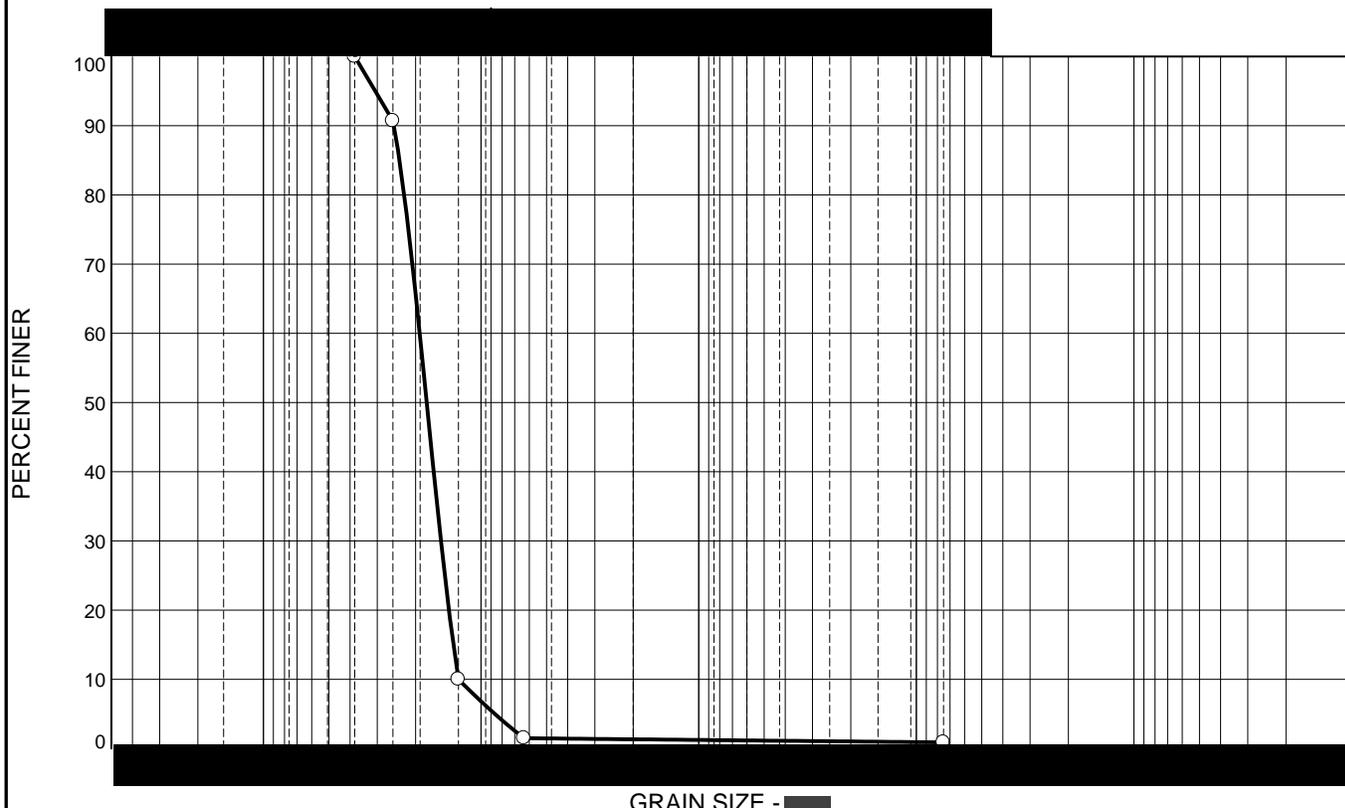
Client: Carver Sand and Gravel
 Project: Aggregate Testing Services - Carver

Schenectady, NY

Project No: [REDACTED]

Figure [REDACTED]

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0							

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
	100.0		
	90.7		
	10.0		
	1.5		
	0.9		

Soil Description

Tappan Zee Armor Stone

Atterberg Limits

PL= LL= PI=

Coefficients

[REDACTED]

Classification

USCS= GP AASHTO=

Remarks

* (no specification provided)

Location: [REDACTED]
 Sample Number: [REDACTED]

Date: 9/19/13

QCQA Laboratories, Inc. Schenectady, NY	Client: Carver Sand and Gravel Project: Aggregate Testing Services - Carver Project No: [REDACTED] Figure [REDACTED]
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Layer 1 Alt 1 – Stone Screenings
Supplier: Tilcon NY Inc.



Basic Quality Statistical Summary Report

Period 01/01/2012 - 12/31/2012
 Plant 00201-Haverstraw
 Product 0999-Screenings
 Specification

Sieve/Test	Tests	Average	St Dev	Target	Specification
[REDACTED]	26	99.5	2.37		
	26	99.2	3.19		
	26	83.1	3.19		
	26	61.3	2.76		
	26	46.2	2.35		
	26	34.0	1.85		
	26	23.4	3.09		
	26	15.81	2.976		
	26	0.00	0.000		

Comments

Query Query Selections
 Date Created 04/19/2013
 Date Range 01/01/2012 - 12/31/2012
 Plant Haverstraw



DRAG BAR IN RAISED POSITION.

PHOTO 1: DRAG BARGE NO. 4. VIEW OF PORT STERN AT ANCHOR IN ST. JOHNS RIVER INLET. JACKSONVILLE, FL.



DRAG BAR IS A STEEL WIDE FLANGE BEAM WITH ITS WEB FILLED WITH CONCRETE. BAR WEIGHS APPROXIMATELY 35 TONS.

PHOTO 2: VIEW ACROSS THE STERN OF THE DRAG BARGE NO. 4.