PORT AUTHORITY OF ALLEGHENY COUNTY

TRANSMITTAL MEMORANDUM

TO: All Holders of Bid Documents for the Subject Contract

SUBJECT: North Shore Connector
NSC Train Systems (System Wide)
Contract No. NSC-009

DATE: September 3, 2008

Please find enclosed the following:

- Addendum No. #4 dated September 3, 2008
- Question and Answers 62, 63, 70, 79, and 96-134
- NSC-009 Site Visit – Bored Tunnel Attendance Sheet

The following signature acknowledges the receipt of this Transmittal.

_____
Signature

_____
Name of Company

_____
Date

Please sign and return one (1) copy to:

Port Authority of Allegheny County
Purchasing and Materials Management Department
Heinz 57 Center
345 Sixth Avenue, Third Floor
Pittsburgh, PA 15222-2527
Attention: Ms. Toni Matessa

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Port Authority of Allegheny County

North Shore Connector

NSC Train Systems (System Wide)

Contract No. NSC-009

ADDENDUM NO. 4

September 3, 2008

This Addendum modifies Bid Documents for the subject Contract as set forth below. The Bidder shall acknowledge receipt of this Addendum in the appropriate space on the Form of Proposal, Form B.

To identify revisions on the attached Contract Drawings, an irregular line joined by a diamond symbol with a number inside it appears at the revision location; and the diamond symbol with a number inside it, date and a description appear in the Revision Block.

To identify revisions on the attached pages, a vertical bar appears in the right margin at the revision location.

CHANGES TO TERMS AND CONDITIONS (VOLUME 1)

1. Table of Contents, Page TOC-2. Delete and replace with page TOC-2.
2. Section 00200, Instructions to Bidders, Page 00200-2. Delete and replace with page 00200-2.
3. Section 00400, Bid/Award Forms, Page 00400-1. Delete and replace with page 00400-1.
4. Section 00400, Bid/Award Forms, Form B, Page B-2. Delete and replace with page B-2.
5. Section 00400, Bid/Award Forms, Form J, Pages J-1 through J-3. Delete pages J-1 through J-3.
6. Section 00500, Agreement, Pages 00500-11 through 00500-12. Delete and replace with pages 00500-11 through 00500-12.
7. Section 00500, Agreement, Page 00500-18. Delete and replace with pages 00500-18.
8. Section 00700, General Conditions, Page 00700-23. Delete and replace with pages 00500-23.

9. Section 00700, General Conditions, Page 00700-25. Delete and replace with pages 00500-25.

10. Section 00700, General Conditions, Page 00700-37. Delete and replace with pages 00500-37.

11. Section 01300, Administrative Requirements, Page 01300-7. Delete and replace with page 01300-7.

12. Section 01400, Quality and Product Requirements, Page 01400-10. Delete and replace with page 01400-10.

CHANGES TO TECHNICAL PROVISIONS (VOLUME 2)

1. Table of Contents, Page TOC-2. Delete and replace with page TOC-2.

2. Volume 2 Table of Contents, Page TP Index-2. Delete and replace with page TP Index-2.

3. Section 02451, Replacement of Existing Direct Fixation Track, Pages 02451-1 through 02451-10. Add Technical Provision.

4. Section 02453, Special Track Construction, Page 02453-2. Delete and replace with page 02453-2.

5. Section 02454, Rail Lubrication System, Page 02454-2. Delete and replace with page 02454-2.

6. Section 02464, Special Trackwork, Page 02464-1. Delete and replace with page 02464-1.

7. Section 03305, Cast-in-Place Concrete and Cement Concrete Structures, Page 03305-5. Delete and replace with page 03305-5.

8. Section 03305, Cast-in-Place Concrete and Cement Concrete Structures, Page 03305-7. Delete and replace with page 03305-7.

9. Section 03305, Cast-in-Place Concrete and Cement Concrete Structures, Page 03305-9. Delete and replace with page 03305-9.

CHANGES TO TECHNICAL PROVISIONS (VOLUME 3)

1. Table of Contents, Page TOC-2. Delete and replace with page TOC-2.

2. Section 15889, Tunnel Ventilation Fans, Page 15889-9. Delete and replace with page 15889-9.

3. Section 16703, Carrier Transmission System, Page 16703-7. Delete and replace with page 16703-7.

4. Section 16703, Carrier Transmission System, Pages 16703-15 through 16703-16. Delete and replace with pages 16703-15 through 16703-16.

CHANGES TO NSC-009 CONTRACT DRAWINGS (VOLUME 1)
(Modified or Added Drawings are attached here to)

1. Drawing No. GN003, Sheet No. 3. Drawing Modified.
2. Drawing No. GN006, Sheet No. 6. Drawing Modified.
3. Drawing No. GN010, Sheet No. 10. Drawing Modified.
4. Drawing No. TK131A, Sheet No. 113A. Drawing Added.
5. Drawing No. TK132B, Sheet No. 114B. Drawing Added.
6. Drawing No. SG023, Sheet No. 349. Drawing Modified.
7. Drawing No. SG024, Sheet No. 350. Drawing Modified.
8. Drawing No. SG170A, Sheet No. 415A. Drawing Added.
9. Drawing No. EL101A, Sheet No. 658A. Drawing Added.
10. Drawing No. EL119A, Sheet No. 672A. Drawing Added.
11. Drawing No. EL150, Sheet No. 676. Drawing Modified
12. Drawing No. EL153A, Sheet No. 679A. Drawing Added
13. Drawing No. EL153B, Sheet No. 679B. Drawing Added.
14. Drawing No. EL153C, Sheet No. 679C. Drawing Added.
15. Drawing No. EL153D, Sheet No. 679D. Drawing Added.
16. Drawing No. EL153E, Sheet No. 679E. Drawing Added.
17. Drawing No. EL153F, Sheet No. 679F. Drawing Added.
18. Drawing No. EL153G, Sheet No. 679G. Drawing Added.
19. Drawing No. EL160, Sheet No. 680. Drawing Modified.
20. Drawing No. EL161, Sheet No. 681. Drawing Modified.
21. Drawing No. EL163, Sheet No. 683. Drawing Modified.
22. Drawing No. EL201, Sheet No. 684. Drawing Modified.
23. Drawing No. EL201A, Sheet No. 684A. Drawing Added.
24. Drawing No. EL202, Sheet No. 685. Drawing Modified.
25. Drawing No. EL202A Sheet No. 685A. Drawing Added.

26. Drawing No. EL208, Sheet No. 688. Drawing Modified.
27. Drawing No. EL219A, Sheet No. 699A. Drawing Added.
28. Drawing No. EL251, Sheet No. 708. Drawing Modified.
29. Drawing No. EL264, Sheet No. 716. Drawing Modified.

CHANGES TO NSC-009 ALSO PLANS (REF DWGS) (VOLUME 2)
(Modified or Added Drawings are attached here to)

1. Drawing No. GN003A. Drawing Modified.
2. Drawing No. GN006A. Drawing Modified.
3. NSC-006, Drawing No. TN650-1. Drawing Modified.
4. NSC-006, Drawing No. TN652-3. Drawing Modified.
5. NSC-006, Drawing No. TN659-3. Drawing Modified.
6. NSC-006, Drawing No. TN678-1. Drawing Modified.
7. Trackwork Drawing Sta. 645+00 to 675+00. Drawing Added.
8. Trackwork Drawing Sta. 1032+00 to 1001+00 (Reversed). Drawing Added.

VOLUME 2 TECHNICAL PROVISIONS NSC-009 NSC TRAIN SYSTEMS (SYSTEM WIDE) CONTINUED

ARTICLE 1 - SCOPE OF WORK AND DEFINITIONS

1.1 Scope

The Contractor shall furnish all materials, tools, equipment, transportation and supervision and perform all labor and services necessary and incidental to the satisfactory completion of the Work in a proper workmanlike manner and within the time limits set forth in the Contract Documents.

A. The Work includes, but is not limited to, the following activities:

1. Design, construction and testing of direct fixation track type I without strap guard rail, type II with single strap guard rail, type III with dual strap guard rail, and type IV with dual emergency guard rail and no strap guard rail, reinforced concrete plinths, track bed embedments and associated track appurtenances.

1A. Demolition of deteriorated concrete plinths, reconstruction with new cast-in-place concrete plinths, and new direct fixation fasteners located within the existing Stage I tunnel between Wood Street and Steel Plaza Stations.

2. Design, construction and testing of special track work including reinforced concrete plinths, track bed embedments, DF fasteners, joints, frogs, switch rods, rail braces, and appurtenances.

a). Phased Demolition of existing single crossover and installation of double crossover located at Wood Street Station. Double crossover has been previously procured by Authority.

3. Design, construction and tested of a fully operational signal system modification including system interlocking and wayside signal system for Allegheny Station interlocking and terminal relay room; North Side Station relay room; Gateway Station relay room; and existing Wood Street Station interlocking relay room.

a). Modifications to the existing signaling system including existing relay-based interlockings, provision of new wayside ground equipment including, but not limited to wayside signals, automatic train stops, and electric switch machines, non-vital interlocking software modifications, control center modifications, any ancillary systems, and all equipment, hardware and software necessary to provide a complete, and working system.

b) Modifications to the existing relay room at Wood Street Interlocking to convert it from an existing single crossover arrangement to a double crossover (scissors) arrangement., the provisioning of newly wired relay racks within the existing relay room, installation of new relays within exiting relay racks, site preparations, and all permits necessary to install the signal system equipment.

Section 00400 – Bid/Award Forms

Table of Articles

Article 1 – Bid/Award Forms

- Form of Bid (Form B)
- Certification of Bidder (Form C)
- Buy America Requirements (Form D)
- Certification Regarding Lobbying (Form E)
- Disclosure of Lobbying Activities (Form F)
- DBE Joint Venture Identification Affidavit (Form GI)
- DBE Letter of Intent (Form GII)
- DBE Certificate of Compliance (Form GIII)
- DBE Request for Waiver (Form GIV)
- Potential Areas of Subcontracting (Form GV)
- Bidder/Subcontractor Data Form (Form (GVI)
- Bid Bond (Form H)
- Agreement (Form I)
- [NOT USED]

