



CONSTRUCTION CONTRACT

New York City
Department of
Environmental Protection

59-17 Junction Boulevard
Elmhurst, New York 11373

Emily Lloyd
Commissioner

Steven W. Lawitts
First Deputy Commissioner

Carol Fenves
Agency Chief Contracting Officer



ADDENDUM TO CONTRACT DOCUMENTS NUMBER 3

FOR
FURNISHING ALL LABOR AND MATERIALS
NECESSARY AND REQUIRED FOR:

Contract: CONTRACT CRO-334G – STRUCTURES AND EQUIPMENT
CONTRACT CRO-334E – ELECTRICAL

Description: NEW CROTON AQUEDUCT REHABILITATION

May 2008

Prepared by:
PARSONS BRINCKERHOFF QUADE & DOUGLAS, INC.

In association with:
MONTGOMERY WATSON HARZA

Metcalf & Eddy ◊ Hazen and Sawyer
A Joint Venture

RECEIVED
MAY 19 2008
EVANSVILLE, IN

**THE CITY OF NEW YORK
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF ENGINEERING DESIGN AND CONSTRUCTION**

TO ALL BIDDERS FOR FURNISHING ALL LABOR AND MATERIALS NECESSARY
AND REQUIRED FOR:

**NEW CROTON AQUEDUCT REHABILITATION
CONTRACT NOS.**

**CRO-334G – Structures and Equipment
CRO-334E – Electrical**

This Addendum is issued for the purpose of amending the requirements of the Contract Documents and is hereby made a part of said Contract Documents to the same extent as though it were originally included therein.

**PLEASE NOTE: THE BID DATE FOR CONTRACTS CRO-334G and E HAS BEEN
CHANGED TO May 29, 2008 AT 11:30 AM (LOCAL TIME).**

The pages of this Addendum are numbered sequentially. All Bidders should check this book carefully to verify that all pages are included. Should any pages be missing, notify the Department of Environmental Protection in writing.

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This Signature Page must be signed, dated, and detached from the book and submitted by the bidder with his/her bid as an acknowledgement of receipt of, having read, and inclusion of same in his/her bid.

Please Note: The bid sheets (Bid Schedule of Prices) for Contract No. CRO-334G have been revised by Addendum No. 3 dated May 16, 2008. Bidder is to submit these revised bid sheets. NO OTHER BID SHEETS WILL BE ACCEPTED FOR CONTRACT NO. CRO-334G.

Emily Lloyd
Commissioner

I acknowledge receipt of Addendum No. 3 for New Croton Aqueduct Rehabilitation, for Contract Nos. CRO-334G and CRO-334E.

Name of Bidder

**New Croton Aqueduct Rehabilitation
Contract Nos. CRO-334G, CRO-334E**

By: _____

Addendum to Contract Documents No. 3

Date: _____

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GENERAL NOTES

1. All Bidders are advised that two (2) Addenda have previously been issued; in the event that Addenda No. 1 and No. 2 have not been received, Bidders are advised to contact Mr. Francis Lo, PE, Project Manager, NYCDEP at (718) 595-5474 to request copies of the Addenda not received. It is the Bidders' responsibility to confirm receipt of all Addenda; NYCDEP will not be responsible for failure of Bidders to confirm receipt of Addenda.
2. The written responses to Bidder questions are provided for information only and are not part of the Contract Documents. Where a written response to a Bidder question conflicts with the Contract Documents, the Contract Documents shall govern.

A. CONSTRUCTION CONTRACT INVITATION FOR BID: CONTRACT CRO-334G – STRUCTURES AND EQUIPMENT,

1. Replace Pages 2C and 2D with Pages 2C through 2F - Prime Contractor Pre-Award Meeting Statement, Subcontractor Pre-Approval Statement, Notice to Bidders and Apprenticeship Program Questionnaire. (See Attachment No. 1).
2. Pages 13A through 13C, delete Bid Schedule of Prices in its entirety and replace with the new Bid Schedule of Prices. (See Attachment No. 2). Revisions to the Bid Schedule of Prices are as follows:

Contract Item G-UP-15: Revised description from "*Setups for Brick Replacement Work in Tunnel and Shafts*" to "*Setups for Brick Replacement Work in Tunnel*"

Contract Item G-UP-15: Revised quantity from "26" to "21"

Contract Item G-UP-16: Revised description from "*Brick Replacement in Tunnel and Shafts*" to "*Brick Replacement in Tunnel*".

Contract Item G-UP-16: Revised quantity from "310" to "265"

Contract Item G-UP-17: Deleted (Description replaced with: "*Not Used*")

Contract Item G-UP-18: Deleted (Description replaced with: "*Not Used*")

Contract Item G-UP-20: Revised description from "*Grouting - Setup for Drilling and Grouting Operations in Shafts*" to "*Setup for Drilling and Grouting Operations in Shafts 20, 21, 22, 23, 25, 28, and 29 only*"

Contract Item G-UP-20: Revised quantity from "20" to "7"

Contract Item G-UP-21: Revised description from "*Grouting - Drilling Grout and Vent Holes 3 Feet to 4 Feet Deep*" to "*Grouting - Drilling Grout and Vent Holes 2 Feet to 4 Feet Deep*"

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B. CONSTRUCTION CONTRACT INVITATION FOR BID: CONTRACT CRO-334E – ELECTRICAL,

1. Replace Pages 2C and 2D with Pages 2C through 2F - Prime Contractor Pre-Award Meeting Statement, Subcontractor Pre-Approval Statement, Notice to Bidders and Apprenticeship Program Questionnaire. (See Attachment No. 1).

C. INFORMATION FOR BIDDERS, STANDARD CONSTRUCTION CONTRACT AND SPECIFICATIONS

NEW YORK CITY PREVAILING WAGE RATES

1. Page 000007, Labor Law 220 – Addendum No. 1. New clarification to be added immediately preceding Page 000007 of the New York City Prevailing Wage Rates. (See Attachment No. 3).

DETAILED SPECIFICATIONS

2. Page 001237, Detailed Specification 01120 – Multiple Contract Summary. Delete Article 1.04.B in its entirety and replace with the following:

“B. Two shut-downs of the Aqueduct are planned during the Contracts period. NYCDEP BWSO will unwater the Aqueduct to such level as allowed by permits. The Contractor shall remove any water remaining after DEP turns the NCA over to the Contractor and shall maintain the Aqueduct unwatered as required for the work of his Contract or for the work of other Contractors as directed by the Engineer. Each Contractor working within the NCA shall be responsible for the disinfection of its work areas within the NCA.

1. The first unwatered period is from January 2009 to April 2009. It is expected that the Contractor for Construction Contract CRO-313 will require access to connect a new tunnel to the Aqueduct near Shaft No. 21. Access to the Aqueduct for the CRO-313 Contractors during this period must be coordinated with the CRO-334 Contractor through the Engineer.
2. The second unwatered period is from September 2009 to September 2010. No work is allowed north of Gate House No. 1 or in the Branch Aqueduct from May to September, because the gravity section must be on line to meet the City’s legal obligations to upstate communities.

Up to 60 million gallons of water may remain in the pressurized tunnel south of Gate House No. 1 after the City unwaters the Aqueduct. The

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CRO-334G Contractor shall remove the remaining water from the Aqueduct to bring the water level down to Elevation +4.0 at Shaft No. 25. The CRO-334G Contractor shall maintain the water level at Elevation +4.0 throughout the work in the tunnel by the CRO-334G Contractor and by the CRO-313 Contractor. This work shall include diverting, pumping, and discharging water from Shaft No. 25 to the city sewer system in accordance with the NYCDEP Wastewater Quality Control Permit and NYCDEP Dewatering/Discharge Permit obtained by the CRO-334G Contractor for this purpose. Work to achieve and maintain the Aqueduct in an unwatered condition shall be in accordance with Detailed Specification 02411 – Pumping.”

3. Page 001238, Detailed Specification 01120 – Multiple Contract Summary. Delete Article 1.05.C.1 in its entirety and replace with the following:

“1. Mobilize all plant, power, equipment, materials, supplies, appurtenances, and personnel services required for commencing and executing the work.”

4. Page 001247, Detailed Specification 01120 - Multiple Contract Summary, Article 1.05.D. Delete entire row for “Shaft No. 20” and replace with the following:

Shaft No. 20	Centerline, Station 1284+16 (Mile 24.32)	Remove and reinstall buried precast concrete cover Scale cast iron lining, prepare surface and install epoxy mortar lining Grout leaks and voids.
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5. Page 001252, Detailed Specification 01120 - Multiple Contract Summary. Delete Article 1.05.F.3 in its entirety.

6. Page 001255, Detailed Specification 01140 – Work Restrictions and Working Hours. Delete Article 1.03.A in its entirety and replace with the following:

“A. “Normal Project Working Hours” for this Contract shall be the hours between 7:00AM and 6:00PM, Monday through Friday (except for holidays). The Contractor acknowledges that in submitting a Bid for Contracts CRO-334G and CRO-334E, the Contractor has the management, labor, equipment, and subcontracted capabilities to perform the Contract work within the Period of Performance indicated in the General Conditions – Schedule A.”

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7. Page 001274, Detailed Specification 01270 – Measurement and Payment. Delete Article 1.04.D.1.cc in its entirety and replace with the following:
- “cc. Rehabilitation of Shaft No. 9 Blow Off Outlet:
- 1) Scale removal, grouting and grease injection. Grease shall be NSF approved, suitable for potable water.
 - 2) Replace gate”
8. Page 001275, Detailed Specification 01270 – Measurement and Payment. Delete Article 1.04.D.1.kk in its entirety and replace with the following:
- “kk. Rehabilitation of Shaft No. 14
- 1) Mechanical Work
 - 2) Sealing of blow off outlets and provide gravity walls
 - 3) Epoxy mortar lining
 - 4) Brick replacement, joint and crack repair, cleaning of efflorescence and grouting in the shaft chambers.
 - 5) Brick replacement, repointing, grouting, and joint and crack repair in the shaft blow-off tunnel.”
9. Page 001275, Detailed Specification 01270 – Measurement and Payment. After Article 1.04.D.1.pp.6), add the following:
- “7) Clean, repoint and grout Waste and Aqueduct Chambers
 - 8) Replace deteriorated brick and repair arch in Waste Chamber”
10. Page 001283, Detailed Specification 01270 – Measurement and Payment. Delete Article 1.06.B.6 in its entirety and replace with the following:
- “6. Contract Items G-UP-13 through G-UP-16: Joint/Crack Repairs and Brick Replacement
- a. Under Contract Items G-UP-13 through G-UP-16, the Contractor shall perform repairs and brick replacement in accordance with Detailed Specification 02428 – Joint/Crack Repairs and Brick Replacement.

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- b. Payment will be made at the unit price bid per each for the following Contract Items:

<u>Contract Item</u>	<u>Description</u>
G-UP-13	Setups for Joint/Crack Repairs in Tunnel
G-UP-15	Setups for Brick Replacement Work in Tunnel

- c. Payment will be made at the unit price bid per linear foot for the following Contract Items:

<u>Contract Item</u>	<u>Description</u>
G-UP-14	Joint/Crack Repairs in Tunnel

- d. Payment will be made at the unit price bid per square foot for the following Contract Items:

<u>Contract Item</u>	<u>Description</u>
G-UP-16	Brick Replacement in Tunnel”

11. Page 001284, Detailed Specification 01270 – Measurement and Payment. Delete Article 1.06.B.7.b in its entirety and replace with the following:

- “b. Payment will be made at the unit price bid per each for the following Contract Items:

<u>Contract Item</u>	<u>Description</u>
G-UP-19	Setup for Drilling and Grouting Operations within Tunnel
G-UP-20	Setup for Drilling and Grouting Operations in Shafts 20, 21, 22, 23, 25, 28, and 29 only.
G-UP-24	Setup for Exploratory and/or Check Hole Drilling within Tunnel.
G-UP-25	Setup for Exploratory and/or Check Hole Drilling in Shafts.”

