REQUEST FOR SEALED BIDS

SJPC-22-49

BALZANO MARINE TERMINAL

RAIL INFRASTRUCTURE REHABILITATION

SOUTH JERSEY PORT CORPORATION

2 Aquarium Drive, Suite 100
Camden, NJ 08103

Proposal Due Date: Thursday, September 1, 2022 at 11:00am

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REQUEST FOR SEALED BIDS

SJPC-22-49 - Balzano Marine Terminal Rail Infrastructure Rehabilitation

OVERVIEW

The South Jersey Port Corporation (SJPC) is an agency of the State of New Jersey with a mission to develop, maintain and operate marine terminals and related intermodal transportation infrastructure within the South Jersey Port District. The agency has primary offices at 2 Aquarium Dr., Suite 100 and port operations at the Balzano Marine Terminal and the Broadway Terminal in Camden, New Jersey. The agency also has facilities in Salem and Paulsboro. SJPC is grantee of Foreign Trade Zone #142.

Additional information may be found by visiting http://www.southjerseyport.com

ADVERTISEMENT FOR BIDS

SOUTH JERSEY PORT CORPORATION
REQUEST FOR SEALED BIDS FOR
BALZANO MARINE TERMINAL RAIL INFRASTRUCTURE REHABILITATION

Notice is hereby given that sealed bids for Balzano Marine Terminal Rail Infrastructure Rehabilitation, will be received by the South Jersey Port Corporation (hereinafter "SJPC"). Three (3) original sealed copies of each firm's bid shall be submitted to Patrick Boyle, Purchasing Manager, at South Jersey Port Corporation, 2 Aquarium Drive, Suite 100, Camden, NJ 08103, by **Thursday, September 1, 2022 at 11:00am** at which time the sealed bids will be opened and recorded.

A Pre-Bid meeting will be held at the Balzano Marine Terminal, 101 Joseph A. Balzano Blvd., Camden, NJ 08103 on **Thursday, August 11, 2022 at 10:00am**. Attendance is not mandatory, but is strongly recommended. Participants planning to attend the Pre-Bid Meeting must notify in advance Patrick Boyle, Purchasing Manager by e-mail at pboyle@southjerseyport.com.

Each submission to be considered shall comport to the criteria set forth in the bid packets. The bid packets may be obtained from SJPC at http://www.southjerseyport.com or upon request to: South Jersey Port Corporation, Attention: Patrick Boyle, Purchasing Manager, 2 Aquarium Drive, Suite 100, Camden, NJ 08103, pboyle@southjerseyport.com.

Bidders are required to comply with the requirements of N.J.S.A. 10:5-31 et seq. and N.J.A.C. 17:27 et seq.

INFORMATION FOR BIDDERS: SJPC-22-49 - Balzano Marine Terminal Rail Infrastructure Rehabilitation

Sealed proposals shall be received in accordance with Public Advertisement as required by law, a copy of said notice being attached hereto and made part of these specifications.

Project Site Pre-Bid Meeting

A recommended project on-site review and walk down meeting for all bidders for this project will be held at the Balzano Marine Terminal, 101 Joseph A. Balzano Blvd., Camden, NJ 08103 on **Thursday, August 11, 2022 at 10:00am**. Attendance is not mandatory, but is strongly recommended. Failure to attend does not relieve the bidder of any obligations or requirements.

Submission of Proposals

In order to be considered, three (3) hard copies of the Bid Proposal must be submitted in a sealed envelope bearing on the outside the name and address of the bidder and the following statement:

"THIS IS A SEALED BID PROPOSAL AND SHALL NOT BE OPENED AND READ UNTIL SEPTEMBER 1, 2022 AT 11:00 A.M. BY PATRICK BOYLE OR HIS DESIGNEE: SJPC-22-49 - BALZANO MARINE TERMINAL RAIL INFRASTRUCTURE REHABILITATION".

Bid proposals may be mailed or hand delivered to the SJPC and shall be addressed to the attention of:

SOUTH JERSEY PORT CORPORATION
c/o Patrick Boyle, Purchasing Manager
2 Aquarium Drive, Suite 100
Camden, New Jersey 08103

SJPC will not assume responsibility for proposals not delivered in person to the above address.

In addition to the requested hard copies, please submit an electronic version of your proposal in a pdf format on a USB drive.

All proposals must be received by Thursday, September 1, 2022 at 11:00am No proposal will be accepted after the specified time.

The sealed proposals will be opened and recorded at SJPC's Corporate Offices at 2 Aquarium Drive, Suite 100, Camden, NJ 08103. Once bids have been opened, they shall remain firm for a period of sixty (60) calendar days.

All prices and amounts must be written in in ink or machine printed. Bids containing any conditions, omissions, unexplained erasures or alteration, items not called for in the bid proposal form, attachment of additive information not required by the specifications or irregularities of any kind, may be rejected by

SJPC. Any changes, white-outs, strikeouts, etc., in the bid must be initialed in ink by the person signing the bid.

Each bid proposal form must give the full business address, business phone number, fax number, e-mail address, and contact person of the bidder, and must be signed by an authorized representative as follows:

- Bids by partnerships must furnish the full name of all partners and must be signed in the partnership name by one of the members of the partnership or by an authorized representative, followed by the signature and designation of the person signing.
- Bids by corporations must be signed in the legal name of the corporation, followed by the name of the State in which incorporated and must contain the signature and designation of the president, secretary or other person authorized to bind the corporation in the matter.
- Bids by sole-proprietorship shall be signed by the proprietor.
- When requested, satisfactory evidence of the authority of the officer signing shall be furnished.

Bidders should be aware of the following statutes that represent "Truth in Contracting" laws:

- N.J.S.A. 2C:21-34 et seq. governs false claims and representations by bidders. It is a serious crime for the bidder to knowingly submit a false claim and/or knowingly make a material misrepresentation.
- N.J.S.A. 2C:27-10 provides that a person commits a crime if said person offers a benefit to a public servant for an official act performed or to be performed by a public servant, which is a violation of official duty.
- N.J.S.A. 2C:27-11 provides that a bidder commits a crime if said person, directly or indirectly, confers or agrees to confer any benefit allowed by law to a public servant.
- Bidders should consult the statutes or legal counsel for further information.

Bidders are expected to examine the bid specifications and related bid documents with care and observe all their requirements. Ambiguities, errors, or omissions noted by bidders should be promptly reported in writing to the appropriate official. Any prospective bidder who wishes to challenge a bid specification shall file such challenges in writing with SJPC no less than three (3) business days prior to the opening of the bids. Challenges filed after that time shall be considered bid and having no impact on SJPC or the aware of the contract pursuant to N.J.S.A. 40A:11-13. In the event the bidder fails to notify SJPC of such ambiguities, errors, or omissions, the bidder shall be bound by the requirements of the specifications and the bidder's submitted bid.

No oral interpretation and or clarification of the meaning of the specifications will be made to any bidder. Questions regarding this Request for Bid Proposals may be directed in writing to Patrick Boyle, Purchasing Manager at pboyle@southjerseyport.com. No questions will be answered after 5pm on August 19, 2022.

Reservations

The SJPC reserves the right to reject any or all proposals, to waive irregularities and technicalities, to request re-submissions, and to award proposals as the SJPC deems will best serve the interests of the SJPC.

The SJPC, nor its respective staff, consultants, or advisors shall be liable for any claims or damages resulting from the solicitation or preparation of the bid proposals, nor will there be any reimbursement to any bidders for the cost of preparing and submitting a bid proposal or for participating in this process.

During the period provided for the preparation of responses to the Request for Bid Proposals, the SJPC may issue addenda, amendments, or answers to written inquiries. When issuing addenda, SJPC shall provide required notice prior to the official receipt of bids to any person who has submitted a bid or who has received a bid package pursuant to N.J.S.A. 40A:11-23c.1, and will constitute a part of the Request for Bid Proposals. All responses shall be prepared with full consideration of the addenda issued prior to the bid proposal submission date.

The SJPC will consider proposals only from firms or organizations that have demonstrated the capability and willingness to provide high quality services in the manner described herein.

A final decision will be made only after all proposals have been received and evaluated and presented to the SJPC Board of Directors for consideration. The SJPC's evaluation process is designed to identify the vendor that provides the most advantageous solution to the SJPC by including an evaluation of each vendor's technical capabilities, past performance, and overall cost of the proposal to the SJPC.

SJPC reserves the right to make any and all decisions regarding the selection of the Project Team and to waive any formality and to take any action that the SJPC determines, in its sole discretion, to be in the best interest of the SJPC. The provisions of this document are made for the benefit of the SJPC, and no right shall be deemed to accrue to any person submitting a bid, statement of qualifications, or proposal by reason of the submission of any bid, statement of qualifications, or proposal, or by the waiver or non-enforcement of any provisions or requirements of this document or by reason of any term or terms thereof.

BID REQUIREMENTS

BID SECURITY

The Form of Bid Security shall be a BID BOND to accompany the Bid Proposal Package in the amount of 10% of the total bid price not to exceed $20,000, payable unconditionally to SJPC. It shall contain a Power of Attorney for the full amount of the Bid Bond from a surety company (see below). The Bond of an unsuccessful bidder shall be returned pursuant to N.J.S.A. 40A:11-24a. The Bond of the bidder to whom

the contract is awarded shall be retained until a contract is executed and the required performance bond (see below) is submitted. The Bond of the successful bidder shall be forfeited if the bidder fails to enter into a contract pursuant to N.J.S.A. 40A:11-21.

*Failure to submit Bid Security shall result in rejection of the bid.

PERFORMANCE BOND

Each bid shall also be accompanied by a letter of intent from the Bidder's Bonding Company confirming that, if the Bidder is awarded the Contract, the Bonding Company will furnish the required PERFORMANCE BOND EQUAL TO THE BID PRICE as security for the faithful performance of the Contract. The performance bonds shall not be released until final acceptance of the whole work and then only if any liens or claims have been satisfied.

Each Surety submitted must be with a company that is rated at least A- or better with AM Best, authorized to do business in the State of New Jersey, and proof of same must accompany the bid.

LETTER OF TRANSMITTAL

SJPC requests that along with the Bid Proposal, the bidder enclose a letter of transmittal, which is not intended to be a summary of the proposal itself, but must contain the following statements and information:

1. General Information

a. Company name, address, and telephone number(s) of the Bidder submitting the proposal.

b. Name, title, address, e-mail address, and telephone number of the person or persons to contact who are authorized to represent the Bidder and to whom correspondence should be directed.

c. Federal and state taxpayer identification numbers of the Bidder.

d. Brief statement of the Bidder’s understanding of the services to be performed and a positive commitment to provide the services as specified.

e. The letter must be signed by a corporate officer or other individual who is legally authorized to bind the applicant to both its proposal and cost schedule.

f. General Vendor Information- Please provide the following information:

i. Length of time in business of providing proposed services

ii. List 3 other public sector clients

iii. Number of full-time personnel in the organization

iv. Location of headquarters and field offices

v. Location of office which would service this account

2. Describe how the Bidder is positioned to provide the services listed above and provide a history of experience on providing similar services.

3. Describe the Bidder's approach to providing these services and its methodology for providing ongoing support.

4. Provide the name, title, address and telephone number of three references for clients whom the Bidder has provided similar services. Please provide information referencing the actual services provided, customer size (number of users), and the length of tenure providing services to this client.

5. Staff Resources – Identify names of principals and key personnel who will perform the services.

REQUIRED INSURANCE ACKNOWLEDGEMENT

The proposer shall complete the Required Insurance Acknowledgement and provide a Certificate of Insurance for coverage consistent with the section "Insurance Requirements" or a letter from their insurance company stating their ability to provide a Certificate of Insurance if awarded the contract.

BID FORM

Bid Form must be complete, with all appropriate signatures and acknowledgement of addenda.

SUBCONTACTOR DECLARATION

The Bidder shall complete a Subcontractor Declaration and submit with their bid, a description of Contract Work they will not be performing with their organization, if any, as outlined in the Subcontractor Declaration.

WARRANTY

Contractor shall provide a warranty covering equipment, material, and workmanship for a minimum of one year, starting from completion and acceptance of the installed components.

ACCESS TO TERMINALS – TWIC REQUIREMENT

In accordance with the Maritime Transportation Security Act, all persons requiring unescorted access to restricted South Jersey Port Corporation (SJPC or "Port Corporation") facilities must possess a Transportation Worker Identification Credential (TWIC), issued by the Transportation Security Administration, before such access is granted. Persons seeking access to SJPC facilities who do not physcially possess a TWIC may only enter SJPC facilities with an SJPC approved TWIC escort as a side-by-side companion.

ADDITIONAL APPLICANT RESPONSIBILITIES

The applicant/proposer shall, in response to the SJPC's Request for Bids, also include the following documents available at www.southjerseyport.com/bids:

1. Small Business Enterprise Questionnaire. The applicant/proposer shall submit a completed form (Exhibit Q1).

2. Mandatory Equal Opportunity. The applicant/proposer shall submit a completed form (Exhibit Q2 or Q3, whichever is applicable).

3. Stockholder Disclosure Certificate. The applicant/proposer shall submit a completed form (Exhibit Q4).

4. Non-Collusion Affidavit. The applicant/proposer shall submit a completed form (Exhibit Q5).

5. Debarred List Affidavit. The applicant/proposer shall submit a completed form (Exhibit Q6).

6. Affirmative Action Evidence for Procurement. The applicant/proposer shall submit a completed form (Exhibit Q7).

7. Business Registration Certificate. The applicant/proposer shall submit a completed form (Exhibit Q8).

8. Set-Off State Tax. The applicant/proposer shall submit a completed form (Exhibit Q9).

9. Intentionally omitted (Exhibit Q10).

10. Source Disclosure Form. The applicant/proposer shall submit a completed form (exhibit Q11).

11. Executive Order #189 Vendor Code of Ethics Affidavit. The applicant/proposer shall submit a completed form (Exhibit Q12).

12. Executive Order #117 Two Year Chapter 51/ Vendor Certification and Disclosure of Political Contributions. The applicant/proposer shall submit a completed form (Exhibit Q13).

13. Executive Order #151 Contract Compliance. The applicant/proposer complete and submit form AA302 (Exhibit Q14).

14. Employee Information Report. The applicant/proposer shall submit a completed form AA302 (Exhibit Q15).

15. Ownership Disclosure Form. The applicant/proposer shall submit a completed form (Exhibit Q16).

16. Prevailing Wage Notification. The applicant/proposer shall submit a completed form (Exhibit Q17).

17. Public Workers Contract Registration. The applicant/proposer shall submit a completed form (Exhibit Q18).

18. Buy American Notice. In the performance of the work under this contract, the contractor and all subcontractors shall use only domestic materials. (Exhibit Q19).

19. Executive Order #117 Pay-to-Play Restrictions. The applicant/proposer shall submit a completed form (Exhibit Q20).

20. Disclosure/Certification of Investment Activities in Iran. The applicant/proposer shall submit a completed form (Exhibit Q21).

21. NJ ELEC Affidavit. The applicant/proposer shall submit a completed form (Exhibit Q22).

22. Executive Order #271 Compliance. The applicant/proposer shall submit a completed form (Exhibit Q23).

23. Certification of Non-involvement in Prohibited Activities in Russia or Belarus. The applicant/proposer shall submit a completed form (Exhibit Q24).

24. Diane Allen Act Acknowledgement. The applicant/proposer shall submit a completed form (Exhibit Q25).

25. Assurances for Payment of Prevailing Wage. The applicant/proposer shall submit a completed form, if applicable. (Exhibit Q26).

INSURANCE REQUIREMENTS

PROFESSIONAL and/ or CONTRACTOR SERVICES CONTRACTS

Prior to the commencement of any work and until completion and final payment is made for the work / final acceptance of the work, the Contractor will provide and maintain the following minimum levels of insurance at Contractor's own expense. The cost of the required insurance shall be included in the Contractor's bid price and no adjustment shall be made to the contract price on account of such costs unless such approval is provided. The term Contractor shall include Subcontractors and Sub-Subcontractors of every tier. Contractor shall furnish Certificates of Insurance evidencing and reflecting the effective date of coverage as outlined below. In no event shall Work be performed until the required evidence of Insurance is provided in accordance with these Contract Documents and is approved by SJPC. If found to be non-compliant, SJPC may purchase the required insurance coverage(s) and the cost will be

borne by the Contractor through direct payment/reimbursement to SJPC or SJPC may withhold payment to the Contractor for amounts owed to them.

a) All insurance shall be procured from insurers permitted to do business in the State in which the project is taking place and have an A.M. Best Rating of at least "A-, Class VIII".

b) Contractor shall not have a Self-Insured Retention (SIR) on any policy greater than $50,000, which is the responsibility of the Contractor. If Contractor's policy (-ies) has a Self-Insured Retention exceeding this amount, approval must be received from SJPC prior to starting work. In the event any policy includes an SIR, the Contractor is solely responsible for payment within the SIR of their policy (-ies) and the Additional Insured requirements specified herein shall be provided within the SIR amount(s).

c) All insurance required herein, with the exception of the Professional Liability Insurance, shall be written on an "occurrence" basis. Claims-Made coverage must include:

    i. The retroactive date must be on or prior to the start of work under this contract; and
    ii. The Contractor must purchase "tail coverage/an extended reporting period" or maintain coverage for a period of three years, subsequent to the completion of their work / final payment.

d) The Contractor's insurance carrier (s) shall agree to provide at least thirty (30) days prior written notice to SJPC in the event coverage is canceled or non-renewed and ten (10) days in the event of cancellation for non-payment of premium. In the event of cancellation or non-renewal of coverage(s), it is the Contractor's responsibility to replace coverage to comply with the Contract requirements so there is no lapse of coverage for any time period.

    In the event the insurance carriers will not issue or endorse their policy(s) to comply with the above it is the responsibility of the Contractor to report any notice of cancellation or non-renewal at least thirty (30) days prior to the effective date of this notice.

e) Contractor shall provide SJPC with Certificates of Insurance, evidencing the insurance coverages listed below, ten days prior to the start of work and thereafter upon renewal or replacement of each coverage. The Contractor shall not begin any work until SJPC has reviewed and approved the Certificate of Insurance. The required insurance shall not contain any exclusions or endorsements, which are not acceptable to SJPC.

    Failure of SJPC to demand such certificate or other evidence of full compliance with these insurance requirements or failure of SJPC to identify a deficiency from evidence that is provided shall not be construed as a waiver of Contractor's obligation to maintain such insurance.

With respect to insurance maintained after final payment in compliance with a requirement below, an additional certificate(s) evidencing such coverage shall be provided to SJPC with final application for payment and thereafter upon renewal or replacement of such insurance until the expiration of the time period for which such insurance must be maintained.

f) SJPC shall be added as ADDITIONAL INSURED on all liability policies (except Workers' Compensation and Professional Liability Policy, where applicable), for ongoing operations and completed operations (using ISO Endorsements CG 2010 and CG 2037, or their equivalents) on a primary noncontributory basis. Coverage to include ongoing and completed operations. Each of the Additional Insured's respective officials, employees, agents and representatives shall also be afforded coverage as an Additional Insured. Coverage should be provided for a period of three years subsequent to the completion of work/final payment.

   SJPC reserves the right to require Contractor to name other parties as additional insureds as required by SJPC.

   There shall be no "Insured versus Insured Exclusion" on any policies (other than "Named Insured versus Named Insured"); all policies will provide for "cross liability coverage" as per standard ISO policy forms.

g) Waiver of Rights of Subrogation: With the exception of Professional Liability, Contractor shall waive all rights of recovery against Owner/Client, SJPC and all the additional insureds for loss or damage covered by any of the insurance maintained by the Contractor.

h) The amount of insurance provided in the required insurance coverages, shall not be construed to be a limitation of the liability on the part of the Contractor.

i) The carrying of insurance described shall in no way be interpreted as relieving the Contractor of any responsibility or liability under the contract.

j) Any type of insurance or any increase in limits of liability not described above which the Contractor requires for its own protection or on account of statute shall be its own expense.

k) Contractor shall promptly notify SJPC and the appropriate insurance company (-ies) in writing of any accident(s) as well as any claim, suit or process received by the Contractor arising in the course of operations under the contract. The Contractor shall forward such documents received to his insurance company (-ies), as soon as practicable, or as required by their insurance policy (-ies).

REQUIRED COVERAGES - the following may be provided through a combination of primary and excess policies in order to meet the minimum limits set forth below:

Workers' Compensation and Employer's Liability:

Provided in the State in which the work is to be performed and elsewhere as may be required and shall include:

a) Workers' Compensation Coverage: Statutory Requirements

b) Employers Liability Limits not less than:

Bodily Injury by Accident:	$500,000 Each Accident
Bodily Injury by Disease:	$500,000 Each Employee
Bodily Injury by Disease:	$500,000 Policy Limit

c) Jones Act/Maritime Liability and USL&H Coverage, as applicable.

d) Includes coverage for sole proprietors, partners, members or officers who will be performing the work.

Commercial General Liability:

Provided on ISO form CG 00 01 04 13 or an equivalent form including Premises - Operations, Independent Contractors, Products/Completed Operations, Broad Form Property Damage, Contractual Liability, and Personal Injury and Advertising Injury.

a) Occurrence Form with the following limits:

(1)	General Aggregate:	$2,000,000
(2)	Products/Completed Operations Aggregate:	$2,000,000
(3)	Each Occurrence:	$1,000,000
(4)	Personal and Advertising Injury:	$1,000,000

b) Products/Completed Operations Coverage must be maintained for a period of at least three (3) years after final payment / completion of work (including coverage for the Additional Insureds as set forth in these Insurance Requirements).

c) The General Aggregate Limit must apply on a **Per Project basis**.

d) Coverage for "Resulting Damage".

e) No sexual abuse or molestation exclusion.

f) No exclusion for marine based work.

g) No amendment to the definition of an "Insured Contract".

h) The definition of an "Insured Contract" must be amended to provide coverage for all work on or within 50 feet of a railroad, if applicable. A stand alone Railroad Protective Liability policy may be required based on the scope of this project.

Automobile Liability:

a) Coverage to include All Owned, Hired and Non-Owned Vehicles (or "Any Auto"), if you do not have any Owned Vehicles you are still required to maintain coverage for Hired and Non-Owned Vehicles as either a stand alone policy or endorsed onto the Commercial General Liability policy above

b) Per Accident Combined Single Limit $1,000,000

c) For Contractor(s) involved in the transportation of hazardous material, include the following endorsements: MCS-90 and ISO-9948.

Commercial Umbrella Liability:

a) Policy(ies) to apply on a Following Form Basis of the following:
   (1) Commercial General Liability,
   (2) Automobile Liability, and
   (3) Employers Liability Coverage.

b) Minimum Limits of Liability

Occurrence Limit:	$10,000,000
Aggregate Limit:	$10,000,000

Watercraft Liability/Protection and Indemnity Liability:

(IF DESIGNATED BY **CONTRACTOR'S** SCOPE OF WORK)

a) Provide coverage for bodily injury, property damage, personal and advertising injury arising out of any owned, leased, hired, or borrowed watercraft; and

b) Minimum Limits of Liability:
$10,000,000 Per Occurrence
$10,000,000 Aggregate

Vessel Pollution Liability Insurance:

(IF DESIGNATED BY **CONTRACTOR'S** SCOPE OF WORK)

a) Covering losses caused by pollution incidents that arise from the vessel(s) used in the operations of the Contractor and /or their subcontractors of any tier.

b) Minimum Limits of Liability:

Occurrence Limit:	$10,000,000
Aggregate Limit:	$10,000,000

Pollution Liability Insurance:

(IF DESIGNATED BY **CONTRACTOR'S** SCOPE OF WORK)

c) Covering losses caused by pollution incidents that arise from the operations of the Contractor and /or their subcontractors of any tier.

d) Minimum Limits of Liability:

Occurrence Limit:	$2,000,000
Aggregate Limit:	$2,000,000

c) Insurance to be maintained for the duration of the work and for a period of three (3) years after completion of work / final payment.

d) No Exclusions for Silica, Asbestos or Lead.

e) Include Mold Coverage for full policy limit of liability.

f) Shall include coverage for all pollutants as defined under the Resource Conservation and Recovery Act, as amended, 42 U.S.C. Section 6901 et. Seq. ("RCRA") or any related state or city environmental statute or the removal of any petroleum contaminated material at the project.

g) All owned and / or 3rd Party disposal facilities must be licensed and maintain pollution liability insurance of not less than $2,000,000, if applicable.

Professional Liability Insurance:

(IF DESIGNATED BY **CONTRACTOR'S** SCOPE OF WORK)

a) Minimum Limits of Liability

Per Claim Limit:	$2,000,000
Aggregate Limit:	$2,000,000

b) The Definition of "Covered Services" shall include the services required in the scope of this contract.

Rigger's Liability Insurance:

(IF DESIGNATED BY **CONTRACTOR'S** SCOPE OF WORK)

a) "All Risk" Replacement Cost Coverage

b) No overload exclusion

c) Minimum Occurrence Limit: $1,000,000

Aircraft Liability and/or Unmanned Aircraft Systems (UAS, aka Drones):

(IF DESIGNATED BY **CONTRACTOR'S** SCOPE OF WORK)

a) Provide coverage for bodily injury, property damage, personal and advertising injury arising out of any owned, leased, hired, or borrowed aircraft or UAS; and

b) Minimum Limits of Liability:

$10,000,000 Per Occurrence
$10,000,000 Aggregate

NOTE: If UAS are covered by the General Liability policy instead of an Aviation Policy, coverage must be provided by CG 24 50 (or its equivalent) for "any aircraft used in the Insured's operations" for "any operations or projects of the Insured".

Owner's Contractor's Protective:

(IF DESIGNATED BY **CONTRACTOR'S** SCOPE OF WORK)

a) The Contractor shall obtain an Owner's and Contractor's Protective in the same limits as set forth in #2, Commercial General Liability, above. This policy shall be issued in the name of the SJPC.

b) If you are providing ongoing and completed operations Additional Insured coverage for one of the following states, noted in "f" above (Montana, New Mexico, Oregon, Colorado, Kansas, California, Louisiana, and Texas) you are required to provide an Owner's Contractor's Protective as outlined in the preceding paragraph.

Owned, Leased, Rented or Borrowed Equipment:

(IF DESIGNATED BY **CONTRACTOR'S** SCOPE OF WORK)

Contractor shall maintain Property Coverage for:

a) their owned, leased, rented or borrowed equipment, tools, trailers, etc.; and

b) include a Waiver of Subrogation in favor of all Additional Insureds.

Installation Floater:

(IF DESIGNATED BY **CONTRACTOR'S** SCOPE OF WORK)

a) Contractor shall provide coverage for damage to property in the course of installation or transit to the installation site.

b) Coverage shall be equal to the full replacement cost of the equipment or materials being installed. Coverage shall also be provided for any ensuing loss of Business or Rental Income.

c) Contractor must determine if the Installation Floater policy, if in place for this project, is adequate to protect the interests of Owner.

d) Include a Waiver of Subrogation in favor of all Additional Insureds.

INDEMNIFICATION

The selected services provider will protect, defend, indemnify and hold harmless the South Jersey Port Corporation, including its respective officials, employees, agents and representatives from and against any and all losses, penalties, damages, settlements, costs, charges, professional fees or other expenses or liabilities arising out of or resulting from the performance of the work or the completed operations provided that any such claims, damage, loss or expense is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of the tangible property including the loss of the use resulting there from; and is caused in whole or in part by any negligent or willful act or omission of the Contractor, Subcontractor(s), Sub-subcontractor(s), and anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable.

In any and all claims against the South Jersey Port Corporation or any of their respective officials, employees, agents and representatives, by an employee of the selected services provider, Contractor, Subcontractor, or any Sub-subcontractor, or anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, the indemnification obligation shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for any Contractor, Subcontractor or any Sub-subcontractor under Workmen's Compensation Acts, Disability Benefits Acts, or other Employee.

These Indemnification provisions shall survive the termination of any Contract entered into between the selected services provider and the South Jersey Port Corporation.

RESPONSIBILITY OF BIDDERS

EXAMINATION OF PROJECT SITE, BID REQUIREMENTS

Bidders should become thoroughly aware of the conditions under which the work will be performed. A Pre-Bid Meeting will be held to orient potential bidders of the project site. Attendance of the Pre-Bid Meeting strongly recommended.

Questions raised by Bidders shall be in writing and will only be officially answered by the issuance of Addenda to all bidders. Only such Addenda will be considered part of the Contract Documents.

Bidders must carefully examine, for themselves, the plans, detailed drawings, estimated quantities and the location of the proposed work, if applicable. They shall exercise their own judgement as to the full scope and nature of the work, the difficulties to be encountered and the accuracy of estimated quantities, when given. Each Bidder will be held fully responsible for having complied with, and thoroughly understood the Contract Documents prior to submitting their bid; and shall not, at any time, thereafter complain of such estimates, nor assert that there was any misunderstanding in regard to the nature or amount of work to be done.

At the time of the opening of Bids, each Bidder will be presumed to have inspected the site, and to have read, and to be thoroughly familiar with the Plans and Contract Documents, including all Addenda. The failure or omission of any Bidder to receive or examine any form, instrument, or document, shall in no way relieve the Bidder from any obligations in respect to their bid.

QUALIFICATIONS OF BIDDERS

SJPC may make such investigation, as is deemed necessary, to determine the ability of the Bidder to perform the work; and the Bidder shall furnish to the SJPC all such information and data for this purpose as the SJPC may request. SJPC reserves the right to reject any bid if the evidence submitted by, or the investigation of such Bidder fails to satisfy the SJPC that such Bidder is properly qualified to carry out the obligations of the Contract, and to complete the work therein contemplated. Conditional bids will not be accepted. See also paragraphs in these documents relating to subcontract work.

SUBMISSION OF BIDS

As set forth herein, bids must be submitted at the specified time due in sealed envelopes bearing the name and address of the Bidder on the outside, and also bearing, on the outside, reference to work bid upon. Any bid may be submitted or withdrawn prior to the scheduled time for the opening of bids, or the authorized postponement thereof. Any bid received after the time and date specified in the Advertisement for Bids or Addenda will not be considered. No bid may be withdrawn within sixty (60) days after the actual date of the opening thereof.

REJECTION OF BIDS

SJPC reserves the right to reject any or all bids received. SJPC also reserves the right to receive any and all bids in whatsoever form they may be, and to waive any informalities in said bids; or to award the work to whichever Bidder or Bidders it may be considered advantageous so to do and in the best interest of the SJPC, regardless of bid prices.

Bids may also be rejected for any of the following reasons:

a. All bids pursuant to N.J.S.A. 40A:11-13.2;
b. If more than one bid is received from an individual, firm, or partnership, corporation, or association under the same name;
c. Multiple bids from an agent representing competing bidders;
d. The bid is inappropriately balanced;
e. The bidder is determined to possess, pursuant to N.J.S.A. 40A:11-4b, Prior Negative Experience; or
f. If the successful bidder fails to enter into a contract within 21 days, Sundays and holidays excepted, or as otherwise agreed upon by the parties to the contract. In this case at its option, the SJPC may accept the bid of the next lowest responsible bidder (N.J.S.A. 40A:11-24b).

CONDITION OF WORK

Each Bidder must inform themselves fully of the conditions relative to the construction under which the work will be performed. Failure to do so will not relieve a successful Bidder of their obligation to furnish all material and labor necessary to carry out the provisions of the Contract Documents, and to complete the contemplated work for the construction set forth in their bid.

CONTRACTORS SCHEDULE

The Contractor shall provide to the SJPC and Engineer of Record for the SJPC a schedule of planned submittals and their proposed construction schedule within two weeks after award of a contract. The schedule of anticipated submittals for the work to be performed shall include a listing of shop drawings, catalogue cuts, material data sheets etc. together with forecasted dates for planned submission to the Engineer of Record. The contractor schedule shall include milestone activities with durations and completion dates necessary for the performance of all contract construction work. The Contractor is required to provide monthly updates to the aforementioned schedule for the duration of construction.

LIQUIDATED DAMAGES

In case the Contractor fails to complete the work contracted for, in a manner satisfactory to and acceptable to the SJPC, within the stipulated time limit, then the Contractor shall and will pay to the SJPC for each and every day they, the Contractor, shall be in default, the sum of Two Thousand Dollars ($2,000.00) or the sum equal to 1/20 of one percent (1%) of the total consideration provided for under the contract, whichever sum if the greater, which sum per day is agreed upon, fixed and determined by the parties hereto to be liquidated damages, not a penalty.

SJPC shall recover said damages by deducting the amount thereof out of any monies which may be due or become due to Contractor, or by an action of law against the Contractor or their surety, or by either or both of these methods.

In case the Contractor shall be delayed due to the failure on the part of the SJPC to furnish anything on its part to be furnished, or of any other cause beyond the control of the Contractor, they shall be entitled to such an extension of time for the delivery of equipment, materials, work and supplies as is the judgement of SJPC shall be fair and just.

EVALUATION OF RESPONSES

Method

The proposal review team will consist of individuals from the SJPC who will independently analyze each proposal. The evaluation team will analyze how the Bidders' qualifications, experience, professional

content and proposed methodology meet the SJPC's needs. Proposals should be prepared simply and economically, providing straightforward, concise description of the Bidder's capabilities to satisfy the requirements of this request.

Criteria

It is the policy of the SJPC that the selection of vendors shall be on the basis of demonstrated competence and on the professional qualifications necessary for the satisfactory performance of the services required. The SJPC will put each proposal submitted through a process of evaluation to determine responsiveness to all administrative and technical requirements of the Request for Bids. Bid proposals will be evaluated primarily on cost/cost effectiveness, but the respondent's qualifications, experience, project approach, and methodology may also be considered when evaluating the responsibility of a bid.

The evaluation criteria are intended to be used to make a recommendation to the SJPC Board of Directors, who will award the contract, but who are not bound to use the criteria or to award to Respondent on the basis of the recommendation. Furthermore, the SJPC reserves the right to vary from this procedure as it determines to be in the SJPC's best interest.

BID FORM - SJPC-22-49 - BMT RAIL INFRASTRUCTURE REHAB, PAGE 1 OF 4

Having carefully examined the Contract Drawings, Technical Specifications, and Agreement for this project, and having examined all conditions affecting the work, the undersigned proposes to complete the work as set forth therein and to furnish all equipment, supervision, transportation, labor, materials and services required to execute the work in accordance with the Contract Drawings and Documents for the following Unit Price Costs, unless noted otherwise:

It is understood and agreed that any incidental work necessary to complete the Project in its entirety will be included in the line items, unit prices and lump sum bid, whether or not the line item or items shall specifically state the nature of the incidental work. The line item or items which the incidental work, and the incidental costs, are included shall be selected by the Bidder. It is also understood and agreed that each line item of work in the Proposal shall include all supervision and personnel costs, markups, and other costs envisioned by the Bidder. In other words, all line item costs bid shall be "all-inclusive". Therefore, the unit prices to be entered on the Bid Form are obtained by dividing the total cost bid to complete the line item by the quantity shown of the form. The bid shall be determined by adding all line item costs for all Bid Items under Base Bid. This grand total Base Bid Price shall constitute the Lump Sum Base Bid Cost of the Project.

Negotiations for the adjustments of the unit price of any item will be completed only when that item and other work or items affecting its quantity have been completed and the total net change in the quantity of such item can be ascertained with sufficient accuracy to determine if it be eligible for consideration in accordance with the foregoing provisions.

The bidder must also furnish a price for all Optional Bids or Alternates requested, as well as all separate unit price items requested. Failure to do so will constitute an incomplete bid, which will be rejected by the South Jersey Port Corporation.

The Contractor agrees that this proposal will be valid and binding for a period of ninety (90) days to allow the Port time to evaluate the complete proposal to allow for the decision. The Port Engineer will officially notify the Contractor of the acceptance of their bid within ninety (90) days following the bid date pending compliance with delivering the requested documentation.

The undersigned accepts responsibility for having completely examined and understood the intent of the Bid Drawings and Documents; for having fully examined the site of the work; and for having obtained all pertinent information affecting the work.

Contractor to provide a lump sum proposal in US dollars to supply all necessary design services, materials, labor, tools, consumables, transportation, water craft, cranes, supervision, PPE, all materials and material controls, and any temporary facilities as necessary to provide for the complete and functional scope of work as described.

BID FORM - SJPC-22-49 - BMT RAIL INFRASTRUCTURE REHAB, PAGE 2 OF 4

Estimated Time Required to Complete All Work in Calendar Days : _____Days

Bidder shall provide rough schedule, including estimated start and completion dates.

All work shall be performed on weekdays during daylight hours. Work may be performed on Saturdays and/or other hours pending prior approval by South Jersey Port Corporation.

We Acknowledge Receipt of the Following Addenda

1. ADDENDUM NO. _____ Dated: _____
2. ADDENDUM NO. _____ Dated: _____
3. ADDENDUM NO. _____ Dated: _____
4. ADDENDUM NO. _____ Dated: _____

If no addenda are received, indicate by writing or typing the word "NONE" in the space for first addenda.

BID FORM - SJPC-22-49 - BMT RAIL INFRASTRUCTURE REHAB, PAGE 3 OF 4

Item No.	Quantity	Units	Bid Item	Unit Price	Total
1	1	LS	MOBILIZATION / DEMOBILIZATION	$	$
2	1	LS	SURVEY & LAYOUT	$	$
3	1	LS	MISCELLANEOUS DEMOLITION	$	$
4	1	LS	REMOVAL OF EXISTING PAVEMENT, CONCRETE AND RR TRACK FOR CONSTRUCTION OF NEW RR TRACK ON SOIL	$	$
5	1	LS	SELECT CONCRETE DEMOLITION AND REMOVAL OF RAIL TRACK ON DOCK	$	$
6	1	LS	EXCAVATION AND GRADING FOR PLACEMENT OF NEW TRACK ON SOIL	$	$
7	1	LS	PLACEMENT OF NEW RR TRACK ON SOIL, INCLUDING SUB-BALLAST, BALLAST, TIES & NEW RAILROAD TRACK	$	$
8	1	LS	PLACEMENT OF NEW RR TRACK ON DOCK EMBEDDED IN CONCRETE	$	$
9	4	EA	NO. 8 DOUBLE TONGUE TURNOUT	$	$
10	1	LS	TRACK CONCRETE TRANSITION SLAB AND ENCASEMENT	$	$
11	1	LS	PRECAST GRADE CROSSING	$	$
12	2	EA	CRANE RAIL CROSSING FROGS	$	$
13	1	EA	RAIL TRACK BUMPER RELOCATION	$	$
14	2	EA	RAIL DERAILS	$	$
15	1	LS	REMOVE & ABANDONED STORM WATER INFRASTRUCTURE	$	$
16	1	LS	STORMWATER INFRASTRUCTURE INCLUDING EXCAVATION, INLETS, STORM PIPING AND ASSOCIATED WORK	$	$
17	2	EA	REMOVE AND RELOCATE EXISTING FIRE HYDRANTS & NEW BOLLARDS	$	$
18	1	LS	PAVING, INCLUDING GRADING, SUB-BASE, BASE COURSES AND WEARING COURSE	$	$
19	1	LS	REMOVE EXISTING LOADING DOCK & CONSTRUCT NEW LOADING DOCK AT SHED 1	$	$
20	1	EA	ROLL UP DOORS, INCLUDING REQUIRED DEMOLITION FOR NEW DOORS	$	$
21	1	LS	ELECTRICAL AT SHED 1 FOR DOORS AND LIGHTS	$	$
22	1	LS	CONCRETE SLABS AT DOORS IN SHED 1	$	$
23	1	LS	REMOVAL OF ROOF DECKING AT SHED 1	$	$

TOTAL BID	**$**

BID FORM - SJPC-22-49 - BMT RAIL INFRASTRUCTURE REHAB, PAGE 4 OF 4

NOTES:

1. All Bid Items shall include the descriptions as defined within Section 012000 - Price and Payment Procedures.
2. The total of the Items above shall constitute the Total Bid for the Contract.
3. The following Suplementray Bid Items are only applicable for changes to the Scope of Work and to not constitute part of the Total Bid amount.

