

THE PORT AUTHORITY OF NY & NJ

PROCUREMENT DEPARTMENT
2 MONTGOMERY STREET, 3RD FL.
JERSEY CITY, NJ 07302

INVITATION FOR BID/PUBLIC BID OPENING

BID INFORMATION

ISSUED DATE: APRIL 16, 2013

TITLE: PATH TRACK TURNOUTS, CROSSOVER AND HOLLOW
STEEL TIES PER CONTRACT REQUIREMENTS

BID NO.: 33128

SUBMIT SEALED BIDS BEFORE THE DUE DATE AND TIME TO THE ABOVE ADDRESS
WHERE THEY WILL BE PUBLICLY OPENED AND READ

BID DUE DATE: MAY 10, 2013

TIME: 11:00 AM

BUYER NAME: LARRY WAXMAN

PHONE NO.: (201) 395-3541

FAX NO.: (201) 395-3425

EMAIL: Lwaxman@panynj.gov

BIDDER INFORMATION

(TO BE COMPLETED BY THE BIDDER)

(PLEASE PRINT)

(NAME OF BIDDING ENTITY)

(ADDRESS)

(CITY, STATE AND ZIP CODE)

(REPRESENTATIVE TO CONTACT-NAME & TITLE

(TELEPHONE)

(FEDERAL TAX I.D. NO.)

(FAX NO.)

____ BUSINESS CORPORATION _____ PARTNERSHIP _____ INDIVIDUAL

____ OTHER (SPECIFY): _____

INVITATION FOR BID

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- PART II – CONTRACT SPECIFIC INFORMATION FOR BIDDERS
- PART III – CONTRACT SPECIFIC TERMS AND CONDITIONS
- PART IV – SIGNATURE SHEET, NAME AND RESIDENCE OF PRINCIPALS AND PRICING SHEET(S)
- PART V – SPECIFICATIONS
- STANDARD CONTRACT TERMS AND CONDITIONS

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PART I - STANDARD INFORMATION FOR BIDDERS

1. General Information: The Port Authority of New York and New Jersey

The Port Authority of New York and New Jersey (the "Port Authority" or the "Authority") is an agency of the States of New York and New Jersey, created and existing by virtue of the Compact of April 30, 1921, made by and between the two States, and thereafter consented to by the Congress of the United States. It is charged with providing transportation, terminal and other facilities of trade and commerce within the Port District. The Port District comprises an area of about 1,500 square miles in both States, centering about New York Harbor. The Port District includes the Cities of New York and Yonkers in New York State, and the cities of Newark, Jersey City, Bayonne, Hoboken and Elizabeth in the State of New Jersey, and over 200 other municipalities, including all or part of seventeen counties, in the two States. The Port Authority manages and/or operates all of the region's major commercial airports (Newark Liberty International, John F. Kennedy International, Teterboro, LaGuardia and Stewart International Airports), marine terminals in both New Jersey and New York (Port Newark and Elizabeth, Howland Hook and Brooklyn Piers); and its interstate tunnels and bridges (the Lincoln and Holland Tunnels; the George Washington, Bayonne, and Goethals Bridges; and the Outerbridge Crossing), which are vital "Gateways to the Nation."

In addition, the Port Authority operates the Port Authority Bus Terminal in Manhattan, the largest facility of its kind in the world, and the George Washington Bridge and Journal Square Transportation Center bus stations. A key link in interstate commuter travel, the Port Authority also operates the Port Authority Trans-Hudson Corporation (PATH), a rapid rail transit system linking Newark, and the Jersey City and Hoboken waterfronts, with midtown and downtown Manhattan. A number of other key properties are managed by the agency including but not limited to a large satellite communications facility (the Teleport) in Staten Island, and a resource recovery co-generation plant in Newark. Prior to September 11, 2001, the Port Authority's headquarters were located in the World Trade Center, and that complex is still owned and being partially redeveloped by the Authority.

2. Form and Submission of Bid

The Bidder shall review carefully every provision of this document, provide all the information required, and sign and return one entire copy to the Port Authority in accordance with the instructions on the Cover Sheet and Part II – Contract Specific Information for Bidders. The Bidder should retain one complete duplicate copy for its own use. The "Signature Sheet" contained herein must be completed and signed by the Bidder. The Pricing Sheet(s) contained herein must also be completed. The bid shall be sealed in the enclosed self-addressed envelope conspicuously marked with the Bidder's name, address, and Vendor Number, if available. In addition, the outside of the package must clearly state the Bid title, the Bid Collective Number and the Bid Due Date. Failure to properly label submissions may cause a delay in identification, misdirection or disqualification of the submissions. In submitting this

bid, the Bidder offers to assume the obligations and liabilities imposed upon it herein and expressly makes the representations and warranties required in this document.

All Bids must be received by the bid custodian on or before the due date and time specified on the cover page, at which time they will be publicly opened and read. Bids are only accepted Monday through Friday, excluding Port Authority holidays, between the hours of 8:00 a.m. and 5:00 p.m., via (1) regular mail, (2) express delivery service (e.g. UPS), or (3) hand delivery. If your bid is to be hand-delivered by messenger or you are planning to attend the formal bid opening, please note that only individuals with valid photo identification will be permitted access to the Authority's offices. Individuals without valid identification shall be turned away and their packages not accepted. Bids that are not received by the bid custodian by the scheduled bid opening date will be considered late.

3. Vendor Profile

To ensure maximum opportunities, it is vitally important that Bidders keep their vendor profiles up to date with an appropriate e-mail address, as this will enable their firm to receive timely notice of advertisements, reminders, solicitations and addenda. Bidders may update their vendor profile or register as a Port Authority Vendor by accessing the online registration system at <https://panynjprocure.com/VenLogon.asp>.

4. Acknowledgment of Addenda

If any Addenda are posted or sent as part of this Bid, the Bidder shall complete, sign and include with its Bid the addenda form(s). In the event any Bidder fails to conform to these instructions, its Bid will nevertheless be construed as though the Addenda had been acknowledged.

If the Bidder downloaded this solicitation document, it is the responsibility of the Bidder to periodically check the Port Authority website at <http://www.panynj.gov/business-opportunities/bid-proposal-advertisements.html> and download any addenda that might have been issued in connection with this solicitation.

5. Firm Offer

The Bidder offers to provide the Port Authority Trans-Hudson Corporation ("PATH") the services and to perform all Work in connection therewith required under this Contract, all as specified by the terms and conditions of the Contract, based on the Pricing Sheets provided herein. As used herein, the term "Port Authority" shall mean the Port Authority of New York and New Jersey acting on behalf of PATH.

EXCEPTIONS TAKEN OR CONDITIONS IMPOSED BY A BIDDER TO ANY PORTION OF THE CONTRACT DOCUMENTS WILL RESULT IN REJECTION OF THE BID.

6. Acceptance or Rejection of Bids

The acceptance of a bid will be by a written notice signed by an authorized representative on behalf of the Authority. No other act of the Port Authority, its Commissioners, officers, agents or employees shall constitute acceptance of a bid. The Port Authority reserves the unqualified right, in its sole and absolute discretion, to reject any or all bids or to accept any bid, which in its judgment will best serve the public interest and to waive defects in any bid. No rights accrue to any Bidder unless and until its bid is accepted.

7. Bidder's Questions

Any questions by prospective Bidders concerning the Work to be performed or the terms and conditions of the Contract may be addressed to the Contracts Specialist listed on the Cover Sheet of this document. The Contracts Specialist is only authorized to direct the attention of prospective Bidders to the portions of the Contract. No employee of the Port Authority is authorized to interpret any portion of the Contract or to give information in addition to that contained in the Contract. When Contract interpretation or additional information as to the Contract requirements is deemed necessary by the Port Authority, it will be communicated to all Bidders by written addenda issued under the name of the Manager, Purchasing Services Division of the Port Authority and may be posted on the Port Authority website. Addenda shall be considered part of the Contract.

8. Additional Information To and From Bidders

Should the Authority require additional information from the Bidder in connection with its bid, such information shall be submitted within the time frame specified by the Port Authority.

If the Bidder is a corporation, a statement of the names and residences of its officers should be submitted on the Name and Residence of Principals Sheet, directly following the Signature Sheet.

9. Union Jurisdiction

All prospective Bidders are advised to ascertain whether any union now represented or not represented at the Facility will claim jurisdiction over any aspect of the operations to be performed hereunder and their attention is directed to the paragraph entitled "Harmony" in the Standard Contract Terms and Conditions.

10. Assessment of Bid Requirements

The Bidder should carefully examine and study the entire contents of these bid documents and shall make its own determinations as to the services and materials to be supplied and all other things required to be done by the Contractor.

11. Bidder's Prerequisites

Only Bidders who can comply with the prerequisites specified in Part II hereof at the time of the submission of its bid should submit bids, as only bids submitted by such Bidders will be considered. By furnishing this document to the Bidder, the Port Authority has not made a determination that the Bidder has met the prerequisites or has otherwise been deemed qualified to perform the services. A determination that a Bidder has met the prerequisites is no assurance that it will be deemed qualified in connection with other bid requirements included herein.

12. Qualification Information

The Port Authority may give oral or written notice to the Bidder to furnish the Port Authority with information and to meet with designated representatives of the Port Authority relating to the Bidder's qualifications and ability to fulfill the Contractor's obligations hereunder. The requested information shall be submitted no later than three (3) days after said notice unless otherwise indicated. Matters upon which the Port Authority may inquire may include, but not be limited to, the following:

- a. The Bidder may be required to demonstrate that it is financially capable of performing this Contract, and the determination of the Bidder's financial qualifications will be made by the Port Authority in its sole discretion. The Bidder shall submit such financial and other relevant information as may be required by the Port Authority from time to time including, but not limited to, the following:
 1. (i) Certified financial statements, including applicable notes, reflecting the Bidder's assets, liabilities, net worth, revenues, expenses, profit or loss and cash flow for the most recent calendar year or the Bidder's most recent fiscal year.
 - (ii) Where the certified financial statements set forth in (i) above are not available, then either reviewed or compiled statements from an independent accountant setting forth the aforementioned information shall be provided.
 - (iii) Where neither certified financial statements nor financial statements from an independent accountant are available, as set forth in (i) and (ii) above, then financial statements containing such information prepared directly by the Bidder may be submitted; such financial statements, however, must be accompanied by a signed copy of the Bidder's most recent Federal income tax return and a statement in writing from the Bidder, signed by an executive officer or their authorized designee, that such statements accurately reflect the present financial condition of the Bidder.

Where the statements submitted pursuant to subparagraphs (i), (ii) or (iii) are dated prior to forty-five (45) days before the bid opening, then the Bidder shall submit a statement in writing, signed by an executive officer of the Bidder or

their designee, that the present financial condition of the Bidder is at least as good as that shown on the statements submitted.

2. Bidder's statement of work on hand, including any work on which a bid has been submitted, containing a description of the work, the annual dollar value, the location by city and state, the current percentage of completion, the expected date for completion, and the name of an individual most familiar with the Bidder's work on these jobs.
 3. The name and address of the Bidder's banking institution, chief banking representative handling the Bidder's account, the Bidder's Federal Employer Identification Number (i.e., the number assigned to firms by the Federal Government for tax purposes), the Bidder's Dun and Bradstreet number, if any, the name of any other credit service to which the Bidder has furnished information, and the number, if any, assigned by such service to the Bidder's account.
- b. Information relating to the Bidder's Prerequisites, if any, as set forth in this document.
 - c. If the Bidder is a corporation: (1) a copy of its Certificate of Incorporation and, if applicable, all Amendments thereto with a written declaration signed by the Secretary of the Corporation with the corporate seal affixed thereto, stating that the copy furnished is a true copy of the Certificate of Incorporation and any such Amendments as of the date of the opening of the bid and (2) if the Bidder is not incorporated under the laws of the state in which the service is to be performed, a certificate from the Secretary of State of said state evidencing the Bidder's legal qualification to do business in that state.
 - d. A statement setting forth the names of those personnel to be in overall charge of the service and those who would be exclusively assigned to supervise the service and their specific roles therein, setting forth as to each the number of years of experience and in which functions and capacities each would serve.
 - e. Information to supplement any statement submitted in accordance with the Standard Contract Terms and Conditions entitled "Contractor's Integrity Provisions."
 - f. In the event that the Bidder's performance on a current or past Port Authority or PATH contract or contracts has been rated less than satisfactory, the Manager, Purchasing Services Division, may give oral or written notice to the Bidder to furnish information demonstrating to the satisfaction of such Manager that, notwithstanding such rating, such performance was in fact satisfactory or that the circumstances which gave rise to such unsatisfactory rating have changed or will not apply to performance of this Contract, and that such performance will be satisfactory.
 - g. The Bidder recognizes that it may be required to demonstrate to the satisfaction of the Port Authority and PATH that it in fact can perform the services as called for in this Contract and that it may be required to substantiate

the warranties and representations set forth herein and the statements and assurances it may be required to give.

Neither the giving of any of the aforesaid notices to a Bidder, the submission of materials by a Bidder, any meeting which the Bidder may have with the Port Authority, nor anything stated by the Port Authority and/or PATH in any such meeting shall be construed or alleged to be construed as an acceptance of said Bidder's bid. Nothing stated in any such meeting shall be deemed to release any Bidder from its offer as contained in the bid.

13. Facility Inspection

Details regarding the Facility inspection for all parties interested in submitting a bid are stipulated in Part II hereof. All Bidders must present company identification and photo identification for access to the Facility.

14. Available Documents - General

Certain documents, listed in Part II hereof, will be made available for reference and examination by Bidders either at the Facility Inspection, or during regular business hours. Arrangements to review these documents at a time other than the Facility Inspection may be made by contacting the person listed in Part II as the contact for the Facility Inspection.

These documents were not prepared for the purpose of providing information for Bidders upon this Contract but they were prepared for other purposes, such as for other contracts or for design purposes for this or other contracts, and they do not form a part of this Contract. PATH makes no representation or guarantee as to, and shall not be responsible for, their accuracy, completeness or pertinence, and, in addition, shall not be responsible for the inferences or conclusions to be drawn there from.

15. Pre-award Meeting

The lowest qualified Bidder may be called for a pre-award meeting prior to award of the Contract.

16. Price Preference

A price preference may be available for Minority/Women Business Enterprises (M/WBEs) or Small Business Enterprises (SBEs) as set forth in the Standard Contract Terms and Conditions.

17. M/WBE Subcontracting Provisions

The Port Authority has a long-standing practice of making its business opportunities available to Minority Business Enterprises (MBEs) and Women-Owned Businesses

(WBEs) and has taken affirmative steps to encourage such firms to seek business opportunities with the Port Authority. The successful Bidder will use good faith efforts to provide for meaningful participation by the Port Authority certified M/WBEs as defined in this document, in the purchasing and subcontracting opportunities associated with this contract, including purchase of equipment, supplies and labor services.

Minority Business Enterprise (MBE) - shall mean a business entity which is at least 51% owned and controlled by one or more members of one or more minority groups, or, in the case of a publicly held corporation, at least 51% of the stock of which is owned by one or more minority groups, and whose management and daily business operations are controlled by one or more such individuals who are citizens or permanent resident aliens.

"Minority Group" means any of the following racial or ethnic groups:

- (a) Black persons having origins in any of the Black African racial groups not of Hispanic origin;
- (b) Hispanic persons of Mexican, Puerto Rican, Dominican, Cuban, Central or South American culture or origin, regardless of race;
- (c) Asian and Pacific Islander persons having origins in any of the original peoples of the Far East, Southeast Asia, The Indian Subcontinent, or the Pacific Islands;
- (d) Native American or Alaskan native persons having origins in any of the original peoples of North America and maintaining identifiable tribal affiliations through membership and participation or community identification.

Women-Owned Business Enterprise (WBE) - shall mean a business enterprise which is at least 51% owned by one or more women, or, in the case of a publicly held corporation, at least 51% of the stock of which is owned by one or more women and whose management and daily business operations are controlled by one or more women who are citizens or permanent or resident aliens.

Good faith efforts to include participation by M/WBEs shall include, but not be limited to the following:

- 1) Dividing the services and materials to be procured into small portions where feasible;
- 2) Giving reasonable advance notice of specific subcontracting and purchasing opportunities to such firms as may be appropriate;
- 3) Soliciting services and materials from M/WBEs, which are certified by the Port Authority;

- 4) Ensuring that provision is made for timely progress payments to the M/WBEs and;
- 5) Observance of reasonable commercial standards of fair dealing in the respective trade or business.

Bidders are directed to use form PA3749B as the recording mechanism for the M/WBE participation Plan, which may be downloaded at <http://www.panynj.gov/business-opportunities/become-vendor.html>

The M/WBE Plan submitted by the Contractor to the Port Authority shall contain, at a minimum, the following:

- Identification of M/WBE's: Provide the names and addresses of all M/WBEs included in the Plan. If none are identified, describe the process for selecting participant firms in order to achieve the good faith goals under this Contract.
- Level of Participation: Indicate the percentage of M/WBE participation expected to be achieved with the arrangement described in the Plan.
- Scope of Work: Describe the specific scope of work the M/WBE's will perform.
- Previous M/WBE Participation: Describe any previous or current M/WBE participation, which the Bidder has utilized in the performance of its contracts.

All M/WBE subcontractors listed on the M/WBE Participation Plan must be certified by the Port Authority in order for the Contractor to receive credit toward the M/WBE goals set forth in this Contract. Please go to www.panynj.gov/supplierdiversity to search for M/WBEs by a particular commodity or service. The Port Authority makes no representation as to the financial responsibility of such firms or their ability to perform Work under this Contract.

Bidders shall include their M/WBE Participation Plan with their Bids, to be reviewed and approved by the Authority's Office of Business Diversity and Civil Rights (OBDCR).

If the Contractor wishes to subcontract a portion of the Work through a firm not listed in the Directory, but which the Contractor believes should be eligible because it is (1) an M/WBE, as defined above and (2) competent to perform portions of the Work, the Contractor shall submit an M/WBE Uniform Certification Application to the Port Authority of New York and New Jersey, Office of Business Diversity and Civil Rights (OBDCR), 233 Park Avenue South, 4th Floor, New York, NY 10003. The application is available online at www.panynj.gov/supplierdiversity. In addition, to update your certification file and to advise OBDCR of changes to any information, please email these changes to OBJOcert@panynj.gov. Credit toward applicable goals will be granted only to Port Authority certified vendors. For more information about M/WBE Programs, call (212) 435-7819.

18. Certification of Recycled Materials

Bidders are requested to submit, with their bid, a written certification entitled "Certified Environmentally Preferable Products / Practices" attached hereto as "Attachment I-A", attesting that the products or items offered by the Bidder contain the minimum percentage of post-consumer recovered material in accordance with the most recent guidelines issued by the United States Environmental Protection Agency (EPA), or, for commodities not so covered, the minimum percentage of post-consumer recovered materials established by other applicable regulatory agencies. The data submitted by the Bidder in Attachment I-A is being solicited for informational purposes only.

Recycling Definitions:

For purposes of this solicitation, the following definitions shall apply:

- a. "Recovered Material" shall be defined as any waste material or by-product that has been recovered or diverted from solid waste, excluding those materials and by-products generated from, and commonly reused within, an original manufacturing process.
- b. "Post-consumer Material" shall be defined as any material or finished product that has served its intended use and has been discarded for disposal or recovery having completed its life as a consumer item. "Post-consumer material" is included in the broader category of "Recovered Material".
- c. "Pre-consumer Material" shall be defined as any material or by-product generated after the manufacture of a product but before the product reaches the consumer, such as damaged or obsolete products. Pre-consumer Material does not include mill and manufacturing trim, scrap, or broken material that is generated at a manufacturing site and commonly reused on-site in the same or another manufacturing process.
- d. "Recycled Product" shall be defined as a product that contains the highest amount of post-consumer material practicable, or when post-consumer material is impracticable for a specific type of product, contains substantial amounts of Pre-consumer Material.
- e. "Recyclable Product" shall be defined as the ability of a product and its packaging to be reused, reconditioned for use, or recycled through existing recycling collection programs.
- f. "Waste Reducing Product" shall be defined as any product that will result in less waste generated due to its use rather than another product designed to serve the same function with an greater waste generation rate. This shall include, but not be limited to, those products that can be reused, refilled or have a longer life expectancy and contain a lesser amount of toxic constituents.

19. City Payroll Tax

Bidders should be aware of the payroll tax imposed by the:

- a. City of Newark, New Jersey for services performed in Newark, New Jersey;
- b. City of New York, New York for services performed in New York, New York;
and
- c. City of Yonkers, New York for services performed in Yonkers, New York.

These taxes, if applicable, are the sole responsibility of the Contractor. Bidders should consult their tax advisors as to the effect, if any, of these taxes. The Port Authority provides this notice for informational purposes only and is not responsible for either the imposition or administration of such taxes. The Port Authority exemption set forth in the Paragraph headed "Sales or Compensating Use Taxes", in the Standard Contract Terms and Conditions included herein, does not apply to these taxes.

20. Additional Bidder Information

Prospective Bidders are advised that additional vendor information, including but not limited to, forms, documents and other information, including protest procedures, may be found on the Port Authority website at: <http://www.panynj.gov/business-opportunities/become-vendor.html>

ATTACHMENT I-A - Certified Environmentally Preferable Products/Practices

Bidder Name: _____ Date: _____

In line with the Port Authority's efforts to promote products and practices which reduce our impact on the environment and human health, Bidders are encouraged to provide information regarding their environmentally preferable/sustainable business practices as they relate to this contract wherever possible. Bidders are requested to complete this form and submit it with their response, if appropriate. Bidders are requested to submit appropriate documentation to support the items for which the Bidder indicates a "Yes" and present this documentation, in the proper sequence of this Attachment.

1. Packaging

Has the Bidder implemented any of the following environmental initiatives? (A checkmark indicates "Yes")

- Use of corrugated materials that exceed the required minimum EPA recommended post-consumer recycled content
- Use of other packaging materials that contain recycled content and are recyclable in most local programs
- Promotes waste prevention and source reduction by reducing the extent of the packaging and/or offering packaging take-back services, or shipping carton return
- Reduces or eliminates materials which have been bleached with chlorine or chlorine derivatives
- Eliminates any packaging that may contain polyvinyl chloride (PVC), or polystyrene or heavy metals.

If yes, a description of the practices being followed should be include with the submission.

2. Business Practices / Operations / Manufacturing

Does the Bidder engage in practices that serve to reduce or minimize an impact to the environment, including, but not necessarily limited to, the following items? (A checkmark indicates "Yes")

- Recycles materials in the warehouse or other operations
- Use of alternative fuel vehicles or vehicles equipped with diesel emission control devices for delivery or transportation purposes
- Use of energy efficient office equipment or signage or the incorporation of green building design elements
- Use of recycled paper (that meets federal specifications) in their marketing and/or resource materials
- Other sustainable initiative

If yes, a description of the practices being followed should be included with the submission.

3. Training and Education

Does the Bidder conduct/offer a program to train or inform customers and employees of the environmental benefits of the products to be offered under this contract, and/or does the Bidder conduct environmental training of its own staff?

- Yes No If yes, Bidder shall attach a description of the training offered and the specific criteria targeted by the training.

4. Certifications

Has the Bidder or any of its manufacturers and/or subcontractors obtained any of the following product / industry certifications? (A checkmark indicates "Yes")

- ISO 14000 or adopted some other equivalent environmental management system
- Other industry environmental standards (where applicable), such as the CERES principles, LEED Certification, C2C Protocol, Responsible Care Codes of Practice or other similar standards
- Third Party product certifications such as Green Seal, Scientific Certification Systems, Smartwood, etc.

If yes, Bidders should attach copies of the certificates obtained.

I hereby certify under penalty of law, the above statements are true and correct.

_____ Name

_____ Date

Open Area Track Replacement
Turnouts 7, 27 and Crossover 11
Purchase of Special Trackwork

**PART II – CONTRACT SPECIFIC INFORMATION FOR BIDDERS,
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Open Area Track Replacement
Turnouts 7, 27 and Crossover 11
Purchase of Special Trackwork

PART II - CONTRACT SPECIFIC INFORMATION FOR BIDDERS

The following information may be referred to in other parts hereof, or further detailed in other parts hereof, if applicable.

1. Service(s) Required

The Work includes, but is not limited to, design, manufacturing, testing, and delivery of special trackwork units.

2. Location(s) Services Required

PATH, as more fully described in the definition of "Facility" in the Specifications.

3. Expected Bid Date

On or about April, 2013.

4. Contract Type

Unit Price.

5. Duration of Contract

The Vendor shall complete delivery of all Work under this Contract within twelve (12) months from the Notice of Award, except for Replacement Parts, which shall be delivered within eighteen (18) months from Notice of Award.

6. Price Adjustment during Base Term (Index Based)

Not Applicable

7. Option Period(s)

Not Applicable

8. Price Adjustment during Option Period(s) (Index Based)

Not Applicable

9. Extension Period

Not Applicable

10. Facility Inspection

Not Applicable

11. Specific Bidder's Prerequisites

- a. The Bidder shall have had at least five (5) years of continuous experience immediately prior to the date of submission of its bid in the business of manufacturing tangential design special trackwork utilizing asymmetrical switch

Open Area Track Replacement
Turnouts 7, 27 and Crossover 11

points, hollow steel ties and solid cast manganese frogs, or a substantially similar design and details as determined by and to the satisfaction of PATH, and actually engaged in providing said or such services to commercial or industrial accounts under contract. The Bidder or the Bidder's subcontractor in charge of providing concrete crossties and switch ties shall have not less than five (5) years experience in the design, testing and production of both concrete crossties and concrete switch ties for use in the United States. The Bidder may fulfill this prerequisite if the Bidder can demonstrate to the satisfaction of the Port Authority that the persons or entities owning and controlling the Bidder have had a cumulative total of at least five (5) years of experience immediately prior to the date of the submission of its bid in the management and operation of a commercial or industrial business actually engaged in providing these services to commercial or industrial accounts under contract during that time, or have owned and controlled other entities which have actually engaged in providing the above described services during that time period.

- b. During the time period as stated in (a) above, the Bidder, or persons or entities owning and controlling the Bidder, shall have satisfactorily performed or be performing under at least one (1) contract(s) for the manufacture of tangential design special trackwork of substantially similar scope to those required under this Contract.

12. Bidder's Additional Submittal Requirements

Bidders are requested to submit additional documentation as follows:

- a. The Bidder shall provide a statement in support of the Specific Bidder's Prerequisites stated above as part of the Bidder's bid submission. The information provided shall include a listing of projects completed, a brief description of the project, date completed, client, and client name and phone number and a copy of at least one such contract. PATH shall be the sole judge as to whether the experience statement provided demonstrates substantially similar experience.
- b. The Bidder shall also submit with its bid a signed affidavit, by a duty authorized officer of the firm, acknowledging the guarantees as stated in Part V - Specifications.

13. Reference Documents

The following specifications were not prepared for use in these Specifications, but were prepared for other purposes, such as for other contracts or for design purposes, and are furnished to the Bidder to give the Bidder such information as may be in the possession of PATH. These specifications, referred to as "Reference Specifications", are as follows:

<u>Section</u>	<u>Title</u>
03480	Concrete Turnout Ties, Crossties and Fastenings

14. Contractor Staff Background Screening

The Contractor awarded this Contract may be required to have its staff, and any subcontractor's staff working under this Contract, authorize the Authority or its designee to perform background checks. Such authorization shall be in a form acceptable to the Authority. The Contractor (and subcontractor) may also be required to use an organization designated by the Authority to perform the background checks. The cost for said background checks for staff that pass and are granted a credential shall be reimbursable to the Contractor (and its subcontractors) as an out-of-pocket expense. Staff that are rejected for a credential for any reason are not reimbursable.

As of January 29, 2007, the Secure Worker Access Consortium (S.W.A.C.) is the only Port Authority approved provider to be used to conduct background screening, except as otherwise required by federal law and/or regulation. Information about S.W.A.C., instructions, corporate enrollment, online applications, and location of processing centers can be found at <http://www.secureworker.com>, or S.W.A.C. may be contacted directly at (877)522-7922.

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PART III – CONTRACT SPECIFIC TERMS AND CONDITIONS,

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PART III – CONTRACT SPECIFIC TERMS AND CONDITIONS

1. General Agreement

Subject to all of the terms and conditions of this Contract, the undersigned (hereinafter called the “Contractor”) hereby offers and agrees to provide all the necessary supervision, personnel, equipment, materials and all other things necessary to perform the Work required by this Contract as specified in Part II, and fully set forth in the Specifications, at the location(s) listed in Part II, and fully set forth in the Specifications, and do all other things necessary or proper therefore or incidental thereto, all in strict accordance with the provisions of the Contract Documents and any future changes therein; and the Contractor further agrees to assume and perform all other duties and obligations imposed upon it by this Contract.

In addition, all things not expressly mentioned in the Specifications but involved in the carrying out of their intent and in the complete and proper execution of the matters referred to in and required by this Contract are required by the Specifications, and the Contractor shall perform the same as though they were specifically delineated, described and mentioned therein.

2. Duration

The initial term of this Contract (hereinafter called the “Base Term”) shall commence on or about the date specified in Part II hereof, on the specific date set forth in the Port Authority’s written notice of bid acceptance (hereinafter called the “Commencement Date”), and unless otherwise terminated, revoked or extended in accordance with the provisions hereof.

3. Payment

Subject to the provisions of this Contract, PATH agrees to pay to the Contractor and the Contractor agrees to accept from PATH in full and complete consideration for the performance of all its obligations under this Contract and as sole compensation for the Work performed by the Contractor hereunder, a compensation calculated in accordance with the prices inserted by the Contractor in the OPEN AREA TRACK REPLACEMENT - TURNOUTS 7, 27 AND CROSSOVER 11 - PURCHASE OF SPECIAL TRACKWORK - PRICE SHEET, forming a part of this Contract, exclusive of compensation under the clause hereof entitled “Extra Work”. The manner of submission of all bills for payment to the Contractor by PATH for Services rendered under this Contract shall be subject to the approval of the Superintendent/Manager in all respects, including, but not limited to, format, breakdown of items presented and verifying records. All computations made by the Contractor and billing procedures shall be done in conformance with the following procedures:

- a) Payment shall be made in accordance with the prices for the applicable Work as they appear on the OPEN AREA TRACK REPLACEMENT - TURNOUTS 7,

27 AND CROSSOVER 11 - PURCHASE OF SPECIAL TRACKWORK - PRICE SHEET, as the same may be adjusted from time to time, minus any deductions for Work not performed and/or any liquidated damages to which the invoice may be subject. All Work must be completed within the time frames specified or as designated by the Superintendent/Manager.

- b) The invoice must show the Contractor's Federal Tax Identification Number. Payment will be made within thirty (30) days of PATH's verification of the invoice.
- c) No certificate, payment, acceptance of any Work or any other act or omission of any representative of PATH shall operate to release the Contractor from any obligation under or upon this Contract, or to stop PATH from showing at any time that such certificate, payment, acceptance, act or omission was incorrect or to preclude PATH from recovering any monies paid in excess of those lawfully due and any damage sustained by PATH.
- d) In the event an audit of received invoices should indicate that the correct sum due the Contractor for the relevant billing period is less than the amount actually paid by the PATH, the Contractor shall pay to PATH the difference promptly upon receipt of the PATH's statement thereof. PATH may, however, in its discretion elect to deduct said sum or sums from any subsequent monthly payments payable to the Contractor hereunder.

"Final Payment", as the term is used throughout this Contract, shall mean the final payment made for Work performed under this contract. The Contractor's acceptance of Final Payment shall act as a full and complete release to PATH of all claims of and of all liability to the Contractor for all things done or furnished in connection with the Contract and for every act and neglect of PATH and others relating to or arising out of the Contract, including claims arising out of breach of contract and claims based on claims of third persons. No payment, however, final or otherwise shall operate to release the Contractor from any obligations in connection with this Contract.

4. Liquidated Damages

- a) The Contractor's obligations for the performance and completion of the Work within the time or times provided for in this Contract are of the essence of this Contract. In the event that the Contractor fails to satisfactorily perform all or any part of the Work required hereunder in accordance with the requirements set forth in the Specifications (as the same may be modified in accordance with provisions set forth elsewhere herein) then, in as much as the damage and loss to PATH for such failure to perform includes items of loss whose amount will be incapable or very difficult of accurate estimation, the damages for such failure to perform shall be liquidated as follows:

If the Contractor fails to deliver the equipment, materials and other items required herein specified in Contract Specifications, damages shall be assessed in

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the amount of \$100 per day as specified in Part II, paragraph 5, Duration of Contract, until the work is performed, unless the delay is not due to the fault of the Contractor, or any subcontractor or supplier.

In the event that, for any reason, the Contractor fails to maintain or provide or have available when required or requested by PATH or fails to submit any documentation, reports or records as required, the amount payable by PATH to the Contractor hereunder shall be reduced by an amount equal to \$50 per day multiplied by the number of days the Contractor fails to maintain or provide any documentation, reports or records, said amount or amounts to be deducted from any sums due and owing from PATH to the Contractor hereunder as PATH shall determine from time to time in its sole discretion.

- b) The Superintendent/Manager shall determine whether the Contractor has performed in a satisfactory manner and his/her determination shall be final, binding and conclusive upon the Contractor.
- c) Failure of the Superintendent/Manager or PATH to impose liquidated damages shall not be deemed PATH acceptance of unsatisfactory performance or a failure to perform on the part of the Contractor or a waiver of its remedies hereunder.

5. Insurance

Insurance Procured by the Contractor

The Contractor shall take out, maintain, and pay the premiums on Commercial General Liability Insurance, including but not limited to premises-operations, products-completed operations, and independent contractors coverage, with contractual liability language covering the obligations assumed by the Contractor under this Contract and, if vehicles are to be used to carry out the performance of this Contract, then the Contractor shall also take out, maintain, and pay the premiums on Automobile Liability Insurance covering owned, non-owned, and hired autos:

Commercial General Liability Insurance - \$ 2 million combined single limit per occurrence for bodily injury and property damage liability.

In addition, the liability policy (ies) shall name "The Port Authority of New York and New Jersey and its related entities, their commissioners, directors, officers, partners, employees and agents as additional insureds", including but not limited to premise-operations, products-completed operations on the Commercial General Liability Policy. Moreover, the Commercial General Liability Policy shall not contain any provisions for exclusions from liability other than provisions for exclusion from liability forming part of the most up to date ISO form or its equivalent unendorsed Commercial General Liability Policy. The liability policy (ies) and certificate of insurance shall contain separation of insured condition and severability of interests clause for all policies so that coverage will respond as if separate policies were in force for each insured. An act or omission of one of the insureds shall not reduce or void coverage to the other insureds. Furthermore, the

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Contractor's insurance shall be primary insurance as respects to the above additional insureds. Any insurance or self-insurance maintained by the above additional insureds shall not contribute to any loss or claim. These insurance requirements shall be in effect for the duration of the contract to include any maintenance/warranty/guarantee period.

The certificate of insurance and liability policy (ies) must contain the following endorsement for the above liability coverages:

“The insurer(s) shall not, without obtaining the express advance written permission from the General Counsel of the Port Authority, raise any defense involving in any way the jurisdiction of the Tribunal over the person of the Port Authority, the immunity of the Port Authority, its Commissioners, officers, agents or employees, the governmental nature of the Port Authority, or the provisions of any statutes respecting suits against the Port Authority.”

Each policy above shall contain an endorsement that the policy may not be canceled, terminated, or modified without thirty (30) days' prior written notice to the Port Authority of NY and NJ, Att: Facility Contract Administrator, at the location where the work will take place and to the General Manager, Risk Management.

The Port Authority may at any time during the term of this agreement change or modify the limits and coverages of insurance. Should the modification or change results in an additional premium, The General Manager, Risk Management for the Port Authority may consider such cost as an out-of-pocket expense.

Within five (5) days after the award of this agreement or contract and prior to the start of work, the Contractor must submit an original certificate of insurance, to the Port Authority of NY and NJ, Facility Contract Administrator, at the location where the work will take place. This certificate of insurance MUST show evidence of the above insurance policy (ies), including but not limited to the cancellation notice endorsement and stating the agreement/contract number prior to the start of work. The General Manager, Risk Management must approve the certificate(s) of insurance before any work can begin. Upon request by the Port Authority, the Contractor shall furnish to the General Manager, Risk Management, a certified copy of each policy, including the premiums.

If at any time the above liability insurance should be canceled, terminated, or modified so that the insurance is not in effect as above required, then, if the Manager shall so direct, the Contractor shall suspend performance of the contract at the premises. If the contract is so suspended, no extension of time shall be due on account thereof. If the contract is not suspended (whether or not because of omission of the Manager to order suspension), then the Authority may, at its option, obtain insurance affording coverage equal to the above required, the cost of such insurance to be payable by the Contractor to the Port Authority.

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Renewal certificates of insurance or policies shall be delivered to the Facility Contractor Administrator, Port Authority at least fifteen (15) days prior to the expiration date of each expiring policy. The General Manager, Risk Management must approve the renewal certificate(s) of insurance before work can resume on the facility. If at any time any of the certificates or policies shall become unsatisfactory to the Port Authority, the Contractor shall promptly obtain a new and satisfactory certificate and policy.

The requirements for insurance procured by the Contractor shall not in any way be construed as a limitation on the nature or extent of the contractual obligations assumed by the Contractor under this contract. The insurance requirements are not a representation by the Authority as to the adequacy of the insurance to protect the Contractor against the obligations imposed on them by law or by this or any other Contract.

6. Extra Work

The Contractor is required to provide separate materials, supplies, equipment and personnel for Extra Work when such is deemed necessary by the Superintendent/Manager. "Extra Work" as used herein shall be defined as work which differs from that expressly or impliedly required by the Specifications in their present form. Total Extra Work performed by the Contractor shall not exceed six percent (6%) of the Total Contract Price of this Contract for the entire Term of this Contract including extensions thereof, or six percent (6%) of the Total Contract Price of each Section if this Contract is awarded by separate Sections.

An increase in area or frequency does not constitute Extra Work, but shall be compensable based on the prices in the Pricing Sheet(s) and the paragraph herein titled "Increase or Decrease in Areas or Frequencies".

The Contractor is required to perform Extra Work pursuant to a written order of the Superintendent/Manager expressly recognizing such work as Extra Work. If Lump Sum or Unit Price compensation cannot be agreed upon by the parties in writing prior to the start of Work, the Contractor shall perform such Extra Work and the Contractor's compensation shall be increased by the sum of the following amounts and such amounts only: (1) the actual net cost, in money, of the labor (including premiums for workers' compensation insurance, taxes and a proper proportion of vacation allowances and union dues and assessments required to be paid by the employer on the basis of such labor costs), and material, required for such Extra Work, (2) ten percent (10%) of the amount under (1) above, (3) such rental as the Manager deems reasonable for plant and equipment (other than small tools) required for such Extra Work, (4) if the Extra Work is performed by a subcontractor, an additional five percent (5%) of the sum of the amounts under (1) through (3) above.

As used in this numbered clause (and in this clause only):

"Labor" means laborers, mechanics, and other employees below the rank of supervisor, directly employed at the Site of the Work subject to the Superintendent/Manager or his/her designee's authority to determine what employees of any category are "required for Extra

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Work” and as to the portion of their time allotted to Extra Work; and “cost of labor” means the wages actually paid to and received by such employees plus a proper proportion of (a) vacation allowances and union dues and assessments which the employer actually pays pursuant to contractual obligation upon the basis of such wages, and (b) taxes actually paid by the employer pursuant to law upon the basis of such wages. “Employees” as used above mean only the employees of one employer.