PORT AUTHORITY OF ALLEGHENY COUNTY
NORTH SHORE CONNECTOR
NSC TRAIN SYSTEM (SYSTEM WIDE)
CONTRACT NO. NSC-009

UNIT PRICE SCHEDULE

BID ITEM	DESCRIPTION	UNITS	ESTIMATED QUANTITY	UNIT PRICE	TOTAL PRICE
00771.001	INSURANCE DEDUCTIBLE FUND ALLOWANCE	PDA	1	$50,000.00	$50,000.00
01100.001	PARTNERING	PDA	1	$50,000.00	$50,000.00
01755.001	MOBILIZATION	LS	1		
01777.001	SYSTEMS INTEGRATION TESTING	LS	1		
01780.001	PARKING LOT NO. 1 ACCESS FOR PNC PARK EVENTS (OVER 30,000 ATTENDANCE)	EA	48		
01780.002	PARKING LOT NO. 1 ACCESS FOR HEINZ FIELD EVENTS	EA	48		
01784.001	TEMPORARY PEDESTRIAN ACCOMMODATIONS	LS	1		
01791.008	RE-INSTALL PARKING LOT SPECIAL SIGNAGE	EA	1		
01791.013	PERMANENT RELOCATION OF EXISTING PARKING LOT BOOTHS	LS	1		
01800.001	EROSION AND SEDIMENTATION CONTROL	LS	1		
01810.001	CITY OF PITTSBURGH OFF-DUTY UNIFORMED POLICE OFFICER	PDA	1	$50,000.00	$50,000.00
01900.001	TRAIN CLEARANCE TESTING PROGRAM	LS	1		
02020.001	CONTAMINATED MATERIALS HANDLING	PDA	1	$50,000.00	$50,000.00
02220.001	DEMOLITION OF EXISTING GATEWAY STATION LOOP FACILITES	LS	1		
02220.002	UNFORESEEN FACILITY DEMOLITION	PDA	1	$50,000.00	$50,000.00
02220.003	DEMOLITION OF TEMPORARY TUNNEL CLOSURE WALL	LS	1		
02316.001	CLASS 1 EXCAVATION	CY	945		
02320.002	AASHTO NO. 57 COURSE AGGREGATE	CY	50		
02451.001	REPLACEMENT OF EXISTING DIRECT FIXATION TRACK	LF	960		
02452.001	DIRECT FIXATION TRACK, TYPE I	LF	7,324		
02452.002	DIRECT FIXATION TRACK, TYPE II	LF	191		
02452.003	DIRECT FIXATION TRACK, TYPE III	LF	995		
02452.004	DIRECT FIXATION TRACK, TYPE IV	LF	3,423		
02453.001	NO.4 SPECIAL CONSTRUCTION CROSSOVER AT ALLEGHENY	LS	1		

NSC-007 Aerial Structure Retained fill to Pier 3 and Laydown Area no. 1	Sta. R 6051+94 (interface with NSC-006) to Sta. R 6074+47	331 calendar days from NTP	392 calendar days from NTP
NSC-007 Aerial Structure Pier 3 to Pier 14	Sta. R 6074+47 to Sta. R 6079+73	483 calendar days from NTP	544 calendar days from NTP
NSC-010/011/012 North Shore Station Finishes Gateway Station (NSC-010) New Ancillary Rooms located within Existing Gateway Loop and New Gateway Station	Sta. 1004+50 to Sta. 1009+00 (Stage I Stationing within Existing Loop) and Sta. L 6010+00 to Sta. L 6011+75 (New Gateway Station Ancillary Rooms)	717 calendar days from NTP	747 calendar days from NTP
NSC-010/011/012 North Shore Station Finishes Gateway Station (NSC-010) Facilities Including Elevators and Escalators	Sta. R 6010+16 to Sta. 6014+50	830 calendar days from NTP	860 calendar days from NTP
NSC-010/011/012 North Shore Station Finishes North Side Station (NSC-011) Ancillary Rooms	Sta. R 6040+00 to Sta. R 6044+03	405 calendar days from NTP	466 calendar days from NTP
NSC-010/011/012 North Shore Station Finishes North Side Station (NSC-011) including Elevators and Escalators, Station Concourse, and Headhouses	Sta. R 6040+00 to Sta. R 6044+03	705 calendar days from NTP	766 calendar days from NTP
NSC-010/011/012 North Shore Station Finishes Allegheny Station (NSC-012) Ancillary Rooms and Station Power	Sta. L 6082+60 to Sta. L 6083+92 (Allegheny Station Building Area)	681 calendar days from NTP	742 calendar days from NTP
NSC-010/011/012 North Shore Station Finishes Allegheny Station (NSC-012) including Elevators and Escalators	Sta. L 6080+64 to Sta. L 6083+92 (Allegheny Station Building and Platform Areas)	803 calendar days from NTP	834 calendar days from NTP
Existing Stage I Tunnel from Steel Plaza Station to Gateway Station and Loop	1669+50 (Steel Plaza Station) to Existing Gateway Loop	83 calendar days from NTP	113 calendar days from NTP
Wood Street #6 Direct Fixation Double Crossover and switch machine materials. (Contract #3002)	R 1025+06 to R 1025+81 (Stage I Tunnel Between Wood Street and Steel Plaza Stations)	83 calendar days from NTP	113 calendar days from NTP

J. Authority anticipates that the following portions of work described in Section 01787, "Transfer of Temporary Facilities." will be available to the Contractor no sooner than the "Early Date of Availability" and no later than the "Late Date of Availability" as set forth in Table 00500-2. Until released by the Engineer in writing, the Contractor shall coordinate its work within these areas with the adjacent contractors in accordance with the requirements of the Contract Documents. Coordination shall occur through the Engineer.

Table 00500-2

Description	**Station to Station** Track Alignment	Early Date of Availability	Late Date of Availability
NSC-003 Left Bored Tunnel and Left Half of the Cut and Cover Tunnel and Station Shell Temporary Facilities	Sta. L 6014+50 (Receiving Pit Headwall) to Sta. L 6039+55 (Interface with NSC-006)	269 calendar days from NTP	330 calendar days from NTP
NSC-003 Right Bored Tunnel and Right Half of the Cut and Cover Tunnel and Station Shell Temporary Facilities	Sta. L 6014+50 (Receiving Pit Headwall) to Sta. L 6039+55 (interface with NSC-006)	386 calendar days from NTP	447 calendar days from NTP
NSC-006 Cut and Cover Tunnel and Station Shell Temporary Facilities	Sta. L 6039+55 (Interface with NSC-003) to Sta. L 6051+94 (Interface with NSC-007)	186 calendar days from NTP	247 calendar days from NTP
NSC-004 R Cut and Cover Tunnel and Station Shell Temporary Facilities	Sta. R 6010+16 to Sta. R 6014+00 (excludes Receiving Pit)	800 calendar days from NTP	830 calendar days from NTP
NSC-007 Temporary Facilities	Sta. L 6051+94 (Interface with NSC-006) to Sta. L 6072+10 (Art Rooney Avenue located within Parking Lot No. 1	331 calendar days from NTP	392 calendar days from NTP

K. If any of the referenced parcels, easements, or portions of work become available sooner than the Early Date of Availability set forth above, the Engineer will, as appropriate and at the sole discretion of Authority, release said parcel, easement, or portions of work and so advise the Contractor in writing.

L. During the performance of the work associated with the installation of the Wood Street Double Crossover, Replacement of Existing Direct Fixation Track, and portions of the existing Gateway Station Loop Demolition, weekend shutdowns of Authority Revenue Service will be required. In addition, additional shutdowns, may be necessary. All shutdowns shall be requested by the Contractor to perform the Work. If a weekend shutdown is approved by the Engineer and Authority, the shutdown shall occur between the hours of 1:30 a.m., Saturday and 4:30 a.m. Monday

GG. System Integration Testing involving Authority personnel and equipment will not occur during Peak Revenue Service (Working Days: 6:00 a.m. to 9:00 a.m. and 3:00 p.m. to 6:00 p.m.) and Special Events as prescribed in Article Q of this Section.

HH. Authority will be performing Pre-Revenue Operations at the completion of milestone work associated with System Integration Testing as described in Article 2.6.A.1.b).4). of this Section. Any additional work associated with the Project will be subject to Authority LRV testing traffic and restrictions associated with an active LRV system. Contractor's remaining work shall be closely coordinated with Authority Pre-Revenue Operations schedules. Coordination shall occur through the Engineer and will be in accordance with Section 01781, "Maintenance and Protection of Authority Traffic" and Section 00700, Article 13.14.

II. Should situations arise with Authority's Operations which require Authority's immediate attention to maintain Operations, Authority reserves the rights to cancel Contractor's scheduled work within the existing system, OCC and/or Pitt Tower, in order to facilitate Authority requirements to support Operations.

JJ. Authority has deleted the bored tunnel internal concrete arch lining and waterproofing work from the NSC-003/006 contract. The Contractor shall be required to mount NSC-009 facilities including, but not limited to: conduit, emergency walkways, standpipes, catenaries, and signals to the bored tunnel precast segmental rings. The precast segment reinforcing and geometry Shop Drawings have been included with Appendix C. The Contractor shall be allowed a 6 inch maximum embedment depth into the tunnel segment. All NSC-009 facility attachment locations shall be positioned a minimum distance from any/all tunnel segmental joint, grout holes, and bolt pockets. Offset distance shall be greater than or equal to the depth of embedment of the anchor. The tunnel segment concrete design strength is 8,000 psi minimum with actual strength values in the range of 12,000 psi, the tunnel segments have drilling location indicators to allow the Contractor to identify areas free of reinforcing steel (see Submittal 349.6 in Appendix C), and the Contractor shall be allowed to provide attachments to the segment longitudinal installation bolts; however, the bolts shall not be completely removed for any reason. Bolts may be loosened and retightened to facilitate attachments. The Contractor shall account for the bored tunnel segment requirements in its plan and execution of Work.

KK. The Contractor shall submit installation and testing procedures for all concrete insert applications covering cut-and-cover, bored tunnel, and aerial structure applications. Procedures shall include the proposed tunnel/structure rebar location procedure, concrete repair procedures for damaged concrete as a result of the insert drilling activities, and pull-out testing procedures. The Contractor shall successfully install six (6) demonstration anchors for each application. The Contractor shall perform a non-destructive static tensile unconfined pull test (ASTM E488) on each of the six (6) demonstration anchors. The minimum pull-out strength required shall be a 1.5 factor above the anchor design load. The demonstration anchors may be in production locations if approved by the Engineer. Insert holes (test and production) must be relocated a minimum of 3 inches if rebar or other obstructions are encountered during the drilling process to meet the minimum edge distance for each hole. The abandoned hole shall be filled in accordance with the approved repair procedures. The field drilling procedure shall provide a positive stopping measure on all equipment to prevent any over-drilling and to demonstrate the proposed embedment depth is met. Drilling through rebar is not permitted.

2.2 Project Schedule

A. Preliminary Project Schedule

1. The Contractor shall develop and submit for review and approval by the Engineer a preliminary Project Schedule in bar chart format, within fifteen (15) days after receipt of the Notice of Award.

2. This preliminary Project Schedule shall show the Contractor's planned operations for the first ninety (90) days including dates for construction operations, submittals and acquiring permits. The Contractor shall also include a preliminary schedule logic narrative stating the general basis of schedule logic and the Contractor's general approach to the remainder of the Work.

E. At the North Side Station, the contract interfaces with the NSC-011 contractors. Provide access to the Work for the NSC-011 contractors to measure, plans, and execute their work within the North Shore Side Station. Construction of the NSC-009 Work shall be coordinated with the NSC-011 contractors so that the NSC-011 contractors can maintain access through the work area.

F. At the Allegheny Station, the contract interfaces with the NSC-012 contractors. Provide access to the Work for the NSC-012 contractors to measure, plans, and execute their work within the Allegheny Station. Construction of the NSC-009 Work shall be coordinated with the NSC-012 contractors so that the NSC-012 contractors can maintain access through the work area.

G. All NSC-009 access requirements to the cut and cover and bored tunnels, and aerial structure shall be submitted to the NSC-004R, NSC-003/006 and/or NSC-007 contractors and Engineer thirty (30) days prior to intended use.

H. The Contractor shall interface with the Advanced Rail Systems Procurement Gateway Double Crossover (Contract 3002) contractor. Coordinate through the Engineer and attend the Contract #3002 preassembly Inspection at the manufacture's facility.

I. The Contractor shall interface with Authority facilities including, but not limited to, the existing Stage I Tunnel, Gateway Station, Wood Street Station, Steel Plaza Station, Authority OCC facilities, and Pitt Tower facilities. Contractor shall follow all Authority access procedures and shall coordinate access and work within these facilities far in advance of the intended access and/or work. Authority is a functioning transit operation and will continue to operate its facilities throughout the Work. Contractor shall plan its work with the Engineer and Authority staff so as not to cause delays or interruptions to the normal workings of the Authority service, unless previously approved by the Engineer and Authority.