ADDITIONS AND DELETIONS					
Item No.	**Quantity**	**Units**	**Supplementary Bid Item**	**Unit Price**	**Total**
A	--	LS	NEW TRACK ALIGNMENT TO BUILDING A, INCLUDING IMPROVEMENTS IN BUILDING A	$	$
B	2	EA	ROLL UP DOORS, INCLUDING REQUIRED DEMOLITION FOR NEW DOORS AT BUILDING A	$	$
C	2	EA	CANOPY AT BUILDING A	$	$
D	1	LS	ELECTRICAL AT BUILDING A FOR DOORS AND LIGHTS	$	$
E	1	LS	CONCRETE SLABS AT DOORS IN BUILDING A	$	$
F	1	EA	RAIL TRACK BUMPER RELOCATION AT BUILDING A	$	$
G	1	LS	CREDIT FOR NOT EMBEDDING TRACK IN ASPHALT	- $	- $
H	1	LS	EMBED TRACK IN PCC PAVEMENT RATHER THAN ASPHALT	$	$

Contractor: _____

Primary Contact Name: _____

Title: _____

Date: _____

Business Address: _____

_____

Phone No.: _____

REQUIRED BID DOCUMENT SUBMISSION CHECKLIST

	GENERAL BID REQUIREMENTS	CHECKLIST
	Bid Security	☐
	Certificate of Surety/Consent of Surety	☐
	Letter of Transmittal	☐
	Required Insurance Acknowledgement	☐
	Bid Form	☐
	Subcontractor Declaration	☐

EXHIBIT #	BID REQUIREMENTS - Q EXHIBITS	CHECKLIST
Q1	Small Business Enterprise Questionnaire	☐
Q2	Mandatory Equal Employment Opportunity "Exhibit A" Language (Goods/Service Contracts – if applicable)	☐
Q3	Mandatory Equal Opportunity "Exhibit B" Language (Construction Contracts -if applicable)*	☐
Q4	Stockholder Disclosure Certification	☐
Q5	Non-Collusion Affidavit	☐
Q6	Debarred List Affidavit	☐
Q7	Affirmative Action Evidence for Procurement/Service	☐
Q8	Business Registration Certificate	☐
Q9	Set-Off for State Tax	☐
Q11	Source Disclosure Form	☐
Q12	Executive Order #189 Vendor Code of Ethics Affidavit	☐
Q13	Executive Order #117 Two Year Chapter 51 / Vender Certification & Disclosure of Political Contributions	☐
Q14	Executive Order #151 Contract Compliance	☐
Q15	Employee Information Report – Form AA302	☐
Q16	Ownership Disclosure Form (formerly E.O. #134)	☐
Q17	Prevailing Wage Notification	☐
Q18	Public Works Contract Registration	☐
Q19	Buy America Notice*	☐
Q20	Pay to Play	☐
Q21	Disclosure/Certification of Investment Activities in Iran	☐
Q22	NJ Election Law Enforcement Commission (Elec) Affidavit	☐
Q23	Executive Order #271 Compliance*	☐
Q24	Certification of Non-involvement in Prohibited Activities in Russia or Belarus Pursuant to P.l.2022, c.3	☐
Q25	Allen Act Acknowledgement	☐
Q26	Assurance for Payment of Prevailing Wage*	☐

*Denotes Items provided for informational purposes. All other items require completion and/or acknowledgement

SOUTH JERSEY PORT CORPORATION

GENERAL REQUIRED DOCUMENTS FOR BID AND PROPOSAL PROJECTS

BID SECURITY

Attach Bid Security (Bid Bond) in the amount of 10% of the bid, but not in excess of $20,000.00.

(ATTACH YOUR BID SECURITY TO THIS SHEET)

_____
(Name of Company)

_____
(Signature of Representative)

_____
(Date)

CONSENT OF SURETY

Attach Consent of Surety from a Surety Company, meeting the requirements, described herein, stating that if the bidder is awarded the contract that the surety company will supply a performance bond for the contract.

Sample wording is as shown below:

CONSENT OF SURETY

_____ , _____ duly qualified to transact
(Name of Surety Company) (address)

business in the State of New Jersey, hereby agrees that if _____
(insert name of Bidder)

located at _____ is the successful Bidder for
(Address)

_____ it as surety, will provide the Bidder with a
(describe contract work here)

bond in such sum as is required in the advertisement or in the specifications.

Signed, sealed and dated this _____ day of _____ , 20 ____ .

_____
(Name of Surety Company)

By _____
(Name of attorney in fact)

NOTE: This form OR a Consent of Surety supplied by the Bidder's Surety Company is required with all bid submissions.

(Seal)

REQUIRED INSURANCE ACKNOWLEDGMENT

I acknowledge I have fully read and understand the insurance requirements as outlined in the Bid Specifications.

Furthermore, I have submitted a Certificate of Insurance or a letter from our company's insurance carrier stating their ability to provide a certificate of insurance if awarded a contract.

_____

(Name of Company)

_____

(Signature of Representative)

_____

(Date)

SUBCONTRACTOR DECLARATION

Each bidder shall set forth in the bid the names and addresses of the subcontractors being utilized for this project and their trade. Failure of the bidder to name said subcontractors will be cause for rejection of the bid.

☐ Our company will **not** be utilizing subcontractors for this project.

☐ Our company will be utilizing subcontractors for this project and have attached a separate sheet with their names, addresses, and trades.

_____
(Name of Company)

_____
(Signature of Representative)

_____
(Date)

SOUTH JERSEY PORT CORPORATION

Q EXHIBITS FOR BID AND PROPOSAL PROJECTS

Small Business Enterprise Questionnaire

South Jersey Port Corporation

FOR INFORMATION PURPOES

New Jersey's Small Business Set-Aside Program obligates the South Jersey Port Corporation to make 25% of all purchase for goods and services for small businesses. Firms classified as Small Business Enterprises must be registered with the New Jersey Business Action Center. Registration instructions can be obtained by visiting the State's website at:

www.nj.gov/njbusiness/contracting/sbsa/ This is not a Set-Aside bid; however South Jersey Port Corporation requires completion of this form to allow the South Jersey Port Corporation to track its Set-Aside obligations are pursuant to Executive Order #71 of former Governor James E. McGreevey and Executive Order #34 of former Governor John S. Corzine.

The South Jersey Port Corporation requests the following:

Our firm is certified/registered with the State of New Jersey Set-Aside Program. Yes No
(Circle One, attach a copy of the certification and enter certification number below)

Certification # _____

	Check Here
SBE (Small Business Enterprise)	☐
MBE (Minority Business Enterprise)	☐
WBE (Woman Business Enterprise)	☐
None of the Above	☐

If yes, please provide Certification & Documentation of MBE & WBE.

NOTE: The South Jersey Port Corporation, being a body politic, is not subject to municipal, state, or federal taxes.

REQUIRED AFFIRMATIVE ACTION EVIDENCE FOR PROCUREMENT PROFESSIONAL AND SERVICES CONTRACTS

All successful vendors must submit one of the following with seven (7) days of the notice to intent to award:

1. A photocopy of their Federal Letter of Affirmative Action Plan Approval

Or

2. A photocopy of their Certificate of Employee Information Report

Or

3. A completed Affirmative Action Employee Information Report (AA302)

PLEASE COMPLETE THE FOLLOWING QUESTIONAIRE AS PART OF THE BID PACKAGE IN THE EVENT THAT YOU OR YOUR FIRM IS AWARED THIS CONTRACT

1. Our company has a Federal Letter of Affirmative Action Plan Approval

Yes ☐ No ☐

2. Our company has a Certificate of Employee Information Report

Yes ☐ No ☐

3. Our company has neither of the above. Please send From AA302 (AFFIRMATIVE ACTION EMPLOYEE INFORMATION REPORT)

Check Here ☐

NOTE: This form will be sent only if your company is awarded the bid,

I certify that the above information is correct to the best of my knowledge.

NAME _____
(Please type or print)

SIGNATURE_____

TITLE _____

DATE _____

PHONE NUMBER _____

FAX NUMBER _____

EXHIBIT A

MANDATORY EQUAL EMPLOYMENT OPPORTUNITY LANGUAGE N.J.S.A. 10:5-31 et seq. (P.L.1975, c.127) N.J.A.C. 17:27 et seq.

GOODS, GENERAL SERVICES, AND PROFESSIONAL SERVICES CONTRACTS

During the performance of this contract, the contractor agrees as follows:

The contractor or subcontractor, where applicable, will not discriminate against any employee or applicant for employment because of age, race, creed, color, national origin, ancestry, marital status, affectional or sexual orientation, gender identity or expression, disability, nationality or sex. Except with respect to affectional or sexual orientation and gender identity or expression, the contractor will ensure that equal employment opportunity is afforded to such applicants in recruitment and employment, and that employees are treated during employment, without regard to their age, race, creed, color, national origin, ancestry, marital status, affectional or sexual orientation, gender identity or expression, disability, nationality or sex. Such equal employment opportunity shall include, but not be limited to the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the Public Agency Compliance Officer setting forth provisions of this nondiscrimination clause. The contractor or subcontractor, where applicable will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to age, race, creed, color, national origin, ancestry, marital status, affectional or sexual orientation, gender identity or expression, disability, nationality or sex.

The contractor or subcontractor will send to each labor union, with which it has a collective bargaining agreement, a notice, to be provided by the agency contracting officer, advising the labor union of the contractor's commitments under this chapter and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

The contractor or subcontractor, where applicable, agrees to comply with any regulations promulgated by the Treasurer pursuant to N.J.S.A. 10:5-31 et seq., as amended and supplemented from time to time and the Americans with Disabilities Act.

The contractor or subcontractor agrees to make good faith efforts to meet targeted county employment goals established in accordance with N.J.A.C. l7:27-5.2.

EXHIBIT A (Cont.)

The contractor or subcontractor agrees to inform in writing its appropriate recruitment agencies including, but not limited to, employment agencies, placement bureaus, colleges, universities, and labor unions, that it does not discriminate on the basis of age, race, creed, color, national origin, ancestry, marital status, affectional or sexual orientation, gender identity or expression, disability, nationality or sex, and that it will discontinue the use of any recruitment agency which engages in direct or indirect discriminatory practices.

The contractor or subcontractor agrees to revise any of its testing procedures, if necessary, to assure that all personnel testing conforms with the principles of job related testing, as established by the statutes and court decisions of the State of New Jersey and as established by applicable Federal law and applicable Federal court decisions.

In conforming with the targeted employment goals, the contractor or subcontractor agrees to review all procedures relating to transfer, upgrading, downgrading and layoff to ensure that all such actions are taken without regard to age, race, creed, color, national origin, ancestry, marital status, affectional or sexual orientation, gender identity or expression, disability, nationality or sex, consistent with the statutes and court decisions of the State of New Jersey, and applicable Federal law and applicable Federal court decisions.

The contractor shall submit to the public agency, after notification of award but prior to execution of a goods and services contract, one of the following three documents:

Letter of Federal Affirmative Action Plan Approval;

Certificate of Employee Information Report; or

Employee Information Report Form AA-302 (electronically provided by the Division and distributed to the public agency through the Division's website at:
http://www.state.nj.us/treasury/contract_compliance

The contractor and its subcontractors shall furnish such reports or other documents to the Division of Purchase & Property, CCAU, EEO Monitoring Program as may be requested by the office from time to time in order to carry out the purposes of these regulations, and public agencies shall furnish such information as may be requested by the Division of Purchase & Property, CCAU, EEO Monitoring Program for conducting a compliance investigation pursuant to N.J.A.C. 17:27-1.1 et seq.

EXHIBIT B

MANDATORY EQUAL EMPLOYMENT OPPORTUNITY LANGUAGE N.J.S.A. 10:5-31 et seq. (P.L.1975, c.127) N.J.A.C. 17:27-1.1 et seq.

CONSTRUCTION CONTRACTS

During the performance of this contract, the contractor agrees as follows:

The contractor or subcontractor, where applicable, will not discriminate against any employee or applicant for employment because of age, race, creed, color, national origin, ancestry, marital status, affectional or sexual orientation, gender identity or expression, disability, nationality or sex. Except with respect to affectional or sexual orientation and gender identity or expression, the contractor will ensure that equal employment opportunity is afforded to such applicants in recruitment and employment, and that employees are treated during employment, without regard to their age, race, creed, color, national origin, ancestry, marital status, affectional or sexual orientation, gender identity or expression, disability, nationality or sex. Such equal employment opportunity shall include, but not be limited to the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the Public Agency Compliance Officer setting forth provisions of this nondiscrimination clause.

The contractor or subcontractor, where applicable will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to age, race, creed, color, national origin, ancestry, marital status, affectional or sexual orientation, gender identity or expression, disability, nationality or sex.

The contractor or subcontractor will send to each labor union, with which it has a collective bargaining agreement, a notice, to be provided by the agency contracting officer, advising the labor union or worker'' representative of the contractor's commitments under this act and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

The contractor or subcontractor, where applicable, agrees to comply with any regulations promulgated by the Treasurer, pursuant to N.J.S.A. 10:5-31 et seq., as amended and supplemented from time to time and the Americans with Disabilities Act.

When hiring or scheduling workers in each construction trade, the contractor or subcontractor agrees to make good faith efforts to employ minority and women workers in each construction trade consistent with the targeted employment goal prescribed by N.J.A.C. l7:27-7.2; provided, however, that the Dept. of LWD, Construction EEO Monitoring Program, may, in its discretion, exempt a contractor or subcontractor from compliance with the good faith procedures prescribed by the following provisions, A, B, and C, as long as the Dept. of LWD, Construction EEO Monitoring Program is satisfied that the contractor or subcontractor is employing workers

EXHIBIT B (Cont.)

provided by a union which provides evidence, in accordance with standards prescribed by the Dept. of LWD, Construction EEO Monitoring Program, that its percentage of active "card carrying" members who are minority and women workers is equal to or greater than the targeted employment goal established in accordance with N.J.A.C. 17:27-7.2. The contractor or subcontractor agrees that a good faith effort shall include compliance with the following procedures:

(A) If the contractor or subcontractor has a referral agreement or arrangement with a union for a construction trade, the contractor or subcontractor shall, within three business days of the contract award, seek assurances from the union that it will cooperate with the contractor or subcontractor as it fulfills its affirmative action obligations under this contract and in accordance with the rules promulgated by the Treasurer pursuant to N.J.S.A. 10:5-31 et. seq., as supplemented and amended from time to time and the Americans with Disabilities Act. If the contractor or subcontractor is unable to obtain said assurances from the construction trade union at least five business days prior to the commencement of construction work, the contractor or subcontractor agrees to afford equal employment opportunities minority and women workers directly, consistent with this chapter. If the contractor's or subcontractor's prior experience with a construction trade union, regardless of whether the union 'has provided said 'assurances, indicates a significant possibility that the trade union will not refer sufficient minority and women workers consistent with affording equal employment opportunities as specified in this chapter, the contractor or subcontractor agrees to be prepared to provide such opportunities to minority and women workers directly, consistent with this chapter, by complying with the hiring or scheduling procedures prescribed under (B) below; and the contractor or subcontractor further agrees to take said action immediately if it determines that the union is not referring minority and women workers consistent with the equal employment opportunity goals set forth in this chapter.

(B) If good faith efforts to meet targeted employment goals have not or cannot be met for each construction trade by adhering to the procedures of (A) above, or if the contractor does not have a referral agreement or arrangement with a union for a construction trade, the contractor or subcontractor agrees to take the following actions:

(l) To notify the public agency compliance officer, the Dept. of LWD, Construction EEO Monitoring Program, and minority and women referral organizations listed by the Division pursuant to N.J.A.C. 17:27-5.3, of its workforce needs, and request referral of minority and women workers.

(2) To notify any minority and women workers who have been listed with it as awaiting available vacancies;

(3) Prior to commencement of work, to request that the local construction trade union refer minority and women workers to fill job openings, provided the contractor or subcontractor has a referral agreement or arrangement with a union for the construction trade;

EXHIBIT B (Cont.)

(4) To leave standing requests for additional referral to minority and women workers with the local construction trade union, provided the contractor or subcontractor has a referral agreement or arrangement with a union for the construction trade, the State Training and Employment Service and other approved referral sources in the area;

(5) If it is necessary to lay off some of the workers in a given trade on the construction site, layoffs shall be conducted in compliance with the equal employment opportunity and nondiscrimination standards set forth in this regulation, as well as with applicable Federal and State court decisions;

(6) To adhere to the following procedure when minority and women workers apply or are referred to the contractor or subcontractor:

(i) The contactor or subcontractor shall interview the referred minority or women worker.

(ii) If said individuals have never previously received any document or certification signifying a level of qualification lower than that required in order to perform the work of the construction trade, the contractor or subcontractor shall in good faith determine the qualifications of such individuals. The contractor or subcontractor shall hire or schedule those individuals who satisfy appropriate qualification standards in conformity with the equal employment opportunity and non-discrimination principles set forth in this chapter. However, a contractor or subcontractor shall determine that the individual at least possesses the requisite skills, and experience recognized by a union, apprentice program or a referral agency, provided the referral agency is acceptable to the Dept. of LWD, Construction EEO Monitoring Program. If necessary, the contractor or subcontractor shall hire or schedule minority and women workers who qualify as trainees pursuant to these rules. All of the requirements, however, are limited by the provisions of (C) below.

(iii) The name of any interested women or minority individual shall be maintained on a waiting list and shall be considered for employment as described in (i) above, whenever vacancies occur. At the request of the Dept. of LWD, Construction EEO Monitoring Program, the contractor or subcontractor shall provide evidence of its good faith efforts to employ women and minorities from the list to fill vacancies.

(iv) If, for any reason, said contractor or subcontractor determines that a minority individual or a woman is not qualified or if the individual qualifies as an advanced trainee or apprentice, the contractor or subcontractor shall inform the individual in writing of the reasons for the determination, maintain a copy of the determination in its files, and send a copy to the public agency compliance officer and to the Dept. of LWD, Construction EEO Monitoring Program.

(7) To keep a complete and accurate record of all requests made for the referral of workers in any trade covered by the contract, on forms made available by the Dept. of LWD, Construction EEO Monitoring Program and submitted promptly to the Dept. of LWD, Construction EEO Monitoring Program upon request.

EXHIBIT B (Cont.)

(C) The contractor or subcontractor agrees that nothing contained in (B) above shall preclude the contractor or subcontractor from complying with the union hiring hall or apprenticeship policies in any applicable collective bargaining agreement or union hiring hall arrangement, and, where required by custom or agreement, it shall send journeymen and trainees to the union for referral, or to the apprenticeship program for admission, pursuant to such agreement or arrangement. However, where the practices of a union or apprenticeship program will result in the exclusion of minorities and women or the failure to refer minorities and women consistent with the targeted county employment goal, the contractor or subcontractor shall consider for employment persons referred pursuant to (B) above without regard to such agreement or arrangement; provided further, however, that the contractor or subcontractor shall not be required to employ women and minority advanced trainees and trainees in numbers which result in the employment of advanced trainees and trainees as a percentage of the total workforce for the construction trade, which percentage significantly exceeds the apprentice to journey worker ratio specified in the applicable collective bargaining agreement, or in the absence of a collective bargaining agreement, exceeds the ratio established by practice in the area for said construction trade. Also, the contractor or subcontractor agrees that, in implementing the procedures of (B) above, it shall, where applicable, employ minority and women workers residing within the geographical jurisdiction of the union.

After notification of award, but prior to signing a construction contract, the contractor shall submit to the public agency compliance officer and the Dept. of LWD, Construction EEO Monitoring Program an initial project workforce report (Form AA-201) electronically provided to the public agency by the Dept. of LWD, Construction EEO Monitoring Program, through its website, for distribution to and completion by the contractor, in accordance with N.J.A.C. 17:27-7. The contractor also agrees to submit a copy of the Monthly Project Workforce Report once a month thereafter for the duration of this contract to the Dept. of LWD, Construction EEO Monitoring Program, and to the public agency compliance officer.

The contractor agrees to cooperate with the public agency in the payment of budgeted funds, as is necessary, for on-the-job and/or off-the job programs for outreach and training of minorities and women.

(D) The contractor and its subcontractors shall furnish such reports or other documents to the Dept. of LWD, Construction EEO Monitoring Program as may be requested by the Dept. of LWD, Construction EEO Monitoring Program from time to time in order to carry out the purposes of these regulations, and public agencies shall furnish such information as may be requested by the Dept. of LWD, Construction EEO Monitoring Program for conducting a compliance investigation pursuant to N.J.A.C. 17:27-1.1 et seq.

STOCKHOLDER DISCLOSURE CERTIFICATION Q4

Name of Business:

☐ I certify that the list below contains the names and home addresses of all stockholders holding 10% or more of the issued and outstanding stock of the undersigned.

OR

☐ I certify that no one stockholder owns 10% or more of the issued and outstanding stock of the undersigned.

Check the box that represents the type of business organization:

☐ Partnership ☐ Corporation ☐ Sole Proprietorship

☐ Limited Partnership ☐ Limited Liability Corporation ☐ Limited Liability Partnership

☐ Subchapter S Corporation

Sign and notarize the form below, and, if necessary, complete the stockholder list below.

Stockholders:

Name: Home Address:	Name: Home Address:
Name: Home Address:	Name: Home Address:
Name: Home Address:	Name: Home Address:

Subscribed and sworn before me this ___ day of _____, 20 __.

(Notary Public)

My Commission expires:

_____
(Affiant)

_____
(Print name & title of affiant)

(Corporate Seal)

NON-COLLUSION AFFIDAVIT

State of New Jersey

County of _____ ss:

I, _____ residing in _____
(name of affiant) (name of municipality)

in the County of _____ and State of _____

of full age, being duly sworn according to law on my oath depose and say that:

I am _____ of the firm of _____
(title or position) (name of firm)

the bidder making this Proposal for the bid entitled _____,
(title of bid proposal)

and that I executed the said proposal with full authority to do so that said bidder has not, directly or indirectly entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of free, competitive bidding in connection with the above named project; and that all statements contained in said proposal and in this affidavit are true and correct, and made with full knowledge that Kean University relies upon the truth of the statements contained in said Proposal and in the statements contained in this affidavit in awarding the contract for the said project.

I further warrant that no person or selling agency has been employed or retained to solicit or secure such contract upon an agreement or understanding for a commission, percentage, brokerage, or contingent fee, except bona fide employees or bona fide established commercial or selling agencies maintained by _____.
(name of firm)

Subscribed and sworn to

before me, this day _____ Signature

_____, 2____ _____
(Type or print name of affiant under signature)

_____

Notary public of

My Commission expires _____

(Seal)

STATE OF NEW JERSEY DEBARRED LIST AFFIDAVIT

I, _____ of the City of _____ in the County of _____ and the State of _____ of full age, being duly sworn according to law on my oath depose that:

I am _____ , an officer of the firm of Bid for the above named work, and that I executed the said Bid with full authority to do so; that said bidder at the time of making of this bid is not included on the State of New Jersey, Department of the Treasurer's List of Debarred, Suspended and Disqualified Bidders and that all statements contained in said Bid and in this Affidavit are true and correct, and made with the full knowledge that the City relies upon the truth of the statements contained in said Bid and in statements contained in the Affidavit in awarding the contract for said work. The undersigned further warrants that should the name of the firm making this bid appear on the State Treasurer's List of Debarred, Suspended and Disqualified Bidders at any time prior to, and during the life of this Contract, including the Guarantee Period, that the City shall be immediately so notified by the signatory of this Eligibility Affidavit.

The undersigned understands that the firm making the bid as a Contractor is subject to debarment, suspension and / or disqualification in contracting with the State of New Jersey and the Department of Environmental Protection if the Contractor, pursuant to N.J.A.C. 7:1-5.2, commits any of the acts listed therein, and as determined according to applicable law and regulation.

Name of Bidder (Type or Print): _____

Signature of Bidder: _____

Address of Bidder: _____

Name & Title of Affiant: _____

Signature of Affiant: _____

Notarization Section

Subscribed and Sworn before me this _____ day of _____ , 20___.

Notary Public

(Seal)

Affirmative Action Evidence for Procurement/Service

Please fill out the following forms AA201 & AA202.

Official Use Only Q7

Assignment

Code

STATE OF NEW JERSEY

DEPARTMENT OF LABOR & WORKFORCE DEVELOPMENT
CONSTRUCTION EEO COMPLIANCE MONITORING PROGRAM

FORM AA-201

Revised 11/11

INITIAL PROJECT WORKFORCE REPORT CONSTRUCTION

For instructions on completing the form, go to: https://www.nj.gov/treasury/contract_compliance/documents/pdf/forms/aa201ins.pdf

1. FID NUMBER

2. CONTRACTOR ID NUMBER

3. NAME AND ADDRESS OF PRIME CONTRACTO R

(Name)

(Street Address)

(City) **(State)** **(Zip Code)**

4. IS THIS COMPANY MINORITY OWNED [ ] OR WOMAN OWNED [ ]

5. NAME AND ADDRESS OF PUBLIC AGENCY AWARDING CONTRACT

Name:
Address:

CONTRACT NUMBER **DATE OF AWARD** **DOLLAR AMOUNT OF AWARD**

6. NAME AND ADDRESS OF PROJECT

Name:
Address:

COUNTY

7. PROJECT NUMBER

8. IS THIS PROJECT COVERED BY A PROJECT LABOR AGREEMENT (PLA)? YES [ ] NO [ ]

9. TRADE OR CRAFT	PROJECTED TOTAL EMPLOYEES				PROJECTED MINORITY EMPLOYEES				**PROJECTED PHASE - IN DATE**	**PROJECTED COMPLETION DATE**
	MALE		FEMALE		MALE		FEMALE			
	J	AP	J	**AP**	J	AP	J	AP		
1. ASBESTOS WORKER										
2. BRICKLAYER OR MASON										
3. CARPENTER										
4. ELECTRICIAN										
5. GLAZIER										
6. HVAC MECHANIC										
7. IRONWORKER										
8. OPERATING ENGINEER										
9. PAINTER										
10. PLUMBER										
11. ROOFER										
12. SHEET METAL WORKER										
13. SPRINKLER FITTER										
14. STEAMFITTER										
15. SURVEYOR										
16. TILER										
17. TRUCK DRIVER										
18. LABORER										
19. OTHER										
20. OTHER										

I hereby certify that the foregoing statements made by me are true. I am aware that if any of the foregoing statements are willfully false, I am subject to punishment.

(Signature)

10. **(Please Print Your Name)** **(Title)**

(Area Code) **(Telephone Number)** **(Ext.)** **(Date)**

FORM AA-202
REVISED 11/11

State Of New Jersey

Department of Labor & Workforce Development
Construction EEO Compliance Monitoring Program

Q7

MONTHLY PROJECT WORKFORCE REPORT - CONSTRUCTION

For instructions on completing the form, go to:
https://www.nj.gov/treasury/contract_compliance/documents/pdf/forms/aa202ins.pdf

3. F ID or SS Number

1.Name and address of Prime Contractor

2. Contractor ID Number

4. Reporting Period

(NAME)

5. Public Agency Awarding Contract **Date of Award**

(ADDRESS)

6. Name and Location of Project **County**

7. Project ID Number

(CITY) (STATE) (ZIP CODE)

8. CONTRACTOR NAME (LIST PRIME CONTRACTOR WITH SUBS FOLLOWING)	9. PERCENT OF WORK COMPLETED	10. TRADE OR CRAFT	CLASSIFICATION (SEE REVERSE)	11. NUMBER OF EMPLOYEES A. TOTAL	B. BLACK	C. HISPANIC	D. AMERICAN INDIAN	E. ASIAN	F. FEMALES	12. TOTAL NO. OF MIN. EMP.	13. WORK HOURS TOTAL WORK HOURS	A. MIN. W/H	B. FEMALE W/H	14. % OF WORK HRS A. % OF MIN. W/H	B. % OF FEMALE W/H	15. CUM. WORK HRS TOTAL WORK HOURS	A. MIN. HOURS	B. FEMALE HOURS	16. CUM. % OF W/H A. % OF MIN W/H	B. % OF FEM. W/H
			J																	
			AP																	
			J																	
			AP																	
			J																	
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			J																	
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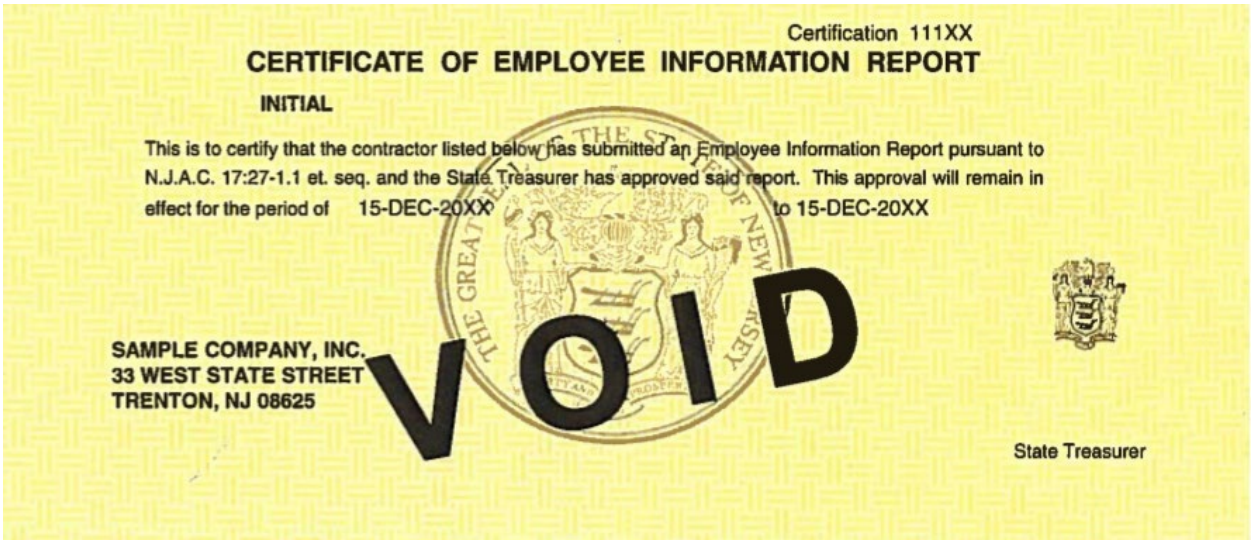
			J																	
			AP																	

17. COMPLETED BY (PRINT OR TYPE)

(NAME) (SIGNATURE) (TITLE)

(AREA CODE) (TELEPHONE NUMBER) (EXT.) (DATE)

Sample Certificate of Employee Information Report



Certification 111XX

CERTIFICATE OF EMPLOYEE INFORMATION REPORT

INITIAL

This is to certify that the contractor listed below has submitted an Employee Information Report pursuant to N.J.A.C. 17:27-1.1 et. seq. and the State Treasurer has approved said report. This approval will remain in effect for the period of 15-DEC-20XX to 15-DEC-20XX

SAMPLE COMPANY, INC.
33 WEST STATE STREET
TRENTON, NJ 08625

VOID

State Treasurer

If you are unable to provide your Certificate of Employee Information Report, please fill out the following form and follow the steps.

Form Duplicate Cert.
Rev. 11/11

Q7

STATE OF NEW JERSEY
DEPARTMENT OF THE TREASURY
Division of Purchase & Property, Contract Compliance Audit Unit
EEO Monitoring Program

DUPLICATE CERTIFICATE OF EMPLOYEE INFORMATION REPORT REQUEST

IMPORTANT- FAILURE TO PROPERLY COMPLETE THE ENTIRE FORM AND SUBMIT THE REQUIRED $75.00 FEE (Non-Refundable) MAY DELAY ISSUANCE OF YOUR DUPLICATE CERTIFICATE OF EMPLOYEE INFORMATION REPORT.

SECTION A - COMPANY IDENTIFICATION

1. FID. NO. OR SOCIAL SECURITY	2. ASSIGNED CERTIFICATION NUMBER	ISSUE DATE	EXPIRATION DATE

3. COMPANY NAME

4. STREET | CITY | COUNTY | STATE | ZIP CODE

5. REASON FOR REQUEST OF DUPLICATE CERTIFICATE
☐ 1. Lost Certificate ☐ 2. Damaged ☐ 3. Other (Specify)

SECTION B - SIGNATURE AND IDENTIFICATION

6. NAME OF PERSON COMPLETING FORM (Print or Type)	SIGNATURE	TITLE	DATE MO DAY YEAR

7. ADDRESS NO. & STREET | CITY | COUNTY | STATE | ZIP CODE PHONE (AREA CODE, NO.,EXTENSION)

I certify that the information on this Form is true and correct.

SECTION C - OFFICIAL USE ONLY

RECEIVED DATE:		DIVISION OF REVENUE DLN # :	

INSTRUCTIONS FOR COMPLETING DUPLICATE CERTIFICATE REQUEST

ITEM 1 - Enter the Federal Identification Number assigned by the Internal Revenue Service, or if a Federal Employer Identification Number has been applied for, or if your business is such that you have not or will not receive a Federal Employer Identification Number, enter the Social Security Number of the owner or of one partner, in the case of a partnership.

ITEM 2 - Enter the Certificate Number that was assigned to your company along with the Issue Date and Expiration Date (If available).

ITEM 3 - Enter the name by which the company is identified.

ITEM 4 - Enter the physical location of the company. Include City, County, State and Zip Code.

ITEM 5 - Enter the reason for requesting a Duplicate Certificate of Employee Information Report.

ITEM 6 - Print or type the name of the person completing the form. Include the signature, title and date.

ITEM 7 - Enter the physical location where the form is being completed. Include City, State, Zip Code and Phone Number.

RETAIN A COPY OF THIS REQUEST FOR THE VENDOR'S OWN FILES AND FORWARD ONE COPY WITH A CHECK IN THE AMOUNT OF $75.00 (Non-Refundable Fee) PAYABLE TO "THE TREASURER, STATE OF NEW JERSEY" TO:

NJ Department of the Treasury
Division of Purchase & Property
Contract Compliance Audit Unit
EEO Monitoring Program
PO Box 206
Trenton, New Jersey 08625-0206 **Telephone No. (609) 292-5473**

PLEASE ALLOW 15 BUSINESS DAYS FOR PROCESSING THE DUPLICATE CERTFICATE

PUBLIC CONTRACT EEO/AA COMPLIANCE PROCEDURES FLOW CHART

EEO/AA Procedures in Awarding Public Contracts

Public Agency

- Include Mandatory Language in advertisements for receipt of bids, solicitation and/or request for proposals.
- Include appropriate Mandatory Language in contracts and bid specifications.
- Obtain Required EEO/AA evidence from contractor or vendor.

Vender

Goods, Professional Services, and General Service Contracts

|

Mandatory Language of Exhibit A

|

All successful vendors must submit one of the following forms of evidence:

1. Copy Letter of Federal Approval

Or

2. Certificate of Employee Information Report

Or

3. Complete Form AA-302 (Employee Information Report)

|

EEO/AA Evidence must be submitted after notification of award, but prior to signing of a goods and services contract

Construction Contracts

|

Mandatory Language of Exhibit B

|

Additional Mandatory Language EO 151 & P.L.2009, c.335 (State Agencies, Independent Authorities, Colleges & Universities Only)

|

Complete Form AA-201 (Initial Project Workforce Report)

|

Submit Form AA-202 (Monthly Project Workforce Report) once a month for the duration of the contract to the Dept. of Labor and to the Public Agency Compliance

|

EEO/AA Evidence must be submitted after notification of award, but prior to signing of a construction contract

BUSINESS REGISTRATION CERTIFICATE

"Pursuant to the terms of N.J.S.A 52:32-44, all bidders/proposers are required to submit with their bid, proof of valid business registration issued by the Division of Revenue in the Department of Treasure. Failure to submit proof of registration is considered cause for mandatory rejection of bids (a non-waivable defect). No contract shall be entered into by the South Jersey Port Corporation unless the contractor first provides proof of valid business registration. In addition, the successful bidder/proposer is required to receive from any subcontractor it used for services under this contract, proof of valid business registration with an contract with the South Jersey Port Corporation unless the subcontractor first provides proof of valid business registration."

If you are already registered go to https://www.state.nj.us/treasury/revenue/busregcert.shtml to obtain a copy of your Business Registration Certificate.

All question regarding this requirement should be referred to the Division of Revenues
https://www.state.nj.us/treasury/revenue/revgencode.shtml

PLEASE ATTACH COPY OF YOUR NJ BUSINESS REGISTRATION CERTIFICATE BELOW

NOTICE TO ALL BIDDERS SET-OFF FOR STATE TAX

Please be advised that, pursuant to P.L. 1995, c.159, effective January 1, 1996, and notwithstanding any provision of the law to the contrary, whenever any taxpayer, partnership or S corporation under contract to provide goods or services or construction projects to the State of New Jersey or its agencies or instrumentalities, including the legislative and judicial branches of State government, is entitled to payment for those goods or services at the same time a taxpayer, partner or shareholder of that entity is indebted for any State tax, the Director of the Division of Taxation shall seek to set off that taxpayer's or shareholder's share of the payment due the taxpayer, partnership or S corporation. The amount set off shall not allow for the deduction of any expenses or other deductions which might be attributable to the taxpayer, partner, or shareholder subject to set-off under this act.

The Director of the Division of Taxation shall give notice of the set-off to the taxpayer and provide an opportunity for a hearing within 30 days of such notice under the procedures for protests established under R.S. 54:49-18. No requests for conference, protest, or subsequent appeal to the Tax Court from any protest under this section shall stay the collection of the indebtedness. Interest that may be payable by the State, pursuant to P.L. 1987, c.184 (c. 52:32-32 et seq.), to the taxpayer shall be stayed".

"I HAVE BEEN ADVISED OF THIS NO"ICE"

COMPANY: _____

SIGNATURE: _____

NAME: _____

TITLE: _____

DATE: _____

SOURCE DISCLOSURE FORM

BID SOLICITATION # AND TITLE: _____

VENDOR/BIDDER NAME: _____

The Vendor/Bidder submits this Form in response to a Bid Solicitation issued by the South Jersey Port Corporation, in accordance with the requirements of N.J.S.A. 52:34-13.2.

PART 1

☐ All services will be performed by the Contractor and Subcontractors in the United States. Skip Part 2.

☐ Services will be performed by the Contractor and/or Subcontractors outside of the United States. **Complete Part 2.**

PART 2

Where services will be performed outside of the United States, please list every country where services will be performed by the Contractor and all Subcontractors. If any of the services cannot be performed within the United States, the Contractor shall state, with specificity, the reasons why the services cannot be performed in the United States. The Director of the South Jersey Transportation Authority will review this justification and if deemed sufficient, the Director may seek the Treasurer's approval.