“Net Cost” shall be the Contractor’s actual cost after deducting all permitted cash and trade discounts, rebates, allowances, credits, sales taxes, commissions, and refunds (whether or not any or all of the same shall have been taken by the Contractor) of all parts and materials purchased by the Contractor solely for the use in performing its obligation hereunder provided, such purchase having received the prior written approval of the Superintendent/Manager as required herein. The Contractor shall promptly furnish to the Superintendent/Manager such bills of sale and other instruments as may be required by it, executed, acknowledged and delivered, assuring to it title to such materials, supplies, equipment, parts, and tools free of encumbrances.

“Materials” means temporary and consumable materials as well as permanent materials; and “cost of materials” means the price (including taxes actually paid by the Contractor pursuant to law upon the basis of such materials) for which such materials are sold for cash by the manufacturers or producers thereof, or by regular dealers therein, whether or not such materials are purchased directly from the manufacturer, producer or dealer (or if the Contractor is the manufacturer or producer thereof, the reasonable cost to the Contractor of the manufacture and production), plus the reasonable cost of delivering such materials to the Site of the Work in the event that the price paid to the manufacturer, producer or dealer does not include delivery and in case of temporary materials, less their salvage value, if any.

The Superintendent/Manager shall have the authority to decide all questions in connection with the Extra Work. The exercise by the Superintendent/Manager of the powers and authorities vested in him/her by this section shall be binding and final upon the PATH and the Contractor.

The Contractor shall submit all reports, records and receipts as are requested by the Superintendent/Manager so as to enable him/her to ascertain the time expended in the performance of the Extra Work, the quantity of labor and materials used therein and the cost of said labor and materials to the Contractor.

The provisions of this Contract relating generally to Work and its performance shall apply without exception to any Extra Work required and to the performance thereof. Moreover, the provisions of the Specifications relating generally to the Work and its performance shall also apply to any Extra Work required and to the performance thereof, except to the extent that a written order in connection with any particular item of Extra Work may expressly provide otherwise.

If the Contractor deems work to be Extra Work, the Contractor shall give written notice to the Superintendent/Manager within twenty-four (24) hours of performing the work that it so considers as Extra Work, and failure of the Contractor to provide said notice shall be a

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waiver of any claim to an increase in compensation for such work and a conclusive and binding determination that it is not Extra Work.

All Extra Work shall be billed to PATH on a separate invoice on a monthly basis.

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**PART IV – SIGNATURE SHEET, NAME AND RESIDENCE OF PRINCIPALS SHEET
AND PRICING SHEET(S)**

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**PART IV – SIGNATURE SHEET, NAME AND RESIDENCE OF PRINCIPALS SHEET
AND PRICING SHEET(S)**

1. SIGNATURE SHEET

OFFER: The undersigned offers and agrees to furnish to the Port Authority of New York and New Jersey the services and/or materials in compliance with all terms, conditions, specifications and addenda of the Contract. Signature also certifies understanding and compliance with the certification requirements of the standard terms and conditions as contained in the Standard Contract Terms and Conditions. This offer shall be irrevocable for 90 days after the date on which the Port Authority opens this bid.

**ONLY THE COMPANY NAMED AS THE BIDDING ENTITY BELOW WILL
RECEIVE PAYMENT. THIS MUST BE THE SAME NAMED COMPANY AS
INDICATED ON THE COVER SHEET**

Bidding Entity _____

Bidder's Address _____

City, State, Zip _____

Telephone No. _____ FAX _____

Email _____ EIN# _____

SIGNATURE _____ Date _____

Print Name and Title _____

ACKNOWLEDGEMENT:

STATE OF: _____

COUNTY OF: _____

On this ___ day of _____, 20___, personally came before me, _____, who duly sworn by me, did depose that (s)he has knowledge of the matters herein stated and they are in all respects true and that (s)he has been authorized to execute the foregoing offer and statement of irrevocability on behalf of said corporation, partnership or firm.

Notary Public

NOTE: If a joint venture is allowed, duplicate this Signature Sheet and have each party to the joint venture sign separately and affix to the back of this Signature Sheet.

Bidder attention is called to the certification requirements contained in the Standard Contract Terms and Conditions, Part III. Indicate below if a signed, explanatory statement in connection with this section is attached hereto.

Date certified by the Port Authority as an SBE or MWBE: _____ (indicate which one).

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PART IV – SIGNATURE SHEET, NAME AND RESIDENCE OF PRINCIPALS SHEET AND PRICING SHEET

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2. NAME AND RESIDENCE OF PRINCIPALS SHEET

Names and Residence of Principals of Bidder. If general or limited partner, or individual, so indicate.

NAME

TITLE

ADDRESS OF RESIDENCE
(Do not give business address)

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3. PRICING SHEET

Entry of Prices

- a. The prices quoted shall be written in figures, in ink, preferably black where required in the spaces provided on the Pricing Sheet(s) attached hereto and made a part hereof.
- b. All Bidders are asked to ensure that all charges quoted for similar operations in the Contract are consistent.
- c. Prices must be submitted for each Item required on the Pricing Sheet.
- d. All Bidders are asked to ensure that all figures are inserted as required, and that all computations made have been verified for accuracy. The Bidder is advised that the Port Authority may verify only that Bid or those Bids that it deems appropriate and may not check each and every Bid submitted for computational errors. In the event that errors in computation are made by the Bidder, the Port Authority reserves the right to correct any error and to re-compute the Total Price, as required, based upon the applicable Unit Price inserted by the Bidder, which amount shall govern in all cases.
- e. In the event that a Bidder quotes an amount in the Total Price column but omits to quote a Unit Price for that amount in the space provided, the Port Authority reserves the right to compute and insert the appropriate Unit Price.
- f. The Total Price is solely for the purpose of facilitating the comparisons of Bids. Compensation shall be in accordance with the section of this Contract entitled "Payment".

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PART IV – SIGNATURE SHEET, NAME AND RESIDENCE OF PRINCIPALS SHEET AND PRICING SHEET

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Pricing Sheet

PHASE IIIC – OPEN AREA – SPECIAL TRACKWORK
PRICE SHEET

Vendor Name: _____

ITEM NO.	ITEM DESCRIPTION (Items shall include connecting rails, prefabricated curves, full rod packages, rail, concrete ties, timber transition ties, 115RE/100RB compromise castings and other appurtenances per contract documents.)	QUANTITY	UNIT PRICE	TOTAL PRICE
1	Furnishing of Crossover 11	1 Each	\$	\$
2	Furnishing of Turnout 7	1 Each	\$	\$
3	Furnishing of Turnout 27	1 Each	\$	\$
4	Furnishing of Hollow Steel Ties with all associated Switch Rods, Signal Rods, Machine and Helper Mounting Hardware, and Switch Point Lock Clamps	Lump Sum	\$	\$
5	Furnishing of Replacement Parts for No. 10 Turnout in accordance with the listing in Part V	Lump Sum	\$	\$
6	Furnishing of Replacement Parts for No. 15 Turnout and Crossover in accordance with the listing in Part V	Lump Sum	\$	\$
	TOTAL CONTRACT PRICE		\$	\$

PART V – SPECIFICATIONS

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PART V - SPECIFICATIONS

1. SPECIFIC DEFINITIONS

- A. To avoid undue repetition, the following terms, as used in this Contract, shall be construed as follows:
- B. "Facility" shall mean PATH.
- C. "Engineer" shall mean the Chief Engineer of the Port Authority of New York and New Jersey, acting either personally or through his/her duly authorized representatives acting within the scope of the particular authority vested in them.
- D. The word "Vendor" shall be used interchangeably with the word "Contractor".

2. WORK REQUIRED BY THE SPECIFICATIONS

- A. This Section includes specifications for design, fabrication of component parts, manufacturing, qualification testing, quality control, handling, shipping, and unloading and stockpiling of switches, frogs, rail, guard rail, plates, rods, hollow steel ties, switch machines, insulated joints, forged rail transition sections, concrete switch ties and crossties, timber ties, replacement parts and other track material associated with replacement of turnouts. Installation of materials in track will be by others.
- B. The Work shall be as shown on the Contract Drawings listed under Paragraph 5B "Contract Drawings" of this Section and as specified herein.
- C. The Vendor shall provide all labor, supervision, materials, equipment and all other things necessary for the performance of the Work.
- D. All trackwork components shall be in conformance with the Contract Documents, unless otherwise approved in writing by the Engineer.
- E. The trackwork shall also be in conformance with the alignment designs as shown on Contract Drawings.
- F. The Vendor shall review all drawings and specifications for internal consistency and recommend any adjustments it may deem to help ensure smooth train operations and track performance.

3. GENERAL

- A. REFERENCES: Following is a listing of the publications referenced in this Section:
 - i. American Railway Engineering and Maintenance-of-Way Association (AREMA)
 - a) Manual for Railway Engineering (Manual)
 - b) Portfolio of Trackwork Plans (Portfolio)

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- c) In AREMA publications, the words “railway”, “railroad”, “railway company”, or words of like import shall be understood to mean PATH.
- ii. ASTM International (ASTM)
 - a) A36 Carbon Structural Steel
 - b) A325 Structural Bolts, Steel, Heat-Treated, 120/105 ksi Minimum Tensile Strength
 - c) A370 Mechanical Testing of Steel Products
 - d) A490 Standard Specification for Structural Bolts, Alloy Steel, Heat Treated, 150 ksi Minimum Tensile Strength
 - e) A536 Ductile Iron Castings
 - f) A578 Straight-Beam Ultrasonic Examination of Rolled Steel Plates for Special Applications
 - g) A588 Standard Specification for High-Strength Low-Allow Structural Steel, up to 50 ksi Minimum Yield Point, with Atmospheric Corrosion Resistance
 - h) B695 Standard Specification for Coatings of Zinc Mechanically Deposited on Iron and Steel
 - i) D395 Rubber Property - Compression Set
 - j) D412 Vulcanized Rubber and Thermoplastic Elastomers – Tension
 - k) D1229 Rubber Property – Compression Set at Low Temperatures
 - l) D2240 Rubber Property - Durometer Hardness
 - m) E10 Brinell Hardness of Metallic Materials
 - n) E94 Radiographic Examination
- iii. American Welding Society (AWS)
 - a) D1.1 Structural Welding Code – Steel
- iv. European Standards (EN)
 - a) 13674 Railway applications – Track – Rail, Part 3: Check rails.

B. CONTRACT DRAWINGS

- i. Follow the Contract Drawings, dated November 9, 2012, which are attached hereto and form a part of these specifications, bear the project title “Open Area Track Replacement, Turnouts 7, 27 and Crossover 11, Purchase of Special Trackwork ” and are separately numbered and entitled as shown on Drawing G2 “INDEX OF DRAWINGS AND LOCATION MAP”.

- ii. The Contract Drawings do not show all of the details of the Work and are intended only to illustrate the character and extent of the Work to be performed. Accordingly, subject to the approval of the Engineer, the Engineer or the Vendor may, during the course of the Work, supplement the Contract Drawings to the extent necessary to further illustrate the Work.
- iii. Before the manufacture of any portion of the Work, the Vendor shall check for accuracy of all dimensions shown on the Contract Drawings and report to the Engineer any discrepancies that may be found therein.

C. REFERENCE DOCUMENTS

- i. Reference documents, including the specification for concrete turnout ties, concrete crossties and fastenings, are contained in Part II of these contract documents.

D. QUALITY ASSURANCE

- i. Perform all of the above Work in accordance with all applicable recommended practices in the AREMA Manual, except as otherwise shown within these Contract Documents.
- ii. Submit the name and qualifications of an independent test agency that will test rail and castings as described herein.
- iii. Develop and maintain a Quality Control Program regulating methods, procedures, and processes to ensure compliance with standards of quality required by the Contract Documents, including inspection and testing, samples and use of certificates of compliance. Perform sufficient inspections and test of all items and components of work, including those by subcontractors in order to assure conformance to applicable standards, specifications and drawings with respect to materials, workmanship, fabrication and identification.
- iv. Provide to the Engineer, prior to shipment, the manufacturer's certifications that the manufacturer meets the requirements as specified in these Contract Documents for each product to be used in the Work.
- v. Establish and maintain a quality assurance program for the entire process of designing and providing Special Trackwork. The quality assurance program plan will be subject to audit. Make available all required documents needed to assure that Work is produced in accordance with the quality assurance program.
- vi. Submit to the Engineer, for approval of format, a sample copy of the standard inspection form to be used by the Vendor's QC staff. The Vendor shall use approved form for inspection report for completed items of crossover.
- vii. Any apparent discrepancies in the Contract Documents shall be brought to the attention of the Engineer by means of written notice, and all modifications to the Contract Document requirements shall be approved by the Engineer before fabrication of Special Trackwork.

- viii. Design Parameters and Operating Conditions
 - a) Multiple unit electrically propelled trains up to 10 cars operating at speeds of up to 60 mph on mainline track. Electrification is by a contact (third) rail with spring-loaded contact shoes allowing DC current from the contact rail to power the train.
 - b) The design axle loads are 26,000 pounds subject to a 300 percent impact factor.
- ix. Design, Components, and Dimensions:
 - a) Turnout geometry, rail layout, tie layout, and associated dimensions shall be in accordance with the Contract Drawings. The Contract Drawings show the general arrangement of special trackwork and such details as are necessary to provide a comprehensive description of the work to be performed. For the three separate locations of special trackwork to be furnished, the Vendor shall provide detailed, dimensioned special trackwork layouts as part of the Shop Drawings specified herein.
 - For the No. 10 turnout only (Switch 27), the Vendor may propose adjustments to the as-designed configuration if it will improve reliability, reduce life-cycle costs, or simplify fabrication with no loss in functionality or economic life.
 - ◇ Adjustments may include rail, switch and frog lengths; tie spacing; switch point geometry; switch rod or helper rod configuration; or other items that meet the criteria of the paragraph above.
 - ◇ All proposals shall be submitted on shop drawings for review. PATH reserves the sole right to accept or reject proposals.
 - For the No. 15 turnouts, the Vendor shall design the hollow steel ties, rods and helper. Other elements of the turnout shall be laid out as shown in the Contract Drawings.
- x. Tolerances:
 - a) For switch point tolerances comply with AREMA Portfolio Plan 1020.
 - b) For frog tolerances comply with AREMA Portfolio Plan 1022.
 - c) For switch clip, plate and switch rod tolerances comply with AREMA Portfolio Plan 1024.
- xi. Welding Standards: Comply with applicable provisions of AWS D1.1.
 - a) Present evidence that each welder has satisfactorily passed AWS qualification tests for welding processes involved and, if pertinent, has undergone recertification.
- xii. Rail inspection and Testing:

- a) The products and material furnished by the Vendor will be subject to inspection and testing by the Engineer, at Vendor's and Subcontractors' facilities, place of manufacture, the shipping point, and at the shipping destination.
 - Whether or not the Engineer inspects or tests any materials, Vendor will not be relieved from any responsibility regarding defects or other failures to meet the Contract requirements, nor will such inspection or testing be considered as a guarantee of acceptance of any material which may be delivered later.
- b) For material furnished by the Vendor, perform all tests and analyses specified in Chapter 4, Part 2, of the AREMA Manual and submit the results in accordance with this Section. Alternately, for guard rail only, perform all relevant tests and analyses specified in EN 13674 – Part 3 and submit the results as specified herein.
- c) Ultrasonically test all rails to be furnished under this Contract for internal defects in accordance with ASTM A578, as modified herein:
 - References to "plate thickness" in ASTM A578 mean rail depth from head to base for measurements from the top of the rail head, or rail web width for measurements laterally through the rail web.
 - In lieu of "Acceptance Standards" in ASTM A578, a defect is defined as the occurrence of one of the following readings:
 - ◇ Complete loss of back reflection.
 - ◇ A reflection from a defect (i.e. not attributable to a reflecting surface of the rail exterior) greater than 5-percent of the back reflection.
 - Reject a rail if a defect occurs more than 3-feet from either end of the rail.
 - Defects within 3-feet of the rail end may be removed by cropping the rail segment containing the defect if the resulting rail length is to an allowable rail length increment and equal to or greater than the minimum allowable rail length.
 - Conduct ultrasonic inspection for the full length of each rail with a 1-inch diameter, 45-degree probe from the top of the rail head, directed along the length of the rail, positioned such that the rail base generates the back reflection.
 - Conduct ultrasonic inspection within 12-inches of each rail end with the 1-inch diameter 45-degree probe, and also with a 1-inch diameter, 0-degree probe from the top of the rail head, vertically, and through

the rail web, laterally. The back reflection for the lateral measurement through the rail web is the web surface opposite the probe side.

- Conduct ultrasonic inspection by a qualified technician. Provide qualification certification of each individual conducting ultrasonic inspection of the material.
 - Permanently mark all indications on the rail head directly over the defect location with the percentage amplitude relative to the back reflection.
 - Vendor shall provide all required rail inspection results.
- d) As an alternative to requirements specified herein above, ultrasonically test all rails furnished by the Vendor 100-percent in-line with a fully computerized DAPCO 200 testing unit. Testing shall conform to the requirements of AREMA Manual Chapter 4, Part 2. A calibration test rail of the same section as being tested will be utilized with the following calibration reference standard:
- Head 3/32-inch wide by 1/2-inch long slot
 - Web 1/16-inch wide by 1/2-inch long slot
 - Base 1/16-inch wide x 1/2-inch long slot
- xiii. Make all rail tests and inspections at the mill prior to shipment. Assume full responsibility for all testing indicated. Give the Engineer sufficient notice when testing in any form is proposed so he may witness the tests. Provide the Engineer, or his representative, free entry at all times to the manufacturer's mill to inspect the processing and testing of rail while work on this Contract is being performed. Perform all tests specified herein at no additional cost. Testing must be witnessed and certified by a qualified independent testing firm or individual.
- xiv. Hardness tests shall be conducted in accordance with ASTM A370. Should the manufacturer perform the testing by another method for his own convenience, the results shall be converted to Brinell Hardness in accordance with the tables in ASTM E10.

E. SUBMITTAL REQUIREMENTS

- i. Format and Procedures
 - a) Dimensions shown on the Vendor's drawings and catalog cuts shall be in Imperial units of feet, inches, and fractions of an inch. Decimals of a foot will not be acceptable. Dimensions of angles shall be in degrees, minutes, seconds, and decimals of seconds. Decimals of a degree will not be acceptable. If the country of origin of the trackwork products uses the SI

system, then Imperial units shall appear on the drawings in addition to the SI units. Imperial units will control.

- b) All notes and texts on the Vendor's drawings and catalog cuts shall be in the English language. Drawings shall have graphic scales.
- c) Drawings for review shall be submitted as ten paper print copies of each drawing and in electronic versions as described below. Finalized "As-built" drawings signed, dated and stamped "FINAL", shall be prepared incorporating any revisions required and submitted as ten paper print copies, and electronic versions for each drawing.
- d) Drawings shall have one-half inch border provided around the full perimeter of each sheet. A title box shall be located in the lower right hand corner and shall contain the following information:
 - "Port Authority Trans-Hudson Corporation"
 - Contract title as it appears in the title box on the Contract Drawings
 - Subtitle specifying what is depicted on drawing
 - Name and address of the Vendor
 - Contract number as it appears in the title box on the Contract Drawings
 - Date of drawing completion.
- e) Electronic versions of drawings for review shall be in Adobe PDF format, submitted on CD-ROM(s). Final versions of all drawings, as well as review submittals where requested by the Engineer, shall be submitted in the latest version of AutoCAD as well as in PDF format. An index of drawings containing drawing numbers and a description of drawings is required.
- f) Where items are identical to each other, or where a component or a part of an item is identical to a component or a part of another item of opposite hand identity or an item of different design, then only one shop drawing of the common component or common part shall be required for submittal.
- g) Within twenty (20) working days after receipt of the shop drawings, the Engineer will approve the same or require corrections or additions to be made thereon. If additions or corrections are required, the Engineer will return within the twenty-day period one set of drawings showing the corrections or additions to the Vendor for incorporation into the shop drawings. Each drawing shall be corrected as required and resubmitted until approval by the Engineer is received.
- h) The Vendor shall not begin manufacture of any item that is to be incorporated into the Work until the shop drawings are approved or until notification to proceed is received in writing from the Engineer.

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i) All final drawings, in their required format, shall be submitted within 30 days after the required delivery of the replacement parts. All shop and design drawings become the property of PATH and may be used on future projects.

ii. List of Submittals:

a) Deliver submittals to PATH and/or Materials Engineering Division, as noted below for review and approval at least 30 days before fabrication:

- Submittals to PATH shall be sent to Port Authority Trans-Hudson, One PATH Plaza, 8th Floor, Jersey City, NJ 07306.
- Where the title "Materials Engineering Division" is used, it shall be understood to mean Manager, Materials Engineering Division, Port Authority Technical Center, 241 Erie Street, Jersey City, New Jersey 07310-1397.

Title	As Described in Paragraph	PATH	Materials Engineering Division
1. Shop Drawings & Product Data	3.D.iii	√	
2. Fabrication and Installation Procedures	3.D.iv	√	
3. Material Certifications	3.D.v		√
4. Acceptance Testing	3.D.vi		√
5. Quality Assurance	3.C		√
6. Operation & Maintenance Instructions	3.D.vii	√	
7. Miscellaneous Rail Manufacturing Documents	3.D.viii	√	√

iii. Shop Drawings and Product Data

The Vendor shall provide shop drawings that will be required in addition to the Contract Drawings or in addition to any other drawing that PATH may issue in supplementing the Contract Drawings. Shop drawings shall include, at a minimum, the following:

- a) Geometric Layout drawing(s) drawn at a minimum scale of 1/4"=1'-0" showing rail lengths along gauge-line and all geometric attributes at centerline of track, plusses and offsets for the closure area of turnout, track gauge and flangeway and other dimensions relating to the trackwork geometry.
- b) General Layout drawing(s) drawn at a minimum scale of 1/4"=1'-0" including all tie lengths, tie spacing, tie plates, all critical dimensions and

necessary data, location of all insulated joints and switch machines, and a list of plans and references for all parts. The plan shall show all of the above to the Limits of Contractor-Furnished Materials, as shown on the Contract Drawings.

- c) Switch drawing(s) shall include straight and curved points, stock rails showing full plan and elevation views, dimensions, cross-sections of critical locations, plusses and offsets for the switch area, transition rail forging, switch point throw dimension at the No. 1 rod, heel spreads of switch tongues and geometric alignment.
 - d) Frog drawing(s) and dimensions of all component parts, showing full plan view, cross-sections, toe and heel spreads and geometric alignment with all appropriate dimensions.
 - e) Switch movement layout drawing showing switch movement, plan and section of each hollow steel tie, running rails and tongue rails, housing plates, switch rods, switch machine, signal rods, and the throw dimension at centerline of No. 1 throw rod. Hollow steel tie details shall show provisions for supporting, guiding and insulating the switch rods. If required by the design, show layout and details for helper rod system or for second switch machine.
 - f) Plate drawing(s) showing and dimensioning each type of tie plate required by the Work.
 - g) Catalog cuts or shop drawings showing miscellaneous parts used and special elements including but not limited to: rail shoulders, rail and plate insulators, bolts, nuts and washers to be incorporated into the Work.
 - h) Include the track stations of Point of Switch (PS) and Theoretical Point of Frog (TPF), if shown on Contract Drawings on the Geometric Layout drawings, General Layout drawings and any panelized track drawings.
- iv. Fabrication and Installation Procedures: The following procedures shall be submitted for approval:
- a) List of proposed suppliers of all components within 90 days of notice to proceed. Subsequent changes in proposed suppliers shall be submitted as they occur.
 - b) Fabrication details of all frogs, switches, rods and plates
 - c) A description of the method to achieve the required rail hardness.
 - d) Marking, shipping and handling plan of special trackwork components.
 - e) Method of handling and shipping running rail for review and approval at least four weeks before shipping of the running rail.
 - f) Shop assembly procedure

- v. Material Certifications: Submit material certifications showing compliance with the Specifications. Certifications shall include the following:
 - a) Bolt certificates of origination and specification compliance.
 - b) Certified test reports for all tests and inspections required by referenced specifications as well as for tests and inspections explicitly mentioned in this Section.
 - c) All other certifications as reasonably required by the Manager, Materials Division.
- vi. Acceptance Testing: Lab certified test reports and associated documentation shall be submitted for approval for the following tests:
 - a) 115RE section steel rail as required by the AREMA Manual
 - b) 33C-1 section guardrail.
 - c) 54E1A1 section switch tongues.
 - d) Manganese steel frog castings.
 - e) Tie pads and plate pads qualification and production testing.
 - f) All other test results as reasonably required by the Manager, Materials Division.
- vii. Operation and Maintenance Instructions shall be provided by the Vendor for the various special trackwork components. Operation and Maintenance Instructions shall include the following:
 - a) Schedule of all components per turnout complete with reference drawing list, part identification numbers and pertinent data for replacement ordering.
 - b) Description, operating and maintenance instructions for special trackwork assemblies.
 - c) Periodic maintenance schedule for all components of the special trackwork, including:
 - Critical locations that require lubrication and type of lubrication to be applied and frequency.
 - Components that require adjustments or tightening.
 - Components that require detailed periodic inspection, and the frequency for which they should be inspected.
 - d) Title sheet listing the Project Name, Contract Title, date of issue, name, address, e-mail, fax, and telephone number of the Vendor.
 - e) Names, addresses, and telephone numbers of Subcontractors and Suppliers responsible for special trackwork components.

- f) Table of Contents listing the operating and maintenance data and other information included in the manual
- viii. Miscellaneous Manufacturing Documents: The following submittals are related to rail fabrication not covered in previous paragraphs):
 - a) Submit certified legal copies of all foreign standards to be used in the performance of the work described herein. The standard shall be in English. If an English language version is not available from the standard writing organization, provide a copy of the standard in the original language of authorship and an accompanying English translation. Foreign standards shall be submitted not less than 60 days before any submittals relative to Work to be performed in accordance with the standard.
 - ix. Schedule of all anticipated submissions, to be provided within 30 days of Notice of Award.
- F. Records of all inspection work by Vendor shall be kept complete and available to the Engineer during the performance of the Contract.
- G. All costs incurred by the Vendor for any technical services, with the exception of Technical Field Work specified in Section 7-of this Part, shall be included in its bid price.

4. MATERIAL

A. GENERAL

- i. All track materials shall be new unless otherwise specified.
- ii. Fabricate all special trackwork components as shown on the Drawings, approved Shop Drawings, and in accordance with the following requirements.
- iii. Special trackwork shall be ballasted construction on concrete ties.
- iv. Special trackwork shall be constructed with zero cant. Provide 1:80 transitions in cant on cross ties as shown on the Contract Drawings. Track outside of special trackwork shall be constructed with 1:40 cant.
- v. The Vendor shall perform all engineering required to design and fabricate turnouts. If the Vendor chooses to revise the dimensions of the components in the Contract Drawings, the Vendor shall return CAD drawings of the proposed revision for review by the Engineer, who will determine if turnouts will fit.
- vi. All turnouts shall be fully floor assembled and operational at the Vendor's plant. After inspection and acceptance by the Engineer, the turnouts shall be dismantled for shipment. All switch ties shall be numbered and rails shall be marked for tie locations for assembly in field locations. Layout plans shall show locations of all switch ties and spacing.

- vii. A minimum warranty of five years on materials and workmanship shall be included in the proposal. The warranty date of a given turnout shall be defined as the day the Vendor completes delivery and unloading of the complete turnout on PATH property. In the event that the turnout is incomplete or subsequently found to be noncompliant with project specifications, to the extent that the turnout cannot be installed, then the warranty date shall be deferred until the date that the Engineer accepts the turnout.

B. RAIL

- i. All rail furnished under this Contract shall be new 115RE rail section, and shall be in accordance with AREMA Manual Chapter 4 requirements for high strength head hardened rail with a hardness in the range of 370-410 BHN.
 - a) All running rail shall be from continuous cast blooms and shall conform to AREMA Manual Chapter 4, Part 2-Manufacture of Rail.
 - b) Classifications, markings, brandings, and stampings shall conform to AREMA specifications.
 - c) All rails shall be capable of being electric flash butt welded and thermite welded in accordance with AREMA rail welding requirements using standard materials, equipment and techniques.
- ii. Mill certification showing compliance with specification shall be furnished at time of inspection. It is the responsibility of the Vendor to inspect rail, including verification of rail hardness, prior to commencing machining.
- iii. Furnish all rails to be used in fabricating special trackwork. Closure rail shall be fabricated in the lengths and curvatures based upon the geometric data shown on the Contract Drawings or approved Shop Drawings. All rails of less than 1000 feet radius must not be sprung to line but shall be pre-curved in a machine.
- iv. Rail end drilling for 115RE rail
 - a) For field welding, drill two holes at 9-1/2 and 15-1/2-inches from rail end.
 - b) For bonded insulated joints, drill three holes at 3-1/2-inches – 9-1/2-inches and 15-1/2-inches from rail end.
 - c) All joint bar holes shall be 1-1/8-inches in diameter and 2-7/8-inches above base of rail.
- v. All rail of same section shall be from the same manufacturer.

C. SWITCH POINTS AND STOCK RAILS

- i. Switch points for turnouts shall be of heavy-web asymmetric 54E1A1 rail type conforming to geometric requirements of EN 13674 Part 3 and meeting or exceeding the AREMA requirements of high strength rail.

- ii. Heel end of switch rails shall be forged to match and electric flash butt-welded to adjacent 115RE rail section. Forged sections shall be heat treated to hardness within 50 BHN of switch points. Welds shall be tested by Vendor in accordance with testing methods specified herein. Joining of 54E1A1 to 115RE rail by bolted joints will not be accepted.
- iii. Front 54E1A1 portion and rear 115RE portion of switch point rails shall each be capable of being laid upon a true flat surface without appreciable twist (change of cant). Each portion (54E1A1 and 115RE) shall be also capable of lying flat (no camber) along their plates.
- iv. Welds are not allowed within the flexible portion of the switch point rails.
- v. The switch rail shall have no rail cant.
- vi. Switch points section shall generally conform to the AREMA Detail No. 5100 (Samson) switch point design in accordance with AREMA Plan 221, with 1/4-inch riser. Switch points shall be uniform riser design with runoff beyond the heel of switch.
- vii. Wherever possible, the machined gauge face of the switch points shall match the gauge face of the 54E1A1 parent rail section. Maintain a minimum head radius of 5/8" at the gauge corner.
- viii. Vendor shall provide shop drawings with detailed cross-sections at regular intervals starting at the point of switch, showing relationship of switch point with stock rail. Cross-sections shall also include the starting point of the full 1/4-inch riser as well as several stations beyond. Switch point thickness shall be shown at each cross-section.
- ix. Sufficient switch rods shall be incorporated to ensure proper alignment of the points when the switch is thrown.
- x. Points shall move satisfactorily with the machines as shown on the approved shop drawings and shall fail to lock up if a 3/8-inch obstruction is inserted anywhere in the moving part of switch rail.
- xi. All spacers and heel blocks shall be attached to the stock rail rather than to the switch point.
- xii. Switch points shall be milled to facilitate the lock and detector rod clamp bolt heads per switch point layout. Bolt heads shall be 1-1/2-inches square.
- xiii. Stock rails shall be undercut in accordance with AREMA Plan 221, Detail No. 5100. The length of the undercut shall be from 12" ahead of the point of switch to the end of the switch side planning. Stock rails shall be of sufficient length to provide thermite welds clear of the switch area.

D. SWITCH MACHINES AND SWITCH RODS

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- i. Provide and package all necessary switch machines with bedplates, switch rods, and hardware to provide proper switch movement, point protection and lockup of points.
- ii. Coordinate the design of the switch rod with hollow steel tie (HST) layout with the switch machine manufacturer to ensure proper fit and operation of the complete switch layout.
- iii. The Contract Documents include a drawing for a standard PATH switch machine bedplate. Design the hollow steel tie mounting around the standard bedplate. No modifications will be permitted to the standard bedplate other than additional mounting holes, if necessary, to fit the specific mounting locations of the hollow steel ties.
- iv. In coordination with the switch machine manufacturer, submit all switch layout drawings to include placement of switch machine and bedplate, mounting, rod and hollow steel tie layouts, detailed dimensioned switch layout drawings and bill of material for each layout. The switch machine configurations shall be designed so that the same HST, bed plate mounting, throw rod, lock rod and point detector rod can be used on either the No. 10 or No. 15 turnouts. The only permissible deviation shall be accommodation of the helper assemblies on the No. 15 turnouts. Demonstrate this interchangeability on the Shop Drawings. If required by the Engineer, physically demonstrate interchangeability during shop inspections.
- v. Switch layout package shall include, but not be limited to the following:
 - a) Ansaldo A5 style switch machine, supplied by PATH.
 - Operating pneumatic pressure: 90 psi.
 - Furnished with 5 inch cylinders, with heater and covers.
 - Control valve: Model CP, with standard wall mount.
 - Cost of shipping switch layout package from PATH, Jersey City, NJ, to the vendor shall be at the vendor's expense.
 - b) All necessary mounting hardware to mount machine onto bedplate and connect machine to the switch layout.
 - c) All necessary switch and helper rods to connect, operate, indicate and lock switch points, including:
 - Front Rod Assembly
 - Lock Connecting Rod
 - Lock Rods
 - Throw Rods (Operating Rods) for machine locations and, if applicable, helper location

- Point Detector
 - Point Detector Connecting Rod
 - Rotary helper rod assembly with all required connections, bearings, adjustment assemblies and tie mountings for concrete and hollow steel ties.
 - All necessary hardware and lugs to connect rods to switch layout.
- vi. All A5 switch machines shall be configured at the factory to suit each application. Switch Machines shall be stenciled with identifying switch number on each machine.
- vii. Switch Machines:
- a) Switch Machines shall be mounted on left hand side of right hand layouts or right hand side of left hand layouts and have the adjacent point open (to machine) when switch is in normal position, unless otherwise specified in Contract Documents.
 - b) Point detector shall check for switch point closure and detect and latch out indication if there is any deflection of switch points when switch machine is locked up.
- viii. The Vendor shall coordinate with the switch machine manufacturer to design and furnish all necessary rods to assure that all switches function properly, and all rods are easily accessible for adjustment.
- a) Factory test shall meet the approval of the Engineer. When approval has been obtained and all necessary parties are satisfied, all layouts shall be repackaged and machines recreated for shipment. All switch machines, mounting brackets and hardware, and associated rods shall be crated and labeled with project name and switch identification. Material other than switch machines may also be shipped on shrink-wrapped pallets, provided that the material is securely fastened and properly labeled.
- ix. Vendor shall furnish all provisions for mounting the switch machine to the turnouts and for successful, reliable operation of the switch machine in service. Such provisions shall include but not be limited to mounting plates, mounting bolts, nuts and washers, insulated elements, elastomer for load attenuation, braces and connecting rods.
- x. Switch machines shall be electrically insulated from running rail potential. This shall be accomplished through the use of insulated switch rods and insulating pads under switch plates on the HST's.
- xi. Control cabling and permanent air connections will be furnished and installed by others. However, Vendor shall protect all cable connections and switch machine control circuitry from damage. Vendor shall assume full responsibility for the physical integrity and operability of internal control cables, relays, and other air

and electrical devices that are an integral part of the switch machines, until the installed switch machines have been delivered to PATH property.

- xii. The switches, including all parts and components provided by the Vendor, shall be designed, tested and constructed so that the power operation is reliable and complies with the Federal Railroad Administration's 1/4-inch obstruction test. The switch furnished by the Vendor shall be adjustable so that in either position, where the switch is held open with a 1/8-inch obstruction at 6-inches from the point of the switch, the switch machine will indicate switch point closure and when held open by a 3/8-inch obstruction at the same place, the switch machine will fail to indicate switch point closure.
- xiii. Mounting of switch machine and bedplate on HST's shall be such that the distance between the centerline of the machine and the gauge line of the nearest stock rail is as shown on the Contract Drawings. The profile of the machine shall not extend above the top of rail elevation.
- xiv. The switch machine shall move both points of the switch at the same time. The two points shall be secured to each other with insulated switch rods that fully extend under the stock rails in either switch position.
- xv. The distance between the switch points when secured to the switch rods determines the switch point throw. The manufacturer shall provide switch rods that produce the following switch point throws:
 - a) Point throw at switch mechanism shall be 3-3/4 inches (plus or minus 1/4-inch) at Rod No. 1 measured 15-1/2 inches behind the tip of the switch point.
 - b) Point throw at each track rod shall be equal to the distance of that track rod from the pivot point, divided by the distance from the number one track rod to pivot point, multiplied by 3-3/4 inches, the point throw at the number one track rod. The track rods shall be adjustable and so centered in the adjustment, that these point openings can be achieved with 1/2-inch adjustment in either direction.
- xvi. Switch rod, complete with jam nuts and coverings from the elements, shall be provided by the manufacturer on the Number One rod for the switch machine operating rod. The switch points shall be drilled so that the front assembly can be bolted to the points. The drilling shall be for 1-inch bolts on 5-inch centers as per AREMA recommended practices. Provide these bolts complete with washers and lock nuts.
- xvii. Provide front rod assembly and all connections to the switch machine for the lock rods and point detector. Provide the switch machine operating rod and all connections to the switch machine.
- xviii. After pre-assemblies are completed, ship the switch machine layout and all other material to PATH as part of the completed turnout package.

- xix. Furnish insulated vertical switch rods equipped with with bolts, security locknuts and cotter pins. Switch clips shall be designed to bolt into the web of the switch rail. Rods shall be specially adapted to work with hollow steel ties. Submit details of the switch rod housing within the HSTs to demonstrate to the Engineer's satisfaction how the rods will be electrically isolated from the HST, thereby avoiding shunting of current around the insulated rod, in all circumstances of longitudinal forces in the switch rails. Design adjustable switch rods with a throw of 3-3/4" inches at the No. 1 rod. A maximum 3/16-inch clearance shall be provided between the top of switch rods and base of stock rails. All switch rods shall project under and beyond the stock rail base in both thrown positions.

E. HOLLOW STEEL TIES

- i. Hollow Steel Ties (HST) as manufactured by VAE Nortrak, Progress Rail, or approved equal shall be furnished as shown on the Contract Documents and shall:
 - a) Enclose all switch rods, operating rod, throw rod, and point detector rod, as well as all other rods and connections to the switch machine and rotary helpers to allow for mechanized tamping of the switch area.
 - b) Provide sufficient clearance between the sides of the HST and the switch rods for smooth operation and maintenance and allow for heaters inside the bottom of the HST.
 - c) Provide mounting for the A5 switch machine and bedplate and maintain proper distance from rail gauge line and alignment and adjustment of all switch rods, connections, and other switch equipment. The switch machine bedplate shall not be welded to the HST's.
 - d) Provide special switch plates and fixation points for plates while maintaining electrical isolation of the tie from the running rails. Test electrical resistance of the tie plate insulation by applying a 500 vdc potential to the top of the rail support plate. Electrical resistance between the rail plate and any point on the metallic body of the tie shall be a minimum of 10 Megohms when tested under dry conditions.
 - e) All hollow steel shall lock the switch machine securely to both stock rails to create a rigid assembly without lost motion. The intent of this requirement is to enable reliable switch point detection and locking for reliable operation.
 - f) Provide fixation points for the rotary helper brackets.
 - g) Provide an easily removable cover.
- ii. Provide HST's in lengths suitable to accommodate switch rods, switch machines, and rotary helper connections.