ARTICLE 11 – DIFFERING SITE CONDITIONS

11.1 The Contractor shall promptly, upon the discovery of the following conditions, and before the conditions are disturbed, notify the Engineer in writing of:

A. Subsurface or latent physical conditions at the Worksite materially differing from those indicated in the Contract Documents or any such conditions known by the Contractor prior to the submission of the Contractor's Bid; or

B. Unknown physical conditions at the Worksite, of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in this type of work.

11.2 The Engineer will promptly investigate the conditions, and determine if the actual conditions do differ materially.

11.3 If conditions are encountered that are materially different from those represented, detailed or defined, as set forth above, or those inherent in the type of work in question, and cause a compensable increase or decrease in the Contractor's cost for performing the Work, or the time required for the performance of the Work, the conditions will constitute a differing site condition and the Contractor may, subject

of the Contract Documents, within ten (10) days after receipt of the Notice of Award.

B. The Contractor's Safety Program shall incorporate such programs and activities as may be necessary to comply with OSHA and other applicable federal, state, county and municipal laws and regulations and Authority's rules, policies and procedures in the performance of the Work. As part of this item, the Contractor shall develop and institute, for the duration of the Contract, procedures in the event of fire, injury, accident or other emergency conditions. This portion of the Safety Program is to be maintained on public display at the Contractor's field office;

C. Designate, at the Pre-Construction Conference, a full time Safety Supervisor whose sole duties shall be to implement and enforce the Safety Program while NSC-009 onsite construction activities are ongoing. Safety Supervisor may also serve as the Security Representative in accordance with Article 32 of this Section; and

D. Conduct weekly Worksite safety meetings. Included at these meetings will be instructions for each employee on the recognition and avoidance of unsafe conditions and the regulations applicable to his or her work environment to control or eliminate any hazards or other exposures to illness or injury. Such meetings shall be administered by the Contractor's Safety Supervisor. Notice of the time and place of such safety meetings shall be given to the Engineer at least three (3) days in advance of each such meeting. A copy of the safety meeting minutes shall be provided to the Engineer within three (3) days after each safety meeting. The Engineer or Authority shall be invited to, and at their discretion, may attend these meetings.

13.5 As an integral part of the Contractor's Safety Program, the Contractor shall prepare and maintain a directory, listing the company name and contact person, business telephone number and emergency telephone number, including a mobile number (i.e. cellular, pager, etc.) as available, for the following, which shall be maintained and updated as required for the duration of the Contract, and shall be provided to Authority and the Engineer and posted at each of the Contractor's telephones and at a prominent place at the Worksite:

A. Contractor's Main Office, including a 24-hour contact for non-business hours;

B. Contractor's Project Manager;

C. Contractor's Field Superintendent, Safety Supervisor(s) and any other Contractor's personnel as required by the Engineer;

D. Each Subcontractor;

E. Each Authority contractor working adjacent to or on the Worksite;

F. Engineer's Field Office, including a 24-hour contact for non-business hours;

G. Engineer's Main Office;

H. Testing laboratories and batch plants;

I. Emergency telephone numbers including, but not limited to, physicians, emergency hospitals, ambulance, police and fire department;

J. Emergency telephone numbers for utility owners who have facilities on or adjacent to the Worksite;

K. Authority's 24 hour emergency numbers:

1. For bus incident - Bus Traffic at (412) 851-4900

2. For rail incident - Operations Control Center at (412) 851-4700

Pittsburgh, PA 15233-1003

Attention: Mr. Jim Runatz
Telephone Number (412) 393-7813

2. Verizon
201 Stanwix Street, 10th Floor
Pittsburgh, PA 15222

Attention: Mr. Jon Gaunt – Central Business District
Telephone Number (412) 633-3843

Attention: Mr. Tony Bronwlee – North Side
Telephone Number (412) 633-8080

B. Anticipated utility related construction activities are set forth below in the following table:

UTILITY OWNER	CONSTRUCTION STATIONS	PRELIMINARY TYPE OF WORK PRELIMINARY DESCRIPTION OF WORK
Duquesne Light	Reedsdale St. 211+00 Left	COORDINATED Contractor shall coordinate with Duquesne Light to provide power to the traction power substation.
Authority	1012+70 Right to Existing Transformer Room	INCORPORATED Contractor shall coordinate with Authority to provide relocation of 23 kv power feed to existing Gateway Loop Transformer room.
Authority	Electrical Room and Communications Room to Emergency Ventilation Fan Room 123	INCORPORATED Contractor shall coordinate with Authority to provide relocation power and control cabling to fans Em-9 and Em-10
Verizon	Gateway, North Side, and Allegheny Stations Communication Rooms	COORDINATED Contractor shall coordinate with Verizon representatives for the installation of the telephone lines and terminations inside each station communication room for PBX system connection

Legend:

Prior	Relocation of utility will be completed before Authority issues the Notice-to-Proceed.
Restrictive	Relocation of the utility must be completed before the Contractor can operate without restriction.
Concurrent	Relocation of the utility will be conducted simultaneously with but not restricting the Contractor's operations.
Coordinated	Construction of the utility will have to be phased specifically with the Contractor's operations. Contractor shall coordinate with the utility to implement required activities.
Not Affected	No utility relocation necessary.
Incorporated	Contractor shall complete this work per the Contract Documents in coordination with other work.

TABLE 01300-1
NSC-009 TRAIN SYSTEMS (SYSTEM WIDE)
SUMMARY OF SUBMITTALS

REFERENCED	ITEM	1 PRODUCT DATA	2 CALCULATIONS / SURVEYS	3 WORKING DRAWINGS / PROCEDURES	4 SHOP DRAWINGS	5 CERTIFICATIONS	6 SAMPLES	7 WARRANTY	8 TECHNICAL DATA	9 TESTING	10 PERMITS	11 TRAINING	12 SCHEDULE	13 OPERATIONS, MAINTENANCE AND REPAIR DATA
01910	Operations Maintenance and Repair Data	X		X				X	X			X	X	X
01911	Operations Maintenance and Information Database						X							X
01920	Cutting and Patching	X		X									X	
02020	Handling of Unforeseen Hazardous and Contaminated Building Materials			X		X				X	X		X	
02220	Demolition		X	X						X	X		X	
02316	Excavation		X										X	
02320	Backfill	X				X			X	X				
02340	Subgrade									X				
02353	Geotextiles					X								
02450	General Track Construction	X		X		X				X				
02451	Replacement of Existing Direct Fixation Track	X	X	X	X	X	X			X			X	
02452	Direct Fixation Track Construction			X	X	X	X							
02453	Special Trackwork Construction				X									
02454	Rail Lubrication System	X		X	X				X					X
02456	Track Appurtenances and Other Track Material				X		X			X				
02462	Direct Fixation Rail Fasteners				X	X	X			X				
02464	Special Trackwork	X			X	X				X				
02466	Steel Rail					X				X				
02468	Rail Welding			X		X	X			X				
02471	Track-to-Earth Resistence Testing			X						X				
02581	Duquesne Light Company Switch Pads									X				
02627	Pipe Underdrain, Pavement Base Drain and Subsurface Drain Outlets	X												
02721	Subbase					X				X				
02740	Bituminous Pavement and Sidewalk	X	X	X		X				X				
02741	Bituminous Tack Coat					X								
02751	Driveways					X				X				
02761	Painting Traffic Lines and Markings	X		X		X			X				X	
02781	Concrete Curb			X		X				X				
02785	Concrete Sidewalk and Stairs			X		X				X				
02825	Security Fence	X			X			X						
02840	Guide Rail			X	X	X								
02843	Bollards	X		X										

delivery date, except where delivery schedules are established in the Contract Documents, or the Contractor's schedule.

4.3 The Contractor shall pay all demurrage and storage charges which may be incurred on any Authority furnished materials. The Contractor shall inspect such materials upon receipt and shall immediately notify the Engineer in writing of any damaged or defective materials.

4.4 The Contractor shall be responsible for any Authority furnished materials received by it and if any Authority-furnished materials are lost, or damaged from any cause, after receipt by the Contractor, the Contractor shall be liable to Authority for the cost of either, at Authority's option, replacing or repairing such Authority-furnished materials and these costs may be deducted from monies due, or to become due, the Contractor under the Contract or any other contract with Authority.

4.5 A. Authority shall supply the No. 6 Direct Fixation Double Crossover, procured by Authority in Contract No. 3002 – Advanced Rail Systems, Procurement – Gateway Double Crossover to the Contractor. The Double Crossover is to be installed at Wood Street Station, not Gateway as the contract title indicates. The Contactor shall notify the Engineer by written advanced notice thirty (30) days prior, followed by a 48 hour telephone confirmation prior to requested delivery date. The Contract No. 3002 contractor will deliver the No. 6 double crossover to the Contractor's designated site. Delivery site shall be within a ten (10) mile radius of the Project Worksite. All materials and equipment shall be fully inspected by the Contractor and accepted for use at the Wood Street installation work area before delivery can occur. Material and equipment delivery will occur no sooner than 8:30 am with delivery fully completed by 2:00 pm, Monday through Friday, except Holidays.

1. The Contractor shall inspect the completely assembled Double Crossover including all switch machines and rods at the fabricators plant prior to delivery to the Worksite. The Contractor shall be notified of this inspection by the track fabricator (21) calendar days prior to the inspection. The Contractor shall inspect and approve the complete assembly on site at the track fabricators plant and shall take responsibility for the completed assembly and all components after it is match marked, disassembled, and shipped by the manufacturer.

B. Authority shall supply three thousand one hundred fifty (3150) linear feet of Strap Guard Assembly. The Contractor shall notify Ken Lockaton of the Authority by written advanced notice thirty (30) days prior, followed by a 48 hour telephone confirmation (412 -488-2059) prior to pick-up date. Pick-up will be at Authority's South Hills Junction Maintenance Yard, 611 West Warrington Ave., Building #5, Pittsburgh, PA 15226. All material shall be fully inspected by the Contractor and accepted for use in the NSC-009

SECTION 02451

REPLACEMENT OF EXISTING DIRECT FIXATION TRACK

ARTICLE 1 GENERAL

1.01 SUMMARY

A. The work of this Section includes, but is not limited to, providing all labor, materials, tools, equipment, and incidentals necessary for Replacement of Existing Direct Fixation Track, in accordance with the Contract Documents.

B. The work of this Section includes, but is not limited to, the demolition of the existing deteriorated concrete plinths; reconstruction with new cast-in-place concrete plinths; new direct fixation fasteners; and utilizing the existing rail, as shown on the Contract Documents and as follows:
   1. Furnish materials including:
      a. Plinth concrete and stirrup and plinth reinforcing steel.
      b. Direct fixation rail fasteners with anchorage assemblies and rail clips.
      c. Track appurtenances and other track material as required to complete the construction.
   2. Construct Direct Fixation Track including:
      a. Identify areas to be removed in the field, review these limits with the Engineer and receive Engineer's acceptance of areas of removal.
      b. Perform survey of areas to be removed to determine the horizontal and vertical alignment of the track in these areas and establish reference marks for re-installation.
      c. Removing existing rail fasteners and demolishing existing deteriorated concrete plinths. Note that the existing rail is to remain in place and is to be temporarily supported as necessary to complete this work.
      d. Protect and clean existing reinforcement bars that connect the plinth to the track bed concrete for re-use.
      e. Locating existing reinforcing steel in track bed if the bar connecting the track bed to the plinth needs to be replaced due to deterioration.
      f. Drilling of track bed for reinforcement bar replacement, installing, orienting, and epoxy in place required replacement reinforcement.
      g. Layout and Forming of plinth concrete, placing reinforcement, embedded inserts and direct fixation fastener anchorage inserts, and placing plinth concrete for direct fixation track.
      h. Installing direct fixation rail fasteners.
      i. Track appurtenances and other track material as required to complete the construction.
   3. Constructing demonstration section.
   4. Performing electrical testing.
   5. Performing final adjustments and clean up of site area.