Name of Contractor / Sub-contractor	Performance Location by Country	Description of Service(s) to be Performed Outside of the U.S.	Reason Why the Service(s) Cannot be Performed in the U.S.

Attach additional sheets if necessary to describe which service(s), if any, will be performed outside of the U.S. and the reason(s) why the service(s) cannot be performed in the U.S.

Any changes to the information set forth in this Form during the term of any Contract awarded under the referenced Bid Solicitation or extension thereof shall be immediately reported by the Contractor to the Director of the South Jersey Transportation Authority. If during the term of the Contract, the Contractor shifts the location of services outside the United States, without a prior written determination by the Director, the Contractor shall be deemed in breach of Contract, and the Contract will be subject to termination for cause. (cont.)

CERTIFICATION

I, the undersigned, certify that I am authorized to execute this certification on behalf of the Vendor/Bidder, that the foregoing information and any attachments hereto, to the best of my knowledge are true and complete. I acknowledge that the South Jersey Transportation Authority ("Authority") is relying on the information contained herein, and that the Vendor/Bidder is under a continuing obligation from the date of this certification through the completion of any Contract(s) with the Authority to notify the Authority in writing of any changes to the information contained herein; that I am aware that it is a criminal offense to make a false statement or misrepresentation in this certification. If I do so, I will be subject to criminal prosecution under the law, and it will constitute a material breach of my agreement(s) with the Authority, permitting the Authority to declare any contract(s) resulting from this certification to be void and unenforceable.

_____ _____

Signature **Date**

_____

Print Name and Title

Code of Ethics for Vendors

EXECUTIVE ORDER # 189

The South Jersey Port Corporation considers the maintenance of public trust and confidence essential to its proper functioning, and accordingly has adopted this vendors' Code of Ethics. Vendors who do business with SJPC must avoid all situation where propriety or financial interests, or opportunity for financial gain, could lead to favored treatment for any organization or individual. Vendors must also avoid circumstances and conduct which may constitute actual wrongdoing, or a conflict of interest, but might nevertheless appear questionable to the general public, this compromising the integrity of SJPC.

This code is based upon the principles established in Executive Order 189 and laws governing the Executive Commission on Ethical Standards. N.J.S.A. 52:13D et seq., which, while not strictly applicable to contractors, provides general guidance in this area. Also, this code has been established pursuant to the authority embodied in N.J.S.A. 27:25A et seq., and for good cause.

This Code of Ethics shall be made part of each Request for Proposal (RFP) promulgated by the SJPC and be attached to every contract and agreement to which the SJPC is a party. It shall be distributed to all parties who presently do business with SJPC and, to the extent feasible, to all those parties anticipated doing business with SJPC.

1. No vendor shall employ any SJPC officer or employee in the business of the vendor or professional activity in which the vendor is involved with the SJPC officer or employee.

2. No vendor shall offer or provide an interest, financial or otherwise, direct, or indirect, in the business of the vendor or professional activity in which the vendor is involved with SJPC officer or employee.

3. No vendor shall cause or influence, or attempt to cause or influence any SJPC officer or employee in his or her official capacity in any manner which might tend to impair the objectivity or independence of judgment of the SJPC official or employee.

4. No vendor shall cause or influence, or attempt to cause influence any SJPC officer or employee to use or attempt to use his or her official position to secure an unwarranted privileges or advantages for that vendor or for any other person.

   No vendor shall offer any SJPC officer or employees any gifts or favors, service or other thing of value under circumstances from which it might be reasonably inferred that such gift, service or other thing of value was given or offered for purpose of influencing the recipient in the discharge of his or her official duties. In addition, officers, or employees of the SJPC will not be permitted to accept breakfasts, lunches, dinner, alcoholic beverages, tickets to entertainment and/or sporting events or any other item which could be construed having more than nominal value.

   NOTE: This section would permit an SJPC officer or employee to accept food or refreshment of relatively low monetary value provided during the course of a meeting, conference or other

occasion where the employee is proper in attendance (for example – coffee, Danish, tea, or soda served during conference break).

Acceptance of unsolicited advertising or promotional material of nominal value (such as inexpensive pens, pencils, or calendars) would be permitted.

Any questions as to what is or is not acceptable or what constitutes proper conduct for an SJPC officer or employee should be referred to the SJPC's Ethic Liaison Officer or his or her designee.

5. This code it intended to augment, not to replace, existing administrative orders and the current SJPC Code of Ethics.

*Vender is defined as any general contractor, subcontractor, consultant, person, firm, corporation, or organization engaging in seeking to do business with the SJPC.

I certify that I have read and understand the aforementioned "Vendor Code of Ethics of the South Jersey Port Corporation".

Vender: _____

Title: _____

Date: _____

State of New Jersey
Two-Year Chapter 51/Executive Order 117 Vendor
Certification and Disclosure of Political Contributions

Q13

FOR STATE AGENCY USE ONLY

Solicitation, RFP, or Contract No._____ Award Amount_____

Description of Services _____

State Agency Name_____ Contact Person _____

Phone Number_____ Contact Email _____

☐ Check if the Contract / Agreement is Being Funded Using FHWA Funds

Please check if requesting recertification ☐

Part 1: Business Entity Information

Full Legal Business Name _____
(Including trade name if applicable)

Address _____

City_____ State_____ Zip_____ Phone _____

Vendor Email_____ Vendor FEIN (SS# if sole proprietor/natural person)_____

Check off the business type and list below the required information for the type of business selected.
MUST BE COMPLETED IN FULL

- ☐ Corporation: LIST ALL OFFICERS and any 10% and greater shareholder
- ☐ Professional Corporation: LIST ALL OFFICERS and ALL SHAREHOLDERS
- ☐ Partnership: LIST ALL PARTNERS with any equity interest
- ☐ Limited Liability Company: LIST ALL MEMBERS with any equity interest
- ☐ Sole Proprietor

Note: "Officers" means President, Vice President with senior management responsibility, Secretary, Treasurer, Chief Executive Officer or Chief Financial Officer of a corporation, or any person routinely performing such functions for a corporation.

All Officers of a Corporation or PC	**10% and greater shareholders of a corporation or all shareholders of a PC**
All Equity partners of a Partnership	**All Equity members of a LLC**

If you need additional space for listing of Officers, Shareholders, Partners or Members, please attach separate page.

IMPORTANT NOTE: You must review the definition of "contribution" and "business entity" on the Information and Instructions form prior to completing Part 2 and Part 3. The Information and Instructions form is available at: http://www.nj.gov/treasury/purchase/forms/eo134/Chapter51.pdf

Part 2: Disclosure of Contributions by the business entity or any person or entity whose contributions are attributable to the business entity. Q13

1. **Report below all contributions solicited or made during the 4 years immediately preceding the commencement of negotiations or submission of a proposal to any:**

   Political organization organized under Section 527 of the Internal Revenue Code and which also meets the definition of a continuing political committee as defined in N.J.S.A. 19:44A-20.13 **(See Information and Instructions form.)**

2. **Report below all contributions solicited or made during the 5 ½ years immediately preceding the commencement of negotiations or submission of a proposal to any:**

   Candidate Committee for or Election Fund of any Gubernatorial or Lieutenant Gubernatorial candidate
   State Political Party Committee
   County Political Party Committee

3. **Report below all contributions solicited or made during the 18 months immediately preceding the commencement of negotiations or submission of a proposal to any:**

   Municipal Political Party Committee
   Legislative Leadership Committee

Full Legal Name of Recipient _____

Address of Recipient _____

Date of Contribution_____Amount of Contribution _____

Type of Contribution (i.e. currency, check, loan, in-kind) _____

Contributor Name _____

Relationship of Contributor to the Vendor _____

☐ **Check this box only if no political contributions have been solicited or made by the business entity or any person or entity whose contributions are attributable to the business entity.**

Part 3: Certification

(A) ☐ I am certifying on behalf of the business entity and all individuals and/or entities whose contributions are attributable to the business entity as listed on Page 1 under **Part 1: Vendor Information**.

(B) ☐ I am certifying on behalf of the business entity and all individuals and/or entities whose contributions are attributable to the business entity as listed on Page 1 under Part 1: Vendor Information, except for the individuals and/or entities who are submitting separate Certification and Disclosure forms which are included with this submittal.

(C) ☐ I am certifying on behalf of the business entity only; any remaining persons or entities whose contributions are attributable to the business entity (as listed on Page 1) have completed separate Certification and Disclosure forms which are included with this submittal.

(D) ☐ I am certifying as an individual or entity whose contributions are attributable to the business entity.

I hereby certify as follows:

1. **I have read the Information and Instructions accompanying this form prior to completing the certification on behalf of the business entity.**

2. **All reportable contributions made by or attributable to the business entity have been listed above.**

3. **The business entity has not knowingly solicited or made any contribution of money, pledge of contribution, including in-kind contributions, that would bar the award of a contract to the business entity unless otherwise disclosed above:**

a) Within the 18 months immediately preceding the commencement of negotiations or submission of a proposal for the contract or agreement to:

(i) A candidate committee or election fund of any candidate for the public office of Governor or Lieutenant Governor or to a campaign committee or election fund of holder of public office of Governor or Lieutenant Governor; OR
(ii) Any State, County or Municipal political party committee; OR
(iii)Any Legisative Leadership committee.

b) During the term of office of the current Governor or Lieutenant Governor to:

(i) A candidate committee or election fund of a holder of the public office of Governor or Lieutenant Governor;

OR

(ii) Any State or County political party committee of the political party that nominated the sitting Governor or Lieutenant Governor in the last gubernatorial election.

c) Within the 18 months immediately preceding the last day of the sitting Governor or Lieutenant Governor's first term of office to:

(i) A candidate committee or election fund of the incumbent Governor or Lieutenant Governor; OR
(ii) Any State or County political party committee of the political party that nominated the sitting Governor or Lieutenant Governor in the last gubernatorial election.

4. **During the term of the contract/agreement the business entity has a continuing responsibility to report, by submitting a new Certification and Disclosure form, any contribution it solicits or makes to:**

(a) Any candidate committee or election fund of any candidate or holder of the public office of Governor or Lieutenant Governor; OR

(b) Any State, County or Municipal political party committee; OR
(c) Any Legislative Leadership committee.

The business entity further acknowledges that contributions solicited or made during the term of the contract/agreement may be determined to be a material breach of the contract/agreement.

5. **During the two-year certification period the business entity will report any changes in its ownership structure (including the appointment of an officer within a corporation) by submitting a new Certification and Disclosure form indicating the new owner(s) and reporting said owner(s) contributions.**

I certify that the foregoing statements in Parts 1, 2 and 3 are true. I am aware that if any of the statements are willfully false, I may be subject to punishment.

Signed Name_____ Print Name _____

Title/Position_____ Date _____

Procedure for Submitting Form(s)

The contracting State Agency should submit this form to the Chapter 51 Review Unit when it has been required as part of a contracting process. The contracting State Agency should submit a copy of the completed and signed form(s), to the Chapter 51 Unit and retain the original for their records.

The business entity should return this form to the contracting State Agency. The business entity can submit this form directly to the Chapter 51 Review Unit only when it -

- Is approaching its two-year certification expiration date and wishes to renew certification;
- Had a change in its ownership structure; OR
- Made any contributions during the period in which its last two-year certification was in effect, or during the term of a contract with a State Agency.

Forms should be submitted either electronically to: cd134@treas.nj.gov**, or regular mail at: Chapter 51 Review Unit, P.O. Box 230, 33 West State Street, Trenton, NJ 08625.**

State of New Jersey
Executive Order #151

Governor Jon S. Corzine

WHEREAS, New Jersey is one of the most racially, culturally, and ethnically diverse states in the United States, and this diversity is reflected in the leaders and owners of its businesses, in the leaders and members of the labor movement, and in the employees in every segment of the workforce; and

WHEREAS, the State's business community includes multi-national enterprises, industrial, commercial, and small business sectors; and

WHEREAS, the State's thousands of small businesses, each with fewer than 100 employees, together generate almost 40% of the jobs in the State; and

WHEREAS, small, minority, and women-owned business enterprises have historically been underrepresented in the receipt of State contract awards; and

WHEREAS, the State's workforce provides New Jersey's multinational enterprises, its industrial, commercial, and small business sectors, and its public and not-for-profit sectors with highly educated, highly skilled, and highly motivated employees, who contribute to the prosperity of the State while supporting their families; and

WHEREAS, in response to the current national recession, the United States Congress enacted the American Recovery and Reinvestment Act of 2009 (ARRA), which will increase federal spending at the State and local levels by approximately $10 billion, and will fully fund certain work in the State, and partially fund other State projects; and

WHEREAS, given the recession and unemployment levels in New Jersey, it is imperative that every sector of the economy be offered the opportunity to benefit from the federal economic recovery funds and the State's own spending; and

WHEREAS, many of the State's businesses have significant public construction contracts and other contracts to provide goods or services to government and many others would like the opportunity to compete for these contracts to expand their businesses while serving the public; and

WHEREAS, residents of the State of New Jersey deserve a government that provides equal opportunity for all contractors to compete to submit winning bids on public contracts; and

WHEREAS, residents of the State of New Jersey, especially during these difficult economic times, deserve a government that does everything it can to expand job opportunities, particularly for men and women who are entering the workforce, who have experienced difficulties entering the workforce, or who have recently become unemployed or underemployed; and

WHEREAS, the State created an internet site, http://www.recovery.nj.gov, which outlines the allocation of New Jersey's share of economic recovery funds under the ARRA; and

WHEREAS, to spend ARRA funds transparently and ensure that those seeking work have a fair chance to obtain ARRA-funded employment, State agencies and entities should be required to post all State and

ARRA-funded jobs on the State Job Bank internet site, http://NJ.gov/JobCentralNJ, to allow New Jersey residents to identify these employment opportunities; and

WHEREAS, the State must procure its construction services, goods, and other services as efficiently as possible, with transparency in the processing, selection, and awarding of public contracts; and

WHEREAS, robust competition for public contracts ensures that the government of the State of New Jersey obtains the construction services, goods, and other services it needs to perform its vital functions with maximum cost effectiveness; and

WHEREAS, broad and sustained efforts to notify all potential bidders of opportunities to contract with government should be encouraged to promote competition for public contracts, thus benefiting the public fisc; and

WHEREAS, the State of New Jersey commissioned the State of New Jersey Construction Services Disparity Study 2000 – 2002 (October 2005) and the State of New Jersey Disparity Study of Procurement in Professional Services, Other Services, and Goods and Commodities (June 2005), and both studies documented significant disparities between the firms ready, willing, and able to do business with the State, and those firms actually awarded contracts by State departments, agencies, authorities, colleges, and universities, as a result of which this Administration created through Executive Order No. 34 (2006) the Division of Minority and Women Business Development ("Division of M/W Business Development"); and

WHEREAS, Executive Order No. 34 charged the Director of the Division of M/W Business Development with monitoring programs to increase the participation of minority and women-owned businesses in the State's purchasing and procurement processes; and

WHEREAS, since its inception, the Division of M/W Business Development, working with the Department of the Treasury's Office of Supplier Diversity ("OSD"), has identified strategies to increase the number of small and minority and women-owned businesses interested in and eligible to benefit from state procurement activity; and

WHEREAS, the Division of M/W Business Development and OSD have increased outreach to and expanded the ability of these businesses to fulfill bid requirements for state contracts; and

WHEREAS, the Division of Public Contracts Equal Employment Opportunity Compliance in the Department of the Treasury (Division of Contract Compliance) monitors the employment of women and minorities with businesses that contract with government in an effort to ensure that contractors and vendors make good faith efforts to hire minorities and women in accordance with targeted goals based on the United States Census' workforce availability statistics;

NOW, THEREFORE, I, JON S. CORZINE, Governor of the State of New Jersey, by virtue of the authority vested in me by the Constitution and by the Statutes of this State, do hereby ORDER and DIRECT:

1. All members of the public should be afforded the opportunity to benefit from the federal economic recovery funds and associated state spending, and in particular, this Administration re-affirms the State's commitment, expressed in statute and regulation, that every public contract, whether for construction services, goods, or other services, shall provide equal employment opportunity for women and minorities.

2. The Commissioners of the Departments of Community Affairs, Education, Environmental Protection, and Transportation; the President of the Board of Public Utilities; and the executive directors of the Schools Development Authority and the Economic Development Authority are directed to meet with members of the Governor's office, the Department of the Treasury, and representatives of the United States Department of Labor's Office of Federal Contract Compliance Programs (OFCCP) to ensure that those departments receiving the bulk of federal economic recovery funds will provide the OFCCP their complete cooperation in complying with its mandates.

3. The Division of Contract Compliance shall be the entity within the Executive Branch responsible for determining whether minorities and women have been offered a fair opportunity for employment on State contracts. Executive branch departments and agencies, independent authorities, and State colleges and universities are directed to cooperate fully with the Division of Contract Compliance's enforcement efforts, consistent with law, and to award public contracts only to those businesses that agree to comply with equal employment opportunity and affirmative action requirements.

4. The Division of Contract Compliance shall work cooperatively with the OFCCP, including sharing its workforce data to the maximum extent permitted by law, to assist the OFCCP in its enforcement efforts.

5. When not restricted by any other State or federal law, the Division of Contract Compliance shall determine whether each of the State entities whose performance it monitors (the "Reporting Agencies" listed in Appendix A to this Order) properly allocated and released to the Department of Labor and Workforce Development, as authorized by law, one-half of one percent of the total cost of a construction contract of $1,000,000 or more, to be used by the department for the New Jersey Builders Utilization Initiative for Labor Diversity program to train minorities and women for employment in construction trades. This provision shall apply to those construction contracts where the funding for the contract consists entirely of appropriated funds or a combination of funds from appropriated funds and other sources.

6. As a result of the aforementioned significant disparities in employment of minorities and women on construction sites and within the construction trades, all construction contracts entered into and funded, in whole or in part, by the State shall include mandatory EEO/AA contract language (in the form of Appendix B to this Order) that requires contractors to make a good faith effort to recruit and employ minorities and women as required by provisions of the Administrative Code, including but not limited to N.J.A.C. 17:27-3.6 to 3.8, and 17:27-7.3 and 7.4. In addition to the language set forth in Appendix B, such construction contracts shall contain the contractual language as required by N.J.A.C. 17-27-3.6, 3.7, and 3.8. As to the portion of each contract that is State funded, the language of the contract shall provide, consistent with Appendix B, that payment may be withheld for failure of the contractor to demonstrate to the satisfaction of the Reporting Agency that the required good faith effort was made. Failure of a contractor to satisfy the good faith effort requirement of its contract may also subject it to assessments imposed pursuant to findings of the Division of Contract Compliance in the Department of the Treasury, in accordance with N.J.A.C. 17:27-10.

7. Except as described in subparagraphs (a) and (b) of this paragraph, each Executive Branch agency that is a recipient of federal economic recovery funds pursuant to ARRA shall include in any contract, grant, or agreement funded in whole or in part with ARRA funds a clause requiring subrecipients, contractors, subcontractors, local education agencies, and vendors to post all job openings created pursuant to the contract, grant, or agreement on the State's Job Bank at least 14 days before hiring is to commence. The clause shall state: "Since the funds supporting this contract, grant, or agreement are provided through the American Recovery and Reinvestment Act of 2009 (ARRA), the subrecipient, contractor, subcontractor, local education agency, or vendor will post any jobs that it creates or seeks to fill as a result of this

contract, grant, or agreement. The subrecipient, contractor, subcontractor, local education agency, or vendor will post jobs to the New Jersey State Job Bank by submitting a job order using the form available at http://www.NJ.gov/JobCentralNJ, notwithstanding any other posting the subrecipient, contractor, subcontractor, local education agency, or vendor might make. Any advertisements posted by the subrecipient, contractor, subcontractor, local education agency, or vendor for positions pursuant to this contract, grant, or agreement must indicate that the position is funded with ARRA funds."

a. Posting shall not be required where the employer intends to fill the job opening with a present employee, a laid-off former employee, or a job candidate from a previous recruitment, where pre-existing, legally binding collective bargaining agreements provide otherwise, or where an exception has been granted to the Reporting Agency by the Department of Labor and Workforce Development.

b. Nothing in this Order shall be interpreted to require the employment of apprentices if such employment may result in the displacement of journey workers employed by any employer, contractor, or subcontractor.

8. All local government entities and local education agencies that have received or will receive directly from a federal agency federal economic recovery funds are strongly encouraged to require their contractors and subcontractors to post job openings on the State's Job Bank at least 14 days before hiring is to commence. Moreover, all New Jersey employers that enter into contracts funded with ARRA funds received by a local government entity or a local education agency directly from a federal agency are likewise strongly encouraged to post job openings created pursuant to the ARRA.

9. The Division of M/W Business Development shall send to the Reporting Agencies the contractual language set forth in Appendix C of this Order. Provisions of this contractual language have been shown to have a significant impact on (a) increasing the number of small and minority and women-owned businesses aware of contracting opportunities with the State and (b) increasing the number of such businesses competing for contracts with the State or subcontracts with entities contracting with the State. The Division of M/W Business Development shall work with each Reporting Agency to ensure the reporting of and ensure compliance with contract-specific contracting and subcontracting goals for the Reporting Agency that are consistent with the availability percentages set forth in Appendix D. These goals should incorporate good faith effort requirements and should be adjusted annually, consistent with the availability of minority and women-owned businesses for which significant disparities in utilization have been demonstrated in each business category.

10. Each Reporting Agency shall:

a. Inform the Division of M/W Business Development of contracting opportunities at the same time that it advertises or otherwise posts public notices of such opportunities, via consistent and timely upload of all-inclusive information to the bid opportunities database services managed by the Division of M/W Business Development. All pre-bid requirements shall be prominently advertised at the time of uploading to the Division of M/W Business Development databases;

b. Actively and regularly use the databases and other on-line services managed and operated by the Division of M/W Business Development to identify additional potential bidders. Because these databases and on-line services identify minority and women-owned businesses known to and registered or certified with the Division of M/W Business Development, the ongoing use of these resources by buyers, procurement agents, and other purchasing staff shall be closely monitored by the Reporting Agency's senior management;

c. Contact the businesses identified in the Division of M/W Business Development's databases and on-line services to provide them with notice of the contracting opportunities available through the Reporting Agency; and

d. Report to the Division of M/W Business Development all payments and awards prime contractors have issued to subcontractors, identifying payments and awards to minority and women-owned businesses on at least a quarterly basis.

11. To the maximum extent practicable, and when not restricted by any other State or federal law, each Reporting Agency shall incorporate the substance of the contractual language set forth in Appendix C into its contracts, while continuing to follow the particular State and federal laws and regulations governing its contracting and procurement practices.

12. Each Reporting Agency shall, where substitution of subcontractors or sub-consultants is permitted, promulgate policies governing the circumstances under which contractors or consultants may substitute subcontractors or sub-consultants named in bid proposals or otherwise identified as small or women or minority-owned business subcontractors, sub-consultants, or vendors ("Substitution Policies"). The Substitution Policies shall provide that:

a. The contractor or consultant must notify and obtain approval from a small or women or minority-owned business subcontractor, sub-consultant, or vendor ("SMWBE contractor") before including that contractor in a bid proposal or similar contract-related submission;

b. The contractor or consultant must notify and obtain authorization from the Reporting Agency before it substitutes a SMWBE contractor named in a bid proposal or other contract-related submission; and

c. If the substitution is approved, the contractor or consultant shall make a good faith effort to utilize another SMWBE contractor in place of the previous SMWBE contractor.

13. Each Reporting Agency shall report to the Division of M/W Business Development when it has incorporated the language set forth in Appendix C in its contracts. It shall also report to the Division of M/W Business Development when it has adopted its Substitution Policy, where such policy is permitted. The Division of M/W Business Development shall report on the number of Reporting Agencies that have modified their contracts and adopted a Substitution Policy at three month intervals until all of the Reporting Agencies have completed incorporation of the contractual language set forth in Appendix C and, where legally permitted, adoption of the Substitution Policy.

14. Nothing in this Order shall modify existing law, state or federal, or authorize a Reporting Agency to amend, modify, or otherwise alter pre-existing legal obligations. Further, this Order shall be interpreted consistently with the ARRA, and the federal regulations and guidelines governing its implementation, and in the event of a conflict between this Order and federal law governing ARRA, the Order shall be interpreted to comply with federal law.

15. Within 90 days of the date of this Order, the Division of M/W Business Development shall prepare a Contracting Guide identifying the management practices that have the greatest success in: (a) increasing the number of small and minority and women-owned businesses made aware of contracting opportunities with the State; and (b) increasing the number of such businesses competing for contracts with the state or subcontracts with entities contracting with the state. As soon as practicable thereafter, the Division of M/W Business Development shall distribute the Contracting Guide to the Reporting Agencies.

16. As soon as practicable after its receipt of the Contracting Guide, each Reporting Agency shall implement those provisions that it views as most likely to have the greatest impact in increasing contracting opportunities for small and minority and women-owned businesses.

17. Within one year and ninety days of the effective date of this Order, the Division of M/W Business Development and the Division of Contract Compliance shall each prepare a report describing the Reporting Agencies' implementation of this Order. The Division of M/W Business Development and the Division of Contract Compliance each shall prepare a second report within one year of issuing its first report.

18. The Department of Labor and Workforce Development shall work together with all other Reporting Agencies that will receive ARRA funding and with the representatives of the United States Environmental Protection Agency, the Federal Departments of Labor, Energy, Transportation, and Housing and Urban Development, and any other federal agencies distributing ARRA funds to:

a. Coordinate with labor unions that will aggressively recruit minorities and women for apprenticeships and training opportunities;

b. Increase outreach to and enrollment of minorities and women in apprenticeship, training, and related programs; and

c. Ensure that, to the greatest extent possible under the law, minorities and women apprentices and trainees are working on State and ARRA-funded work sites.

19. The Department of the Treasury and other departments, agencies, and independent authorities shall, consistent with law, take steps to increase their engagement of small, minority, or women-owned or controlled banks and credit unions to meet their financial service's needs.

20. This Order shall take effect immediately.

GIVEN, under my hand and seal this 28th day of August
Two Thousand and Nine, and of the Independence of
the United States, the Two Hundred and Thirty-Fourth.

/s/ Jon S. Corzine

Governor

[seal]

Attest:

/s/ Kay Walcott-Henderson

First Assistant Chief Counsel

APPENDIX A

LIST OF REPORTING AGENCIES

Board of Public Utility Commissioners
Casino Control Commission
Casino Reinvestment Development Authority
Commission on Higher Education
Commission on Science & Technology
Council on Affordable Housing
Department of Agriculture
Department of Military & Veterans' Affairs
Department of Banking & Insurance
Department of Children & Families
Department of Community Affairs
Department of Corrections
Department of Education
Department of Environmental Protection
Department of Health and Senior Services
Department of Human Services
Department of Labor and Workforce Development
Department of Law & Public Safety
Department of Public Advocate
Department of State
Department of Transportation
Department of the Treasury
Division of Property Management and Construction
Election Law Enforcement Commission
Fort Monmouth Economic Revitalization Planning Authority
Garden State Preservation Trust
Higher Education Student Assistance Authority
Kean University
Legalized Games of Chance Control Commission
Montclair State University
Motion Picture Commission
Motor Vehicle Commission
New Jersey City University
New Jersey Cultural Trust
New Jersey Institute of Technology
New Jersey Transit
NJ Building Authority
NJ Economic Development Authority
NJ Educational Facilities Authority
NJ Environmental Infrastructure Trust
NJ Health Care Facilities Financing Authority
NJ Highlands Council
NJ Housing & Mortgage Finance Agency
NJ Maritime Pilot and Docking Pilot Commission
NJ Meadowlands Commission
NJ Pinelands Commission

NJ Public Television & Radio (NJN) NJ Racing Commission NJ Redevelopment Authority
NJ Schools Development Authority
NJ Sports & Exposition Authority
NJ State Museum
NJ Turnpike Authority
NJ Water Supply Authority
North Jersey Transportation Planning Authority
North Jersey District Water Supply Commission
Office of Homeland Security
Office of Information Technology
Office of the Child Advocate
Office of the Inspector General
Office of the Public Defender
Ramapo College
Rowan University
Rutgers University
South Jersey Port Corporation
South Jersey Transportation Authority
South Jersey Transportation Planning Organization
State Agriculture Development Committee
State Economic Recovery Board For Camden
State Ethics Commission
State Employment & Training Commission
State Lottery Commission
Stockton College
The College of New Jersey
Thomas Edison State College
Transportation Trust Fund Authority
University of Medicine & Dentistry of New Jersey
William Paterson University

APPENDIX B

It is the policy of the South Jersey Port Corporation that its contracts should create a workforce that reflects the diversity of the State of New Jersey. Therefore, contractors engaged by the South Jersey Port Corporation to perform under a construction contract shall put forth a good faith effort to engage in recruitment and employment practices that further the goal of fostering equal opportunities to minorities and women.

The contractor must demonstrate to the South Jersey Port Corporation's satisfaction that a good faith effort was made to ensure that minorities and women have been afforded equal opportunity to gain employment under the South Jersey Port Corporation's contract with the contractor. Payment may be withheld from a contractor's contract for failure to comply with these provisions.

Evidence of a "good faith effort" includes, but is not limited to:

1. The Contractor shall recruit prospective employees through the State Job bank website, managed by the Department of Labor and Workforce Development, available online at http://NJ.gov/JobCentralNJ.

2. The Contractor shall keep specific records of its efforts, including records of all individuals interviewed and hired, including the specific numbers of minorities and women.

3. The Contractor shall actively solicit and shall provide the South Jersey Port Corporation with proof of solicitations for employment, including but not limited to advertisements in general circulation media, professional service publications and electronic media.

4. The Contractor shall provide evidence of efforts described at 2 above to the South Jersey Port Corporation no less frequently than once every 12 months.

5. The Contractor shall comply with the requirements set forth at N.J.A.C. 17:27.

APPENDIX C

It is the policy of the South Jersey Port Corporation that small businesses (each a "small business enterprise" or "SBE"), as determined and defined by the State of New Jersey, Division of Minority and Women Business Development ("Division") and the New Jersey Department of the Treasury ("Treasury") in N.J.A.C. 17:14 et seq. or other application regulation, should have the opportunity to participate in South Jersey Port Corporation Contracts.

To the extent the Firm engages subcontractors or sub-consultants to perform Services for the South Jersey Port Corporation pursuant to this Contract, the Firm must demonstrate to the South Jersey Port Corporation's satisfaction that a good faith effort was made to utilize subcontractors and sub-consultants who are registered with the Division as SBEs. Furthermore, the South Jersey Port Corporation shall be evaluated quarterly by the Division, based on its attainment of the Participation Goals set forth in the State of New Jersey Construction Services Disparity Study (October 2005) and the State of New Jersey Disparity Study of Procurement in Professional Services, Other Services, and Goods and Commodities (June, 2005). (These participation goals are set forth below.)

Evidence of a "good faith effort" includes, but is not limited to:

1. The Firm shall request listings of SBEs from the Division (609) 292-2146 and/or the South Jersey Port Corporation and attempt to contact same.

2. The Firm shall keep specific records of its efforts, including records of all requests made to the Division, the names of SBEs contacted, and the means and results of such contacts, including without limitation receipts from certified mail and telephone records. 3. The Firm shall actively solicit and shall provide the South Jersey Port Corporation with proof of solicitations of SBEs for the provision of Services, including advertisements in general circulation media, professional service publications and small business, minority-owned business or women-owned business focus media.

4. The Firm shall provide evidence of efforts made to identify categories of Services capable of being performed by SBEs.

5. The Firm shall provide all potential subcontractors and sub-consultants that the Firm has contacted pursuant to 2 or 3 above with detailed information regarding the scope of work of the subject contract.

6. The Firm shall provide evidence of efforts made to use the goods and/or services of available community organizations, consultant groups, and local, State, and federal agencies that provide assistance in the recruitment and placement of SBEs.

Furthermore, the Firm shall submit proof of its subcontractors' and/or sub-consultants' SBE registrations on the form attached as Exhibit __, and shall complete such other forms as may be required by the South Jersey Port Corporation for State reporting as to participation.

Participation Goals

1. Construction Services Contracts/Subcontracts (including new construction and renovations, except routine building maintenance; residential and non-residential building construction; heavy construction, such as streets, roads and bridges; and special trade construction, such as fencing, HVAC, paving and electrical).

(a) State Agencies/Authorities/Commissions

African Americans -- 6.3%
Asian Americans -- 4.34%

(b) State Colleges and Universities

African Americans -- 6.3%
Asian Americans -- 4.34%
Caucasian Females -- 12.67%

2. Construction-Related Services Contracts/Subcontracts (including design services, such as architectural, engineering and construction management services, that are performed as part of a construction project).

State Colleges and Universities

African Americans -- 4.51%
Asian Americans -- 7.11%
Hispanics -- 4.

3. Professional Services (with the exception of those professional services deemed to be construction-related, all services that are of a professional nature and requiring special licensing, education degrees and/or very highly specialized expertise, including accounting and financial services, advertising services, laboratory testing services; legal services; management consulting services; technical services and training).

State Agencies/Authorities/Commissions/Colleges and Universities

African Americans -- 2.47%
Asian Americans -- 1.47%
Hispanics -- 1.1%
Native Americans -- 0.07%
Caucasian Females -- 3.

4. Other Services (any service that is labor-intensive and neither professional nor construction-related, including, but not limited to equipment rental; janitorial and maintenance services; landfill services; laundry and dry cleaning; maintenance and repairs; printing; real property services; security services; special department supplies; subsidy, care and support; telecommunications; and temporary help).

State Agencies/Authorities/Commissions/Colleges and Universities

African Americans -- 1.22%
Asian Americans -- 0.85%
Hispanics -- 0.67%
Native Americans -- 0.05%
Caucasian Females -- 1.

5. Goods and Commodities (equipment and consumable items purchased in bulk, or a deliverable product including, but not limited to automobiles and equipment; chemicals and laboratory supplies, construction

materials and supplies; equipment parts and supplies; fuels and lubricants; janitorial and cleaning supplies; office equipment; office supplies; radio equipment; special department supplies; technical supplies; tires and tubes; traffic signals; and uniforms).

State Agencies/Authorities/Commissions/Colleges and Universities

African Americans -- 2.71%
Asian Americans -- 1.74%
Hispanics -- 1.32%
Native Americans -- 0.10%
Caucasian Females -- 4.45%

Appendix D

Consistent with the findings of the State of New Jersey Construction Services Disparity Study (October 2005) and the State of New Jersey Disparity Study of Procurement in Professional Services, Other Services, and Goods and Commodities (June 13, 2005), each Reporting Agency should aspire to allocate a portion of its total contracting dollars in accordance with the following goals.

1. Construction Services Contracts/Subcontracts (including new construction and renovations, except routine building maintenance; residential and non-residential building construction; heavy construction, such as streets, roads and bridges; and special trade construction, such as fencing, HVAC, paving and electrical.

(c) State Agencies/Authorities/Commissions

African Americans -- 6.3%
Asian Americans -- 4.34%

(d) State Colleges and Universities

African Americans -- 6.3%
Asian Americans -- 4.34%
Caucasian Females -- 12.67%

2. Construction-Related Services Contracts/Subcontracts (including design services, such as architectural, engineering and construction management services, that are performed as part of a construction project).

State Colleges and Universities

African Americans -- 4.51%
Asian Americans -- 7.11%
Hispanics -- 4.

3. Professional Services (with the exception of those professional services deemed to be construction-related, all services that are of a professional nature and requiring special licensing, education degrees and/or very highly specialized expertise, including accounting and financial services, advertising services, laboratory testing services; legal services; management consulting services; technical services and training).

State Agencies/Authorities/Commissions/Colleges and Universities

African Americans -- 2.47%
Asian Americans -- 1.47%
Hispanics -- 1.1%
Native Americans -- 0.07%
Caucasian Females -- 3.

4. Other Services (any service that is labor-intensive and neither professional nor construction-related, including, but not limited to equipment rental; janitorial and maintenance services; landfill services; laundry and dry cleaning; maintenance and repairs; printing; real property services; security services; special department supplies; subsidy, care and support; telecommunications; and temporary help).

State Agencies/Authorities/Commissions/Colleges and Universities

African Americans -- 1.22%
Asian Americans -- 0.85%
Hispanics -- 0.67%
Native Americans -- 0.05%
Caucasian Females -- 1.

4. Goods and Commodities (equipment and consumable items purchased in bulk, or a deliverable product including, but not limited to automobiles and equipment; chemicals and laboratory supplies, construction materials and supplies; equipment parts and supplies; fuels and lubricants; janitorial and cleaning supplies; office equipment; office supplies; radio equipment; special department supplies; technical supplies; tires and tubes; traffic signals; and uniforms).

State Agencies/Authorities/Commissions/Colleges and Universities

African Americans -- 2.71%
Asian Americans -- 1.74%
Hispanics -- 1.32%
Native Americans -- 0.10%
Caucasian Females -- 4.45%

GIVEN, under my hand and seal thi[s] 28th day of August
Two Thousand and Nine, and of the Independence of
the United States, the Two Hundred and Thirty-Fourth.

/s/ Jon S. Corzine

Governor

[seal]

Attest:

/s/ Kay Walcott-Henderson

First Assistant Chief Counsel

Form AA302
Rev. 11/11

STATE OF NEW JERSEY

Division of Purchase & Property
Contract Compliance Audit Unit
EEO Monitoring Program

Q15

EMPLOYEE INFORMATION REPORT

IMPORTANT-READ INSTRUCTIONS CAREFULLY BEFORE COMPLETING FORM. FAILURE TO PROPERLY COMPLETE THE ENTIRE FORM AND TO SUBMIT THE REQUIRED $150.00 FEE MAY DELAY ISSUANCE OF YOUR CERTIFICATE. DO NOT SUBMIT EEO-1 REPORT FOR SECTION B, ITEM 11. For Instructions on completing the form, go to: http://www.state.nj.us/treasury/contract_compliance/pdf/aa302ins.pdf

SECTION A - COMPANY IDENTIFICATION

1. FID. NO. OR SOCIAL SECURITY	2. TYPE OF BUSINESS ☐ 1. MFG ☐ 2. SERVICE ☐ 3. WHOLESALE ☐ 4. RETAIL ☐ 5. OTHER	3. TOTAL NO. EMPLOYEES IN THE ENTIRE COMPANY

4. COMPANY NAME

5. STREET CITY COUNTY STATE ZIP CODE

6. NAME OF PARENT OR AFFILIATED COMPANY (IF NONE, SO INDICATE) CITY STATE ZIP CODE

7. CHECK ONE: IS THE COMPANY: ☑ SINGLE-ESTABLISHMENT EMPLOYER ☑ MULTI-ESTABLISHMENT EMPLOYER

8. IF MULTI-ESTABLISHMENT EMPLOYER, STATE THE NUMBER OF ESTABLISHMENTS IN NJ

9. TOTAL NUMBER OF EMPLOYEES AT ESTABLISHMENT WHICH HAS BEEN AWARDED THE CONTRACT

10. PUBLIC AGENCY AWARDING CONTRACT
CITY COUNTY STATE ZIP CODE

Official Use Only	DATE RECEIVED	INAUG.DATE	ASSIGNED CERTIFICATION NUMBER

SECTION B - EMPLOYMENT DATA

11. Report all permanent, temporary and part-time employees ON YOUR OWN PAYROLL. Enter the appropriate figures on all lines and in all columns. Where there are no employees in a particular category, enter a zero. Include ALL employees, not just those in minority/non-minority categories, in columns 1, 2, & 3. *DO NOT SUBMIT AN EEO-1 REPORT.*

JOB CATEGORIES	ALL EMPLOYEES			PERMANENT MINORITY/NON-MINORITY EMPLOYEE BREAKDOWN										
				* ******* MALE**********				*********	**** FEMAL		********	********	****	
	COL. 1 TOTAL (Cols.2 &3)	COL. 2 MALE	COL. 3 FEMALE	BLACK	HISPANIC	AMER. INDIAN	ASIAN	NON MIN.	BLACK	HISPANIC	AMER. INDIAN	ASIAN	NON MIN.
Officials/ Managers													
Professionals													
Technicians													
Sales Workers													
Office & Clerical													
Craftworkers (Skilled)													
Operatives (Semi-skilled)													
Laborers (Unskilled)													
Service Workers													
TOTAL													
Total employment From previous Report (if any)													
Temporary & Part-Time Employees	The data below shall NOT be included in the figures for the appropriate categories above.												