- iii. HST's shall withstand the vertical impact loads, gauge loads, and lateral loading transferred from the rail without excessive deflection, permanent deformation, or warping. HST's shall also withstand the lateral thrust from the switch machine and the impact and handling of tamping tongs.
- iv. HST's shall be able to withstand the heat emitted from the ballast crib heaters without excessive deflection, permanent deformation, or warping.
- v. Steel shall meet ASTM A588 standards for High-Strength Low-Alloy Structural Steel.
- vi. All connections shall be bolted and allow for removal.
- vii. The Vendor shall coordinate with the manufacturer of the switch machine to ensure proper mounting of the switch machine and bedplate, as well as ensure that all switch rods, operating rod, lock rod, point detector rod, and connections to the switch machines and rotary helpers fit within the confines of the HST's.

F. HELPER RODS

- i. Furnish switch machines with helper rods where indicated on the Contract Drawings.
- ii. Helper rods shall be of a rotary (torsion) style, with a heavy grade structural shaft mounted to the HST's outside of and adjacent to the stock rail opposite the side of the switch machine. The structural shaft shall transfer the throw force from the front switch machine to the rear throw point by rotating and moving a cam that in turn moves the rear throw position.
- iii. Mount the helper shaft to the HST's with brackets that bolt directly to the upper lip of the ties.
- iv. Design helper rod to be mounted directly to the operating rod so that the full stroke of the switch machine is transmitted to the helper rod. Provide Shop Drawings indicating the detailed layout of the helper rod and its connections to both the HST's and the switch rods. Furnish all parts required to completely assemble the helper rod.
- v. Provide detailed ordering information for all replacement parts in the Maintenance Manual.

G. FROGS, SOLID MANGANESE

- i. Frogs shall be solid cast manganese monoblock frog furnished with 115RE rail toe and heel lengths as shown on Contract Documents. Toe and heel rails shall be welded to the manganese casting and shall be fully weldable to high strength 115RE closure rails in the field using the thermite process.
- ii. Manganese frog shall be in accordance with AREMA Portfolio Plan 671 except as modified herein.

- iii. Castings shall be manganese steel in accordance with AREMA Portfolio Plan 100 Section M2.
- iv. Castings shall be three shot explosion depth hardened with a minimum hardness of 352 BHN.
- v. Radiographic testing shall be done in accordance with AREMA Portfolio Plan 100 Article M2.5 Workmanship. Submit test results to Materials Engineering Division.
- vi. Flangeways shall be as per AREMA Portfolio Plan 600 as modified herein:
 - a) Flangeway shall be 2-1/16" deep.
 - b) At point of frog, wing rail risers shall be omitted and frog point shall be depressed
- vii. Toe and heel rails shall comply with all requirements for 115RE rail as stated herein.

H. FROG GUARD RAILS AND APPURTENANCES

- i. Frog guard rails shall be 33C1 rail (formerly known as UIC U-69 or UIC-33) furnished to lengths shown on the Contract Drawings, in accordance with EN 13674, Part 3.
 - a) Tolerance shall be plus or minus 0.020-inch for total width of section from back to guarding face. All other tolerances shall be plus or minus 0.040-inch.
 - b) The hardness of the wheel contact surface shall average 300 Brinell Hardness Number (BHN) (per rail) or greater, measured at the middle of the rail and within 3-feet (1000 mm) of each rail end (3 locations per rail). Any rail producing one or more hardness measurements below 280 BHN shall be measured again at adjacent locations, and the rail shall be rejected if the repeat measurements fall below the minimum hardness value. Hardness variations shall not exceed plus or minus 30 BHN within any rail length. Adjacent point variations shall not exceed plus or minus 20 BHN.
 - c) The chemical composition shall be in accordance with EN 13674, Grade R260 or the AREMA Manual, Chapter 4 for Standard Chemistry Rail Steel, as long as Brinell hardness requirements cited above are met. Alloying to improve hardenability shall not exceed the limits allowed in the referenced section of the AREMA Manual.
- ii. Guard rail shall be flared as per AREMA Portfolio Plan 504.
- iii. Guard rail flangeway shall be 1-3/4" as furnished but shall have an adjustable range from 1-3/8" to 1-7/8" through the use of shims. Guard rail shall be bolted to braces as shown on Contract Drawings.

- iv. Low-profile spring rail clips such as PVT, Schwihag or approved equal shall be used to hold down the gauge side of the running rail at guard rail brace plates. Standard e-clips shall not be used for this purpose.
 - a) Mounting braces shall be fabricated for concrete switch ties with specific height as shown on the Contract Drawings. Mounting plates shall be secured to ties through the use of Pandrol 'e' clips and Pandrol shoulders.
 - b) Guard rail mounting bolts shall be square head, 7/8-inch diameter by 4-inches long with a hole for a cotter pin, in accordance with ASTM A325. Nuts shall be castellated hex nuts. Threads shall be 9 UNC, 2A and 2B fit. Spring washers shall be in accordance with the AREMA Manual.
- v. The guard rail offset adjustment shims shall be ASTM A36 steel, galvanized to the requirements of ASTM B695 or non galvanized A36 steel with the addition of not less than 0.20 percent copper.
 - a) Brace shall be designed to position shims between the guard rail and mounting brace when shims are in use and store shims behind the brace (toward track gauge) when not in use.

I. SWITCH AND FROG PLATES

- i. Switch slide plates shall be as shown on Contract Drawings and as follows:
 - a) Plates shall accommodate spring clips for attachment of stock rail and switch points. Switch plates shall be designed for 54E1A1 asymmetric switch points. Switch plates under 54E1A1 switch points shall provide for a low-profile spring rail clip, extending under the slide plate, to hold down the gauge side rail base of the stock rail. Acceptable clips are Schwihag, PVT or approved equal. Stock rail braces shall not be used on any switch plates.
 - b) A sufficient number of switch plates shall be equipped with switch point rollers to allow smooth movement of the switch points between normal and reverse positions. Switch plate rollers shall be adjustable multi-roller assemblies that are housed in the slide plate, Schwihag or approved equal. Lubricant will not be accepted as a substitute.
 - c) Cast switch plates shall be designed to be affixed to the concrete ties and hollow steel ties with spring clips.
- ii. Switch heel plates and frog plates shall be affixed to the concrete ties through the use of Pandrol 'e' 2055 rail clips, standard cast Pandrol shoulders, and 'pop-up' shoulders. Vendor shall do detailed engineering to develop the mounting plan for each plate within the constraints of the concrete tie footprint and reinforcement locations.
 - a) Rail clips shall secure outside of running rails, including stock rails, to the switch plates throughout the turnout with the use of weld-on and 'pop-up'

shoulders. Resilient spring clips shall be right hand mounting wherever possible. If left-hand clips are required, show locations in Shop Drawings.

- iii. Rails throughout the turnout area shall be uncanted.
- iv. Welded monoblock manganese frog shall be secured to frog plates using Pandrol e-clips inserted into Pandrol shoulders welded onto plates. Vendor shall demonstrate during shop inspection that frog plates can accommodate replacement monoblock manganese frogs without modification to the frog plates. This shall be done assembling the turnout using a second frog.
- v. All switch, frog, and other turnout plates shall be rolled mild steel in accordance with AREMA Portfolio Plan 100 Article M7 and ASTM A36 with the exception of the plates utilizing PVT and Schwihag rail clamps which shall be cast ductile iron in accordance with AREMA Portfolio Plan 100 Article M5 and ASTM A536, Grade 65-45-12.
- vi. Metal components shall be corrosion-resistant, consistent with strength and hardness requirements. Metal components shall not be brittle, able to withstand handling at minus 29 degrees Celsius, and be sufficiently ductile to withstand installation and maintenance activities.

J. INSULATED JOINTS

- i. Insulated joints shall be shop-assembled, bonded units manufactured by Allegheny Rail Products, Koppers or approved equal.
 - a) Provide insulated joints at locations shown on the Contract Drawings. Plug rail shall be at least 12 feet long on both sides of insulated joint.
 - b) Rail gaps shall be 3/16" at insulated joints locations.
- ii. All insulated joints shall be suspended over tie cribs.
- iii. Any raised brand on web of rails within joint bar area shall be ground flush with web.
- iv. Insulated joints shall comply in all respects with the provisions of AREMA Manual, Chapter 4, Section 3.8. Provide certified qualification test results, less than three years old, that demonstrate compliance with AREMA requirements.

K. REPLACEMENT PARTS

- i. Furnish the following replacement parts with this order:
 - a) Furnish the following replacement parts for the right-hand No. 10 Turnout designated as Turnout 27:
 - LH straight stock rail: 1 each
 - RH curved stock rail: 1 each

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- LH curved switch point: 1 each
 - RH straight switch point: 1 each
 - Full set of switch rods including operating, lock and point detector rods: 1 each.
 - No. 10 Frog: 1 each
- b) Furnish the following No. 15 Turnout replacement parts for Turnout 7 and Crossover 11:
- LH straight stock rail: 2 each
 - RH curved stock rail: 2 each
 - LH curved switch point: 2 each
 - RH straight switch point: 2 each
 - LH curved stock rail: 1 each
 - RH straight stock rail: 1 each
 - LH straight switch point: 1 each
 - RH curved switch point: 1 each.
 - Full set of switch rods including operating, lock and point detector rods for Hollow Steel Ties: 2 each
 - No. 15 Frog: 2 each
- ii. All replacement stock rails, points, and frogs shall be furnished as per the original design length at each rail end except point of switch. Provide shop drawings of replacement parts for review prior to fabrication.

L. RAIL FASTENINGS

- i. Rail Clips
- a) Pandrol "E" '2055' clips shall be used for all rail fastenings. No substitutions will be permitted except as described above.
- Except where otherwise explicitly permitted by these contract documents, the toe load on each Pandrol rail clip shall be 2750 lb, +/- 10 percent.
 - Pandrol clips shall not interfere with joint bolts. Pandrol Modified "E" clips or approved equal shall be used at all bonded insulated joint locations. Pandrol "C" clips or approved equal shall be furnished at all field weld joint locations, to accommodate temporary joint bars.

- b) The supplier of the rail fastening shall submit shop drawings for all components of the fastening system showing all dimensions and the manufacturing tolerances.
- ii. Tie Plate Pads
 - a) This article applies to pads installed between plates and ties in special trackwork. For pads installed directly under the rails, see Reference Specification 03480.
 - b) Use tie plate pads, described below, under the plates on all special trackwork ties where a plate is required. The tie pad shall be a 9 mm thick special trackwork pad as manufactured by Press Seal Gasket or approved equal.
 - Hardness: Measure the hardness in accordance with ASTM D2240. The reading on each pad shall be between 60 and 90 Durometer, Shore A.
 - Tensile Strength, measured by ASTM D412: 1,500-psi, minimum.
 - Ultimate Elongation, measured by ASTM D412: 250-percent, minimum.
 - High Temperature Compression Set: Using Method B of ASTM D395 with Type 2 specimen, test for 22 hours at 100 degrees Celsius. The compression set shall not exceed 30-percent.
 - Low Temperature Compression Set: Using ASTM D1229, test for 22 hours at minus 18 degrees Celsius. The specimen thickness shall be 6.0 mm plus or minus 0.2 mm. The compression set at 30 minutes after release (t30 reading) shall not exceed 40-percent.

M. RAIL JOINTS

- i. All non-insulated rail joints shall be furnished with new joint bars matching the rail section and with two holes in each rail end for thermite welding, unless otherwise noted on the Contract Drawings.
- ii. All joints will be thermite field welded by others. The Vendor shall furnish sufficient field weld kits from Orgo-Thermit, Inc. or approved equal to field weld all joints within special trackwork and adjoining track up to the Limit of Supplied Material. Welded joints within special trackwork shall be located as shown on the Contract Drawings or approved shop drawings.
- iii. All 115RE field weld kits shall be formulated for welding high strength rail sections.

N. TRANSITION RAILS

- i. Provide forged welded transitions between 100ARA-B and 115RE rail sections as shown in Contract Documents.
 - a) Brinell hardness shall be the same as adjacent head hardened rail: 370-410 BHN.
 - b) Transition rails shall be furnished as plug rails. Both ends shall be drilled with two holes for field welding, unless otherwise directed in the Contract Drawings.
 - 115RE drilling: See 6.B.iv above
 - 100ARA-B drilling: Drill two 1-1/8-inch diameter holes, 2-1/2" above base of rail. One hole shall be of 9-29/32-inches from end of rail and the second shall be 15-13/32-inches from end of rail.
 - c) Provide both left hand and right hand transitions in the quantities required to connect to existing rail as indicated on the Contract Drawings.

O. WOOD CROSSTIES

- i. Provide 7 inch by 9 inch white oak crossties for wood-to-concrete transition zones in quantities and lengths shown on Contract Drawings in accordance with AREMA Manual Chapter 30, Part 3-Solid Sawn Timber Ties.
- ii. Preplate ties with 1:40 cant Pandrol tie plates to accommodate the rail section to be provided (115RE throughout, except for five ties for 100ARA-B under Type A Transitions).

5. EXECUTION

A. GENERAL PROCEDURES

- i. Ensure that all moving parts of switches throw freely and that the movable parts of these assemblies remain at least 1/2-inch clear of ties, plates or any other elements of the assembly that may impede free movement, through the entire range of the throwing motion.
- ii. Verify that ample space is provided for use of standard tools and operations to maintain the special trackwork, including but not limited to throw adjustment, locking adjustment, replacement of rods, and replacement of point and stock rail combinations. List required special tools and procedures for these operations in the maintenance manuals.
- iii. Furnish five sets of any special tools required upon completion of shop assembly and inspection. Provide ordering information for additional sets of special tools in the maintenance manuals.

B. MANUFACTURE OF RAIL

- i. Rail shall have been rolled not more than 12 months prior to contract award date.

- ii. A mill certificate shall be furnished to the Engineer containing the following data:
 - a) The identity of each rail in a charge by heat, bloom and letter.
 - b) The identity of each equivalent sample by heat.
 - c) A listing of the accepted and rejected rail in each charge.
- iii. All running rail shall be manufactured in accordance with AREMA, except as specified herein.
- iv. Cut rails square and clean by means of rail saws, or abrasive cutting wheels. Torch cutting is prohibited.
- v. Rail shall be roller-straightened.
- vi. Rails failing to meet the requirements of these Specifications shall be reworked, retreated, cutback or rejected in accordance with the AREMA, as modified herein.
- vii. End flares for the guard rail shall be milled in the shop before delivery to the Work Site. End flares shall not be cut in the field.

C. FROG DEPTH HARDENING

- i. Castings shall be explosive depth hardened or otherwise treated in accordance with the AREMA Track Portfolio, Plan 100, Article M2.7. After the castings are hardened, an approved testing agency shall inspect each casting as follows:
 - a) Visual inspection or penetrant testing for cracks, flaws, or porosity.
 - b) Hardness in accordance with ASTM E10.
- ii. Shop Drawings shall specify the procedures to be used in the depth hardening process, the portions of each frog which are to be depth hardened, and the Brinell hardness pattern which the Vendor normally achieves with such procedures.
- iii. Submit reports of the tests and inspections for review. Repair defective castings damaged as a result of this inspection as specified below. Rearden castings rejected for lack of hardness at no additional cost. Defects detected in the immediate wheel running surfaces of the castings shall be rejected and not be repaired. Replace non-repairable castings at no additional cost.
- iv. Repair defects in the castings in accordance with the AREMA Portfolio, Plan 100, Article M2.6, as modified herein. Defects repaired by welding shall be made only by shielding manual arc welding or semi-automatic arc welding, in accordance with AWS D1.1, latest issue. Only use manganese filler to repair defective areas.
- v. After weld repairs, the independent testing agency shall re-inspect the repaired areas of the castings, in accordance with ASTM E94 and determine the acceptance of the castings.

- vi. The tolerance for Brinell hardness shall be minus 10 Brinell points. The maximum shall be open, but subject to metallurgical steel structure detrimental to the product.

D. SWITCH HEATERS

- i. Switch heaters and ballast crib heaters shall not be furnished as part of this contract.
- ii. HSTs shall accommodate ballast crib heaters, supplied by others, below the switch rods. HSTs shall be designed to permit installation, power supply and replacement of switch heater elements and power supply cords by removal of HST end plates or other methods approved by the Engineer. Illustrate means or switch heater installation or replacement on the shop drawings.
- iii. Coordinate with supplier of switch heater and ballast heaters, providing adequate information on tie and switch dimensions to permit the switch heater supplier to properly size and locate heaters and power feeds.

E. SHOP ASSEMBLY

- i. Each turnout and crossover, including concrete switch ties shall be fully mounted and laid out on the Vendor's shop floor for inspection purposes. The Engineer will inspect all special trackwork units. Notify Engineer at least 15 days in advance of the final date when special trackwork units will be available for inspection. Reconfirm that the assembly will actually be complete and ready for inspection no later than 48 hours prior to the promised date and time for the commencement of inspection.
- ii. Costs associated with delays in inspection dates, such as financial penalties for changing flights of Engineer or designated personnel, will be at the Vendor's expense.
- iii. Special trackwork layouts shall have been completely inspected by the Vendor's quality control representatives and all corrective actions taken prior to the arrival of the Engineer. Provide the Engineer with a copy of inspection reports, deviations noted, and re-inspection reports.
- iv. Provide a minimum of 8 hours during normal daylight working hours for the Engineer to inspect each completely assembled layout before disassembly for shipment is scheduled to commence.
- v. The Engineer will examine shop-assembled items up to a maximum of one trip and one day per layout at its own expense; additional trips and time will be charged to the Vendor. If the Engineer must either make a second trip or stay extra time for re-inspections due to the Vendor's failure to present acceptable materials in a timely fashion, the Engineer's extra costs for labor (including overhead costs and fee), transportation, lodging, and per diem will be deducted from money due or to become due to the Vendor.

- vi. The switch movement(s) shall be connected to the throw rod(s) with approved connecting rod(s). Switch movement(s) shall be operated with 90 psi (pounds per square inch) compressed air to test the switch for satisfactory operation.
- vii. The inspection shall include the fully assembled crossover fully fastened with plate fastenings and rail clips applied. The Engineer may choose to waive some or all of his/her inspections at the plant but in all cases the Vendor shall conduct his/her own inspection of parts and fully assembled crossover. The Vendor shall submit results of his/her own inspections to the Engineer using inspection forms in accordance with Section 5D of this Part.
- viii. Vendor shall use one of the PATH supplied switch machines in its shop for fitting and testing, and ship this machine as part of the order when fitting and testing are complete.

F. HANDLING, SHIPPING, AND LOADING

- i. Submit the proposed method of grouping, packaging, handling, and loading for all items to the Engineer for review during the submittal of Shop Drawings.
- ii. Upon approval by the Engineer after his/her inspection, or in the case where the Engineer waives his/her inspection, The Vendor shall prepare the crossover for shipment as follows:
 - a) Switch portion of turnouts shall be panelized less the switch machine. Switch point and stock rails shall remain fully clipped to their plates. Indicate weight of panelized section.
 - b) All other components pre-assembled for inspection prior to shipment including turnout frogs, shall be shipped in complete partial subassemblies.
 - c) All switches, rails and frogs shall be fully painted with bituminous black enamel paint to prevent corrosion.
 - d) All switches, rails and frogs shall be painted with markings identifying the item, the adjoining item to which it will be joined and the Turnout number. Rail flanges shall be paint marked to indicate each tie plate location.
 - e) All ties shall be tagged with a mark number using aluminum or stainless steel tags.
 - f) The centerline of the tangent track shall be marked on the ties by painting a 1/8 inch wide black stripe on each tie for the entire length of the switch or crossover.
 - g) Small loose parts shall be shipped in secure shipping boxes and kegs. Cardboard boxes, pallets not fully banded, and loose items for shipping are not acceptable.
 - h) All assembled parts, pallets, bundles, boxes and kegs shall be clearly marked or tagged in the appropriate turnout identification color with the

following: identifications of item contained, Vendor's name, shipping date, number of pieces, destination, gross weight, turnout letter designation, and special trackwork unit for which parts are intended.

- i) All contact rail inserts in concrete ties shall be covered with plastic caps.
- iii. All components and parts of any one trackwork item shall be delivered at the same time with the exception of parts, which may be delivered later as described elsewhere herein.
- iv. Carefully handle all special trackwork components in a manner which will prevent damage during loading, unloading, storing, and transporting. Rails shall not be dropped or struck sharply. Handle and ship all rail and special trackwork in accordance with AREMA Manual.
- v. Ship special trackwork by rail if manufactured in the United States or in open top containers if manufactured overseas.
- vi. Prior to each delivery, give the Engineer fifteen (15) business days' notice. At the time of notification of delivery, the Engineer will advise the Vendor of who will be responsible for unloading.
- vii. All deliveries shall be F.O.B. delivered. It is anticipated, but not guaranteed, that unloading may be done solely by, or in conjunction with others. Therefore, it may be necessary for the Vendor to unload the delivered items. Additional costs, if any, for Vendor unloading operations will be reimbursed in accordance with Part III, Section 8 "Extra Work".
- viii. Deliver all items to a location(s) within a ten-mile radius of Jersey City, NJ as determined by PATH. At the time of notification of delivery, the Engineer will advise the Vendor of the actual delivery location. All deliveries from overseas shall be through the Port of NY & NJ. Deliver signal related material to Port Authority Trans-Hudson Corporation, Waldo Stockroom and Signal Shop, 122 Academy Street, Jersey City, NJ 07302.
- ix. Make all deliveries during regular business hours between 7 AM and 12 Noon at the locations specified herein. Make no deliveries on Saturdays, Sundays or holidays within the State of New Jersey, unless otherwise approved by the Engineer.
 - a) Provide confirmation notice within 48 hours in advance of deliveries except for signal- related material to the Track Supervisor's office at 201-216-7027.
 - b) Provide confirmation notice within 48 hours in advance of deliveries for signal-related material (consisting of switch machines, control valves, helper rod system – if furnished, and switch point lock clamps) to Mr. Michael Galluccio, Chief Supervisor of Signal Construction.

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- x. Delivery of Special Trackwork will be deemed complete only after the Engineer conducts an inspection of these products and determines that they are satisfactory in regards to their conformance to the approved designs, that they are of the proper quantity, and that they are in a satisfactory condition after shipment. The Vendor, at its own expense, shall replace or supply any products that the Engineer determines are in non-conformance with the approved designs, or are of insufficient quantity, or are damaged.
 - a) This inspection will be conducted no later than three (3) days after actual delivery of Special Trackwork.
 - b) At its option, the Vendor shall be entitled to be present when the Engineer conducts this inspection. The Vendor shall also be entitled to conduct its own inspection in the event that the Engineer has determined that the delivery is not satisfactory, as described herein.

END OF SECTION

SECTION 03480

CONCRETE TURNOUT TIES, CROSSTIES AND FASTENINGS

PART 1 – GENERAL

1.01 DESCRIPTION

- A. This Section includes specifications for design, fabrication of component parts, manufacturing, qualification testing, quality control, handling, shipping, and unloading and stockpiling of monoblock prestressed concrete crossties and turnout ties, together with cast rail fastening shoulders and embedded inserts.
- B. Two types of monoblock prestressed concrete ties shall be provided.
1. Standard 8 feet – 6 inch crosstie with embedded rail fastening shoulders and stainless steel threaded inserts for attachment of the third rail extension plate. Each tie shall include rail, fastening spring clips, spring clip insulators and insulating elastomeric rail pads.
 2. Concrete turnout ties varying between 7 feet - 6 inches and 16 feet long shall include with embedded rail shoulders for attachment of either running rails or switch, heel, guard rail and frog plates. Inserts are also required in most ties for attachment of the third rail extension plate bracket. Ties in crossover areas between frogs also will require attachments for tie splices.
- C. Track Configuration for Concrete Tie Design: Concrete cross tie design loading using AREMA's Flexural Performance Requirements are for use in ballasted track sections with 115 RE rail and 4 feet 8-1/2 inch gauge. For purposes of design of the concrete ties only, the design spacing shall be 30 inches.

1.02 REFERENCES

<u>Sponsor</u>	<u>Number</u>	<u>Subject</u>
AASHTO	T26	Standard Method for Test for Quality of Water to be used in Concrete.
ACI	301	Specifications for Structural Concrete.
ACI	305	Hot Weather Concreting.
ACI	318	Building Code Requirements for Structural Concrete
AREMA		Manual for Railway Engineering, Volume I, Chapter 30, "Ties," Part 4, hereinafter referred to as the AREMA Manual.
ASTM	A421	Standard Specification for Uncoated Stress-Relieved Steel Wire for Prestressed Concrete.
ASTM	A881	Specification for Steel Wire, Deformed, Stress-Relieved or Low-Relaxation for Prestressed Concrete Railroad Ties
ASTM	C31	Standard Practice for Making and Curing Concrete Test Specimens in the Field

Sponsor	Number	Subject
ASTM	C33	Specification for Concrete Aggregates
ASTM	C39	Test Method for Compressive Strength of Cylindrical Concrete Specimens
ASTM	C78	Test Method for Flexural Strength of Concrete (Using Simple Beam with Third-Point Loading)
ASTM	C143	Standard Test Method for Slump of Hydraulic-Cement Concrete.
ASTM	C150	Specification for Portland Cement
ASTM	C172	Practice for Sampling Freshly Mixed Concrete
ASTM	C231	Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
ASTM	C359	Test Method for Early Stiffening of Portland Cement (Mortar Method)
ASTM	C494	Specification for Chemical Admixtures for Concrete
ASTM	C1260	Standard Test Method for Potential Alkali Reactivity of Aggregates (Mortar-Bar Method)
ASTM	C1293	Standard test Method for Determination of Length Change of Concrete Due to Alkali-Silica Reaction
ASTM	C1567	Standard Test Method for Determining the Potential Alkali-Silica Reactivity of Combinations of Cementitious Materials and Aggregate (Accelerated Mortar-Bar Method)
ASTM	D257	Test Methods for DC Resistance or Conductance of Insulating Materials
ASTM	D570	Standard Test Method for Water Absorption of Plastics.
ASTM	D573	Standard test Method for Rubber Deterioration in an Air Oven.
ASTM	D732	Standard Test Method for Shear Strength of Plastics by Punch Tool.
ASTM	E122	Standard Practice for Calculating Sample Size to Estimate, with Specified Precision, the Average for a Characteristic of a Lot or Process.
PCI	MNL 116	Manual for Quality Control for Plants and Production of Structural Precast Concrete Products

1.03 DESIGN CRITERIA AND REQUIREMENTS

- A. Design: Prepare the final design of each of the types of concrete crossties, turnout ties and appurtenances required for use in ballasted track:
1. Monoblock concrete crossties with Pandrol shoulders, e-clips and threaded inserts for attachment of the third rail extension plate.
 2. Monoblock concrete turnout ties varying between 7 feet - 6 inches and 16 feet in length with embedded rail shoulders where indicated on the Contract Drawings. Where used in crossovers, some ties shall be furnished in two segments that are joined together with tie splices in the gauge of the track.

3. Turnout ties shall be furnished with either or both of the following configurations, as required by the tie location in the turnouts:
 - a. Two or more rail seats with Pandrol shoulders and e-clips, for mounting of individual rails with rail pads.
 - b. Embedded Pandrol shoulders for attachment of switch plates, heel plates, frog plates or guard rail plates to the tie using rail clips.
- B. All crossties and turnout ties, except at locations specifically indicated otherwise in the Contract Drawings, shall have two inserts embedded in each end for mounting of third rail extension plates by others.
- C. Track Configuration: Prestressed concrete turnout ties shall be designed for use in ballasted track sections with 115 RE continuously welded rail. The track gauge shall be 4 feet 8-1/2 inches and the tie spacing shall be based on 30 inches. The tie support foundation shall be based on a minimum 12-inch layer of crushed quarry rock ballast stone and 8-inch layer of subballast. The allowable bearing pressure at the tie/ballast interface shall be limited to 65 psi.
- D. Installation and Track Maintenance: The compaction of ballast under and around the concrete tie will be done by using hydraulic or electric activated tamping tools on a production ballast tamper. The tie must resist these tamping forces without spalling of concrete on the sides and bottom corners.
- E. Design Parameters and Operating Conditions
 1. Maximum spacing is 30 inches.
 2. Multiple unit electrically propelled trains of up to 10 cars operating at speeds of up to 60 mph on mainline track.
 3. The design axle loads are 26,000 pounds subject to a 300 percent minimum impact factor.
 4. Annual tonnage on each track is approximately 10 million gross tons
 5. Design moments and test loads for the concrete ties, as calculated from the formulas in AREMA Manual Chapter 30. If the Vendor proposes to use the axle loads stated herein to design ties for bending moments other than those calculated by AREMA formulas, Vendor shall submit all of its proposed design loads and calculations showing the derivation of these moments, for review and acceptance by the Engineer. Calculations shall show all assumptions and cite relevant design standards.
- F. Tie Design, Components, and Dimensions:
 1. Concrete ties shall be of a prestressed monoblock design, provided with steel prestressing tendons and rail fastenings consisting of embedded cast iron shoulders, Pandrol standard e-clips, plastic insulators, and pads. Switch plates, heel plates, frog plates and tie splices shall be in accordance with Part V. Two inserts shall be provided at each end of each crosstie and at each end of each turnout tie for attachment of third rail extension plates, except at explicit locations shown on the Contract Drawings as not requiring inserts. .

- a. Existing concrete tie designs that have already passed tests equivalent to those specified herein may be excepted from certain tests if so approved by the PATH.
 - b. For such acceptance to be given, certified laboratory test reports shall be submitted in sufficient detail as required by the PATH to make the determination as to its equivalency.
 - c. The concrete turnout ties shall be suitable for manufacturing in various lengths from 7 feet – 6 inches to 16 feet on an economical production basis.
2. The tie design and fabrication shall be subjected to the acceptance tests specified in Article 3.07. Failure of the concrete ties to pass the prescribed tests will be cause for rejection.
 3. Location and tolerances of rail fastening shoulders shall be in accordance with the fastening manufacturer's drawings and specifications.
- G. Turnout Tie Configuration
1. Provide concrete turnout tie configurations for all turnouts as shown in the Contract Drawings and fully coordinate concrete tie layout with hollow steel tie (HST) locations shown therein. See Section 05660 for HST requirements.
 2. Concrete tie sets shall have embedded inserts for mounting of all switch attachments, including rails, plates, switch machine bedplates, third rail extension plates and rotary helper rod brackets.
 3. Provide as part of the turnout tie set every tie that, due to the turnout configuration, must be in any way modified from a standard 8'-6" concrete tie with 1:40 canted rail seats.
- H. Rail Fastening Assembly:
1. Crossties and turnout ties shall include cast shoulders for the Pandrol Type "e" Series rail clips.
 2. Ties shall be designed so that the rail clips can be easily installed or replaced in the field by one worker using standard, readily available track tools. Clips shall also be capable of being installed by commercially available automated equipment. Clip installation and removal shall not damage the tie, shoulder, clip, or rail. The rail clip shall not notch or otherwise damage the rail base during installation or removal.
 3. Rail Cant:
 - a. Rail seats on crossties shall be sloped at 40:1 toward the gauge side of the rail.
 - b. Turnout ties shall have zero cant.

- c. One transition tie with 80:1 cant shall be provided at each location where rail cant changes from 40:1 to zero. Show locations of transition ties on shop drawings for each turnout.
- 4. Rail fastening assembly shall be subjected to the acceptance tests specified under Article 3.07. Failure of the fastening system to pass the prescribed tests will be cause for rejection.
 - a. Existing fastening designs which have already passed tests equivalent to those specified herein may be excepted from certain tests if so approved by the PATH.
 - b. For such acceptance to be given, certified laboratory test reports shall be submitted in sufficient detail as required by the PATH to make the determination as to its equivalency.
- I. Cap plugs: Shall be furnished for each insert to prevent entry of moisture and debris.

1.04 SUBMITTALS

- A. General: Submit the following to the PATH and/or Materials Engineering Division as noted for review and approval at least 30 days before fabrication
 - 1. Submittals to PATH shall be sent to Port Authority Trans-Hudson, One PATH Plaza, 8th Floor, Jersey City, NJ 07306.
 - 2. Where the title “Materials Engineering Division” is used, it shall be understood to mean Manager, Materials Engineering Division, Port Authority Technical Center, 241 Erie Street, Jersey City, New Jersey 07310-1397.
- B. **List of Submittals:**

	Title	Reference	PATH	Materials Engineering Division
1.	Shop Drawings	1.04.C and 1.04.H.	√	
2.	Samples	1.04.J	√	
3.	Certified Test Reports	1.04.G	√	√
4.	Plant Certification	1.05.A	√	
5.	On Site Review and Acceptance	1.04.D	√	
6.	Concrete Tie Marking Scheme	1.04.E	√	
7.	Test Records and Documentation	1.04.F	√	√
8.	Design Calculations	1.04.I	√	
9.	Concrete Mix Design	3.01		√

	Title	Reference	PATH	Materials Engineering Division
10.	False Set Penetration Test	2.01.A		√
11.	Uniformity of Cement	2.01.A		√
12.	Aggregate Tests (ASTM C33)	2.01.B		√
13.	Alkali-Carbonate Reaction	2.01.B		√
14.	Water Soluble Chlorides	2.01.C		√
15.	Admixtures Tests	2.01.D		√
16.	Compressive Strength Test	3.02.A		√
17.	Flexural Strength Test	3.02.A		√
18.	Acceptance Tests			
a.	Design Criteria and Requirements	1.03	√	
b.	Center Positive Bending Moment	3.07.E	√	
c.	Center Negative Bending Moment	3.07.F	√	
d.	Rail Seat Vertical Load Test	3.07.H	√	
e.	Rail Seat Repeated Load Test	3.07.I	√	
f.	Bond Development, Tension Anchorage & Ultimate Load	3.07.G	√	
g.	Fastening Insert Torque Test	3.07.J	√	
h.	Fastening Uplift Test	3.07.K	√	
i.	Electrical Impedance Test	3.07.L	√	
j.	Fastening Repeated Load Test	3.08.E	√	
k.	Fastening Longitudinal Restraint Test	3.08.F	√	
l.	Fastening Lateral Restraint Test	3.08.G	√	
m.	Tie Pad Test	3.08.C	√	
n.	Tie Pad Attenuation Test	3.08.D	√	
19.	Quality Control Program	1.05.C	√	
20.	Production Control Program	1.05.D	√	
21.	Organization and Management Plan	1.05.E	√	
22.	Method of Storage, Handling, and Shipping	3.010	√	

- C. **Shop Drawings:** Submit shop drawings for concrete ties in accordance with Part II for approval. These drawings are to be complete and detailed. Shop drawings shall consist of fabrication diagrams, all dimensions, including a layout of the steel prestressing tendons, rail fastening components, inserts, and any other pertinent information. Shop drawings showing dimensions and configuration for each turnout tie.
- D. **On Site Review and Acceptance:** Submit a quality control plan for the manufacture of ties and components, and a fabrication plan describing the tie manufacturing process. Submit the method of handling, shipping, unloading, and stacking of concrete crossties for review and approval at least four weeks before shipping of the concrete crossties.
- E. **Concrete Tie Marking Scheme:**
1. Each crosstie shall be marked with the name of the manufacturer and a unique tie design identifier by which the manufacturer can locate design drawings and details in its files.
 2. In addition, each turnout tie shall be marked with a unique identifier that indicates which turnout unit it is associated with and its position in that unit. Turnout tie identifiers shall be inscribed into the tie with characters not less than 2 inches high.
 3. Each turnout tie and crosstie shall be provided with a date plug or equivalent serial number by which the plant, casting date and batch number can be traced.
- F. **Test Records and Documentation:** Provide test records and all other required test documentation, for informal review during the in-plant inspection and formally submit for approval prior to shipping of the ties.
1. Submit concrete batch compositions as outlined in Section 2.01. The submission shall include physical and chemical composition of the batch, including type and source of cement and admixtures used, source and gradation of aggregates, source and quality assurance of water, curing procedure, including concrete strength at prestress transfer and separation of the tie from the form. Provide complete documentation regarding the concrete mix and satisfy the Engineer that the concrete composition and quality is suitable for its intended purpose.
 2. Documentation confirming the quality of the material used in prestressing tendons and Pandrol shoulders.
 3. Documentation that the proposed concrete tie and shoulders will satisfy all test requirements as specified herein. Such documentation may include qualified laboratory test results, calculations and performance reports from a proven fastener design with ten (10) years of operational service.
 4. Mail Certificates of Compliance directly to PATH for each shipment. If the supplier is not certified under one of the ISO 9000 Series of Quality System Standards or equivalent quality system standard, the Production and Quality Control Plans shall be submitted to PATH. PATH must approve the method of packaging for shipment prior to production.
 5. Tie fabrication schedule

- G. **Certified Test Reports:** Submit test reports and/or certificates of compliance indicating that the tests identified in articles 1.04.B, 3.07 and 3.08 of this specification have been performed and that the test reports and other specified documents comply with these specifications.
1. Insulator testing results
 2. Tie pad testing results
 3. Contact Rail support plate inserts
 4. Submit two (2) copies of the results of all inspection and quality control tests to the Engineer within 48 hours of the performance of the daily production quality control tests
- H. Shop Drawings and Data requirements:
1. Shop Drawings show the general arrangement and such details as are necessary to provide a comprehensive description of the work to be performed.
 2. As indicated below, prepare Shop Drawings including design calculations and other data as may be required by the Specifications as are necessary to adequately perform the work.
- I. Furnish tie-design calculations prepared in accordance with AREMA Chapter 30, Part 4 including bending moments and loads for specified tests, and other required data in PDF files designed to print standard 8-1/2 by 11 inch sheets. Calculations shall include shear and moment analysis for the tie under no-cracking conditions and shall consider all long-term permanent prestress losses. Each sheet shall bear the information required by paragraph H.3 above, except that the 5 inch square blank space will not be required.
- J. Samples:
1. Unless otherwise indicated, submit not less than two identical samples of each type of component to be used in the fabrication prior to supply of concrete tie.
 2. Label each sample indicating:
 - a. Contract Name and Number.
 - b. Name of Contractor and Subcontractor.
 - c. Material or equipment represented.
 - d. Source.
 - e. Name of producer and brand.
 - f. Reference Specifications Section and Article Number.