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12. Page 001284, Detailed Specification 01270 – Measurement and Payment. Delete Article 1.06.B.7.c in its entirety and replace with the following:

“c. Payment will be made at the unit price bid per linear foot for the following Contract Items:

<u>Contract Item</u>	<u>Description</u>
G-UP-21	Drilling Grout and Vent Holes 2 Feet to 4 Feet Deep
G-UP-22	Drilling Grout and Vent Holes 6 Feet Minimum to 15 Feet Maximum Deep
G-UP-26	Drilling Exploratory and/or Check Holes Within Tunnel or Shafts.

13. Page 001285, Detailed Specification 01270 – Measurement and Payment, Article 1.06.B.10, replace “*Contract Item...*” with “*Contract Items...*”.

14. Page 001386, Detailed Specification 01410 – Regulatory Requirements. Delete Article 1.12.E in its entirety and replace with the following:

“E. Additional requirements shall be as specified in General Specification 02240 – Dewatering, Detailed Specifications 01570 - Temporary Controls and 02411- Pumping.”

15. Page 001558, Detailed Specification 02402 – Shaft Hoisting Systems and Logistical Support. Delete Article 3.02.A.5 in its entirety and replace with the following:

“5. Personnel shall be lowered and raised between the surface and the Aqueduct Bronx Pressurized Section at Shaft No. 21.”

16. Page 001573, Detailed Specification 02428 – Joint/Crack Repair and Brick Replacement. Delete Article 1.01.C in its entirety and replace with the following:

“C. Prominent joints/cracks have been observed in previous inspections in the Aqueduct and their approximate locations are shown on the Drawings. The Contractor shall repair all such joints/cracks, and other joints/cracks as directed by the Engineer in the field during the course of the Work within this Contract.”

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17. Page 001574, Detailed Specification 02428 – Joint/Crack Repair and Brick Replacement. Delete Article 1.03 in its entirety and replace with the following:

“1.03 PAYMENT

A. Measurement for Payment

1. Measurement for payment for setting up for joint/crack repairs in the tunnels will be based on the number of setups made for such operations.
 - a. Each area in the tunnels identified by stationing on the Drawings as requiring joint/crack repairs will be counted as a single setup. Areas in the tunnels identified by stationing on the Drawings will not be separately measured for setup payments if the distance between the end of any joint/crack repair in an area for which setup has been measured for payment and the closest end of a joint/crack repair identified by stationing on the Drawings further along the tunnel alignment is less than 50 LF. Multiple joint/crack repairs within an area measured for setup will not be considered for measurement of an additional setup. Any area in the tunnels identified by stationing on the Drawings as requiring both joint/crack repairs and brick replacement work will only be measured as a setup for brick replacement work.
 - b. No measurement for payment will be made for setups for joint/crack repairs in shafts, blow-off chambers, blow-off outlets or raceways, as this work shall be included in Contract Item G-LS-1.
 - c. Each additional area in the tunnels not identified by stationing on the Drawings but designated by the Engineer for joint/crack repairs will be counted as a single setup. Additional setups in the tunnels not identified by stationing on the Drawings but designated by the Engineer for joint/crack repairs will not be measured for payment if the distance between the end of any joint/crack repair in an area for which setup has been measured for payment and the closest end of a joint/crack repair further along the tunnel alignment is less than 50 LF.
2. Measurement for payment for joint/crack repairs in the tunnels will be based on the number of lineal feet of joints/cracks repaired in

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accordance with the Specifications. No measurement for payment will be made for joint/crack repairs in the shafts, blow-off chambers, blow-off outlets or raceways, as this work shall be included in Contract Item G-LS-1.

3. Measurement for payment for setting up in the tunnels for brick replacement work will be based on the number of setups made for such operations.
 - a. Each area in the tunnels identified by stationing on the Drawings as requiring brick replacement work will be counted as a single setup. Areas in the tunnels identified by stationing on the Drawings will not be separately measured for payment if the distance between the end of any brick replacement work in an area for which setup has been measured for payment and the closest end of brick replacement work further along the tunnel alignment identified by stationing on the Drawings is less than 50 LF. Multiple brick replacements within an area measured for setup will not be considered for measurement of an additional setup. Any area in the tunnels identified by stationing on the Drawings as requiring both joint/crack repairs and brick replacement work will only be measured as a setup for brick replacement work.
 - b. No measurement for payment will be made for setups for brick replacement work in the shafts, blow-off chambers, blow-off outlets or raceways, as this work shall be included in Contract Item G-LS-1.
 - c. Each additional area in the tunnels not identified by stationing on the Drawings but designated by the Engineer for brick replacement work will be counted as a single setup. Areas in the tunnels not identified by stationing on the Drawings but designated by the Engineer for brick replacement work will not be separately measured for setup payments if the distance between the end of any brick replacement in an area for which setup has been measured for payment and the closest end of a brick replacement further along the tunnel alignment is less than 50 LF.
4. Measurement for payment for brick replacement in the tunnels will be based on the number of square feet of area for each single layer of brick replaced in accordance with the Specifications. No

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measurement for payment will be made for brick replacement work in the shafts, blow-off chambers, blow-offs or raceways, as this work shall be included in the Contract Item G-LS-1

5. No separate measurement for payment will be made for mobilizing, demobilizing, furnishing all plant and equipment necessary, furnishing all labor and materials necessary, set-ups, core drilling, core recovery, packaging cores, transporting cores, performing petrographic analyses, and preparing reports for work within two zones where alkali-silica reaction is indicated at the brick-mortar interface; payment for this work will be included in the lump sum price bid for Contract Item No. G-LS-1.

B. Payment

1. Payment for setting up for joint/crack repairs in the tunnels will be made at the unit price bid in the Bid Schedule of Prices for Setups for Joint/Crack Repairs. No payment will be made for setups for joint/crack repairs in the shafts, blow-off chambers, blow-off outlets or raceways, as this work shall be included in Contract Item G-LS-1.
2. Payment for joint/crack repairs in the tunnels will be made at the unit price bid for Joint/Crack Repairs in the Bid Schedule of Prices, which price shall include the cost of raking, sawing out mortar, preparation, rinsing, mortar trial mixes, tuck-pointing in layers, cleaning and all other specified work incidental to the repairs. No payment will be made for joint/crack repairs in the shafts, blow-off chambers, blow-off outlets or raceways, as this work shall be included in Contract Item G-LS-1.
3. Payment for setting up for brick replacement work in the tunnels will be made at the unit price bid in the Bid Schedule of Prices for Setups for Brick Replacement Work. No payment will be made for setups for brick replacement work in the shafts, blow-off chambers, blow-off outlets or raceways, as this work shall be included in Contract Item G-LS-1.
4. Payment for brick replacement in the tunnels will be made at the unit price bid for Brick Replacement in the Bid Schedule of Prices, which price shall include the cost of sawing, brick removal, debris disposal, replacement backfill material, masonry, mortar, curing and all other specified work incidental to the brick replacement work. No payment will be made for brick replacement work in the

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shafts, blow-off chambers, blow-off outlets or raceways, as this work shall be included in Contract Item G-LS-1.

5. Payment for all work related to coring and performing petrographic analyses within two zones where alkali-silica reaction is indicated at the brick-mortar interface will be made as part of the lump sum price bid for Contract Item No. G-LS-1. Such payment shall be full compensation for mobilizing, demobilizing, furnishing all plant and equipment necessary, furnishing all labor and materials necessary, set-ups, core drilling, core recovery, packaging cores, transporting cores, performing petrographic analyses, and preparing petrographic reports for work within two zones where alkali-silica reaction is indicated at the brick-mortar interface.”

18. Page 001581, Detailed Specification 02432 – Contact and Consolidation Grouting, Article 1.01.A, revise the second sentence to read “For the various types of construction, typical holes, including rock drilling, are approximately 2 to 6 feet in length through brick and mortar liner or concrete liner and mortar/rubble backing material and voids.”

19. Page 001582, Detailed Specification 02432 – Contact and Consolidation Grouting. Delete Articles 1.03.A.1 and 1.03.A.2 in their entirety and replace with the following:
 - “1. Setup for Drilling and Grouting Operations by Area: Measurement will be made for Setting up for Drilling and Grouting Operations Within Tunnel, and for Setting up for Drilling and Grouting Operations In Shafts 20, 21, 22, 23, 25, 28 and 29. Measurement will be based on the number of setups of the drilling and grouting equipment at the location of each area to be contact and consolidation grouted within the tunnel and each area to be contact and consolidation grouted within shaft. The single setup measured at a specific area shall include the setup of drilling and grouting equipment for both contact and consolidation grouting where required and no separate measurements shall be made for contact and consolidation drilling and grouting even though these operations are performed separately. A setup is defined at each specific grouting area indicated on the Drawings or as directed by the Engineer. Setups will include moving all equipment, materials and manpower from major access points to the grouting area or from previous grouting areas located at least 50 feet away from the next grouting area. Each grouting setup will cover up to 50ft beyond each end of a tunnel grouting area as defined in the

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contract drawings (50 feet upstream to 50 feet downstream of the work location indicated on the drawings). Only one setup shall be measured for grouting within or surrounding the cast iron linings in a particular shaft. No additional setup at a specific drilling and grouting area will be measured for payment unless the Contractor is directed by the Engineer to move off the drilling and grouting area before completion of drilling and grouting the entire area. No additional setup measurement will be made for drilling a specific area even though the drilling in a specific area precedes the grouting in that area. No measurement for payment will be made for setup for drilling, installation and removal of grout nipples and surface dry packing.

2. Drilling Grout and Vent Holes: Measurement for payment for Drilling Grout and Vent Holes 2 to 4 Feet Deep, and Drilling Grout and Vent Holes 6 Feet Minimum to 15 Feet Maximum Depth will be based on the number of lineal feet of grout and vent hole drilled as measured along the axis of the hole. Actual lengths of drill holes shall be as indicated on the Drawings or as directed. No separate measurement shall be made for drilling grout holes within shafts and any additional costs for drilling grout holes within shafts shall be included in the costs for Setup for Drilling and Grouting Operations in Shaft.”
20. Page 001584, Detailed Specification 02432 – Contact and Consolidation Grouting. Delete Article 1.03.B.2 in its entirety and replace with the following:
- “2. Drilling Grout and Vent Holes: Payment for all work relating to drilling grout and vent holes will be made based on the number of lineal feet of drilled hole measured and at the unit price bid for Drill Grout Holes 2 to 4 Feet Deep, and Drilling Grout, and Vent Holes 6 Feet Minimum to 15 Feet Maximum in the Bid Schedule of Prices.”
21. Page 001587, Detailed Specification 02432 – Contact and Consolidation Grouting. Delete Article 1.07.A.1 in its entirety and replace with the following:
- “1. The grout mix design and injection pressure shall be developed during field grout test prior to production grouting. However the nature of the drilling and grouting program dictates that changes will be made as the work progresses. Grout holes will be drilled at locations indicated on the Drawings. The Engineer may delete some holes and areas and include additional holes and areas for the purpose of effectively filling voids behind the brick and mortar

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lining, behind the grouted/mortared rubble backfill material, and in rock. In some areas where the lining is apparently weak or where significant water is entering the Aqueduct, the Engineer will direct additional drilling and grouting of holes up to a maximum depth of 15-feet or as directed by the Engineer. Generally contact grout holes will be drilled 2 feet deep from the interior tunnel lining and the consolidation grout holes will be drilled 6 feet deep from the interior tunnel lining into the rock foundation approximately 3 to 4 feet. However, the intent is to drill a minimum of 6 feet deep from the interior tunnel lining surface with a minimum of 3 feet into rock whichever is deeper. Grout holes for grouting the brick and mortar lining surrounding the cast iron lining at Shafts 22, 23 and 24 shall be up to 15 feet deep. Vent holes also will be drilled in voided areas and generally will be capped or grouted when grout fills the voids and exits the vent holes.”