12. HOW WAS INFORMATION AS TO RACE OR ETHNIC GROUP IN SECTION B OBTAINED?
☐ 1. Visual Survey ☐ 2. Employment Record ☐ 3. Other (Specify)

13. DATES OF PAYROLL PERIOD USED
From: To:

14. IS THIS THE FIRST Employee Information Report Submitted?
1. YES ☐ 2. NO ☐

15. IF NO, DATE LAST REPORT SUBMITTED
MO. DAY YEAR
/ /

SECTION C - SIGNATURE AND IDENTIFICATION

16. NAME OF PERSON COMPLETING FORM (Print or Type)	SIGNATURE	TITLE	DATE MO DAY YEAR / /

17. ADDRESS NO. & STREET CITY COUNTY STATE ZIP CODE PHONE (AREA CODE, NO.,EXTENSION)
- -

STATE OF NEW JERSEY
DEPARTMENT OF THE TREASURY
DIVISION OF PURCHASE AND PROPERTY
33 WEST STATE STREET, P.O. BOX 230
TRENTON, NEW JERSEY 08625-0230

Q16

OWNERSHIP DISCLOSURE FORM

BID SOLICITATION #: ______________________ **VENDOR {BIDDER}:** ______________________

ALL PARTIES ENTERING INTO A CONTRACT WITH THE STATE ARE REQUIRED TO PROVIDE THE INFORMATION REQUESTED PURSUANT TO N.J.S.A. 52:25-24.2.

PLEASE NOTE THAT IF THE VENDOR/BIDDER IS A NON-PROFIT ENTITY, THIS FORM IS NOT REQUIRED.

PART 1

	YES	NO
Are there any individuals, partners, members, stockholders, corporations, partnerships, or limited liability companies owning a 10% or greater interest in the Vendor {Bidder}?	☐	☐

If you answered, "YES" above, you must disclose the following: (a) the names and addresses of all stockholders in the corporation who own 10 percent or more of its stock, of any class; (b) all individual partners in the partnership who own a 10 percent or greater interest therein; or, (c) all members in the limited liability company who own a 10 percent or greater interest therein.

NAME ______________________
ADDRESS 1 ______________________
ADDRESS 2 ______________________
CITY ______________ **STATE** ______________ **ZIP** ______________

NAME ______________________
ADDRESS 1 ______________________
ADDRESS 2 ______________________
CITY ______________ **STATE** ______________ **ZIP** ______________

NAME ______________________
ADDRESS 1 ______________________
ADDRESS 2 ______________________
CITY ______________ **STATE** ______________ **ZIP** ______________

NAME ______________________
ADDRESS 1 ______________________
ADDRESS 2 ______________________
CITY ______________ **STATE** ______________ **ZIP** ______________

NAME ______________________
ADDRESS 1 ______________________
ADDRESS 2 ______________________
CITY ______________ **STATE** ______________ **ZIP** ______________

Attach Additional Sheets If Necessary.

Q16

PART 2

	YES	NO
Of those entities disclosed above owning a 10% or greater interest in the Vendor {Bidder}, are there any individuals, partners, members, stockholders, corporations, partnerships, or limited liability companies owning a 10% or greater interest of those listed entities?	☐	☐

If you answered, "YES" above, you must disclose the following: (a) the names and addresses of all stockholders in the corporation who own 10 percent or more of its stock, of any class; (b) all individual partners in the partnership who own a 10 percent or greater interest therein; or, (c) all members in the limited liability company who own a 10 percent or greater interest therein. Please note that this disclosure shall be continued until names and addresses of every non-corporate stockholder, and individual partner, and member, exceeding the 10 percent ownership criteria established in this act, has been identified.

Name of the entity listed above to which the disclosure below applies: ______________________

NAME					
ADDRESS 1					
ADDRESS 2					
CITY		**STATE**		**ZIP**	

NAME					
ADDRESS 1					
ADDRESS 2					
CITY		**STATE**		**ZIP**	

NAME					
ADDRESS 1					
ADDRESS 2					
CITY		**STATE**		**ZIP**	

NAME					
ADDRESS 1					
ADDRESS 2					
CITY		**STATE**		**ZIP**	

NAME					
ADDRESS 1					
ADDRESS 2					
CITY		**STATE**		**ZIP**	

Attach Additional Sheets If Necessary.

PART 3

As an alternative to completing this form, a Vendor {Bidder} with any direct or indirect parent entity which is publicly traded may submit the name and address of each publicly traded entity and the name and address of each person that holds a 10 percent or greater beneficial interest in the publicly traded entity as of the last annual filing with the federal Securities and Exchange Commission or the foreign equivalent, and, if there is any person that holds a 10 percent or greater beneficial interest, also shall submit links to the websites containing the last annual filings with the federal Securities and Exchange Commission or the foreign equivalent and the relevant page numbers of the filings that contain the information on each person that holds a 10 percent or greater beneficial interest.

____

____

____

PREVAILING WAGE ACT COMPLIANCE DECLARATION

The Contractor hereby agrees to comply in all respects with the New Jersey Prevailing Wage Act, Chapter 150, P.L. 1963 as amended. A copy of the prevailing wage rates pertaining to the work issued by the New Jersey Department pf Labor and Industry entitled, "Prevailing Wage Rate Determination", is attached at the close of this section, or is available upon request at the Offices of the South Jersey Port Corporation. Pursuant to N.J.S.A., 34:11-56.37 and 34:11-56.38, Prevailing Wage Act, no public works contact may awarded to any contractor or subcontractor or to any firm, corporation or partnership in which they have an interest on the disbarred bidders list located at the end of this specification, or available upon request at the Offices of the South Jersey Port Corporation, until expiration date give. Workmen shall be paid not less than such prevailing wage rate. In the event it is found that any workmen employed by the Contractor or any Subcontractor covered by the contract herein has been paid a rate of wages less then the prevailing rate required to be paid such contract, the Owner may terminate the Contractor's or Subcontract's right to proceed with the work or such part of the work as to which there has been a failure to pay required wages and to prosecute the work to completion or otherwise. The Contractor and his sureties shall be liable to the Owner for any excess cost occasioned thereby.

Before final payment is made by or on behalf of the Owner any sum or sums due to the work, the Contract of Subcontractor shall file with the treasurer of the Owner, written statements in a form satisfactory to the Commissioner of Labor and Industry certifying to the amounts then due owning from such contractor or subcontractor filling such statement to any and all workmen wages due on account of the work, setting forth therein the name of the persons whose wages are unpaid and the amount due to each respectively which statement shall be certified by the oath of the Contractor or Subcontractor as the case may be in accordance with the said New Jersey Prevailing Wage Act.

The prevailing wage rate shall be determined by the Commissioner of Labor and Industry or his duly authorized deputy or representative.

The undersigned in an (individual)(partnership)(corporation) under the Laws of the State of, _____ having principal offices at _____.

Signature: _____

Print Name: _____

Company Name : _____

Address : _____

Phone Number: _____

COMPLIANCE WITH PUBLIC WORKS CONTRACTOR REGISTRATION ACT

The bidder shall comply with the Public Works Contractor Registration Act P.L. 1999, c 238 (N.J.S.A, 34:11-56.48, et seq.) on all bids for public works as defined in the law. Proof of compliance with this law when it applies, must be submitted with the bid.

- Attached hereto is a copy of Certificate of Registration pursuant to N.J.S.A. 34:11-56.54

Or

- Attached hereto is a copy of filed registration from and proof of payment of the registration fee pursuant to N.J.S.A. 34:11-56.55

Bidders Signature: _____

Bidders Name: _____

Address of Bidder: _____

Signature of Affiant: _____

Printed Name & Title of Affiant: _____

NOTARIZATION SECTION

Subscribed and sworn before me this _____ day of _____, 20____.

Notary Public of _____

My Commission Expires: _____

BUY AMERICAN NOTICE

In the performance of the work under this contract the contractor and all subcontractors shall use only domestic materials. Builders may bid using non-domestic material but shall specify wherever such non-domestic materials are bid the difference in cost between the domestic and non-domestic materials and shall explain any justification for the use of non-domestic materials such as but not limited to unavailability, inferiority, incompatibility, impracticality, increased cost of domestic materials, etc.

~ Guidance ~

Buy America **Notice** Q19

All Federally Funded Construction Projects

Reference:

The FHWA Buy America statutory provisions are in 23U.S.C.313 and the regulatory provisions are in 23CFR635.410.

Buy America

Q&A's: http://www.fhwa.dot.gov/construction/contracts/buyam_qa.cfm

Applicability:

Applicable to all Federal-aid projects.

Guidance:

Simply stated, the FHWA's Buy America policies require a DOMESTIC manufacturing process for ALL steel or iron products that are permanently incorporated in a Federal-aid highway construction project. Manufacturing begins with the initial melting and mixing, and continues through the coating stage. Any process which modifies the chemical makeup, physical shape or finish is considered a manufacturing process and as such must be performed in the United States. Waivers may be granted, in rare cases that meet specified criteria. Refer to the Q&A's above for more details.

Buy America requirements apply to the entire federal aid project even if some steel or iron products are purchased with non federal funds. All steel/iron must be manufactured in the United States.

Buy America provisions do allow use of a small portion of foreign steel and iron materials (less than one tenth of one percent of the total contract cost [0.1%] or $2500, whichever is greater). Be vigilant and document. The consequences of exceeding this amount can be severe. Maintain a separate file for "Buy America" to facilitate oversight, certifications and compliance. It's that important.

Buy America requirements apply to all UTILITY RELOCATION WORK (regardless of funding) that is part of a FHWA funded contract and to all federally funded standalone utility work. Standalone, non-FHWA funded, contracts are NOT covered.

Compliance:

The RE needs to receive the Buy America certification at time of delivery--absolutely PRIOR TO incorporating the steel/iron product in the project. Typically, the certification states:

"All manufacturing processes for these steel and iron materials, including the application of coatings, have occurred in the United States."

The certification MUST BE current, dated, signed and be specific to the material and project at hand. Step certification is encouraged when manufacturing occurs at different locations. This involves separate, self-supporting, certifications that are prepared at each location and accompany the product to the job site—a documentation trail confirming ALL manufacturing in the US.

~ Guidance ~

Contract Changes and Time Q19

Inherent in every project – processing is key

Reference:

Title 23 C.F.R. 635.120 - Changes and extra work
Title 23 C.F.R. 635.121 - Contract time and contract time extensions
2007 NJDOT Standard Specifications for Road and Bridge Construction

Guidance:

Contract changes and progress of work must be monitored and documented daily.

The State's standard specifications shall govern the approval of changes in a contract. Below are some provisions that apply:

- Do not deviate from the requirements of the contract unless and until a field order is issued.
- Reimbursement cannot be made until a change order is approved by the Department.
- Extensions in contract time will only be granted for excusable, compensable delays and only for work defined on the critical path of the project, as defined in an approved project schedule.

Issue a formal "Notice to Proceed" (NTP) and stipulate a Contract Completion Date.

Example NTP: ***The NTP date for this project is Friday, June 15, 2012. The duration for this project per section 100.03 of the Supplemental Specifications is sixty (60) calendar days. The date for final completion is Tuesday, August 14, 2012.***

Basic Requirements:

"Time is of the essence as to all time frames stated in the Contract", *Section 108.10 NJDOT Standard Specification*

Any new or extra work needs to be defined and approved prior to being included in the contract. This approval is done through a change order which requires written justification, a breakdown of costs and quantities, and timely approvals.

Contract line item overruns are not permissible without formal requests and approvals.

Time shall always be evaluated as part of a change order.

Change orders for a time extension only must be fully substantiated in accordance with the contract requirements and specifications. Weather, right-of-way, utilities, and/or rail road work are not normally a legitimate basis for excusable, compensable delays.

Liquidated Damages: If changes in time are not fully justified and documented, liquidated damages may be assessed per the contract documents. Daily documentation of work activities is crucial.

The standard form DC-173A will be used to document the change order.

New or Supplemental Costs:

All new or supplemental costs **must be** negotiated, itemized and justified. All documentation of the negotiations, including the basis of cost, must be on file and included in the change order request.

DBE/ESBE/SBE Program

Q19

Project Responsibility from Day One

References:

- FHWA regulatory provisions: 49 CFR 26
- NJDOT's Construction Procedure Handbook for ESBE/DBE & SBE Program Implementation: Section V, Subsection B
- NJDOT DBE & ESBE Programs: http://www.state.nj.us/transportation/business/civilrights/dbe.shtm

Applicability:

All federal aid projects with a contract DBE/ESBE requirement.

Guidance:

The DBE Program is a legislatively mandated USDOT program. The mission of NJDOT's Disadvantaged and Small Business Programs is to promote contracting opportunities for small, socially and economically disadvantaged firms who seek to do business with the NJDOT.

DBE contract specifications are legally binding and **must be enforced in the same fashion as any other contract requirement.** Failure to carry out contract provisions may result in loss of Federal funds. The success of these programs is achieved by thoroughly implementing the monitoring and reporting procedures in place AS THE PROJECT PROGRESSES. REs will then be able address any issues early and take effective steps to ensure proper administration of the DBE/ ESBE/SBE Program and avoid any penalties.

Implementation:

Beginning at the commencement of the project, the RE must continuously monitor DBE/ESBE/SBE participation as the project progresses to ensure that that the assigned DBE /ESBE/SBE goal on the contract will be met by the time the project is completed. This is a project responsibility. Maintain a separate file.

1. Check Recommendation To Award memorandum and the Schedule of Participation ESBE/DBE/SBE Form CR-266 (former "Form A") to determine status of subcontractors to monitor for compliance.
2. During the course of the Contract, the RE will monitor true participation by comparing contractor DBE/ ESBE/SBE Goal commitments against each Request for Approval to Sublet Form DC-18. In addition, the RE will cross check the Daily Work Reports with each affected Form DC-18, the Recommendation To Award, and the Utilization of ESBE/DBE/SBE Monthly Report Form CR-267.
3. During construction the RE and staff will use the Daily Work Report to document on-site monitoring of stipulated DBE work items and contractor performing the work in order to insure compliance.
4. The RE will notify the Person in Responsible Charge and the Contractor in writing of any violations and will direct the Contractor to comply with these requirements. Revisions can only be made to the committed DBE/ ESBE/SBE Program when the Contractor submits a revised Form CR-266.
5. Failure of the Contractor to comply will result in the RE notifying the Person in Responsible charge, NJDOT District Office, and DCR/AA by memorandum and presenting pertinent documents for their review and action. The RE must follow-up with all promptly to insure timely resolution.
6. If the DBE/ ESBE/SBE commitment is not fulfilled, documentation supporting adequate good faith effort (GFE) must be promptly submitted by the Contractor with Form CR-268. GFE will be reviewed by DCR/AA based on the guidance set forth in 49 CFR Part 26 Appendix A. .

Pedestrian Facilities and ADA compliance – Curb Ramps

Must Conform To Standards and Contract Plans

References:

All pedestrian facilities constructed or reconstructed must provide safe and easy accessibility **for all users**.
The Americans with Disabilities Act (ADA) of 1990
Section 504 of the Rehabilitation Act of 1973
28 CFR Part 35.151(e)
NJDOT Construction Details 607 and 608

Guidance:

Inspectors need to have immediate on-site access to contract plans.

It is the inspector's responsibility to insure that all sidewalks and ramps are constructed in strict accordance with contract plans. Slope is of critical importance; as are location, alignment, length, width and depth. Check plans. Measure-measure-measure, compare with plans and **DOCUMENT** conformance and quantities.

Immediately elevate questions or 'issues' for discussion and resolution. Document!

It starts with the concrete forms - PRIOR TO the placement of concrete.
NJDOT Standard Specifications, Sections 606 and 607, require RE approval of excavation and forms prior to placing concrete. Nonconformance at this stage means nonconformance with final product.

All measurements, checks, approvals and findings, including pay quantities, must be clearly documented. They become "Source Documents" – a critical item necessary to support payment.

This simple and basic guidance will promote compliance and avoid completed work that does not conform to contract plans and specifications.

Be Vigilant:

The plans should be consistent with established design standards. If you note any design problems or inconsistencies, document and bring them to the attention of the RE/person in charge. Field inspection and documentation must occur for the following:

- The curb ramp type and crossing location are consistent with the plans.
- The curb ramp running slope **does not exceed 8.3%.**
- The curb ramp cross slope and connecting sidewalks **do not exceed 2.0%.**
- The turning areas (landings) are a minimum of 4 foot by 4 foot and cross slopes do not exceed 2% in both directions.
- All street connections, joints, and grade changes must be flush…no lip.
- There are no protrusions or obstacles within the pedestrian accessible route.
- The surface is firm, stable, & nonslip, including during temporary conditions.
- The pedestrian accessible route is free of utilities unless the design allows for exceptions.
- Detectable warning surface with truncated domes have been properly installed, are color contrasting, and aligned in the direction of pedestrian travel.
- No water ponding at the curb ramp or in the pedestrian pathway.
- Accessibility (walkway) has been provided to pedestrian push buttons, including a turning space at the button location.
- Diagonal ramps are discouraged. If provided for in the plans, they must provide a turning space at the back of curb to facilitate travel to the adjacent pedestrian pathway.

Q19

Responsible Charge

Every federal-aid project must have a person in responsible charge.

Reference:

23 CFR 635.105 – '*Supervising Agency*': the State Transportation Department (STD) has responsibility for the construction of all Federal-aid projects, whether or not; it or a local public agency (LPA) performs the work. This section stresses that such projects must receive adequate supervision and inspection to insure that they are completed in conformance with approved plans and specifications.

The regulation provides that the STD and LPA must provide a full time employee to be in "responsible charge" of the project. This cannot be the consultant.

Purpose:

To insure that (think *public interest*) every project receives adequate supervision and inspection to insure that it is completed in conformance with contract plans and specs.

Implementation:

Implementation and accountability is mandated through the person in responsible charge. Who is this person?

STD-For projects administered by the STD, the regulation requires that the person in "responsible charge" be a full-time employed state engineer. This requirement applies even when consultants are providing construction engineering services.

LPA-For locally administered projects, the regulation requires that the person in "responsible charge" be a full time employee of the LPA. The regulation is silent about engineering credentials. Thus, the person in "responsible charge" of LPA administered projects need not be an engineer. This requirement applies even when consultants are providing construction engineering services.

Duties:

Regardless of whether the project is administered by the STD or a LPA, the person designated as being in "responsible charge" is expected to be a full time public employee (not a consultant) who is accountable for the project. This person, may share duties, but is expected to be able to perform the following duties and functions:

- Administers inherently governmental project activities, including those dealing with cost, time, adherence to contract requirements, construction quality and scope of Federal-aid projects;
- Maintains familiarity of day to day project operations, including project safety issues;
- Makes or participates in decisions about changed conditions or scope changes that require change orders or supplemental agreements
- Reviews financial processes, transactions and documentation to ensure that safeguards are in place to minimize fraud, waste, and abuse; and
- Directs project staff, agency or consultant, to carry out project administration and contract oversight, including proper documentation.
- Is aware of the qualifications, assignments and on-the-job performance of the agency and consultant staff at all stages of the project.
- Visits and reviews the project on a frequency that is commensurate with the magnitude and complexity of the project
- On the jobsite for the time needed to verify and insure that the project receives adequate supervision and inspection to insure that work is accomplished in conformance with approved plans and specifications.

Source Documents

Q19

An Absolute Must Have

Reference:

23 CFR 635.123: Determination and documentation of PAY QUANTITIES.

Applicability:

Applicable to all Federal-aid projects—basis for payment.

Guidance:

What is a "Source Document"? Look at it in reverse: it's a document prepared at the source--the 'source' being the point of delivery or the location of construction activity.

This is essentially the handwritten "receipt" of exactly how many and what was delivered. It is the **single most important document that substantiates quality and quantities and provides the required basis for payment to the contractor.**

The document consists of notes (documentation) of: counts; measurements (length, width, depth, and slope); calculations of area, volume, weights, etc; sketches; a STATEMENT of compliance with contract plans and specs; field changes; comments; and delivery tickets collected/initialed by the inspector at the point of unloading.

Who develops this documentation? The inspector, who is assigned to that project/location to protect the public interest and to insure that the number, size, and characteristics of what is being delivered match the plans/specs, completes this basic and essential documentation. Incorporate 'established' quantities into a Quantity Summary Sheet for each work item.

Importance:

Highest level! This source documentation establishes quantities for payment. Without it, the eligibility of pay quantities may come under question. Later, after the fact, verification is very time consuming and often not possible.

Examples:

Item # ___; Sidewalk-Forms: ***C****hecked and measured forms for the sidewalk and ADA ramp at the NE corner of Grand and Market. Specific measurements including depth and slope are shown below (or are shown on the sketches below) along with quantity calculations. Also, noted on plan sheet # 21. Forms were clean, stable and uniform. Base was solid. Expansion joints were in place. All measurements, including depth and slopes, are in conformance with contract plans-a section was added to reach push button. The contractor was given approval to place concrete.* (Sect. 606.03.02 DOT Spec)

Observed the ***placement of concrete*** *at the NE corner of Grand and Market. Prior approval of forms had been granted. Placement and finishing procedures in accordance with specs. No access water. Curing compound placed 15 minutes after finishing.* ***Total quantity 24 SY*** *based on measurements taken. See plan sheet 21 of the contract plans. See calculations.*

Item # ____: HMA *Surface Coarse: Inspected HMA placement from Station 3+50 to 9+50. Took numerous measurements of D, W, and Temp as follows. Compaction/finish observed. Equipment and pattern as per spec (describe). Tickets collected at point of unloading. Initialed each w/station. Total tonnage _____. # of tickets _____. Refused one truck (# 254) due to time in transit was substantially over that allowed by spec.*

Item # ____: Tack Coat; *Observed test strip and noted several nozzles not functioning. Required repair of distributor to achieve uniform application. Repaired. Checked quantities before and after to affirm actual usage and pay quantity. See notes below.*

IMPORTANT NOTICE

NEW "PAY-TO-PLAY" RESTRICTIONS TO TAKE EFFECT NOVEMBER 15, 2008

Individual Certification of Compliance with Executive Order No. 117 (2008)

I hereby certify as follows:

On or after November 15, 2008, I have not solicited or made any reportable contribution of money or pledge of contribution, including in-kind contributions or company or organization contributions, to the following:

a) Any candidate committee and/or election fund of the Governor;
b) A State political party committee;
c) A legislative leadership committee;
d) A county political party committee; or
e) A municipal political party committee

I certify that, to the best of my knowledge and belief, the foregoing statements by me are true. I am aware that if any of the statements are willfully false, I am subject to punishment.

Signed: _____

Print Name: _____ Date: _____

State of New Jersey
Executive Order #117

Governor Jon S. Corzine

WHEREAS, the residents of New Jersey are entitled to a government that is effective, efficient, and free from corruption, favoritism, and waste; and

WHEREAS, in pursuit of those goals, a series of actions have been taken in New Jersey since 2004 – through legislation, executive order, and regulation – to protect the integrity of government contractual decisions and increase the public's confidence in government by prohibiting the awarding of government contracts to business entities that also are contributors to certain candidates and political parties; and

WHEREAS, among those actions were the issuance of Executive Order No. 134 (2004) and the codification of its provisions into statute in P.L.2005, c.51 (C.19:44A-20.13 et seq.) ("Chapter 51"); and

WHEREAS, since its adoption, Chapter 51 has significantly reduced the influence of contractor contributions in the process of awarding State government contracts and has proven to be an effective method of ensuring that merit and cost-effectiveness drive the government contracting process; and

WHEREAS, this administration is committed to ensuring the highest ethical standards in government contracting and rooting out corruption, favoritism, and waste; and

WHEREAS, experience has shown that additional measures are needed to ensure there is no dilution of the protections provided by Chapter 51 against the improper influence of political contributions on the process of awarding State government contracts and to ensure compliance with the provisions of Chapter 51; and

WHEREAS, many State government contractors, particularly those that provide professional services, are business entities whose form of business organization and ownership structure are such that the political contribution limits in Chapter 51 apply to few if any of the individuals who own or control the entity; and

WHEREAS, the strong public interest in limiting political contributions by businesses that contract with the State requires that the contribution limits in Chapter 51 be applied to such individuals and that those limits otherwise be applied in such a way that the purposes of Chapter 51 will be served regardless of the form of business organization of the State government contractor; and

WHEREAS, because New Jersey's campaign finance laws permit large, and in some cases unlimited, political contributions to flow between and among various types of political committees and State officeholders, the effectiveness of the restrictions in Chapter 51 can be, and

have been, undermined by the current ability of State government contractors to make large contributions to legislative leadership committees and municipal political party committees; and

WHEREAS, the Constitution of this State requires the Governor to manage the operations of State government effectively and fairly, uphold the law to ensure public order and prosperity, and confront and uproot malfeasance in whatever form it may take; and

WHEREAS, it is the Governor's responsibility to safeguard the integrity of the State government procurement process by ensuring that there is no dilution of the protections provided by Chapter 51 against the improper influence of political contributions on the process of awarding and overseeing the performance of State government contracts and that there be full compliance with the provisions of Chapter 51;

NOW, THEREFORE, I, JON S. CORZINE, Governor of the State of New Jersey, by virtue of the authority vested in me by the Constitution and by the Statutes of this State, do hereby ORDER and DIRECT:

1. For the purposes of this Order:

    a. "Business entity" means:

        i. a for-profit entity as follows:

            A. in the case of a corporation: the corporation, any officer of the corporation, and any person or business entity that owns or controls 10% or more of the stock of the corporation;

            B. in the case of a general partnership: the partnership and any partner;

            C. in the case of a limited partnership: the limited partnership and any partner;

            D. in the case of a professional corporation: the professional corporation and any shareholder or officer;

            E. in the case of a limited liability company: the limited liability company and any member;

            F. in the case of a limited liability partnership: the limited liability partnership and any partner;

            G. in the case of a sole proprietorship: the proprietor; and

            H. in the case of any other form of entity organized under the laws of this State or any other state or foreign jurisdiction: the entity and any principal, officer, or partner thereof;

        ii. any subsidiary directly or indirectly controlled by the business entity;

iii. any political organization organized under section 527 of the Internal Revenue Code that is directly or indirectly controlled by the business entity, other than a candidate committee, election fund, or political party committee; and

iv. with respect to an individual who is included within the definition of business entity, that individual's spouse or civil union partner, and any child residing with the individual, provided, however, that, this Order shall not apply to a contribution made by such spouse, civil union partner, or child to a candidate for whom the contributor is entitled to vote or to a political party committee within whose jurisdiction the contributor resides unless such contribution is in violation of section 9 of P.L.2005, c.51 (C.19:44A-20.13 et seq.) ("Chapter 51").

b. "Contribution" means a contribution reportable by the recipient under "The New Jersey Campaign Contributions and Expenditures Reporting Act," P.L.1973, c.83 (C.19:44A-1 et seq.) made on or after the effective date of this Order.

2. Any Executive Branch department, agency, authority, or independent State authority charged with implementing and enforcing Chapter 51 shall apply its provisions to a "business entity" as defined in Paragraph 1(a) of this Order in the same manner as those provisions apply to a "business entity" as defined in section 5 of Chapter 51.

3. Any Executive Branch department, agency, authority, or independent State authority charged with implementing and enforcing Chapter 51 shall apply its provisions to a contribution made to a legislative leadership committee or a municipal political party committee in the same manner as those provisions apply to a contribution to any candidate committee, election fund, or political party committee identified in Chapter 51.

4. Any Executive Branch department, agency, authority, or independent State authority charged with implementing and enforcing Chapter 51 shall apply its provisions to a contribution made to a candidate committee or election fund of any candidate for or holder of the office of Lieutenant Governor in the same manner as those provisions apply pursuant to Chapter 51 to a contribution to any candidate committee or election fund of any candidate for or holder of the office of Governor.

5. This Order shall take effect on November 15, 2008 and is intended to have prospective effect only. This Order shall not apply to any contribution made prior to November 15, 2008.

GIVEN, under my hand and seal this 24th day
of September, Two Thousand and Eight, and of
the Independence of the United States, the Two
Hundred and Thirty-Third.

/s/ Jon S. Corzine

Governor

[seal]

Attest:

/s/ Edward J. McBride, Jr.

Chief Counsel to the Governor

SOUTH JERSEY PORT CORPORATION - DISCLOSURE OF INVESTMENT ACTIVITIES IN IRAN FORM

BID SOLICITATION # AND TITLE: _____

VENDOR NAME: _____

Pursuant to N.J.S.A. 52:32-57, et seq. (P.L. 2012, c.25 and P.L. 2021, c.4) any person or entity that submits a bid or proposal or otherwise proposes to enter into or renew a contract must certify that neither the person nor entity, nor any of its parents, subsidiaries, or affiliates, is identified on the New Jersey Department of the Treasury's Chapter 25 List as a person or entity engaged in investment activities in Iran. The Chapter 25 list is found on the Division's website at https://www.state.nj.us/treasury/purchase/pdf/Chapter25List.pdf. Vendors/Bidders must review this list prior to completing the below certification. If the SJPC finds a person or entity to be in violation of the law, s/he shall take action as may be appropriate and provided by law, rule or contract, including but not limited to, imposing sanctions, seeking compliance, recovering damages, declaring the party in default and seeking debarment or suspension of the party.

CHECK THE APPROPRIATE BOX

☐ I certify, pursuant to N.J.S.A. 52:32-57, et seq. (P.L. 2012, c.25 and P.L. 2021, c.4), that neither the Vendor/Bidder listed above nor any of its parents, subsidiaries, or affiliates is listed on the New Jersey Department of the Treasury's Chapter 25 List of entities determined to be engaged in prohibited activities in Iran.

OR

☐ I am unable to certify as above because the Vendor/Bidder and/or one or more of its parents, subsidiaries, or affiliates is listed on the New Jersey Department of the Treasury's Chapter 25 List. I will provide a detailed, accurate and precise description of the activities of the Vendor/Bidder, or one of its parents, subsidiaries or affiliates, has engaged in regarding investment activities in Iran by completing the information requested below.

Entity Engage in Investment Activities _____

Relationship to Vendor/Bidder _____

Description of Activities _____

_____

_____

Duration of Engagement _____

Anticipate Cessation Date _____

Attach additional sheets if necessary _____

CERTIFICATION

I, the undersigned, certify that I am authorized to execute this certification on behalf of the Vendor, that the foregoing information and any attachments hereto, to the best of my knowledge are true and complete. I acknowledge that the South Jersey Port Corporation is relying on the information contained herein, and that the Vendor is under a continuing obligation from the date of this certification through the completion of any contract(s) with the SJPC to notify the SJPC in writing of any changes to the information contained herein; that I am aware that it is a criminal offense to make a false statement or misrepresentation in this certification. If I do so, I may be subject to criminal prosecution under the law, and it will constitute a material breach of my contract(s) with the SJPC, permitting the SJPC to declare any contract(s) resulting from this certification void and unenforceable.

Signature: _____ **Date:** _____

Print Name: _____ **Print Title:** _____

Rev. 12.13.2021

PLEASE BE ADVISED

New Jersey Election Law Enforcement Commission Requirements for ALL Bids and Requests for Proposals

All Business entities are advised of their responsibility to file an annual disclosure statement of political contributions with the New Jersey Election Law Enforcement Commission (ELEC) pursuant to N.J.S.A. 19:44A20.27 if they receive contracts in excess of $50,000.00 from public entities in a calendar year. Business entities are responsible for determining if filing is necessary. Additional information on this requirement is available from ELEC at 888-313-3532 or at www.elec.state.nj.us.

DISCLOSURE OF CONTRIBUTIONS TO NEW JERSEY ELECTION LAW ENFORCEMENT COMMISSION IN ACCORDANCE WITH N.J.S.A. 19:44A-20.27

STATE OF _____

: SS

COUNTY OF _____

I, _____of the _____ of _____ in the County of

_____ and the State of _____of full age, being duly sworn according to

law on my oath depose and say that:

I am _____, a _____
(Name) (Title, Position, etc.)

in the firm of _____ the bidder making the proposal to

_____ for work under_____
(Name of Owner) (Contract No. – Description)

and that I executed the said Proposal with full Authority to do so; that said Bidder acknowledges our responsibility to file an annual disclosure statement of political contributions with the New Jersey Election Law Enforcement Commission (ELEC) pursuant to N.J.S.A. 19:44A-20.27 if in receipt of contracts in excess of $50,000.00 from public entities in a calendar year. I further acknowledge that business entities are solely responsible for determining if filing is necessary and that all statements contained in said Proposal and in this Affidavit are true and correct, and made with full knowledge that the

_____
(Name of Owner)

relies upon the truth of the statements contained in said Proposal and in the statements contained in this Affidavit in awarding the Contract for the said project.

I further warrant that no person or selling agency has been employed or retained to solicit or secure such contract upon an agreement or understanding for commission, percentage brokerage, or contingent fee, except Bona Fide employees of the Contractor, and as may be permitted by law.

_____

Name: _____
(print)

Subscribed and Sworn to before me this _____day of _____20___.

Notary Public of _____

My Commission Expires: _____

(seal)

EXECUTIVE ORDER NO. 271 COMPLIANCE

Per attached Executive Order No. 271, the contractor of any subcontractors that is party to this contract ("covered contractor(s)") must maintain a policy that requires all covered workers to either provide adequate proof to the covered contractor that they have been fully vaccinated or submit to COVID-19 testing at a minimum one to two times weekly.

South jersey Port Corporation shall require bidders for contracts to certify prior to executing a contract that the bidder, if awarded a contract, shall comply with Executive Order No, 271. Covered contractors shall certify, at the time of submission of an invoice that they have complied with Executive Order during the period of time covered by the invoice.

EXECUTIVE ORDER NO. 271

WHEREAS, on March 9, 2020, I issued Executive Order No. 103, declaring the existence of a Public Health Emergency, pursuant to the Emergency Health Powers Act ("EHPA"), N.J.S.A. 26:13-1 et seq., and a State of Emergency, pursuant to the New Jersey Civilian Defense and Disaster Control Act ("Disaster Control Act"), N.J.S.A. App A:9-33 et seq., in the State of New Jersey for Coronavirus disease 2019 ("COVID-19"); and

WHEREAS, through Executive Order Nos. 119, 138, 151, 162, 171, 180, 186, 191, 200, 210, 215, 222, 231, 235, and 240, issued on April 7, 2020, May 6, 2020, June 4, 2020, July 2, 2020, August 1, 2020, August 27, 2020, September 25, 2020, October 24, 2020, November 22, 2020, December 21, 2020, January 19, 2021, February 17, 2021, March 17, 2021, April 15, 2021, and May 14, 2021, respectively, the facts and circumstances of which are adopted by reference herein, I declared that the COVID-19 Public Health Emergency continued to exist and declared that all Executive Orders and Administrative Orders adopted in whole or in part in response to the COVID-19 Public Health Emergency remained in full force and effect; and

WHEREAS, in accordance with N.J.S.A. App. A:9-34 and -51, I reserve the right to utilize and employ all available resources of State government to protect against the emergency created by COVID-19; and

WHEREAS, as COVID-19 continued to spread across New Jersey, I have issued a series of Executive Orders pursuant to my authority under the EHPA and the Disaster Control Act, to protect the public health, safety, and welfare against the emergency created by COVID-19, including Executive Order Nos. 104-133, Nos. 135-138, Nos. 140-166, Nos. 168-173, No. 175, Nos. 177-181, No. 183, Nos. 186-187, Nos. 189- 198, No. 200, Nos. 203-204, No. 207, and

Nos. 210-211 (2020) and Nos. 214-216, Nos. 219-220, Nos. 222-223, No. 225, Nos. 228-235, Nos. 237-244, No. 246, No. 249, Nos. 251-253, Nos. 263-264, and Nos. 266-267 (2021), the facts and circumstances of which are all adopted by reference herein; and

WHEREAS, on June 4, 2021, I signed Assembly Bill No. 5820 into law as P.L.2021, c.103 and issued Executive Order No. 244, which terminated the Public Health Emergency declared in Executive Order No. 103 (2020) but maintained the State of Emergency declared in that same Order; and

WHEREAS, P.L.2021, c.103 provided that following the termination of the Public Health Emergency declared in Executive Order No. 103 (2020), the Governor, Department of Health ("DOH") Commissioner (the "Commissioner"), and the head of any other State agency may continue to issue orders related to implementation of recommendations of the Centers for Disease Control and Prevention ("CDC") to prevent or limit the transmission of COVID-19 and related to vaccine distribution, administration, and management, COVID-19 testing, and data collection; and

WHEREAS, parties that contract with the State government provide essential services to the public and interact with the public on a regular basis, and because of the nature of their work, a significant portion of their workers are not able to work remotely; and

WHEREAS, ensuring the safety of the government workforce during this overall escalation in COVID-19 cases, hospitalizations, and deaths resulting from the B.1.617.2 ("Delta") variant is essential for continued operation and service to the public, and it is fitting and proper to require additional protections to the State workforce and public by requiring contractors to provide their vaccination or testing status as a

condition of entry onto State property and into State facilities, including property and facilities leased by a contractor; and

WHEREAS, the CDC has reported that new variants of COVID-19 have been identified in the United States, and that certain variants, particularly the Delta variant, are more transmissible than previous strains; and

WHEREAS, the State has experienced significant overall upticks in critical COVID-19 metrics since July of this year, including COVID-19 positive cases, the rate of transmission, spot positivity, and new hospitalizations, that warrant additional precautions in certain settings, especially those with a substantial number of unvaccinated individuals; and

WHEREAS, while over 5.7 million people in the State have been fully vaccinated against COVID-19, additional steps are necessary to ensure continued vaccinations of individuals in certain settings of concern to protect against the spread of COVID-19; and

WHEREAS, on July 6, 2021, the U.S. Department of Justice's Office of Legal Counsel issued an opinion concluding that Section 564 of the Food, Drug, and Cosmetic Act, 21 U.S.C. § 360bbb-3 does not prohibit public or private entities from imposing vaccination requirements while vaccinations are only available pursuant to Emergency Use Authorization ("EUA"); and

WHEREAS, ensuring that parties that contract with the State government provide adequate COVID-19 safeguards to their workers performing on or in connection with a State government contract will decrease worker absence, reduce labor costs, and improve the efficiency of contractors and subcontractors at sites where they are performing work for the State; and

WHEREAS, the CDC has emphasized that COVID-19 vaccines are effective, in that they can prevent individuals from getting and spreading the virus, and can prevent severe illness in individuals who do contract COVID-19; and

WHEREAS, this Order is related to vaccination management, COVID-19 testing, data collection, and the implementation of CDC recommendations, and is thus authorized under P.L.2021, c.103;

NOW, THEREFORE, I, PHILIP D. MURPHY, Governor of the State of New Jersey, by virtue of the authority vested in me by the Constitution and by the Statutes of this State, do hereby ORDER and DIRECT:

1. Each executive department and agency, including an independent authority, shall, to the extent permitted by law, ensure that contracts or agreements entered into by the executive department or agency include a clause that the contractor or any subcontractors, at any tier, that is party to the contract ("covered contractor(s)") must maintain a policy that requires all covered workers to either provide adequate proof to the covered contractor that they have been fully vaccinated or submit to COVID-19 testing at minimum one to two times weekly. This clause shall also be required to be incorporated into lower-tier subcontracts. Any covered worker subject to a policy maintained pursuant to this paragraph that has not provided adequate proof that the covered worker is fully vaccinated must submit to a minimum of weekly or twice weekly testing on an ongoing basis until fully vaccinated.