1.05 QUALITY ASSURANCE AND CONTROL

- A. Qualifications of Manufacturer:

1. Concrete ties shall be produced in a plant or production facility by a manufacturer that has been regularly and continuously engaged in the manufacture of precast, prestressed concrete ties for a minimum of five years.
 2. The manufacturer shall have sufficient production capacity to produce the required number of ties in accordance with the quality requirements and without causing any delay in the work.
 3. The manufacturer shall furnish certification that all aspects of the yard operation, including materials testing, storage, and handling conform to the quality control requirements herein, and current industry standards as defined in PCI MNL 116.
 4. Current certification by PCI throughout the fabrication period will be accepted as evidence of conformance with this requirement.
 5. Certification by a qualified, independent consultant or laboratory will also be accepted as evidence of conformance with this requirement. Initial certification shall be based on a plant inspection of yard operations and quality control procedures. PATH shall be notified prior to the inspection and may attend. At least two follow-up inspections shall be performed during the production run, and after each certificate of conformance submitted to the PATH.
- B. Tolerances: Fabricate concrete ties within the tolerances indicated and specified. When not indicated or specified, conform to tolerances specified in the AREMA Manual.
- C. Quality Control Program - Develop and maintain a quality control program under which the Contractor shall perform sufficient inspections and tests of all items of work, including those by subcontractors, in order to assure conformance to applicable standards, specifications and drawings with respect to material, workmanship, fabrication and identification. The control plan shall specifically provide for:
1. Vendor surveillance (e.g., shoulder inserts, contact rail bracket support plate inserts, wire, etc.)
 2. Drawing control (changes)
 3. Mold Certification
 4. Document control
 5. Inspection Procedures – In Process and Final
 6. Production test requirements
 7. Segregation and disposition of defective material and products
 8. Material and process control in plant identifying critical control points
 9. Production equipment and instrumentation calibration, maintenance and data recording
 10. Work procedures and instruction

11. Failure reporting analysis and corrective action
12. Sample plans and quality levels
13. Raw materials standards and controls
14. Records of test and inspection
15. Time and temperature control
16. Strength testing
17. Storage handling and shipment controls
18. Procedure and/or tests for determining within 24 hours that the condition necessary to achieve the 28-day strength have been met, with a margin of safety
19. Quality budget in percentage of contract price
20. Assurance that the plant will meet and continue to meet PCI certification. Provide, or arrange for the tie manufacturer to provide, an ACI Level I Field Technician to perform Quality Control concrete testing
21. Quality Control (QC) organization chart showing all QC personnel and their level of authority. QC organization must report independently from Production to Project Manager level or above.

D. Production Program:

1. Plant layout
2. Form design with tolerances
3. Raw material requirements
4. Primary and alternate sources for materials
5. Material handling
6. Material placement with tolerances
7. Curing method
8. Bond release method
9. Method of vibration
10. Pretensioning and detensioning method for strand or wire
11. Daily production capability
12. Finished tie inventory plan

13. Plan for handling finished ties
 14. Flow chart for production process indicating points of control for all significant operations
- E. The Contractor shall provide weekly written reports to PATH documenting a strict adherence to the Quality Control and Production Control Programs
- F. Organization and Management
1. Submit plans for an organization and management program sufficiently comprehensive to meet and maintain the requirements and objectives of the contract. This program shall employ the systems and techniques necessary to identify the product configuration; control changes to the product during development, production, testing and delivery; and monitor the contractual effort to determine the degree to which the objectives of the contract are being achieved.
 2. Delineate all primary suppliers and their locations as well as the intended alternate suppliers. Immediately notify PATH of any change in material sources from primary to alternate suppliers. Provide written documentation that any materials from alternate suppliers meet all specifications required and will yield a final product capable of performing as intended.
- G. Location for Inspection and Quality Control Testing:
1. Arrange for quality control testing of production ties to be performed at the manufacturer's plant with the facilities and test equipment approved by the Engineer prior to production of ties. Two copies of the results of all inspection and quality control tests shall be submitted to the Engineer within 48 hours of the performance of the tests. Notify the Engineer in writing at least 14 days in advance of dates scheduled for quality control tests. Facilities shall be provided for the Engineer to witness all testing.

PART 2 – PRODUCTS

2.01 CONCRETE

- A. The concrete used for concrete ties shall have a minimum 28-day compressive strength of 7,000 pounds per square inch as determined by ASTM C39 Test Method. The maximum water-cement ratio shall be 0.45 and maximum air content shall be 5.0%. The test cylinders shall be made and stored in accordance with ASTM C31. The Portland cement used shall be low alkali cement with a maximum alkali content of 0.6 percent conforming to ASTM C150, Type III low alkali. Conduct false set penetration tests per ASTM C359. False set penetration values shall not be less than 50 mm initially, 35mm at intermediate times, and 40 mm after remix.
1. Cement mill certificates shall be obtained and available for review for all cement use during tie production in order to ensure consistency in chemical ingredients. Under no circumstances, shall any material substitution be permitted unless it has been pre-qualified through testing.

- B. Concrete Aggregates: Fine and coarse aggregates shall be clean, hard, strong, durable, and free of deleterious material.
1. Aggregates shall be natural aggregates conforming to ASTM C33 Class 4S.
 2. Soluble sulfates and chlorides shall not exceed the values given in Table 4.3.1 of ACI 318, for prestressed sections.
 3. The Contractor shall submit evidence that concrete containing aggregate from the proposed source, with a cement content and alkali burden similar to the job mix, has a satisfactory service history of at least 10 years. This evidence shall include concrete with Class 4S aggregate.
 4. The Contractor shall submit evidence that the fine and coarse aggregates do not react with alkalis in the cement, to the extent that excessive expansion in the concrete may result. The results shall be interpreted as outlined in ASTM C33, Concrete Aggregates.
 - a. Evaluation of potential alkali-silica reactivity shall be made according to either ASTM C1260 or, if the design mix contains fly ash, ASTM C1567. Furnish results of successful testing that shall have been conducted no more than 60 days prior to the start date for concrete batching for this order.
 - b. In the event that the mix fails ASTM C1260 or ASTM C1567 criteria, then certified test results shall be submitting showing that the aggregate has been tested in accordance with ASTM C1293 and that the requirements of that test have been met. The ASTM C1293 test shall have been concluded no more than one year prior to the start date for concrete batching on this order.
 5. The maximum size of aggregate shall be 3/4 inch (size number 67) for coarse aggregate gradation. If the coarse or fine aggregate is supplied in more than one size, each size shall be stored separately.
 6. Washed aggregate shall be allowed to drain in stockpiles before use. All aggregates shall be free from ice when used.
- C. Water: Mixing water shall be fresh water complying with the requirements of AASHTO T26 and the following additional requirements:
1. pH shall be between 6.0 and 8.0.
 2. Chloride content shall not exceed 500 ppm.
 3. Sulfate content shall not exceed 2,000 ppm.
 4. Total solids content, including chlorides and sulfates shall not exceed 30,000 ppm.
- D. Concrete Admixtures: Accelerating, Retarding, and Water-Reducing Admixtures: Water-reducing admixtures, retarding admixtures, and accelerating admixtures, if used, shall conform to ASTM C494. In no case shall admixtures containing chlorides be used. Air entraining agents shall conform to ASTM C260.

2.02 PRESTRESSING WIRE

- A. The wire shall be deformed, stress relieved wire complying with ASTM A881 or uncoated complying with ASTM A421.
 - 1. The wire shall be from an approved source of supply. Acceptance of the wire shall be dependent on the tie manufacturer, showing that the wire meets the following strength requirements set forth in this section and that the ties meeting all specified requirements can be produced using the wire. It is also the responsibility of the tie manufacturer to monitor the wire used in production to ensure consistent quality.
 - 2. The prestressing wire used shall be an indented wire 0.2 inch in nominal diameter with a minimum breaking load of 7070 pounds. These breaking loads correspond to a tensile strength of 225,000 pounds per square inch.

2.03 PANDROL SHOULDERS

- A. Embedded ductile iron shoulders shall conform to ASTM A536 Grade 60-40-18 or 65-45-12. Acceptable models shall be Pandrol part No.'s 4714 for standard shoulders and 7250 insulated for "pop-up" shoulders. Weld on shoulders will be permitted in the frog toe, heel, and switch heel areas. The shoulders shall be marked, on non-bearing surfaces above the concrete level, with the part number, supplier's identification, and pattern number.
 - 1. The shoulders shall be free from burned-on sand, cracks, cavities, injurious blow holes, and other defects. All fins shall be removed from the vertical faces of the head of each shoulder. Fins across the top of the head shall not exceed 1/32 inch and below the head, fins shall not exceed 1/16 inch. At gates, there shall be no cavity in the shoulder more than 1/8 inch below the general surface level.
 - 2. Go and No Go inspection gages shall be used to check that tolerances conform to the iron shoulder drawings. A sampling plan for Acceptable Quality Levels of 1 percent for major dimensions and 4 percent for minor dimensions shall be used (see ASTM E122). The manufacturer shall decide which are major and minor dimensions. These shall be indicated on the shop drawings.
 - 3. Model 7250 shall be coated with a high quality powder epoxy coating that covers the entire stem and extends a minimum of 1/2 inch above the top of tie. Coated rail shoulders shall be individually packed for shipment to the tie manufacturer and handled with all due care to avoid chips, cracks, holidays or other damage to the epoxy coating. The Engineer reserves the right to witness tie casting and to test epoxy-coated shoulders with a holiday tester. Rail shoulders with holidays shall be removed and replaced at Vendor's sole expense.
- B. Iron shoulders shall be free of mud, oil, loose rust, and other contamination when cast into ties. They shall be rigidly secured in the forms during casting and shall not move within the concrete when the securing device is released. Location within the ties shall comply with the Drawings.
 - 1. The shoulder shall not be directly anchored to the pretensioned steel. The shoulder shall not come in contact with pretensioned steel.

2.04 EMBEDDED THIRD RAIL INSERTS

- A. Insert Material: $\frac{3}{4}$ " x 2 $\frac{3}{4}$ " long UNC stainless steel, Press-Seal Corporation NSS-34 or approved equal.
- B. Inserts shall be covered with a watertight protective cap to protect insert threads from infiltration of concrete or other materials during production and installation.
- C. Inserts shall be free-draining to the bottom of the tie.

2.05 RAIL FASTENING COMPONENTS

- A. The rail fastening system shall include rail pads, clips, insulators, and threaded inserts for switch, heel, and frog plates and the third rail extension plate.
- B. Rail fastening shall be resilient, threadless and detachable. Component part shapes shall be such that they are easily recognizable and are difficult to install incorrectly.
 - 1. Fastening shall be comprised of as few components as economically and technically feasible for ease of assembly, disassembly, and maintenance. The rail clips, rail seat pads, and insulators shall be furnished by the rail clip manufacturer.
 - 2. Construct fastenings so that the rail clips can be installed or replaced in the field by one man using hand tools.
 - 3. Fastenings shall have, on both sides of the rail base, a positive means of preventing more than $\frac{1}{8}$ inch total lateral movement of the rail base relative to the shoulders in case of failure or loosening of one or both rail clips. The positive means of restraint shall extend at least $\frac{3}{8}$ inch, but not higher than 1- $\frac{3}{4}$ inches above the base of rail in the installed position.
- C. Rail Fastening Spring Clips shall be in accordance with Specification Part V.
- D. Insulators between fastening shoulder and rails, where required:
 - 1. Configuration:
 - a. Provide keys between the insulators and the fastening shoulder to prevent relative motion in any direction.
 - b. The insulators shall cover the full widths of the shoulders.
 - c. Except for surfaces in contact with the rail, the surfaces of the insulators shall be smooth, clearly finished and free of flash. Insulators shall be free of internal defects and cavities.
 - 2. Volume Resistivity: 10^{12} ohm-cm, minimum. Measure in accordance with ASTM D257.
 - 3. Water Absorption at Saturation: Three percent, maximum. Measure in accordance with ASTM D570.

4. Dry Shear Strength: 6500 psi, minimum. Measure in accordance with ASTM D732.
5. The insulator shall be capable of withstanding degradation from temperatures (-10 to +150 degrees F), oxidation, water, alkali, petroleum oils, synthetic lubricants, and sunlight without having detrimental effect on the performance of the insulator. The insulator shall be designed to withstand the rigors of application and reapplication of the rail clips and other components without breaking, cracking, or any other detrimental effect of the performance of the insulator.
6. Heat Aging: Age for 10 days at 70°C using ASTM D573 as a guide. Compare properties before and after aging at 70°C. The tensile strength shall not decrease more than 10 percent. The Rockwell Hardness shall not change more than five points. There shall be no warping, cracking, discoloration, or exudation of plasticizer.

E. Rail Seat Pads:

1. This Article applies to pads installed directly under the rail. For pads installed under special trackwork plates see Part V.
2. Provide rail seat pads compatible with the rail fastening system, that have a shape which provides positive means of preventing movement of the pad parallel to the rail. Pad thickness shall be at least 3/16 inch and not more than 1/2 inch, with a width identical to the distance between the shoulder faces on the rail seat (+0, -1/16 inch) and a length one inch longer than the rail seat bearing area (plus or minus 1/16 inch). Mark pads in a permanent manner to identify manufacturer, month and year manufactured, and pad designation.
3. Use first quality new ingredients processed and cured in accordance with accepted good practice.
4. Rail pads shall be 6.5 mm in thickness, composed of polyurethane or of a polyurethane base with a polyethylene top segment, with a history of installation and service on North American railways.
5. Material Properties Testing: Conduct the following tests on the batch of material used to manufacture the tie pad specimens. Test specimens must be cured in the same manner as the final product. Conduct each specified test on three samples and report on each test. Arrange for all testing to be conducted by an independent testing laboratory approved by PATH. The following tests shall be conducted:
 - a. Compression Set Test ASTM D395 (Method B) Type II. The test shall be conducted for 22 hours at 100 degrees F. The compression set shall not exceed 40%.
 - b. Tensile Strength, Heat Aging, Tensile Strength Tests:

- i. Tensile Strength Test (before aging) ASTM D412. Tensile Strength will be 1,500 psi/min. Elongation will be 250% min.
- ii. Heat Aging Resistance Test (2 days at 212 degrees F) ASTM D573
- iii. Tensile Strength Test (after aging) ASTM D 412. Elongation will be 200% min. and 60% of results of (1) (before aging). The change in tensile strength resulting from this test series shall not exceed 15% of test (1) (before aging).
- c. Compression Set at Low Temperature ASTM D1229. The test shall be conducted for 22 hours at 0 degrees F. The compression set shall not exceed 50% at time 30 minutes.
- d. Submit results of industry standard tests with acceptance criteria by the minimum/maximum range. Test shall include the following:
 - i. Hardness (ASTM D2240)
 - ii. Abrasion resistance (ASTM D2228)
 - iii. Resistance to fluids such as water, acids, alkali, petroleum oils and synthetic lubricants (ASTM D471)
 - iv. Resistance to ozone (ASTM D518)

2.06 TIE SPLICES

- A. Furnish tie splice plates in the gauge of crossover tracks at the locations shown in the Contract Drawings or in other areas where required to limit concrete turnout tie lengths to 16 feet nominal. Acceptable tie splices will be Amtrak Flexible Tie Splices per Amtrak Drawing AM73320-A or approved equal. Splices shall have the following characteristics.
 1. Readily removable by one person with simple tools, in order to raise one side of the crossover while maintaining the opposite track in service.
 2. With continuously adjustable gauge effected by turning a nut or clevis on a threaded shaft or rod. Rod shall be 1-1/2 inches in diameter, with 12-UNF threads at both ends
 3. Allows flexure in the vertical direction so as to reduce bending moments on adjoining tie ends.
 4. Affixes to the ties with a Pandrol Model 7250 shoulder rather than a threaded fastening.

PART 3 – EXECUTION

3.01 CONCRETE DESIGN MIX

- A. Trial mixtures using aggregates, water, cement, and admixtures proposed for the manufacture of the concrete ties shall be made using at least three different water-cement ratios which will produce a range of strengths. For each water-cement ratio, at least three specimens for each age shall be made, cured, and tested as described in Article 3.02. Each batch of concrete shall be mixed separately in a pan mixer.
- B. Design compressive strength at the time proposed for transfer of prestress forces to the concrete shall be no less than 4,500 psi, or higher if so required by the tie design or manufacturing method. Design compressive strength at 28 days shall be not less than 7,000 psi. Design flexural strength at 28 days shall be not less than 600 psi.
- C. Aggregates and cement shall be measured by weight. The weight of aggregate shall be based on the saturated surface dry condition corrected for free moisture. Water shall be measured by weight or volume and admixtures shall be measured by volume, unless otherwise directed by the admixture manufacturer.
- D. Mix proportions shall be developed using the method of ACI 301.
- E. For restrictions on design mix proportions see Article 2.01 of this Section.
- F. The proportions of aggregate to cement shall be such to produce a mixture that will work readily into corners and angles of the form and around the prestressing elements with the assistance of specified vibration, but without permitting the materials to segregate or excess of free water to collect on the surface.
- G. The strength tests shall be made at 28 days. A curve shall be developed for each design mix showing the relationship between water-cement ratio and compressive strength.
- H. Acceptance of trial mix: Substantiate attainment of all specified properties by designated ASTM test methods. Provide concrete that has 56-day compressive strengths that exceed the specified design strength (f'_c) in accordance with ACI 318, Chapter 5, Table 5.3.2.2.

3.02 STRENGTH TESTS OF CONCRETE

- A. Compressive and Flexural Strength tests shall be made to check the adequacy of the mix proportions and as a basis for acceptance. Samples for compressive test specimens shall be secured in accordance with ASTM C172. Samples for flexural tests specimens shall be secured and all specimens shall be made and laboratory cured in accordance with ASTM C31. Specimens made to check the adequacy of curing and protection of concrete shall be cured entirely under production conditions.
 - 1. Compressive Strength tests shall be made on 4 inch by 8 inch cylinders in accordance with ASTM C39. For each day of production at least nine cylinders shall be prepared; three for 28 day testing, and three for checking strength at transfer, and three spares.

2. Flexural Strength tests shall be made on 6 by 6 by 20 inch beams in accordance with ASTM C78. Minimum flexural strength (modulus of rupture) at 28 days shall be 600 psi.
- B. Durability of Concrete shall be in accordance with AREMA Chapter 30, Part 4, Article 4.2.2.6. Testing for excessive sulfate content in the cement or excessive temperatures during the curing process shall be testing in accordance with Duggan Concrete Expansion Test as detailed in AREMA Chapter 30, Part 4, Section 4.2.3.

3.03 FABRICATION AND FORMS

- A. Dimensions and Tolerances: The tie design shall be within the following dimensional limits set forth in this section. The finished tie shall not deviate in any dimension from that shown in the Contract Drawings for the approved tie design by more than the tolerance associated with that dimension.
1. Nominal Length: Crossties shall be 8 feet 6 inches long. Turnout ties: as per layout design. Lengths of turnout ties shall allow for mounting of contact rail extension plates by others on all ties shown on Contract Drawings. Tolerance shall be plus $\frac{1}{2}$ inch, minus $\frac{1}{8}$ inch.
 2. Width of Bottom: 10 inches minimum, 13 inches maximum plus or minus $\frac{1}{8}$ inch.
 3. Width of Top: 9 inches minimum, 10 inches maximum plus or minus $\frac{1}{8}$ inch.
 4. Depth of tie: 7 inches minimum at any location and 10 inches maximum.
 5. Track Gauge: 4 feet -8- $\frac{1}{2}$ inches, plus or minus $\frac{1}{16}$ inch, exclusive of rail dimensional tolerances.
 6. Rail Cant: zero cant within the turnout and 1 in 40, plus or minus 5, towards the center line of the tie, for crossties.
 7. The center line of crossties shall be within $\frac{1}{8}$ inch of the center line of track gauge.
 8. Chamfer: 1 inch at 45 degrees nominal plus or minus $\frac{1}{2}$ inch
 9. Rail Seat Plane: The rail seat shall be a smooth, flat surface, plus or minus $\frac{1}{32}$ inch.
 10. Concrete cover: The minimum concrete cover for prestress strands shall be as specified in ACI Standard 318
 11. Weight: Weight of concrete crossties shall not exceed 700 pounds. Weight of concrete switch ties shall not exceed 100 pounds per foot of length.
 12. Surface finish on top and sides shall be smooth and uniform. A random scattering of surface voids will not be cause for rejection. Heavy concentration of surface voids or evidence of improper mixing, vibration, or curing shall be cause for rejection.
 13. Identification Marking: submit the identification system for approval. Markings must be such that they will remain legible for the design life of the ties. Permanently label

ties by indented or raised numerals or letters on the top surface to identify the following:

- a. Manufacturer's I.D.
 - b. Line or Form Number
 - c. Tie number
 - d. Year of manufacture
 - e. Date code traceable to day of manufacture
- B. Method of Production: Monoblock ties shall be manufactured in accordance with AREMA Chapter 30, Part 4, Section 4.9.2.
- C. Forms:
1. Forms shall be rigid and constructed of material that will result in finished ties conforming to the shape, lines, dimensions, and tolerances called for on the Contract Drawings.
 2. Forms shall be constructed to permit movement of the tie without damage during release of the prestressing force.
 3. Forms shall provide proper marking with indented or raised letters or numerals to identify the manufacturer and year of production. Marking shall be placed on top of tie surface.

3.04 PLACEMENT OF PRESTRESSING STEEL

- A. Prestressing force in each of the strands shall be 16,750 pound +/- 500 pounds.
- B. The load shall be applied in two increments. An initial load of approximately 1,000 pounds shall be applied to the individual strands to straighten them, eliminate slack, and provide a starting or reference point for measuring elongation.
- C. Prestressing force shall be determined by (1) measuring strand elongation and also (2) by either checking jack pressure on a calibrated gauge or by the use of a calibrated dynamometer. The cause of discrepancy that exceeds 5 percent shall be ascertained and corrected. Elongation requirements shall be taken from average load elongation curves for the steel used.
- D. Strands shall be stretched either individually or simultaneously. If strands are stretched simultaneously, provision for taking up slack and equalizing stress shall be made individually as required to induce approximately equal stress in each strand.
- E. Transfer of force from bulkheads of the pretensioning bed to the concrete shall be accomplished by gradual and simultaneous detensioning of all strands. Exposed strands shall be cut near the tie end. The projection of strands beyond the ends of the ties shall be no more than 1/4 inch.

3.05 MIXING, PLACING, AND CURING OF CONCRETE

A. Preparation for Placing Concrete:

1. Prior to the placing of concrete, all equipment for mixing the concrete shall be clean, all debris shall be removed from spaces to be occupied by the concrete, the forms shall be thoroughly coated with a bond-breaker, and the reinforcement shall be thoroughly cleaned of deleterious coatings. The iron shoulder and prestressing wire shall not be contaminated with bond-breaker or any other substance which would interfere with bond development. The forms shall be inspected for alignment, tightness of joints, and dimensional accuracy of the position of bulkheads, prestressing steel, inserts, etc., shall be verified.
2. Proportioning of Component Materials:
 - a. Fine and coarse aggregates and cement shall be measured by weight. Weights of aggregates shall be based on a saturated surface dry condition corrected for free moisture.
 - b. Water and liquid admixtures may be measured by either weight or volume.
3. The accuracy of measurement of the various components of concrete shall be within the following limits:

Cement	1%
Water	1%
Fine aggregate	2%
Coarse aggregate	2%
Cumulative aggregate	2%
Admixtures	3%

B. Mixing of Concrete:

1. Mixing equipment shall be capable of combining all specified materials within the time specified by the equipment manufacturer into a thoroughly mixed and homogeneous mass, and discharging the mixture without segregation.
2. All concrete shall be mixed until there is a uniform distribution of the materials and shall be discharged completely before the mixer is recharged.
3. Optimum mixing time shall be established by the equipment manufacturer's recommendations. Generally, minimum mixing time shall be one minute for batches of one cubic yard or less. This mixing time shall be increased by at least 15 seconds for each cubic yard, or fraction thereof, of capacity in excess of one cubic yard. Mixing time shall not exceed three times the specified time.

C. Conveying:

1. Concrete shall be conveyed from the mixer to the place of final deposit in the shortest possible time by methods that will prevent segregation or loss of materials.
2. Equipment for chuting, pumping, and pneumatic conveying of concrete shall be of such size and design as to assure flow of concrete at the delivery location without segregation of materials.

D. Depositing:

1. Concrete shall be deposited as nearly as practical in its final position to avoid segregation due to rehandling or flowing. No concrete that has partially hardened or has been contaminated by foreign materials shall be used.
2. Concrete shall not be placed when the ambient air temperature of the casting room is below 40°F. Concrete shall have a minimum temperature of 50°F, and a maximum temperature of 90°F. When concrete is placed at an ambient temperature of 90°F or greater. The “Hot Weather Concreting” procedures recommended by ACI 305 shall be followed to prevent rapid drying and other detrimental effects of elevated temperature on fresh concrete.

E. Consolidating:

1. All concrete shall be thoroughly consolidated by vibration during placement, and shall be thoroughly worked around the prestressing elements and embedded fixtures, and into corners of the forms. Consolidation at the ends of ties is paramount to comply with the void tolerance specified in Article 3.06.B.1.
2. External form vibration, supplemented if necessary, by internal vibration shall be used to obtain uniform mix, and shall be sufficient to yield concrete with a density not less than 148 pounds per cubic foot.
3. Care shall be taken to assure that forms are not damaged during consolidation.

F. Surface Finishing-Bottom of Tie:

1. The bottom surface of the tie shall have a rough broom finish, with broom marks perpendicular to the tie centerline.

G. Testing Fresh Concrete:

1. The first batch on any bed shall be tested and if this requires no adjustment to the mix, a further test shall be made after approximately 25 cubic yards has been poured. If the first batch requires adjustment to the mix, each subsequent batch shall be tested until no further adjustment is necessary and then a further batch shall be tested after approximately 25 cubic yards has been poured.
2. Slump: When measured in accordance with ASTM C143, the slump shall not exceed 2 inches when concrete is placed in the forms.
3. Air Content: When measured in accordance with ASTM C231, the range of air content in the plastic concrete shall ensure a minimum 3.5 percent air void content in the hardened concrete.

4. Temperature: The temperature of freshly mixed concrete shall not exceed 90 degrees F.
- H. Curing:
1. Immediately after placing and consolidating the concrete, the exposed surface shall be covered with impermeable sheeting.
 2. Concrete shall not be placed in forms whose temperature is less than 40 degrees F. and the concrete temperature shall not be allowed to fall below 50 degrees F. between casting and transfer of prestress.
 3. The rate of temperature rise in the concrete shall not exceed 35 degrees F. per hour and the maximum concrete temperature shall not exceed 160 degrees F. Transfer of prestress shall not be carried out at a concrete temperature above 135 degrees F. The heating method used shall be such that all ties in a bed are at a similar temperature.
 4. Curing shall be done in accordance with established procedures to produce concrete strength as specified.
- I. Detensioning. Stress transfer shall be performed in a controlled manner with hydraulic jacks. The forms shall be free to move and the stress in all wires shall be transferred at the same time and same rate. No wire shall be cut until it is completely detensioned.

3.06 REMOVAL OF TIES FROM FORMS AND FINISHING

- A. Ties shall be removed from forms in a manner such as to avoid damage.
- B. Surface Finishing:
1. All formed surfaces of the finished tie shall have a uniformly dense surface. The surface of the rail seat shall have a smooth finish and be free from honeycomb, surface irregularities, and air holes in excess of 1/8 inch diameter. Other formed surfaces shall have a smooth finish that may contain honeycomb not to exceed 2 percent of the surface and a maximum void diameter of 1/4 inch.
 2. Two ties which, in the opinion of the Inspector, show the required surface finish and two ties, also in the opinion of the Inspector, show the maximum allowable rail seat defects shall be set aside as comparison standards for acceptance of ties. These four ties are in addition to those for bottom finish comparison.
- C. Inspection and Repair of Surface Defects:
1. Every tie produced shall be visually inspected.
 2. The surface of the rail seat shall have a smooth, formed finish not inferior to the comparison standards. No rubbing, brushing, or other treatment shall be used on the rail seat.
 3. Surface conditioning with a mixture of 3 parts sand and 1 part cement, mixed with 1 part latex cement mix and 1 part water shall be undertaken on surfaces containing air

pockets. The maximum size of any one pocket shall not exceed 3/8 inch diameter by 1/4 inch deep.

4. Air voids may not exceed greater than 50% of the circumference of a prestressing strand nor than 1 inch in depth.
5. Corner breakage less than 1/2 inch deep and 1-1/2 inch along the end faces need not be repaired providing reinforcing wire is not exposed. If the wire is exposed, the breakage must be repaired.
6. Corner breakage from 1/2 to 1-1/2 inch in depth must be repaired. Corner breakage in excess of that shall be rejected.
7. Prestressing wires protruding more than 1/4 inch beyond the concrete surface of the end of the tie shall be cut back. Sharp ends which would be hazardous in handling shall be smoothed or cut back.

3.07 ACCEPTANCE TESTS FOR CONCRETE TIES AND RAIL FASTENING SYSTEMS

A. Design Tests:

1. Testing shall be in accordance with AREMA Chapter 30, Part 4, Section 4.9.1. Prior to approval of the concrete tie design, the following tests shall be performed. The tie samples submitted will be subjected to testing for compliance with these Specifications.
2. The Engineer shall select two crossties and two switch ties at random for laboratory testing. For design testing of the fastening system, the Contractor shall also furnish a section of a tie or a concrete block with railseat and fastening system identical to the concrete ties furnished for testing. A separate test series shall be conducted for the standard cross ties and the turnout ties.
3. Each of the four ties and the tie block submitted for testing shall be carefully measured and examined to determine their compliance with the requirements specified below. Upon satisfactory completion of the examination, two switch ties, designated as Tie No. 1 and Tie No. 2, and two crossties, designated as Tie No. 3 and Tie No. 4, shall be subjected to the specified performance tests.
4. Prior to testing, all dimensions of the ties shall be taken and included in the report.

B. Sequence of Design Tests (Tie Nos. 1 and 3):

1. The sequence of design performance tests using Tie Nos. 1 and 3 shall be as follows:
 - a. Rail Seat Vertical Load Test as detailed in Section 3.07.H and AREMA Chapter 30, Article 4.9.1.4 shall be performed on one rail seat, hereinafter designated as rail seat A.
 - b. Center Negative Bending Moment Test as detailed in AREMA Chapter 30, Article 4.9.1.6.

- c. Center Positive Bending Moment Test as detailed in AREMA Chapter 30, Article 4.9.1.7.
 - d. Rail Seat Vertical Load Test as detailed in Section 3.07.H and AREMA Chapter 30, Article 4.9.1.4 shall be performed on the other rail seat hereinafter designated as rail seat B.
 - e. Rail Seat Repeated Load Test as detailed in Section 3.07.I and AREMA Chapter 30, Article 4.9.1.5 shall be performed on rail seat B.
 - f. Bond Development, Tendon Anchorage and Ultimate Load Test as detailed in Section 3.07.G and AREMA Chapter 30, Article 4.9.1.8 shall be performed on Railseat A.
- C. Sequence of Design Tests (Tie Nos. 2 and 4):
- 1. The sequence of design performance tests using Tie Nos. 2 and 4 shall be as follows:
 - a. Fastening Insert Test as detailed in Section 3.07.J and AREMA Chapter 30, Article 4.9.1.9 shall be performed on all inserts.
 - b. Fastening Uplift Test as detailed in Section 3.07.K and AREMA Chapter 30, Article 4.9.1.10a and b shall be performed on one rail seat.
 - c. Electrical Impedance Test as detailed in Section 3.07.L and AREMA Chapter 30, Article 4.9.1.14 shall be performed.
- D. Sequence of Design Test (Tie Block)
- 1. The sequence of design performance testing using tie block shall be as follows:
 - a. Tie Pad Test as detailed in AREMA Chapter 30, Article 4.9.1.15.
 - b. Fastening Uplift Test Part A as detailed in AREMA Chapter 30, Article 4.9.1.10
 - c. Fastening Longitudinal Restraint Test as detailed in Section 3.08.G and AREMA Chapter 30, Article 4.9.1.12.
 - d. Fastening Repeated Load Test as detailed in Section 3.08.F and AREMA Chapter 30, Article 4.9.1.11.
 - e. Fastening Longitudinal Restraint Test as detailed in Section 3.08.G and AREMA Chapter 30, Article 4.9.1.12.
 - f. Fastening Uplift Test Part A as detailed in Section 3.07.K and AREMA Chapter 30, Article 4.9.1.10.
 - g. Fastening Lateral Load Restraint Test as detailed in Section 3.08.H and AREMA Chapter 30, Article 4.9.1.13.
 - h. Tie Pad Test as detailed in AREMA Chapter 30, Article 4.9.1.15.

- i. Fastening tests previously conducted for other buyers will be considered as satisfactory evidence of passing this test if the Vendor submits the previous test results and a certification that the fastening system tested therein is identical to the system provided for PATH.
- E. Center Positive Bending Moment Test:
 1. Summary of Test: With the tie supported and loaded as shown in AREMA Chapter 30, Figure 30-4-10, a load increasing at a rate not greater than 5 kips per minute shall be applied until the load required to produce the positive center design moment is obtained. This load shall be held for not less than three minutes, during this time an inspection shall be made to determine if structural cracking occurs. A five power magnifying glass may be used to locate cracks. If structural cracking does not occur, the requirements of this test will have been met.
 2. Minimum test thresholds for the center positive bending test shall be as computed as described above but shall in no case be less than 116 in-kips for turnout ties or 90 in-kips for crossties
- F. Center Negative Bending Moment Test:
 1. Summary of Test: With the tie supported and loaded as shown in AREMA Chapter 30, Figure 3-4-9, a load increasing at a rate not greater than 5 kips per minute shall be applied until the load required to produce the specified negative center design moment is obtained. This load shall be held for not less than three minutes, during this time an inspection shall be made to determine if structural cracking occurs. A five power magnifying glass may be used to locate cracks. If structural cracking does not occur, the requirements of this test will have been met.
 2. Minimum test thresholds for the center negative bending test shall be as computed as described above but shall in no case be less than 163 in-kips for turnout ties or 125 in-kips for crossties.
- G. Rail Seat Positive Bending Moment Test (Bond Development, Tension Anchorage, and Ultimate Load):
 1. Summary of Test: With the tie supported and loaded as shown in AREMA Chapter 30, Figure 30-4-8, a load increasing at a rate not greater than 5 kips per minute shall be until a total load of 1.5P is obtained. If there is no more than 0.001 inch strand slippage determined by an extensometer reading to 0.0001 inch, the requirements of this test will have been met. The measurements shall be made on the outermost tendons of the lower layer. The load shall be increased until ultimate failure occurs.
 2. Minimum test thresholds for the railseat positive bending test shall be as computed as described above but shall in no case be less than 220 in-kips for turnout ties or 163 in-kips for crossties.
- H. Rail Seat Vertical Load Test
 1. Summary of Test: With the tie supported and loaded as shown in AREMA Chapter 30, Figure 30-4-7, a load increasing at a rate not greater than 5 kips per minute shall be applied until the load (P) required to produce the specific rail seat negative

moment as derived in Section 1.03.E.5 of this specification is obtained. This load shall be held for not less than three minutes, during this time an inspection shall be made to determine if structural cracking occurs. A five power magnifying glass may be used to locate cracks. If structural cracking does not occur, the requirements of this test will have been met.

2. Minimum test thresholds for the railseat negative bending test shall be as computed as described above but shall in no case be less than 131 in-kips for turnout ties or 101 in-kips for crossties.

I. Rail Seat Repeated-Load Test

1. Summary of Test: Following the vertical load test for positive moment on rail seat B, the load shall be increased at a rate of at least 5 kips per minute until the tie is cracked from its bottom surface up to the level of the lower layer of reinforcement.
2. After removal of the static rail seat load necessary to produce cracking, and substitution of ¼" -thick plywood strips for those shown in AREMA Chapter 30, Figure 30-4-8, the tie shall be subjected to 3 million cycles of repeated loading with each cycle varying uniformly from 4 kips to the value of 1.1P. The repeated loading shall not exceed 600 cycles per minute. If after the application of 3 million cycles, the tie can support the rail seat load (1.1P), the requirement of this test will have been met.

J. Fastening Insert Test:

1. Summary of Test: The pull-out test shall be performed on each insert as indicated in AREMA Chapter 30, Figure 30-4-11. An axial load of 12 kips shall be applied to each insert separately and held for not less than 3 minutes, during which time an inspection shall be made to determine if there is any slippage of the insert or any cracking of the concrete. Following successful completion of the insert pull-out test, the torque test shall be performed on each insert. A torque of 250 ft-lb shall be applied about the vertical axis of the insert by means of a calibrated torque wrench and a suitable attachment to the insert. The torque shall be held for not less than 3 minutes. Ability of the insert to resist this torque without rotation, cracking of the concrete or permanent deformation shall constitute passage of this test.

K. Fastening Uplift Test:

1. Summary of Test: A 19 inch section of 115 RE rail shall be secured to one rail seat using a complete rail fastening system including pads, clips, and associated hardware, as recommended by the manufacturer of the rail fastening system. In accordance with the loading diagram and method described in AREMA Chapter 30, Figure 30-4-12, an incremental load shall be applied to the rail. The load P (measured load plus unsupported tie weight plus frame weight) at which separation of the rail from pad or pad from rail seat occurs (whichever occurs first) shall be recorded. The load shall then be completely released. A load of 1.5P not to exceed 10 kips shall then be applied. The inserts shall not pull out or loosen in the concrete and no component of the fastening system shall fracture nor shall the rail be released.

L. Electrical Impedance Test:

1. Summary of Test: Secure two short pieces of 115 RE rail to the tie using complete concrete tie fastenings. The rail pieces shall be no longer than the width of the tie. Immerse the complete tie and rail assembly in water for a minimum of 6 hours. Clean contact points on each rail and attach test cables. Apply 10 volts AC 60-hertz potential between the two running rails for 15 minutes, measure the current flow between the two rails, and calculate the impedance by dividing the applied 10 volts by the current flow in amperes. The minimum impedance shall be 20,000 ohms.