22. Page 001592, Detailed Specification 02432 – Contact and Consolidation Grouting. Delete Article 3.02.B.2 in its entirety and replace with the following:

“2. Grouting to Reduce Water Infiltration: The areas of seepage through cracks and existing holes within the liner will be contact and consolidation grouted to reduce water infiltration. The contact grout holes will be drilled approximately 2 feet deep at locations selected by the Engineer. The consolidation grout holes will be drilled 6 to 10 feet into the rock in a pattern as indicated on the Drawings or as directed by the Engineer. The grout nipple/pipe assembly shall be installed capable of holding refusal pressure without leakage in each hole. Grout injection pressure shall be as directed by the Engineer. Neat cement and/or sanded grout mixes shall be used and mixes may be varied as directed by the Engineer from 1:1 to 0.5:1 (water cement by weight and 1:1:1 water, cement, sand or as directed by the Engineer).”

23. Page 001875, Detailed Specification 15052 – Steel and Stainless Steel Pipe. After Article 2.09.A, add the following:

“D.

1. The pipe and fittings shall be lined before installation in conformity with the requirements of AWWA C205. The lining shall be shop applied.”

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D. ATTACHMENTS

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Reference Drawings (Added)

(Reference Drawings shall be used for reference only and shall not be taken as part of the Contract)

- 1 - SH-011: JPR – SHAFT PLAN AND PROFILE
- 2 - SH-021: CONNECTION: NCA TO RW
TUNNEL PLANS AND SECTIONS
- 3 - SH-023: CONNECTION: NCA TO LS
TUNNEL INITIAL GROUND SUPPORT AND
DETAILS
- 4 - SH-024: SHAFT 21A SECTIONS AND
DETAILS
- 5 - No. 19: SECTION & PLAN OF UPPER PART
OF SHAFT NO. 25 ELEVATION 95.5
- 6 - No. 33: GENERAL DRAWING AT BOTTOM
OF SHAFT NO. 25
- 7 - No. 30: DRAIN 7 BLOW-OFF PIPE AT
ELEVATION 8 SHAFT NO. 25
- 8 - No. 7-1/2: CAST-IRON LINING FOR
AQUEDUCT SHAFT AT BLOW-OFF SHAFT
NO. 25
- 9 - No. 11-1/4A: CAST IRON MANHOLE COVER
FOR AQUEDUCT SHAFTS SHAFT NO. 25
- 10 - No. 11b: CAST IRON MANHOLE COVER
FOR AQUEDUCT SHAFTS SHAFT NO. 25
- 11 - No. 6: CASTINGS FOR SUPPORT OF
MANHOLES IN SHAFT NO. 25
- 12 - No. 7: CAST-IRON CATCH BASIN FOR
BLOW-OFF SHAFT NO. 25

E. REPLIES TO BIDDER QUESTIONS
(For Information Only)

Prime Contractor Pre-Award Meeting Statement – Prevailing Wage Contracts

Agency: _____

Prime Contractor: _____

Contract #: _____

On behalf of the prime contractor and contract shown above, I affirm that I have reviewed the following information with the contracting agency:

- The work to be done or the trades that will be employed on the contract;
- The Comptroller’s prevailing wage schedules for each trade;
- The requirement to pay the prevailing wage and supplement rates in effect at the time the work is done, and the dates of likely changes in such rates (July 1 and January 1);
- The requirement for written agreements with all subcontractors, which include prevailing wage and supplement requirements;
- The registration, ratio and payment guidelines for apprentices, and whether their use is optional or required under this contract;
- The requirement to use City-approved certified payroll forms, and the need to fill those forms out completely;
- The requirement to use standard sign-in and sign-out logs or an agency-approved electronic or biometric system, and that such logs must be submitted to the resident engineer or agency representative daily;
- The requirement that all workers on job sites shall wear identification badges;
- The requirement to pay all workers by check weekly, and that for contracts over \$1,000,000 and subcontracts over \$750,000 such checks must be generated by either a payroll service or an agency-approved automated system; and
- That the prime contractor shall be liable to the City for the cost of enforcement in the event the prime contractor or any subcontractor is found in violation of these requirements.

I further affirm that the prime contractor will comply with these and all other relevant requirements of the New York State Labor Law and City of New York laws and regulations concerning payment of prevailing wages and supplements, and that violation of such laws may subject the prime contractor to various administrative, civil and criminal penalties.

Prime Contractor Signature: _____ Date: _____

Printed Name: _____

Position: _____

Agency Witness: _____ Date: _____

Printed Name: _____

Rev 2/08

Subcontractor Pre-Approval Statement – Prevailing Wage Contracts

Agency: _____

Prime Contractor: _____

Subcontractor: _____

Contract #: _____

On behalf of the subcontractor and contract shown above, I affirm that I have reviewed the following information with the prime contractor:

- The work to be done or the trades that will be employed on the subcontract;
- The Comptroller’s prevailing wage schedules for each trade;
- The requirement to pay the prevailing wage and supplement rates in effect at the time the work is done, and the dates of likely changes in such rates (July 1 and January 1);
- The registration, ratio and payment guidelines for apprentices, and whether their use is optional or required under this contract;
- The requirement to use City-approved certified payroll forms, and the need to fill those forms out completely;
- The requirement to use standard sign-in and sign-out logs or an agency-approved electronic or biometric system, and that such logs must be submitted to the resident engineer or agency representative daily;
- The requirement that all workers on job sites shall wear identification badges; and
- The requirement to pay all workers by check weekly, and that for subcontracts over \$750,000 such checks must be generated by either a payroll service or an agency-approved automated system.

I further affirm that the subcontractor will comply with these and all other relevant requirements of the New York State Labor Law and City of New York laws and regulations concerning payment of prevailing wages and supplements.

Subcontractor Signature: _____ Date: _____

Printed Name: _____

Position: _____

Prime Contractor Witness: _____ Date: _____

Printed Name: _____

Rev 2/08

NOTICE TO BIDDERS

Please be advised that, pursuant to the authority granted to the City under Labor Law §816-b, the Department of Environmental Protection hereby requires that the contractor awarded a contract as a result of this Invitation for Bids, and any of its subcontractors with subcontracts worth one million dollars or over, have, prior to entering into such contract or subcontract, apprenticeship agreements appropriate for the type and scope of work to be performed that have been registered with, and approved by, the New York State Commissioner of Labor. In addition, the contractor and its subcontractors will be required to show that such apprenticeship programs have three years of current, successful experience in providing career opportunities.

The failure to prove, upon request, that these requirements have been met shall result in the contract not being awarded to the contractor or the subcontractor not being approved.

Please be further advised that, pursuant to Labor Law §220, the allowable ratio of apprentices to journeypersons in any craft classification shall not be greater than the ratio permitted to the contractor as to its workforce on any job under the registered apprenticeship program.

Revised 10/18/07

THE CITY OF NEW YORK
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF ENGINEERING DESIGN AND CONSTRUCTION

NEW CROTON AQUEDUCT
REHABILITATION PROGRAM

CONTRACT CRO-334G - STRUCTURES AND EQUIPMENT

BID
SCHEDULE OF PRICES

No.	Contract Item*	Description of Work	Units	Estimated Quantity	Unit Price	Total Price
1	G-LS-1	All Work Required Under The Contract That Is Not Included In The Allowances, Unit Prices, Or Other Lump Sums Listed In This Bid Schedule of Prices	Lump Sum	--	Lump Sum	\$ _____
2	G-A-1	Remediation of Unforeseen Hazardous Materials	Allowance	--	Allowance	\$500,000
3	G-A-2	Quality Assurance Inspection	Allowance	--	Allowance	\$10,000
4	G-A-3	Traffic Control Agents	Allowance	--	Allowance	\$230,000
5	G-A-4	Sediment and Debris Removal - Locations not Specified Elsewhere in the Bid Schedule of Prices	Allowance	--	Allowance	\$300,000
6	G-A-5	Rehabilitation of Shaft 33 Components	Allowance	--	Allowance	\$1,300,000
7	G-A-6	Laboratory Testing of Samples Obtained for Water Quality Testing	Allowance	--	Allowance	\$100,000
8	G-A-7	Rehabilitation of Shaft 3 and Municipal Tap	Allowance	--	Allowance	\$2,350,000
9	G-A-8	Rehabilitation of Shaft 4 and Municipal Tap	Allowance	--	Allowance	\$1,620,000
10	G-A-9	Rehabilitation of Shaft 6 and Municipal Tap	Allowance	--	Allowance	\$1,285,000
11	G-A-10	Rehabilitation of Shaft 10 and Municipal Tap	Allowance	--	Allowance	\$595,000
12	G-A-11	Furnish and Install Permanent Security Covers at Valve Chambers and Blow-off Outlets	Allowance	-	Allowance	\$200,000
13	G-UP-1	Engineer's Field Office	Month	27	\$ _____ per month	\$ _____
14	G-UP-2	Engineer's Change and Storage Facilities	Month	60	\$ _____ per month	\$ _____
15	G-UP-3	Sanitary Facilities, Portable Toilets	Month	180	\$ _____ per month	\$ _____
16	G-UP-4	Watchman Services	Manhour	51,000	\$ _____ per manhour	\$ _____
17	G-UP-5	Labor Assistance for Inspection	Crew Day	20	\$ _____ per crew day	\$ _____

* See Detailed Specification 01270 - Measurement and Payment

No.	Contract Item*	Description of Work	Units	Estimated Quantity	Unit Price	Total Price
18	G-UP-6	Sediment and Debris Removal and Disposal - Shaft 25 Blow Off Valve Chamber, and Arched Chamber	Ton	100	\$ _____ per ton	\$ _____
19	G-UP-7	Sediment and Debris Removal and Disposal - Shaft 24A Chamber	Ton	10	\$ _____ per ton	\$ _____
20	G-UP-8	Sediment and Debris Removal and Disposal - Shaft 9 Waste Chamber, Blow Off Outlet Tunnel, and Raceway and Adjacent Slopes	Ton	525	\$ _____ per ton	\$ _____
21	G-UP-9	Sediment and Debris Removal and Disposal - Shaft 18 Outlet Culverts, Waste Chamber, Outlet Structure, and Raceway and Adjacent Slopes	Ton	150	\$ _____ per ton	\$ _____
22	G-UP-10	Sediment and Debris Removal and Disposal - Shaft 14 Blow Off Tunnel	Ton	350	\$ _____ per ton	\$ _____
23	G-UP-11	Sediment and Debris Removal and Disposal - Gage Vault on Branch Aqueduct	Ton	2	\$ _____ per ton	\$ _____
24	G-UP-12	Lighting Plants	EA	10	\$ _____ each	\$ _____
25	G-UP-13	Setups for Joint/Crack Repairs in Tunnel	EA	47	\$ _____ each	\$ _____
26	G-UP-14	Joint/Crack Repairs in Tunnel	LF	900	\$ _____ per LF	\$ _____
27	G-UP-15	Setups for Brick Replacement Work in Tunnel	EA	21	\$ _____ each	\$ _____
28	G-UP-16	Brick Replacement in Tunnel	SF	265	\$ _____ per SF	\$ _____
29	G-UP-17	- NOT USED -	_____	_____	\$ _____	\$ _____
30	G-UP-18	- NOT USED -	_____	_____	\$ _____	\$ _____
31	G-UP-19	Grouting - Setup for Drilling and Grouting Operations within Tunnel	EA	244	\$ _____ each	\$ _____
32	G-UP-20	Setup for Drilling and Grouting Operations in Shafts 20, 21, 22, 23, 25, 28, and 29 only	EA	7	\$ _____ each	\$ _____
33	G-UP-21	Grouting - Drilling Grout and Vent Holes 2 Feet to 4 Feet Deep	LF	13,100	\$ _____ per LF	\$ _____
34	G-UP-22	Grouting - Drilling Grout and Vent Holes 6 Feet Minimum to 15 Feet Maximum Deep	LF	20,100	\$ _____ per LF	\$ _____
35	G-UP-23	Grouting - Cement Grouting per 94LB Sack	Sack	63,000	\$ _____ per Sack	\$ _____
36	G-UP-24	Grouting - Setup for Exploratory and/or Check Hole Drilling within Tunnel	EA	35	\$ _____ each	\$ _____