2. This Order shall apply to any new contract, new solicitation for a contract, extension or renewal of an existing contract, and exercise of an option on an existing contract, if it is a contract for services, construction, including demolition,

remediation, removal of hazardous substances, alteration, custom fabrication, repair work, or maintenance work, or a leasehold interest in real property through which covered workers have access to State property, and the cost or contract price thereof is to be paid, in whole or in part, with or out of executive department or agency funds. This Order shall not apply to financial assistance, including but not limited to grants, bonds, loans, or tax credits; contracts or subcontracts whose value is less than the State bid advertising threshold under N.J.S.A. 52:34-7; employees who perform work outside of the State; or contracts solely for the provision of goods.

3. Covered workers may demonstrate proof of full vaccination status by presenting the following documents to the covered contractor if they list COVID-19 vaccines currently authorized for EUA in the United States and/or the World Health Organization ("WHO"), along with an administration date for each dose:

a. The CDC COVID-19 Vaccination Card issued to the vaccine recipient by the vaccination site, or an electronic or physical copy of the same;

b. Official record from the New Jersey Immunization Information System (NJIIS) or other State immunization registry;

c. A record from a health care provider's portal/medical record system on official letterhead signed by a licensed physician, nurse practitioner, physician's assistant, registered nurse or pharmacist;

d. A military immunization or health record from the United States Armed Forces; or

e. Docket mobile phone application record or any state specific application that produces a digital health record.

Covered contractors collecting vaccination information from covered workers must comport with all federal and State laws, including but not limited to the Americans with Disabilities Act, that regulate the collection and storage of that information.

4. To satisfy the testing requirement, a covered worker must undergo screening testing at minimum one to two times weekly. Where a covered contractor requires an unvaccinated covered worker to submit proof of a COVID-19 test, the worker may choose either antigen or molecular tests that have EUA by the U.S. Food and Drug Administration ("FDA") or are operating per the Laboratory Developed Test requirements by the U.S. Centers for Medicare and Medicaid Services. Where a covered contractor provides the unvaccinated covered worker with on-site access to COVID-19 tests, the covered contractor may similarly elect to administer or provide access to either an antigen or molecular test. If the covered worker is not working on-site during a week where testing would otherwise be required, the covered contractor's policy need not require the worker to submit to testing for that week. This requirement shall not supplant any requirement imposed by the covered contractor regarding diagnostic testing of symptomatic workers or screening testing of vaccinated workers.

5. Covered contractors must have a policy for tracking test results from testing required by this Order and must report results to local public health departments.

6. An executive department or agency shall require bidders for contracts subject to this Order to certify at the time of bid or proposal or prior to executing a contract that the bidder, if

awarded a contract, shall comply with this Order by having the policies and practices required by this Order in place, and shall collect all data necessary for compliance with this Order. Covered contractors shall certify, at the time of submission of an invoice, that they have complied with this Order during the period of time covered by the invoice.

7. For purposes of this Order, "covered worker" means any full-time or part-time worker for a covered contractor working on or in connection with a contract with an executive department or agency that requires such worker to enter, work at, or provide services in any place, site, installation, building, room, or facility in which any executive department or agency conducts official business or is within an executive department or agency's jurisdiction, custody, or control, or that relates to offering services for State employees, their dependents, or the general public.

8. For purposes of this Order, a covered worker shall be considered "fully vaccinated" for COVID-19 two weeks or more after they have received the second dose in a two-dose series or two weeks or more after they have received a single-dose vaccine. Individuals will only be considered fully vaccinated where they have received a COVID-19 vaccine that is currently authorized for emergency use by the FDA or the WHO, or that are approved for use by the same. Workers who are not fully vaccinated, or for whom vaccination status is unknown or who have not provided sufficient proof of documentation, shall be considered unvaccinated for purposes of this Order.

9. Nothing in this Order shall prevent a covered contractor from instituting a vaccination or testing policy that includes additional or stricter requirements, so long as such policy

comports with the minimum requirements of this Order. A covered contractor may also maintain a policy that requires more frequent testing of covered workers.

10. The Commissioner is hereby authorized to issue a directive supplementing the requirements outlined in this Order, which may include, but not be limited to, any requirements for reporting vaccination and testing data to the DOH. Actions taken by the Commissioner pursuant to this Order shall not be subject to the requirements of the Administrative Procedure Act, N.J.S.A. 52:14B-1 et seq.

11. The State Director of Emergency Management, who is the Superintendent of State Police, shall have the discretion to make additions, amendments, clarifications, exceptions, and exclusions to the terms of this Order.

12. It shall be the duty of every person or entity in this State or doing business in this State and of the members of the governing body and every official, employee, or agent of every political subdivision in this State and of each member of all other governmental bodies, agencies, and authorities in this State of any nature whatsoever, to cooperate fully in all matters concerning this Order, and to cooperate fully with any Administrative Orders issued pursuant to this Order.

13. No municipality, county, or any other agency or political subdivision of this State shall enact or enforce any order, rule, regulation, ordinance, or resolution which will or might in any way conflict with any of the provisions of this Order, or which will or might in any way interfere with or impede its achievement.

14. Penalties for violations of this Order may be imposed under, among other statutes, N.J.S.A. App. A:9-49 and -50.

15. This Order shall take effect immediately and shall remain in effect until revoked or modified by the Governor.

GIVEN, under my hand and seal this 20th day of October, Two Thousand and Twenty, and of the Independence of the United States, the Two Hundred and Forty-Sixth.

[seal]

/s/ Philip D. Murphy

Governor

Attest:

/s/ Parimal Garg

Chief Counsel to the Governor

New Contracting Requirement-Russia/Belarus Certification

On March 9, 2022, Governor Murphy signed P.L.2022, c.3, which prohibits certain government dealings with businesses engaged in prohibited activities in Russia or Belarus. As an agency of the State of New Jersey, South Jersey Port Corporation will now be required to have a business, or person with whom it is contracting, sign a certification that they are not engaged in prohibited activities in Russia or Belarus. That form is included in this bid document and the awarded contractor must complete it.

CERTIFICATION OF NON-INVOLVEMENT IN PROHIBITED ACTIVITIES IN RUSSIA OR BELARUS PURSUANT TO P.L.2022, c.3

CONTRACT / BID SOLICITATION TITLE _____

CONTRACT / BID SOLICITATION No. _____

CHECK THE APPROPRIATE BOX

☐ I, the undersigned , am authorized by the person or entity seeking to enter into or renew the contract identified above, to certify that the Vendor/Bidder is not engaged in prohibited activities in Russia or Belarus as such term is defined in P.L.2022, c.3,[1] section 1.e, except as permitted by federal law.

I understand that if this statement is willfully false, I may be subject to penalty, as set forth in P.L.2022, c.3, section 1.d.

OR

☐ I, the undersigned am unable to certify above because the person or entity seeking to enter into or renew the contract identified above, or one of its parents, subsidiaries, or affiliates may have engaged in prohibited activities in Russia or Belarus. A detailed, accurate and precise description of the activities is provided below.

Failure to provide such description will result in the Quote being rendered as non-responsive, and the Department/Division will not be permitted to contract with such person or entity, and if a Quote is accepted or contract is entered into without delivery of the certification, appropriate penalties, fines and/or sanctions will be assessed as provided by law.

Description of Prohibited Activity

_____

_____

_____

_____

_____

_____

Attach Additional Sheets If Necessary.

If you certify that the bidder is engaged in activities prohibited by P.L. 2022, c. 3, the bidder shall have 90 days to cease engaging in any prohibited activities and on or before the 90th day after this certification, shall provide an updated certification. If the bidder does not provide the updated certification or at that time cannot certify on behalf of the entity that it is not engaged in prohibited activities, the State shall not award the business entity any contracts, renew any contracts, and shall be required to terminate any contract(s) the business entity holds with the State that were issued on or after the effective date of P.L. 2022, c. 3.

_____ _____

Signature of Authorized Representative Date

_____

Print Name and Title of Authorized Representative

_____

Vendor Name

[1] Engaged in prohibited activities in Russia or Belarus" means (1) companies in which the Government of Russia or Belarus has any direct equity share; (2) having any business operations commencing after the effective date of this act that involve contracts with or the provision of goods or services to the Government of Russia or Belarus; (3) being headquartered in Russia or having its principal place of business in Russia or Belarus, or (4) supporting, assisting or facilitating the Government of Russia or Belarus in their campaigns to invade the sovereign country of Ukraine, either through in-kind support or for profit.

NEW JERSEY'S DIANE B. ALLEN EQUAL PAY ACT ACKNOWLEDGEMENT

Pursuant to the DIANE B. ALLEN EQUAL PAY ACT, N.J.S.A. 34:11-56.14.b., the Contractor shall provide to the Commissioner of the New Jersey Department of Labor and Workforce Development, through certified payroll records required pursuant to N.J.S.A. 34:11-56.25 et seq., information regarding the gender, race, job title, occupational category, and rate of total compensation of every employee of the employer employed in the State in connection with the contract. The Contractor shall provide the Commissioner, throughout the duration of the contract with an update to the information whenever payroll records are required to be submitted pursuant to N.J.S.A. 34:11-56.25 et seq.

Information regarding the Diane B. Allen Equal Pay Act and its requirements may be obtained from the New Jersey Department of Labor and Workforce Development (LWD) web site at: https://nj.gov/labor/equalpay/equalpay.html

LWD forms may be obtained from the online web site at: https://nj.gov/labor/forms_pdfs/equalpayact/MW-562withoutfein.pdf

The undersigned is an (individual) (partnership) (corporation) under the Laws of the State of_____ having principal offices at_____.

_____

(Signed)

_____

(Name - Type or Print)

_____

(Company Name)

_____

(Address)

_____

_____

(Telephone Number)

CHAPTER 60
PREVAILING WAGES FOR PUBLIC WORKS

SUBCHAPTER 9. ASSURANCES FOR PAYMENT OF PREVAILING WAGE

12:60-9.1 Certification by bidder with lowest bid by 10 percent or more

(a) When a public body engages in competitive bidding for public work subject to the provisions of the New Jersey Prevailing Wage Act (PWA), the person who makes the lowest bid for the contract by 10 percent or more under the amount of the next lowest bid shall prior to award of the contract certify to the public body on the form found at N.J.A.C. 12:60 Appendix that the prevailing wage rates required by the PWA shall be paid in performing the work under the contract.

(b) If the bidder does not provide the certification required pursuant to (a) above prior to the award of the contract, the public body shall award the contract to the next lowest responsible and responsive bidder.

12:60-9.2 Required contract provisions concerning payment of prevailing wage

(a) Every contract for the performance of public work shall contain the following contract provisions:

1. "Attached hereto and incorporated herein is(are) the Department of Labor and Workforce Development prevailing wage determination(s) for the locality and craft(s) that will be employed in the performance of work under this contract. It is hereby stipulated that each individual who performs work under this contract shall be paid not less than the prevailing wage rate to which that worker is entitled under the New Jersey Prevailing Wage Act, as reflected in the appropriate Department of Labor and Workforce Development prevailing wage determination"; and

2. "In the event it is found that any worker employed by the contractor or any subcontractor covered by this contract has been paid a rate of wages less than the prevailing wage rate required to be paid by this contract, the public body, the lessee to whom the public body is leasing a property or premises or the lessor from whom the public body is leasing or will be leasing a property or premises may terminate the contractor's or subcontractor's right to proceed with the work, or such part of the work as to which there has been a failure to pay required wages, and to prosecute the work to completion or otherwise. The contractor and his sureties shall be liable to the public body, any lessee to whom the public body is leasing a property or premises, or to any lessor from whom the public body is leasing or will be leasing a property or premises for any excess costs occasioned by the termination of the contractor's or subcontractor's right to proceed with the work, or such part of the work as to which there has been a failure to pay required wages."

APPENDIX
54 N.J.R. 1009(a)

In the matter of an award of a	)	STATE OF NEW JERSEY
contract for public work for a	)	DEPARTMENT OF LABOR AND
project described as:	)	WORKFORCE DEVELOPMENT
	)	DIVISION OF WAGE &
[Enter project description here]	)	HOUR COMPLIANCE
	)	
	)	
	)	Certification of Lowest Bidder

LOWEST BIDDER PREVAILING WAGE CERTIFICATION

_____, of full age and under oath, duly provides the following sworn statement:

(1). I am the owner and/or highest-ranking official or officer of a company or firm named _____, which holds a currently valid public works contractor registration pursuant to the New Jersey Public Works Contractor Registration Act, N.J.S.A. 34:11-56.48 et seq., certificate number _____.

(2). I submitted a bid for a contract award in the above identified project and the public body has informed me that I am the lowest bidder by 10 percent or more as compared to the next lowest bid submitted.

(3). The amount of my bid does include paying the prevailing wage rate to all workers who perform work on the project at rates of pay, including both base wage and fringe benefits, set forth in applicable Wage Determinations, (1) for the appropriate locality, (2) for the appropriate work classification (e.g., carpenter, electrician, mason, plumber), and (3) for the appropriate job title (e.g., Apprentice, Journeyman, Forman), published by the New Jersey Department of Labor and Workforce Development (NJDOL) pursuant to the New Jersey Prevailing Wage Act (NJPWA), N.J.S.A. 34:11-56.25 et seq., and corresponding NJDOL rules, N.J.A.C. 12:60.

I certify under penalty of perjury that the foregoing statements made by me are true. I am aware that if any of the foregoing statements made by me are false, I am subject to punishment. See N.J.S.A. 2C:28-1 et seq., specifically, N.J.S.A. 2C:28-3, within the New Jersey Code of Criminal Justice.

Dated:_____ Signature:_____

Title: _____

CONSTRUCTION AGREEMENT

THIS AGREEMENT made this _____ day of _____, 2022, by and between the **SOUTH JERSEY PORT CORPORATION**, having its principal offices located at Two Aquarium Drive, Camden, New Jersey, hereinafter referred to as "Owner," and _____, having its principal offices located at _____, hereinafter referred to as "Contractor."

W I T N E S S E T H:

The South Jersey Port Corporation (SJPC) is an agency of the State of New Jersey with a mission to develop, maintain and operate marine terminals and related intermodal transportation infrastructure within the South Jersey Port District. The SJPC was established and created pursuant to the "South Jersey Port Corporation Act" (the Act), N.J.S.A. 12:11A-1 et seq.; and

1. That for and in consideration of the sum of **$ _____ DOLLARS**, Contractor agrees to construct the **____Project Name____** in accordance with the Contract Documents hereinafter set forth.

2. That for and in consideration of the amount payable under this Agreement by the Owner, the Contractor agrees, at its own proper cost and expense, and with due skill and diligence, that it will perform the aforesaid in accordance with the Contract Documents and in compliance with this Agreement.

3. Contractor agrees to receive as full compensation the amount stated above herein. Contractor shall be responsible for all loss or damage arising out of the furnishing of the aforesaid or from any action of the elements; or from any unforeseen obstruction or difficulties which may be encountered of every description connected with the furnishing of the aforesaid until the same have been accepted by the Owner.

4. To prevent all disputes and litigation, it is agreed by and between the parties to this Agreement that the Owner shall in all cases determine the services rendered and paid for under this Agreement, and as to the interpretation of the plans and specifications.

5. The Contract Documents shall consist of (1) Notice to Bidders; (2) Bid Specifications; (3) Contractor's Proposal (as accepted); (4) Contract Agreement; (5) All Addenda. (6) Any other written instructions or interpretations given by the Owner, or its representative.

6. The Contractor shall furnish all of the material, supplies, tools, equipment, labor and other services necessary for the construction and completion of the Project described in the Contract Documents.

7. The Contractor shall commence the work required by the Contract Documents within seven (7) calendar days after the date of the notice to proceed. The Contractor shall complete all work required by the Contract Documents within ___ **calendar days** from and including the date of the written notice to proceed unless the period of completion is extended otherwise pursuant to the Contract Documents.

8. The Owner will pay to the Contractor, in the manner and at such times as set forth in the Contract Documents, such amounts as required by the Contract Documents. The Contractor specifically agrees to the provision for liquidated damages contained in the Contract Documents.

9. Notwithstanding the fact that a dispute, controversy, or question shall have arisen between the Contractor and the Owner under this Contract, Contractor agrees that it will not directly or indirectly stop or delay the Work, or any part thereof, or stop or delay the delivery of any material required to be furnished to the Project site pending the termination of such dispute, controversy or question. This provision does not excuse the Owner from its obligation to pay the

Contractor that portion of an application for payment that is not in dispute nor is it intended hereby that the Contractor is prohibited from stopping or delaying work in the event the Owner does not pay such undisputed amount is accordance with the terms and conditions hereof.

10. Where reference is made in this Contract to a provision of any of the Contract Documents, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

11. The Contract may be terminated by the Owner or Contractor as provided in the Contract Documents; the work may be suspended by the Owner as provided in the Contract Documents. Contract may be terminated by the Owner for failure to provide services in accordance with the contract. The Owner may also terminate the contract for any other matter as authorized by law.

12. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral.

13. To the extent not superseded by federal law, the contract shall be governed by New Jersey law.

14. The parties to this agreement agree to incorporate into this agreement the mandatory language of subsection 3.6(a) of the Affirmative Action Regulations promulgated by the Treasurer pursuant to P.L.1975, c.127, as amended and supplemented from time to time, and the contractor or subcontractor agrees to comply fully with the terms, provisions and obligations of said subsection.

15. Small Business Set-Aside. New Jersey's Small Business Set-Aside Program obligates the Owner to make 25% of all purchases for goods and services from small businesses.

The Contractor shall execute the Small Business Enterprise Questionnaire, bid requirement Q1, attached hereto, which shall be incorporated herein by reference.

The Contractor agrees to make a good faith effort to award at least 25% of this contract to subcontractors registered by the Commerce Commission as a SBE. Subcontracting goals are not applicable if the prime contractor is a registered Small Business Enterprise (SBE) firm.

16. The Contractor shall execute the Mandatory Equal Employment Opportunity Language, "Exhibit B", bid requirement Q3, attached hereto, which shall be incorporated herein by reference.

17. Attached hereto and incorporated herein is(are) the Department of Labor and Workforce Development prevailing wage determination(s) for the locality and craft(s) that will be employed in the performance of work under this contract. It is hereby stipulated that each individual who performs work under this contract shall be paid not less than the prevailing wage rate to which that worker is entitled under the New Jersey Prevailing Wage Act, as reflected in the appropriate Department of Labor and Workforce Development prevailing wage determination.

18. In the event it is found that any worker employed by the contractor or any subcontractor covered by this contract has been paid a rate of wages less than the prevailing wage rate required to be paid by this contract, the public body, the lessee to whom the public body is leasing a property or premises or the lessor from whom the public body is leasing or will be leasing a property or premises may terminate the contractor's or subcontractor's right to proceed with the work, or such part of the work as to which there has been a failure to pay required wages, and to prosecute the work to completion or otherwise. The contractor and his sureties shall be liable to the public body, any lessee to whom the public body is leasing a property or premises, or to any lessor from whom the public body is leasing or will be leasing a property or premises for any

excess costs occasioned by the termination of the contractor's or subcontractor's right to proceed with the work, or such part of the work as to which there has been a failure to pay required wages.

19. The undersigned does hereby warrant and represent that this Agreement has not been solicited or secured, directly or indirectly, in a manner contrary to the laws of the State of New Jersey, and that said laws have not been violated and shall not be violated as they relate to the procurement or the performance of this Agreement by any conduct, including the paying or giving of any fee, commission, compensation, gift, gratuity or consideration of any kind, directly or indirectly, to any Owner employee, officer or official.

20. The address given below shall be the address of the representative of the parties to which all notices and reports required by this Agreement shall be sent by mail.

As to the Owner:

Mr. Andrew Saporito, Executive Director
SOUTH JERSEY PORT CORPORATION
Two Aquarium Drive
Camden, NJ 08103

As to the Contractor:

(insert address)

21. If it becomes necessary for the Contractor either as principal or by agent or employee to enter upon the premises or property of the Owner in order to construct, erect, inspect, make delivery or remove property hereunder, the Contractor hereby covenants and agrees to take, use, provide and make all proper, necessary and sufficient precautions, safeguards and protections against the occurrence of happenings or any accidents, injuries damages or hurt to any person or property during the progress of the work herein covered. Contractor shall hold the Owner, its Chairman, commissioners, members, officers and employees harmless from and against all claims,

suits, and judgments of every kind and description arising from any damage to or loss of property of the Owner, Contractor, or their respective agents, servants or employees, or any other person, or injury to or death of persons, including agents, servants, or employees of Owner or Contractor, or any other person, arising directly or indirectly from the services provided by this Agreement, except that which is due solely to the fault or negligence of Owner, its agents, servants or employees. The Contractor will carry insurance and will indemnify the Owner, its Chairman, commissioners, members, officers and employees from and against any such claim for loss, damage or injury to property or person arising out of the services covered by this Agreement and the use, misuse or failure of any equipment used by the Contractor or his employees or agents, and shall provide certification of such insurance to the Owner.

22. The Contractor shall submit a properly completed Affirmative Action Form AA-201 (Initial Project Workforce Report – Construction) prior to execution of this agreement. The Contractor agrees thereafter to submit once a month, prior to the receipt of any monthly payment, Affirmative Action Form AA-202 (Monthly Project Workforce Report).

23. Business Registration Certificate, bid requirement Q8. The Contractor shall provide written notice to its subcontractors of the responsibility to submit proof of business registration to the Contractor. The requirement of proof of business registration extends down through all levels (tiers) of the project.

Before final payment on the contract is made by the Owner, the Contractor shall submit an accurate list and the proof of business registration of each subcontractor or supplier used in the fulfillment of the contract, or shall attest that no subcontractors were used.

For the term of the contract, the Contractor and each of its affiliates, and a subcontractor and each of its affiliates, [N.J.S.A. 52:32-44(g)(3)] shall collect and remit to the

Director, New Jersey Division of Taxation, the use tax due pursuant to the Sales and Use Tax Act on all sales of tangible personal property delivered into this State, regardless of whether the tangible personal property is intended for a contract with a contracting agency.

A business organization that fails to provide a copy of a business registration as required pursuant to Section 1 of P.L. 2001, c. 134 (C.52:32-44 *et al.*) or subsection e. or f. of Section 92 P.L. 1977, c.110 (C.5:12-92), or that provides false business registration information under the requirements of either of those sections, shall be liable for a penalty of $25 for each day of violation, not to exceed $50,000 for each business registration copy not properly provided under a contract with a contracting agency.

24. This Agreement, together with the contract documents, forms the contract and they are as fully a part of this Agreement as if hereto attached or herein repeated.

25. The Owner and the Contractor for themselves, their heirs, executors, administrators, successors, or assigns, hereby agree to the full performance of the covenants herein contained.

IN WITNESS WHEREOF, the parties hereto have set their hands and seals the day and year first written above.

WITNESS & ATTEST:	**SOUTH JERSEY TRANSPORTATION OWNER**
_____ By	_____
VICTORIA D'AMICO Board Secretary	**ANREW SAPORITO** Executive Director
(Seal)	
WITNESS & ATTEST:	**[CONTRACTOR]**
_____ By	_____
Secretary	President or Owner
(Seal)	

GENERAL CONDITIONS
Table of Contents

GENERAL INFORMATION

1. GENERAL

These GENERAL CONDITIONS contain contractual-legal Articles that establish the requirements and conditions governing responsibility, policy and procedures that apply during the Contract and guarantee period. Any revisions, additions, or deletions to the following Articles that are special to the work under this Contract will be made in the SUPPLEMENTARY CONDITIONS. Additional requirements and conditions that have special significance to the Contract for the work are as set forth elsewhere in these Contract Documents.

2. ABBREVIATIONS

AAN	American Association of Nurserymen
AAR	Association of American Railroads
AASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute
AGC	Association of General Contractors of America
AI	Asphalt Institute
AIA	American Institute of Architects
AIP	Airport Improvement Program
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
ANG	Air National Guard
ANSI	American National Standards Institute
AOA	Airport Operations Area
API	American Petroleum Institute
ARA	American Railway Association
AREA	American Railway Engineering Association
ARTBA	American Road and Transportation Builders Association
ASCE	American Society of Civil Engineers
ASLA	American Society of Landscape Architects
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
AWG	American Wire Gage
AWPA	American Wood Preservers Association
AWS	American Welding Society
AWWA	American Water Works Association
B&S	Bown & Sharpe Wire Gage
CFR	Code of Federal Regulation
CIAP	Construction Industry Advancement Program of New Jersey
CRSI	Concrete Reinforcing Steel Institute
CTC	Concrete Technology Corporation
EEI	Edison Electrical Institute
EPA	Environmental Protection Agency of the United States Government
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulations
FHWA	Federal Highway Administration
FSS	Federal Specifications and Standards, General Services Administration
ICEA	Insulated Cable Engineers Association
IEEE	Institute of Electrical and Electronic Engineers
IES	Illuminating Engineering Society
IMSA	International Municipal Signal Association
ISO	International Organization for Standardization

ITE	Institute of Transportation Engineers
MIL	Military Specifications
MUTCD	Manual on Uniform Traffic Control Devices (FHWA)
NBFU	National Board of Fire Underwriters
NCSA	National Crushed Stone Association
NEC	National Electric Code
NELA	National Electrical Light Association
NEMA	National Electrical Manufacturers Association
NESC	National Electrical Code
NFPA	National Fire Prevention Association
NIST	National Institute for Standards and Technology
NJAC	New Jersey Administrative Code
NJANG	New Jersey Air National Guard
NJDEP	New Jersey Department of Environmental Protection
NJDOT	New Jersey Department of Transportation
NOAA	National Oceanic and Atmospheric Administration
NOTAM	Notice to Airman
OSHA	Occupational Safety and Health Administration
PCA	Portland Cement Association
PCI	Pre-stressed Concrete Institute
PEI	Porcelain Enamel Institute, Incorporated
SAE	Society of Automotive Engineers
SI	International System of Units
SRL	Skid Resistance Level
SSPC	Steel Structures Painting Council
UL	Underwriter's Laboratories
UNC	Unified National Coarse
USACE	United States Army Corps of Engineers
USCG	United States Coast Guard
USSWG	United States Steel Wire Gage

3. DEFINITIONS

Wherever in the Contract Documents the following terms are used, the intent and meaning shall be interpreted as stated below.

ACCEPTANCE -The term "Acceptance" means the formal written acceptance of the Project by the South Jersey Port Corporation, which has been completed in all respects, including changes, in accordance with the Contract Documents.

ADDENDA (Addenda or Addendum used interchangeably) - The term "Addenda" means the written and/or graphic documents and/or computer disk issued prior to the opening of bids, which clarify, correct, or change the Contract Documents.

ADDITIONAL WORK - Work, of a type already provided by the contract and for which the contract has established a unit price under a Pay Item.

ADVERTISEMENT - The public announcement, as required by law, inviting bids for work to be performed or materials to be furnished.

AIR TEMPERATURE - The measured temperature, in the shade, not in the direct rays of the sun, and away from artificial heat.

ARCHITECT – "Architect" shall mean the Chief Engineer's duly authorized representative(s), such representative(s) acting within the scope of the particular duties delegated to him or the firm designated in the Contract Documents as Architect for the project, with its associated consultants, or their duly authorized representatives or agents, such firm being the authorized representative of the Owner, acting directly for the Owner. The Architect is referred to throughout the Contract Documents as if singular in number and masculine in gender.

AS APPROVED - The words "as approved," unless otherwise qualified, shall be understood to be followed by the words "by the Engineer."

AS SHOWN, AS INDICATED, AND AS SPECIFIED - The words "as shown," "as indicated" or "as specified" shall be understood to be followed by the words "in the Contract Documents."

OWNER - The term "Owner" means the SOUTH JERSEY PORT CORPORATION of the State of New Jersey, as created by law acting through its Executive Director or his duly authorized representative. Throughout the Contract Documents the Owner is referred to as singular in number and masculine in gender.

OWNER'S REPRESENTATIVE - "Owner's Representative" shall mean the firms or individuals designated in the Contract Documents as Engineer or Construction Manager for the project, with associated consultants, or their duly authorized representatives or agent, such firms or individuals being the authorized representatives of the Owner, acting directly for the Owner. The Owner's Representative is referred to throughout the Contract Documents as if singular in number and masculine in gender.

AWARD - The term "Award" means the decision of the Owner to accept the Proposal of the lowest responsible Bidder, subject to the execution and approval of a satisfactory Contract based thereon and bonds to secure the performance thereof, and such conditions as may hereinafter be specified or as may be specified or required by law.

BID FORM - The term "Bid Form" means the approved form furnished by the Owner on which the Owner requires bids to be prepared and submitted for the Work.

BID SECURITY - The term "Bid Security" means the security furnished with a bid to guarantee that the Bidder shall enter into the Contract if awarded the Contract.

BIDDER - The term "Bidder" means an individual, firm, partnership, corporation, or any acceptable combination thereof, acting directly or through a duly authorized representative, legally submitting a bid for the advertised work defined in the Contract Documents.

BRIDGE - A structure, including supports, spanning and providing passage over a waterway, a railroad, a highway, or other obstruction; more than 20 feet long, measured along the center of the roadway or railroad, between faces of abutments. In the case of boxes or arches, the length is measured between the face of the sidewalls and, in the case of multiple boxes, between the inside faces of the outside walls.

BUSINESS ENTITY – The term "Business Entity" means any natural or legal person, business corporation, professional services corporation, limited liability company, partnership, limited partnership, business trust, association of any other legal commercial entity organized under the laws of New Jersey or any other state or foreign jurisdiction. It also includes (i) all principals who own or control more than 10 percent of the profits or assets of a business entity or 10 percent of the stock in the case of a business entity that is a corporation for profit, as appropriate; (ii) any subsidiaries directly or indirectly controlled by the business entity; (iii) any political organization under 26 U.S.C.A. 527 that is directly and indirectly controlled by the business entity, other than a

candidate committee, election fund or political party committee; and (iv) if a business entity is a natural person, that person's spouse or child, residing in the same household.

BY OTHERS - The term "by others" refers to a person, firm, or corporation other than the Contractor or its surety including persons, firms, or corporations in a contractual relationship with the Contractor or its surety, such as a Subcontractor, supplier, fabricator, or consultant at any tier. "By others" shall include the Owner or other public body.

CALENDAR DAY - Each and every day shown on the calendar.

CLAIM - A "claim" is a written statement requesting additional time and/or money for acts or omissions during the performance of the Contract. The Contractor must set forth the facts and circumstances for which the Owner or Engineer is responsible in order to be entitled to additional compensation and/or time.

COMPLETION - The term "Completion" means Completion of the Work. Completion shall occur when:

1. the Work has been satisfactorily completed in all respects in accordance with the Contract Documents;
2. the Project is ready for use by the Owner to the degree required by the terms of the Contract, and;
3. the Contractor has satisfactorily executed and delivered to the Engineer all documents, certificates, and proofs of compliance required by the Contract Documents, it being understood that the satisfactory execution and delivery of said documents, certificates, and proofs of compliance is a requirement of the Contract.

CONTRACT DOCUMENTS - The "Contract Documents" consist of the Bidder's completed Proposal Section, Project Manual, the Plans, all Addenda issued prior to the opening of Bids and all Contract Modifications or Change Orders issued after execution of the Contract. This Contract represents the entire and integrated agreement between the parties hereto and supersedes all prior negotiations, representations, or agreements, either written or oral. The Contract may be amended or modified only by a Contract Modification as defined in Articles "CHANGES," "DIFFERING SITE CONDITIONS" and "SUSPENSION OF WORK" of these GENERAL CONDITIONS. The Contract Documents shall not be construed to create any contractual relationship of any kind between the Engineer and the Contractor.

CONSTRUCTION MANAGER - "Construction Manager" shall mean the firm or individuals designated in the Contract Documents as the construction manager for the project, with associated consultants, or their duly authorized representative or agent, such firm being the authorized representatives of the Owner acting directly for the Owner. The Construction Manager is referred to throughout the Contract Documents as if singular in number and masculine in gender.

CONSTRUCTION OPERATIONS - Construction operations shall include site clearing, demolition, movement of utilities or other facilities, and actual construction of any of the temporary or permanent structures, roadways, or public improvements required by the Contract. The term shall not include mobilization, procurement and storage of materials and plants, providing engineering, Performance Bond and Payment Bond, surveys, working drawings, field offices, or other schedules, certificates, forms, or documents necessary prior to the performance of Work on Pay Items.

CONTRACT - The term "Contract" means the entire and integrated agreement between the parties thereunder and supersedes all prior negotiations, representations, or agreements, either written or oral. The Contract Documents form the Contract between the Owner and the Contractor setting

forth the obligations of the parties thereunder, including, but not limited to, the performance of the Work and the basis of payment.

CONTRACT COMPLETION - The "Contract Completion" is the date the Owner accepts the entire work as being in compliance with the Contract Documents, or formally waives nonconforming work to the extent of the nonconformity, and issues the final payment in accordance with the requirements set forth in Article "FINAL PAYMENT" of these GENERAL CONDITIONS.

CONTRACT MODIFICATIONS - "Contract Modifications" shall mean any written alteration to the specifications, delivery point, rate of delivery, contract period, price, quantity or other contract provision of an existing contract, whether accomplished by unilateral action in accordance with a contract provision, or by mutual action of the parties to the Contract and includes, but is not limited to, changes in the work, differing site conditions, delays in performance, suspensions of work, and acceleration of performance.

CONTRACT TIME - The term "Contract Time" means the number of working days or calendar days including authorized adjustments allowed for Completion. When a specified completion date is shown in the Specifications in lieu of the number of working or calendar days, Completion shall be on or before that date. Specified completion date and calendar day contracts shall be completed on or before the day indicated even when that date is a Saturday, Sunday, or holiday.

CONTRACTOR - The term "Contractor" means the individual, firm, partnership, corporation, or any acceptable combination thereof contracting with the Owner for performance of the prescribed Work. Throughout the Contract Documents, the Contractor is referred to as if singular in number and masculine in gender. The term "Contractor" means the Contractor or the Contractor's authorized representative.

CONTRIBUTION – The term “Contribution” means a contribution reportable as a recipient under “The New Jersey Campaign Contributions and Expenditures Reporting Act.” P.L. 1973, c.83 (C.10:44A-1 et seq.), and implementing regulations set forth at N.J.A.C. 19:25-7 and N.J.A.C. 19:25-10.1 et seg. As of January 1, 2005, contributions in excess of $300.00 during a reporting period are deemed “reportable” under these laws.

CROSS SECTIONS - Graphic representation of the ground elevations of the ground or other improvements taken at various intervals during the contract at right angles to the centerline or base line.

CULVERT - Any enclosed Structure, not classified as a bridge, which provides an opening under the roadway, runway, taxiway, or ground surface for the purpose of conveying storm water runoff.

DAYS - Unless otherwise designated, days as used in the Contract Documents means calendar days.

DEFECTIVE WORK - "Defective Work" is work that (i) is unsatisfactory, faulty, or deficient; (ii) does not conform to the Contract Documents; (iii) does to meet the requirements of any inspection, test, or approval referred to in the Contract Documents; (iv) has been damaged prior to the Engineer's recommendation for final payment; or (v) does not conform to generally accepted standards of workmanship.

DISPUTE - A disagreement between the Owner and the Contractor with regard to the Work or Contract Documents.

DRAWINGS - See “PLANS”

ENGINEER - "Engineer" shall mean the Owner's Director of Engineering or his/her duly authorized representatives, such representatives acting within the scope of the particular duties delegated to him or the firm designated in the Contract Documents as Engineer for the project, with its associated consultants, or their duly authorized representatives or agent, such firm being the authorized representatives of the Owner, acting directly for the Owner. The Engineer is referred to throughout the Contract Documents as if singular in number and masculine in gender.

EQUIPMENT - All machinery and equipment, together with the necessary supplies for upkeep and maintenance, and also tools and apparatus necessary for the proper construction of the Work.

EXECUTION OF CONTRACT - "Execution of Contract," or equivalent words, shall mean the signing of the Contract by the jurisdictional representatives of both the Owner and the Contractor.

EXTRA WORK - The term "Extra Work" means new and unforeseen work found essential to the satisfactory completion of the Project, as determined by the Engineer, and not covered by any of the various Pay Items for which there is a bid price or by combination of such items. In the event portions of such work are determined by the Engineer to be covered by one (1) of the various Pay Items for which there is a bid price or combinations of such items, the remaining portion of such work will be designated as Extra Work. Extra Work also includes work specifically designated as Extra Work in the Contract Documents.

FABRICATOR - A firm, company, or individual supplying fabricated material for the Project.

FIELD ORDER - The term "Field Order" means a written order, signed by the Engineer, requiring performance by the Contractor without negotiation of any sort.

GRADE LINE - The profile of the finished roadway, runway or taxiway surface along the proposed construction centerline or base line.

INSPECTOR - The Engineer's authorized representative assigned to inspect contract performance, methods, and materials related to the Work both on and off the site of the Project.

IN WRITING - Communication between parties delivered or sent, and received, in the form of a written letter, telegram, or mailgram.

JOBSITE - "Jobsite" shall mean the area upon or in which the Contractor's operations are carried on and such other areas adjacent thereto as may be designated as such by the Engineer.

LATENT DEFECT - The term "Latent Defect" means a defect that is present or potential but is not evident or active.

LAW - "Law" shall mean any Federal, State, or local law, statute, ordinance, rule, regulation or code.

LOT - An isolated quantity of specified material from a single source, or a measured amount of specified construction, to be produced by the same process.

MAJOR AND MINOR PAY ITEMS - The term "Major Pay Item" means any Pay Item having an original Contract value equal to or in excess of 10 percent (20 percent for Port Improvement Program projects) of the total amount of the award contract. The original Contract value of a Pay Item equals the per unit price bid for said Pay Item multiplied by the estimated quantity of such item contained in the Proposal Form. All other Pay Items shall be considered "Minor Pay Items."