3.08 ACCEPTANCE OF DESIGN TESTS FOR FASTENING SYSTEM

- A. Fastenings shall be subjected to the acceptance tests as specified below. Failure of fastening system to pass tests will be cause for rejection. Certified laboratory test reports shall be submitted in sufficient detail to the PATH.
- B. Acceptance of design testing of the fastening system consists of testing of components cast into the concrete tie, in addition to tests conducted on the external components and consists of the following tests.
- C. Tie Pad Test:
 1. Summary of Test: The tie pad shall be loaded vertically using a section of 115RE rail and applying a cyclic load varying from 4 to 30 kips at a rate of 4 to 6 cycles per second for a total of 1,000 cycles. A static load shall be applied at a rate between 3 and 6 kips/min. in increments of 1 kip up to a maximum of 50 kips. For each load increment, vertical pad deflection shall be measured to the nearest .0001 inch and recorded values for vertical loads versus deflection shall be plotted on a graph. Spring rate will be calculated as determined by the slope of the line connecting the points representing pad deflections at 24 and 44 kips. The load shall be released and pad deflection and temperature recorded 10 seconds after load removal. The requirements will be met if:
 - a. The pad returns to within .002 inch of its original position 10 seconds after load removal;
 - b. Spring rate values determined from both pad tests, conducted as part of the design performance tests specified in AREMA Chapter 30, Article 4.9.1.3, do not vary by more than 25%;
 - c. Spring rate values determined from initial tests in AREMA Chapter 30, Article 4.9.1.3.a conducted on the three test pads, as part of the design performance tests specified do not vary more than 25%;
 - d. Spring rate values determined from final tests in Article 4.9.1.3.h conducted on the two test pads, as part of the design performance tests specified do not vary by more than 25%.
- D. Tie Pad Attenuation Test:
 1. Test procedure and acceptance criteria are shown in AREMA Chapter 30, Part 2, Section 2.5.2 Test 4B and Figure 30-2-6.
- E. Fastening Repeated Load Test:

1. Summary of Test: A 19 inch section of 115 RE rail, from which loose mill scale has been removed by wiping with a cloth, shall be secured to the rail seat in the tie block using a complete rail fastening assembly. Three million cycles of loading shall be applied in accordance with the loading diagram in AREMA Chapter 30, Figure 30-4-13, alternating downward and upward loads at an angle of 20 degrees to the vertical axis of the rail at a rate not to exceed 300 cycles per minute for 3 million cycles. Rupture failure of any component of the fastening system shall constitute failure of the test.
- F. Fastening Longitudinal Restraint Test:
1. In accordance with AREMA Chapter 30, Article 4.9.1.12, test procedure and acceptance criteria shall be in accordance with AREMA Chapter 30, Part 2, Section 2.6.2, Test 5B
 2. Summary of Test: Conduct test before and after the Rail Fastening Repeated Load Test as detailed in AREMA Chapter 30, Part 2.6.3 Test 5C without disturbing the rail fastening assembly in any manner. A longitudinal pull load shall be applied in increments of .4 kip increments with readings taken of longitudinal rail displacement after each increment. Refer to AREMA Chapter 30, Figure 30-2-8. The rail displacement readings shall be the average of two dial indicator readings measured to .001 inch. The dial indicators shall be placed on each side of the rail with plungers parallel to the longitudinal axis of the rail. The load shall be increased incrementally until a load of 2.4 kips is reached. The load shall not be held for less than 15 minutes. The fastenings shall meet the requirements of this test in either direction of loading. The fastenings will have successfully passed this test if the rail movement is less than 0.2 inch during the loading and initial 3 minute period.
- G. Fastening Lateral Load Restraint Test:
1. In accordance with AREMA Chapter 30, Article 4.9.1.13, test procedure and acceptance criteria shall be in accordance with AREMA Chapter 30, Part 2, Section 2.6.4, Test 5D
 2. Summary of Test: A 19 inch section of 115 RE rail shall be secured to one rail seat using a complete fastening assembly. The entire assembly shall be supported and loaded as indicated in Figure 30-2-10 of AREMA Chapter 30, Part 2, Section 2.6.4, Test 5D. A preload of 20 kips is to be applied to the rail to seat the rail in the fastening. Upon release of the preload, a zero reading is to be taken on the dial indicators which measure rail translation. Load is to be applied at a rate not to exceed 5 kips per minute until either 41 kips has been applied or the rail base has translated 1/8 inch, whichever occurs first. With all load removed from the rail, a roller nest is to be placed between the fixed loading head and the wood block on the rail head. The roller nest shall not offer resistance to lateral movement of the rail head. After taking zero reading on the dial indicators a load of 20.5 kips shall be applied at a rate not to exceed 5 kips per minute. Inability of the fastening to carry a 41 kip load with 1/8 inch or less or rail translation shall constitute failure. Rail rotation, gauge widening less rail translation, greater than 1/4 inch shall constitute failure of the unrestrained lateral load test. Complete failure of any component of the tie or fastening is cause for rejection.

3.09 DAILY PRODUCTION QUALITY CONTROL TESTS

A. Acceptance Tests:

1. At the start of any production contract, a minimum of 6 rail seat positive, 6 tie center negative, and 6 shoulder pull-out tests shall be undertaken by the Contractor on randomly selected ties to establish compliance with this specification. After the acceptance test load results are checked, additional loading shall be applied to the ties to produce the first crack greater than 25 mm (1 inch) in vertical length and these loads and crack lengths recorded.

B. Routine Production Testing:

1. Routine acceptance testing shall be carried out on all beds cast. One tie selected from every 200 ties, or fraction thereof from one form, selected at random from each bed cast, shall be load tested as follows:
 - a. Center Positive Bending Moment Test as detailed in Section 3.07.E of this specification.
2. If structural cracking occurs in the tests, two additional ties from the same lot shall be subjected to the same test and acceptance of the lot shall be based on the following conditions:
 - a. If both retest ties meet the test requirements, the lot shall be accepted.
 - b. If either of the retest ties fails to meet the test requirements, the remaining ties shall be tested in accordance with a statistical sampling plan.
3. One tie selected at random from every 200 ties, or fraction thereof, produced each day shall be subjected to testing the distance from the center of track to the center of rail seats by use of a template. The rail seat configuration and shoulder insert location shall be verified.
4. Not less than 1% of the contract order shall be selected at random from those ties previously subjected to the Rail Seat Positive Bending Moment Test (one of every five of such ties) shall additionally be tested for Bond Development and Tension Anchorage as detailed in Section 3.07.G of this specification.
 - a. If strand slippage does not exceed 0.001 inches, the requirements of this test will have been met.
 - b. If strand slippage exceeds 0.001 inches, three additional ties shall be tested. If any of the three ties does not meet the requirements of the test, the remaining ties in the lot shall be tested in accordance with a statistical sampling plan.

3.010 DELIVERY AND HANDLING

A. Shipping and Handling of Concrete Ties

1. Ship concrete ties with plastic caps or plugs securely installed in all inserts. Securely brace ties for transportation to prevent any movement that could cause damage.
 2. Ship ties in a horizontal position, braced with wooden spacer blocks so that the switch plates, top surface or embedded shoulders do not come into contact with ties loaded above. Do not load ties higher than six layers deep.
 3. Ship turnout ties preplated, with rubber pads secured in place under each plate.
 4. Do not drop or skid the ties.
- B. Shipping and Handling of Fastenings
1. Pack Pandrol fastenings separately in units convenient for handling. The fastenings shall be in weatherproof containers, banded on pallets for forklift handling.
 2. All containers for Pandrol e-clips shall be clearly marked with the following: identification of item contained, manufacturer's name, shipping date, number of pieces, designation, and gross weight.
 3. All fastening shipments shall be adequately prepared to preclude damage during shipment. Handle all fastenings in a manner which will prevent damage during packaging, loading and transporting.

END OF SECTION

PORT AUTHORITY TRANS-HUDSON CORPORATION



PATH

OPEN AREA TRACKWORK REPLACEMENT TURNOUTS 7, 27, AND CROSSOVER 11 PURCHASE OF SPECIAL TRACKWORK

CONTRACT No. PAT-024.068

No.	Date	Revision	Approved

ASSISTANT CHIEF ENGINEER/ DESIGN

DATE

SENIOR PROGRAM MANAGER -
PATH CAPITAL PROGRAMS

DATE

Drawing
Number

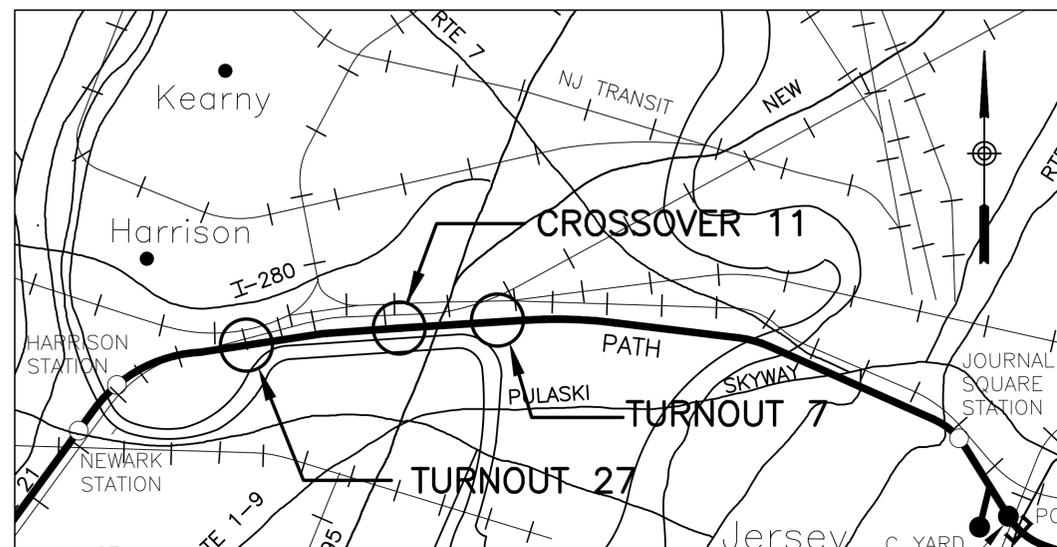
G001

PID# 10977000



PORT AUTHORITY
TRANS-HUDSON CORPORATION

LIST OF DRAWINGS		
SHEET No.	DWG. No.	TITLE
01	G001	TITLE SHEET
02	G002	INDEX OF DRAWINGS AND LOCATION MAP
03	C001	NOTES, LEGEND AND ABBREVIATIONS
04	C002	TURNOUT 27 GENERAL LAYOUT
05	C003	NO. 15 TURNOUT GENERAL LAYOUT SHEET 1 OF 2
06	C004	NO. 15 TURNOUT GENERAL LAYOUT SHEET 2 OF 2
07	C005	TURNOUT 7 RAIL AND TIE LAYOUT
08	C006	CROSSOVER 11 RAIL AND TIE LAYOUT
09	C007	DETAILS OF SWITCH MACHINE AND HOLLOW STEEL TIES
10	C008	TURNOUT DETAILS
11	C009	MISCELLANEOUS DETAILS
12	C010	TURNOUT 27 TRACK ALIGNMENT AND PROFILE
13	C011	TURNOUT 7 TRACK ALIGNMENT AND PROFILE
14	C012	CROSSOVER 11 TRACK ALIGNMENT AND PROFILE



LOCATION OF WORK
NTS

No.	Date	Revision	Approved
ENGINEERING DEPARTMENT			
PATH			

GENERAL

Title
**OPEN AREA TRACKWORK REPLACEMENT
TURNOUTS 7, 27, AND CROSSOVER 11
PURCHASE OF SPECIAL TRACKWORK**

**INDEX OF DRAWINGS
AND
LOCATION MAP**

This drawing subject to conditions in contract. All inventions, ideas, designs and methods herein are reserved to Port Authority and may not be used without its written consent. All recipients of Contract documents, including bidders and those who do not bid and their prospective subcontractors and suppliers who may receive all or a part of the Contract documents or copies thereof, shall make every effort to ensure the secure and appropriate disposal of the Contract documents to prevent further disclosure of the information contained in the documents. Secure and appropriate disposal includes methods of document destruction such as shredding or arrangements with refuse handlers that ensure that third persons will not have access to the documents' contents either before, during, or after disposal. Documents may also be returned for disposal purposes to the Contract Desk on the 3rd Floor, 3 Gateway Center, Newark, NJ 07102 or the office of the Director of Procurement, One Madison Avenue, 7th Floor, New York, NY 10010.

M.LOUIE S.BURDEYNIK T.CARROLL
Designed by Drawn by Checked by

Date **JANUARY 9, 2013**

Contract Number **PAT-024.068**

Drawing Number **G002**

PID# 10977000



NOTES:

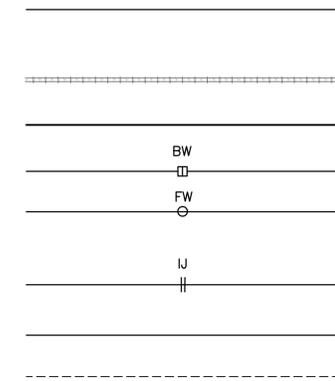
1. FURNISH SUFFICIENT QUANTITY OF RAIL, CONCRETE TIES AND ALL FASTENINGS FOR TRACK AHEAD OF PS AS SHOWN ON CONTRACT DRAWINGS. FURNISH SUFFICIENT QUANTITY OF RAIL, CONCRETE TIES AND FASTENINGS FOR TRACKS BEHIND TPF AS SHOWN ON CONTRACT DRAWINGS.
2. ALL INSULATED JOINTS SHALL BE EPOXY BONDED, SHOP-FABRICATED INTO PLUG RAILS, UNLESS SPECIFICALLY INDICATED OTHERWISE.
3. STATIONS ON THE DRAWINGS SHALL BE SHOWN BY THE VENDOR ON THEIR GEOMETRIC LAYOUT, GENERAL LAYOUT AND SWITCH DRAWINGS TO FACILITATE INSTALLATION IN THE FIELD BY OTHERS.
4. RUNNING RAILS SHALL BE LEVEL (ZERO CANT) THROUGHOUT TURNOUT TO LIMITS SHOWN.
5. ALL TURNOUTS SHALL BE DESIGNED TO ALLOW PANELIZATION. PROPOSED JOINT LOCATIONS AND WEIGHT OF EACH PANEL SHALL BE SHOWN ON SHOP DRAWINGS.
6. LONG TIES EXTENDING UNDER BOTH MAIN TRACKS AT CROSSOVER SHALL BE AVOIDED WHEREVER POSSIBLE.
7. HORIZONTAL COORDINATE SYSTEM IS STATE PLANE NAD83 (NEW YORK EAST AND LONG ISLAND FOOT). VERTICAL DATUM IS NAVD 88.
8. ALL WELDED JOINTS HAVE 0" GAP. ALL INSULATED JOINTS HAVE 3/16" GAP.

ABBREVIATIONS:

- | | | |
|---------|---|---------------------------|
| 1/2" PF | = | ACTUAL POINT OF FROG |
| BW | = | BUTT WELD |
| CL | = | CENTERLINE |
| CVD | = | CURVED |
| DIA, Ø | = | DIAMETER |
| DWG | = | DRAWING |
| ELEV | = | ELEVATION |
| EXIST | = | EXISTING |
| GL | = | GAGE LINE |
| HST | = | HOLLOW STEEL TIE |
| IJ | = | INSULATED JOINT |
| JT | = | JOINT |
| Lc | = | LENGTH OF CURVE |
| LLT | = | LAST LONG TIE |
| MN | = | MANGANESE |
| No | = | NUMBER |
| NOM | = | NOMINAL |
| NTS | = | NOT TO SCALE |
| OC | = | ON CENTERS |
| PC | = | POINT OF CURVATURE |
| PF | = | POINT OF FROG |
| PI | = | POINT OF INTERSECTION |
| PT | = | POINT OF TANGENCY |
| R | = | RADIUS OF CURVE |
| S | = | SWITCH |
| SM | = | SWITCH MACHINE |
| STA | = | STATION |
| STR | = | STRAIGHT |
| TF | = | TOE OF FROG |
| T/O | = | TURNOUT |
| TOR | = | TOP OF RAIL |
| TPF | = | THEORETICAL POINT OF FROG |
| TR | = | TRANSITION RAIL |
| TYP | = | TYPICAL |
| WP | = | WORKING POINT |
| X/O | = | CROSSOVER |

LEGEND:

- RAIL/TRACK MATERIAL SUPPLIED BY SPECIAL TRACKWORK MANUFACTURER
- EXISTING TRACK AND/OR EXISTING GUARD RAIL
- CENTERLINE OF TRACK
- RUNNING RAIL WITH BUTT WELD LOCATION
- RUNNING RAIL WITH BOLTED JOINT LOCATION FOR FIELD WELD BY PATH
- RUNNING RAIL WITH INSULATED JOINT LOCATION
- PROPOSED PROFILE TOP OF RAIL
- EXISTING PROFILE TOP OF RAIL

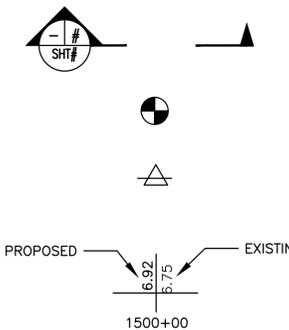


SECTION

PROFILE GRADE LINE (PGL)

PI, PVI, PS, PITO

PROFILE ELEVATIONS



No.	Date	Revision	Approved
ENGINEERING DEPARTMENT			
PATH			

CIVIL
Title
**OPEN AREA TRACKWORK REPLACEMENT
TURNOUTS 7, 27, AND CROSSOVER 11
PURCHASE OF SPECIAL TRACKWORK**

NOTES, LEGEND AND ABBREVIATIONS

This drawing subject to conditions in contract. All inventions, ideas, designs and methods herein are reserved to Port Authority and may not be used without its written consent. All recipients of Contract documents, including bidders and those who do not bid and their prospective subcontractors and suppliers who may receive all or a part of the Contract documents or copies thereof, shall make every effort to ensure the secure and appropriate disposal of the Contract documents to prevent further disclosure of the information contained in the documents. Secure and appropriate disposal includes methods of document destruction such as shredding or arrangements with refuse handlers that ensure that third persons will not have access to the documents' contents either before, during, or after disposal. Documents may also be returned for disposal purposes to the Contract Desk on the 3rd Floor, 3 Gateway Center, Newark, NJ 07102 or the office of the Director of Procurement, One Madison Avenue, 7th Floor, New York, NY 10010. It is a violation of law for any person to alter a document in any way, unless acting under the direction of a licensed professional engineer or registered architect. If this document bearing the seal of an engineer/architect is altered, the altering engineer/architect shall affix to the document their seal and the notation "altered by" followed by their signature and the date of such alteration, and a specific description of the alteration.

AREICHLE M.LOUIE T.CARROLL
Designed by Drawn by Checked by

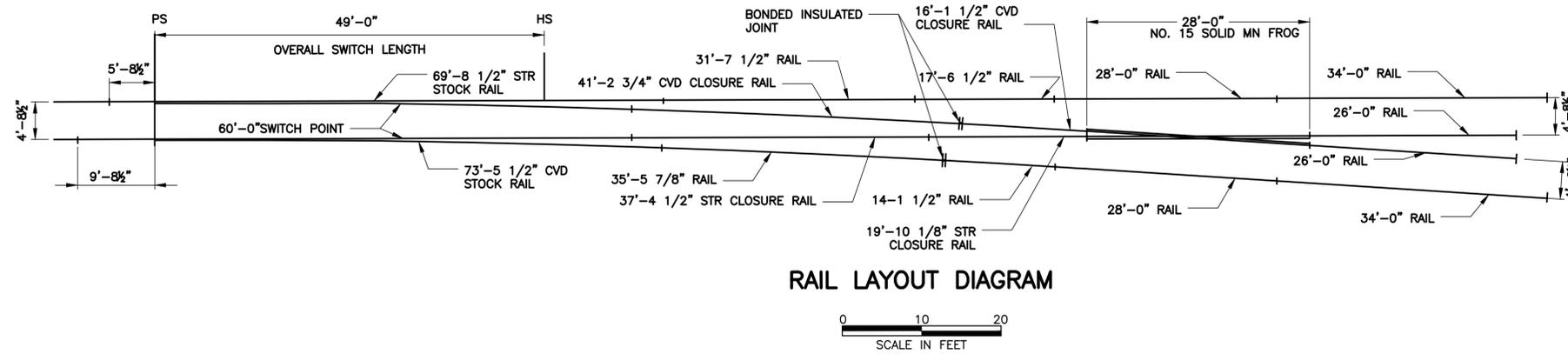
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Contract Number **PAT-024.068**

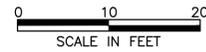
Drawing Number **C001**
PID# 10977000



PORT AUTHORITY
TRANS-HUDSON CORPORATION



RAIL LAYOUT DIAGRAM



TURNOUTS FURNISHED UNDER THIS CONTRACT

NUMBER	HAND	SWITCH MACHINE SIDE	HELPER SIDE	NOTES
11W	RH	LEFT	RIGHT	SEE DWG C006 FOR TIE ARRANGEMENT
11E	RH	LEFT	RIGHT	THROUGH CROSSOVER
7	LH	RIGHT	LEFT	SEE DWG C005 FOR TIE ARRANGEMENT

NOTES:

1. RUNNING RAIL SHALL BE 115 RE SECTION.
2. SWITCH POINTS SHALL BE 54E1A1 SECTION.
3. FROG SHALL BE FULLY WELDED MANGANESE.
4. GUARD RAIL SHALL BE 33C1 SECTION.
5. ALL JOINTS SHALL BE WELDED UNLESS OTHERWISE NOTED.
6. RH TURNOUT SHOWN. LH TURNOUT WILL BE MIRROR IMAGE.
7. WHILE THIS DRAWING SHOWS THE FULL TURNOUT TIE SET FOR COMPLETENESS, ALL TURNOUTS DELIVERED UNDER THIS ORDER ARE PARTS OF CROSSOVERS AND THUS WILL REQUIRE DIFFERENT TIE DESIGNS BEYOND THE FROG HEEL.
8. SEE CROSSOVER DRAWINGS FOR MATCHLINE LOCATIONS TO THIS DRAWING. DIMENSIONS ON THIS DRAWING ARE INTENDED TO MAXIMIZE COMMONALITY OF REPLACEMENT PARTS WITH EXISTING TURNOUTS. THESE DIMENSIONS SHALL BE FOLLOWED EXPLICITLY EXCEPT FOR CONFIGURATIONS OF HST'S AND HELPER RODS, WHICH SHALL BE DETAILED BY THE CONTRACTOR.
9. VENDOR SHALL PROVIDE HEEL SPREAD BASED UPON FIRST POINT OF SWITCH FIXATION.
10. SEE DWGS C011 AND C012 FOR LIMITS OF SUPPLIED MATERIALS.

No.	Date	Revision	Approved

ENGINEERING DEPARTMENT			
PATH			

CIVIL

Title
**OPEN AREA TRACKWORK REPLACEMENT
TURNOUTS 7, 27, AND CROSSOVER 11
PURCHASE OF SPECIAL TRACKWORK**

**NO. 15 TURNOUT
GENERAL LAYOUT
SHEET 2 OF 2**

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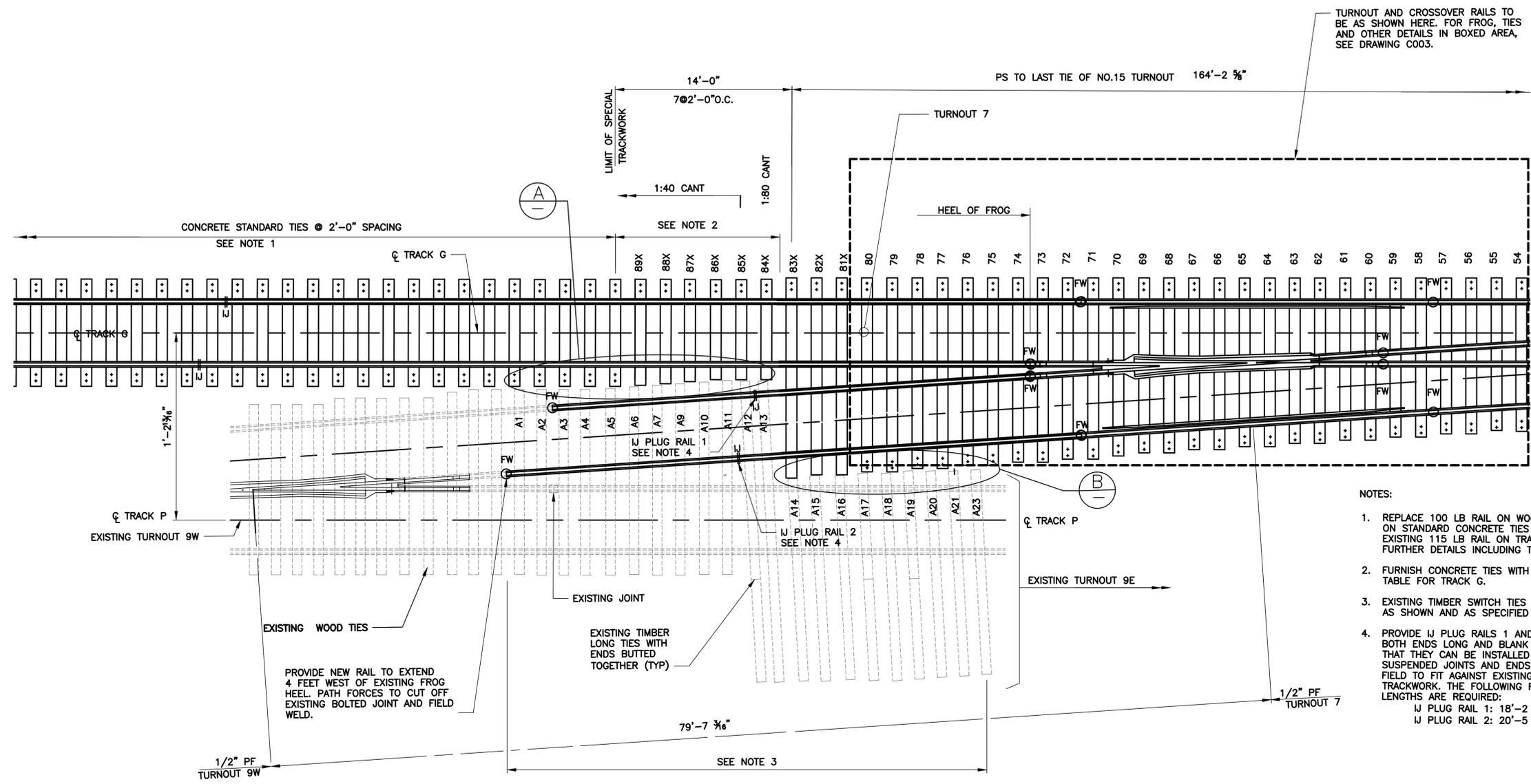
A.REICHLÉ A.REICHLÉ T.CARROLL
Designed by Drawn by Checked by

Date JANUARY 9, 2013

Contract Number **PAT-024.068**

Drawing Number **C004**
PID# 10977000

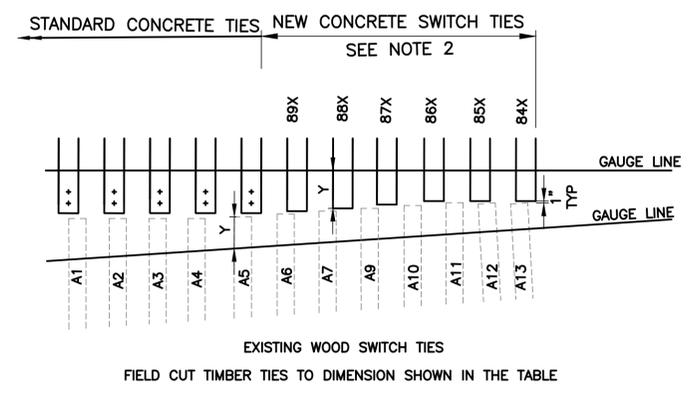
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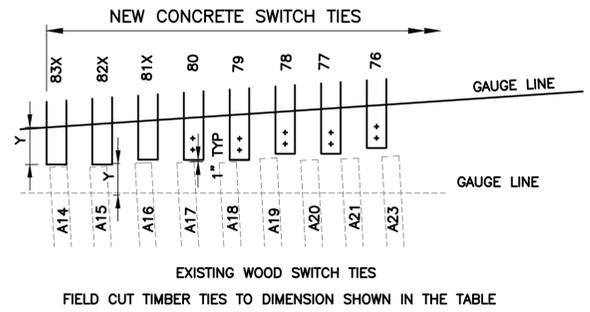
- NOTES:
- REPLACE 100 LB RAIL ON WOOD TIES WITH NEW 115 LB RAIL ON STANDARD CONCRETE TIES WITH INSULATED JOINTS TO MEET EXISTING 115 LB RAIL ON TRACK G. SEE ALSO DWG. C011 FOR FURTHER DETAILS INCLUDING TRANSITION AREA.
 - FURNISH CONCRETE TIES WITH EDGE DISTANCES SPECIFIED IN TABLE FOR TRACK G.
 - EXISTING TIMBER SWITCH TIES OF CROSSOVER 9 TO BE FIELD CUT AS SHOWN AND AS SPECIFIED IN TABLE.
 - PROVIDE U PLUG RAILS 1 AND 2 WITH BOTH ENDS LONG AND BLANK SO THAT THEY CAN BE INSTALLED WITH SUSPENDED JOINTS AND ENDS CUT IN FIELD TO FIT AGAINST EXISTING TRACKWORK. THE FOLLOWING RAIL LENGTHS ARE REQUIRED:
 U PLUG RAIL 1: 18'-2 1/2" / 23'-9 3/8"
 U PLUG RAIL 2: 20'-5 5/8" / 29'-2 5/8"

EDGE DISTANCES AT INTERFACE BETWEEN TURNOUTS 7 & 9W

TIE NUMBER	Y (INCH)	TIE NUMBER	Y (INCH)
81X	16	A10	16
82X	16	A11	16
83X	16	A12	14 1/2
84X	16	A13	14
85X	16	A14	13 1/2
86X	16	A15	13 1/2
87X	16	A17	15 1/2
88X	18	A18	16
89X	21	A19	16
A1	21	A20	18
A2	20	A21	18
A3	18 1/2	A22	18
A4	16	A23	22
A5	16		
A6	16		
A7	16		
A8	16		
A9	16		



A DETAIL
SCALE: NTS



B DETAIL
SCALE: NTS



No.	Date	Revision	Approved
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Title
**OPEN AREA TRACKWORK REPLACEMENT
TURNOUTS 7, 27, AND CROSSOVER 11
PURCHASE OF SPECIAL TRACKWORK**

**TURNOUT 7
RAIL AND TIE
LAYOUT**

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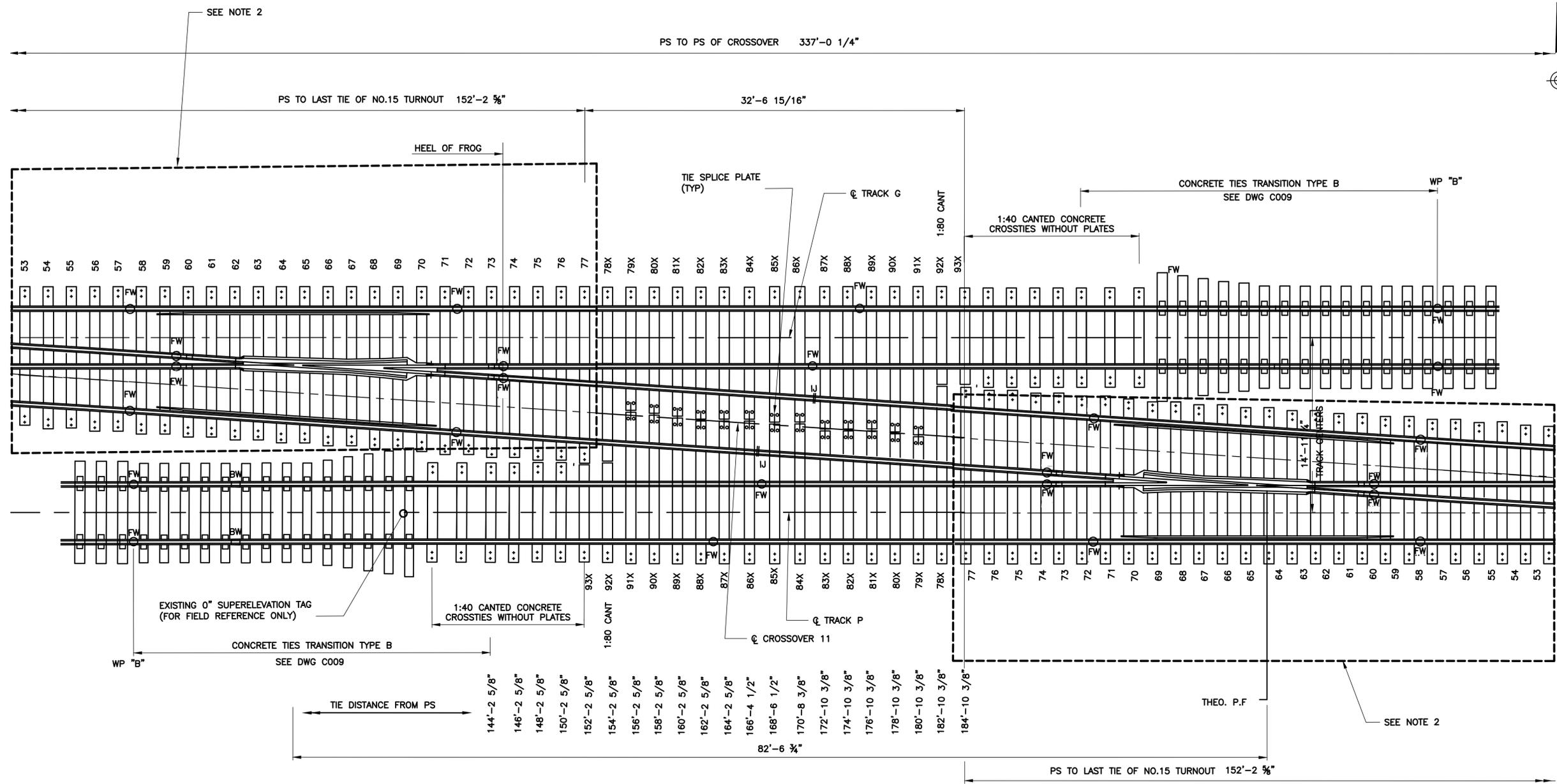
A.REICHLÉ A.REICHLÉ T.CARROLL
Designed by Drawn by Checked by

Date JANUARY 9, 2013

Contract Number **PAT-024.068**

Drawing Number **C005**
PID# 10977000

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CIVIL			

Title
**OPEN AREA TRACKWORK REPLACEMENT
 TURNOUTS 7, 27, AND CROSSOVER 11
 PURCHASE OF SPECIAL TRACKWORK**

**CROSSOVER 11 RAIL
 AND TIE LAYOUT**

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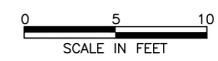
Designed by **A.REICHL** Drawn by **A.REICHL** Checked by **T.CARROLL**

Date **JANUARY 9, 2013**

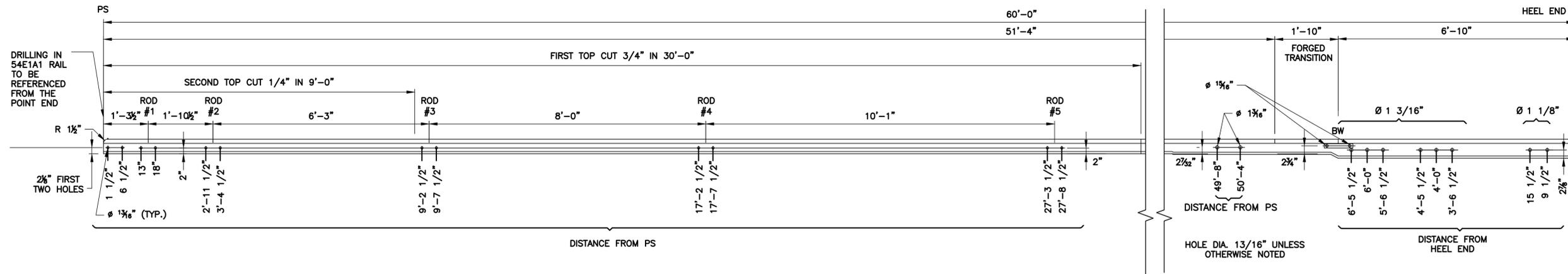
Contract Number **PAT-024.068**

Drawing Number **C006**
 PID# 10977000

- NOTES:
- CROSSOVER RAIL LENGTHS TO BE CALCULATED BY FABRICATOR AND SHOWN ON SHOP DRAWINGS.
 - FOR FROGS, TIES AND OTHER DETAILS IN AREAS DELINEATED BY DASHED BOX, SEE DRAWING C003.

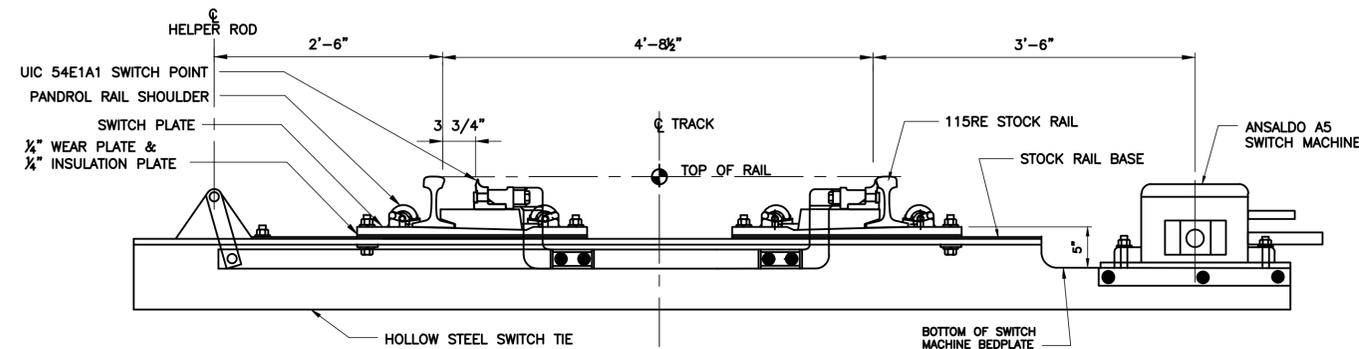


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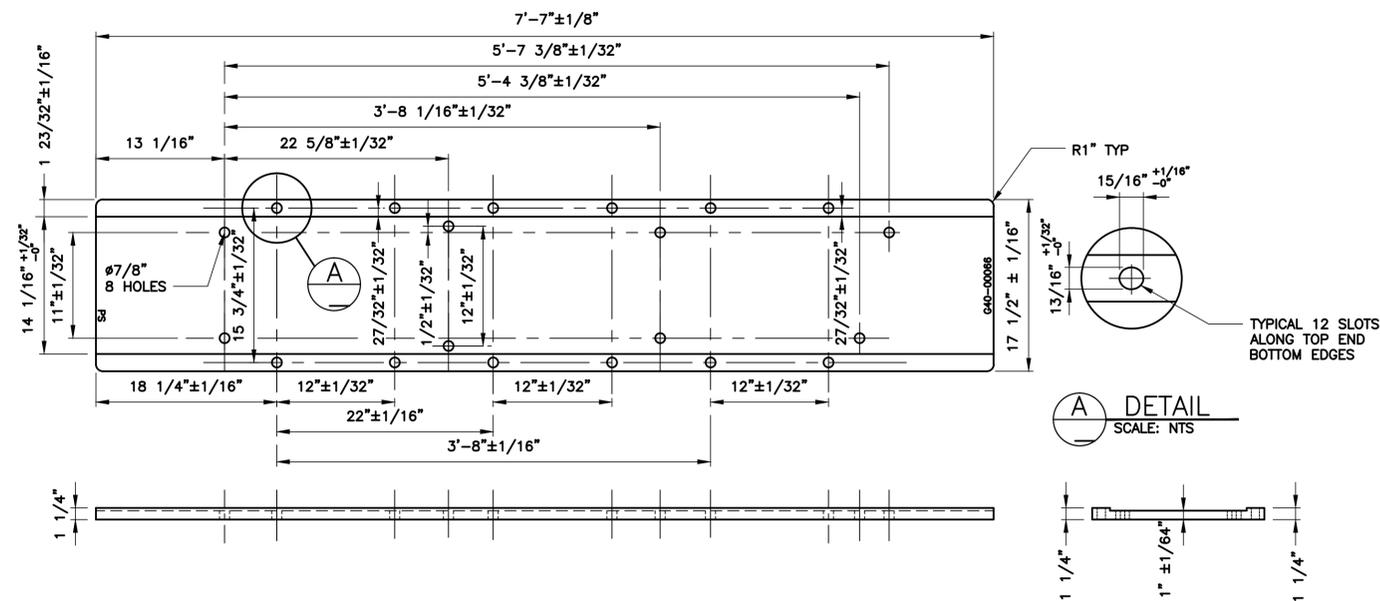
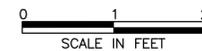


**SWITCH POINT ELEVATION FOR No. 15 TURNOUT
NO VERTICAL BEND – UNIFORM RISERS THROUGHOUT**

NTS



TYPICAL SECTION AT SWITCH POINT NO. 1 ROD



BASE PLATE FOR US&S A-5 SWITCH MACHINE HST ASSEMBLY

NOTES:

- MATERIAL: MILD STEEL PLATE, ASTM A36, 1 1/4" THICK
- TOP SURFACE SLOT SHALL BE MACHINED FIRST, AND MACHINED EDGE SHALL BECOME THE DATUM FOR ROUND HOLES AND SLOTTED HOLES.