* See Detailed Specification 01270 - Measurement and Payment

No.	Contract Item*	Description of Work	Units	Estimated Quantity	Unit Price	Total Price
37	G-UP-25	Grouting - Setup for Exploratory and/or Check Hole Drilling within Shaft	EA	35	\$ _____ each	\$ _____
38	G-UP-26	Grouting - Drilling Exploratory and/or Check Holes within Tunnel or Shaft	LF	1,000	\$ _____ per LF	\$ _____
39	G-UP-27	Pointing - Additional	LF	6,000	\$ _____ per LF	\$ _____
40	G-UP-28	Granite Cleansing - Additional	SF	4,000	\$ _____ per SF	\$ _____
41	G-UP-29	Limestone and Masonry Cleansing - Additional	SF	4,500	\$ _____ per SF	\$ _____
42	G-UP-30	Graffiti and Paint Removal - Additional	SF	100	\$ _____ per SF	\$ _____
43	G-UP-31	Horizontal Joint Seal - Additional	LF	100	\$ _____ per LF	\$ _____
44	G-UP-32	Deep Joint/Crack Repair - Additional	SF	5,500	\$ _____ per SF	\$ _____
45	G-UP-33	Realignment of Stone - Additional	EA	100	\$ _____ per EA	\$ _____
46	G-UP-34	Miscellaneous Contractor Services to Assist City in Restoring Aqueduct to Service	Crew Day	15	\$ _____ per crew day	\$ _____
47	G-UP-35	Repair of Decorative Stair Railings	LF	120	\$ _____ per LF	\$ _____
48	G-UP-36	Replacement of Decorative Stair Railings	LF	60	\$ _____ per LF	\$ _____
49	G-UP-37	Repair of Posts at Decorative Stair Railings	EA	7	\$ _____ per EA	\$ _____
50	G-UP-38	Replacement of Posts at Decorative Stair Railings	EA	12	\$ _____ per EA	\$ _____
51	G-UP-39	Repair of Terrace Railings & Posts	LF	80	\$ _____ per LF	\$ _____
52	G-UP-40	Replacement of Terrace Railings & Posts	LF	140	\$ _____ per LF	\$ _____

NOTE: The Total Bid for this Contract (the sum of all Items) shall be entered in Paragraph 8 on the next page.
* See Detailed Specification 01270 - Measurement and Payment



Bureau of Labor Law

THE CITY OF NEW YORK
OFFICE OF THE COMPTROLLER
1 CENTRE STREET ROOM 1122
NEW YORK, N.Y. 10007-2341

TELEPHONE: (212) 669-4437
FAX NUMBER: (212) 669-4002

WILLIAM C. THOMPSON, JR.
COMPTROLLER

March 27, 2008

TO ALL CITY AGENCIES

Classifications for asbestos removal and remediation, lead abatement and hazardous materials handling are as follows:

- 1. Asbestos Handler (Local 78) for work performed on general building construction projects; and**
- 2. Laborer (Local 731) for work performed on heavy and highway construction projects and engineering projects.**

Please notify all contractors of this clarification.

VERY TRULY YOURS,

**WASYL KINACH, P.E.
DIRECTOR OF CLASSIFICATIONS**

NO TEXT FOR THIS PAGE

CRO-334E ELECTRICAL

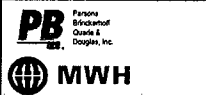
SHT NO.	DWG NO.	DRAWING TITLE
ELECTRICAL DRAWINGS		
244	E1	ELECTRICAL GENERAL NOTES, SYMBOL LIST, FIXTURE SCHEDULE AND ABBREVIATIONS LIST
245	E2	ELECTRICAL TYPICAL INSTALLATION DETAILS
246	E5	ELECTRICAL DEMOLITION PLAN - SHAFT NO. 9 - SHEET 1 OF 3
247	E6	ELECTRICAL DEMOLITION PLAN - SHAFT NO. 9 - SHEET 2 OF 3
248	E7	ELECTRICAL DEMOLITION PLAN - SHAFT NO. 9 - SHEET 3 OF 3
249	E8	ELECTRICAL POWER DISTRIBUTION PANEL SCHEDULE - SHAFT NO. 9
250	E9	ELECTRICAL LIGHTING AND POWER PLAN - SHAFT NO. 9
251	E10	ELECTRICAL GROUNDING AND LIGHTNING PROTECTION PLAN - SHAFT NO. 9
252	E15	ELECTRICAL DEMOLITION PLAN - SHAFT NO. 11A
253	E16	ELECTRICAL PLOT PLAN - SHAFT NO. 11A
254	E17	ELECTRICAL POWER DISTRIBUTION PANEL SCHEDULE - SHAFT NO. 11A
255	E18	ELECTRICAL LIGHTING AND POWER PLAN - SHAFT NO. 11A
256	E19	ELECTRICAL GROUNDING AND LIGHTNING PROTECTION PLAN - SHAFT NO. 11A
257	E22	ELECTRICAL DEMOLITION PLAN - SHAFT NO. 14 - SHEET 1 OF 2
258	E23	ELECTRICAL DEMOLITION PLAN - SHAFT NO. 14 - SHEET 2 OF 2
259	E24	ELECTRICAL POWER DISTRIBUTION PANEL SCHEDULE - SHAFT NO. 14
260	E25	ELECTRICAL LIGHTING AND POWER PLAN - SHAFT NO. 14
261	E34	ELECTRICAL DEMOLITION PLAN - SHAFT NO. 18 - SHEET 1 OF 4
262	E35	ELECTRICAL DEMOLITION PLAN - SHAFT NO. 18 - SHEET 2 OF 4
263	E36	ELECTRICAL DEMOLITION PLAN - SHAFT NO. 18 - SHEET 3 OF 4
264	E37	ELECTRICAL DEMOLITION PLAN - SHAFT NO. 18 - SHEET 4 OF 4
265	E38	ELECTRICAL POWER DISTRIBUTION PANEL SCHEDULE - SHAFT NO. 18
266	E39	ELECTRICAL LIGHTING AND POWER PLAN - SHAFT NO. 18
267	E40	ELECTRICAL GROUNDING AND LIGHTNING PROTECTION PLAN - SHAFT NO. 18
268	E41	ELECTRICAL PLOT PLAN - SHAFT NO. 18
269	E46	ELECTRICAL PLOT PLAN - SHAFT NO. 23
270	E47	ELECTRICAL POWER DISTRIBUTION PANEL SCHEDULE - SHAFT NO. 23
271	E48	ELECTRICAL LIGHTING AND POWER PLAN - SHAFT NO. 23
272	E49	ELECTRICAL GROUNDING AND LIGHTNING PROTECTION PLAN - SHAFT NO. 23
273	E55	ELECTRICAL DEMOLITION PLAN - SHAFT NO. 24A - SHEET 1 OF 2
274	E56	ELECTRICAL DEMOLITION PLAN - SHAFT NO. 24A - SHEET 2 OF 2
275	E57	ELECTRICAL POWER DISTRIBUTION PANEL SCHEDULE - SHAFT NO. 24A
276	E58	ELECTRICAL LIGHTING AND POWER PLAN - SHAFT NO. 24A - SHEET 1 OF 2
277	E59	ELECTRICAL LIGHTING AND POWER PLAN - SHAFT NO. 24A - SHEET 2 OF 2
278	E60	ELECTRICAL GROUNDING AND LIGHTNING PROTECTION PLAN - SHAFT NO. 24A
279	E61	ELECTRICAL GROUNDING PLAN - SHAFT NO. 24A
280	E65	ELECTRICAL DEMOLITION PLAN - SHAFT NO. 25
281	E67	ELECTRICAL POWER DISTRIBUTION PANEL SCHEDULE - SHAFT NO. 25
282	E68	ELECTRICAL LIGHTING PLAN - SHAFT NO. 25
283	E69	ELECTRICAL POWER AND GROUNDING PLAN - SHAFT NO. 25
284	E70	ELECTRICAL DEMOLITION PLAN OUTDOOR LIGHTING - SHAFT NO. 25

REFERENCE DRAWINGS

(REFERENCE DRAWINGS SHALL BE USED FOR REFERENCE ONLY AND SHALL NOT BE TAKEN AS PART OF THE CONTRACT)

SHT NO.	SOURCE	DWG NO.	DRAWING TITLE	DATE
1	CRO-313	SH-011	JPR - SHAFT - PLAN AND PROFILE	MARCH 2006
2	CRO-313	SH-021	CONNECTION: NGA TO RW TUNNEL - PLANS AND SECTIONS	MARCH 2006
3	CRO-313	SH-023	CONNECTION: NGA TO L5 TUNNEL - INITIAL GROUND SUPPORT AND DETAILS	MARCH 2006
4	CRO-313	SH-024	SHAFT 21A - SECTIONS AND DETAILS	MARCH 2006
5	AQUEDUCT COMMISSION	NO. 19	SECTION AND PLAN OF UPPER PART OF SHAFT NO. 25 ELEVATION 85.5	1888
6	AQUEDUCT COMMISSION	NO. 33	GENERAL DRAWING AT BOTTOM OF SHAFT NO. 25	1888
7	AQUEDUCT COMMISSION	NO. 30	DRAIN AND BLOW-OFF PIPE AT ELEVATION 8 - SHAFT NO. 25	1888
8	AQUEDUCT COMMISSION	NO. 7-1/2	CAST IRON LINING FOR AQUEDUCT SHAFT AT BLOW-OFF - SHAFT NO. 25	1888
9	AQUEDUCT COMMISSION	NO. 11-1/4A	CAST IRON MANHOLE COVER FOR AQUEDUCT SHAFTS - SHAFT NO. 25	1888
10	AQUEDUCT COMMISSION	NO. 11B	CAST IRON MANHOLE COVER FOR AQUEDUCT SHAFTS - SHAFT NO. 25	1888
11	AQUEDUCT COMMISSION	NO. 8	CASTINGS FOR SUPPORT OF MANHOLES IN SHAFT NO. 25	1888
12	AQUEDUCT COMMISSION	NO. 7	CAST IRON CATCH BASIN FOR BLOW-OFF 0 SHAFT NO. 25	1888

U:\Croton\CRO-334E\General\CAD-G2-ADD.dwg, C2



DESIGNED	MS	SCALE	
DRAWN	JM		
CHECKED	MS	NONE	
SECT. CHIEF	JS		
PROJECT ENGR.	ASH		
DATE	ISSUED FOR	BY	
5/17/2008	ADDENDUM 1	DR	

APPROVED FOR THE CITY OF NEW YORK
[Signature] P.E.
 EXECUTIVE PROJECT MANAGER
[Signature] P.E.
 CHIEF, DIVISION OF WATERSHED FACILITIES DESIGN