MANUFACTURER - A firm, company, or individual manufacturing material for the project.

MARINE TERMINAL OPERATIONS AREA – The term “marine terminal operations area” shall mean any area of the marine terminal used or intended to be used for the docking, loading, or unloading of ships. An marine terminal operations area shall include such paved or unpaved areas that are used or intended to be used for the unobstructed movement of ships and cargo handling vehicles in addition to its associated paving, sheds, and warehouses. Only persons with security clearance who are properly credentialled shall have access to the marine terminal operations area.

MATERIALS - Any substances specified for use in the construction of the Project.

MODIFICATION ORDER - "Modification Order" shall mean a written order, which carries out a Contract Modification.

MULTIPLE DEFICIENCY - Deficiency in more than one (1) characteristic within the same lot.

NOTICE - The term "notice" or the requirement to notify, means a written communication delivered in person or by certified or registered mail (receipt required) to the person for whom it is intended. Certified or registered mail shall be addressed to that last known business address of the intended recipient.

NOTICE TO PROCEED - The term "Notice to Proceed" means the written notice to the Contractor to begin Work.

OR EQUAL - The term "or equal" shall be understood to indicate that the "equal" product is the same or better than the product named in the Specifications in the function, performance, reliability, quality, and general configuration in accordance with Article "SUBSTITUTES OR “OR EQUAL” ITEMS” of these GENERAL CONDITIONS.

OWNER - The term “Owner” means the South Jersey Port Corporation of the State of New Jersey, as created by law acting through its Executive Director or his duly authorized representative. Throughout the Contract Documents, the Owner is referred to as singular in number and masculine in gender.

PAY ITEM (CONTRACT ITEM) - The term "Pay Item" means a specifically described item of Work for which the Bidder provides a per-unit or lump-sum price in the Proposal.

PAYMENT BOND - The approved form of security, furnished by the Contractor and the surety, as a guarantee to pay promptly, or cause to be paid promptly, in full, such as may be due for all material furnished, labor supplied or performed, rental or equipment used, and services rendered by public utilities in, or in connection with, the work under contract.

PERFORMANCE BOND - The term "Performance Bond” means the approved form of security, furnished by the Contractor and the surety, as a guarantee on part of the Contractor to execute the work, in accordance with the terms of the specifications and contract.

PLANS - The term "Plans" means the sealed plan, profiles, cross sections, elevations, details, and other working drawings, supplemental drawings, all adjustments made to the plans in Addenda or by Modification Order, or reproductions thereof, signed by the Engineer and accepted by the Owner; and which show the location, character, dimensions, and details of the work to be performed.

PRECONSTRUCTION CONFERENCE - The initial Project meeting conducted by the Engineer, normally held after Award of the Contract and prior to the start of Work. A separate utility

preconstruction conference may be scheduled. The Contractor shall attend preconstruction conferences.

PROFILE - The trace of a vertical plane intersecting the top surface of the proposed improvement surface, usually along the longitudinal centerline. Profile grade means either the elevation or gradient of such trace according to the context. From this, cross-section elevations are established based on the typical section.

PROJECT - The specific section of Port, highway or other public improvement together with all appurtenances and construction to be performed thereon, under the Contract. The Project may include work by others under other contracts.

PROJECT MANUAL - The term project manual shall be synonymous with the term specifications as defined herein.

PROPOSAL - The term "Proposal" means the offer of a Bidder, properly signed and guaranteed, on the prepared form furnished by the Owner to perform the Work at the prices therein.

PROPOSAL FORM - The term “Proposal Form” means the approved form furnished by the Owner on which the Owner requires bids to be prepared and submitted for the Work.

REGISTRATION - The term “Registration” means the process by which any business can have its eligibility for participation in the New Jersey Commerce and Economic Growth Commission’s small business programs determined.

RESIDENT ENGINEER - The term "Resident Engineer" means the field representative of the Engineer having direct supervision of the administration of the Contract and all work.

SHALL - Designates an obligation to perform the specified the specified directive, unless otherwise indicated.

SMALL BUSINESS ENTERPRISE - For a **goods and services Contractor**, the term “Small Business Enterprise” shall mean a business certified by the State of New Jersey to qualify as a business which has its principal place of business in the State, is independently owned and operated, has no more than 100 full-time employees, has gross revenues that do not exceed $12 million.

For a **construction Contractor**, the term “Small Business Enterprise” shall mean a business certified by the State of New Jersey to qualify as a business which has its principal place of business in the State, is independently owned and operated, has no more than 100 full-time employees, has gross revenues that do not exceed either $1 million or the applicable annual revenue standards set forth in 13 CFR 121.201, whichever is higher.

SPECIFICATIONS - The term "Specifications" means the terms, provisions, and requirements, bound together herein and designated the “Project Manual” and all revisions made to the Specifications in Addenda, or by Modification Order, signed by the Engineer and accepted by the Owner.

Unless a particular issue is designated, all references to the above specifications, standards, or methods shall be understood to refer to the issue in effect (including all amendments) on the date of the NOTICE TO BIDDERS.

STRAIGHTEDGE - An accurate, 10 foot square-edged straightedge used in testing variations in the surface to verify specified tolerances.

SUBCONTRACTOR - An individual, firm, partnership, corporation, or any acceptable combination thereof, to which the Contractor subcontracts part of the Work pursuant to the GENERAL CONDITIONS article entitled SUBCONTRACTING.

SUBGRADE - The surface of the roadbed upon which the first layer of the pavement structure and/or shoulder section is constructed.

SUBSTANTIAL COMPLETION - "Substantial Completion" shall be that degree of completion of the project or a designated portion of the project, sufficient to provide the Owner, at his discretion, the full-time use of the project or designated portion of the project of the purposes for which it was intended and if it is safe and convenient for use by the public.

Substantial Completion of an operating facility or system shall be that degree of completion that will provide a minimum of seven (7) continuous calendar days of successful operation during which all performance and acceptance testing has been successfully demonstrated to the Engineer. All equipment contained in the work, plus all other components necessary to enable the Owner to operate the facility in the manner that was intended, shall be complete on the Substantial completion date at the end of the seven (7) calendar days. Substantial Completion of all or any designated part of the work is not to be construed as the Contract completion. Additional provisions regarding Substantial Completion are set forth in Article "SUBSTANTIAL COMPLETION DATE" and "OWNER'S USE OF PORTIONS OF THE WORK" of these GENERAL CONDITIONS.

SUPERINTENDENT - The Contractor's authorized representative responsible for and in charge of the Work. The Superintendence shall be authorized to receive all communications from the Owner per Article “SUPERINTENDENCE.”

SURETY - The corporate body bound with and for the Contractor for the full and complete performance of the Contract and for the payment of all debts and obligations pertaining to the Work.

TIME OF COMPLETION - “Time of Completion” is the duration allotted or completion date in the Contract for the Contractor to complete all or any portion of the Project called for under the Contract in all parts and requirements within the time or times for completion of the Contract set forth in the Information to Bidders.

UNBALANCED BID - The term "Unbalanced Bid" means a materially unbalanced bid where there is a reasonable doubt that award to the Bidder submitting a mathematically unbalanced bid, which is structured on the basis of nominal prices for some work and inflated prices for other work, will result in the lowest ultimate cost to the Owner.

UNBALANCED BID, MATHEMATICALLY - A bid containing lump sum or unit bid items that do not reflect reasonable actual cost plus a reasonable proportionate share of the Bidder’s anticipated profit, overhead costs, and other indirect costs. Some examples of a mathematically unbalanced bid are 'front-end loading' and 'covering' (moving money from one item to another).

UTILITY - A publicly, privately, or cooperatively owned agency or agencies operated by one (1) or more persons or corporations for public service. For purposes of the Contract, railroads shall be considered utilities.

WORK - The word "Work" within these Contract Documents shall include all material, labor, utility services, tools, supplies, expendable equipment, and all appliances, machinery, transportation, and appurtenances necessary to perform and complete the Contract; and such additional items not

specifically indicated or described that can be reasonably inferred as belonging to the item described or indicated and as required by the good practice to provide a complete and satisfactory system or structure described in the Contract Documents and the carrying out of all duties and obligations imposed by the Contract Documents on the Contractor. As used herein, "provide" shall be understood to mean "furnish and install, complete in place."

WORKING DAY - Any calendar day, exclusive of:

1. Saturdays, Sundays, and holidays;
2. days on which the Contractor is specifically required by the Contract Documents to suspend construction operations; and
3. days on which the Contractor is prevented by inclement weather or conditions resulting immediately therefrom adverse to the current controlling operation or operations, as determined by the Engineer, from proceeding with regular work for at least 6 hours toward completion of the contract.

Unless work is suspended for causes beyond the Contractor's control, Saturdays, Sundays and holidays on which the Contractor's forces engage in regular work, requiring the presence of an inspector will be considered as working days.

4. RESERVED

5. RESERVED

BIDDING REQUIREMENTS AND CONDITIONS

6. INQUIRIES REGARDING THE PROJECT

Inquiries prior to the receipt of bids regarding any discrepancy, error, or omission, or concerning the intent or meaning of the Plans, Specifications, or other Contract Documents shall be directed to the Owner as provided in the Information to Bidders section. Bidders shall rely only upon written responses to their inquiries. Oral responses will be of no effect.

7. PREQUALIFICATION OF PROSPECTIVE BIDDERS

For Bridge and Highway Projects - proposals will be received only from Bidders who, at the time of Bid, provide with the Proposal and have, as required by statute, submitted under oath, statements relating to their financial ability, adequacy of plant and equipment, organization and prior experience, and other matters, on forms furnished by the Owner; who have been prequalified in the areas so designated by the SJPC in accordance with NJDOT Regulations Covering the Classification of Prospective Bidders issued in accordance with NJSA 27:7-35.1 *et seq.*

All Other Projects - The prime Contractor shall be prequalified by the New Jersey Department of Treasury, Division of Property Management and Construction (DPMC) in the areas so designated by the SJPC, which may include: Construction Manager as Contractor, Design Build, or General Construction

As set forth in the Bid Specifications, the Owner may also require DPMC classification or DOT Pre-qualification for Subcontractors in the following areas: Plumbing, HVAC, Electrical, and Concrete Repairs. Subcontractor DPMC OR DOT classification requirements shall be identified in the Listing of Subcontractors Declaration. General Contractors shall note on said list whether it will be performing the work in any such area that requires Subcontractor DPMC classification or DOT Pre-qualification and whether it is classified to perform such work.

SJPC reserves the right to require Bidders and/or Subcontractors to provide proof of both DOT prequalification and DPMC classification documentations in given disciplines as determined by the scope of the particular project.

8. DISQUALIFICATION OF PREQUALIFIED PROSPECTIVE BIDDERS

The Owner reserves the right to disqualify or refuse to receive a Proposal Form from a prospective Bidder even though prequalified as required by the Article titled "PREQUALIFICATION OF PROSPECTIVE BIDDERS," or reject a Proposal after having received same for any of the following reasons:

1. Lack of competency or lack of adequate machinery, plant, or other equipment.
2. Uncompleted work which in the judgment of the Owner, might hinder or prevent the prompt completion of additional work, if awarded.
3. Failure to pay, or satisfactorily settle, all bills due for labor, equipment, or material on previous Contracts.
4. Failure to comply with any prequalification regulations of the Owner.
5. Default under any previous contract.
6. Unsatisfactory performance on previous or current contracts.
7. Questionable moral integrity as determined by the Attorney General of New Jersey.
8. Failure to reimburse the Owner for monies owed on any previously awarded contracts including those where the prospective Bidder is a party to a joint venture and the joint venture has failed to reimburse the Owner for monies owed.
9. Documented failure to comply with the conditions of permits.

9. CONTENTS OF THE PROPOSAL

Upon request, the Owner will furnish prospective Bidders with a Proposal Form. The Proposal Form states the location and description of the Project, shows the approximate estimate of the various quantities and kinds of Work to be performed, and includes a schedule of Pay Items for which bid prices are invited. The Proposal Form and accompanying Specifications state the number of days or date in which the Project must be completed, the amount of the Bid Security, and the date, time and place of the opening of Proposals.

All papers bound with or attached to the Proposal Form are considered a part thereof and must not be altered and must be submitted with the Proposal. These papers must be submitted with the Proposal Form for official bid. Other Contract Documents are considered a part of the Proposal whether attached or not.

Prospective Bidders are required to pay the Owner the sum stated in the Specifications for each copy of the Proposal Form, Specifications, and each set of Plans. Informational copies of the Proposal Form are available by the Owner for review upon written request to the South Jersey Port Corporation, Purchasing Department, Two Aquarium Drive, Camden, New Jersey 08103.

10. INTERPRETATION OF QUANTITIES IN BID FORM

The quantities appearing in the bid form are approximate only and are prepared for the comparison of bids. Payment will be made only for the actual quantities of Work completed in accordance with the Contract. Such payment will be made at the original unit prices for the quantities of Work accepted by the Engineer. The form quantities of Work may be increased or decreased, or Pay Items may be eliminated in their entirety as hereinafter provided.

11. "IF AND WHERE DIRECTED" ITEMS

The Proposal Form may request bids on one (1) or more Pay Items to be incorporated into the Project "if and where directed" by the Engineer. Such items may not be located on the Plans. The estimated quantities set out in the Proposal Form for such items are presented solely for the purpose of obtaining a representative bid price, but are not intended to indicate the Owner's anticipation as to the quantities of such items which are to be actually incorporated into the Project. Depending on field conditions, such "if and where directed" items may or may not be incorporated into the Project and if incorporated, may be many times the estimated quantity or only a fraction thereof.

Incorporation of such items shall only be made on written directions of the Engineer. In the absence of written directions, no such items shall be incorporated into the Project and if incorporated will not be paid for. The Engineer may order incorporation of such items at any location within the Project and at any time during the Contract Time. Claims for additional compensation shall not be made because of any increase, decrease, or elimination of such items, nor because of an increase or decrease in the amount of Work due to the field conditions encountered in incorporating such items into the Project.

12. EXAMINATION OF CONTRACT DOCUMENTS AND SITE OF PROJECT

The Bidder shall examine carefully the site of the proposed Project and the Contract Documents before submitting a Proposal. The submission of a bid is conclusive evidence that the Bidder has made such examination and is fully aware of the conditions to be encountered in performing the Work and is fully aware of the requirements of the Contract Documents and has considered the following:

A. Investigation of Subsurface and Surface Conditions - Where the Owner has made investigations of subsurface conditions in areas where Work is to be performed under the Contract, or in other areas, some of which may constitute possible local material sources, such investigations are made only for the purpose of study, estimating, and design. Where such investigations have been made, Bidders may, upon written request, inspect the records of the Owner as to such investigations subject to and upon the conditions set forth herein. Such inspection of records may be made at the South Jersey Port Corporation, Two Aquarium Drive, Camden, NJ 08103, or at such other locations as directed in response to the written request. In the event the Bidder’s site examination reveals that the site conditions are inconsistent with the Contract Documents, the Bidder shall immediately notify the Owner.

Boring logs, if borings are taken, are part of the subsurface information made available. Such borings, which are taken solely for design purposes, were obtained with reasonable care and recorded in good faith. The soil and rock descriptions shown are determined by a visual inspection of samples from the various explorations unless otherwise noted. These samples are made available for nondestructive examination. The observed water levels and other water conditions indicated on the boring logs are as recorded at the time of the exploration. These levels and other conditions may vary considerably, with time, according to the prevailing climate, rainfall, and other factors. Boring logs may be inspected at the South Jersey Port Corporation, Two Aquarium Drive, Camden, NJ 08103, or at such other locations as directed in response to the written request.

The records of the Owner's subsurface investigation are not a part of the Contract and are made available for inspection solely for the convenience of the Bidder or Contractor. This investigation, while considered by the Owner to be sufficient for design purposes in both

scope and content, is not necessarily sufficient for construction purposes and is not keyed to the needs of the Bidder and Contractor.

It is expressly understood and agreed that the Owner assumes no responsibility whatsoever in respect to the sufficiency or accuracy of the subsurface investigations, the records thereof, or of the interpretations set forth therein or made by the Owner in its use thereof other than as used to establish a design for the Project's in-situ site conditions. There is no warranty or guarantee, either expressed or implied, that the conditions indicated by such investigations or records thereof are representative of those existing throughout such areas, or any part thereof, or that unlooked-for developments may not occur, or that materials other than, or in proportions different from those indicated, may not be encountered.

The availability or use of information described in this Article is not to be construed in any way as a waiver of the above provisions, and a Bidder is cautioned to make such independent investigation and examination as necessary to satisfy the Bidder as to conditions to be encountered in the performance of the Work and, with respect to possible local material sources, the quality and quantity of material available and the type and extent of processing that may be required in order to produce material conforming to the requirements of the Contract Documents.

Information derived from such inspection of records of investigations or compilation thereof made by the Owner, the Consultant, or assistants, does not relieve the Bidder or Contractor from any risk or from properly fulfilling the terms of the Contract.

Moreover, New Jersey is a small, heavily populated State whose physical geography has received thorough examination. The Bidder is charged with knowledge of the State's physical geography from publications prepared under the auspices of the Federal and State governments, educational institutions, and others. Therefore, the Bidder, in performing his site investigation, should be fully aware of the following publications and such others as may be listed in the Specifications:

1. State of New Jersey Department of Transportation Bulletin 50, Geologic Series, "The Geology of New Jersey" by H. Kummel, out of print, available generally as library reference material.
2. Geologic Maps of New Jersey, available through New Jersey Department of Environmental Protection (NJDEP).
3. Engineering Soils Survey of New Jersey, available through the Bureau of Research, College of Engineering, Rutgers University, New Brunswick, New Jersey 08903.
4. Soil Surveys of Individual Counties prepared by the US Department of Agriculture, Soil Conservation Service, in cooperation with the New Jersey Agricultural Experiment Station and Cook College, Rutgers University, available through local Soil Conservation District Offices.

The Bidder should also conduct such borings, soils tests, and other subsurface investigations and obtain such expert advice on site conditions, both surface and subsurface, as is required for bidding and for the construction of the Project.

B. When contour maps have been used in the design of the Project and have not been incorporated in the Plans, the Bidders may inspect such maps upon written request, and if available, they may obtain copies for their use.

C. Right-of-Way Availability - The Bidder shall consider the effect on his work schedule of any delays in right-of-way availability. The submission of a bid shall be considered conclusive evidence that the Bidder has considered such delays and made allowance for them in the progress schedule.

D. Utilities - The Bidder shall consider the effect on his work schedule of GENERAL CONDITIONS Articles “COOPERATION WITH UTILITIES” and “COOPERATION BETWEEN CONTRACTORS.” The Bidder shall make a diligent investigation of all utilities on the job site, including any necessary de-energization of power lines, and contact all utilities inquiring as to their planned operations and existing and proposed facilities prior to bidding.

E. Other Contractors - The Bidder shall examine the Project site and adjacent areas so as to be fully aware of other Contractors working on or adjacent to the site. The Bidder shall become fully aware of the operations of such Contractors before bidding and how their operations affect his progress. The Bidder should also consider, and allow for in bidding, the right of the Owner at any time to contract for and perform other or additional work on or near the Project, and the conditions and terms of the Contract relative thereto as set forth in GENERAL CONDITIONS Article “COOPERATION BETWEEN CONTRACTORS.”

F. Mass Diagram and Cross-Sections - The swell or shrinkage of excavated material and direction and quantities of haul or overhaul as and if shown on said mass diagram are for the purpose of design only, and in like manner as provided in Subheading A above, concerning furnishing information resulting from subsurface investigations, the Owner assumes no responsibility whatever in the interpretation or exactness of any of the information shown on said mass diagram, and does not, either express or imply, make any guarantee of the same. Similarly, the cross-sections are not intended to be relied upon to accurately indicate the location or quantities of rock and soil. The Bidder should independently make an investigation as to the location, quality, and quantity of rock and soil.

G. Existing Structures - A list of known existing structures within the Project will be listed in the Contract or on the Plans. If plans for such structures are available, the Bidder may, upon written request to the Owner, review the plans at the South Jersey Port Corporation, Two Aquarium Drive, Camden, NJ 08103, or at such other locations as directed in response to the written request. The Owner assumes no responsibility for the correctness of the Plans. Any information obtained from the existing Plans shall be verified by the Bidder prior to use of such information for bidding for the construction of the Project. In the event the Bidder's site examination reveals that the site conditions are inconsistent with the Contract Documents, the Bidder shall immediately notify the Owner.

13. PREPARATION OF PROPOSAL

The Bidder shall submit a Proposal on the forms furnished by the Owner. The Bidder shall specify a price in figures for each Pay Item. For lump sum items, the price should appear solely in the box provided for the lump sum item under the column designated as "Item Total.” For unit price items the per unit price shall appear under the column designated "Unit Price" in the appropriate box, and the product of the respective unit price times the approximate quantity for that item shall appear under the column designated "Item Total." The “Total Amount Bid” is the sum of all figures shown in the column designated “Item Total " and shall appear at the location provided therefor. When the Bidder intends to bid zero ($0.00) for a Pay Item, a "0" should appear in the "Unit Price" and "Item Total" columns for unit price items or in the "Item Total" column for lump sum items.

When the Proposal contains alternate items, the Bidder shall only provide the unit price and amount for the lowest priced alternate item. When alternate items in the proposal have a lump sum pay quantity, the Bidder shall only provide the amount for the lowest priced alternate item. The alternate item for which a price has been provided shall be constructed. When the proposal contains alternate groups of items, the Bidder shall only provide the unit price and amount for each item within the lowest priced alternate group. The alternate group of items for which a price has been provided shall be constructed.

All figures entered in the "Unit Price" and "Item Total" columns, and the figure entered for the "Total Amount Bid" shall be in ink or typed. Bids will be accepted only if submitted on the Proposal Form supplied by the Owner. In all instances, the Proposal Form shall govern. Bid prices presented on any other form by the Bidder, if different from those submitted on the Proposal Form, shall not govern.

The Proposal Form must be signed in ink by the Bidder. If the Bidder is an individual, the Bidder's name must be shown; by a partnership, the name of each partnership member must be shown; as a joint venture, the name of each member or officer of the firms represented by the joint venture must be shown; by a corporation, the name of the corporation and the authorized officers name must be shown.

14. BALANCED BIDS

Each Pay Item should reflect the actual cost which the Bidder anticipates incurring for the performance of that particular item, together with a proportional share of the Bidder's anticipated profit, overhead, and costs to perform work for which no separate Pay Item is provided. In no event will the Owner consider any claim for additional compensation arising from the bid on an item, or group of items, inaccurately reflecting a disproportionate share of the Bidder's anticipated profit, overhead, and other costs.

15. DELIVERY OF PROPOSALS

Each Proposal should be submitted in a sealed envelope or, if provided, in the special envelope furnished by the Owner. The envelope shall be filled in correctly to clearly indicate it as a Bid Proposal and not to open until date and time of bid opening. When an envelope other than the special one furnished by the Owner is used, it shall be of the same general size and shape and be similarly marked to clearly indicate its contents. The Proposal shall be mailed, or hand carried to the Owner at the address and in care of the official in whose office the bids are to be received. Proposals must be received prior to or at the time and at the place specified in the Advertisement. Proposals will not be accepted after the receipt of bids has been declared closed by the Presiding Officer. Enclosed in the sealed envelope with the Proposal shall be submitted the following documents:

A. The BID SECURITY as described in GENERAL CONDITIONS Article “BID SECURITY.”
B. The Proposal Section is to be completed and submitted with the Proposal. The Proposal Section contains the following:

1. Bid Document Submission Checklist
2. Bid Guarantee
3. Certificate from a surety company
4. Listing of Subcontractors
5. Bidder’s acknowledgement of receipt of any notice(s) or revision(s) or addenda to an advertisement, specifications or bid document(s)
6. Bid Form

7. Federal Affirmative Action Form
8. Ability Questionnaire
9. Debarred List Affidavit
10. Submission of a Non-Collusion Affidavit
11. Prevailing Wage Act Compliance Declaration
12. Business Registration Certification
13. Any other additional submissions identified on the Bid Document Submission Checklist
14. General Contractor DPMC Classification or NJDOT Prequalification form(s) as required.

16. BID SECURITY

The Proposal, when submitted, shall be accompanied by a Bid Security satisfactory to the Owner, on the form furnished by the Owner, for a sum of not less than ten percent (10%) of the TOTAL BID PRICE but not to exceed $20,000.00. The Bid Security shall be properly filled out, signed, and witnessed, and shall be furnished only by such surety company or companies authorized to do business in the State of New Jersey as are listed in the current US Treasury Department Circular 570 as of the date for receipt of bids for the particular Project. The Proposal Bond shall be accompanied by a copy of the power of attorney executed by the Surety Company or companies. The power of attorney shall set forth the Owner of the attorney-in-fact who has signed the bond on behalf of the surety company to bind the company and shall further certify that such power is in full force and effect as of the date of the bond.

17. WITHDRAWAL OF PROPOSALS

A Bidder may withdraw a Proposal after it has been submitted to the Owner, provided the request for such withdrawal is received by the Owner, in writing or by telegram, before the time set for opening Proposals. Proposals shall not be withdrawn after the time designated for the public opening of such Proposal, except that when Proposals for more than one (1) project are to be opened at the same time, a Bidder, at his option, may submit a written request to withdraw his Proposal for the second or succeeding project. The Bidder shall notify the Owner, in writing, of his intent to exercise this option before the time set for opening of Proposals. In such event, a short interval of time will be allowed between project Proposal openings to allow the Bidder time to submit a written request for withdrawal of bid. Upon presentation of the written request at the proper time, a Bidder's Proposal will be returned unopened.

18. COMBINATION OR CONDITIONAL PROPOSALS

If the Owner so elects, Proposal Forms may be issued for projects in combination and/or separately, so that bids may be submitted either on the combination or on separate units of the combination. The Owner reserves the right to make awards on combination bids or separate bids to the best advantage of the Owner. Combination bids other than those specifically provided for in the Proposal Forms will not be considered. Separate Contracts will be awarded for each individual Project included in the combination. Conditional Proposals will be considered only when provided for in the Specifications.

19. ACKNOWLEDGEMENT OF REVISIONS

When Addenda and other forms of notice giving revisions and interpretations of the Contract Documents are mailed or otherwise transmitted to prospective Bidders, acknowledgement thereof must be made by the Bidder. The acknowledgment shall be sent or hand delivered to the office and/or individual noted on the form and must be received before the Proposal of the Bidder concerned is

opened. If the acknowledgment has not been received prior to the opening of bids, the bid envelope will be returned to the Bidder unopened.

20. PUBLIC OPENING OF PROPOSALS

Proposals will be opened and read publicly at the time and place indicated in the *Notice to Bidders* or such other time and place as may be established by Addendum. Bidders, their authorized agents, and other interested parties are invited to be present.

21. IRREGULAR PROPOSALS

Proposals will be considered irregular and may be rejected for the following reasons:

A. If the Proposal is on a form other than that furnished by the Owner or if the form is altered or any part thereof is detached or incomplete.
B. If the Proposal is not properly signed.
C. If the bid is not typed or not in ink
D. If there are unauthorized additions, conditional or alternate bids, or irregularities of any kind which may tend to make the Proposal incomplete, indefinite, or ambiguous as to its meaning.
E. If the Bidder adds any provisions reserving the right to accept or reject an award, or to enter into a contract pursuant to an award. The prohibition does not exclude a reservation limiting the maximum gross amount of awards acceptable to any one (1) Bidder at any one (1) bid letting. However, the Owner will make the selection of which Contract or Contracts are to be awarded to such Bidder within the maximum gross amount reserved.
F. If the Bidder makes an alteration of the "Unit Prices" or "Amounts" that have been included by the Owner, unless otherwise directed by Addendum received prior to receipt of bids.
G. Subject to GENERAL CONDITIONS Article “CONSIDERATION OF PROPOSAL,” if the Proposal does not contain a unit price for each Pay Item listed or a Total Contract Price. In the case of alternate items or alternate groups of items, the Bidder shall provide prices as stated in GENERAL CONDITIONS Article “PREPARATION OF PROPOSAL” and the Proposal.
H. If the Proposal is not accompanied by the Proposal Bond as specified in GENERAL CONDITIONS Article “PROPOSAL BOND.”
I. If acknowledgment of letters and other notices to prospective Bidders, giving revisions of or amendments to the Contract Documents, have not been received as prescribed in GENERAL CONDITIONS Article “ACKNOWLEDGEMENT OF REVISIONS.”
J. If the Executive Director deems it advisable to do so in the interest of the Owner.

22. DISQUALIFICATION OF BIDDERS

Any of the following reasons may be considered as being sufficient for the disqualification of a Bidder and the rejection of his Proposal:

A. More than one (1) Proposal for the same work from an individual, firm, partnership, corporation, or combination thereof, under the same or different names. Reasonable grounds for believing that any individual, firm, partnership, corporation, or combination thereof, is interested in more than one (1) Proposal for the work contemplated may cause the rejection of all Proposals in which such individual, firm, partnership, corporation, or combination thereof, is interested.

B. Evidence of collusion among Bidders. Participants in such collusion will not be permitted to submit bids for future work of the Owner until reinstatement as a qualified Bidder by the Executive Director.
C. If any Pay Item bid price is obviously unbalanced. However, non-rejection of a bid on this basis shall not be deemed to be a determination by the Owner that the bid is balanced.
D. Uncompleted work which, in the judgment of the Owner, might hinder or prevent the prompt completion of additional work, if awarded.
E. Failure to satisfy the requirements of the Minority Utilization attachments included in the Specifications.

23. RESERVED

24. RESERVED

AWARD AND EXECUTION OF CONTRACT

25. CONSIDERATION OF PROPOSALS / BID DISCREPANCIES

Where applicable, Bidders shall state on such form a unit price (**written in words and numbers**) for each item bid, and such unit prices shall be extended, and extensions added to produce a total bid price. For the purpose of the comparison of bids received, they are re-tabulated by the Owner. The total re-tabulated by the Owner will prevail.

When evaluating bids the following shall apply:

- Discrepancies between words and figures will be resolved in favor of words.
- Discrepancies between unit prices and totals of unit prices will be resolved in favor of the unit prices.
- Discrepancies in the multiplication of units of work and unit prices will be resolved in the favor of the unit prices.
- Discrepancies between the indicated total of multiplied unit prices and units of work and the actual total will be resolved in favor of the actual total.
- Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the corrected sum of the column of figures.
- Discrepancy where a unit price is bid for a Pay Item, but no extension is provided; the Owner will provide the extension based on the unit price bid and the estimated quantity for that Pay Item.
- Discrepancy where an extension is provided by the Bidder in the "Item Total" column, but no unit price appears in the "Unit Price" column of the Proposal Form, the Owner will provide the unit price by dividing the "Item Total" figure provided by the Bidder by the estimated quantity.

In the event a corporation not incorporated in the State of New Jersey is the lowest Bidder, it shall be authorized to do business in New Jersey pursuant to NJSA 14A:15 *et seq*.

The Owner may reject any and all Proposals when the Owner determines that it is in the public interest to do so. The Owner reserves the right to waive technicalities or to advertise for new Proposals.

26. AWARD OF CONTRACT

The Award will be made to the lowest responsible Bidder whose Proposal conforms in all respects to the requirements set forth in the Contract Documents. The Owner will award the Contract or

reject all bids 90 calendar days after the bids are received. The Owner may make a Conditional Award pending the approval of the Federal Government, another State governmental body, or private party. Should the Contract not be awarded or conditionally awarded within 90 calendar days, all Bidders shall have the right to withdraw their bids. However, the Owner and the lowest responsible Bidder and/or the second lowest responsible Bidder can agree to extend the time within which the Owner may make an award or conditional award by mutual consent.

For AIP Contracts, unless otherwise specified in this Section, no award shall be made until the FAA has concurred in the Owner's recommendation to make such award and has approved the Owner's proposed contract to the extent that such concurrence and approval are required by 49 CFR Part 18.

At the time of Award or Conditional Award to a Bidder not a resident of the State of New Jersey, such Bidder shall appoint, on the form furnished by the Owner, a proper agent in the State of New Jersey on whom service can be made in event of litigation of any type arising under the Contract or as a result of performance of the Contract. Said agency shall remain in effect during the performance of the Contract and for six (6) years following Acceptance.

The Award or Conditional Award is not binding upon the Owner until the Contract has been executed by the Owner's Executive Director, nor shall any work be performed on account of the proposed Contract until the prospective Contractor has been notified that the Contract has been executed by the Executive Director, and then only as provided in GENERAL CONDITIONS Article "COMMENCEMENT OF WORK."

27. CANCELLATION OF AWARD

The Owner reserves the right to cancel an Award or Conditional Award at any time before the execution of said Contract by all parties without any liability against the Owner.

28. RETURN OF BID SECURITY

All Bid Securities except those of the three (3) lowest Bidders will be returned to Bidders as soon as possible after the award of a contract. The Bid Security of the lowest and next lowest Bidders will be returned when the Contract and Performance Bond and Payment Bond have been executed and delivered in accordance with the provisions of GENERAL CONDITIONS Article "EXECUTION AND APPROVAL OF CONTRACT," or, if not executed, when other disposition of the matter has been made by the Owner. However, when the Award or Conditional Award has been annulled due to failure of the Bidder to whom award was made to execute and deliver the Contract and Performance Bond and Payment Bond, the Bid Security of such Bidder shall become operative as provided in GENERAL CONDITIONS Article "FAILURE TO EXECUTE CONTRACT."

29. EXECUTION AND APPROVAL OF CONTRACT

The Contract shall be signed by the successful Bidder and returned, together with the Performance Bond and Payment Bond, within ten calendar days of the date of receipt of the contract by the successful Bidder from the Owner. If the Contract is not executed by the Owner within 120 calendar days following receipt from the Bidder of the signed Contract and Performance Bond and Payment Bond, the Bidder shall have the right to withdraw his bid without penalty. The Contract is not effective until it has been fully executed.

30. PERFORMANCE BOND AND PAYMENT BOND

Within ten calendar days of the date of Award or Conditional Award, the Bidder to whom the Contract has been awarded shall complete and deliver a Performance Bond and a Payment Bond in accordance with the requirements of the Owner. Each bond shall be the sum of not less than the Total Contract Price and shall be maintained by the Contractor until Acceptance. In the event of the insolvency of the surety or if the Performance Bond and Payment Bond have not been properly authorized or issued by the Surety company, the Contractor shall furnish and maintain, as above provided, other surety satisfactory to the Owner.

All alterations, extensions of Contract Time, extra and additional work, and other changes authorized by the Contract Documents may be made without securing the consent of the surety or sureties of the bonds.

The surety corporation bonds shall be furnished by only those sureties listed in the US Treasury Department Circular 570 and authorized to do business in the State of New Jersey. The bonds shall be accompanied by a certification as to authorization of the attorney-in-fact to commit the surety company and a true and correct statement of the financial condition of said surety company.

31. FAILURE TO EXECUTE CONTRACT

Failure on the part of the Bidder to whom the Contract has been awarded to execute and deliver the Contract as provided in GENERAL CONDITIONS Article “EXECUTION AND APPROVAL OF CONTRACT”, and the bonds as provided in Article “PERFORMANCE BOND AND PAYMENT BOND”, in the manner and within the time provided, is just cause for annulment of the Award or Conditional Award and for the exclusion of the Bidder from bidding on subsequent projects for such period as the Owner may deem appropriate. If the Award is annulled for the above reasons, the Proposal Bond, as described in GENERAL CONDITIONS Article “PROPOSAL BOND,” shall become forfeited and the Owner may proceed to recover under the terms and provisions of the Proposal Bond. Award may then be made to the next lowest responsible Bidder, or the Work may be re-advertised and constructed under contract, or otherwise, as the Owner may decide. The successful Bidder may file with the Owner a written notice, signed by the Bidder or the Bidder's authorized representative, specifying that the Bidder refuses to execute the Contract. The filing of such notice has the same force and effect as the failure of the Bidder to execute the Contract and furnish a Performance Bond and Payment Bond within the time herein before prescribed.

32. RESERVED

33. RESERVED

SCOPE OF WORK

34. INTENT

The Contract Documents are complementary, and what is called for by one part shall be as binding as if called for by all. The intent of the Contract Documents is to describe a functionally complete and aesthetically acceptable Project to be constructed and completed by the Contractor in every detail in accordance with the Contract Documents. Any Work that may be reasonably inferred from the Contract Documents as being required to produce the intended result shall be supplied whether or not specifically called for. Where the Contract Documents describe portions of the Work in general terms, but not in complete detail, it is understood that only the best construction practice is to prevail and only materials and workmanship of the first quality are to be used. The intent of the Documents is to include all work (except specific items to be furnished by the Owner) necessary for completion of the Contract. Materials or work described in words that indicate the proper execution and a well-known technical or trade designation shall be held to refer to such recognized standards. Only where the Contract Documents specifically describe a portion of the Project as being performed by others is the Work deemed not to constitute construction of the entire Project. It is understood and agreed that the written terms and provisions of the Contract Documents represent the entire and integrated agreement between the parties hereto and supersede all prior negotiations, representations, or agreements, either written or oral.

35. CHANGES

The Owner reserves the right to make such alterations, deviations, additions to, or omissions from the Contract Documents, including the right to increase or decrease the quantity of any Pay Item or portion of the Work or to omit any Pay Item or portion of the Work, and to require Extra Work as needed for the satisfactory completion of the Project. Such increases or decreases, alterations, and omissions do not invalidate the Contract nor release the Surety, and the Contractor agrees to accept the Work as altered, the same as if it had been a part of the original Contract.

Changes which solely involve the increase or decrease in the quantity of Pay Items (not involving unit price adjustments pursuant to GENERAL CONDITIONS Articles “INCREASED OR DECREASED QUANTITIES” and “PAYMENT FOR MODIFICATIONS,” the elimination of Pay Items, the adjustment of the estimated quantities in the Proposal as the result of as-built calculations, or minor changes in the Work as provided in GENERAL CONDITIONS Article “MINOR CHANGES IN THE WORK,” may be effected by Field Order or Change Order, as determined by the Engineer. All other changes will be included in a Change Order which specifies, in addition to the Work to be done, an adjustment of Contract Time, if any, and the basis of compensation for such Work. A Change Order submitted by the Engineer does not become effective until appropriate signatures have been affixed. Once a certain monetary threshold has been exceeded, Change Orders require Board of Commissioners approval. Once the Board of Commissioners has approved the proposed Change Order, the Governor has a subsequent 30 day veto period.

Upon receipt of a Field Order or Change Order, the Contractor shall proceed with the ordered Work. Where the changes involved require a Change Order, and a Change Order has not yet been issued, the Engineer may direct, by Field Order, that the Contractor proceed with the desired Work, and the Contractor shall comply. In such cases, the Engineer will, as soon as practicable, issue a Change Order for such Work. When the compensation for an item of Work is subject to adjustment under the provisions of GENERAL CONDITIONS Articles “PROCEDURES AND PROTEST,” “INCREASED OR DECREASED QUANTITIES,” “ELIMINATED ITEMS,” “CHANGES IN CHARACTER OF WORK,” “EXTRA WORK,” “NOTIFICATION OF CHANGES” or “PAYMENT FOR MODIFICATIONS,” the Contractor shall, upon request, furnish the Engineer with adequate detailed cost data for such item of Work. If the Contractor requests an adjustment in compensation for an item of Work as provided in GENERAL CONDITIONS Articles “INCREASED OR DECREASED

QUANTITIES" and "PAYMENT FOR MODIFICATIONS," such cost data shall be submitted with the request.