6. Contractor to note that all demolition and installation work will take place within an existing subway tunnel, with limited access and clearances.

C. The Contract Documents provide the performance parameters and design criteria to complete the Direct Fixation Track Construction portion of the Work. The Contractor shall be responsible to provide a complete design for this portion of the Work.

1.02 RELATED SECTIONS

A. Section 01785, "Construction Surveying."

B. Section 02450, "General Track Construction."

C. Section 02452, "Direct Fixation Track Construction."

D. Section 02456, "Track Appurtenances and Other Track Material."

E. Section 02462, "Direct Fixation Rail Fasteners."

F. Section 02471, "Track-to-Earth Resistance Testing."

G. Section 03211, "Reinforcement Bars and Dowels."

H. Section 03305, "Cast-in-Place Concrete and Cement Concrete Structures."

I. Section 03630,"Plinth Anchoring Systems."

1.03 REFERENCE STANDARDS

A. ASTM

B. CRD

1.04 SUBMITTALS

A. Submit the following:
   1. Samples: Insert positioning template. Direct Fixation Fastener Assembly will be permitted to be used as Insert positioning template.

B. Cast-in-Place Plinth Shop Drawings, Working Drawings and Data.
   1. Shop Drawings: Method and procedure for computing and establishing cant and cross level of track in the formwork, based on surveyed data of existing track.
   2. Working Drawings: Submit detailed drawings of jig and formwork for plinth construction. Contractor shall illustrate manner of setting the top surface elevations of the plinth concrete, to fit surveyed data of existing track.

3. Certificates and reports: Submit a Certificate of Compliance with ASTM Standards for each product submittal.
4. The Contractor's design drawings shall be sealed by a Professional Engineer.

C. Submit a Work Plan that identifies the schedule for the completion of this work and includes the schedule of the required existing system impacts and shutdowns and the areas to be removed and replaced for each shutdown.

D. Submit the existing track survey data to the Engineer prior to beginning any portion of this Work.

E. Submit a method for temporary support of track for revenue operations for the review and approval of the Authority, in accordance with Article 3.01.B.

F. Product data and manufacturers' recommendations for specified and "Approved equal materials and products.

G. Certification and calibration records for all tools and equipment to be used.

1.05 DEFINITIONS

A. [NOT USED]

1.06 ENVIRONMENTAL REQUIREMENTS

A. Contractor shall protect any drainage inlet that may lie within the area to be repaired from collecting any debris from this Work.

1.07 QUALITY ASSURANCE

A. Tolerances for cast-in-place plinth.
   1. The allowable deviations for plinth concrete are:
      a. Horizontal: Plus or minus ¼".
      b. Vertical: Plus or Minus 1/8".
      c. Transverse cross slope: plus or minus 1/8" from required.
      d. Uniformity of slope: deviation from a 3' straight-edge placed in all directions: 1/8".
   2. The allowable deviations for placement of the DF plate assembly used as a templates are:
      a. Horizontal: ¼" with respect to centerline of track.
      b. Vertical elevation at centerline of inserts : Plus or Minus 1/8".
      c. Difference in deviation from vertical between adjacent anchor assemblies:1/16".
      d. Uniformity of concrete bearing surface formed by the positioning template – free of voids greater than ½" in size and less than ten percent (10%) of area

occupied by voids. Maximum 1/32" gap between straight-edge and concrete surface all around.

3. Deviation from gauge, cross level, superelevation, horizontal alignment and vertical alignment: Section 02450, "General Track Construction."

1.08 QUALIFICATIONS

A. Contractor shall demonstrate the ability to correctly install the direct fixation track in conformance with Contract requirements by constructing a demonstration section. The demonstration for the cast-in-place plinth will be satisfied by the demonstration required by Article 1.08.A, of Section 02452, "Direct Fixation Track Construction."

B. The replacement of existing direct fixation track construction shall not proceed until the demonstration installation has been constructed by Contractor, inspected and accepted by the Engineer.

ARTICLE 2 PRODUCTS

2.01 TRACK PLINTH CONCRETE REINFORCEMENT

A. In accordance with Contract Drawings and Section 03211, "Reinforcement Bars and Dowels."

2.02 CONCRETE

A. Concrete: Accelerated Strength Class AAA Concrete shall be used for the cast-in-place plinth, Section 03305, "Cast-in-Place Concrete and Cement Concrete Structures."

2.03 GROUT

A. General Requirements
   1. Grout shall be for repairing voids in second-pour concrete only. No grout pad will be allowed under the direct fixation plate assembly to adjust the vertical placement of the direct fixation plate/rail. Grout to be of type that exhibits zero percent (0%) shrinkage in plastic state and not more than one-tenth percent (0.1%) expansion in hardened state when tested in accordance with CRD-C621, Sections 10.1 and 10.2.
   2. Provide a grout which does not initially set sooner than sixty (60) minutes as determined by ASTM C191.
   3. Provide a grout which develops a compressive strength of at least 5000psi at the end of twenty-eight (28) days as determined by ASTM C109.

B. Materials: Pre-measured, pre-packaged, cement-based, non-metallic (aluminum powder or iron filings), non-shrink type grout.

C. Manufacture
   1. Supply technical services of grout manufacturer's representative when producing grout for installation.
   2. Retemper grout in accordance with manufacturer's printed instructions.
   3. Water utilized in making grout shall be potable.

2.04 DIRECT FIXATION TRACK FORMING JIG

A. Plinth bearing area forming jig shall be rigid steel construction providing the following features:
   1. Hold all rails, DF Fastener assemblies, complete with shims(s) and anchor assemblies, at proper horizontal and vertical alignments shown in Contract Drawings, including superelevation and rail cant. Rail cant is 1:40 inward with respect to the plane through the top of the running rails, except for special trackwork areas, which shall be level.
   2. Vertical and horizontal adjustment devices for holding the jig in proper alignment during the placement of concrete.
   3. Sufficient rigidity and bracing to prevent displacement of jigs during placement of concrete and normal construction activities.
   4. No portion of the jig shall be imbedded in the plinth concrete, during or after placement of concrete.

B. A sufficient number of jigs shall be on-hand to form at least 200' of direct fixation track.

2.05 DIRECT FIXATION RAIL FASTENERS AND ANCHORAGE ASSEMBLIES

A. Section 02462, "Direct Fixation Rail Fasteners."

2.06 CURING COMPOUND

A. White pigmented, non-wax, liquid type conforming to ASTM C309, Type 2; Feb America, Inc.'s "Febcure," or approved equal.

2.07 THREAD SEALANT

A. Low melting point wax; Sanchem, Inc.'s "NO-OX-ID 'A' Special," or approved equal.

2.08 SHIMS

A. Shims: ASTM D1248, High Density, Type 3, Class C, Grade W8, Hardness 60D to 65D.

B. Polyethylene Shims shall be furnished by the direct fixation fastener manufacturer.

2.09 CONCRETE BONDING COMPOUND

A. In accordance with PENNDOT 408, Section 706.

ARTICLE 3 EXECUTION

3.01 GENERAL

A. Staged replacement of the deteriorated plinths identified in the Contract Documents shall be performed during numerous, full shutdown, weekend outages, with revenue service being returned after each outage. This work shall be completed concurrent with the existing Wood Street double crossover replacement schedule in accordance with Section 00500, Article 2.1.L.

B. Contractor shall plan this work so that only the length of plinth that can be completed within these weekend shutdowns is demolished, replaced, tested, and ready for Revenue Service. If the Contractor has demolished more plinth than can be replaced, before the "Return to Service", the Contractor shall support and anchor the track in a method acceptable to Authority. Method of support and anchorage shall be designed by Contractor and submitted for approval.

C. Contractor shall protect all existing components to remain including station platform areas from demolition and construction debris, and clean these componets after each outage before returning track to service.

3.02 LOCATING DETERIORATED PLINTHS

A. Contractor shall mark the deteriorated existing plinths to be removed based on the locations described in Article 3.03 of this Section. The Contractor shall have these areas approved by the Engineer prior to performing any work.

B. Contractor shall survey the existing track horizontal and vertical geometry in the areas where the existing plinths are to be removed and shall survey 50 feet outside these removal limits on either side of the replacement area. Contractor shall provide the Engineer with a copy of the survey data.

3.03 DETERIORATED PLINTH LOCATIONS

A. The existing plinths vary in length with a maximum length of approx. 60 feet. Note the left and right rail identified below are based on looking in the direction of travel.

B. INBOUND TRACK

Approx. Station 1019+90 to 1020+60 through the horizontal curve after Wood Street Station. 6 plinths total 3 on left rail and 3 on the right rail.

C. OUTBOUND TRACK
   1. Approx. Station 1020+56. 2 plinths total 1 on left rail and 1 on the right rail.
   2. Approx. Station 1025+00. 2 plinths total 1 on left rail and 1 on the right rail.
   3. Approx. Station 1028+50. 1 plinth on the right rail.
   4. Approx. Station 1031+50. 1 plinth on the right rail.
   5. Approx. Station 1667+30 to 1669+50 at Steel Plaza Station. 4 plinths on the right rail.

D. The existing track geometry through the areas where plinth replacement is to be performed is included with the Contract Documents.

3.04 DEMOLITION OF DETERIORATED PLINTHS

A. Contractor shall remove and dispose of all existing rail fasteners in the area to be demolished.

B. Contractor shall leave the existing rail in place and remove the existing concrete plinth by way of 90 pound maximum weight hand held pneumatic hammers. Contractor shall temporarily support the rail as necessary to complete this work.

C. Contractor shall take care not to damage the existing reinforcing steel dowels that connect the concrete plinth to the existing track bed. All removed existing concrete, reinforcing steel, and existing anchorages shall be removed and disposed.

D. Contractor shall inspect the existing track bed concrete that remains, to verify that the remaining concrete surface is sound and does not require repair prior to beginning plinth replacement. If repair is necessary, use the grout material identified in Article 2.03.

3.05 PREPARATION

A. Alignment and elevation points shall be established in accordance with Section 02450, "General Track Construction" utilizing the survey information obtained.

B. Replacement plinths shall be laid out per typical sections and requirements shown in Contract Drawings, including, but not limited to, overall plinth length and quantity of direct fixation fasteners per plinth.

C. Existing dowel bars that are to be re-used, for the cast-in-place plinth, shall be sand blast cleaned and painted with a zinc-rich primer.