APPROVED FOR THE CITY OF NEW YORK
 DEPARTMENT OF ENVIRONMENTAL PROTECTION
 BUREAU OF ENGINEERING DESIGN & CONSTRUCTION
 DIVISION OF WATERSHED FACILITIES DESIGN
 NEW CROTON AQUEDUCT REHABILITATION

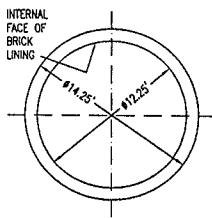


CONTRACT CRO-334G-STRUCTURES & EQUIPMENT
 CONTRACT CRO-334E - ELECTRICAL

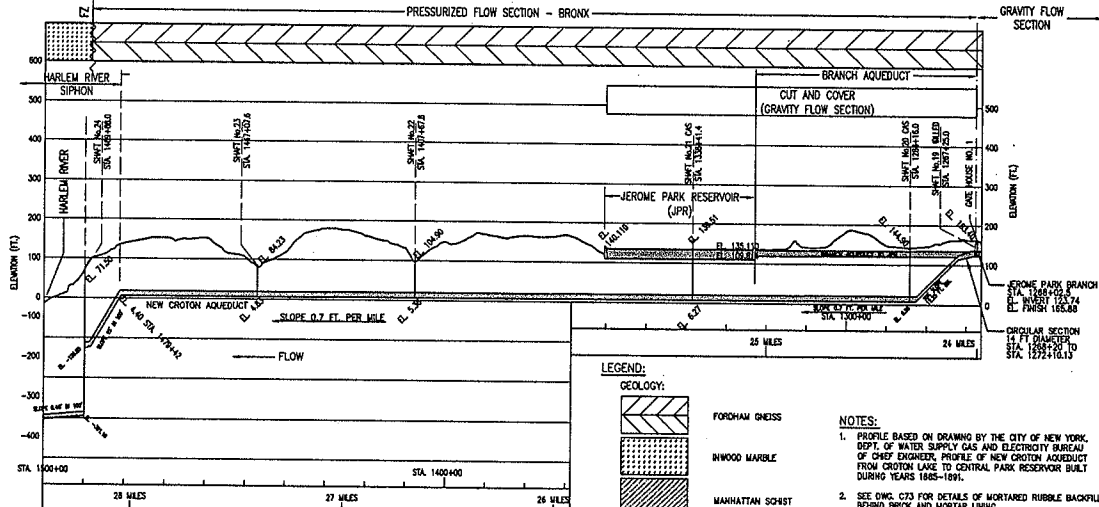
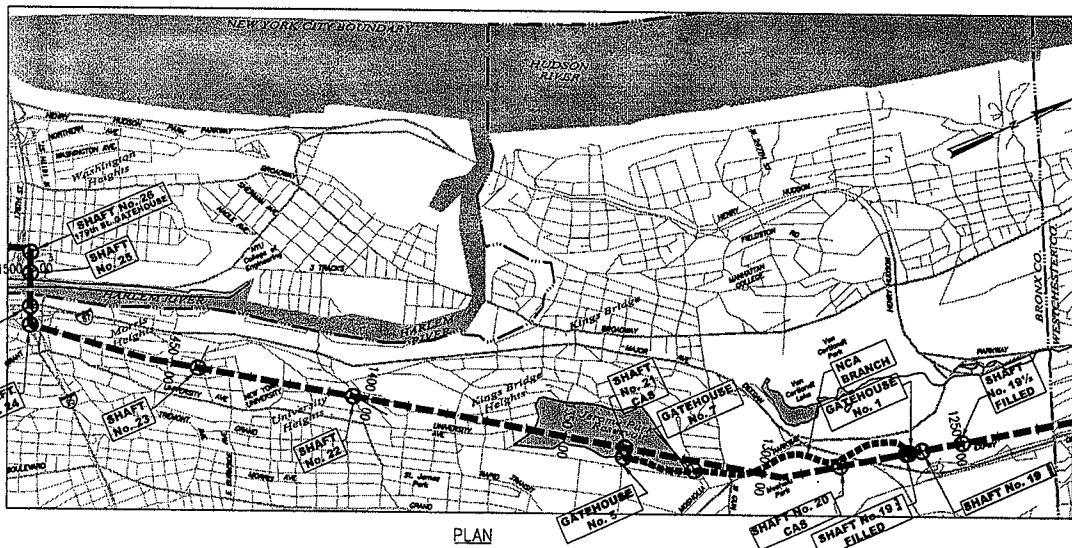
LIST OF DRAWINGS
 SHEET 2 OF 2

DATE FEBRUARY 2008
 SHEET 3 of 284
 DWG. NO. G2

PRIVILEGED AND CONFIDENTIAL



NEW CROTON AQUEDUCT
PRESSURIZED FLOW SECTION
STA. 1272+10 TO STA. 1466+87
STA. 1503+00 TO STA. 1628+05



WORK LOCATION	GROUT METHOD	MINIMUM TUNNEL LENGTH COVERED BY GROUT	CO POSITIONS TO MINIMIZE INFILTRATION INTO TUNNEL	SECTION LENGTH OF CO	CO POSITIONS TO FILL VOIDS BEHIND LINING/BACKING MATERIAL	
					CO POSITION	CO POSITION
1267+70	CC			96	1267+23 - 43 (12:00 - 3:00)	1267+42 - 1268+16 (9:00 - 12:00)
1268+70	CCG	1269+00 - 1269+20	12:00 - 8:00	89	1268+00 - 1269+00 (9:00 - 3:00)	1268+14 - 62 (9:00 - 11:00), 65 - 68 (9:00 - 3:00)
1269+70	CC	1269+20 - 1270+05	FULL CRC	100	1269+11 - 18 (12:00 - 12:00), 25 - 26 (9:00 - 12:00), 43 - 60 (12:00 - 3:00), 65 - 1270+2 (9:30), 495 - 1270+4 (2:00 - 3:00)	
1270+70	CC			83	1270+25 - 75 (9:00 - 11:00), 76 - 86 (12:00 - 3:00), 87 - 95 (12:00 - 3:00), 97 - 98 (9:00), 99 - 100 (9:00)	
1271+70	CC			100	1271+20 - 30 (9:00 - 3:00), 40 - 46 (11:00 - 12:00), 55 - 70 (1:00 - 3:00), 71 - 75 (11:00 - 12:00), 1272+06 - 20 (9:00 - 2:00)	
1274+25	CCG	1274+00 - 1274+60	8:00 - 3:00	60	1280+34 - 39 (12:00), 485 - 500 (12:00)	
1280+80	CCG	1280+60 - 1281+00	10:00 - 2:00	66	1280+34 - 39 (12:00), 485 - 500 (12:00)	
1281+72	CC			15	1281+65 - 90 (9:00 - 2:00)	
1283+70	CC			19	1283+71 - 98 (10:00 - 11:00)	
1284+16	CC			19	GROUT F LEAK	
1286+68	CCG	1286+19 - 1287+19	3:00 - 8:00	100		
1288+35	CCG	1288+95 - 1289+75	3:00 - 8:00	2	1289+47 - 59 (9:00)	
1290+70	CCG	1290+50 - 1291+60	FULL CRC	7	1290+76 - 80 (12:00 - 2:00)	
1293+61	CCG	1293+50 - 1293+70	FULL CRC	20		
1294+80	CCG	1294+70 - 1294+90	3:00 - 8:00	55	1294+11 - 12 (12:00), 136 - 146 (10:00 - 12:00)	
1295+70	CC			24	1295+50 - 59 (12:00), 66 - 74 (12:00)	
1296+70	CCG	1296+30 - 1297+10	FULL CRC	80		
1297+70	CC			87	1297+26 - 35 (12:00), 437 - 491 (12:00)	
1299+50	CCG	1299+20 - 1299+40	FULL CRC	95	1299+45 - 10 (11:00), 447 - 497 (12:00), 490 - 10 (1:00 - 3:00)	
1300+50	CCG	1300+30 - 1300+70	FULL CRC	73	1300+19 - 40 (2:30), 432 - 500 (12:00)	
1302+50	CC			95	1302+00 - 10 (9:00)	
1304+05	CCG			100	1304+54 - 60 (12:00 - 3:00), 63 - 66 (9:30), 1304+01 - 13 (9:00), 420 - 60 (1:00 - 3:00)	
1305+45	CCG	1304+95 - 1305+95	3:00 - 8:00	86	1305+04 - 20 (1:00), 444 - 68 (11:00 - 3:00), 462 - 80 (9:00 - 11:00), 472 - 90 (2:00 - 3:00)	
1306+40	CCG	1306+10 - 1306+90	FULL CRC	33	1306+68 - 1306+21 (9:00 - 11:00), 459 - 69 (3:00), 476 - 60 (12:00 - 3:00), 480 - 60 (11:00)	
1307+50	CCG	1307+60 - 1308+00	FULL CRC	98	1307+61 - 61 (12:00 - 3:00), 625 - 61 (9:00 - 12:00), 669 - 90 (2:00 - 3:00), 683 - 99 (11:00)	
1308+50	CCG	1308+00 - 1308+40	FULL CRC	56	1308+30 - 33 (3:00), 431 - 57 (9:00)	
1308+50	CCG	1308+10 - 1308+70	3:00 - 3:00	100	1308+70 - 1310+00 (9:00 - 3:00)	
1310+50	CC			92	1310+61 - 70 (9:00 - 12:00), 431 - 70 (12:00 - 3:00), 490 - 83 (12:00)	
1311+50	CCG	1311+05 - 1311+25	6:00 - 8:00	89	1311+23 - 31 (3:00), 436 - 58 (9:30)	
1312+50	CC			57	1312+26 - 29 (8:00), 448 - 59 (10:30), 476 - 60 (12:00 - 2:00)	
1313+50	CC			100	1313+43 - 21 (10:00 - 3:00), 433 - 66 (10:00 - 2:00), 476 - 70 (9:30), 494 - 07 (12:00 - 1:00)	
1314+75	CCG	1314+65 - 1314+85	FULL CRC	80		
1317+50	CC			100	1316+85 - 1317+88 (9:00 - 12:00)	
1318+50	CCG	1318+70 - 1319+50	FULL CRC	18	1318+00 - 19 (9:00 - 12:00)	
1319+50	CCG	1319+00 - 1319+10	FULL CRC	69	1319+13 - 42 (9:00 - 12:00), 493 - 01 (11:00)	
1322+45	CC			26	1321+34 - 60 (12:00 - 3:00)	
1322+70	CCG	1322+80 - 1322+90	3:00 - 8:00	20	1322+69 - 69 (3:00)	
1329+25	CCG	1329+15 - 1329+35	3:00 - 8:00	15	1329+25 - 25 (9:00)	
1332+90	CCG	1332+70 - 1333+10	3:00 - 8:00	15	1331+86 - 01 (3:00), 1333+07 - 11 (9:00)	
1334+10	CCG	1334+20 - 1334+40	9:00 - 3:00	98	1333+68 - 74 (9:30), 1334+00 - 20 (3:00), 406 - 42 (9:30 - 2:30), 458 - 66 (9:30)	
1337+65	CCG	1337+65 - 1337+85	FULL CRC	20		
1338+50	CCG	1338+10 - 1338+60	FULL CRC	95	1338+04 - 11 (6:30 - 9:30)	
1340+00	CCG	1339+85 - 1340+35	FULL CRC	45	1339+90 - 1340+00 (11:30 - 1:30), 413+01+16 - 28 (9:00)	
1341+45	CCG	1341+10 - 1341+40	6:00 - 11:00	100	1340+85 - 1341+05 (12:00), 425 - 35 (11:00 - 12:30), 440 - 65 (9:30 - 10:30), 460 - 70 (1:00), 470 - 80 (12:00), 485 - 85 (12:30 - 2:30)	
1342+25	CCG	1342+15 - 1342+45	6:00 - 4:00	30	1342+13 - 19 (9:00), 415 - 40 (11:30 - 12:30), 430 - 48 (1:00 - 3:00)	
1343+10	CCG	1342+60 - 1343+60	FULL CRC	100	1342+75 - 86 (12:00), 1343+45 - 58 (9:00)	
1343+95	CCG	1343+60 - 1344+00	6:00 - 3:00	70	1343+65 - 90 (9:30 - 10:30), 1344+00 - 05 (1:30 - 2:30), 1344+21 - 21 (9:30 - 10:30), 1344+25 - 30 (3:00 - 4:00)	

CC - CONTACT GROUTING ONLY
CCG - CONTACT AND CONSOLIDATION GROUTING TO BE PERFORMED IN AREAS WHERE LEAKAGE HAS BEEN NOTED DURING THE TUNNEL DURING DETAILED INVESTIGATION PERFORMED IN 2004-2005 TUNNEL UNWATERING.