NTS

NOTES:

- FOLLOW SWITCH POINT DIMENSIONS AS SHOWN IN ORDER TO STANDARDIZE REPLACEMENT PARTS WITH EXISTING TURNOUTS. THE SOLE EXCEPTION IS IN DRILLING FOR RAIL CLIPS, WHERE ADDITIONAL HOLES WILL BE ALLOWED WHERE NECESSARY TO MOUNT RODS IN HST'S.

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Title
**OPEN AREA TRACKWORK REPLACEMENT
TURNOUTS 7, 27, AND CROSSOVER 11
PURCHASE OF SPECIAL TRACKWORK**

**DETAILS OF SWITCH
MACHINE AND
HOLLOW STEEL TIES**

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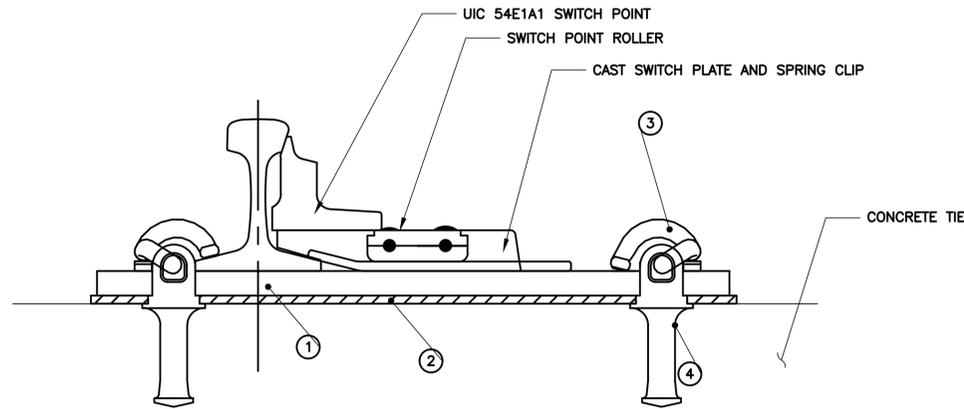
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Designed by Drawn by Checked by

Date JANUARY 9, 2013

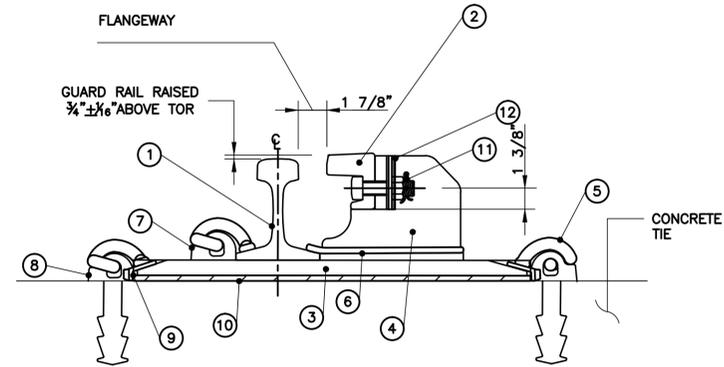
Contract Number **PAT-024.068**

Drawing Number **C007**

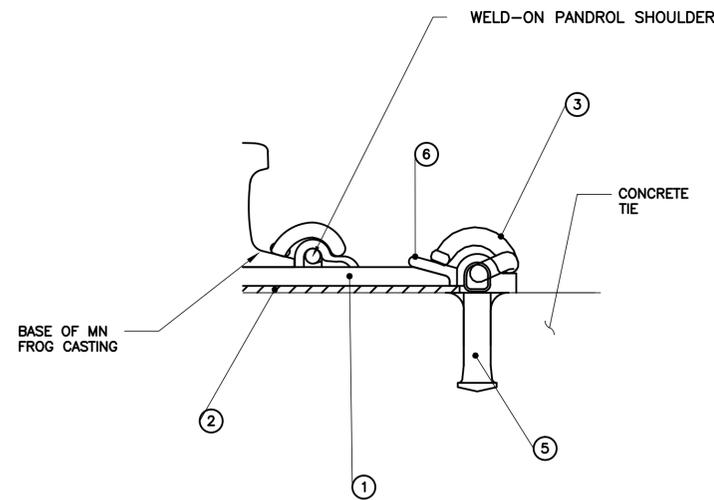
PID# 10977000



SWITCH PLATE ASSEMBLY FOR UIC54E1A1 ASYMMETRIC SWITCH POINT
NTS



GUARD RAIL PLATE AND BRACKET FOR 33C1 GUARD RAIL
NTS



FROG PLATE ASSEMBLY
NTS

SWITCH PLATE AND FROG PLATE ASSEMBLY BILL OF MATERIALS			
ITEM	DESCRIPTION	QUANTITIES SWITCH	QUANTITIES FROG
1	RAIL FASTENER PLATE	1	1
2	9 MM TIE PAD	1	1
3	PANDROL 'e' CLIP TYPE 2055	2	4
4	PANDROL RAIL SHOULDER TYPE 7250 EPOXY COATED	2	-
5	PANDROL RAIL SHOULDER TYPE 4714 EPOXY COATED	-	2
6	PANDROL HD-10 INSULATOR	-	2

BILL OF MATERIAL GUARD RAIL PLATE		
ITEM	DESCRIPTION	QUANTITY
1	115-8RE RUNNING RAIL	AS REQUIRED
2	33C1 GUARD RAIL	AS REQUIRED
3	STEEL GUARD RAIL BRACE PLATE	1
4	CAST STEEL GUARD RAIL BRACE	1
5	PANDROL 'e' CLIP TYPE 2055	3
6	LOW RAIL PROFILE CLIP	1
7	PANDROL RAIL SHOULDER SHL-7299	2
8	PANDROL RAIL SHOULDER TYPE 4714 EPOXY COATED	2
9	PANDROL HD-10 INSULATOR	2
10	9MM TIE PAD	1
11	SQUARE HEAD BOLT 7/8" x 4" WITH CASTLE NUT AND COTTER PIN	1
12	GALVANIZED STEEL ADJUSTMENT SHIM SET-1@3/8", 2@3/8", AND 1@1/4"	1 SET

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Title
OPEN AREA TRACKWORK REPLACEMENT TURNOUTS 7, 27, AND CROSSOVER 11 PURCHASE OF SPECIAL TRACKWORK

TURNOUT DETAILS

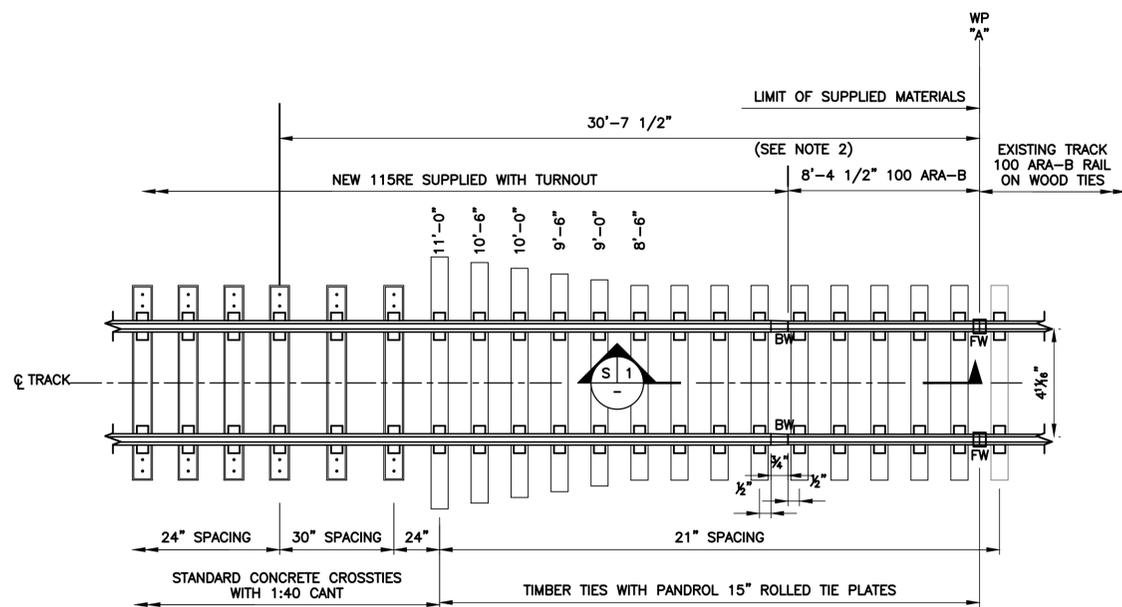
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Designed by Drawn by Checked by

Date JANUARY 9, 2013

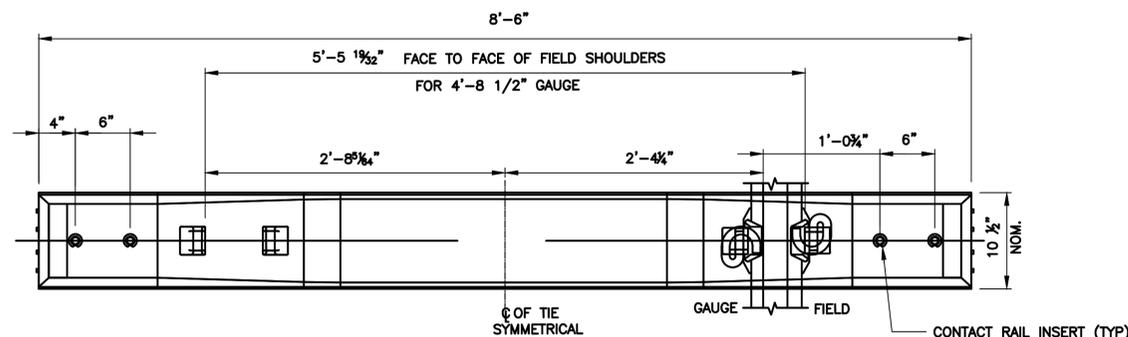
Contract Number **PAT-024.068**

Drawing Number **C008**
PID# 10977000



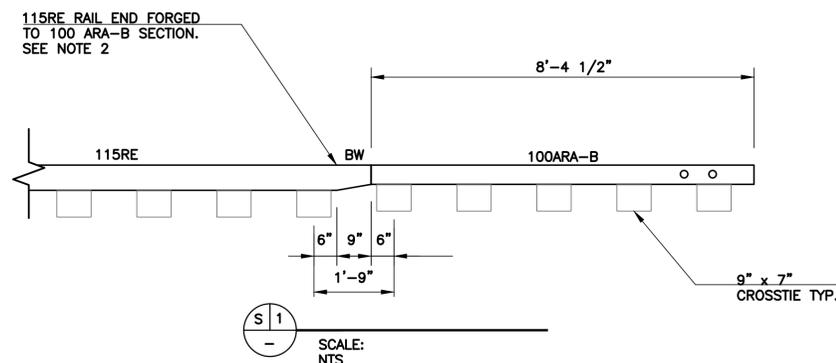
TRANSITION TYPE A CONCRETE TIES TO TIMBER TIES AND 115RE/100ARA-B RAIL TRANSITION

SCALE: NTS



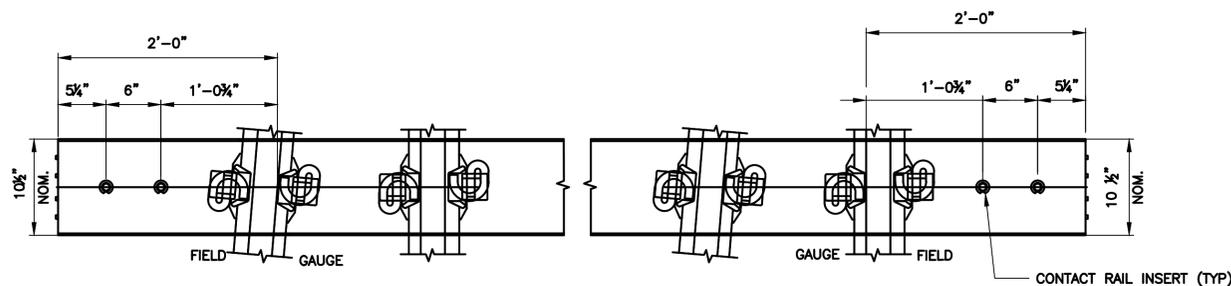
TYPICAL STANDARD CONCRETE TIE

SCALE: NTS



TRANSITION TYPE B CONCRETE TIES TO TIMBER TIES 115RE RAIL THROUGHOUT

SCALE: NTS



TYPICAL TURNOUT CONCRETE TIE

SCALE: NTS

NOTES:

1. END DRILLING PATTERN AT 100 ARA-B RAIL END SHALL BE AT 9-1/2" AND 15-1/2" FROM END OF RAIL AT 2-5/8" ABOVE BASE OF RAIL. HOLES SHALL BE 1-1/8" IN DIAMETER.
2. BUTT WELDS BETWEEN 115RE AND 100 ARA-B SECTIONS SHALL BE FLASH-BUTT ELECTRIC WELDS MADE IN THE SHOP.
3. TOP OF TRANSITION RAIL SHALL HAVE NO DIP OR CROWN EXCEEDING 0.060" WHEN MEASURED AGAINST A 36" STRAIGHT EDGE CENTERED ON THE BUTT WELD. GAUGE LINE OF TRANSITION RAIL SHALL HAVE NO BOW EXCEEDING 0.060" WHEN MEASURED AGAINST A 36" STRAIGHT EDGE CENTERED ON THE BUTT WELD
4. WP "A" AND WP "B" REPRESENT WORKING POINTS IN THE TRANSITION DETAIL THAT CORRESPOND TO SPECIFIC LOCATIONS IN THE INSTALLATION PLANS. SEE INSTALLATION DWGS C010, C011 AND C012.
5. SEE TIE LAYOUT DRAWINGS FOR LOCATIONS OF SPECIAL TRACK WORK TIES FURNISHED WITHOUT CONTACT RAIL INSERTS.

No.	Date	Revision	Approved
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CIVIL
Title
OPEN AREA TRACKWORK REPLACEMENT TURNOUTS 7, 27, AND CROSSOVER 11 PURCHASE OF SPECIAL TRACKWORK

MISCELLANEOUS DETAILS

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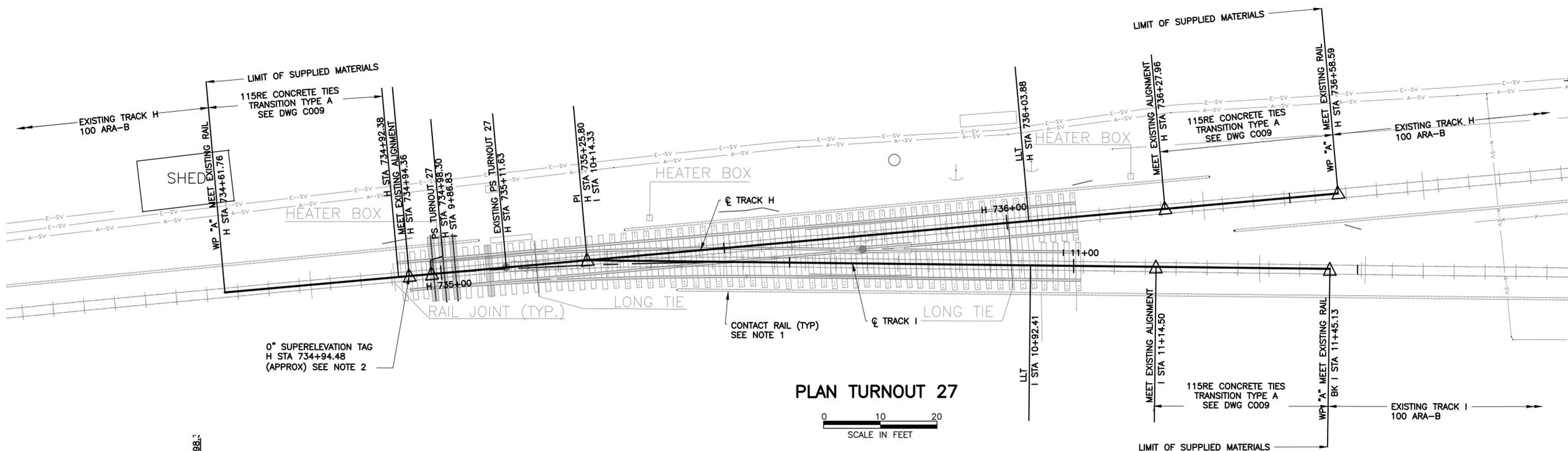
A.REICHLÉ M.LOUÏE T.CARROLL
Designed by Drawn by Checked by

Date JANUARY 9, 2013

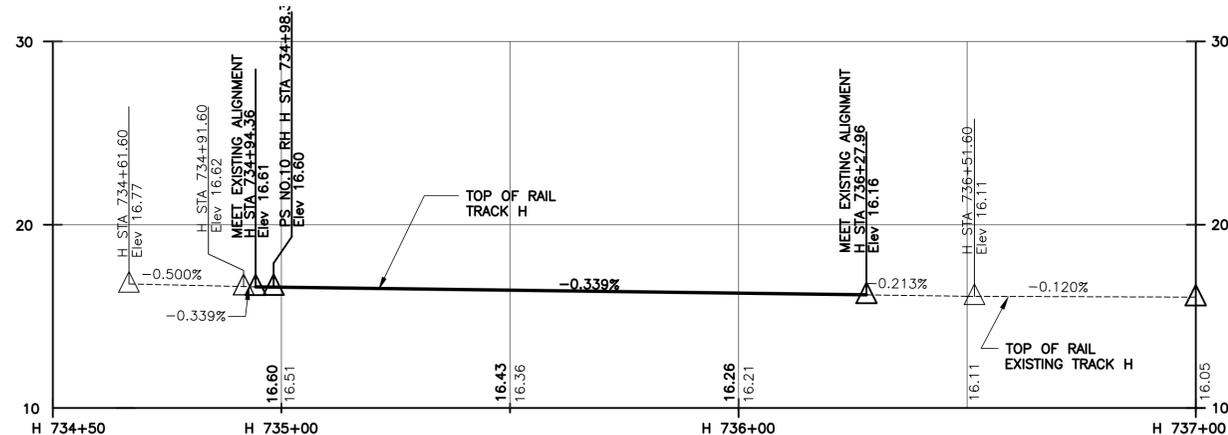
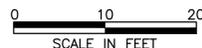
Contract Number **PAT-024.068**

Drawing Number **C009**

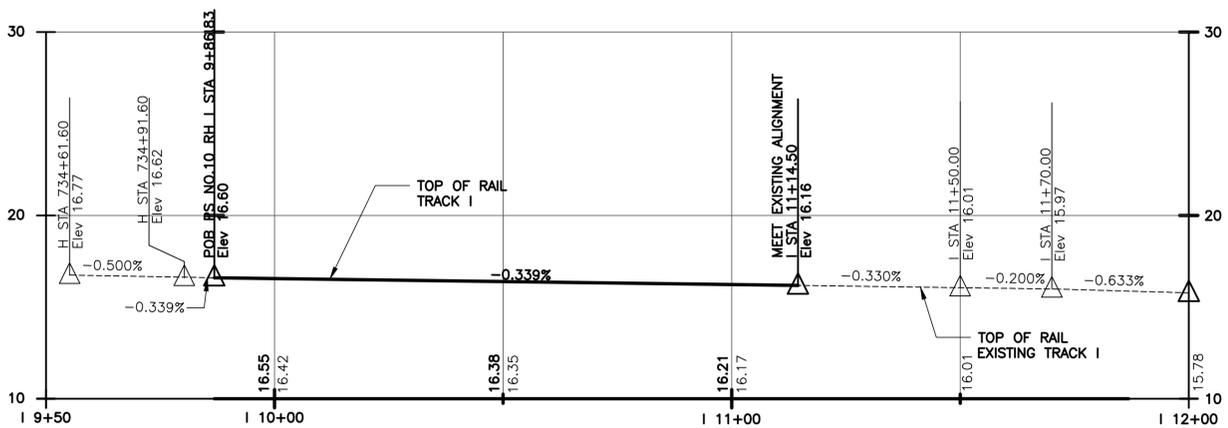
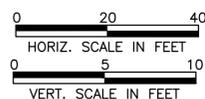
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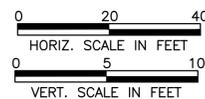
PLAN TURNOUT 27



PROFILE TRACK H



PROFILE TRACK I



NOTE:

1. MODIFICATIONS OF CONTACT RAIL AND SIGNAL COMPONENTS NOT SHOWN. WORK SHALL BE COORDINATED WITH INSTALLATION OF TURNOUT.
2. 0° SUPERELEVATION TAG LOCATION WAS MEASURED IN THE FIELD AT THIS LOCATION DURING FIELD INSPECTIONS.

ALIGNMENT DATA					
TRACK	POINT	STATION	NORTHING	EASTING	BEARING
H	MEET EXIST ALIGNMENT	H 734+94.36	695128.3582	588924.1896	N 84°56'02.652" E
	PS 27	H 734+98.30	695128.7064	588928.1181	N 84°56'02.652" E
	MEET EXIST ALIGNMENT	H 736+27.96	695140.1554	589057.2780	N 84°56'02.652" E
I	POB PS 27	I 9+86.83	695128.7064	588928.1181	N 84°56'02.652" E
	PITO	I 10+14.33	695131.1347	588955.5107	
	MEET EXIST ALIGNMENT	I 11+14.50	695129.9830	589055.6748	S 89°20'28.348" E

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CIVIL
Title
OPEN AREA TRACKWORK REPLACEMENT
TURNOUTS 7, 27, AND CROSSOVER 11
PURCHASE OF SPECIAL TRACKWORK

TURNOUT 27
TRACK ALIGNMENT
AND PROFILE

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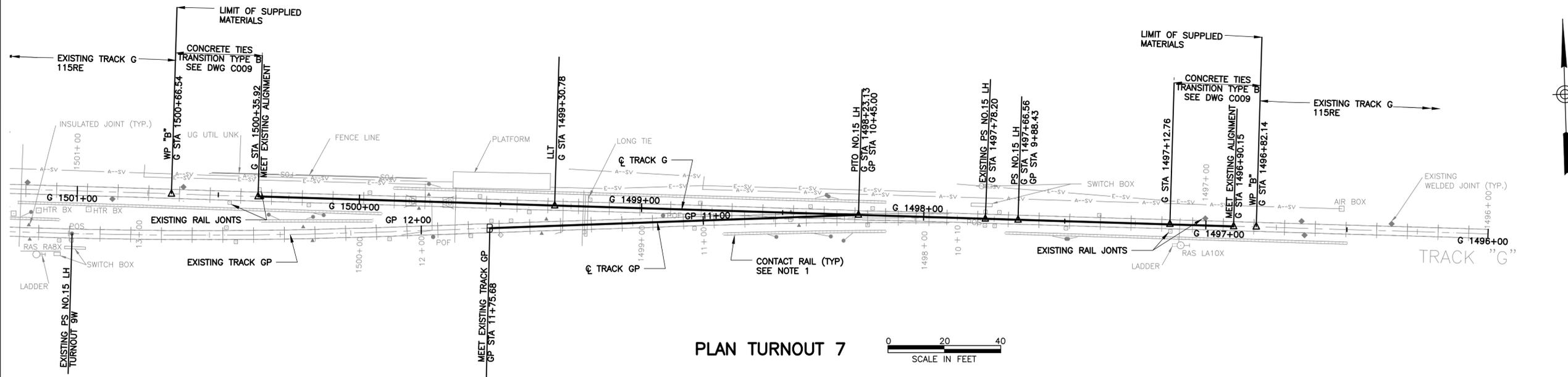
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Designed by Drawn by Checked by

Date JANUARY 9, 2013

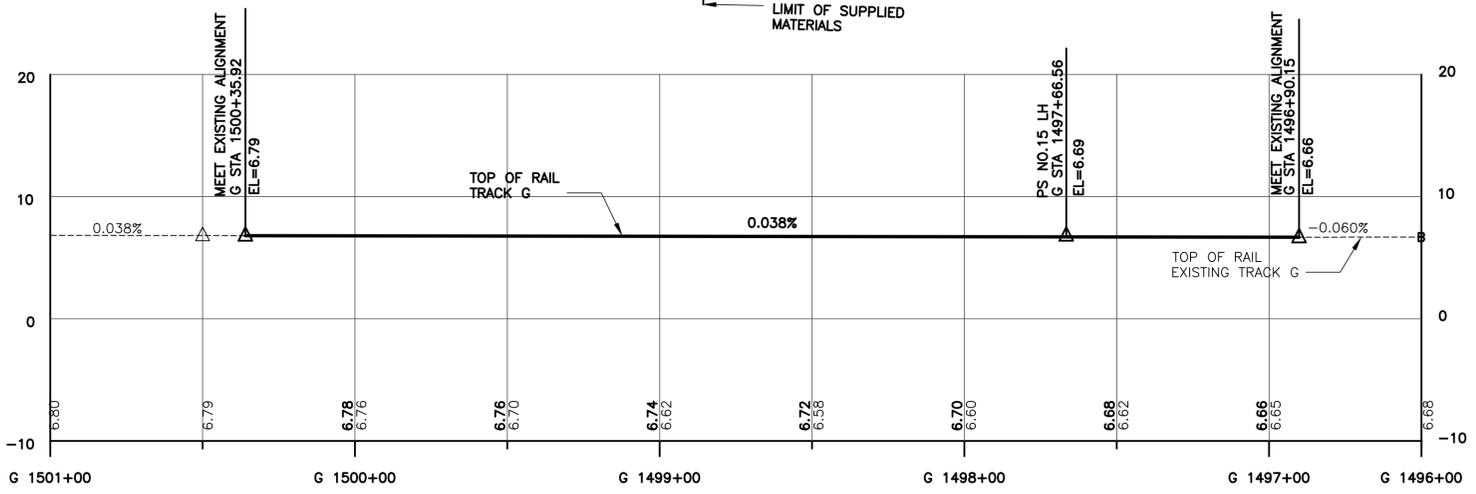
Contract Number PAT-024.068

Drawing Number C010

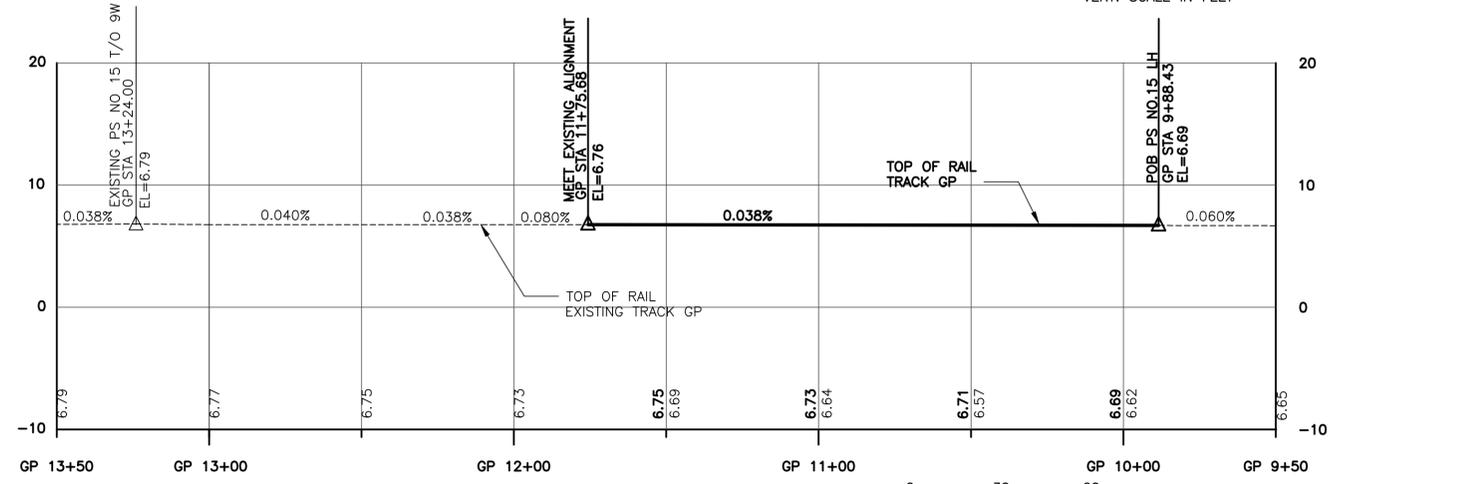
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PLAN TURNOUT 7
SCALE IN FEET



PROFILE TRACK G
HORIZ. SCALE IN FEET
VERT. SCALE IN FEET



PROFILE TRACK GP
HORIZ. SCALE IN FEET
VERT. SCALE IN FEET

NOTE:
1. MODIFICATIONS OF CONTACT RAIL AND SIGNAL COMPONENTS NOT SHOWN. WORK SHALL BE COORDINATED WITH INSTALLATION OF TURNOUT.

ALIGNMENT DATA					
TRACK	POINT	STATION	NORTHING	EASTING	BEARING
G	MEET EXISTING ALIGNMENT	G 1496+90.15	695873.7732	597432.3212	N 88°14'50.933" W
	PS 7	G 1497+66.56	695876.1099	597355.9482	N 88°14'50.933" W
	PITO	G 1498+23.13	695877.8401	597299.4017	N 88°14'50.933" W
GP	MEET EXISTING ALIGNMENT	GP 1500+35.92	695884.3475	597086.7169	N 88°14'50.933" W
	PS 7	GP 9+88.43	695876.1099	597355.9482	N 88°14'50.933" W
	PITO	GP 10+45.00	695877.8401	597299.4017	N 88°14'50.933" W
	MEET EXISTING ALIGNMENT	GP 11+75.68	695873.1295	597168.8105	S 87°56'03.067" W

No.	Date	Revision	Approved
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Title
**OPEN AREA TRACKWORK REPLACEMENT
TURNOUTS 7, 27, AND CROSSOVER 11
PURCHASE OF SPECIAL TRACKWORK**

**TURNOUT 7
TRACK ALIGNMENT
AND PROFILE**

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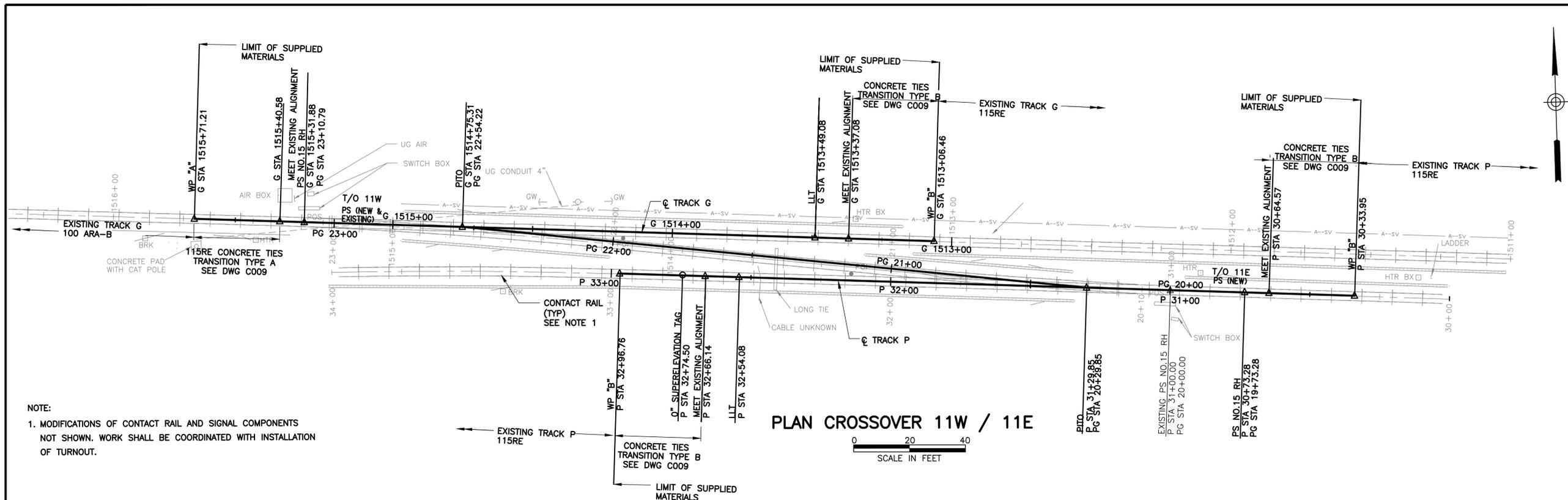
A.REICHLER A.REICHLER T.CARROLL
Designed by Drawn by Checked by

Date JANUARY 9, 2013

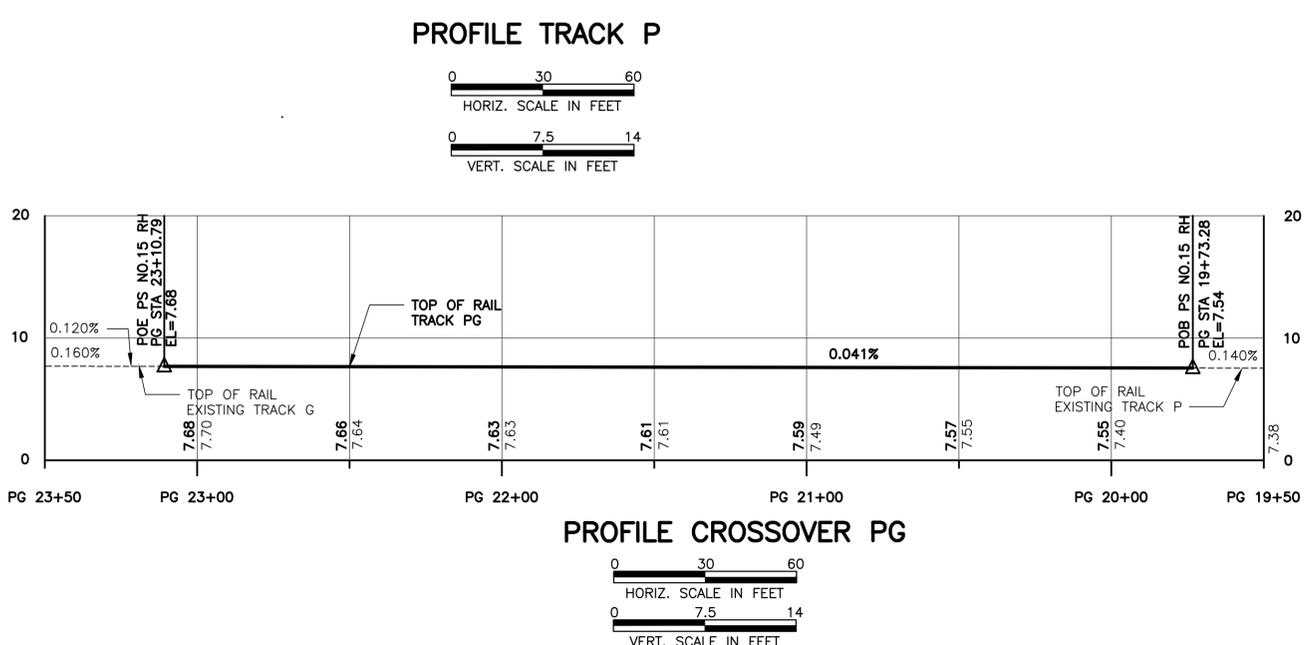
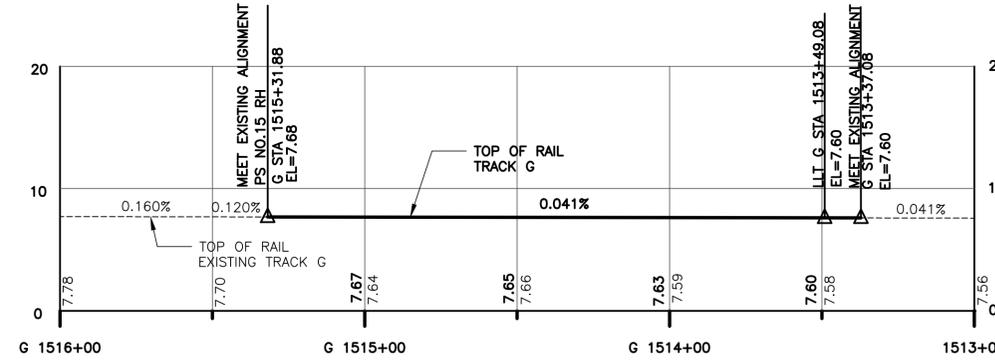
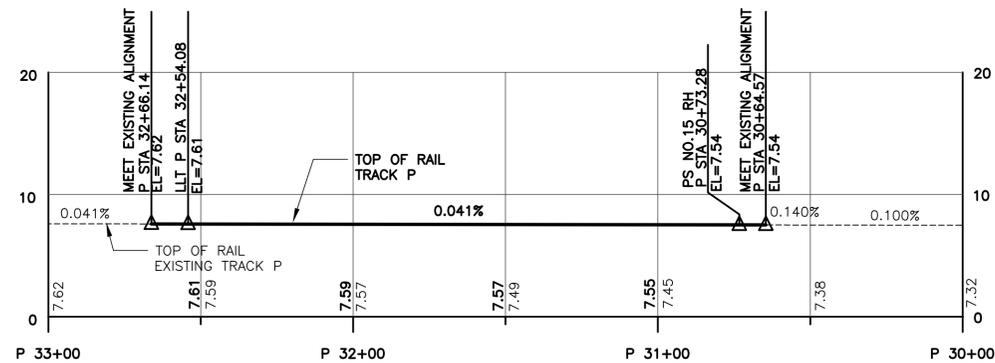
Contract Number **PAT-024.068**

Drawing Number **C011**
PID# 10977000

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NOTE:
1. MODIFICATIONS OF CONTACT RAIL AND SIGNAL COMPONENTS NOT SHOWN. WORK SHALL BE COORDINATED WITH INSTALLATION OF TURNOUT.