D. The existing concrete track bed surface shall be etched with muriatic acid and washed with water.

E. Locate existing track bed rebar and mark replacement dowel bar locations per Section 03630,"Plinth Anchoring System

3.06 INSTALLATION

A. Cast-in-Place Plinth Concrete Placement
   1. Establish bench marks for top of rail by referencing to the survey of the existing track geometry.
   2. Drill and epoxy dowel bar replacements at locations laid out in accordance with 3.05 E. above, if required. Provide a minimum embedment of 6" into existing track bed concrete.
   3. Install reinforcing steel within the plinths in accordance with Section 03211, "Reinforcement Bars and Dowels" and the typical sections shown in the Contract Drawings.
   4. Set forms for plinth concrete for direct fixation track per typical sections and details provided in the Contract Drawings. Provide a 3/8" formed v-notch along the sides and top of the plinth centered between the DF fastener assemblies.
   5. Secure DF fastener assemblies, shims, and anchor inserts, at typical spacings shown in Contract Drawings, to rails: Place and attach approved rail holding devices and set rails to horizontal and vertical alignments shown on Contract Drawings.
      a. In tangent track set DF Fastener assemblies in pairs directly opposite each other and perpendicular to the centerline of track.
      b. In curved track, set DF Fastener assemblies in pairs opposite each other and radial to the centerline of track.
      c. Set the template pairs so that maximum fastener spacing will not exceed 30" for tangent track and curves with radii greater than 500', 27" for curves with radii less than or equal to 500' but greater than 300', and 24" for radii less than or equal to 300'.
   6. Reinforcement steel may be bent, but not cut, to achieve insert clearance.
   7. Apply concrete bonding compound to the existing track bed concrete in the plinth replacement areas.
   8. Place plinth concrete and trowel concrete surfaces.
   9. Finish surfaces between fasteners to a true plane between edges of template or DF fastener assembly.
   10. Do not remove forms until concrete has been in place for not less than seven (7) hours and has attained a compressive strength of not less than 1,500psi, in accordance with Section 03305, "Cast-in-Place Concrete and Cement Concrete Structures."
   11. Grout shall not be used to correct plinth concrete which is not within required tolerances.
   12. Concrete, which is not within required tolerances and cannot be corrected without disturbing anchorage inserts, shall be removed and replaced.
   13. Cure concrete in accordance with Section 03305, "Cast-in-Place Concrete and Cement Concrete Structures."
   14. Concrete placement shall be done such that DF fastener assemblies and all hardware are not fouled with concrete. Fasteners shall be free from all concrete

before final reassembly. Any complete fastener, or part thereof, that is damaged during concrete removal shall be replaced with no additional cost to Authority.

15. Plinths that require more than 1" of shims for final vertical rail alignment shall be demolished and recast.
16. During the work for the next plinth demolition, or after concrete has cured, per above, remove rail, DF fastener assemblies, anchor bolts, and shims of the section previously completed and repair any voids in the direct fixation rail fastener area with approved grout. Then re-install the DF fastener assemblies.

B. Direct Fixation Rail Fasteners
   1. Prior to positioning the direct fixation rail fasteners, sweep, wash clean, and dry the plinth concrete.
   2. Install fasteners at the time outlined in Article 3.06.A.16 of this Section.
   3. Coat threads of anchor bolts with thread sealant specified in this Section before engaging bolts in inserts.
   4. Position the direct fixation rail fastener and required shims to proper horizontal and vertical alignments. Engage anchor bolt into insert treads by hand for at least three (3) full turns, do not apply torque by wrench or mechanical means until threads are engaged three (3) turns. Torque bolts per manufactures specifications

C. Laying, Joining and Anchoring CWR.
   1. In accordance with Section 02450, "General Track Construction."
   2. Adjust rail, if required, to final vertical alignment with polyethylene shims. Place shim between the rail fastener and the concrete. At least one (1) polyethylene shim is to be used under each direct fixation rail fastener, but not more than two (2) shims total under each fastener.
   3. Fully anchor rail fasteners to plinth concrete with anchor bolts tensioned to torque as recommended by rail fastener manufacturer. Tighten anchor bolts on both sides of rail simultaneously. Before and during installation of rail fasteners, the equipment to be used for torquing anchor bolts shall be checked daily and shall be within 5lb-ft of the calibrated and certified torque wrench specified.
   4. Final track alignment: After final aligning and surfacing of track, not less than ½" of lateral rail adjustment in each fastener shall remain for tightening gauge to compensate for rail wear and alignment adjustment.

3.07 FIELD QUALITY CONTROL

A. Contractor shall perform the electrical tests in accordance with Section 02450, "General Track Construction" and Section 02471," Track-to-Earth Resistance Testing."

B. Running rail exhibiting high electrical resistance or non-conductance shall be corrected and retested by Contractor at no cost to Authority.

C. Track installations which exhibit low resistance to ground shall be corrected and retested by Contractor at no additional cost to Authority.

C. Perform concrete testing in accordance with Section 03305, "Cast-in-Place Concrete and Cement Concrete Structures."

3.08 ADJUSTMENT AND CLEANING

A. In accordance with Section 02450, "General Track Construction."

ARTICLE 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

A. Item 02451.001 – Replacement of Existing Direct Fixation Track shall be measured per linear foot of plinth constructed, complete in place.

4.02 PAYMENT

A. Item 02451.001 – Replacement of Existing Direct Fixation Track will be paid at the unit price and shall include the cost of all related work specified in this Section.

END OF SECTION

j. Installing continuous welded rail, strap guard rail, anchoring rail, aligning and joining rail at indicated grades, lines and elevations.
k. Track appurtenances and other track material as required to complete the construction.

4. [NOT USED]
5. Perform electrical tests.
6. Perform final adjustments and clean up of site area.

C. The Contract Documents provide the performance parameters and design criteria to complete the Special Track Construction portion of the Work. The Contractor shall be responsible to provide a complete design for this portion of the Work.

1.02 RELATED SECTIONS

A. Section 01781, "Maintenance and Protection of Authority Traffic."

B. Section 02450, "General Track Construction."

C. Section 02452, "Direct Fixation Track Construction."

D. Section 02456, "Track Appurtenances and Other Track Material."

E. Section 02462, "Direct Fixation Rail Fasteners."

F. Section 02464, "Special Trackwork."

G. Section 02466, "Steel Rail."

H. Section 02468, "Rail Welding."

I. Section 02471, "Track-to-Earth Resistance Testing.

J. Section 03630,"Plinth Anchoring Systems."

1.03 REFERENCE STANDARDS

A. AREMA, Latest edition, "Portfolio of Trackwork Plans" and "Manual For Railway Engineering"

1.04 SUBMITTALS

A. Contractor shall submit the following:

5. Reservoir NEMA 4 rated.
6. Pump has a return tank relief valve that activates if system faults
7. Pump filtration of 420 microns.

B. Controller
1. Pump controller monitors delivery of grease through a control valve.
2. Controller has an adjustable run time (2-14 sec) and monitors wheel count to start lubrication cycle.
3. Axle counter that can detect the range of 1 – 32 axles.
4. Manual run button.

C. Distribution Block
1. Divider valve made of carbon steel with 8 port outlet for even distribution to all outlets.

D. Wiper Bars
1. Wiper bars to be 54 inches long with internal lube ports of a non clog design.
2. Bars to have a nylon brush applicator, gauge face, preventing top of rail migration.
3. Bars shall have a no drilling adjustable mounting bracket with height adjustment.
4. Metering valve.

E. Wheel Sensors
1. Sensor to be of an electric type with a monitoring light.
2. Mounting bracket shall be of a non drilling type and with height adjustment.

F. Hose
1. Hoses to be of a sufficient length and size to carry grease from pump/reservoir housing to application points. Due to length of supply hose from pumps to distribution blocks, hose shall be pre-charged with grease.

ARTICLE 3 EXECUTION

3.01 GENERAL

A. Pump and reservoir unit shall be installed level on surfaces at locations as shown on Contract Drawings.

B. All hoses to wiper bars and port openings and wires to wheel sensors to be installed in RGS conduit. Conduit runs along track to be attached to side of plinths.

C. Wiper bars to be installed at end of high rail strap guard in accordance with manufacturers requirements.

D. Distribution block to be installed on galvanized steel strap attached to plinths as shown on Contract Drawings.

SECTION 02464
SPECIAL TRACKWORK

ARTICLE 1 GENERAL

1.01 SUMMARY

A. The Work of this Section includes, but is not limited to, providing all labor, materials, tools, equipment, and incidentals necessary for special trackwork, in accordance with the Contract Documents.

B. The work of this Section includes, but is not limited to, the following activities:
   1. Manufacturing, testing, shop assembly and delivery to the Worksite of special trackwork and spare parts.

C. The Contract Documents provide the performance parameters and design criteria to complete the Special Trackwork portion of the Work. The Contractor shall be responsible to provide a complete design for this portion of the Work.

D. Authority shall supply the No. 6 Direct Fixation Double Crossover, procured by Authority in Contract No. 3002 – Advanced Rail Systems, Procurement – Gateway Double Crossover to the Contractor. The Double Crossover is to be installed at Wood Street Station, not Gateway as the contract title indicates. The Contactor shall notify the Engineer by written advanced notice thirty (30) days prior, followed by a 48 hour telephone confirmation prior to requested delivery date. The Contract No. 3002 contractor will deliver the No. 6 double crossover to the Contractor's designated site. Delivery site shall be within a ten (10) mile radius of the Project Worksite. All materials and equipment shall be fully inspected by the Contractor and accepted for use at the Wood Street installation work area before delivery can occur. Material and equipment delivery will occur no sooner than 8:30 am with delivery fully completed by 2:00 pm, Monday through Friday, except Holidays.
   1. The Contractor shall inspect the completely assembled Double Crossover including all switch machines and rods at the fabricators plant prior to delivery to the Worksite. The Contractor shall be notified of this inspection by the track fabricator (21) calendar days prior to the inspection. The Contractor shall inspect and approve the complete assembly on site at the track fabricators plant and shall take responsibility for the completed assembly and all components after it is match marked, disassembled, and shipped by the manufacturer.

1.02 RELATED SECTIONS

A. Section 02450, "General Track Construction."

B. Section 02452, "Direct Fixation Track Construction."

C. Section 02453, "Special Trackwork Construction."

D. Section 02462, "Direct Fixation Rail Fasteners."

E. Section 02466, "Steel Rail."

F. Section 02468, "Rail Welding."

G. Section 02456, "Track Appurtenances and other Track Material."

H. Section 02471, "Track-to-Earth Resistance Testing."

I. Section 13574, "Wayside Signal Equipment.'

1.03 REFERENCE STANDARDS

A. American Railway Engineering and Maintenance Association (AREMA) Latest Edition, Manual for Railway Engineering and the AREA Portfolio of Trackwork Plans.

3. Accelerated Strength Class AAA Concrete – Primarily used for existing plinth replacement concrete.
   a. Submit in accordance with PENNDOT 408, Section 704, except delete Table A.
   b. Provide Class AAA Concrete for acceptance having a 28-day minimum compressive strength of 4500 psi when tested in accordance with PTM No. 604.
   c. Submit mix design as specified in PENNDOT 408, Section 704.1(c), having a minimum target value for compressive strength of 1500 psi at 7 hours when tested in accordance with PTM No. 604.
   d. Deliver concrete to the site at temperatures between 65 and 90 degrees F.

B. Aggregates
   1. Coarse and fine aggregates to be used in all classes of concrete shall be in accordance with PENNDOT 408, Section 703.1 and 703.2, limestone only.