CONTACT GROUTING IN THIS AREA WILL BE PERFORMED TO MINIMIZE THE POTENTIAL FOR INFILTRATION PRIOR TO START OF CONSOLIDATION GROUTING.

150 100 50 0 150
SCALE IN FEET

1500 1000 500 0 1500
SCALE IN FEET

PB Parsons Brinckerhoff Quade & Douglas, Inc.

MWH

DESIGNED	J.C.	SCALE	AS NOTED
DRAWN	M.K.		
CHECKED	M.J.		
SET. CHIEF	D.S.		
PROJ. ENGR.	A.S.H.		

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EXECUTIVE PROJECT MANAGER

CHIEF, DIVISION OF WATERBOD FACILITIES DESIGN

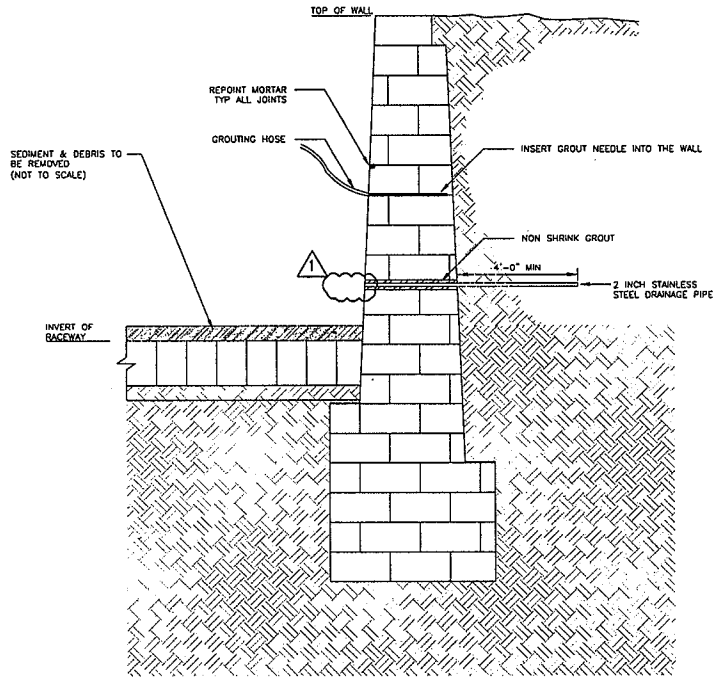


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DIVISION OF WATERBOD FACILITIES DESIGN
NEW CROTON AQUEDUCT REHABILITATION

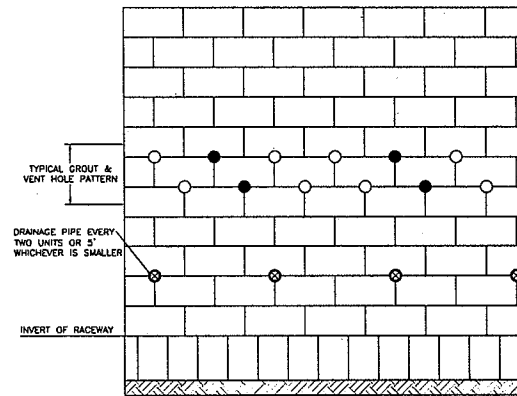
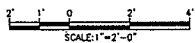
CONTRACT CO-334G-STRUCTURES & EQUIPMENT

CONSOLIDATION GROUTING OF PRESSURIZED AQUEDUCT
PLAN AND PROFILE - SHEET 1 OF 4

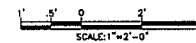
DATE: FEBRUARY 2008
SHEET 64 OF 264
DWG. NO. C69



TYPICAL RACEWAY WALL SECTION



RACEWAY MASONRY STONE WALL ELEVATION



RACEWAY WALLS REPAIR PROCEDURE

1. REMOVE THE TREE STUMPS AND VEGETATION ON THE WALL ACCORDING TO THE NOTES ON DRAWINGS C116 AND C125.
2. REMOVE LOOSE AND DETERIORATED MORTAR, MORTAR NOT BONDED TO ONE SIDE OF A UNIT, OR EASILY DEBONDED FROM ONE SIDE OF A UNIT SHALL BE REMOVED. THE WORK TO REMOVE MORTAR SHALL PROCEED FROM ONE SIDE TO THE OTHER HORIZONTALLY AND FROM TOP TO THE BOTTOM VERTICALLY. THE MAXIMUM LENGTH OF AN OPEN JOINT SHALL BE 6' OR AS ALLOWED BY THE ENGINEER.
3. AFTER REMOVING MORTAR, CLEAN THE OPEN JOINTS WITH CLEAN WATER AT LOW PRESSURE.
4. REPOINT PRE-MOISTENED OPEN JOINTS WITH PREHYDRATED MORTAR TO A DEPTH OF 2 TIMES THE WIDTH OF THE JOINT. THE WORK SHALL PROCEED FROM ONE SIDE TO THE OTHER HORIZONTALLY AND FROM BOTTOM TO THE TOP VERTICALLY. TOOL THE MORTAR JOINTS TO MATCH THE ADJACENT EXISTING JOINTS. LEAVE OPENINGS FOR GROUT HOLES OR VENT HOLES AT THE ENDS OF EACH UNIT.
5. INSERT GROUT NEEDLE INTO THE GROUT HOLES AND CONNECT TO GROUTING HOSE. THE GROUT NEEDLE SHALL PENETRATE TO THE EXISTING BONDED MORTAR OR TO 2 INCHES FROM THE FAR FACE OF THE WALL, WHICHEVER IS DEEPER. LEAVE VENT HOLES AT THE TWO ENDS OF EACH UNIT ADJACENT TO THE GROUTING HOLE AT THE SAME LEVEL.
6. INJECT GROUT INTO THE MASONRY STONE WALL FROM THE LOWEST ELEVATION AND FROM ONE SIDE TO THE OTHER HORIZONTALLY. LIMIT THE GROUTING PUMP PRESSURE TO NOT MORE THAN 5 PSI. GROUTING SHOULD BE STOPPED IF PUMP PRESSURE IS MORE THAN 5 PSI AND THERE IS NO COMMUNICATION FROM THE VENT HOLES. WASH GROUT SPILLAGE FROM THE WALL IMMEDIATELY. VENT HOLES SHALL BE PLUGGED WITH DAKUM AS SOON AS GROUT FLOWS FROM THEM.
7. ONE DAY AFTER GROUTING, REMOVE TEMPORARY PLUGS AND POINT HOLES WITH NON-SHRINK MORTAR. TOOL THE MORTAR TO MATCH THE ADJACENT EXISTING. REMOVE AND DISPOSE OF ALL SPILLED MORTAR AND GROUT.
8. WHEN MASONRY WALL GROUTING WORK IS FINISHED DRILL WEEP HOLES IN THE MASONRY STONE WALL AT EVERY TWO UNITS SPACING (APPROX 5 FEET). INSERT STAINLESS STEEL DRAINAGE PIPE 4 FEET BEYOND THE BACK OF THE MASONRY WALL AND PATCH THE ANNULUS WITH NON-SHRINK GROUT.

RACEWAY WALLS REPAIR QUANTITY ESTIMATE

SHAFT 18	REPOINT LENGTH (FT)	DRAINAGE PIPE (FT)	GROUTING VOLUME (CF)
EAST WALL	520	100	397
WEST WALL	520	60	238
NORTH WALL	520	100	421
SOUTH WALL	720	120	532
TOTAL	2330	380	1588

SHAFT 9	REPOINT LENGTH (FT)	DRAINAGE PIPE (FT)	GROUTING VOLUME (CF)
NORTH WALL	720	380	692
SOUTH WALL	720	380	692
TOTAL	1440	760	1385

NOTE: QUANTITIES ARE APPROXIMATE AND SERVE AS REFERENCE ONLY. ACTUAL QUANTITIES MAY VARY.



NO.	DATE	ISSUED FOR	BY
1	5/17/2008	ADDENDUM 3	OR

DESIGNED: CWF
 DRAWN: JIN
 CHECKED: OAR
 SECTION CHIEF: JS
 PROJECT ENGINEER: ASH

SCALE: NTS
 P.E.

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 Environmental Engineers & Scientists

APPROVED FOR THE CITY OF NEW YORK
Thomas P. Carroll P.E.
 EXECUTIVE PROJECT MANAGER
Robert J. Kelly P.E.
 CHIEF, DIVISION OF WATERBORN FACILITIES DESIGN

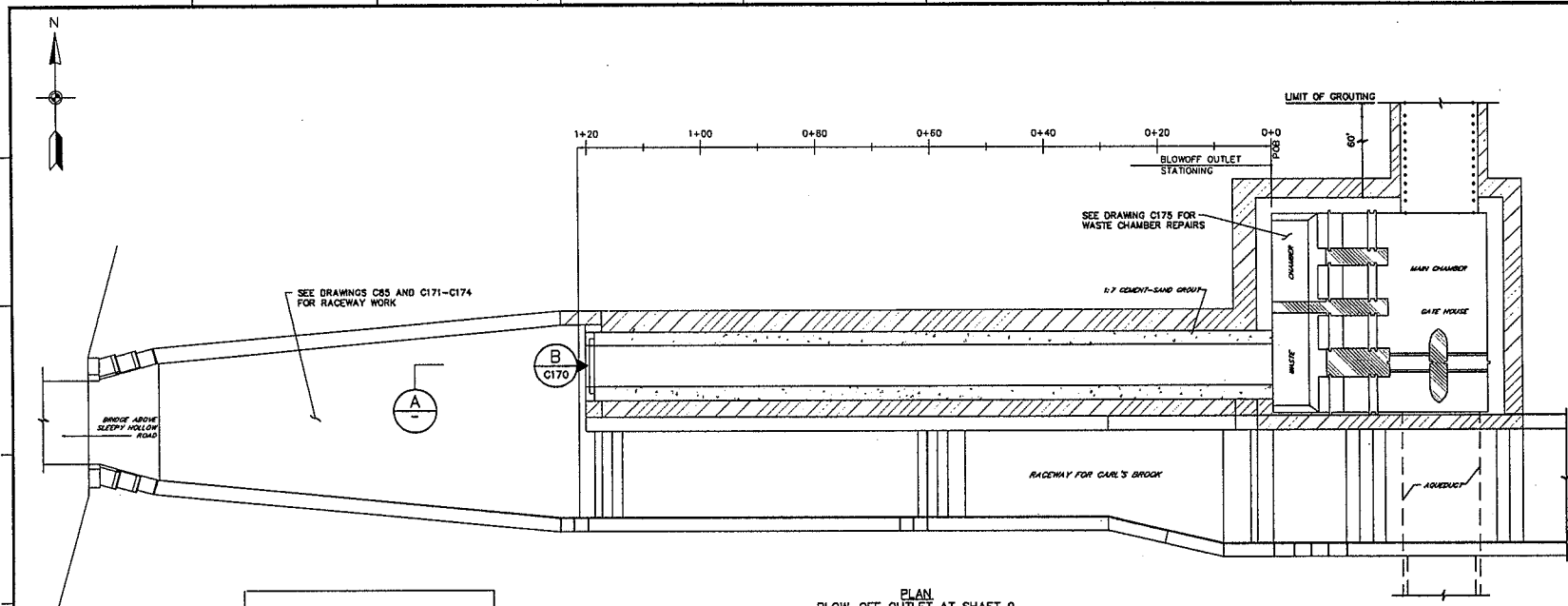


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 DIVISION OF WATERBORN FACILITIES DESIGN
 NEW CROTON AQUEDUCT REHABILITATION