ALIGNMENT DATA					
TRACK	POINT	STATION	NORTHING	EASTING	BEARING
G	MEET EXISTING ALIGNMENT	G 1513+37.08	695924.0852	595786.0515	N 88°16'25.750" W
	PITO	G 1514+75.31	695928.2488	595647.8912	N 88°16'25.750" W
	POE/PS 11W	G 1515+31.88	695929.9530	595591.3438	N 88°16'25.750" W
P	MEET EXISTING ALIGNMENT	P 30+64.57	695904.6041	595936.4597	N 88°16'25.750" W
	PS 11E	P 30+73.28	695904.8664	595927.7576	N 88°16'25.750" W
	PITO	P 31+29.85	695906.5705	595871.2104	N 88°16'25.750" W
	MEET EXISTING ALIGNMENT	P 32+66.14	695910.6760	595734.9820	N 88°16'25.750" W
CROSSOVER 11W/11E	POB PS 11E	PG 19+73.28	695904.8664	595927.7576	N 88°16'25.750" W
	PITO	PG 20+29.85	695906.5705	595871.2104	N 84°27'19.750" W
	PITO	PG 22+54.22	695928.2488	595647.8912	N 88°16'25.750" W
	POE PS 11W	PG 23+10.79	695929.9530	595591.3438	N 88°16'25.750" W

No.	Date	Revision	Approved
ENGINEERING DEPARTMENT			
PATH			
CIVIL			

Title
**OPEN AREA TRACKWORK REPLACEMENT
TURNOUTS 7, 27, AND CROSSOVER 11
PURCHASE OF SPECIAL TRACKWORK**

**CROSSOVER 11
TRACK ALIGNMENT
AND PROFILE**

This drawing subject to conditions in contract. All inventions, ideas, designs and methods herein are reserved to Port Authority and may not be used without its written consent. All recipients of Contract documents, including bidders and those who do not bid and their prospective subcontractors and suppliers who may receive all or a part of the Contract documents or copies thereof, shall make every effort to ensure the secure and appropriate disposal of the Contract documents to prevent further disclosure of the information contained in the documents. Secure and appropriate disposal includes methods of document destruction such as shredding or arrangements with refuse handlers that ensure that third persons will not have access to the documents' contents either before, during, or after disposal. Documents may also be returned for disposal purposes to the Contract Desk on the 3rd Floor, 3 Gateway Center, Newark, NJ 07102 or the office of the Director of Procurement, One Madison Avenue, 7th Floor, New York, NY 10017.

A.REICHLÉ A.REICHLÉ T.CARROLL
Designed by Drawn by Checked by

Date JANUARY 9, 2013
Contract Number **PAT-024.068**
Drawing Number **C012**
PID# 10977000

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STANDARD CONTRACT TERMS AND CONDITIONS

PART I GENERAL DEFINITIONS

To avoid undue repetition, the following terms, as used in this Agreement, shall be construed as follows:

Authority or Port Authority - shall mean the Port Authority of New York and New Jersey.

PATH – shall mean the Port Authority Trans-Hudson Corporation.

Contract, Document or Agreement - shall mean the writings setting forth the scope, terms, conditions and Specifications for the procurement of Goods and/or Services, as defined hereunder and shall include, but not be limited to: Invitation for Bid (IFB), Request for Quotation (RFQ), Request for Proposal (RFP), Purchase Order (PO), Cover Sheet, executed Signature Sheet, AND PRICING SHEETS with Contract prices inserted," "STANDARD CONTRACT TERMS AND CONDITIONS," and, if included, attachments, endorsements, schedules, exhibits, or drawings, the Authority's acceptance and any written addenda issued over the name of the Authority's Manager, Purchasing Services Division.

Days or Calendar Days - shall mean consecutive calendar days, Saturdays, Sundays, and holidays, included.

Week - unless otherwise specified, shall mean seven (7) consecutive calendar days, Saturdays, Sundays, and holidays.

Month – unless otherwise specified, shall mean a calendar month.

Director/General Manager – shall mean the Director/General Manager of PATH which operates the facility of PATH at which the services hereunder are to be performed, for the time being, or his/her successor in duties for the purpose of this Contract, acting personally or through one of his/her authorized representatives for the purpose of this Contract.

Superintendent/Manager – shall mean the Superintendent/Manager of the PATH Division responsible for operating the said Facility for the time being or his/her successor in duties for the purpose of this Contract, acting personally or through his/her duly authorized representative for the purpose of this Contract.

No person shall be deemed a representative of the Director/General Manager or Superintendent/Manager except to the extent specifically authorized in an express written notice to the Contractor signed by the Director/General Manager or Superintendent/Manager as the case may be. Further, no person shall be deemed a successor in duties of the Director/General Manager unless the Contractor is so notified in writing signed by the Authority's Manager, Purchasing Services Division. No person shall be deemed a successor in duties of the Superintendent/Manager unless the Contractor is so notified in a writing signed by the Director/General Manager.

Minority Business Enterprise (MBE) - shall mean a business entity which is at least 51% owned and controlled by one or more members of one or more minority groups, or, in the case of a publicly held corporation, at least 51% of the stock of which is owned by one or more minority groups, and whose management and daily business operations are controlled by one or more such individuals who are citizens or permanent resident aliens.

"Minority Group" means any of the following racial or ethnic groups:

- (a) Black persons having origins in any of the Black African racial groups not of Hispanic origin;

- (b) Hispanic persons of Mexican, Puerto Rican, Dominican, Cuban, Central or South American culture or origin, regardless of race;
- (c) Asian and Pacific Islander persons having origins in any of the original peoples of the Far East, Southeast Asia, The Indian Subcontinent, or the Pacific Islands;
- (d) Native American or Alaskan native persons having origins in any of the original peoples of North America and maintaining identifiable tribal affiliations through membership and participation or community identification.

Site of the Work - or words of similar import shall mean the Facility and all buildings and properties associated therewith as described in this Contract.

Small Business Enterprise (SBE) - The criteria for a Small Business Enterprise are:

- o The principal place of business must be located in New York or New Jersey;
- o The firm must have been in business for at least three years with activity;
- o Average gross income limitations by industry as established by the Port Authority.

Subcontractor - shall mean anyone who performs work (other than or in addition to the furnishing of materials, plant or equipment) in connection with the services to be provided hereunder, directly or indirectly for or on behalf of the Contractor (and whether or not in privity of contract with the Contractor), but shall not include any person who furnished merely his own personal labor or his own personal services. "Subcontractor", however, shall exclude the Contractor or any subsidiary or parent of the Contractor or any person, firm or corporation which has a substantial interest in the Contractor or in which the Contractor or the parent or the subsidiary of the Contractor, or an officer or principal of the Contractor or of the parent of the subsidiary of the Contractor has a substantial interest, provided, however, that for the purpose of the clause hereof entitled "Assignments and Subcontracts" the exclusion in this paragraph shall not apply to anyone but the Contractor itself.

Women-Owned Business Enterprise (WBE) - shall mean a business enterprise which is at least 51% owned by one or more women, or, in the case of a publicly held corporation, at least 51% of the stock of which is owned by one or more women and whose management and daily business operations are controlled by one or more women who are citizens or permanent or resident aliens.

Work - shall mean all services, equipment and materials (including materials and equipment, if any, furnished by the Authority) and other facilities and all other things necessary or proper for, or incidental to the services to be performed or goods to be furnished in connection with the service to be provided hereunder.

PART II GENERAL PROVISIONS

1. Facility Rules and Regulations of PATH

- a. The Contractor shall observe and obey (and compel its officers, employees, guests, invitees, and those doing business with it, to observe and obey) the facility Rules and Regulations of PATH now in effect, and such further reasonable Rules and Regulations which may from time to time during the term of this Agreement be promulgated by PATH for reasons of safety, health, preservation of property or maintenance of a good and orderly appearance and efficient operation of the Facility. PATH agrees that, except in case of emergency, it shall give notice to the Contractor of every Rule and Regulation hereafter adopted by it at least five days before the Contractor shall be required to comply therewith.
- b. A copy of the facility Rules and Regulations of PATH shall be available for review by the Contractor at the Office of the Director/General Manager of PATH.

2. Contractor Not An Agent

This Agreement does not constitute the Contractor the agent or representative of PATH or the Port Authority, for any purpose whatsoever except as may be specifically provided in this Agreement. It is hereby specifically acknowledged and understood that the Contractor, in performing its services hereunder, is and shall be at all times an independent Contractor and the officers, agents and employees of the Contractor shall not be or be deemed to be agents, servants or employees of PATH or the Port Authority.

3. Contractor's Warranties

The Contractor represents and warrants:

- a. That it is financially solvent, that it is experienced in and competent to perform the requirements of this Contract, that the facts stated or shown in any papers submitted or referred to in connection with the solicitation are true, and, if the Contractor be a corporation, that it is authorized to perform this Contract;
- b. That it has carefully examined and analyzed the provisions and requirements of this Contract, and that from its own investigations it has satisfied itself as to the nature of all things needed for the performance of this Contract, the general and local conditions and all other matters which in any way affect this Contract or its performance, and that the time available to it for such examination, analysis, inspection and investigation was adequate;
- c. That the Contract is feasible of performance in accordance with all its provisions and requirements and that it can and will perform it in strict accordance with such provisions and requirements;
- d. That no Director, officer, agent or employee of PATH is personally interested directly or indirectly in this Contract or the compensation to be paid hereunder and that no Commissioner, officer, agent or employee of the Port Authority is personally interested directly or indirectly in this Contract or the compensation to be paid hereunder;
- e. That, except only for those representations, statements or promises expressly contained in this Contract, no representation, statement or promise, oral or in writing, of any kind whatsoever by the Port Authority, PATH, their Directors, Commissioners, officers, agents, employees or consultants has induced the Contractor to enter into this Contract or has been relied upon by the Contractor, including any with reference to: (1) the meaning, correctness, suitability, or completeness of any provisions or requirements of this Contract; (2) the nature, quantity, quality or size of the materials, equipment, labor and other facilities needed for the performance of this Contract; (3) the general or local conditions which may in any way affect this Contract or its performance; (4) the price of the Contract; or (5) any other matters, whether similar to or different from those referred to in (1) through (4) immediately above, affecting or having any connection with this Contract, the bidding thereon, any discussions thereof, the performance thereof or those employed therein or connected or concerned therewith.

Moreover, the Contractor accepts the conditions at the Site of the Work as they may eventually be found to exist and warrants and represents that it can and will perform the Contract under such conditions and that all materials, equipment, labor and other facilities required because of any unforeseen conditions (physical or otherwise) shall be wholly at its own cost and expense, anything in this Contract to the contrary notwithstanding.

Nothing in the Specifications or any other part of the Contract is intended as or shall constitute a representation by PATH as to the feasibility of performance of this Contract or any part thereof.

The Contractor further represents and warrants that it was given ample opportunity and time and by means of this paragraph was requested by the Port Authority and PATH to review thoroughly all documents forming this Contract prior to opening of Bids on this Contract in order that it might request inclusion in this Contract of any statement, representation, promise or provision which it desired or on which it wished to place reliance; that it did so review said documents, that either every such statement, representation, promise or provision has been included in this Contract or else, if omitted, that it expressly relinquishes the benefit of any such omitted statement, representation, promise or provision and is willing to perform this Contract without claiming reliance thereon or making any other claim on account of such omission.

The Contractor further recognizes that the provisions of this numbered clause (though not only such provisions) are essential to PATH's consent to enter into this Contract and that without such provisions, PATH would not have entered into this Contract.

4. Personal Non-Liability

Neither the Directors of PATH, the Commissioners of the Port Authority nor any of them, nor any officer, agent or employee of PATH or the Port Authority, shall be charged personally by the Contractor with any liability, or held personally liable to the Contractor under any term or provision of this Agreement, or because of its execution or attempted execution, or because of any breach, or attempted or alleged breach, thereof.

5. Equal Employment Opportunity, Affirmative Action, Non-Discrimination

- a. The Contractor is advised to ascertain and comply with all applicable federal, State and local statutes, ordinances, rules and regulations and, federal Executive Orders, pertaining to equal employment opportunity, affirmative action, and non-discrimination in employment.
- b. Without limiting the generality of any other term or provision of this Contract, in the event of the Contractor's non-compliance with the equal opportunity and non-discrimination clause of this Contract, or with any of such statutes, ordinances, rules, regulations or Orders, this Contract may be cancelled, terminated or suspended in whole or in part.

6. Rights and Remedies of PATH

PATH shall have the following rights in the event the Contractor is deemed guilty of a breach of any term whatsoever of this Contract:

- a. The right to take over and complete the Work or any part thereof as agent for and at the expense of the Contractor, either directly or through others.
- b. The right to cancel this Contract as to any or all of the Work yet to be performed.
- c. The right to specific performance, an injunction or any appropriate equitable remedy.
- d. The right to money damages.

For the purpose of this Contract, breach shall include but not be limited to the following, whether or not the time has yet arrived for performance of an obligation under this Contract: a statement by the Contractor to any representative of PATH indicating that the Contractor cannot or will not perform any one or more of its obligations under this Contract; any act or omission of the Contractor or any other occurrence which makes it improbable at the time that it will be able to perform any one or more of its obligations under this Contract; any suspension of or failure to proceed with any part of the Work by the Contractor which makes it improbable at the time that it will be able to perform any one or more of its obligations under this Contract.

The enumeration in this numbered clause or elsewhere in this Contract of specific rights and remedies of PATH shall not be deemed to limit any other rights or remedies which PATH would have in the absence of such enumeration; and no exercise by PATH of any right or remedy shall operate as a waiver of any other of its rights or remedies not inconsistent therewith or to estop it from exercising such other rights or remedies.

7. Rights and Remedies of the Contractor

Inasmuch as the Contractor can be adequately compensated by money damages for any breach of this Contract which may be committed by PATH, the Contractor expressly agrees that no default, act or omission of PATH shall constitute a material breach of this Contract, entitling the Contractor to cancel or rescind this Contract or to suspend or abandon performance.

8. Submission To Jurisdiction

The Contractor hereby irrevocably submits itself to the jurisdiction of the Courts of the State of New York and New Jersey, in regard to any controversy arising out of, connected with, or in any way concerning this Contract.

The Contractor agrees that the service of process on the Contractor in relation to such jurisdiction may be made, at the option of PATH, either by registered or certified mail addressed to it at the address of the Contractor indicated on the signature sheet, or by actual personal delivery to the Contractor, if the Contractor is an individual, to any partner if the Contractor be a partnership or to any officer, director or managing or general agent if the Contractor be a corporation.

Such service shall be deemed to be sufficient when jurisdiction would not lie because of the lack of basis to serve process in the manner otherwise provided by law. In any case, however, process may be served as stated above whether or not it might otherwise have been served in a different manner.

9. Harmony

- a. The Contractor shall not employ any persons or use any labor, or use or have any equipment, or permit any condition to exist which shall or may cause or be conducive to any labor complaints, troubles, disputes or controversies at the Facility which interfere or are likely to interfere with the operation of PATH or with the operations of lessees, licensees or other users of the Facility or with the operations of the Contractor under this Contract.

The Contractor shall immediately give notice to the Port Authority (to be followed by written notices and reports) of any and all impending or existing labor complaints, troubles, disputes or controversies and the progress thereof. The Contractor shall use its best efforts to resolve any such complaint, trouble, dispute or controversy. If any type of strike, boycott, picketing, work stoppage, slowdown or other labor activity is directed against the Contractor at the Facility or against any operations of the Contractor under this Contract, whether or not caused by the employees of the Contractor, and if any of the foregoing, in the opinion of PATH, results or is likely to result in any curtailment or diminution of the services to be performed hereunder or to interfere with or affect the operations of PATH, or to interfere with or affect the operations of lessees, licensees, or other users of the Facility or in the event of any other cessation or stoppage of operations by the Contractor hereunder for any reason whatsoever, PATH shall have the right at any time during the continuance thereof to suspend the operations of the Contractor under this Contract, and during the period of the suspension the Contractor shall not perform its services hereunder and the Port Authority shall have the right during said period to itself or by any third person or persons selected by it to perform said services of the Contractor using the equipment which is used by the Contractor in its operations hereunder as PATH deems necessary and without cost to PATH. During such time of suspension, the Contractor shall not be entitled to any compensation. Any flat fees, including management fees, shall be prorated. Prior to the exercise of such right by PATH, it shall give the Contractor notice thereof, which notice may be oral. No exercise by PATH of the rights granted to it in the above subparagraph shall be or be deemed to be a waiver of any rights of termination or revocation contained in this Contract or a waiver of any rights or remedies which may be available to PATH under this Contract or otherwise.

- b. During the time that the Contractor is performing the Contract, other persons may be engaged in other operations on or about the worksite including Facility operations, pedestrian, bus and vehicular traffic and other Contractors performing at the worksite, all of which shall remain uninterrupted.

The Contractor shall so plan and conduct its operations as to work in harmony with others engaged at the site and not to delay, endanger or interfere with the operation of others (whether or not specifically mentioned above), all to the best interests of PATH and the public as may be directed by PATH.

10. Claims of Third Persons

The Contractor undertakes to pay all claims lawfully made against it by subcontractors, suppliers and workers, and all claims lawfully made against it by other third persons arising out of or in connection with or because of the performance of this Contract and to cause all subcontractors to pay all such claims lawfully made against them.

11. No Third Party Rights

Nothing contained in this Contract is intended for the benefit of third persons, except to the extent that the Contract specifically provides otherwise by use of the words "benefit" or "direct right of action."

12. Provisions of Law Deemed Inserted

Each and every provision of law and clause required by law to be inserted in this Contract shall be deemed to be inserted herein and the Contract shall be read and enforced as though it were included therein, and if through mistake or otherwise any such provision is not inserted, or is not correctly inserted, then upon the application of either party, the Contract shall forthwith be physically amended to make such insertion.

13. Costs Assumed By The Contractor

It is expressly understood and agreed that all costs of the Contractor of whatever kind or nature and whether imposed directly upon the Contractor under the terms and provisions hereof or in any other manner whatsoever because of the requirements of the operation of the service or otherwise under this Agreement shall be borne by the Contractor or without compensation or reimbursement from PATH, except as specifically set forth in this Agreement. The entire and complete cost and expense of the Contractor's services and operations hereunder shall be borne solely by the Contractor and under no circumstances shall PATH be liable to any third party (including the Contractor's employees) for any such costs and expenses incurred by the Contractor and under no circumstances shall PATH be liable to the Contractor for the same, except as specifically set forth in this Section.

14. Default, Revocation or Suspension of Contract

a. If one or more of the following events shall occur:

1. If fire or other cause shall destroy all or a substantial part of the Facility.
2. If any governmental agency shall condemn or take a temporary or permanent interest in all or a substantial part of the Facility, or all of a part of PATH's interest herein;

then upon the occurrence of such event or at any time thereafter during the continuance thereof, PATH shall have the right on twenty-four (24) hours written notice to the Contractor to revoke this Contract, such revocation to be effective upon the date and time specified in such notice.

In such event this Contract shall cease and expire on the effective date of revocation as if said date were the date of the expiration of this Contract. Such revocation shall not, however, relieve the Contractor of any liabilities or obligations hereunder which shall have accrued on or prior to the effective date of revocation.

b. If one or more of the following events shall occur:

1. The Contractor shall become insolvent, or shall take the benefit of any present or future insolvency statute, or shall make a general assignment for the benefit of creditors, or file a voluntary petition in bankruptcy or a petition or answer seeking an arrangement or its reorganization or the readjustment of its indebtedness under the federal bankruptcy laws or under any other law or statute of the United States or of any State thereof, or consent to the

- appointment of a receiver, trustee, or liquidator of all or substantially all its property; or
2. By order or decree of a court the Contractor shall be adjudged bankrupt or an order shall be made approving a petition filed by any of the creditors, or, if the Contractor is a corporation, by any of the stockholders of the Contractor, seeking its reorganization or the readjustment of its indebtedness under the federal bankruptcy laws or under any law or statute of the United States or of any State thereof; or
 3. A petition under any part of the federal bankruptcy laws or an action under any present or future insolvency law or statute shall be filed against the Contractor and shall not be dismissed within thirty (30) days after the filing thereof; or
 4. The interest of the Contractor under this Contract shall be transferred to, passed to or devolve upon, by operation of law or otherwise, any other person, firm or corporation, or
 5. The Contractor, if a corporation, shall, without the prior written approval of the Port Authority, become a surviving or merged corporation in a merger, a constituent corporation in a consolidation, or a corporation in dissolution; or
 6. If the Contractor is a partnership, and the said partnership shall be dissolved as the result of any act or omission of its copartners or any of them, or by operation of law or the order or decree of any court having jurisdiction, or for any other reason whatsoever; or
 7. By or pursuant to, or under authority of any legislative act, resolution or rule, or any order or decree of any court or governmental board, agency or officer having jurisdiction, a receiver, trustee, or liquidator shall take possession or control of all or substantially all of the property of the Contractor and such possession or control of all or substantially all of the property of the Contractor and shall continue in effect for a period of fifteen (15) days;

then upon the occurrence of any such event or at any time thereafter during the continuance thereof, the PATH shall have the right upon five (5) days notice to the Contractor to terminate this Contract and the rights of the Contractor hereunder; termination to be effective upon the date and time specified in such notice as if said date were the date of the expiration of this Contract. Termination shall not relieve the Contractor of any liabilities or obligations hereunder which have accrued on or prior to the effective date of termination.

c. If any of the following shall occur:

1. The Contractor shall cease, abandon any part of the service, desert, stop or discontinue its services in the premises for any reason whatsoever and regardless of the fault of the Contractor; or
2. The Contractor shall fail to keep, perform and observe each and every other promise, covenant and agreement set forth in this Contract on its part to be kept, performed or observed, within five (5) days after receipt of notice of default thereunder from PATH or the Port Authority on behalf of PATH (except where fulfillment of its obligations requires activity over a greater period of time, and the Contractor shall have commenced to perform whatever may be required for fulfillment within five (5) days after receipt of notice and continues such performance without interruption except for causes beyond its control);

then upon the occurrence of any such event or during the continuance thereof, PATH shall have the right on twenty four (24) hours notice to the Contractor to terminate this Contract and the rights of the Contractor hereunder, termination to be effective upon the date and time specified in such notice. Termination shall not relieve the Contractor of any liabilities which shall have accrued on or prior to the effective date of termination.

d. If any of the events enumerated in this Section shall occur prior to commencement date of this Contract PATH upon the occurrence of any such event or any time thereafter during the continuance thereof by twenty-four (24) hours notice may terminate or suspend this Contract and the rights of

the Contractor hereunder, such termination or suspension to be effective upon the date specified in such notice.

- e. No payment by PATH of any monies to the Contractor for any period or periods after default of any of the terms, covenants or conditions hereof to be performed, kept and observed by the Contractor and no act or thing done or omitted to be done by PATH shall be deemed to be a waiver of the right of PATH to terminate this Contract or of any other right or remedies to which PATH may be entitled because of any breach thereof. No waiver by PATH of any default on the part of the Contractor in the performance of any of the terms, covenants and conditions hereof to be performed, kept or observed by the Contractor shall be or be construed to be a waiver by PATH of any other subsequent default in the performance of any of the said terms, covenants and conditions.
- f. In addition to all other rights of revocation or termination hereunder and notwithstanding any other provision of this Contract PATH may terminate this Contract and the rights of the Contractor hereunder without cause at any time upon five (5) days written notice to the Contractor and in such event this Contract shall cease and expire on the date set forth in the notice of termination as fully and completely as though such dates were the original expiration date hereof and if such effective date of termination is other than the last day of the month, the amount of the compensation due to the Contractor from PATH shall be prorated when applicable on a daily basis. Such cancellation shall be without prejudice to the rights and obligations of the parties arising out of portions already performed but no allowance shall be made for anticipated profits.
- g. Any right of termination contained in this paragraph, shall be in addition to and not in lieu of any and all rights and remedies that PATH shall have at law or in equity consequent upon the Contractor's breach of this Contract and shall be without prejudice to any and all such other rights and remedies. It is hereby specifically agreed and understood that the exercise by the Port Authority of any right of termination set forth in this paragraph shall not be or be deemed to be an exercise by the Port Authority of an election of remedies so as to preclude PATH from any right to money damages it may have for the period prior to the effective date of termination to the original expiration date of the Contract, and this provision shall be deemed to survive the termination of this Contract as aforesaid.
- h. If (1) the Contractor fails to perform any of its obligations under this Contract or any other agreement between PATH or the Port Authority and the Contractor (including its obligation to PATH or the Port Authority to pay any claim lawfully made against it by any supplier, subcontractor or worker or other person which arises out of or in connection with the performance of this Contract or any other agreement with PATH or the Port Authority) or (2) any claim (just or unjust) which arises out of or in connection with this Contract or any other agreement between PATH or the Port Authority and the Contractor is made against the Port Authority or PATH or (3) any subcontractor under this Contract or any other agreement between PATH or the Port Authority and the Contractor fails to pay any claims lawfully made against it by any supplier, subcontractor, worker or other third person which arises out of or in connection with this Contract or any other agreement between PATH or the Port Authority and the Contractor or if in the opinion of PATH or the Port Authority any of the aforesaid contingencies is likely to arise, then the Port Authority or PATH, as applicable, shall have the right, in its discretion, to withhold out of any payment (final or otherwise) such sums as PATH may deem ample to protect it against delay or loss or to assure the payment of just claims of third persons, and to apply such sums in such manner as PATH may deem proper to secure such protection or satisfy such claims. All sums so applied shall be deducted from the Contractor's compensation. Omission by PATH to withhold out of any payment, final or otherwise, a sum for any of the above contingencies, even though such contingency has occurred at the time of such payment, shall not be deemed to indicate that PATH does not intend to exercise its right with respect to such contingency. Neither the above provisions for rights of PATH to withhold and apply monies nor any exercise or attempted exercise of, or omission to exercise, such rights by

PATH shall create any obligation of any kind to such supplier, subcontractors, worker or other third persons. If, however, the payment of any amount due the Contractor shall be improperly delayed, PATH shall pay the Contractor interest thereon at the rate of 6% per annum for the period of the delay, it being agreed that such interest shall be in lieu of and in liquidation of any damages to the Contractor because of such delay.

- i. If PATH has paid any sum or has incurred any obligation or expense which the Contractor has agreed to pay or reimburse PATH, or if PATH is required or elects to pay any sum or sums or incurs any obligations or expense by reason of the failure, neglect or refusal of the Contractor to perform or fulfill any one or more of the conditions, covenants, or agreements contained in this Contract, or as a result of an act of omission of the Contractor contrary to the said conditions, covenants and agreements, the Contractor shall pay to PATH the sum or sums so paid or expense so incurred, including all interests, costs and damages, promptly upon the receipt of PATH's statement therefore. PATH may, however, in its discretion, elect to deduct said sum or sums from any payment payable by it to the Contractor.
- j. If PATH pays any installment to the Contractor without reducing said installment as provided in this Contract, it may reduce any succeeding installment by the proper amount, or it may bill the Contractor for the amount by which the installment paid should have been reduced and the Contractor shall pay to PATH any such amount promptly upon receipt of PATH's statement therefore.
- k. PATH shall also have the rights set forth above in the event the Contractor shall become insolvent or bankrupt or if his affairs are placed in the hands of a receiver, trustee or assignee for the benefit of creditors.

15. Sales or Compensating Use Taxes

Purchases of services and tangible personal property by PATH in the States of New York and New Jersey are generally exempt from state and local sales and compensating use taxes, and from most federal excises (Taxes). Therefore, PATH's purchase of the Contractor's services under this Contract is exempt from Taxes. Accordingly, the Contractor must not include Taxes in the price charged to PATH for the Contractor's services under this Contract. The Contractor certifies that there are no such taxes included in the prices for this Contract. The Contractor shall retain a copy of this Contract to substantiate the exempt sale.

The compensation set forth in this Agreement is the complete compensation to the Contractor, and PATH will not separately reimburse the Contractor for any taxes unless specifically set forth in this Agreement.

16. No Estoppel or Waiver

PATH shall not be precluded or estopped by any payment, final or otherwise, issued or made under this Contract, from showing at any time the true amount and character of the services performed, or from showing that any such payment is incorrect or was improperly issued or made; and PATH shall not be precluded or estopped, notwithstanding any such payment, from recovering from the Contractor any damages which it may sustain by reason of any failure on its part to comply strictly with this Contract, and any moneys which may be paid to it or for its account in excess of those to which it is lawfully entitled.

No cancellation, rescission or annulment hereof, in whole or as to any part of the services to be provided hereunder, or because of any breach hereof, shall be deemed a waiver of any money damages to which PATH may be entitled because of such breach. Moreover, no waiver by the Authority of any breach of this Contract shall be deemed to be a waiver of any other or any subsequent breach.

17. Records and Reports

The Contractor shall set up, keep and maintain (and shall cause its subcontractors to set up, keep and maintain) in accordance with generally accepted accounting practice during the term of this Agreement and any extensions thereof and for three years after the expiration, termination or revocation thereof, records, payroll records and books of account (including, but not limited to, records of original entry and daily forms, payroll runs, cancelled checks, time records, union agreements, contracts with health, pension and other third party benefit providers) recording all transactions of the Contractor (and its subcontractors), at, through or in any way connected with or related to the operations of the Contractor (and its subcontractors) hereunder, including but not limited to all matters relating to the charges payable to the Contractor hereunder, all wages and supplemental benefits paid or provided to or for its employees (and its subcontractors' employees) and such additional information as PATH may from time to time and at any time require, and also including, if appropriate, recording the actual number of hours of service provided under the Contract, and keeping separate records thereof which records and books of account shall be kept at all times within the Port District. The Contractor shall permit (and cause its subcontractors to permit) in ordinary business hours during the term of this Agreement including any extensions thereof and for three years thereafter the examination and audit by the officers, employees and representatives of PATH of such records and books of account and also any records and books of account of any company which is owned or controlled by the Contractor, or which owns or controls the Contractor if said company performs services similar to those performed by the Contractor anywhere in the Port District. However, if within the aforesaid three year period PATH has notified the Contractor in writing of a pending claim by PATH under or in connection with this Contract to which any of the aforesaid records and documents of the Contractor or of its subcontractors relate either directly or indirectly, then the period of such right of access shall be extended to the expiration of six years from the date of final payment with respect to the records and documents involved.

Upon request of the Port Authority, the Contractor shall furnish or provide access to the federal Form I-9 (Employment Eligibility Verification) for each individual performing work under this Contract. This includes citizens and noncitizens.

The Contractor (and its subcontractors) shall, at its own expense, install, maintain and use such equipment and devices for recording the labor hours of the service as shall be appropriate to its business and necessary or desirable to keep accurate records of the same and as the general manager or the Facility Superintendent/Manager may from time to time require, and the Contractor (and its subcontractors) shall at all reasonable times allow inspection by the agents and employees of PATH of all such equipment or devices.

- a. The Contractor hereby further agrees to furnish to PATH from time to time such written reports in connection with its operations hereunder as PATH may deem necessary or desirable. The format of all forms, schedules and reports furnished by the Contractor to PATH shall be subject to the continuing approval of PATH.
- b. No provision in this Contract giving PATH a right of access to records and documents is intended to impair or affect any right of access to records and documents which they would have in the absence of such provision. Additional record keeping may be required under other sections of this Contract.

18. General Obligations

- a. Except where expressly required or permitted herein to be oral, all notices, requests, consents and approvals required to be given to or by either party shall be in writing and all such notices, requests, consents and approvals shall be personally delivered to the other party during regular business hours or forwarded to such party by United States certified mail, return receipt requested, addressed to the other party at its address hereinbefore or hereafter provided. Until further notice the Contractor hereby designates the address shown on the bottom of the Contractors Signature Sheet as their address to

which such notices, requests, consents, or approvals may be forwarded. All notices, requests, consents, or approvals of the Contractor shall be forwarded to the Superintendent/Manager at the Facility.

- b. The Contractor shall comply with the provisions of all present and future federal, state and municipal laws, rules, regulations, requirements, ordinances, orders and directions which pertain to its operations under this Contract and which affect the Contract or the performance thereof and those engaged therein as if the said Contract were being performed for a private corporation, except where stricter requirements are contained in the Contract in which case the Contract shall control. The Contractor shall procure for itself all licenses, certificates, permits or other authorization from all governmental authorities, if any, having jurisdiction over the Contractor's operations hereunder which may be necessary for the Contractor's operations. The Contractor's obligation to comply with governmental requirements are not to be construed as a submission by PATH or the Port Authority to the application to itself of such requirements.
- c. The Contractor shall pay all taxes, license, certification, permit and examination fees and excises which may be assessed on its property or operations hereunder or income therefrom, and shall make all applications, reports and returns required in connection therewith.
- d. The Contractor shall, in conducting its operations hereunder, take all necessary precautions to protect the general environment and to prevent environmental pollution, contamination, damage to property and personal injury. In the event the Contractor encounters material reasonably believed to be asbestos, polychlorinated biphenyl (PCB) or any other hazardous material, in conducting its operations hereunder, the Contractor shall immediately stop Work in the area affected and report the condition in writing to the Superintendent/Manager. Work in the affected area shall not thereafter be resumed by the Contractor except upon the issuance of a written order to that effect from the Superintendent/Manager.
- e. The Contractor shall promptly observe, comply with and execute the provisions of any and all present and future rules and regulations, requirements, standard orders and directions of the American Insurance Association, the Insurance Services Office, National Fire Protection Association, and any other body or organization exercising similar functions which may pertain or apply to the Contractor's operations hereunder.

The Contractor shall not do or permit to be done any act which:

1. will invalidate or be in conflict with any fire insurance policies covering the Facility or any part thereof or upon the contents of any building thereon; or
 2. will increase the rate of any fire insurance, extended coverage or rental insurance on the Facility or any part thereof or upon the contents of any building thereon; or
 3. in the opinion of PATH will constitute a hazardous condition, so as to increase the risk normally attendant upon the operations contemplated by this Contract; or
 4. may cause or produce in the premises, or upon the Facility any unusual, noxious or objectionable smoke, gases, vapors, odors; or
 5. may interfere with the effectiveness or accessibility of the drainage and sewerage system, fire protection system, sprinkler system, alarm system, fire hydrants and hoses, if any, installed or located or to be installed or located in or on the Facility; or
 6. shall constitute a nuisance in or on the Facility or which may result in the creation, commission or maintenance of a nuisance in or on the Facility.
- f. If by reason of the Contractor's failure to comply with the provisions of this Section and provided PATH has given the Contractor five (5) days written notice of its failure and the Contractor shall not have cured said failure within said five (5) days, any fire insurance, extended coverage or rental insurance rate on the Facility or any part thereof or upon the contents of any building thereon shall at any time be higher than it otherwise would be, then the Contractor shall on demand pay PATH that part of all fire insurance, extended coverage or rental insurance premiums paid or payable by PATH which shall have been charged because of such violations by the Contractor.

- g. The Contractor shall conduct its operations hereunder so as not to endanger, unreasonably interfere with, or delay the operations or activities of any tenants or occupants on the premises or the Facility and, moreover, shall use the same degree of care in performance on the premises as would be required by law of PATH and shall conduct operations hereunder in a courteous, efficient and safe manner.
- h. The Contractor shall provide such equipment and medical facilities as may be necessary to supply first aid service in case of accidents to its personnel who may be injured in the furnishing of service hereunder. The Contractor shall maintain standing arrangements for the removal and hospital treatment of any of its personnel who may be injured.

19. Assignments and Subcontracting

- a. The Contractor shall not sell, transfer, mortgage, pledge, subcontract or assign this Contract or any part thereof or any of the rights granted hereunder or any moneys due or to become due to it hereunder or enter into any contract requiring or permitting the doing of anything hereunder by an independent Contractor, without the prior written approval of PATH, and any such sale, transfer, mortgage, pledge, subcontract, assignment or contract without such prior written approval shall be void as to PATH.
- b. All subcontractors who provide permanent personnel to the Contractor for work under this Contract shall be given written notice to comply with all requirements of the Contract. The Contractor shall be responsible and liable for the performance and acts of each subcontractor.
- c. All persons to whom the Contractor sublets services shall be deemed to be its agents and no subletting or approval thereof shall be deemed to release this Contractor from its obligations under this Contract or to impose any obligations on PATH to such subcontractor or to give the subcontractor any rights against PATH.

20. Indemnification and Risks Assumed By The Contractor

To the extent permitted by law, the Contractor shall indemnify and hold harmless PATH, the Port Authority, their Directors, Commissioners, officers, representatives and employees from and against all claims and demands, just or unjust, of third persons (including Contractor's employees, employees, officers, and agents of PATH and the Port Authority) arising out of or in any way connected or alleged to arise out of or alleged to be in any way connected with the Contract and all other services and activities of the Contractor under this Contract and for all expenses incurred by it and by them in the defense, settlement or satisfaction thereof, including without limitation thereto, claims and demands for death, for personal injury or for property damage, direct or consequential, whether they arise from the acts or omissions of the Contractor, of PATH, of the Port Authority, third persons (including Contractor's employees, employees, officers, and agents of PATH and the Port Authority), or from the acts of God or the public enemy, or otherwise, including claims and demands of any local jurisdiction against the Port Authority in connection with this Contract.

The Contractor assumes the following risks, whether such risks arise from acts or omissions (negligent or not) of the Contractor, PATH, the Port Authority, or third persons (including Contractor's employees, employees, officers, and agents of PATH and the Port Authority) or from any other cause, excepting only risks occasioned solely by affirmative willful acts of PATH or the Port Authority, as applicable, done subsequent to the opening of proposals on this Contract, and shall to the extent permitted by law indemnify PATH and the Port Authority for all loss or damage incurred in connection with such risks:

- a. The risk of any and all loss or damage to PATH or Port Authority property, equipment (including but not limited to automotive and/or mobile equipment), materials and possessions, on or off the premises, the loss or damage of which shall arise out of the Contractor's operations hereunder. The Contractor shall if so directed by PATH, repair, replace or rebuild to the satisfaction of PATH or the Port Authority, as applicable, any and all parts of the premises or the Facility which may be damaged or destroyed by the acts or omissions of the Contractor, its officers, agents, or employees and if the Contractor shall fail so to repair, replace, or rebuild with due diligence PATH or the Port Authority, as applicable, may, at its option, perform any of the foregoing work and the Contractor shall pay to PATH or the Port Authority as applicable the cost thereof.

- b. The risk of any and all loss or damage of the Contractor's property, equipment (including but not limited to automotive and/or mobile equipment) materials and possessions on the Facility.
- c. The risk of claim, whether made against the Contractor, the Port Authority or PATH, for any and all loss or damages occurring to any property, equipment (including but not limited to automotive and/or mobile equipment), materials and possessions of the Contractor's agents, employees, materialmen and others performing work hereunder.
- d. The risk of claims for injuries, damage or loss of any kind just or unjust of third persons arising or alleged to arise out of the performance of work hereunder, whether such claims are made against the Contractor, the Port Authority or PATH.

If so directed, the Contractor shall at its own expense defend any suit based upon any such claim or demand, even if such suit, claim or demand is groundless, false or fraudulent, and in handling such shall not, without obtaining express advance permission from the General Counsel of the Port Authority, raise any defense involving in any way the jurisdiction of the tribunal over the person of the Port Authority or PATH, the immunity of the Port Authority or PATH, their Directors, Commissioners, officers, agents or employees, the governmental nature of the Port Authority or PATH or the provision of any statutes respecting suits against PATH or the Port Authority.

Neither the requirements of PATH under this Contract, nor of PATH of the methods of performance hereunder nor the failure of PATH to call attention to improper or inadequate methods or to require a change in the method of performance hereunder nor the failure of PATH to direct the Contractor to take any particular precaution or other action or to refrain from doing any particular thing shall relieve the Contractor of its liability for injuries to persons or damage to property or environmental impairment arising out of its operations.

21. Approval of Methods

Neither the approval of PATH of the methods of furnishing services hereunder nor the failure of PATH to call attention to improper or inadequate methods or to require a change in the method of furnishing services hereunder, nor the failure of PATH to direct the Contractor to take any particular precautions or to refrain from doing any particular thing shall relieve the Contractor of its liability for injuries to persons or damage to property or environmental impairment arising out of its operations.