C. Concrete Curing Material and Admixtures
   1. Curing and protecting covers in accordance with PENNDOT 408, Section 711.1.
   2. Curing compounds in accordance with PENNDOT 408, Section 711.2 (a) (clear compound only) and (c), compatible with protective coating, if any.
   3. For Accelerated Strength Class AAA Concrete provide concrete curing in accordance with PENNDOT 408, Section 711.1(b) and Section 711.2(a), Type 2, or 711.2(b) and as may be specified with the approved concrete mix design.
   4. Concrete admixtures in accordance with PENNDOT 408, Section 711.3.
   5. For Accelerated Strength Class AAA Concrete provide concrete admixtures in accordance with PENNDOT 408, Section 711.3 that contain no chlorides.

D. Nonstaining, Nonshrinking Grout in accordance with PENNDOT 408, Section 1001.2(d).

E. Nonshrink Grout for Studs, Dowels, and Anchor Bolts: A PENNDOT Bulletin 15 approved premixed, nonshrink grout or PENNDOT 408, Section 1080.2(c), except use Type C Fine Aggregate.
   1. Contractor may use premixed nonshrink grout that passes a No. 8 sieve. Mix according to the manufacturer's instructions.

F. Forms
   1. Temporary in accordance with PENNDOT 408, Section 1001.2 (h) 1.

G. Other Material
   1. Premolded expansion joint filler in accordance with PENNDOT 408, Section 705.1.
   2. Joint sealing material in accordance with PENNDOT 408, Section 705.4(d).
   3. Reinforcement bars and welded and deformed fabric in accordance with Section 03211, "Reinforcing Bars and Dowels."
   4. Anchor bolts in accordance with PENNDOT 408, Section 1105.02(c)2, unless modified in the Contract Documents.
   5. Epoxy bonding compound in accordance with ASTM C881.
   6. Vapor barrier in accordance with 6 mil polyethylene film.

H. Penetrating Concrete Sealer in accordance with Section 09900, "Protective Coating for Concrete Surfaces."

I. No materials shall be used if they contain volatile organic compounds (VOC's) without prior written approval of the Engineer.

2.03 MIXES

A. Proportioning and Mixing Concrete
   1. In accordance with PENNDOT 408, Section 704 and Article 2.02, for proportioning and mixing all classes of concrete except for architectural concrete and silica-fume concrete as noted below.

G. Joints shall be constructed in accordance with PENNDOT 408, Section 1001.3 (n).

H. Curing and protection of concrete in accordance with PENNDOT 408, Section 1001.3 (p). For Accelerated Strength Class AAA Concrete provide concrete curing in accordance with PENNDOT 408, Section 516.3(j).

I. Removal of falsework and forms and application of external loads to concrete in accordance with PENNDOT 408, Section 1001.3 (q).

3.02 FIELD QUALITY CONTROL

A. Concrete shall be field tested in accordance with PENNDOT 408, Section 704.

B. Prior to the removal of forms for cement concrete construction, Contractor shall determine the minimum compressive strength, using equipment in accordance with ASTM C39 on previously molded cylinder specimens. Test cylinders shall be cured in accordance with PENNDOT PTM No. 611.

3.03 JOINTS, BONDING, AND EMBEDDED ITEMS

A. Construction Joints
1. Make construction joints straight and as inconspicuous as possible (where exposed to view), and in accurate vertical and horizontal alignment. Grind down exposed surface irregularities and protrusions that could cause voids.
2. Thoroughly clean the surface of the concrete at construction joints by water blasting, green cutting, or other effective method prior to placing adjoining concrete. As an allowance for initial shrinkage, do not place concrete against the hardened side of a construction joint for at least 36 hours.
3. Reinforcement shall be continuous across construction joints. Provide keys and dowels in accordance with the Contract Drawings.
4. Locations of construction joints shall be shown on submittals, except in case of emergency as specified below. The locations shall be in accordance with those shown on the Contract Drawings. If not shown on the Contract Drawings, the maximum spacing shall be 30 feet.
5. When the work of placing concrete is unexpectedly interrupted by breakdowns, storms, or other causes, and the concrete as placed would produce an improper construction joint, the Contractor shall form a construction joint approved by the Engineer. When such a joint occurs at a section on which there is a shearing stress, the Contractor shall provide an adequate mechanical bond across the joint by forming a key, inserting reinforcing steel, or some other satisfactory means, which will prevent a plane of weakness.

B. Expansion and Contraction Joints
1. Construct joints in accordance with the Contract Drawings. Carefully inspect joints and ensure that they are free of concrete, grout, and debris. The outer edges of the joint shall be straight, parallel, and neat in appearance.
2. Reinforcement and other embedded metal items bonded in the concrete shall not extend through the joint, unless shown on the Contract Drawings for corrosion control bonding or other purpose.

C. Embedded Items

D. Before containers of sealing materials are opened, the labels shall be checked and the label information documented. If multi-component systems are used, mixing shall be completed prior to application. Manufacturers' instructions shall be followed.

E. For all types, an initial demonstration application shall be satisfactorily made in the presence of the Engineer and approved before the application is allowed to continued.

F. Cracks shall be sealed:
   1. On the top surface of slabs.

G. Before application of the sealant, the crack shall be routed full length to form a V-shaped notch with a depth of between 1/4 inch and 3/8 inch and a width of between 3/16 inch and 3/8 inch. The routed crack shall be cleaned with an air jet and a wire brush to remove dust and loose particles.

H. The routed crack shall be filled with sealant by trowel or pressure gun. The sealant shall be tooled to ensure intimate contact with the joint sides and removal of trapped air and voids, and brought flush and consistent with the concrete face.

3.06 ACCELERATED CONCRETE AREAS OPENING TO TRAFFIC

A. In accordance with PENNDOT 408, Section 516.3(q).

ARTICLE 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

A. Item 03305.001 - Traction Power Substation Pad and Transformer Pads shall be measured as a lump sum, complete in place.

4.02 PAYMENT

A. Item 03305.001 - Traction Power Substation Pad and Transformer Pads will be paid at the lump sum price and shall include the cost of all related work specified in this Section.

END OF SECTION

VOLUME 2 TECHNICAL PROVISIONS NSC-009 NSC TRAIN SYSTEMS (SYSTEM WIDE) CONTINUED

full capacity flow after de-energization shall not exceed 30 seconds. Three reversals shall be possible during a 20 minute, period where a reversal is defined as one change from forward mode operation to reverse mode operation or vice versa.

2. The requirement for short turnaround reversals may require a fan brake. If included, the brake shall incorporate limit switches to facilitate interlocks in the motor control center (MCC) to prevent the motor being energized until the brake is off and to prevent the brake being applied while the motor is energized. Both the interlock connections and the brake status signals shall also be available to the control system. Fan braking can be performed by the use of variable speed drives.

H. Tunnel Ventilation Variable Speed Drives
   1. Multiple speed operation of the tunnel ventilation fans shall be achieved by the use of variable speed drive units installed in the MCC Rooms.
   2. VSDs shall be capable of running at least two preset speeds, selected remotely by volt free contacts (1 pair for each speed) hard wired into the VSD unit. Closing any of these contacts shall override any programmable logic controller (PLC) command present.
   3. VSDs shall comply with NEMA MG-1 Part 31.

I. High Temperature Performance
   1. Fans shall be designed to continue to operate for at least one hour while moving air at a temperature of 482°F.

J. Balancing
   1. Each fan shall be balanced statically and dynamically in accordance with ISO 1940 (or BS 6861).

K. Impeller and Blades
   1. It shall be possible to adjust the pitch angle of all fan blades with the fan stationary and in its installed location. The design of the pitch adjustment method shall ensure that blades will not 'freeze up' with time. Provision shall be made to accurately measure and set the blade pitch.
   2. Impellers and blades shall be made of materials suitable for the specified temperature, pressure and pollution conditions and speeds, dynamic loads and fatigue loads.
   3. Impellers shall be designed so that the bearings do not suffer permanent damage when the fans are stationary, over the design life of the fan.
   4. All fan blades and the hubs shall be inspected by x-ray, or other non-intrusive means, and results provided to demonstrate freedom from cracks and imperfections, to the approval of the Engineer.
   5. The first critical speed (natural frequency) of the shaft impeller motor assembly shall be at least 50% higher than the design maximum operating speed.
   6. The assembly shall be able to withstand stresses and load created by over speed testing to 125% of the maximum operating speed.

minimum:

1. VMS/PA, via Station Ethernet 10 mbps LAN and 4-Wire E&M
2. Public Address Live Audio from OCC to Station via 4-Wire E&M
3. WQED Audio from Pitt Tower to NSC Stations via 4-Wire E&M
4. Radio System Audio via 4-Wire E&M
5. Signal System Vital Processors via 4-Wire E&M
6. Substation RTUs via 4-Wire E&M
7. Fan Control PLCs via 4-Wire E&M
8. NMS to Station T1 Multiplexers via 10 mbps LAN
9. Future Ticket Vending Machine via Station Ethernet 10 mbps LAN

C. The Contractor shall provision the DACS located at the OCC to reorganize DS0 circuits from the remote NSC station T1s (Channel Banks) into functional groupings at the OCC. The DS0 circuits from the NSC stations shall be put into functional groups (radio voice, PA system voice, and RTU data circuits) assigned to separate T1 circuits. Each T1 group at the OCC shall be assigned to a separate channel bank.

ARTICLE 2 PRODUCTS

2.01 SONET MULTIPLEXER

A. General

1. The NSC SONET Ring shall be configured with a head-end Add-Drop Multiplexer at the OCC and four remote Add-Drop Multiplexers at the NSC stations and Pitt Tower as indicated on Contract Drawing CM004. The following description applys to both types of SONET multiplexers with the exception of maximum expansion capabilities.

B. Add-Drop Multiplexer

1. Each SONET multiplexer shall be initially configured as an OC-12 Add-Drop Multiplexer (ADM) with the remote upgradable to OC-48 and the head-end upgradable to OC-192.
2. The ADM physical design shall feature ease of configuration with one or more shelves or racks containing removable modules. The ADM shall be capable of implementing various custom SONET configurations depending on the deployment of the various modules and software. Modules shall be easily combined and interchanged across shelf slots allowing for the custom configurations. Modules shall be readily replaced in the field.
3. The ADM shall support scaleable bandwidth migration, in order to provide increased capacity in the future, by replacing optic modules in the ADM.
4. The ADM shall support Time Slot Assignment (TSA), Time Slot Interchange (TSI), hairpining, drop and continue, and one- or two-way traffic routing.
5. The ADM shall support multi-vendor interoperability through the use of standardized interfaces.

C. Multiplexer Inputs

1. Each ADM shall be capable of terminating up to the full compliment of 28 DS-1 signals. Each multiplexer shall have flexible bandwidth management with the capability to accommodate a mixture of input signals to be multiplexed in combination, up to system capacity.
2. Each SONET OC-12 ADM furnished under this Contract shall be configured into a network of two-fiber UPSR (Unidirectional Path Switched Rings). Input to the multiplexer, as a minimum, shall be DS-1 signal format from the T1 multiplexers

E. Manufacturer: Charles Industries, Model # 360-80(IAD) or approved equal

2.03 DIGITAL SIGNAL CROSS-CONNECT (DSX) PANEL

A. Contractor shall provide a digital signal cross-connect panel at each communications equipment room with DS-1 circuits as the point of demarcation for DS-1 signals.

B. The DSX shall be equipped for the required quantity of DS-1 signals (no less than 8), to be terminated on the panel.

C. The DSX shall be capable of EIA 23 inch or 19 inch rack mounting.

D. The DSX shall include the required number and length of DS-1 patch cables with appropriate connectors.

E. The DSX shall be equipped to terminate all permanent DS-1 circuits on the rear of the panel in RJ-48 jacks. The front of the panel shall be equipped with IN, OUT, and TEST bantam jacks to allow for temporary patching and in-service testing of DS-1 signals.