In addition to Field Orders and Change Orders, the terms and conditions relating to changes may be negotiated with the Contractor. If the Contractor signifies acceptance of such terms and conditions by executing a Supplementary Agreement, and if such Supplementary Agreement is approved by the Owner, the Engineer will issue payment to the Contractor in accordance with the terms and conditions as to compensation and adjustments in the Contract Time therein set forth which shall constitute full compensation and mutually acceptable adjustment of Contract Time for all Work included therein or required thereby. The Contractor agrees that a proposed Supplementary Agreement which is not approved by the Owner and Governor, or which is rejected by the Contractor shall have no effect and that neither may attempt to use it in any litigation which may result from the Contract.

If the Contractor intends to assert a claim for an equitable adjustment under this Article, he must, within seven (7) days after receipt of the Owner's alterations, deviations, additions to, omissions from the Contract Documents, or directed Extra Work and prior to performing the work, submit to the Owner a written statement setting forth the general nature and monetary extent of such claim.

No claim for additional compensation shall be made because of any such alteration, deviation, addition to, or omission from the Work required by the Contract, by reason of any variation between the approximate quantities in the Bid Form and the quantities of Work as done, by reason of Extra Work, by reason of elimination of Pay Items, or by reason of changes in the character of Work except as allowed in this Section. Attention is directed to GENERAL CONDITIONS Articles "BALANCED BIDS."

No claim for additional compensation or extension of Contract Time within the scope of this Section will be allowed if asserted after Acceptance. No claim by the Contractor for an equitable adjustment hereunder shall be allowed if asserted after final payment under this Contract.

36. MINOR CHANGES IN THE WORK

The Resident Engineer has the Owner to order minor changes in the Work not involving an adjustment to the unit or lump sum prices, or an adjustment to Pay Items, or an extension of Contract Time, and not inconsistent with the intent of the Contract Documents. Such changes may be effected by Field Order and are binding on the Owner and the Contractor. Additional compensation or extension of Contract Time will not be allowed.

37. PROCEDURE AND PROTEST

A Field Order or Change Order may be issued at any time. Should the Contractor disagree with any terms or conditions set forth in a Field Order or a Change Order, the Contractor shall submit a written protest to the Engineer within seven (7) days after the receipt of such Field Order or Change Order or prior to performing the work. The protest shall state the points of disagreement, and, if possible, the specification references, quantities, and costs involved. The protest shall be a specific, detailed statement of the points of disagreement, and the Engineer reserves the right to reject general protests. Rejected general protests, which are not cured by the submission of a specific, detailed statement within five (5) days of such rejection will not be considered. If a written protest is not submitted, payment will be made as set forth in the Field Order or Change Order and such payment constitutes full compensation for all Work included therein or required thereby and also is conclusive as to any Contract Time adjustments provided for therein or in establishing that no Contract Time adjustment was warranted.

Protests related to Work ordered by Field Order, but as to which a Change Order is required, shall be made within seven (7) days after receipt of the Field Order or prior to performing the work. Subsequent issuance of the Change Order shall not be the basis for a protest except to the extent that the Change Order differs materially from the Field Order.

Where the protest concerning a Field Order or a Change Order relates to compensation, the compensation payable for all Work specified or required by said Field Order or Change Order to which such protest relates, if later deemed appropriate by the Engineer, will be determined as provided in GENERAL CONDITIONS Articles "PAYMENT FOR MODIFICATIONS," "INCREASED OR DECREASED QUANTITIES," "ELIMINATED ITEMS," "CHANGES IN CHARACTER OF WORK," and "EXTRA WORK." The Contractor shall keep full and complete records of the cost of such Work and shall permit the Engineer to have such access thereto consistent with GENERAL CONDITIONS Article "AUDIT: ACCESS TO RECORDS," as may be necessary to assist in the determination of the compensation payable for such Work.

Where the protest concerning a Change Order relates to the adjustment of Contract Time, the time to be allowed, if later deemed appropriate, will be determined as provided in GENERAL CONDITIONS Articles "TERMINATION FOR DEFAULT, DAMAGES FOR DELAY, TIME EXTENSIONS," "CLAIMS FOR ADDITIONAL TIME AND/OR COMPENSATION" and "EXTENSION OF TIME."

38. INCREASED OR DECREASED QUANTITIES

Increases or decreases in the quantity of a Pay Item will be determined by comparing the total actual quantity of such item of Work with the quantity contained in the Proposal. In making such a comparison, quantities which are the subject of Supplementary Agreements or Change Orders for Extra Work will not be considered.

Minor Pay Items are not eligible for any adjustment in unit price regardless of how much the total as-built quantity varies from the quantity contained in the Proposal unless eligible for adjustment pursuant to GENERAL CONDITIONS Article "CHANGES IN THE CHARACTER OF THE WORK".

If the total pay quantity of any Major Pay Item varies from the estimate contained in the Proposal by more than 25 percent, payment will be made in accordance with the following categories:

A. Increases of More Than 25 Percent

1. Lump-Sum Items - Should the total actual quantity of or actual component quantity for lump sum Items of any Major Pay Item exceed the estimate contained in the Proposal by more than 25 percent, the Work in excess of 125 percent of such estimate will be paid for by adjusting the unit price, as hereinafter provided. Alternatively, the Contractor and Engineer may request in writing to negotiate a Supplementary Agreement for such adjustment.

2. Unit Price - Such adjustment of the unit price is to be the difference between the unit price and the actual unit cost, which will be determined as hereinafter provided. If the costs applicable to such item of Work include overhead, such overhead will be deemed to have been recovered by the Contractor by the payments made for the 125 percent of the Contract quantity for such item already paid, and in computing the actual unit cost, such overhead will be excluded. Subject to the above provisions, such actual unit costs will be determined in the same manner as if the Work were to be paid for on a Force Account basis as provided in GENERAL CONDITIONS Article "PAYMENT FOR MODIFICATION."

When the compensation payable for the number of units of an item of Work performed in excess of 125 percent of the Engineer's estimate is less than $1,500 at the applicable unit price, the Engineer reserves the right to make no adjustment in said price if the Engineer so elects, except that an adjustment may be made if requested in writing by the Contractor.

B. Decreases of More than 25 Percent

1. Lump Sum - Should the total actual quantity or component quantity for lump sum Items of any Major Pay Item be less than 75 percent of the estimate contained in the Proposal Form, an adjustment in compensation pursuant to this Article will not be made unless the Contractor so requests in writing. If the Contractor so requests, the quantity of said item performed will be paid for by adjusting the unit price as hereinafter provided, or at the option of the Engineer, payment for the quantity of the Work of such item performed will be made on the basis of Force Account as provided in GENERAL CONDITIONS Article “PAYMENT FOR MODIFICATION,” provided, however, that in no case shall the payment for such Work be less than that which would be made at the unit price bid. Alternately, the Contractor or Engineer may request in request to negotiate a Supplementary Agreement for such adjustment.

2. Unit Price - Such adjustment of the unit price is to be the difference between the unit price and the actual unit cost, which will be determined as hereinafter provided, of the total actual quantity of the item, including overhead. Such actual unit cost will be determined in the same manner as if the Work were to be paid for on a Force Account basis as provided in GENERAL CONDITIONS Article “PAYMENT FOR MODIFICATION.”

The payment for the total actual quantity of such item of Work is not to exceed the payment which would be made for the performance of 75 percent of the estimate contained in the Proposal for such item at the original unit price bid or component cost for lump sum items.

39. ELIMINATED ITEMS

Should any Pay Item contained in the Proposal be found unnecessary for the proper completion of the Work, the Engineer may, upon written order to the Contractor, eliminate such item from the Contract. In such case compensation, if any is appropriate, will be made as provided in this Article.

If acceptable material is ordered by the Contractor for the eliminated item prior to the date of notification of such elimination and if orders for such material cannot be canceled, material will be paid for at the actual cost to the Contractor. In such case, the material paid for becomes the property of the Owner, and the actual cost of any further handling will be paid for by the Owner. If the material is returnable to the vendor, and if the Engineer so directs, the material shall be returned, and the Contractor will be paid for the actual cost or charges made by the vendor for returning the material. The actual costs of handling returned material will be paid for by the Owner.

The actual costs or charges will be computed in the same manner as if the Work were to be paid for as provided in GENERAL CONDITIONS Article “PAYMENT FOR MODIFICATIONS.” However, no profit will be allowed.

40. DIFFERING SITE CONDITIONS

A. The Contractor shall immediately, and before such conditions are disturbed, except in the event of an emergency, notify the Owner by written notice of:

1. Subsurface or latent physical conditions at the site differing materially from those indicated in this Contract; or

2. Unknown physical conditions at the site, of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in the work of the character provided for this Contract.

The Engineer shall promptly investigate the conditions. If he finds that such conditions do materially differ and cause an increase or decrease in the Contractor's cost of, or the time required for, performance of any part of the work under this Contract, whether or not changed as a result of such conditions, an equitable adjustment shall be made and the Contract modified in writing accordingly.

B. No claim of the Contractor under this Article shall be allowed unless the Contractor has given the notice required in Paragraph A of this Article, except that the Owner may extend the prescribed time.

C. No claim of the Contractor shall be allowed if filed later than thirty (30) days after the differing site condition has been overcome unless such period is extended by the Owner.

D. No claim by the Contractor for an equitable adjustment hereunder shall be allowed if asserted after final payment under this Contract.

41. CHANGES IN CHARACTER OF WORK

If the Engineer determines that an ordered change in the Work materially changes the character of the Work of a Pay Item, or a portion thereof, and if the change substantially increases or decreases the actual unit cost of such changed item as compared to the actual or estimated cost of performing the Work of said item in accordance with the Contract Documents originally applicable thereto, in the absence of a Supplementary Agreement or unprotested Change Order specifying the compensation payable, an adjustment in compensation will be made in accordance with the following:

A. The basis of such adjustment in compensation will be the difference between the actual unit cost to perform the Work of said item or portion thereof involved in the change as originally planned and the actual unit cost of performing the Work of said item or portion thereof involved in the change, as changed. Actual unit costs will be determined in the same manner as if the Work were to be paid for as provided in GENERAL CONDITIONS Article “PAYMENT FOR MODIFICATIONS,” or such adjustment is as agreed to in a Supplementary Agreement. Any such adjustment is to apply only to the portion of the Work of said item actually changed in character.

B. At the option of the Engineer, the Work on said item or portion of item which is changed in character will be paid for as provided in GENERAL CONDITIONS Article “PAYMENT FOR MODIFICATIONS.”

C. If the compensation for an item of Work is adjusted under this Article, the costs recognized in determining such adjustment and quantity involved will be excluded from consideration in making an adjustment for such item of Work under the

provision in GENERAL CONDITIONS Article “INCREASED OR DECREASED QUANTITIES.”

Failure of the Engineer to recognize a change in character of the Work at the time a Field Order or Change Order is issued does not relieve the Contractor of the duty and responsibility of filing a written protest within the five (5) day limit as provided in GENERAL CONDITIONS Article “NOTIFICATION OF CHANGES.”

An adjustment in compensation will be made if there is an increase or decrease in excess of five percent (5%) in solid waste disposal costs incurred as a result of lawful increases or decreases in the rates, fees, or charges of the solid waste facility to be used or due to an order issued by the NJDEP in conjunction with the Bureau of Public Utilities directing the solid waste to be disposed at a solid waste facility other than the disposal facility previously used. Adjustments in compensation will be made in accordance with the provisions above. Adjustments in compensation will not be made if actual disposal costs have changed by less than five percent (5%) of the fee structure provided in accordance with the requirements of GENERAL CONDITIONS Article “PROSECUTION OF THE WORK.”

42. EXTRA WORK

The Owner reserves the right to require Extra Work as needed for the satisfactory completion of the Project. Such Work will be designated as Extra Work when it is determined by the Engineer that such Work is not covered by any of the various items for which there is a bid price or combinations of such items. In the event portions of such Work are determined to be covered by some of the various items for which there is a bid price or combinations of such items, the remaining portion of such Work will be designated as Extra Work. Extra Work also includes Work specifically designated as Extra Work in the Contract Documents.

The Contractor shall do such Extra Work and furnish labor, material, and equipment therefor upon receipt of a Change Order, Field Order, or Supplementary Agreement. In the absence of such, the Contractor shall not perform, nor be entitled to payment for, such Extra Work.

Payment for Extra Work required pursuant to the provisions in this Article will be made as provided in GENERAL CONDITIONS Article “PAYMENT FOR MODIFICATIONS, or as agreed to in a Supplementary Agreement.

If the Contractor and the Engineer cannot agree on a Supplementary Agreement for Extra Work and the Engineer deems it inadvisable to have such Work completed on a Force Account basis as provided in GENERAL CONDITIONS Article “PAYMENT FOR MODIFICATIONS,” the Owner may elect to have such Work completed by others, and the Contractor shall not interfere therewith nor have any claim for additional compensation as the result of such election.

43. NOTIFICATION OF CHANGES

The Contractor shall promptly report Owner conduct which the Contractor believes to constitute a change to the Contract. Except for changes identified as such pursuant to GENERAL CONDITIONS Articles “CHANGES” and “MINOR CHANGES IN THE WORK,” the Contractor shall promptly notify the Engineer in writing within 14 calendar days from the date that the Contractor identifies any Owner conduct including actions, inactions, and written or oral communications, which the Contractor regards as a change to the Contract terms and conditions. In no event shall the Contractor begin Work nor incur any expenses with relation to the claimed change prior to giving notice. The notice shall state the following on the basis of the most accurate information available to the Contractor:

A. The date, nature, and circumstances of the conduct regarded as a change.
B. The name, function, and activity of each Owner individual and official or employee involved in or knowledgeable about such conduct.
C. The identification of any documents and the substance of any oral communication involved in such conduct.
D. In the instance of alleged acceleration of scheduled performance or delivery, the basis for the Contractor's claim of accelerations.
E. In the instance of alleged Extra Work, the basis for the Contractor's claim that the Work is extra.
F. The particular elements of Contract performance for which the Contractor may seek additional compensation under this Section including:
    (1) What Pay Items have been or may be affected by the alleged change.
    (2) What labor or materials or both have been or may be added, deleted, or wasted by the alleged change and equipment idled, added, or required for additional time.
    (3) To the extent practicable, what delay and disruption in the manner and sequence of performance and effect on continued performance have been or may be caused by the alleged change.
    (4) What adjustments to Contract price, delivery schedule, and other provisions affected by the alleged change are estimated.

Following submission of the notice, the Contractor shall diligently continue performance of the Contract to the maximum extent possible in accordance with the Contract Documents, unless such notice results in a direction by the Engineer, in which event the Contractor shall continue performance in compliance therewith, provided, however, that if the Contractor regards such direction itself as a change, notice shall be given as provided above. All directions, orders, and similar actions of the Engineer will be reduced to writing and copies thereof furnished to the Contractor. The Resident Engineer will promptly, and in any event within ten days after receipt of notice, respond thereto in writing. In such response, the Resident Engineer will do one of the following:

A. Confirm that the conduct of which the Contractor gave notice constitutes a change, and when necessary direct the mode of further performance.
B. Revise or rescind any communication regarded as a change.
C. Deny that the conduct of which the Contractor gave notice constitutes a change, and when necessary direct the mode of further performance; or
D. In the event the Contractor's notice information is inadequate to make a decision under Items A, B, or C of this paragraph, advise the Contractor as to what additional information is required, and establish the date by which it should be furnished and the date thereafter by which the Owner will respond.

If the Engineer confirms that Owner conduct effected a change as alleged by the Contractor, and such conduct causes an increase or decrease in the cost of, or the time required for performance of any part of the Work under the Contract, whether changed or not changed by such conduct, an adjustment in compensation will be made in accordance with the provisions of this Section, and the Contract will be modified in writing accordingly. In the case of drawings, designs, or specifications which are defective and for which the Owner is responsible, the adjustment will be made to include the cost and extension of Contract Time for delay reasonably incurred by the Contractor in attempting to comply with such defective drawings, designs, or specifications before the Contractor identified, or reasonably should have identified, such defect. When the cost of property made obsolete or excess as a result of a change confirmed by the Engineer pursuant to this Article is included in the adjustment in compensation, the Engineer has the right to prescribe the manner of disposition of such property. Adjustments will not be made which include increased costs or extensions of Contract Time for delay resulting from the Contractor's failure to provide adequate

notice or to continue performance as provided above. Any adjustments of Contract Time will be made pursuant to GENERAL CONDITIONS Articles “TERMINATION FOR DEFAULT, DAMAGES FOR DELAY, TIME EXTENSIONS,” “CLAIMS FOR ADDITIONAL TIME AND/OR COMPENSATION” and “EXTENSION OF TIME.”

The failure of the Contractor to give notice pursuant to the provisions of this Article shall constitute a waiver of any and all claims and damages which could have been avoided or mitigated had such timely notice been given. Moreover, no action or inaction of any person shall constitute a waiver of the Owner's absolute right to receive written notice of an alleged claim pursuant to this Article.

44. RIGHTS IN AND USE OF MATERIALS FOUND ON THE WORK

The Contractor, with the approval of the Engineer, may use on the Project such stone, gravel, sand, or other material determined suitable by the Engineer, as may be found in the excavation and will be paid both for the excavation of such materials at the corresponding unit price and for the Pay Item for which the excavated material is used except for the provisions for roadway excavation as provided by the contract. The Contractor shall replace at his own expense with other acceptable material all of that portion of the excavated material which was needed in the embankments, back fills, approaches, or otherwise. Charge for the materials so used will not be made against the Contractor. The Contractor shall not excavate or remove any material from within the Project location which is outside the grading limits, as indicated by the slope and grade lines, without written authorization. The Contractor will not be paid for the excavation so authorized and shall replace the excavated material at no cost to the Owner.

45. MAINTENANCE OF TRAFFIC

When the contract requires the maintenance of vehicular traffic on an existing road, street, or highway during the Contractor's performance of work that is otherwise provided for in the contract, plans, and specifications, the Contractor shall keep such road, street, or highway open to all traffic and shall provide such maintenance as may be required to accommodate traffic. The Contractor shall furnish erect, and maintain barricades, warning signs, flagmen, and other traffic control devices in conformity the requirements of the New Jersey Department of Transportation, unless otherwise specified herein. The Contractor shall also construct and maintain in a safe condition any temporary connections necessary for ingress to and egress from abutting property or intersecting roads, streets or highways.

On marine terminal projects it is the explicit intention of the contract that the safety of all persons, as well as the Contractor's equipment and personnel, is the most important consideration. It is understood and agreed that the Contractor shall provide for the free and unobstructed movement of cargo handling equipment and operators in the Marine Terminal Operations Areas with respect to its own operations and the operations of all his Subcontractors as specified in the Article titled “LIMITATION OF OPERATIONS.”

With respect to his/her own operations and the operations of all his/her Subcontractors, the Contractor shall provide marking, lighting, and other acceptable means of identifying: personnel; equipment; vehicles; storage areas; and any work area or condition that may be hazardous to the operation of cargo handling equipment, fire-rescue equipment, or maintenance vehicles at the marine terminal.

The Contractor shall make his/her own estimate of all labor, materials, equipment, and incidentals necessary for providing the maintenance of cargo handling and vehicular traffic as specified in this subsection.

The cost of maintaining the pedestrian and vehicular traffic specified in this subsection shall not be measured or paid for directly, but shall be included in the various contract items.

46. VALUE ENGINEERING

The term proposal as used in this Article is construed to mean a Value Engineering proposal submitted by the Contractor for changing the Plans, Specifications, or other requirements of the Contract. The Value Engineering proposal shall conform to the following:

A. Purpose and Scope - The intent of Value Engineering is to share with the Contractor any cost savings generated on the Contract as a result of a proposal or proposals offered by the Contractor and approved by the Owner. The purpose is to encourage the use of Contractor's ingenuity and experience in arriving at alternative, lower cost or time-saving construction methods other than those reflected in the Contract Documents, by the sharing of savings resulting therefrom. The proposals contemplated are those that could produce a savings to the Owner without, in the sole judgement of the Engineer, impairing essential functions and characteristics of the Project or a portion of the Work involved. They include but are not limited to safety, service life, stage construction, economy of operation, ease of maintenance, and desired appearance.

B. Submittal of Initial Proposal - An initial proposal is required for all Value Engineering proposals and shall outline the general technical concepts associated with the proposal and the estimated savings which will result.

The initial proposal will be reviewed by the Owner and, if found to be conceptually acceptable, approval to submit a final proposal will be granted by the Owner. A finding of conceptual acceptability of the initial proposal in no way obligates the Owner to approve the final proposal. The Contractor shall have no claim against the Owner as a result of the rejection of any such final proposal.

C. Submittal of Final Proposal - Final proposals will be considered only after Owner approval of the initial proposal in accordance with Subheading B above. Final proposals will not be considered if submitted after 50 percent completion of the Work has occurred, based on monthly estimates amounting to more than 50 percent of the total adjusted Contract price, unless the remaining Contract Time is one (1) year or more. As a minimum, the following materials and information shall be submitted with each final proposal plus any additional information requested by the Owner:

(1) A statement that the final proposal is submitted as a Value Engineering proposal.
(2) A description of the difference between the existing Contract requirements and the proposed change, and the comparative advantages and disadvantages of each, including considerations of safety, service life, economy of operations, ease of maintenance, and desired appearance.
(3) Complete plans, specifications, and calculations showing the proposed revisions relative to the original Contract features and requirements. All plans and engineering calculations shall bear the signature of a Professional Engineer licensed to practice in the State of New Jersey.
(4) A complete cost analysis indicating the final estimate costs and quantities to be replaced by the proposal, the new costs and quantities generated by the final proposal, and the cost effects of the proposed changes on operational, maintenance, and other considerations.

(5) A specific date by which a Change Order or Supplementary Agreement adopting the final proposal must be executed so as to obtain the maximum cost reduction during the remainder of the Contract. This date must be selected to allow the Owner ample time, usually a minimum of 60 days, for review and processing a Change Order or Supplementary Agreement. Should the Owner find that insufficient time is available for review and processing, it may reject the final proposal solely on such basis. If the Owner fails to respond to the final proposal by the date specified, the Contractor shall consider the final proposal rejected and shall have no claim against the Owner as a result thereof.

(6) A statement as to the effect the final proposal has on the Contract Time.

(7) A description of any previous use or testing of the final proposal on another Owner project or elsewhere and the conditions and results therewith. If the final proposal was previously submitted on another Owner project, indicate the date, the project, and the action taken by the Owner.

D. Conditions - Proposals will be considered only after Award of Contract and only when all of the following conditions are met:

(1) The Contractor is cautioned not to base any bid prices on the anticipated approval of a proposal and to recognize that such proposal may be rejected. In the event of rejection, the Contractor is required to complete the Contract in accordance with the Plans and Specifications and the prices bid.

(2) All proposals, approved or not approved by the Owner for use in the Contract, apply only to the ongoing Contract or Contracts referenced in the proposal. The proposals shall become the property of the Owner and shall contain no restrictions imposed by the Contractor on their use or disclosure. The Owner will have the right to use, duplicate, and disclose in whole or in part any data necessary for the utilization of the proposal. The Owner retains the right to use any accepted proposal or part thereof on any other or subsequent project without any obligation to the Contractor. This provision is not intended to deny rights provided by law with respect to patented materials or processes.

(3) If the Owner already has under consideration certain revisions to the Contract which are subsequently incorporated in a proposal, the Owner will reject the Contractor's proposal and may proceed with such revisions without any obligation to the Contractor.

(4) The Contractor shall have no claim against the Owner for any costs or delays due to the Owner's rejection of a proposal, including but not limited to development costs, anticipated profits, or increased materials or labor costs resulting from delays in the review of such proposal.

(5) The Engineer will determine as to whether a proposal qualifies for consideration and evaluation. The Engineer may reject any proposal that requires excessive time or costs for review, evaluation and/or investigations, or which is not consistent with the Owner's design policies and basic design criteria for the Project.

(6) The Engineer may reject all or any portion of Work performed pursuant to an approved proposal if the Engineer determines that unsatisfactory results are being obtained. The Engineer may direct the removal of such rejected Work and require the Contractor to proceed in accordance with the original Contract requirements without reimbursement for any Work performed under the proposal, or for its removal. Where modifications to the proposal are approved in order to adjust to field or other conditions, reimbursement is limited to the total amount payable for the Work at the

Contract prices as if it were constructed in accordance with the original Contract requirements. Such rejection or limitation of reimbursement does not constitute the basis of any claim against the Owner for delay or for any other costs.

(7) The proposal shall not be experimental in nature but shall have been proven to the Owner's satisfaction under similar or acceptable conditions on another Owner project or at another location acceptable to the Owner.

(8) Proposals will be considered only if equivalent options are not already provided in the Contract Documents.

(9) The proposal shall be made based on items of Work scheduled to be done by the Contractor. Anticipated cost savings based on revisions of utility relocations or other similar items to be done by others will not be considered. Proposals which may increase the cost of Work done by others will not be considered.

(10) The savings generated by the proposal must be of sufficient significance to warrant review and processing.

(11) If additional information is needed to evaluate proposals, this information must be provided in a timely manner, otherwise the proposal will be rejected. Such additional information could include, where design changes are proposed, results of field investigations and surveys, design computations, and field change sheets.

If the proposal is approved, the Contractor shall submit drawings, in Autodesk compatible CAD files and PDF digital files.

All plans and engineering calculations shall bear the signature of a Professional Engineer licensed to practice in the State of New Jersey. Proposals will not be considered that change the following:

a. The types, thicknesses, or joint designs of a concrete, a bituminous, or a stabilized surface or base course.

b. The thicknesses of the unbound material immediately underlying a concrete, a bituminous, or a stabilized surface or base course.

c. The basic design of bridges, defined as the type of superstructure and substructure, span length type and thickness of deck, type of beam and arrangement, geometrics, width, and under clearance.

d. The basic design of retaining walls.

e. The basic design of overhead sign supports or breakaway sign supports.

f. The type of noise barriers.

E. Payment - If the proposal is accepted, the changes and payment therefor will be authorized by Supplementary Agreement. Payment will be made as follows:

(1) The changes will be incorporated into the Contract by adjustments in the quantities of Pay Items, agreed upon Extra Work Items or by Force Account, as appropriate, in accordance with the Specifications.

(2) The cost of the revised Work as determined from the aforementioned changes will be paid in accordance with GENERAL CONDITIONS Article “MEASUREMENT AND PAYMENT.” In addition to such payment, upon Completion, the Owner will pay to the Contractor, under a separate Pay Item, 50 percent of the actual savings as reflected by the difference between the above as-built payment and the cost of the related construction required by the original Contract Documents computed at Contract bid prices. However, the Owner may disregard the Contract bid

prices if such prices do not represent the value of the Work to be performed or to be deleted.

(3) The Owner's costs for review and processing of the proposal will not be deducted from the savings.

(4) The Contractor's costs for development, design, and implementation of the proposal are not eligible for reimbursement.

(5) The Contractor may submit proposals for an approved Subcontractor, provided that reimbursement is made by the Owner to the Contractor and that the terms of the remuneration to the Subcontractor are satisfactorily negotiated and accepted before the proposal is submitted to the Owner. Subcontractors may not submit a proposal except through the Contractor.

47. FINAL CLEANUP

Before final inspection and Completion, borrow and local material sources and all areas occupied by the Contractor in connection with the Work shall be cleaned of all rubbish, excess materials, temporary structures, and equipment, and all parts of the Work shall be left in an acceptable condition. If the Contractor fails to complete final cleanup within the time stated in the Specifications for the completion of the Contract or within such further time as may have been granted in accordance with the provisions of the Contract, the Contractor shall pay the Owner liquidated damages pursuant to GENERAL CONDITIONS Article “LIQUIDATED DAMAGES OR ACTUAL DAMAGES FOR DELAY.”

48. RESERVED

49. RESERVED

CONTROL OF WORK

50. COMMUNICATIONS

Unless otherwise directed, all communications with the Owner shall be sent to the Engineer. Where communications are directed to persons other than the Engineer, a clear copy shall be sent to the Engineer.

51. THE OWNER’S PROJECT ADMINISTRATION

Information or services under the Owner's control shall be furnished by the Owner through the Engineer with reasonable promptness so as to avoid delay in the orderly progress of the work. All instructions to the Contractor shall be issued through the Engineer.

52. AUTHORITY OF THE ENGINEER

The Engineer shall be the Owner's representative during the construction period. His authority and responsibility shall be limited to the provisions set forth in these Contract Documents. The Engineer will decide all questions which may arise as to the quality and acceptability of the Work and shall have the Owner to reject defective work and materials whenever such rejection may be necessary to assure execution of the Contract in accordance with the intent of the Contract Documents. The Engineer will further decide all questions, which may arise as to the rate of progress of the Work as related to crews, equipment and work hours, interpretation of the Contract Documents, the acceptable fulfillment of the Contract on the part of the Contractor, and all questions as to compensation. All questions as to the interpretation of the Contract Documents shall be submitted to the Engineer in writing.

The Engineer shall have the authority to interpret project schedule requirements and to establish the necessary priorities for resolving conflicts between Contractors, and to enforce such measures as may be necessary to maintain overall project schedules. It is the intent of this Article that there shall be no delays in the progress of the critical elements of the project work, and the decision of the Engineer as rendered shall be promptly observed. The Engineer has the authority to suspend the Work wholly or in part pursuant to GENERAL CONDITIONS Article “SUSPENSION OF WORK” or “TEMPORARY SUSPENSION OF WORK” and to suspend partial payments under GENERAL CONDITIONS Article “PARTIAL PAYMENTS” due to the failure of the Contractor to correct conditions unsafe for the workers or the general public, for failure to carry out provisions of the Contract, or for failure to carry out orders. The Engineer may also suspend the Work wholly or in part for such periods as deemed necessary due to unsuitable weather, for conditions considered unsuitable for the prosecution of the Work, or for any other condition or reason deemed to be in the public interest.

53. DUTIES AND RESPONSIBILITIES OF THE ENGINEER

The Engineer is responsible for the administration of the Contract. This responsibility includes the authority to reject defective material and to suspend any and all the Work in accordance with GENERAL CONDITIONS Articles “SUSPENSION OF WORK” and “TEMPORARY SUSPENSION OF WORK.” The Engineer will make periodic observations at the site of the project to determine the progress, quantity, and quality of the work and to determine, in general, if the work is proceeding in accordance with the intent of the Contract Documents. He shall not be required to make comprehensive or continuous inspections to check quality or quantity of the work. He shall not be responsible for construction means, methods, techniques, or procedures, or for safety precautions and programs in connection with the work. He shall not be responsible for the Contractor's failure to execute the work in accordance with Contract Documents. Observations made by the Engineer shall not relieve the Contractor of his obligation to conduct comprehensive inspections of the work and to furnish materials, to perform acceptable work, and to provide adequate safety precautions in conformance with the intent of the Contract Documents.

The Engineer will not be responsible for the acts or omissions of the Contractor, or any Subcontractor, or of the agents or employees of any Contractor or Subcontractor, or any other persons at the site or otherwise executing any of the work.

All claims by the Contractor arising from interpretation of or performance under the Contract Documents shall, in the first instance, be submitted to the Engineer, who shall issue his determination in writing within a reasonable period of time. If the Contractor considers that a determination made by the Engineer hereunder is not in accord with the meaning and intent of the Contract, the Contractor may, within fifteen (15) days from the receipt of the Engineer's determination, file with the Engineer a written objection to the Engineer's initial determination. The Contractor’s written objection shall contain detailed arguments and all documentation necessary to support the objection. The Engineer shall consider and review the Contractor's written objection to the initial determination, with detailed supporting documentation, and render a final determination on the issue within a reasonable period of time. Failure to provide such detailed arguments and documentation shall be considered acceptance of the determination, and the determination shall become final and conclusive. Failure to file a written objection to the final determination, which requests a hearing before the Owner's Executive Director, within fifteen (15) days, shall be considered acceptance of final determination.

The Engineer's initial determination, the filing of the written objection thereto, and the Engineer's determination of such objection shall be a condition precedent to the right to request a hearing before the Owner's Executive Director, as provided for in Article "DISPUTES" of these GENERAL CONDITIONS. Thereafter, unless the Contractor and the Owner amicably resolve the matter, it shall be subject to the provisions of the Article "DISPUTES" of the GENERAL CONDITIONS.

54. INSPECTORS

The Owner may appoint (either directly or through the Engineer) such inspectors as the Owner deems proper, to inspect the materials furnished and the work performed for compliance with the Contract Documents. The Inspectors are authorized to inspect all Work. Such inspection may extend to all or any part of the Work and to the preparation, fabrication, or manufacture of the materials to be used. The Inspector is not authorized to alter or waive the provisions of the Contract. The Inspector is not authorized to issue instructions contrary to the Contract Documents or to act as foreman for the Contractor; however, the Inspector has the Owner to reject Work subject to confirmation with the Engineer. The Contractor shall allow access and furnish all reasonable assistance required by the Engineer or Inspectors for the proper inspection of the work.

55. INSPECTION BY CONTRACTOR

The Contractor shall observe and inspect the quality and accuracy of his own work and work executed by his Subcontractors. Deficiencies found in the work shall be corrected prior to requesting inspection by the Engineer.

Inspection by the Engineer shall not relieve the Contractor from any obligation to perform his work strictly in accordance with the Contract Documents. Defective work performed shall be removed and replaced by the Contractor at his own expense.

56. INSPECTION OF WORK

Each part or detail of the Work is subject to inspection by the Engineer. The Engineer shall be allowed access to all parts of the Work and shall be furnished with such information and assistance by the Contractor as is required to make a complete and detailed inspection. When the Engineer is in or about the site of the Work in the course of his employment, the Engineer is deemed conclusively to be an invitee of the Contractor. If the Contractor is not the Owner of the place where fabrication, preparation, or manufacture is in progress, the Owner thereof shall be deemed to be the agent of the Contractor with respect to the obligation assumed hereunder. The Contractor or his agent shall be responsible for the payment of claims for injuries to the Engineer due to negligence on the part of the said Contractor or his agent.

The Engineer may order any Work done without the Engineer's inspection to be removed and replaced at the Contractor's expense. Payment for the Work will be made and the uncovering, or removing, and the replacing of the covering, or making good of the parts removed, of the uninspected Work will be paid for as Extra Work only if all of the following conditions are met:

1. The Work removed, uncovered, and/or replaced proves to have been acceptable in accordance with the Contract Documents; and
2. The Contractor gave reasonable notice in writing to the Owner that the uninspected work was to be performed; and
3. The Contractor, in performing the uninspected work, did not do so in the face of a directive from the Owner that such work not be performed.

Projects financed in whole or in part with Federal funds are subject to inspection at all times by the Federal agency involved, or such other Federal agencies as the United States requires. Such inspection does not make the Federal Government a party to this Contract. When any unit of government or political subdivision or any railroad is to pay a portion of cost of the Work covered by the Contract, its respective representatives shall have the right to inspect the Work. Such inspection does not make any such unit of government or political subdivision or any such railroad a party to the Contract and shall in no way interfere with the rights of either party hereunder.

The Contractor is responsible for carrying out the provisions of the Contract at all times and for control of the quality of the Work regardless of whether an authorized Inspector is present or not. This obligation to perform the Work in accordance with the Contract Documents is not relieved by the observations of the Engineer in the administration of the Contract, nor by inspections, tests, or approvals by others. Work not meeting the Contract requirements shall be made good, and unsuitable Work may be rejected, notwithstanding that such Work had been previously inspected and approved by the Owner or that payment therefor has been included in an estimate.

57. QUALITY CONTROL & QUALITY ASSURANCE TESTING

Quality control testing: The Contractor shall be responsible for all quality control testing as required and as specified in the technical sections of the Project Manual. All testing shall be performed by an Independent Testing Laboratory hired by the Contractor and approved by the Engineer. The Independent Testing Laboratory shall not be subject to control, restriction, modification or limitation from the Contractor and/or the project sub-Contractors. The Independent Testing Laboratory shall be certified to perform the testing by the appropriate certifying agency where said certification is either a requirement of the technical specifications or is considered industry standard. All cost associated with quality control testing shall be borne by the Contractor, and no separate payment will be made to the Contractor for this testing. The Contractor shall include the cost of quality control testing in either his lump sum bid or in the various items of work to which the quality control testing applies.

Quality assurance testing: The Engineer, in his discretion, may choose to perform quality assurance testing to verify that the construction or components thereof are in accordance with the contract documents. Said quality assurance testing is not obligatory on the part of the Engineer nor does performance of said quality assurance testing in any way obviate the performance of quality control testing on the part of the Contractor. The Contractor shall provide the Engineer, unhindered access to the Project for the performance of said quality assurance testing and shall assist the Engineer when necessary in the retrieval of samples for quality assurance testing of materials.

Should quality assurance testing indicate that the Work or portions of the Work do(es) not meet the specifications, the defective portion of the Work shall be removed and reinstalled correctly without cost to the Owner. Costs associated with quality assurance testing when Work is deemed to be deficient shall be borne by the Contractor. The Owner shall deduct these costs from payments due the Contractor. Otherwise, all costs associated with quality assurance testing shall be borne by the Owner.

58. SPECIAL INSPECTION, TESTING, OR APPROVAL

Whenever the Engineer considers it necessary or advisable to ensure the proper implementation of the Contract Documents, the Engineer has Owner to require special inspection or testing of the Work in addition to that required elsewhere in the Contract Documents, whether or not such Work be then fabricated, installed, or completed. However, neither the Engineer's Owner to act under this Article, nor any decision made by the Engineer either to exercise or not to exercise such Owner, creates a duty or responsibility of the Engineer to the Contractor, any Subcontractor, or any of their agents or employees performing any of the Work.

If after commencement of the Work the Engineer determines that any Work requires special inspection, testing, or approval not provided for elsewhere in the Contract Documents, the Engineer will perform such inspection, testing, or approval using Owner facilities, by contracting with others for such services, or by instructing the Contractor by Field Order to order special inspection, testing, or approval. If such special inspection or testing reveals a failure of the Work to comply with the requirements of the Contract Documents or, with respect to the performance of the Work, with laws,

ordinances, rules, regulations, or orders of any public Owner having jurisdiction, the Contractor shall bear all costs thereof, including the Engineer's additional services made necessary by such failure. If tests reveal no such failure, the Owner will bear such costs, and a Supplementary Agreement will be negotiated.

59. CONFORMITY WITH CONTRACT DOCUMENTS

All Work performed shall be in conformity with the lines, grades, cross-sections, dimensions, and material requirements, including tolerances shown in the Contract Documents. The purpose of tolerances is to accommodate occasional minor variations from the middle portion of the tolerance range that are unavoidable for practical reasons. When a maximum or minimum value is specified, the production and processing of the material and the performance of the Work shall be so controlled that the Work shall not be preponderantly of borderline quality or dimension. Although measurement, sampling, and testing may be considered evidence of conformity, the Engineer will determine whether the Work deviates from the Contract Documents.