22. Safety and Cleanliness

- a. The Contractor shall, in the furnishing of services hereunder, exercise every precaution to prevent injury to person or damage to property or environmental impairment and avoid inconvenience to the occupants of or any visitors to the Facility. The Contractor shall, without limiting the generality hereof, place such personnel, erect such barricades and railings, give such warnings, display such lights, signals or signs, place such cones and exercise precautions as may be necessary, proper or desirable.
- b. The Contractor shall in case of unsafe floor conditions due to construction, wetness, spillage, sickness and all other types of hazardous conditions proceed to rope off the unsafe area and place appropriate warnings signs to prevent accidents from occurring. The Contractor shall clean said area to the satisfaction of the Superintendent/Manager.
- c. The Contractor shall at all times maintain in a clean and orderly condition and appearance any and all facilities provided by PATH for the Contractor's operations, and all fixtures, sink closets, equipment, and other personal property of PATH which are located in said facilities.

23. Accident Reports

The Contractor shall promptly report in writing to the Manager of the Facility and to the Deputy Chief, Litigation Management of the Port Authority all accidents whatsoever arising out of or in connection with its operations hereunder and which result in death or injury to persons or damage to property, setting forth such details thereof as PATH may desire. In addition, if death or serious injury or serious damage is caused, such accidents shall be immediately reported by telephone to the aforesaid representatives of PATH (or the Port Authority, as applicable).

24. Trash Removal

The Contractor shall remove daily from the Facility by means provided by the Contractor all garbage, debris and other waste material (solid or liquid) arising out of or in connection with its operations hereunder, and any such garbage, debris and other waste material not immediately removed shall be temporarily stored in a clear and sanitary condition, approved by the Superintendent/Manager and shall be kept covered except when filling or emptying them. The Contractor shall exercise care in removing such garbage, debris and other waste materials from the Facility. The manner of such storage and removal shall always be subject in all respects to the continual approval of PATH. No equipment or facilities of PATH shall be used in such removal unless with its prior consent in writing. No such garbage, debris or other waste materials shall be or be permitted to be thrown, discharged or disposed into or upon the waters at or bounding the Facility.

25. Lost and Found Property

The Contractor shall instruct its personnel that all items of personal property found by the Contractor's employees at the Site must be turned in to PATH and a receipt will be issued therefor.

26. Property of the Contractor

- a. All property of the Contractor at the Site by virtue of this Contract shall be removed on or before the expiration or sooner termination or revocation of this Contract.
- b. If the Contractor shall fail to remove its property upon the expiration, termination or revocation of this Contract PATH may, at its option, dispose of such property as waste or as agent for the Contractor and at the risk and expense of the Contractor, remove such property to a public warehouse, or may retain the same in its own possession, and in either event after the expiration of thirty (30) days may sell the same in accordance with any method deemed appropriate; the proceeds of any such sale shall be applied first, to the expenses of sale and second, to any sums owed by the Contractor to PATH; any balance remaining shall be paid to the Contractor. Any excess of the total cost of removal, storage and sale and other costs incurred by PATH as a result of such failure of performance by the Contractor over the proceeds of sale shall be paid by the Contractor to PATH upon demand.

27. Modification of Contract

This Contract may not be changed except in writing signed by PATH and the Contractor. The Contractor agrees that no representation or warranties shall be binding upon PATH unless expressed in writing in this Contract.

28. Invalid Clauses

If any provision of this Contract shall be such as to destroy its mutuality or to render it invalid or illegal, then, if it shall not appear to have been so material that without it the Contract would not have been made by the parties, it shall not be deemed to form part thereof but the balance of the Contract shall remain in full force and effect.

29. Approval of Materials, Supplies and Equipment

Only Port Authority/PATH approved materials, supplies, and equipment are to be used by the Contractor in performing the Work hereunder. Inclusion of chemical containing materials or supplies on the Port Authority/ PATH Approved Products List – Environmental Protection Supplies constitutes approval. The

list may be revised from time to time and at any time by the Port Authority/PATH and it shall be incumbent upon the Contractor to obtain the most current list from the Superintendent/Manager of the Facility.

At anytime during the Solicitation, pre-performance or performance periods, the Contractor may propose the use of an alternate product or products to those on the Approved Products List – Environmental Protection Supplies, which product(s) shall be subject to review and approval by the Port Authority. Any alternate product so approved by the Port Authority/PATH may be used by the Contractor in performing the Services hereunder. Until such approval is given, only products on the Approved Products List – Environmental Protection Supplies may be used.

30. Intellectual Property

The right to use all patented materials, appliances, processes of manufacture or types of construction, trade and service marks, copyrights and trade secrets, collectively hereinafter referred to as “Intellectual Property Rights”, in the performance of the work, shall be obtained by the Contractor without separate or additional compensation. Where the services under this Agreement require the Contractor to provide materials, equipment or software for the use of PATH/the Port Authority or its employees or agents, PATH/the Port Authority shall be provided with the Intellectual Property Rights required for such use without further compensation than is provided for under this Agreement.

The Contractor shall indemnify PATH and the Port Authority against and save it harmless from all loss and expense incurred as a result of any claims in the nature of Intellectual Property Rights infringement arising out of the Contractor’s or PATH or the Port Authority’s use, in accordance with the above immediately preceding paragraph, of any Intellectual Property. The Contractor, if requested, shall conduct all negotiations with respect to and defend such claims. If the Contractor, the Port Authority or PATH, its employees or agents be enjoined either temporarily or permanently from the use of any subject matter as to which the Contractor is to indemnify PATH, or the Port Authority as applicable, against infringement, then PATH, or the Port Authority as applicable, may, without limiting any other rights it may have, require the Contractor to supply temporary or permanent replacement facilities approved by the Superintendent/Manager, and if the Contractor fails to do so the Contractor shall, at its expense, remove all such enjoined facilities and refund the cost thereof to PATH or the Port Authority, as applicable, or take such steps as may be necessary to insure compliance by the Contractor, and PATH (or the Port Authority, as applicable) with said injunction, to the satisfaction of PATH or the Port Authority as applicable.

In addition, the Contractor shall promptly and fully inform the Director/General Manager in writing of any intellectual property rights disputes, whether existing or potential, of which it has knowledge, relating to any idea, design, method, material, equipment or any other matter related to the subject matter of this Agreement or coming to its attention in connection with this Agreement.

31. Contract Records and Documents – Passwords and Codes

When the performance of the contract services requires the Contractor to produce, compile or maintain records, data, drawings, or documents of any kind, regardless of the media utilized, then all such records, drawings, data and documents which are produced, prepared or compiled in connection with this contract, shall become the property of PATH (or the Port Authority as applicable), and PATH (or the Port Authority as applicable) shall have the right to use or permit the use of them and any ideas or methods represented by them for any purpose and at any time without other compensation than that specifically provided herein.

When in the performance of the contract services the Contractor utilizes passwords or codes for any purpose, at any time during or after the performance of such services, upon written request by PATH (or the Port Authority as applicable), the Contractor shall make available to the designated PATH (or the Port Authority as applicable) representative all such passwords and codes.

32. Designated Secure Areas

Services under the Contract may be required in designated secure areas, as the same may be designated by the Superintendent/Manager from time to time ("Secure Areas"). The Port Authority shall require the observance of certain security procedures with respect to Secure Areas, which may include the escort to, at, and/or from said high security areas by security personnel designated by the Contractor or any subcontractor's personnel required to work therein. All personnel that require access to designated secure areas who are not under positive escort by an authorized individual will be required to undergo background screening and personal identity verification.

Forty-eight (48) hours prior to the proposed performance of any work in a Secure Area, the Contractor shall notify the Superintendent/Manager. The Contractor shall conform to the procedures as may be established by the Superintendent/Manager from time to time and at any time for access to Secure Areas and the escorting of personnel hereunder. Prior to the start of work, the Contractor shall request a description from the Superintendent/Manager of the Secure Areas which will be in effect on the commencement date. The description of Secure Areas may be changed from time to time and at any time by the Superintendent/Manager during the term of the Contract.

33. Notification of Security Requirements

PATH has the responsibility of ensuring safe, reliable and secure transportation facilities, systems, and projects to maintain the well-being and economic competitiveness of the region. Therefore, PATH reserves the right to deny access to certain documents, sensitive security construction sites and facilities (including rental spaces) to any person that declines to abide by Port Authority or PATH security procedures and protocols, any person with a criminal record with respect to certain crimes or who may otherwise poses a threat to the construction site or facility security. The Authority and PATH reserve the right to impose multiple layers of security requirements on the Contractor, its staff and subcontractors and their staffs depending upon the level of security required, or may make any amendments with respect to such requirements as determined by the Authority and/or PATH.

These security requirements may include but are not limited to the following:

- Contractor/ Subcontractor identity checks and background screening

PATH and the Port Authority's designated background screening provider may require inspection of not less than two forms of valid/current government issued identification (at least one having an official photograph) to verify staff's name and residence; screening federal, state, and/or local criminal justice agency information databases and files; screening of any terrorist identification files; access identification to include some form of biometric security methodology such as fingerprint, facial or iris scanning, or the like.

The Contractor may be required to have its staff, and any subcontractor's staff, material-men, visitors or others over whom the Contractor/subcontractor has control, authorize the Authority or its designee to perform background checks, and a personal identity verification check. Such authorization shall be in a form acceptable to the Authority and/or PATH. The Contractor and subcontractors may also be required to use an organization designated by the Authority and/or PATH to perform the background checks.

As of January 29, 2007, the Secure Worker Access Consortium (S.W.A.C.) is the only Port Authority approved provider to be used to conduct background screening and personal identity verification, except as otherwise required by federal law and/or regulation (such as the Transportation Worker Identification Credential for personnel performing in secure areas at Maritime facilities). Information about S.W.A.C.,

instructions, corporate enrollment, online applications, and location of processing centers can be found at <http://www.secureworker.com>, or S.W.A.C. may be contacted directly at (877) 522-7922 for more information and the latest pricing. The cost for said background checks for staff that pass and are granted a credential shall be reimbursable to the Contractor (and its subcontractors) as an out-of-pocket expense as provided herein. Staff that are rejected for a credential for any reason are not reimbursable.

- Issuance of Photo Identification Credential

No person will be permitted on or about a Port Authority or PATH construction site or facility (including rental spaces) without a facility-specific photo identification credential approved by the Authority and/or PATH. If the authority requires facility-specific identification credential for the Contractor's and the subcontractor's staff, the Authority and/or PATH will supply such identification at no cost to the Contractor or its subcontractors. Such facility-specific identification credential shall remain the property of the Authority and/or PATH and shall be returned to the Authority and/or PATH at the completion or upon request prior to completion of the individual's assignment at the specific facility. It is the responsibility of the appropriate Contractor or subcontractor to immediately report to the Authority and/or PATH the loss of any staff member's individual facility-specific identification credential. The Contractor or subcontractor shall be billed for the cost of the replacement identification credential. Contractor's and subcontractor's staff shall display Identification badges in a conspicuous and clearly visible manner, when entering, working or leaving an Authority or PATH construction site or facility.

Employees may be required to produce not less than two forms of valid/current government issued identification having an official photograph and an original, unlaminated social security card for identify and SSN verification. Where applicable, for sensitive security construction sites or facilities, successful completion of the application, screening and identify verification for all employees of the Contractor and subcontractors shall be completed prior to being provided a S.W.A.C. ID Photo Identification credential.

- Access control, inspection, and monitoring by security guards

The Authority may provide for Authority and/or PATH construction site or facility (including rental spaces) access control, inspection and monitoring by Port Authority Police, Authority or PATH retained contractor security guards. However, this provision shall not relieve the Contractor of its responsibility to secure its equipment and work and that of its subconsultant/subcontractor's and service suppliers at the Authority or PATH construction site or facility (including rental spaces). In addition, the Contractor, subcontractor or service provider is not permitted to take photographs, digital images, electronic copying and/or electronic transmission or video recordings or make sketches on any other medium at the Authority or PATH construction sites or facilities (including rental spaces), except when necessary to perform the Work under this Contract, without prior written permission from the Authority or PATH. Upon request, any photograph, digital images, video recording or sketches made of the Authority construction site or facility shall be submitted to the Authority to determine compliance with this paragraph, which submission shall be conclusive and binding on the submitting entity.

- Compliance with the Port Authority Information Security Handbook

The Contract may require access to Port Authority or PATH information considered Confidential Information ("CI") as defined in the Port Authority Information Security Handbook ("Handbook"), dated October, 2008, corrected as of February, 2009, and as may be further amended. The Handbook and its requirements are hereby incorporated into this agreement and will govern the possession, distribution and use of CI if at any point during the lifecycle of the project or solicitation it becomes necessary for the Contractor to have access to CI. Protecting sensitive information requires the application of uniform safeguarding measures to prevent unauthorized disclosure and to control any authorized disclosure of this information within the Port Authority or when released by the Port Authority to outside entities. The following is an outline of some of the procedures, obligations and directives contained in the Handbook:

- (1) require that the Contractor and subcontractors, when appropriate, sign Non-Disclosure Agreements (NDAs), or an Acknowledgment of an existing NDA, provided by the Authority as

- a condition of being granted access to Confidential Information categorized and protected as per the Handbook;
- (2) require that individuals needing access to CI be required to undergo a background check, pursuant to the process and requirements noted in § 3.2 of the Information Security Handbook.
 - (3) require Contractors and commercial enterprises to attend training to ensure security awareness regarding Port Authority and PATH information;
 - (4) specific guidelines and requirements for the handling of CI to ensure that the storage and protection of CI;
 - (5) restrictions on the transfer, shipping, and mailing of CI information;
 - (6) prohibitions on the publication, posting, modifying, copying, reproducing, republishing, uploading, transmitting, or distributing CI on websites or web pages. This may also include restricting persons, who either have not passed a pre-screening background check, or who have not been granted access to CI, from viewing such information;
 - (7) require that CI be destroyed using certain methods, measures or technology pursuant to the requirements set forth in the Handbook;
 - (8) require the Contractor to mandate that each of its subcontractors maintain the same levels of security required of the Contractor under any Port Authority or PATH awarded contract.
 - (9) prohibit the publication, exchange or dissemination of CI developed from the project or contained in reports, except between Contractors and subcontractors, without prior approval of the Port Authority;
 - (10) require that CI only be reproduced or copied pursuant to the requirements set forth in the Handbook.

- Audits for Compliance with Security Requirements

The Port Authority and/or PATH may conduct random or scheduled examinations of business practices under this section entitled "NOTIFICATION OF SECURITY REQUIREMENTS" and the Handbook in order to assess the extent of compliance with security requirements, Confidential Information procedures, protocols and practices, which may include, but not be limited to, verification of background check status, confirmation of completion of specified training, and/or a site visit to view material storage locations and protocols.

34. Construction In Progress

The Contractor recognizes that construction may be in progress at the Facility and may continue throughout the term of this Contract. Notwithstanding, the Contractor shall at all times during the term hereof maintain the same standards of performance and cleanliness as prevails in non-affected areas as required by the standards hereunder.

35. Permit-Required Confined Space Work

Prior to commencement of any work, the Contractor shall request and obtain from PATH a description of all spaces at the facility which are permit-required confined spaces requiring issuance of an OSHA permit.

Prior to the commencement of any work in a permit-required confined space at a Port Authority facility requiring issuance of an OSHA permit, the Contractor shall contact the Superintendent/Manager to obtain a PATH Contractor Permit-Required Confined Space Notification form. The notification form must be filled out and submitted prior to commencing permit-required confined space work. All confined space work shall be performed in accordance with all applicable OSHA requirements. The Contractor shall provide its employees with a copy of its own company permit and shall furnish PATH with a copy of the permit upon completion of the work. The Contractor must supply all equipment required for working in a confined space.

36. Signs

Except with the prior written approval of PATH, the Contractor shall not erect, maintain or display any signs or posters or any advertising on or about the Facility.

37. Vending Machines, Food Preparation

The Contractor shall not install, maintain or operate on the Facility, or on any other PATH property, any vending machines without the prior written approval of the Port Authority. No foods or beverages shall be prepared or consumed at the Facility by any of the Contractor's employees except in areas as may be specifically designated by PATH for such purpose.

38. Confidential Information/Non-Publication

a. As used herein, confidential information shall mean all information disclosed to the Contractor or the personnel provided by the Contractor hereunder which relates to the Authority's and/or PATH's past, present, and future research, development and business activities including, but not limited to, software and documentation licensed to the Authority or proprietary to the Authority and/or PATH and all associated software, source code procedures and documentation. Confidential information shall also mean any other tangible or intangible information or materials including but not limited to computer identification numbers, access codes, passwords, and reports obtained and/or used during the performance of the Contractor's Services under this Contract.

b. Confidential information shall also mean and include collectively, as per *The Port Authority of New York & New Jersey Information Security Handbook (October 15, 2008, corrected as of February, 9 2009)*, Confidential Proprietary Information, Confidential Privileged Information and information that is labeled, marked or otherwise identified by or on behalf of the Authority so as to reasonably connote that such information is confidential, privileged, sensitive or proprietary in nature. Confidential Information shall also include all work product that contains or is derived from any of the foregoing, whether in whole or in part, regardless of whether prepared by the Authority or a third-party or when the Authority receives such information from others and agrees to treat such information as Confidential.

c. The Contractor shall hold all such confidential information in trust and confidence for the Authority, and agrees that the Contractor and the personnel provided by the Contractor hereunder shall not, during or after the termination or expiration of this Contract, disclose to any person, firm or corporation, nor use for its own business or benefit, any information obtained by it under or in connection with the supplying of services contemplated by this Contract. The Contractor and the personnel provided by the Contractor hereunder shall not violate in any manner any patent, copyright, trade secret or other proprietary right of the Authority or third persons in connection with their services hereunder, either before or after termination or expiration of this Contract. The Contractor and the personnel provided by the Contractor hereunder shall not willfully or otherwise perform any dishonest or fraudulent acts, breach any security procedures, or damage or destroy any hardware, software or documentation, proprietary or otherwise, in connection with their services hereunder. The Contractor shall promptly and fully inform the Director/General Manager in writing of any patent, copyright, trade secret or other intellectual property rights or disputes, whether existing or potential, of which the Contractor has knowledge, relating to any idea, design, method, material, equipment or other matter related to this Contract or coming to the Contractor's attention in connection with this Contract."

d. The Contractor shall not issue nor permit to be issued any press release, advertisement, or literature of any kind, which refers to PATH (or the Port Authority as applicable) or to the fact that goods have been, are being or will be provided to it and/or that services have been, are being or will be performed for it in connection with this Agreement, unless the vendor first obtains the written approval of PATH (or the Port

Authority as applicable). Such approval may be withheld if for any reason PATH believes that the publication of such information would be harmful to the public interest or is in any way undesirable

39. Time is of the Essence

Time is of the essence in the Contractor's performance of this Contract inasmuch as the Work to be performed will affect the operation of public facilities.

40. Holidays

The following holidays will be observed at the Site:

New Year's Day	Labor Day
Martin Luther King Jr. Day	Columbus Day
Presidents' Day	Election Day
Memorial Day	Veterans Day
Independence Day	Thanksgiving Day
	Christmas Day

This list is subject to periodic revision and the Contractor shall be responsible for obtaining all updated lists from the office of the Superintendent/Manager. If any such holiday falls on a Sunday then the next day shall be considered the holiday and/or if any such holiday falls on a Saturday then the preceding day shall be considered the holiday.

41. Personnel Standards

In addition to any specific personnel requirements that may be required under the clause entitled "Personnel Requirements" in the Specifications, the Contractor (and any Subcontractor) shall furnish competent and adequately trained personnel to perform the Work hereunder. If, in the opinion of the Superintendent/Manager, any employee so assigned is performing their functions unsatisfactorily, they shall be replaced by the Contractor within twenty-four (24) hours following the Contractor's receipt of the Superintendent/Manager's request for such replacement.

All Contractor's employees performing Work hereunder shall have the ability to communicate in the English language to the extent necessary to comprehend directions given by either the Contractor's supervisory staff or by the Superintendent/Manager's staff. Any employee operating a motor vehicle must have a valid driver's license.

The Contractor shall verify that employees working under this Contract in the United States are legally present in the United States and authorized to work by means of the federally required I-9 program

42. General Uniform Requirements for Contractor's Personnel

In addition to any specific uniform requirements that may be required by the Specifications, uniforms must be worn at all times during which the Services are being performed hereunder. The Contractor agrees that his/her employees will present a neat, clean and orderly appearance at all times. Uniforms shall include the Contractor's identification badge with picture ID bearing the employee's name. All uniforms, colors, types and styles shall be subject to the prior approval of the Superintendent/Manager. The Contractor will also be responsible for ensuring that its employees are wearing shoes appropriate for the tasks performed. The Superintendent/Manager shall have the right to require removal of any employee who shall fail to wear the proper uniform and shoes, and the exercise of this right shall not limit the obligation of the Contractor to perform the Services or to furnish any required number of employees at a specific location at the Site as specified.

43. Labor, Equipment and Materials Supplied by the Contractor

The Contractor shall, at all times during the performance of this Contract, furnish all necessary labor, supervision, equipment and materials necessary for the prompt and efficient performance of the Work, whether such materials and equipment are actually employed in the furnishing of the Work or whether incidental thereto.

All materials used by the Contractor in furnishing Work hereunder shall be of such quality as to accomplish the purposes of this Contract and the Services to be furnished hereunder in such manner so as not to damage any part of the Site.

PATH by its officers, employees and representatives shall have the right at all times to examine the supplies, materials and equipment used by the Contractor, to observe the operations of the Contractor, its agents, servants and employees and to do any act or thing which PATH may be obligated or have the right to do under this Contract or otherwise.

All equipment, materials and supplies used in the performance of this Contract required hereunder shall be used in accordance with their manufacturer's instructions.

Materials and supplies to be provided by the Contractor hereunder shall comply with OSHA and all applicable regulations.

44. Contractor's Vehicles – Parking - Licenses

At the discretion of the Superintendent/Manager, PATH may permit the Contractor during the effective period of this Contract to park vehicle(s) used by it in its operations hereunder in such location as may from time to time or at any time be designated by the Superintendent/Manager. The Contractor shall comply with such existing rules, regulations and procedures as are now in force and such reasonable future rules, regulations and procedures as may hereafter be adopted by PATH for the safety and convenience of persons who park automotive vehicles in any parking area at the Site or for the safety and proper persons who park automotive vehicles in any parking area at the Site or for the safety and proper identification of such vehicles, and the Contractor shall also comply with any and all directions pertaining to such parking which may be given from time to time and at any time by the Superintendent/Manager. Any vehicle used by the Contractor hereunder shall be marked or placarded, identifying it as the Contractor's vehicle.

45. Superintendent/Manager's Authority

In the performance of the Work hereunder, the Contractor shall conform to all orders, directions and requirements of the Superintendent/Manager and shall perform the Work hereunder to the satisfaction of the Superintendent/Manager at such times and places, by such methods and in such manner and sequence as he/she may require, and the Contract shall at all stages be subject to his/her inspection. The Superintendent/Manager shall determine the amount, quality, acceptability and fitness of all parts of the Work and shall interpret the Specifications and any orders for Extra Work. The Contractor shall employ no equipment, materials, methods or staff or personnel to which the Superintendent/Manager objects. Upon request, the Superintendent/Manager shall confirm in writing any oral order, direction, requirement or determination.

The Superintendent/Manager shall have the authority to decide all questions in connection with the Services to be performed hereunder. The exercise by the Superintendent/Manager of the powers and authorities vested in him/her by this section shall be binding and final upon PATH and the Contractor.

46. Price Preference

If this solicitation has not been set aside for the purposes of making an award based on bids solicited from Port Authority certified Minority Business, Women Business or Small Business Enterprises as indicated by the bidder pre-requisites in Part II hereof, for awards of contracts, not exceeding \$1,000,000, for:

- (a) Services, a price preference of 5% is available for New York or New Jersey Small Business Enterprises (SBE); or

(b) Services (excluding Janitorial/Cleaning Services), a price preference of 10% is available for New York or New Jersey Minority or Women Business Enterprises (M/WBE),

certified by the Port Authority by the day before the bid opening.

If the Bidder is a Port Authority certified MBE, WBE or SBE, enter the applicable date(s) certification was obtained in the space provided on the Signature Sheet attached hereto.

47. M/WBE Good Faith Participation

If specified as applicable to this Contract, the Contractor shall use every good-faith effort to provide for participation by certified Minority Business Enterprises (MBEs) and certified Women-owned Business Enterprises (WBEs) as herein defined, in all purchasing and subcontracting opportunities associated with this Contract, including purchase of equipment, supplies and labor services.

Good Faith efforts to include participation by MBEs/WBEs shall include the following:

- a. Dividing the services and materials to be procured into small portions, where feasible.
- b. Giving reasonable advance notice of specific contracting, subcontracting and purchasing opportunities to such MBEs/WBEs as may be appropriate.
- c. Soliciting services and materials from a Port Authority certified MBE/WBE or seeking MBEs/WBEs from other sources. To access the Port Authority's Directory of MBE/WBE Certified Firms go to www.panynj.gov/supplierdiversty
- d. Ensuring that provision is made to provide progress payments to MBEs/WBEs on a timely basis.
- e. Observance of reasonable commercial standards of fair dealing in the respective trade or business.

Subsequent to Contract award, all changes to the M/WBE Participation Plan must be submitted via a modified M/WBE Participation Plan to the Manager for review and approval by the Authority's Office of Business Diversity and Civil Rights. For submittal of modifications to the M/WBE Plan, Contractors are directed to use form PA3749C, which may be downloaded at <http://www.panynj.gov/business-opportunities/become-vendor.html>. The Contractor shall not make changes to its approved M/WBE Participation Plan or substitute M/WBE subcontractors or suppliers for those named in their approved plan without the Manager's prior written approval. Unauthorized changes or substitutions, including performing the work designated for a subcontractor with the Contractor's own forces, shall be a violation of this section. Progress toward attainment of M/WBE participation goals set forth herein will be monitored throughout the duration of this Contract.

The Contractor shall also submit to the Manager, along with invoices, the Statement of Subcontractor Payments as the M/WBE Participation Report, which may be downloaded at <http://www.panynj.gov/business-opportunities/become-vendor.html>. The Statement must include the name and business address of each M/WBE subcontractor and supplier actually involved in the Contract, a description of the work performed and/or product or service supplied by each such subcontractor or supplier, the date and amount of each expenditure, and such other information that may assist the Manager in determining the Contractor's compliance with the foregoing provisions.

If, during the performance of this Contract, the Contractor fails to demonstrate good faith efforts in carrying out its M/WBE Participation Plan and the Contractor has not requested and been granted a

full or partial waiver of the M/WBE participation goals set forth in this Contract, the Authority will take into consideration the Contractor's failure to carry out its M/WBE Participation Plan in its evaluation for award of future Authority contracts.

PART III CONTRACTOR'S INTEGRITY PROVISIONS

1. Certification of No Investigation (criminal or civil anti-trust), Indictment, Conviction, Debarment, Suspension, Disqualification and Disclosure of Other Information

By bidding on this Contract, each Bidder and each person signing on behalf of any Bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, that the Bidder and each parent and/or affiliate of the Bidder has not

- a. been indicted or convicted in any jurisdiction;
- b. been suspended, debarred, found not responsible or otherwise disqualified from entering into any contract with any governmental agency or been denied a government contract for failure to meet standards related to the integrity of the Bidder;
- c. had a contract terminated by any governmental agency for breach of contract or for any cause based in whole or in part on an indictment or conviction;
- d. ever used a name, trade name or abbreviated name, or an Employer Identification Number different from those inserted in the Bid;
- e. had any business or professional license suspended or revoked or, within the five years prior to bid opening, had any sanction imposed in excess of \$50,000 as a result of any judicial or administrative proceeding with respect to any license held or with respect to any violation of a federal, state or local environmental law, rule or regulation;
- f. had any sanction imposed as a result of a judicial or administrative proceeding related to fraud, extortion, bribery, bid rigging, embezzlement, misrepresentation or anti-trust regardless of the dollar amount of the sanctions or the date of their imposition; and
- g. been, and is not currently, the subject of a criminal investigation by any federal, state or local prosecuting or investigative agency and/or a civil anti-trust investigation by any federal, state or local prosecuting or investigative agency.

2. Non-Collusive Bidding, and Code of Ethics Certification, Certification of No Solicitation Based On Commission, Percentage, Brokerage, Contingent or Other Fees

By bidding on this Contract, each Bidder and each person signing on behalf of any Bidder certifies, and in the case of a joint bid, each party thereto certifies as to its own organization, that

- a. the prices in its bid have been arrived at independently without collusion, consultation, communication or agreement for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;
- b. the prices quoted in its bid have not been and will not be knowingly disclosed directly or indirectly by the Bidder prior to the official opening of such bid to any other bidder or to any competitor;
- c. no attempt has been made and none will be made by the Bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition;
- d. this organization has not made any offers or agreements or taken any other action with respect to any Authority or PATH employee or former employee or immediate family member of either which would constitute a breach of ethical standards under the Code of Ethics dated April 11, 1996, (a copy of which is available upon request to the individual named in the clause hereof entitled "Bidder's Questions"), nor does this organization have any knowledge of any act on the part of an Authority or PATH employee or former Authority or PATH employee relating either

- directly or indirectly to this organization which constitutes a breach of the ethical standards set forth in said Code;
- e. no person or selling agency other than a bona fide employee or bona fide established commercial or selling agency maintained by the Bidder for the purpose of securing business, has been employed or retained by the Bidder to solicit or secure this Contract on the understanding that a commission, percentage, brokerage, contingent, or other fee would be paid to such person or selling agency; and
 - f. the bidder has not offered, promised or given, demanded or accepted, any undue advantage, directly or indirectly, to or from a public official or employee, political candidate, party or party official, or any private sector employee (including a person who directs or works for a private sector enterprise in any capacity), in order to obtain, retain, or direct business or to secure any other improper advantage in connection with this Contract.

The foregoing certifications shall be deemed to be made by the Bidder as follows:

- * if the Bidder is a corporation, such certification shall be deemed to have been made not only with respect to the Bidder itself, but also with respect to each parent, affiliate, director, and officer of the Bidder, as well as, to the best of the certifier's knowledge and belief, each stockholder of the Bidder with an ownership interest in excess of 10%;
- * if the Bidder is a partnership, such certification shall be deemed to have been made not only with respect to the Bidder itself, but also with respect to each partner.

Moreover, the foregoing certifications, if made by a corporate Bidder, shall be deemed to have been authorized by the Board of Directors of the Bidder, and such authorization shall be deemed to include the signing and submission of the bid and the inclusion therein of such certification as the act and deed of the corporation.

In any case where the Bidder cannot make the foregoing certifications, the Bidder shall so state and shall furnish with the signed bid a signed statement which sets forth in detail the reasons therefor. If the Bidder is uncertain as to whether it can make the foregoing certifications, it shall so indicate in a signed statement furnished with its bid, setting forth in such statement the reasons for its uncertainty. As a result of such disclosure, the PATH shall take appropriate action up to and including a finding of non-responsibility.

Failure to make the required disclosures shall lead to administrative actions up to and including a finding of non-responsibility.

Notwithstanding that the Bidder may be able to make the foregoing certifications at the time the bid is submitted, the Bidder shall immediately notify PATH in writing during the period of irrevocability of bids on this Contract of any change of circumstances which might under this clause make it unable to make the foregoing certifications or require disclosure. The foregoing certifications or signed statement shall be deemed to have been made by the Bidder with full knowledge that they would become a part of the records of PATH and that PATH will rely on their truth and accuracy in awarding this Contract. In the event that PATH should determine at any time prior or subsequent to the award of this Contract that the Bidder has falsely certified as to any material item in the foregoing certifications or has willfully or fraudulently furnished a signed statement which is false in any material respect, or has not fully and accurately represented any circumstance with respect to any item in the foregoing certifications required to be disclosed, PATH (or the Port Authority as applicable) may determine that the Bidder is not a responsible Bidder with respect to its bid on the Contract or with respect to future bids on PATH (or Port Authority) contracts and may exercise such other remedies as are provided to it by the Contract with respect to these matters. In addition, Bidders are advised that knowingly providing a false certification or statement pursuant hereto may be the basis for prosecution for offering a false instrument for filing (see e.g. New York Penal Law, Section 175.30 et seq.). Bidders are also advised that the inability to make such certification will not in and of itself disqualify a Bidder, and that in each instance PATH will evaluate the reasons therefor provided by the Bidder. Under

certain circumstances the Bidder may be required as a condition of Contract award to enter into a Monitoring Agreement under which it will be required to take certain specified actions, including compensating an independent Monitor to be selected by PATH, said Monitor to be charged with, among other things, auditing the actions of the Bidder to determine whether its business practices and relationships indicate a level of integrity sufficient to permit it to continue business with PATH and the Port Authority as applicable).

3. Bidder Eligibility for Award of Contracts - Determination by an Agency of the State of New York or New Jersey Concerning Eligibility to Receive Public Contracts

Bidders are advised that PATH has adopted a policy to the effect that in awarding its contracts it will honor any determination by an agency of the State of New York or New Jersey that a Bidder is not eligible to bid on or be awarded public contracts because the Bidder has been determined to have engaged in illegal or dishonest conduct or to have violated prevailing rate of wage legislation.

The policy permits a Bidder whose ineligibility has been so determined by an agency of the State of New York or New Jersey to submit a bid on a Port Authority contract and then to establish that it is eligible to be awarded a contract on which it has bid because (i) the state agency determination relied upon does not apply to the Bidder, or (ii) the state agency determination relied upon was made without affording the Bidder the notice and hearing to which the Bidder was entitled by the requirements of due process of law, or (iii) the state agency determination was clearly erroneous or (iv) the state determination relied upon was not based on a finding of conduct demonstrating a lack of integrity or violation of a prevailing rate of wage law.

The full text of the resolution adopting the policy may be found in the Minutes of the Port Authority's Board of Commissioners meeting of September 9, 1993.

4. No Gifts, Gratuities, Offers of Employment, Etc.

During the term of this Contract, the Contractor shall not offer, give or agree to give anything of value either to a Port Authority or PATH employee, agent, job shopper, consultant, construction manager or other person or firm representing the Port Authority, or to a member of the immediate family (i.e., a spouse, child, parent, brother or sister) of any of the foregoing, in connection with the performance by such employee, agent, job shopper, consultant, construction manager or other person or firm representing the Port Authority or PATH of duties involving transactions with the Contractor on behalf of the Port Authority or PATH, whether or not such duties are related to this Contract or any other Port Authority contract or matter. Any such conduct shall be deemed a material breach of this Contract.

As used herein "anything of value" shall include but not be limited to any (a) favors, such as meals, entertainment, transportation (other than that contemplated by the Contract or any other Port Authority or PATH contract), etc. which might tend to obligate the Port Authority or PATH employee to the Contractor, and (b) gift, gratuity, money, goods, equipment, services, lodging, discounts not available to the general public, offers or promises of employment, loans or the cancellation thereof, preferential treatment or business opportunity. Such term shall not include compensation contemplated by this Contract or any other Port Authority or PATH contract. Where used herein, the term "Port Authority" shall be deemed to include all subsidiaries of the Port Authority.

The Contractor shall insure that no gratuities of any kind or nature whatsoever shall be solicited or accepted by it and by its personnel for any reason whatsoever from the passengers, tenants, customers or other persons using the Facility and shall so instruct its personnel.

In addition, during the term of this Contract, the Contractor shall not make an offer of employment or use confidential information in a manner proscribed by the Code of Ethics and Financial Disclosure dated April 11, 1996, (a copy of which is available upon request to the Office of the Secretary of the Port Authority).

The Contractor shall include the provisions of this clause in each subcontract entered into under this Contract.

5. Conflict of Interest

During the term of this Contract, the Contractor shall not participate in any way in the preparation, negotiation or award of any contract (other than a contract for its own services to PATH) to which it is contemplated PATH or the Port Authority may become a party, or participate in any way in the review or resolution of a claim in connection with such a contract if the Contractor has a substantial financial interest in the contractor or potential contractor of PATH or the Port Authority or if the Contractor has an arrangement for future employment or for any other business relationship with said contractor or potential contractor, nor shall the Contractor at any time take any other action which might be viewed as or give the appearance of conflict of interest on its part. If the possibility of such an arrangement for future employment or for another business arrangement has been or is the subject of a previous or current discussion, or if the Contractor has reason to believe such an arrangement may be the subject of future discussion, or if the Contractor has any financial interest, substantial or not, in a contractor or potential contractor of PATH or the Port Authority, and the Contractor's participation in the preparation, negotiation or award of any contract with such a contractor or the review or resolution of a claim in connection with such a contract is contemplated or if the Contractor has reason to believe that any other situation exists which might be viewed as or give the appearance of a conflict of interest, the Contractor shall immediately inform the Director/General Manager in writing of such situation giving the full details thereof. Unless the Contractor receives the specific written approval of the Director/General Manager, the Contractor shall not take the contemplated action which might be viewed as or give the appearance of a conflict of interest. In the event the Director/General Manager shall determine that the performance by the Contractor of a portion of its Services under this Agreement is precluded by the provisions of this numbered paragraph, or a portion of the Contractor's said Services is determined by the Director/General Manager to be no longer appropriate because of such preclusion, then the Director/General Manager shall have full authority on behalf of both parties to order that such portion of the Contractor's Services not be performed by the Contractor, reserving the right, however, to have the Services performed by others and any lump sum compensation payable hereunder which is applicable to the deleted work shall be equitably adjusted by the parties. The Contractor's execution of this document shall constitute a representation by the Contractor that at the time of such execution the Contractor knows of no circumstances, present or anticipated, which come within the provisions of this paragraph or which might otherwise be viewed as or give the appearance of a conflict of interest on the Contractor's part. The Contractor acknowledges that PATH (or the Port Authority as applicable) may preclude it from involvement in certain disposition/privatization initiatives or transactions that result from the findings of its evaluations hereunder or from participation in any contract which results, directly or indirectly, from the Services provided by the Contractor hereunder.

6. Definitions

As used in this section, the following terms shall mean:

Affiliate - Two or more firms are affiliates if a parent owns more than fifty percent of the voting stock of each of the firms, or a common shareholder or group of shareholders owns more than fifty percent of the voting stock of each of the firms, or if the firms have a common proprietor or general partner.

Agency or Governmental Agency - Any federal, state, city or other local agency, including departments, offices, public authorities and corporations, boards of education and higher education, public development corporations, local development corporations and others.

Investigation - Any inquiries made by any federal, state or local criminal prosecuting agency and any inquiries concerning civil anti-trust investigations made by any federal, state or local governmental agency. Except for inquiries concerning civil anti-trust investigations, the term does not include

inquiries made by any civil government agency concerning compliance with any regulation, the nature of which does not carry criminal penalties, nor does it include any background investigations for employment, or Federal, State, and local inquiries into tax returns.

Officer - Any individual who serves as chief executive officer, chief financial officer, or chief operating officer of the Bidder by whatever titles known.

Parent - An individual, partnership, joint venture or corporation which owns more than 50% of the voting stock of the Bidder.

If the solicitation is a Request for Proposal:

Bid - shall mean Proposal;

Bidder - shall mean Proposer;

Bidding - shall mean submitting a Proposal.

In a Contract resulting from the taking of bids:

Bid - shall mean bid;

Bidder - shall mean Bidder;

Bidding - shall mean executing this Contract.

In a Contract resulting from the taking of Proposals:

Bid - shall mean Proposal;

Bidder - shall mean Proposer;

Bidding - shall mean executing this Contract.