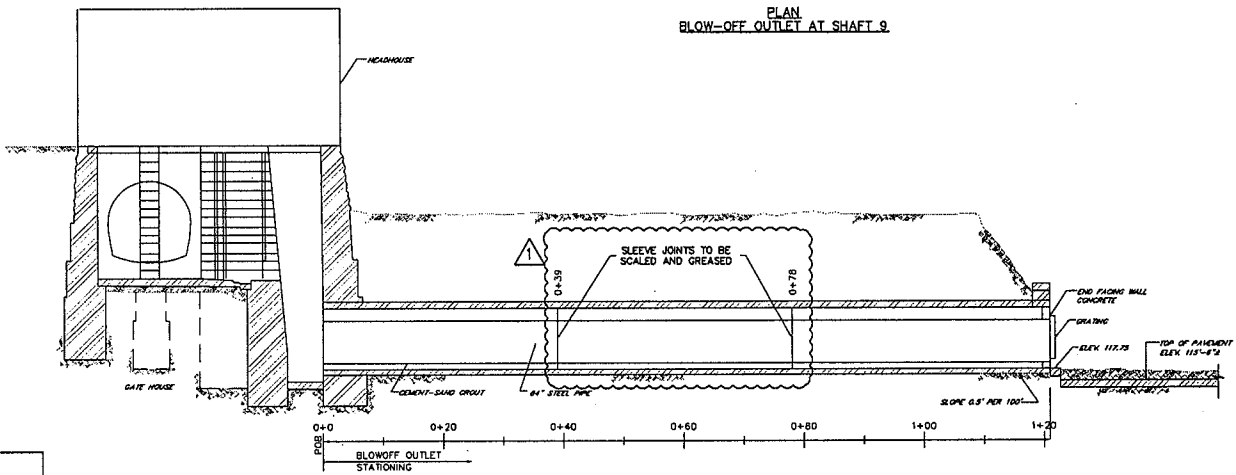
CONTRACT CRO-334G-STRUCTURES & EQUIPMENT
 RACEWAY WALL REPAIRS

DATE: FEBRUARY 2008
 SHEET 71 OF 284
 DWG. NO. C85

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PLAN
BLOW-OFF OUTLET AT SHAFT 9



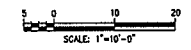
SECTION - BLOW-OFF OUTLET AT SHAFT 9

NOTES FOR BLOW-OFF REPAIR:

1. STATIONING BEGINS AT FACE OF WASTE CHAMBER WALL.
2. CLEAN BLOW-OFF IN CONJUNCTION WITH RACEWAY WORK.
3. REMOVE SEDIMENT FROM INVERT. REMOVE TUBERCLES, SCALE AND REMOVE LOOSE COATING FROM PIPE PERIMETER (600 SF OF SCALING).
4. GROUT AT 0+37 AND 0+85, FOR LEAKS AT 3 O'CLOCK (30 CF AND 10 HOLES PER LOCATION).
5. INJECT JOINTS WITH NSF APPROVED GREASE, SUITABLE FOR POTABLE WATER (70 LB TOTAL IN 2 JOINTS).

NOTES FOR GROUTING AT NORTH PORTAL:

- DENOTES SURFACE TO BE GROUTED BEHIND AT LOW PRESSURE (5 PSI)
1. BRICK REPAIRS WERE MADE IN 2005. ASSIST ENGINEER IN INSPECTION OF TUNNEL SURFACES. REPOINT AND REPLACE BRICK AS DIRECTED.
 2. GROUT FROM BOTTOM TO TOP AND NORTH TO SOUTH AND IN ACCORDANCE WITH SPECIFICATIONS AND/OR AS DIRECTED BY ENGINEER.
 3. DO NOT EXCEED 5 PSI UNLESS DIRECTED BY ENGINEER.
 4. QUANTITY OF GROUT 100 CF.



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NO.	DATE	ISSUED FOR	BY
1	5/17/2008	ADDENDUM 3	DR

DESIGNED	DR	SCALE	
DRAWN	JD	AS NOTED	
CHECKED	MS		
SECTION ECH	JS		
PROJECT ENGR.	ASH		

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EXECUTIVE PROJECT MANAGER

Paul J. Kelly P.E.
CHIEF, DIVISION OF WATERSHED FACILITIES DESIGN



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NEW CROTON AQUEDUCT REHABILITATION

CONTRACT CRO-334G-STRUCTURES & EQUIPMENT

REHABILITATION OF BLOW-OFF OUTLET AT
SHAFT NO. 9 - SHEET 1 OF 2

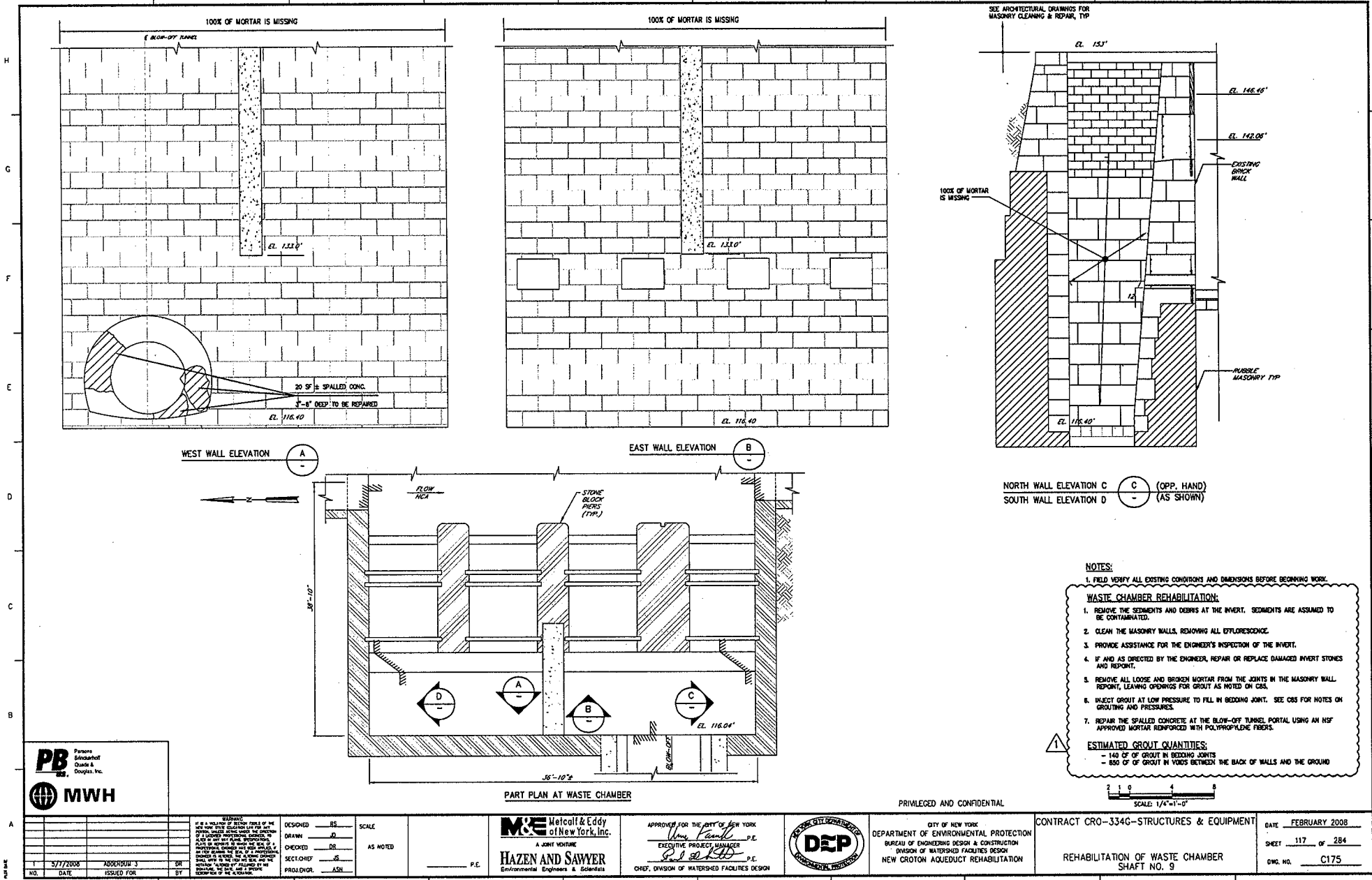
DATE FEBRUARY 2008

SHEET 111 of 284

DWG. NO. C169

U:\cros\cro334\Sections\NC-SB-C169-ADD.dwg Layout1

U:\CRO\CR0-334\Structure\NC-SB-C175-ADD.dwg LAYOUT



NOTES:

1. FIELD VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS BEFORE BEGINNING WORK.

WASTE CHAMBER REHABILITATION:

1. REMOVE THE SEDIMENTS AND DEBRIS AT THE INVERT. SEDIMENTS ARE ASSUMED TO BE CONTAMINATED.
2. CLEAN THE MASONRY WALLS, REMOVING ALL EFFLORESCENCE.
3. PROVIDE ASSISTANCE FOR THE ENGINEER'S INSPECTION OF THE INVERT.
4. IF AND AS DIRECTED BY THE ENGINEER, REPAIR OR REPLACE DAMAGED INVERT STONES AND REPORT.
5. REMOVE ALL LOOSE AND BROKEN MORTAR FROM THE JOINTS IN THE MASONRY WALL, REPORTING, LEAVING OPENINGS FOR GROUT AS NOTED ON CBS.
6. INJECT GROUT AT LOW PRESSURE TO FILL IN BEDDING JOINT. SEE CBS FOR NOTES ON GROUTING AND PRESS.
7. REPAIR THE SPALLED CONCRETE AT THE BLOW-OFF TUNNEL PORTAL USING AN NSF APPROVED MORTAR REINFORCED WITH POLYPROPYLENE FIBERS.