F. Manufacturer: ADC, Model # DD1-311001 or approved equal

2.04 DIGITAL ACCESS AND CROSS-CONNECT SYSTEM (DACS)

A. The Contractor shall provide a Digital Access and Cross-Connect System at the OCC to reorganize T1 DS0s from the NSC stations into functional groupings at the OCC.

B. The DACS shall be equipped with 28 DS1 ports with expansion capability to 84 DS1 ports

C. The DACS shall be equipped with an Ethernet port, which shall support network management functions via SNMP protocol

D. The DACS shall include user software to provision the matrix from a local port or remotely via the Ethernet

E. Interfaces supported shall include DS1, DS3, STS-1

F. Protocols supported: ASCII, X.25, TL1, TCP/IP

G. Communications ports: RS232, RS449, X.25, LAN 802.3, 10Base-T, 10Base-2

H. Manufacturer: Loop Telecommunications International, Model: Loop V 4100 or approved equal.

2.05 WIRE AND CABLE

A. DS-1 Cable
   1. Rated for DS-1 transmission.
   2. RJ-48C connectors.
   3. Minimum specifications:
      a. Insulation: plenum rated, low flame, no smoke.
      b. Jacket: plenum rated, low flame, no smoke.
      c. Resistance: 100 Ohm balanced.
      d. Temperature rating: 220 degrees F.
      e. Voltage rating: 6 V p-p $\pm$10%.

B. DS-1 Patch Cable
   1. Rated for DS-1 transmission.
   2. Appropriate connectors to mate with DSX panel.
   3. Contractor shall supply at each communications equipment room one for each DS-1 circuit plus 100% spares.
   4. Minimum specifications:
      a. Insulation: plenum rated, low flame, no smoke.
      b. Jacket: plenum rated, low flame, no smoke.

c. Resistance: 100 Ohm balanced.
d. Temperature rating: 220 degrees F.
e. Voltage rating: 6 V p-p +/-10%.
f. Length: 2 meters.

C. Cross Connect Wire
1. Suitable for voice and high speed data communications up to 16 Mbps.
2. UL Listed and conforming to Bellcore TA-TSY-000130.
3. Minimum Specifications:
a. Conductor gauge: 24 AWG.
b. Maximum resistance: 29 ohms per 1000 ft.
c. Insulation: Plenum rated, low flame spread, no smoke.
d. Maximum capacitance: 0.15 mF per 1000 ft.

ARTICLE 3 EXECUTION

3.01 SONET OC-12 ADD-DROP MULTIPLEXERS

A. Contractor shall provide and install all equipment and material necessary to form a complete and operational OC-12 fiber optic network as specified within the Contract Documents and in accordance with the Manufacturer's Specifications.
1. A Head-end OC-12 multiplexer shall be installed in the OCC equipment room.
2. An OC-12 multiplexer shall be installed at the Gateway, North Shore, and Allegheny station nodes as shown on the Contract Drawings.
3. An OC-12 multiplexer shall be installed in the CTS cabinet located in the Pitt Tower equipment room.
4. Each OC-12 multiplexer shall be pre-assembled, pre-wired, and tested at the factory for the requirements of each node.
5. All OC-12 multiplexers shall be configured at the factory in the UPSR ring configuration as shown on Contract Drawings CM004 and CM005 and specified herein. The OC-12 system shall be operated to simulate ultimate field operation, including random generation of fault conditions with subsequent network healing via path switching.
6. All network simulation shall be documented for initial set-up, hardware and software configuration, test patterns, and test results.
7. Contractor shall notify the Engineer a minimum of two weeks in advance of the testing of the system so that the Engineer or the Engineer's representative may be present for the tests, if the Engineer so elects, as specified in Section 16901, "Communication System Inspection and Test."
8. All fiber optic and copper cable connections from the SONET multiplexer to the FDP and DSX panels shall be made according to the Contract Drawings.
9. Equipment inside communications equipment rooms may be subject to interference from hand-held radio transmissions. To help prevent this, Contractor shall place a minimum of two signs inside the communications equipment rooms, such that a sign can be seen from all areas of the room. The signs shall state "HAND-HELD RADIOS, CELL PHONES, OR ANY WIRELESS TRANSMITTING DEVICE MUST NOT BE USED INSIDE THIS ROOM." The signs shall have lettering a minimum of 3/4 inch in height, be constructed of a highly visible durable plastic material, and rigidly mounted to walls or racks.

3.02 T1 INTELLIGENT MULTIPLEXER (CHANNEL BANK)

PORT AUTHORITY OF ALLEGHENY COUNTY
NORTH SHORE CONNECTOR PROJECT

CONTRACT NO. NSC-009

The following Questions and Answers Summary shall not be construed to modify or change the Bid Documents. The Bidder shall submit its Bid based upon the Bid Documents. The Bid Documents may only be changed through the use of explicitly identified changes to the Bid Document, and any necessary change to the Bid Documents will be explicitly identified as such in an Addendum that would be issued by Port Authority.

Question 62: Specification Section 13595 3.14 A. 1. discussed the LRV Brake Rate Adjustment for the safe braking test. Will PAAC be adjusting the brake rate on the test vehicles on a daily basis or will a vehicle with permanently de-rated braking be made available to the test team?

Response 62: Port Authority will de-rate the LRV Braking Rate on the Test Vehicle and make reasonable accommodations for access to the vehicle during the Contractor's testing program.

Question 63: Specification Section 13595 3.14 A.3.a references the "LRV Speed Recorder." Is there any information available on this PAAC device?

Response 63: Port Authority is reviewing this question and if a change to the Bid Documents is required it will be issued as an addendum.

Question 70: On Contract Drawing 349, there appear to be overlay (AFO) track circuits applied within the interlocking limits which has single-rail PF track circuits. Since propulsion return current from both ends of each vehicle axle will be attempting to reach the one propulsion return rail, it will naturally pass through the AFO equipment connected to the rails and most likely cause permanent damage to it. Therefore, in place of these particular AFO circuits, would the use of additional single-rail PF track circuits within the interlocking be considered to achieve the same system result?

Response 70: See Addendum 4

Question 79: 16703 - There are several references to a Digital Access and Cross-Connect System (DACS) although there are no requirements for port density, expansion, recommended manufacturer etc. Would you please provide the requirements for this piece of equipment?

Response 79: See Addendum 4

Question 96: In looking through the contract drawings, we have been able to final all of the paving items with the exception of item with the exception of Item 02740.006 BCBC 2.5" depth, and the balance of item 02740.0002 ID-2 Wearing SRL-L, and Item 02721.003 Subbase 6" depth, which don't appear on sheet 4 of 95 of the Drawing Series CV and TK. Can you please direct us to the detail which indicates what these items are used for and where they are to be placed?

Response 96: See detail 1 shown on CV002.

Question 97: Section 15889-3, 1.04, F.5.: Is it anticipated that the pressure transients could occur while the fans are running?

Response 97: Yes, pressure transients are to be expected while fans are running due to piston effects of moving trains.

Question 98: Section 15889-8, 2.02, F.8.: Should the expected maximum pressure to which the fans will be exposed include an allowance for the 4.0" WG transient pressure.

Response 98: No, the fans shall be sized based on specified flow rates and pressures in Table 15889-1 Tunnel Ventilation Fan Schedule. Pressure transients are short duration fluctuations in pressure due to train piston effects, but should not affect fan static pressures which are based on system losses.

Question 99: Section 15889-8, 2.02, G.1.: Does the reversal time requirement pertain to VFD operation, across-the-line operation or both?

Response 99: Both. Timely reversals could be called for in operation. The reversal time related to the ability of the mechanical/electrical components of the fan to withstand the stresses incurred by a full speed forward to full speed reverse within a specific time frame. Across-the-line operation will probably require a fan brake to meet those specifications, whereas on VFD operation, DC injection braking can be applied. If the specified

reversal time cannot be achieved via VFD braking, then a fan brake must also be incorporated.

Question 100: Section 15889-9, 2.02, G.2.: Is this section referencing operation of the fans under VFD operation or across-the-line operation?

Response 100: See answer to Question 99.

Question 101: Section 15889-10, 2.02, P.1.: Does the number of required starts per hour pertain to across-the-line starting?

Response 101: Motors shall be capable of being started by across-the-line and shall be capable of at least 6 starts per hour started that way. Motors shall also be suitable for VFD operation. There is no additional starts per hour criteria relating to VFD operation.

Question 102: Section 15889-10, 3.01, B.6.: Is high temperature certification per ISO 21927-3 satisfactory for meeting verification requirements?

Response 102: Yes, if the proposed fans have been independently certified to at least 482°F (250°C) for 1 hour according to ISO 21927-3, certification will be accepted as meeting the specified requirements.

Question 103: Specification item # 2.03 A.4 'Where the VSD requires additional functions such as dynamic braking capability" these will be specified in the Article 2.01 of this section. There is no mention of dynamic braking requirement in 2.01 of this section, but dynamic braking resistor is shown on electrical drawings for all VFD's.

Is dynamic braking required, and if so, are we to quote the braking resistors to be mounted external to the VFD's by others?

Response 103: Port Authority is reviewing this question and if a change to the Bid Documents is required it will be issued as an addendum.

Question 104: Reference Modified Drawing TK132A, #4 Deck Stirrups. The detail on this drawing says that the deck stirrups will be spaced 2 each on 12" centers. The original drawing TK132A shown that there will be 2 stirrups per each rail seat. Please clarify.

Response 104: TK132A issued in Addendum 2 is correct.

Question 105: Specification Section 15889, item 2.02.H. states variable speed drives (VSD's) are to be installed in the MCC but are shown on the contract drawings as being from the MCC. Please clarify.

Response 105: See Addendum 4. VSD's shown in Contract Drawings are wall/floor mounted units.

Question 106: Section 02454, 3.01 B. specifies the use of PVC schedule 40 conduit along the track plinth. This is in conflict with the drawings which call for Rigid Galvanized Steel (RGS) Conduit. Please clarify.

Response 106: All conduit shall be Rigid Galvanized Steel. See Addendum 4.

Question 107: Will consideration be given to the price volatility of steel, such as a price index or an escalator clause covering excessive steel price increase?

Response 107: This has been considered. There will be no price index changes to the Contract Documents.

Question 108: Where will the PAAC supplied No. 6 double cross-over be located? Will the contractor be responsible for transporting it from the factory to the jobsite?

Response 108: See Addendum 4

Question 109: For GW Tie Breaker Station (ref Drawing TP114), detail indicates cable to be run exposed and fastened to uni-strut. Conduit cable plan on drawing TP116, indicates cable to be run in 3" PVC from OCS to Tie breaker. Please clarify' installation method.

Response 109: Port Authority is reviewing this question and if a change to the Bid Documents is required it will be issued as an addendum.

Question 110: Drawing TP111 indicates that conduits DP 9 and DP 10 are spares between the Tie-Breaker room and OCS. If cable is fastened to uni-strut, are you requiring uni-strut be long enough to add two additional l000mcm cables for future use?

Response 110: Port Authority is reviewing this question and if a change to the Bid Documents is required it will be issued as an addendum.

Question 111: Drawing TP116 indicates 1000mcm cable to have insulation type EPR. Please confirm this insulation is required for the 1000mcm cable in a tunnel

Response 111: Port Authority is reviewing this question and if a change to the Bid Documents is required it will be issued as an addendum.

Question 112: Drawing TP114, Section A-A, calls for (4) 1C cables for negative return reference. Drawing TP116 only indicates one cable. Conduit schedule on TP116 indicates two conduits from Negative return to rail. Please clarify how many negative returns reference there are and if these are to be in conduits in the tunnel or attached directly to the uni-strut

Response 112: Port Authority is reviewing this question and if a change to the Bid Documents is required it will be issued as an addendum.

Question 113: Drawing TP116. Regarding the conduit ACI; it appears that the "from" should be from the ATS not Electrical room. Station utility is feeding power to the ATS and NSC-009 needs to get power from the ATS to the PNP panel. Please confirm.

Response 113: Port Authority is reviewing this question and if a change to the Bid Documents is required it will be issued as an addendum.

Question 114: Drawing TP111. Is the panel labeled PDP A Station Service panel the same panel as the PNP panel listed in the conduit schedule on sheet TP116?

Response 114: Port Authority is reviewing this question and if a change to the Bid Documents is required it will be issued as an addendum.

Question 115: Drawing TP116. Conduit schedule list conduits AC7, AC8, and AC9. These conduits go from panel PNP to the air conditioning, EF-1, and EF-2. Please identity the physical location of these devices so conduits and cable length can be determined. Please note that the electrical schematic on drawing TP102 does not show these device connected in the Tie breaker room AC panel.

Response 115: Port Authority is reviewing this question and if a change to the Bid Documents is required it will be issued as an addendum.

Question 116: Drawing TP111, what is the physical location of the battery charger?

Response 116: Port Authority is reviewing this question and if a change to the Bid Documents is required it will be issued as an addendum.

Question 117: Reference Drawing TP116. Conduit CM1 is designated to go from the SCADA Panel to the Comm Room. There are two Comm Rooms, E107 and E116 shown on drawing EL010. Please indicate in which Comm Room CM1 terminates and provide additional information as to where in the Comm Room the CM1 terminates.

Response 117: Port Authority is reviewing this question and if a change to the Bid Documents is required it will be issued as an addendum.

Question 118: Conduit CM1 on Drawing TP116 is listed as PVC. This is low voltage running through the existing loop in the tunnel. Typically you call for RGS in this application. Please clarify.

Response 118: Port Authority is reviewing this question and if a change to the Bid Documents is required it will be issued as an addendum.

Question 119: Drawing TP016, conduit schedule NS, has 1000 mcm cable for conduits, PSF 113 and PSF 115. These are the Passenger station AC feeders and on drawing TP310 they are listed as *4/0.* Please clarify' whether these cables are 1000 mcm or 4/0.

Response 119: Port Authority is reviewing this question and if a change to the Bid Documents is required it will be issued as an addendum.

Question 120: Drawing TP036 references Drawing TN697, Note 4. Please provide this drawing as a reference

Response 120: Port Authority is reviewing this question and if a change to the Bid Documents is required it will be issued as an addendum.

Question 121: Please provide a detail on how you would like the 1000 mcm DC feeders cables connected to the 500 mcm messenger wire. The detail provided is for connecting to a 1000 mcm messenger wire.

Response 121: Port Authority is reviewing this question and if a change to the Bid Documents is required it will be issued as an addendum.

Question 122: Please quantify' the disconnect switches that are currently in place at Wood Street Station Cross-over.

Response 122: Port Authority is reviewing this question and if a change to the Bid Documents is required it will be issued as an addendum.

Question 123: Please confirm that since the anchor bolts for the OCS poles have been previously installed by other, all anchor bolt nuts shall be provided to the NSC-009 Contractor by others at no additional cost.

Response 123: Port Authority is reviewing this question and if a change to the Bid Documents is required it will be issued as an addendum.

Question 124: Please reference Specification Section 13585-3.04 regarding grounding requirements. Note 7 of Drawing SG150 states "All signals to be grounded to the Signal System Ground", Additionally, Drawings CR700 to CR703 all show a ground wire attached to the tunnel ceiling.

a) Is the ground wire shown in Drawings CR700 to CR703 the aerial/signal system ground?
b) Is the signal system ground connected to each ground plate in each signal relay room?
c) Is there a signal system ground to be continued from the Gateway portion of the tunnel to the new tunnel?
d) Are the signal system and electrical conduits to be grounded every 500' as shown on Drawing 0C805 (Addenda #3)?
e) Is the signal system ground the same as the ground wire shown mounted on the ceiling in the OC# Drawings (from Addenda #3)?

Response 124: Port Authority is reviewing this question and if a change to the Bid Documents is required it will be issued as an addendum.

Question 125: Please clarify the requirement for a Safety Supervisor. Must the role be filled by a dedicated person with their sole responsibility to be Safety Supervisor?

Response 125: See Addendum 4

Question 126: Terms and Conditions Section 00500-2.7.B. 1 addresses "Additional Shift Work". This section should be limited to instances where the Contractor is the sole cause of falling behind schedule.

Response 126: No change to the Contract Documents is required. Refer to Section 00900 for Contract change requirements.

Question 127: Terms and Conditions Section 00500-2.8 addresses Liquidated Damages. This section identifies various categories of potential damages to the Authority. Specifically, this section states "including for additional construction management costs for the Engineer, increased inspection costs, increased costs for Authority's administration, increased design services and submittal review costs, impacts to Authority's ongoing transit operations, and increased insurance costs." The language suggests that there may be more categories of damages that are not covered by the stipulated liquidated damages amount. Please confirm that the assessment of the liquidated damages amounts set forth in Section 00500-(a)(4)(a)-(e) represents the Authority's sole and exclusive remedy for unexcused late completion by the Contractor. Additionally, there is currently no cap given on liquidated damages. Contractor suggests that the Liquidated Damages be capped at no more than 10% of the contract value.

Response 127: Liquidated Damages are the sole and exclusive remedy for unexcused late completion by the Contractor. Such damages are not limited where the Contractor's actions constitute a separate breach of other Contract provisions.

Question 128: Terms and Conditions Section 00700-Article 7 requires for the Contractor to maintain and evidence a Professional Liability policy with a $1 million per wrongful act, error, or omission and $2 million aggregate. If Contractor elects to subcontract out all design portions of the project, please confirm that it is acceptable to satisfy this requirement through evidence of its design subcontractor's Professional Liability policy.

Response 128: Yes

Question 129: Terms and Conditions Section 00700-Article 12 addresses historical and scientific specimens. This section states that items of historical, archeological or scientific value may be encountered on the Project. Please clarify that Contractor is entitled to equitable compensation for any additional time and/or cost associated with suspending the work

caused by the discovery of such historical, archeological or scientific findings.

Response 129: Suspension of work as a result of this Article will be handled in accordance with Section 00900.

Question 130: Terms and Conditions Section 00700-Article 17. While we can accept the obligation to properly handle and dispose of the material, once the contractor has done so in accordance with the plans and specifications he should not carry the long term liability associated with assuming the role of "generator" from the Owner. Remedial action hazardous waste contractors who do this kind of work do not accept that kind of liability, and the Owner's construction contractors should not be asked to do so where the Owner chooses to include contaminated materials in a construction Contract rather than through remedial action cleanup contracts. The risk is wholly beyond the control of the contractor once it is properly disposed of, and it is an essentially uninsurable risk. The material does not belong to the contractor, and he cannot adequately price the generator risk.

Accordingly, we request that the Contract reflect that the Contractor does not assume this risk.

Response 130: The Contractor is not considered as the generator on the manifest unless contaminated or hazardous materials are created by their own construction activities or operations. The Contractor has legal responsibility for the proper handling, transport and disposal of any hazardous materials. No change required.

Question 131: Terms and Conditions Section 00900-3.16 addresses "incidental or consequential. We suggest that this waiver of "incidental or consequential damages" be mutual.

Response 131: Port Authority is reviewing this question and if a change to the Bid Documents is required it will be issued as an addendum.

Question 132: Form J is the Authority's "Waiver of Right to File Mechanic's Lien". It is our understanding that recent legislation in the State of Pennsylvania renders such requirement as being unenforceable. Specifically, 49 P.S. § 1401(b) states that "a waiver by a contractor of lien rights is against public policy, unlawful and void unless given in consideration for payment for the work, services, materials or equipment provided and only to the extent that such payment is actually received." We request

that this Form and all references to the "Waiver of Right to File Mechanic's Lien" be removed.

Response 132: Form J has been deleted in Addendum 4 and any reference to Form J within the Contract Documents should be disregarded.

Question 133: The present bid date of September 24, 2008 does not allow sufficient time to prepare a complete and competitive price for the North Shore Connector Contract NSC-009. We respectfully request that the bid date be extended an additional 30 days.

Response 133: The construction of the NSC-009 Contract is key to the NSC Program schedule. Port Authority is currently reviewing this schedule to assess if an additional bid extension can be accommodated. Bidders will be notified of any bid extensions in a near future Addendum.

Question 134: Reference Dwg.TN151, Sht. *69* Tunnel Cross Section; Detail 1 contains a note which we request clarification. *"D20 wire reinforcement with 2" x 2" mesh to be welded* to *grating and rested against tunnel wall in sections of tunnel between cabinets"* Explain what is D20 wire reinforcement? Is the D20 wire to be place the entire length of the tunnel and what cabinets are being referenced?

Response 134: This is a 20 gage wire mesh used to protect feet from getting trapped in the gap between the edge of walkway grating and the wall of the tunnel and help prevent tools falling through. The cabinets referred to are any conduit or small work boxes used for equipment mounted on the wall.

PORT AUTHORITY OF ALLEGHENY COUNTY

SITE VISIT – BORED TUNNEL

SUBJECT: **NORTH SHORE CONNECTOR – NSC TRAIN SYSTEMS (SYSTEM WIDE)**

CONTRACT NO. **NSC-009**

DATE: **FRIDAY, AUGUST 26, 2008 – 10:30 a.m. – 12:30 p.m.**

ATTENDANCE SHEET

Representative	Company	Mailing Address	Phone / Fax
Greg Marsteller	Delta RR Const	2648 West Prospect Rd Ashtabula Oh 44004	440-992-2997 440 992 1311
GARY ABEL	BALFOUR BEATTY RAIL	100 GALLAWAY DR. EIGHTY FOUR, PA 15330	724-239-2480 724-239-2488
LEE WILLIAMS	"	"	"
Robert F. Brosick	Port Authority	345 SIXTH AVE PGH PA 15222	412-566-5372 412-566-5356
Craig Whytt	Golden Triangle Const Inc	40 Partridge Lane Imperial PA 15126	724 695-1600 724 695-1611
Scott Stark	Railworks Track Systems	3601 Stonecroft Blvd Lot #15 Chantilly VA	678-776-8646 703-572-5081
Michael Blobner	McLamish.	50-55TH ST PGH PA 15201	412-781-6262 Phone 412-781-3205 Fax
John McCluskey	MAI	1106 Ohio River Blvd. 15143	(412) 741-1612

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Representative	Company	Mailing Address	Phone / Fax
BOB RENNINGER	WELLINGTON POWER	40TH & BUTLER ST. PGH, PA 15201	(412)246-7689
JOHN LAPP	RA. LWORKS	985 Union Hill Rd. Alpharetta GA	678.776-8358
J. Berger	TR. GOLD	3 GATEWAY 15E	412 497 6266
STEVE MINASSIAN	"	" " "	412 497-6272
Dave Haines	DMJM Harris		412 395-8880
Craig Jones	GANNett Fleming		610 650 7730

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