ESTIMATED GROUT QUANTITIES:

- 140 CF OF GROUT IN BEDDING JOINTS
- 850 CF OF GROUT IN VOIDS BETWEEN THE BACK OF WALLS AND THE GROUND



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DRAWN	JD	AS NOTED	
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PROJECT	ASH		

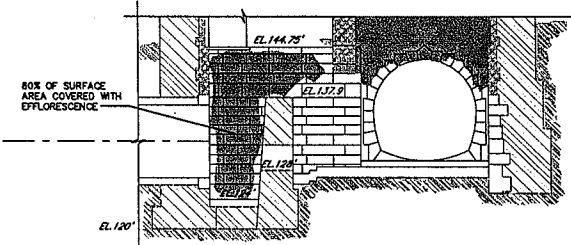
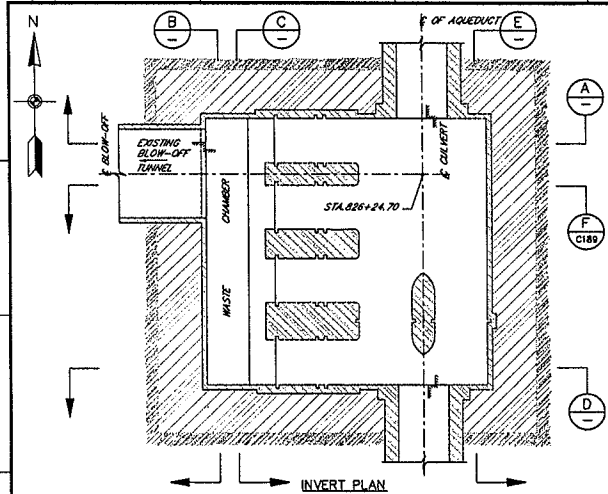
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EXECUTIVE PROJECT MANAGER
... P.E.
CHIEF, DIVISION OF WATERSHED FACILITIES DESIGN

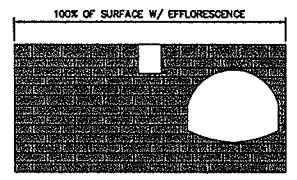
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NEW CROTON AQUEDUCT REHABILITATION

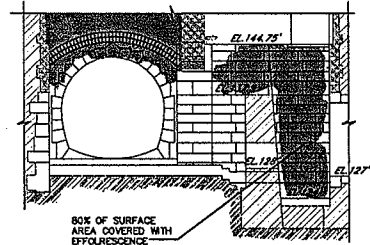
CONTRACT CRO-334C-STRUCTURES & EQUIPMENT	DATE FEBRUARY 2008
REHABILITATION OF WASTE CHAMBER SHAFT NO. 9	SHEET 117 of 284
	DWG. NO. C175



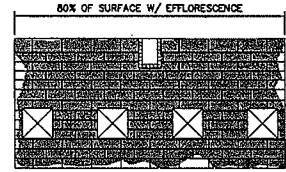
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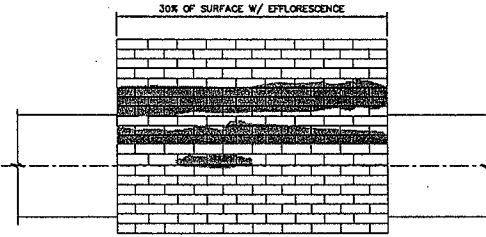
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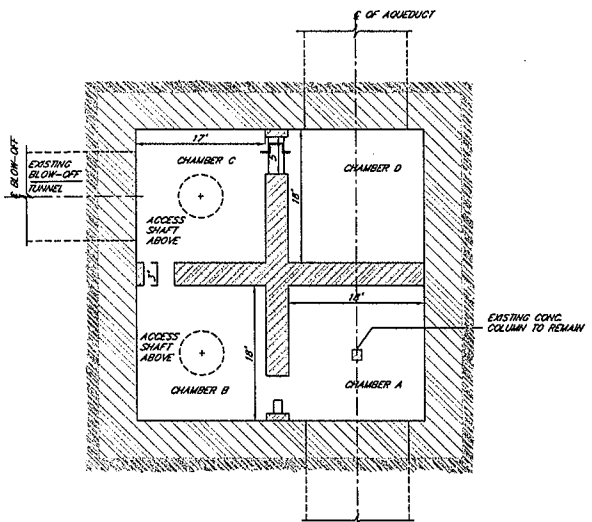
SECTION D



SECTION C



SECTION E



PLAN EL. 145

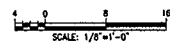
KEY:
 INDICATES EXISTING EFFLORESCENCE

- NOTES:**
- DRAWING IS BASED ON THE AQUEDUCT COMMISSION DETAIL DRAWING No. 8, "SAW MILL RIVER BLOW-OFF AND WASTE-WEIR NEAR ARDLEY", SHEET No. 4, DATED AUGUST 3, 1885.
 - FIELD VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS BEFORE BEGINNING WORK.

WASTE CHAMBER REHABILITATION:

- REMOVE THE SEDIMENTS AND DEBRIS AT THE INVERT. SEDIMENTS ARE ASSUMED TO BE CONTAMINATED.
- CLEAN THE MASONRY WALLS, REMOVING ALL EFFLORESCENCE.
- PROVIDE ASSISTANCE FOR THE ENGINEER'S INSPECTION OF THE INVERT AND OF THE WASTE CHAMBER WALLS.
- IF AND AS DIRECTED BY THE ENGINEER, REPAIR OR REPLACE DAMAGED INVERT MASONRY UNITS AND REPORT.
- REMOVE ALL LOOSE AND BROKEN MORTAR FROM THE JOINTS IN THE MASONRY WALL, REPORT, LEAVING OPENINGS FOR GROUT AS NOTED ON CBS.
- INJECT GROUT AT LOW PRESSURE TO FILL IN BEDDING JOINT. SEE CBS FOR NOTES ON GROUTING AND PRESSURES.

ESTIMATED GROUT QUANTITIES:
 - 300 CF OF GROUT IN BEDDING JOINTS
 - 1,000 CF OF GROUT IN VOIDS BETWEEN THE BACK OF WALLS AND THE GROUND



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MWH

DESIGNED	SC	SCALE	
DRAWN	JD	AS NOTED	
CHECKED	DR		
SECTION	JS		
PROJECT/NO.	ASH		

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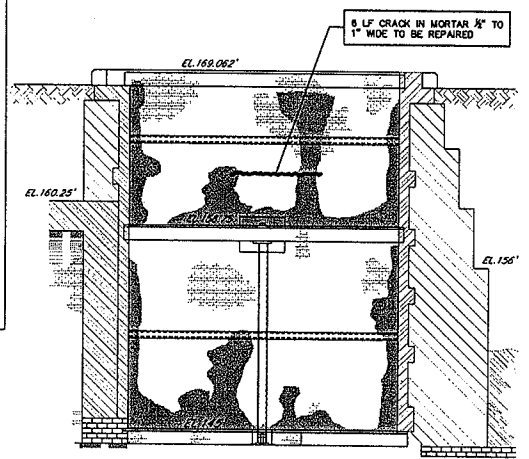
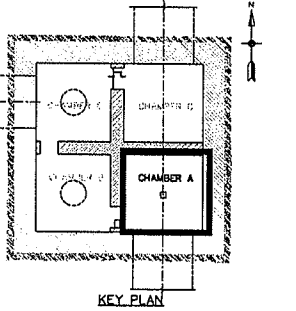
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 DIVISION OF WATERSHED FACILITIES DESIGN
 NEW CROTON AQUEDUCT REHABILITATION

CONTRACT CRO-334G-STRUCTURES & EQUIPMENT

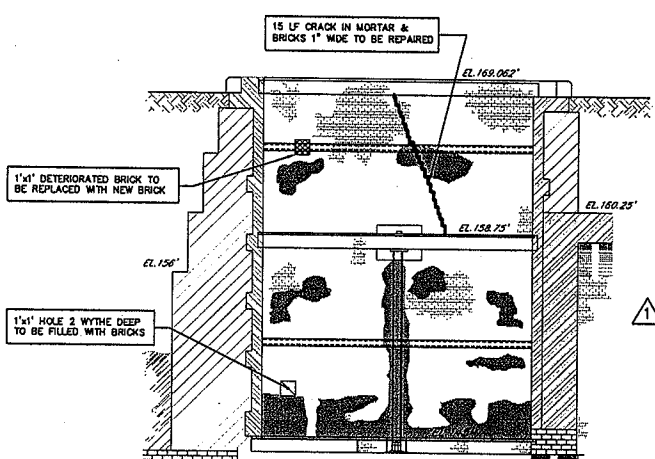
REHABILITATION OF SHAFT NO. 14
 SHEET 1 OF 5

DATE FEBRUARY 2008
 SHEET 123 OF 284
 DWG. NO. C184

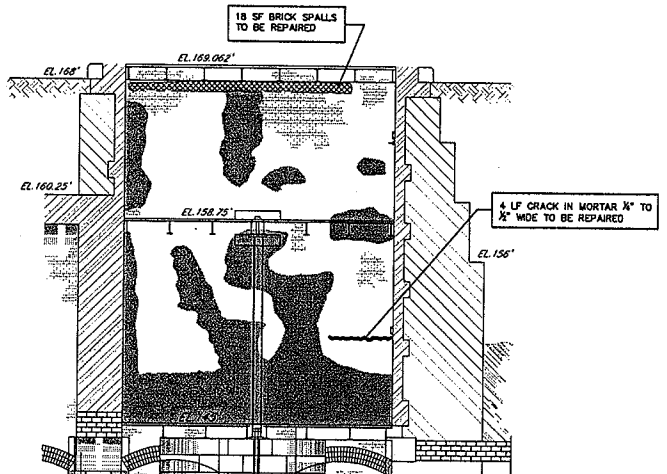
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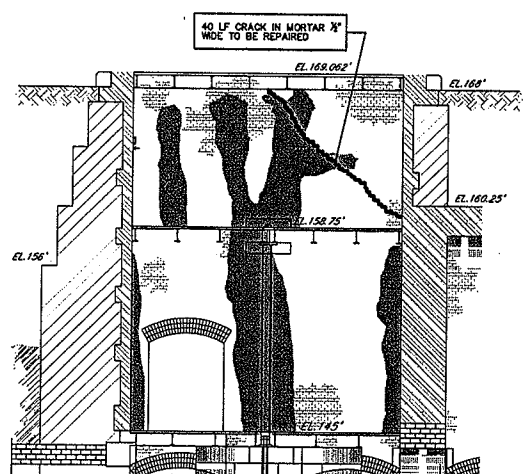
NORTH WALL



SOUTH WALL



EAST WALL



WEST WALL

- KEY:**
- INDICATES EXISTING EFFLORESCENCE
 - INDICATES EXISTING SPALLS OR DETERIORATED BRICK
 - INDICATES EXISTING CRACKS $\frac{1}{8}$ " WIDE OR GREATER
- NOTES:**
1. BRICK SPALLS TO BE REPAIRED USING DETAILS FOR BRICK AND MORTAR LOSS REPAIR SEQUENCE.
 2. ALL EFFLORESCENCE IS TO BE REMOVED FROM THE INTERIOR BRICK SURFACE.
 3. ALL MORTAR JOINTS ON ALL INTERIOR BRICK SURFACES TO BE REPOINTED IN CONFORMANCE WITH SPECIFICATIONS.
 4. CRACKS $\frac{1}{8}$ " OR GREATER TO BE REPAIRED IN CONFORMANCE WITH DRAWINGS AND SPECIFICATIONS. REPOINT CRACKED JOINTS. REPLACE CRACKED BRICKS.

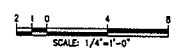
QUANTITIES:

BRICK	QUANTITY	UNIT
BRICKS TO BE REPLACED (VISIBLE WYTHE)	20	SF
BRICKS TO BE REPLACED (MIDDLE WYTHE)	1	SF
BRICKS TO BE CLEANED	450	SF

MORTAR	QUANTITY	UNIT
REPOINT	10,800	LF
REMOVE AND REPLACE MORTAR	85	LF

OTHER	QUANTITY	UNIT
CRACKS TO BE GROUTED	0	LF

GROUT INJECTION	QUANTITY	UNIT
INJECTION PORTS	0	EA
INJECT GROUT	0	CF



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MWH

NO.	DATE	ISSUED FOR	BY
1	5/7/2008	ADDENDUM 3	DM

DESIGNED	RT	SCALE	AS NOTED
DRAWN	JD		
CHECKED	DR		
SECT. CHIEF	JS		
PROJ. ENGR.	ASH		

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NEW CROTON AQUEDUCT REHABILITATION

CONTRACT CRO-3340-STRUCTURES & EQUIPMENT

REHABILITATION OF SHAFT NO. 14 CHAMBER A
SHEET 2 OF 5

DATE	FEBRUARY 2008
SHEET	124 OF 284
DRG. NO.	C185

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