In the event the Engineer finds the Work not in conformance with the Contract Documents but that reasonably acceptable Work has been produced, the Engineer will determine if the Work is to be accepted and remain in place. In this event, the Engineer will document the basis of the acceptability of the Work and provide for an appropriate adjustment in the contract price for such Work as deemed necessary. If an appropriate adjustment cannot be negotiated, the Work shall be removed and replaced or otherwise corrected at no cost to the Owner.

In the event the Engineer finds the Work not in conformance with the Contract Documents, including tolerances resulting in an inferior or unsatisfactory product, the Work shall be removed and replaced or otherwise corrected at no cost to the Owner.

Neither the observations of the Engineer in the administration of the Contract, nor inspections, tests, or approvals by persons other than the Contractor relieves the Contractor from his obligation to perform the Work in accordance with the Contract Documents.

EXAMINATION OF QUESTIONED WORK

At the direction of the Engineer, the Contractor, at any time before Acceptance, shall remove or uncover specified portions of the finished Work, which the Engineer had previously inspected. If such work is found to be in accordance with the Contract Documents, the Owner will issue a Modification Order authorizing payment for the cost of examination and replacement. The Contractor shall restore said portions of the Work to the standard required by the Contract Documents. If such work is found to be not in accordance with the Contract Documents, the Contractor shall correct the defective work, and the cost of examination and correction of the defective work shall be borne by the Contractor. If any work should be covered up without approval or consent of the Engineer, it shall, if examination is required by the Engineer, be uncovered at the Contractor's expense.

60. UNNOTICED DEFECTS

Any defective work that may be discovered by the Engineer before Contract Completion, or before final payment has been made, or during the guarantee period, shall be removed and replaced by work which shall conform to the provisions of the Contract Documents. Failure on the part of the Engineer to condemn or reject unacceptable work shall not be construed to imply acceptance of such work.

61. REMOVAL OF UNACCEPTABLE AND UNAUTHORIZED WORK

All Work that does not conform to the requirements of the Contract is unacceptable unless otherwise determined acceptable under the provisions in GENERAL CONDITIONS Article “CONFORMITY WITH CONTRACT DOCUMENTS.” Unacceptable Work, whether the result of poor workmanship, use of defective materials, damage through carelessness or any other cause, found to exist prior to Acceptance, shall be removed immediately and replaced in an acceptable manner at no cost to the Owner. Work shall not be done without lines and grades having been given by the Engineer or the Contractor as provided under GENERAL CONDITIONS Article “CONSTRUCTION STAKES, LINES, AND GRADES.” Work done contrary to the instructions of the Engineer, Work done beyond the lines shown on the Plans, except as herein specified, or any Extra Work done without Owner is considered as unauthorized and will not be paid for under the provisions of the Contract. Work so done may be ordered removed or replaced at no cost to the Owner. If the Contractor fails to comply promptly with any order of the Engineer made under the provisions of this Article, the Engineer will have Owner to cause unacceptable Work to be removed or replaced by others and to deduct the costs thereof from any monies due or that may become due the Contractor.

62. RIGHT TO RETAIN DEFECTIVE WORK

If any part or portion of the work executed under this Contract shall prove defective, and if the defect in the same shall not be of sufficient magnitude or importance as to make the work dangerous or unsuitable, or if the removal of such work will create conditions which are dangerous or undesirable, the Owner has the right and Owner to retain such work and the Owner may make such deductions in the final payment therefor as may be just and reasonable. Acceptance of such work shall in no way negate the guarantee on such work as set forth in the Article "GUARANTEE" of these GENERAL CONDITIONS.

63. LATENT DEFECTS

The Owner reserves and retains all of his rights and remedies at law against the Contractor and his Surety for the correction of any and all latent defects discovered after the guarantee period.

64. PROJECT MEETINGS

The Engineer will conduct project meetings for the purpose of discussing and resolving matters concerning the various elements of the work. Time and place for these meetings and the names of persons required to be present will be as directed by the Engineer. The Contractor shall comply with these attendance requirements and shall also require, if needed, his Subcontractors to comply.

65. INDEPENDENT CONTRACTOR

The Contractor shall execute all work under this Contract as an independent Contractor and neither he nor his Subcontractors at any time shall be considered as an agent of the Owner or Engineer.

66. SUPERINTENDENCE

The Contractor shall designate in writing before starting Work, a competent, English-speaking Superintendent capable of reading and thoroughly understanding the Contract Documents, and thoroughly experienced in the type of construction being performed. The Contractor shall inform the Engineer in writing of the name, address, and the telephone number (day and night) of such representative and shall submit the representative's resume of qualifications, years of experience, and names of previous projects on which he has worked in a supervisory capacity. The Superintendent shall have the Owner to represent and act for the Contractor. The Contractor shall

not remove or replace his authorized representative without notifying the Engineer. In the event the Contractor's representative ceases to be in his employ, the name and qualifications of an alternate representative shall be submitted to the Engineer. An alternate to the Superintendent, with equal Owner and qualifications, may also be designated. The Superintendent or the alternate shall be present at the site of the Project at all times while Work is actually in progress on the Contract irrespective of the amount of Work subcontracted.

The Superintendent or the alternate shall have full Owner to execute orders or direction from the Engineer, without delay, and to promptly supply such materials, equipment, tools, labor, and incidentals as may be required. When Work is not in progress and during periods when Work is suspended, arrangements acceptable to the Engineer shall be made for any emergency Work, which may be required.

Whenever the Superintendent or the alternate is not present on the site or at the location of any particular part of the Work where it may be desired to give direction, the Engineer may suspend all of the Work or the particular Work in reference until the superintendent or the alternate is present. Such suspension shall not be the basis of any claim against the Owner.

67. RECEPTION OF ENGINEER'S DIRECTIONS

The Superintendent, or other duly authorized representative of the Contractor, shall represent the Contractor in all directions given to him by the Engineer, and such directions, instructions, and other communications given shall be as binding as if given to the Contractor. Directions of major importance will be confirmed in writing, as will all directions, if requested by the Contractor.

68. ACCESS TO WORK

The Contractor shall provide to the Owner, Engineer, other Contractors working on the project, authorized government agents, and their representatives, at all times, safe access to the work wherever it is in preparation or progress. Such persons shall inform the Contractor of their visits and the Contractor shall provide facilities for such access and for such inspection in keeping with his responsibility for construction site control, including maintenance of temporary and permanent access.

69. AUTOMATICALLY CONTROLLED EQUIPMENT

Whenever equipment is required to be operated automatically under the Contract and a breakdown or malfunction of the automatic controls occurs, the equipment may be operated manually or by other methods only for the remainder of the working day on which the breakdown or malfunction occurs, provided this method of operation produces results which otherwise meet the Specifications.

70. LOAD RESTRICTIONS

Within the limits of the Project, the operation of equipment of such weight or so loaded as to cause damage to structures, the roadway, Port facilities, or to any other type of construction will not be permitted. Hauling of materials over the base course or surface course under construction shall be limited as directed. No loads will be permitted on a concrete surface course, base course, or structure before the expiration of the curing period. In no case shall legal load limits be exceeded when equipment is used for hauling to and from the Project site unless permitted in writing by the Director of Motor Vehicles and the South Jersey Port Corporation. The Contractor shall be responsible for all damage done by his hauling equipment.

The Owner will monitor the Contractor's observance of the legal load limits in accordance with the following:

1. For trucks with weigh tickets, a certified weigh ticket shall be furnished with each load.
2. For trucks without weigh tickets that are hauling material for items of 5,000 cubic yards or more, a list of trucks and their motor vehicle classifications shall be furnished prior to the start of work and shall be updated at the start of each construction season thereafter. A certified weigh ticket showing the gross weight shall be furnished with the first load for each truck for each item. The Engineer shall be notified in advance so that the first load can be documented by measurements and photographs.
3. For trucks hauling bituminous concrete from automated batch plants, a list of trucks including the certified tare weights and maximum allowable load for each shall be furnished prior to the start of work. This list shall be kept current and include all trucks to be used throughout the duration of the Project. Failure to provide this information will be cause for rejection of material.
4. For Portland cement concrete delivery trucks, a list of trucks including the certified tare weight and the maximum cubic yard load for each shall be furnished prior to the start of work and shall be updated at the start of each construction season thereafter.

Any truck found to be in excess of the legal load limit may have that load of material rejected for use on the Project. Repeated violations may be cause for suspension of operations until the condition is remedied to the satisfaction of the Engineer. No payment will be made for any material in excess of the legal truck load limit.

71. MAINTENANCE DURING CONSTRUCTION

Except as provided for below, the Contractor shall be responsible for maintenance within the Project limits until Acceptance pursuant to GENERAL CONDITIONS Article “COMPLETION AND ACCEPTANCE.” This maintenance shall consist of continuous and effective work prosecuted day by day, with adequate equipment and forces to the end that the roadway or Port facility is kept in satisfactory condition at all times.

In the case of a Contract requiring the placing of a course upon a course or subgrade previously constructed, the Contractor shall maintain the previous course or subgrade during all construction operations.

On any section opened to traffic, whether provided for in the Contract Documents or opened as directed, any damage to the roadway due to the Contractor's operations shall be repaired at no cost to the Owner.

The Contractor shall not be responsible for removal of ice or snow from sections of roadways or Port facility opened to traffic or for damage to the Project caused by the operation of snow plows or other snow removal or de-icing operations carried on by others under the supervision or direction of the Owner or of the various counties and municipalities.

The Contractor shall not be responsible for mowing unless an item for mowing is scheduled in the Bid Form or an item directs the Contractor to perform mowing.

All costs for maintenance during construction shall be included in the various Pay Items scheduled in the BID FORM.

72. FAILURE TO MAINTAIN ROADWAY

If the Contractor at any time fails to comply with the provisions of GENERAL CONDITIONS Article "MAINTENANCE DURING CONSTRUCTION," the Engineer will immediately notify the Contractor of such noncompliance. If the Contractor fails to remedy unsatisfactory maintenance within 24 hours after receipt of such notice, the Engineer may proceed to maintain the Project and deduct the entire cost of this maintenance from any monies due or that may become due the Contractor.

73. CONSTRUCTION STAKES, LINES, AND GRADES

The Owner shall only furnish benchmarks for vertical control and monuments for horizontal control.

The Contractor shall provide all survey services required in connection with the layout for construction of the Project, using the control points and data furnished by the Owner. The Contractor shall furnish all necessary qualified personnel, registered in the State of New Jersey, and adequate equipment to preserve such controls throughout the duration of the Contract and shall lay out all of the lines and grades necessary for the complete construction of the Project. Also, furnish the Engineer with any assistance required for checking lines, grades, and measurements established (other than the Owner established survey points) and necessary for the performance of the work. The Owner does not assume responsibility for the performance of the work as a consequence of this checking.

The Contractor shall make all necessary computations to establish the exact position of all the Work from the control points, which are shown on the Plans or furnished by the Owner. All the Work shall be referenced to baselines which the Contractor shall establish from the control points, re-establish when necessary, and maintain throughout the life of the Contract so as not to delay the Engineer from making necessary preliminary, interim, and final measurements and from checking the Contractor's layout if the Engineer so desires.

The Owner will lay out the work to be done by utility companies using the baselines established by the Contractor. The Engineer will notify the Contractor, in writing, not less than five (5) days in advance of when the baselines shall be established.

The Contractor shall be responsible for the preservation of all control points furnished by the Owner for its use in staking out the Work. If such control points are damaged, lost, displaced, or removed, they shall be reset at no cost to the Owner.

The Contractor shall provide and maintain offset stakes from each main roadway baseline, from each ramp, or turnaround baseline, and from each local road baseline, at each station, and outside the limits of grading and construction.

Each stake shall be identified and marked to show the offset distance from the baseline, and the Contractor shall furnish grade sheets showing the cut or fill to the finished profile lines with reference to the offset stakes. Grade sheets for construction of subbase and underlayer preparation shall also include calculations to establish the typical cross-section from the profile grade stake. The Contractor shall provide adequate and accurate offset lines during such construction that require occupation of the baseline points by construction operations.

The Contractor shall be responsible for maintaining the points it has established. Any error or apparent discrepancies found in the Plans or Specifications shall be called to the Engineer's attention in writing for interpretation prior to proceeding with the Work. The Contractor shall be responsible for the finished Work conforming to the lines and grades called for on the Plans, and the Contractor shall correct all errors caused by his personnel at no cost to the Owner.

Attention is directed to the need for caution in laying out and constructing storm drains or headwalls to ascertain that these items do not encroach on private property where easements have not been obtained.

Prior to the beginning of any construction work which requires accurate elevations, rough grading and clearing not included, the vertical control network shall be verified in the field by the Contractor's survey crew. The Contractor shall be responsible for the verification work. In most cases, some vertical control is provided for the Project as shown on the Plans. This control must be verified in the field using, at a minimum, third-order, Class I, procedural standards and equipment. In addition, supplemental benchmarks may be required to provide a denser network for efficient construction surveys. Any discrepancies or errors shall be brought to the attention of the Engineer for resolution prior to proceeding with the Work. The Contractor shall provide the Owner with the field notes and calculations of the field verification of the vertical control. The Contractor, in addition, shall provide to the Engineer a list of the existing and new benchmark elevations which will be used on the Project.

The Contractor's survey crew shall be responsible to recover, verify, and check the horizontal control shown on the Plans. The Contractor shall be responsible for all the verification work. The field verification shall be performed at the beginning of the Project, as the control line(s) establish(es) a network of control points which are the basis for all subsequent horizontal work on the Project.

The Contractor's survey crew shall use, at a minimum, third-order, Class I, accuracy and procedures to establish and re-establish the horizontal control line. The Project baseline(s) shall be verified and established during the early phases of the Project. This baseline establishes a network of control monuments which are the basis for all subsequent horizontal surveys on the Project. Any discrepancies or errors shall be brought to the attention of the Engineer for resolution prior to proceeding with the Work. The Contractor shall provide the field notes and calculations of the field verification work.

No separate payment will be made for Contractor’s Survey. The cost of the construction stakes, lines, and grades shall be absorbed by the Contractor in the prices bid for the various items of work.

74. COOPERATION BY CONTRACTOR

The Contractor shall give the Work the constant attention necessary to facilitate the progress thereof, and shall cooperate with the Engineer, the Owner’s Inspectors, and other Contractors in every way possible.

The Contractor shall be solely responsible for all construction means, methods, techniques, and procedures; and he shall provide adequate safety precautions, coordinate all portions of his own work with the work of his Subcontractor, schedule his work to avoid conflict with the Owner's operations, and cooperatively coordinate his work with the work of other prime Contractors performing work for the Owner.

When the Contractor is comprised of two (2) or more persons, firms, partnerships, or corporations functioning on a joint venture basis, said Contractor shall designate in writing, before starting Work, the name of one (1) individual who shall have the Owner to represent and act for the joint venture.

75. COOPERATION BETWEEN CONTRACTORS

The Owner reserves the right at any time to contract for and perform other or additional work on or near the Project site. When separate contracts are let within the limits of the Project, or in areas adjacent thereto, the Contractor shall conduct his Work so as not to interfere with or hinder the

progress or completion of the work being performed by other Contractors. Moreover, the Contractor assumes the positive obligation of cooperating with such other Contractors and coordinating his activities with theirs. If there is a difference of opinion as to the respective rights of the Contractor and others doing work within the limits of or adjacent to the Project, the Engineer will decide as to the respective rights of the various parties involved in order to secure the completion of the Owner's Work in general harmony and in a satisfactory manner. The decision of the Engineer is final and binding and is not cause for claims by the Contractor for additional compensation.

The Contractor shall assume all liability, financial or otherwise, in connection with his Contract, and hereby waives any and all claims against the Owner for additional compensation that may arise because of inconvenience, delay, or loss experienced by it because of the presence and operations of other Contractors working within the limits of or adjacent to the Project.

The Contractor shall arrange his Work and shall place and dispose of the materials being used so as not to interfere with the operation of the other Contractors within the limits of the Project or adjacent thereto. The Contractor shall join his Work with that of the others in an acceptable manner and shall perform it in proper sequence to that of the others.

The Contractor is not responsible for damage to Work performed on the Contract or on other contracts within or adjacent to the site of the Project that may be caused by or on account of the work of other Contractors. The Contractor is responsible for any damage done or caused by his Work or forces to the work performed by other Contractors within or adjacent to the site of the Project, and the Contractor shall repair or make good any such damage in a manner satisfactory to the Engineer and at no cost to the Owner.

The provisions of this Article also apply to utilities and their Contractors working on the Project site or adjacent thereto.

76. COOPERATION WITH UTILITIES

The Contractor shall cooperate with the owner of any public or private utility service, or a utility service of another government agency that may be authorized by the Owner to construct, reconstruct or maintain such utility services or facilities during the progress of the work. In addition, the Contractor shall control his/her operations to prevent the unscheduled interruption of such utility services and facilities.

To the extent that such public or private utility services, or utility services of another governmental agency are known to exist within the limits of the contract work, the approximate locations have been indicated on the plans.

It is understood and agreed that the Owner does not guarantee the accuracy or the completeness of the location information relating to existing utility services, facilities, or structures that may be shown on the plans or encountered in the work. Any inaccuracy or omission in such information shall not relieve the Contractor of his/her responsibility to protect such existing features from damage or unscheduled interruption of service. Any damage shall be immediately repaired on a continuous basis until service is restored.

Within the site of the Project there may be public utility structures, and notwithstanding any other clause or clauses of the Contract, the Contractor shall not proceed with his Work until it has made inquiry at the offices of the Engineer, the utility owners and municipal authorities, or other owners to determine their exact location. The Contractor shall notify, in writing, the utility owners and municipalities or other owners involved of the nature and scope of the Project, and of his operations that may affect their facilities or property. Two (2) copies of such notices shall be sent to the Engineer. The Contractor shall also comply with the State's Underground Facility Protection Act

and notify the State's One Call System and identify itself as the Owner's Contractor and specify the route and section number of the Project before performing Work on the Project. The One Call System can be reached by calling 1-800-272-1000.

The Contractor shall make a written request to the Engineer ten (10) working days in advance of the notice called for in the schedule to notify utility owners to proceed with each utility item. The Contractor's failure to give the ten (10) working days' notice hereinabove provided shall be cause for the Engineer to suspend the Contractor's operations in the general vicinity of a utility service or facility. The Contractor shall guarantee the site availability for utility operations. The Engineer will notify the utility owners to proceed if in the Engineer's opinion the site will be available for a particular item of utility work. In addition to the general written notification hereinbefore provided, it shall be the responsibility of the Contractor to keep such individual owners advised of changes in his/her plan of operations that would affect such owners.

Where the outside limits of an underground utility service have been located and staked on the ground, the Contractor shall be required to use excavation methods acceptable to the Engineer within 3 feet of such outside limits at such points as may be required to ensure protection from damage due to the Contractor's operations.

Utility items constructed or installed by the Contractor for a utility owner must meet the owner's specifications. The owner shall be given the opportunity to inspect the actual material to be installed as well as the installation. The Contractor shall notify the utility owner ten (10) days in advance of the beginning of construction of the utility items.

Electrical installations of the Owner constructed either before or as part of the Contract shall be considered a utility, and all provisions of this Article shall be applicable. The Contractor shall protect, support, and secure all in place utility facilities so as to avoid damage to them and their interruption of service. The Contractor shall satisfactorily maintain the flow in drains and sewers at all times.

The Contractor shall not move utility facilities without the owner's written consent, and the facilities shall be as safe and permanent at Completion as they were before the Contractor's involvement. In the event the Contractor damages a utility facility, the Contractor shall notify the owner immediately and the owner may require the damage to be repaired at the Contractor's expense. The Contractor shall pay for the repair of utility facilities damaged by the Contractor within 30 days of the completed repair or the Owner may retain sufficient monies due or about to be due the Contractor to reimburse the owner for the repair of its facility. The Contractor shall be responsible to repair house services damaged by the Contractor's operation and must have the repair performed by competent mechanics.

The Contractor shall permit the utility owners or their agents access to their facilities at all times and shall cooperate with them in performing their work. The Contractor shall be cognizant that where joint use poles or duct banks are used the time frames for work performed by each user are cumulative.

Should the Contractor, solely for his own convenience, cause the utility company to incur costs not covered by the utility agreement, or delay the utility company, or incur costs without prior written approval of the Resident Engineer, the Contractor shall be responsible for these costs.

The Contractor shall cooperate with the utility owners concerned and shall notify them, through the Engineer, not less than ten (10) days in advance of the time it proposes to perform any Work that may endanger or affect their facilities. The Contractor assumes the obligation of coordinating his activities with those of the utilities.

For the purpose of establishing the exact location of subsurface utilities, the Engineer may direct the excavation of test pits. Failure of the Engineer to direct the digging of test pits does not relieve the Contractor of his responsibilities regarding the protection and preservation of utilities.

It is understood and agreed that the Contractor has considered in his bid all of the permanent and temporary utility facilities in their present or relocated positions as may be shown on Plans, as described in Specifications and as revealed by his site investigation; is aware that utility company service demands, adverse field conditions and emergencies may affect the Owner's ability to comply with the proposed schedules for utility work; and is cognizant of the limited ability of the Owner to control the actions of the utilities, including the actions of railroads, and has made allowances in his bid that no further compensation or extensions of Contract Time will be granted for delays, inconvenience or damage sustained by the Contractor due to any interference from utility facilities or the operation of moving them.

In addition to the foregoing provisions, the following specific provisions relate to railroads only:

A. Railroad Traffic and Property - Where the Project includes Work across, over, under, or adjacent to railroad tracks or railroad right-of-way, the Contractor shall safeguard the traffic, tracks, and appurtenances, and other property of the railroad which may be affected by his work. The Contractor shall obtain the railroad's approval of the method of construction and timing of the Work. The Contractor shall comply with the regulations of the railroad relating to the Work, shall keep tracks clear of obstructions, and shall provide barricades, warning signs, lights, or other safety devices as required by the railroad. Payment for such safety devices will be made in accordance with Traffic Control Item(s).

All Work done within the railroad right-of-way is subject to the approval of the railroad company in matters affecting operations, railroad property, safety and train operation. The safety and continuity of railroad operation shall be the first priority when working in proximity to the railroad. The Contractor and Subcontractors shall protect and safeguard railroad interest at all times and arrange their work to avoid interruption of train movements and damage to facilities of the railroad. Railroad approval does not release the Contractor from responsibility or liability for any damage which the railroad may suffer, or for which the Contractor may be held liable, by the acts of the Contractor or those of his Subcontractors or employees.

The Contractor shall develop a schedule with the railroad for his work within the railroad right-of-way and submit a copy of the schedule to the Resident Engineer.

The Contractor shall give written notice to the railroad and the Resident Engineer not less than 14 days in advance of when he or his Subcontractors shall start Work within the railroad right-of-way, or other Work which may affect railroad property, in order that necessary arrangements may be promptly made to protect railroad property. In the event the Contractor does not start work on the scheduled date, through no fault of the railroad, and the railroad incurs costs resulting from the Contractor's request for the railroad services, the Owner will reimburse the railroad, and these costs will be deducted from partial or final payments to be made to the Contractor. If the Contractor does not submit to the Resident Engineer a copy of the notice to the railroad and the Contractor performs the Work within the railroad right-of-way for which the railroad incurs costs, the Owner will reimburse the railroad and these costs will be deducted from partial or final payments to be made to the Contractor.

Fouling of railroad facilities track, power lines, and signal systems occur when the railroad parameters for normal operation are jeopardized because of obstructions in close proximity to the facilities. The Contractor shall obtain from the railroad its fouling parameters for the Work site and observe the railroad's regulations concerning fouling. Construction equipment or material shall not be stored or operated within the fouling distance of the railroad facilities without written permission of the operating railroad.

Equipment used on and adjacent to the railroad right-of-way shall be in first class condition so as to fully prevent any failure that might cause delay in the operation of trains or damage to railroad facilities. Contractor equipment is subject to railroad inspection at all times and shall not stand or be put in operation adjacent to the track without first obtaining permission from the railroad.

The railroad company may assign inspectors or engineers during the time the Contractor is engaged in Work on railroad property for the general supervision of construction operations, to ensure adherence to the Contract documents and applicable railroad requirements, and to ensure the use of approved construction methods. The salary and expense of said inspectors or engineers and the cost of any other engineering services furnished by the railroad will be paid directly to the railroad by the Owner in accordance with the Railroad Utility Agreement. The Owner will also reimburse the railroad for Project related costs to be incurred by the railroad as set forth in the Railroad Utility Agreement.

Should the Contractor, solely for its own convenience, cause the railroad to incur costs not covered by the railroad agreement or delay the railroad, or incur costs without prior written approval by the Resident Engineer, the Contractor shall be responsible for these costs. The Owner will reimburse the railroad for the Contractor generated costs and deduct these expenses from partial or final payment due the Contractor.

B. Railroad Insurance - The applicable insurance provisions are as specified in the Specifications for Railroad Insurance.

77. SAFETY

The Contractor shall be solely and completely responsible for conditions at the jobsite, including safety of all persons (including employees) and property during execution of the work. This requirement shall apply continuously and not be limited to normal working hours. Project safety provisions shall conform to U.S. Department of Labor (OSHA), the New Jersey Occupational Safety and Health Act, and all other applicable laws including those that may be specified in other parts of these Contract Documents and shall in any event comply with the common law standards of due care. Where any of these are in conflict, the more stringent shall apply. The Contractor's failure to thoroughly familiarize himself with these safety provisions shall not relieve him of responsibility.

SAFETY REQUIREMENTS

The Contractor shall adhere to the following safety requirements for all projects.

The Contractor shall take all precautions necessary to insure the safety of the public as well as his own equipment and personnel. The Contractor shall obey all instructions as to routes to be taken by equipment traveling within the Port area and keep all such equipment marked with a three foot (3') checkered orange and white flag. Equipment not actually in operation shall be kept clear of

aircraft movement areas and designated restricted areas. The Engineer must approve all equipment storage locations.

The Contractor will not be permitted to leave any trenches or other excavations open overnight, on weekends, or at other times when the Contractor's workmen are not on the site. If it is absolutely necessary to leave a trench or excavation open when approved by the Engineer, the Contractor shall barricade and cover the opening to the complete satisfaction of the Engineer. The Contractor may be required to use covers over such open excavation, which will withstand the wheel load of the heaviest vehicle using the Port facilities.

The Contractor shall take all necessary precautions to prevent fires adjacent to the work, and he shall prevent the spread of fires to areas outside the limits of the work. He shall provide adequate facilities for extinguishing fires and shall safely dispose of combustible materials off Port property.

Any signs, lights, signals, temporary walkways, traffic control, portable flashing lights, Port breakaway barriers, and other devices which may be required for safe traffic control shall be provided and maintained by the Contractor during the course of the work, subject to the approval of the Engineer.

Air traffic will continue to use existing runways and taxiways of the Port during the work under this Contract is being performed. The Contractor shall at all times conduct his work so as to create no hindrance, hazard, or obstacle to air traffic using such portions of the Port as are not officially closed to air traffic, and must, at all times, conduct the work in conformance with the requirements of the Port Manager. The Contractor is cautioned that he should not have any men or equipment within 280' of either runway centerline when the runway is open for operations. Any inconvenience occurring is assumed to be a subsidiary obligation of the Contractor and the cost shall be absorbed in the unit prices bid for the various items of work.

Port hazard marking shall be furnished, installed and maintained by the Contractor, in accordance with "Safety on Ports During Construction Activities" contained in an Appendix in the Specifications.

The Contractor shall hold harmless the Owner, the Engineer, and their respective agents or representatives from any and all claims for damages, costs, expenses, judgement or decrees resulting from negligence on the part of the Contractor, or his, or their, or its agent or employees in conducting the work as required by this Contract.

The cost of the Port Safety Requirements shall be absorbed by the Contractor in the prices bid for the various items of work.

78. PROTECTION OF WORK AND PROPERTY AND SECURITY

The Contractor shall, at all times, safely guard all property from injury or loss in connection with work performed under this Contract. All passageways, guard fences, lights, and other facilities required for protection by Federal, State or local laws shall be provided and maintained.

The Contractor shall protect his work and materials from damage due to the nature of the work, the elements, adjacent construction operations, or from any cause whatsoever until the completion and acceptance of the work. All loss or damages arising out of the nature of the work to be done under these Contract Documents shall be borne by the Contractor.

79. RESPONSIBILITY OF CONTRACTOR TO ACT IN EMERGENCY

In case of an emergency that threatens loss or injury of property or safety of life, the Contractor shall act, without previous instructions from the Owner or Engineer, as the situation may warrant. The Contractor shall immediately inform the Engineer of the emergency action taken. Any claim for compensation by the Contractor, together with substantiating documents in regard to expense, shall be submitted to the Engineer and the amount of compensation, if any, shall be determined by agreement prior to the issuance of a Modification Order. However, if the emergency is created or aggravated by the Contractor, he shall be liable for the resulting damages. If the Contractor fails to take the necessary action as required by such an emergency, the Owner may assign another Contractor or use his own forces to perform the emergency work.

80. PARTIAL ACCEPTANCE

If at any time during the prosecution of the Project the Contractor completes a unit or portion of the Project, such as a structure, an interchange, or a section of road, or pavement, or runway, or taxiway, the Contractor may request the Engineer to make final inspection of that unit. If the Engineer finds upon inspection that the unit has been satisfactorily completed in compliance with the Contract, the Engineer may accept that unit as being completed, and the Contractor may be relieved of the responsibility of doing further Work on or maintaining that unit or portion of the Project. The Engineer reserves the right to reject the request made by the Contractor, if the Engineer determines that the unit or portion of the Project should not be the subject of a partial acceptance. Such partial acceptance shall in no way void or alter any of the terms of the Contract, including GENERAL CONDITIONS Articles “RISKS ASSUMED BY THE CONTRACTOR”, nor shall it be construed as relieving the Contractor of full responsibility for making good defective work or materials found at any time before Acceptance pursuant to GENERAL CONDITIONS Article “COMPLETION AND ACCEPTANCE.”

81. SUBSTANTIAL COMPLETION DATE

When the Contractor considers that the work, or a designated portion thereof which is acceptable to the Owner, is substantially complete, the Contractor shall prepare and submit to the Engineer a list of items to be completed or corrected and request an inspection for Substantial Completion. The failure to include any items on such list does not alter the responsibility of the Contractor to complete all work in accordance with the Contractor Documents.

If, however, the inspection discloses that the Work is not substantially completed to the Engineer's satisfaction, the Engineer will give the Contractor the necessary instructions for completion and correction of same, and the Contractor shall immediately comply with and execute such instructions. Upon completion and correction of the Work, the Contractor shall re-notify the Engineer and another inspection will be made.

When the Engineer on the basis of the inspection determines that the work or that designated portion of the work is substantially complete the Engineer; shall state the responsibilities of the Owner and the Contractor for security, maintenance, heat utilities, damage to the work, and insurance; and shall fix the time within which the Contractor shall complete the items listed therein.

Guarantees required by the Contract Documents shall commence on the date of the Substantial Completion of the Work or designated portion thereof, unless otherwise provided in the Certificate of Substantial Completion. The Certificate of Substantial Completion shall be submitted to the Owner and the Contractor for their written acceptance of the responsibilities assigned to them in such Certificate.

The issuance of a Certificate of Substantial Completion for any part of the work shall not relieve the Contractor of his obligation to promptly remedy any omissions and latent or unnoticed defects in the work covered by the Certificate of Substantial Completion.

Upon substantial completion of the work, an amount retained may be paid to the Contractor. When the work has been substantially completed, except for work which cannot be completed because of weather conditions, lack of materials, or other reasons which in the judgment of the Owner are valid reasons for non-completion, the Owner may make additional payments, retaining at all times an amount sufficient to cover the estimated cost of the work still to be completed or, in the alternative, may pay out the entire amount retained and receive from the Contractor guarantees in the form of a bond or other collateral sufficient to ensure completion of the work. The application for payment at substantial completion shall be accompanied by all documentation called for in the Contract Documents and such other data and schedules as the Owner may reasonably require, together with complete and legally effective releases or waivers (satisfactory to the Owner) of all liens arising out of or filed in connection with the work. In lieu thereof and as approved by the Owner, the Contractor shall furnish receipts or releases in full; an affidavit of the Contractor that the releases and receipts, including all labor, services, material and equipment for which a lien could be filed, and that all payrolls, material and equipment bills, and other indebtedness connected with the work for which the Owner or his property might in any way be responsible, have been paid or otherwise satisfied; and consent of the Surety, if any, to this payment.

The Owner shall have the right to restrict the Contractor's use of the occupied portion of the work after the date of Substantial Completion, but the Owner shall allow the Contractor reasonable access to complete or correct items required by the Contract Documents.

82. COMPLETION AND ACCEPTANCE

Upon receipt by the Engineer of written notice from the Contractor that the Work has reached Completion and is ready for final inspection and Acceptance, the Engineer will promptly make such inspection. When such inspection indicates that the Work is to be in compliance with the Contract, the Engineer will promptly issue a Certificate of Completion stating that, to the best of his knowledge, information, and belief, and on the basis of observations and inspections, the Work has been completed in accordance with the terms and conditions of the Contract. If, however, the final inspection discloses that the Work has not reached Completion, the Engineer will give the Contractor the necessary instructions for the correction of deficiencies, and the Contractor shall immediately comply with and execute such instructions. Upon correction of the deficiencies, the Contractor shall re-notify the Engineer, and another inspection will be made. This procedure is to be repeated until a Certificate of Completion is issued.

At the request of the Contractor, the Engineer may issue a Certificate of Completion without receiving all required documents, certificates, or proofs of compliance. The Contractor's request must satisfactorily establish that the Contractor could not reasonably and in good faith provide some of the required documents, certificates, or proofs of compliance at a time contemporaneous with Completion and with the Project being ready for use by the Owner to the degree contemplated by the Contract. In such instances where a Certificate of Completion is issued, the Contractor shall expeditiously attempt to provide the exempted document, certificate, or proofs of compliance. Final payment will not be made, however, until all such documents, certificates, and proofs of compliance have been satisfactorily executed and delivered to the Engineer.

The Certificate of Completion is issued establishing Completion as of the date of the notice or re-notice from the Contractor. If the Executive Director concurs in the Certificate of Completion, the Contractor will be notified of Acceptance and the date thereof.

After Acceptance, the Contractor is relieved of the duty of maintaining and protecting the Work as a whole, and is not required to perform any further Work thereon. In addition, the Contractor is relieved of his responsibility for damage to the Work, which may occur after Acceptance. However, nothing herein shall be construed to limit the provisions of GENERAL CONDITIONS Articles "RISKS ASSUMED BY THE CONTRACTOR," "INSURANCE AND LIABILITY," and "NO WAIVER OF RIGHTS."

83. RESERVED

84. RESERVED

CONTRACT DOCUMENTS

85. PLANS AND SPECIFICATIONS

The Plans consist of general drawings and show such details as are necessary to give a comprehensive idea of the construction contemplated. The Plans show details of all structures, lines, grades, typical cross-sections and/or roadway, runway or taxiway location and design of all structures, and a summary of items appearing on the Proposal Form. The Contractor shall keep one (1) set of Plans available on the Project site at all times. All alterations affecting the requirements and information given on the Plans will be authorized in writing.

Omissions from the Plans or Specifications of details of Work which are manifestly necessary to carry out the intent of the Contract Documents, or which are customarily included, shall not relieve the Contractor from including such omitted details of Work, but they shall be included as if fully and correctly set forth and described.

86. ADDITIONAL CONTRACT DOCUMENTS

The Engineer will furnish to the Contractor on request and free of charge, three (3) copies of the Contract Documents. Additional copies of Contract Documents may be obtained on request by paying the actual cost of supplying the additional Contract Documents.

87. SUPPLEMENTING DRAWINGS, INSTRUCTIONS, WORKING DRAWINGS AND CATALOG CUTS

Upon request, the Engineer may furnish, with reasonable promptness, additional instructions by means of supplementing drawings or otherwise if, in the Engineer's opinion, such are required for the proper execution of the work and are in accordance with the requirements of the Contract Documents. All such instructions will be consistent with the terms and become a part of the Contract Documents. The purpose of these instructions is to provide further explanation of the work. If, in the opinion of the Engineer, additions or deletions to the work are identified in these instructions, such additions or deletions shall be made to the Contract by a Change Order a defined in Article "CHANGES" of these GENERAL CONDITIONS.

The Contractor shall make all working drawings, which may be required in addition to the Contract Drawings or in addition to any other drawings, which the Engineer may issue in supplementing the Contract Drawings.

The specific requirements elsewhere set forth in the Specifications for furnishing working drawings for any particular portion of the Contract shall not limit the obligation of the Contractor to furnish working drawings for any other portion when so required by the Engineer.

In preparing the working drawings, the Contractor may adopt a sheet size of 24 x 36 inches. All sheets thereafter of a similar nature shall be of the same size as the adopted. Each drawing shall have a margin on the top, bottom and right-hand side of one-half inch (.5”) and on the left-hand side a margin of one and one-half inch (1.5”).

Before using any working drawings, the Contractor shall submit nine (9) blueprints thereof (or more if requested) for the approval of the Engineer. Within fourteen (14) calendar days after receipt of the prints, the Engineer shall approve the same or require corrections or additions to be made thereon. If additions or corrections are required, the Engineer shall return within the fourteen (14) calendar day period three (3) of the nine (9) blueprints submitted and the Contractor shall make the corrections or additions shown thereon to be made. He shall resubmit nine (9) blueprints showing the drawing corrected as required. Each drawing shall be corrected as required until the approval of the Engineer is obtained. After each re-submission, the Engineer shall have a similar period of fourteen (14) calendar days in which to approve corrections.

As soon as approval has been given to any working drawing or shop bill, the Contractor shall within five (5) days send to the Engineer nine (9) prints, except that when the Engineer specifically so directs twelve (12) prints shall be sent. After approval thereof, no change will be permitted thereon unless approved in writing by the Engineer.

Before final payment for the Work is made, the Contractor shall furnish to the Engineer one (1) set of working drawings, all clearly revised, completed and brought up to date showing the permanent construction as actually made. These working drawings shall be either Autodesk CAD digital drawings files or PDF digital files that print to scale.

The Contractor shall prepare and furnish to the Engineer, in duplicate, prints showing in detail all plant and equipment which he intends to use at the construction site.

The Contractor shall furnish catalog cuts where specifically required by the Specifications, and for other items where the Engineer may deem them necessary. Nine (9) copies of catalog cuts shall be submitted for approval and the Engineer shall return five (5) copies to the Contractor within fourteen (14) calendar days indicating appropriate action.

Approval of drawings or catalog cuts which are inconsistent with the requirements of the Contract Drawings and Specifications shall not be deemed to waive or change such requirements or to relieve the Contractor of his obligation to perform such requirements, unless the Engineer shall expressly and specifically state that he is waiving or changing such requirements.

The Contractor shall fill in the dates on which he will furnish such working drawings and catalog cuts in a schedule furnished by the Contractor to the Owner. The completed schedule shall be delivered to the Engineer for his approval within ten (10) days after execution of the Contract.

All drawings, data, and other papers of any type whatsoever, whether in the form of writing, figures or delineations, which are prepared in connection with this Contract and submitted to the Owner shall become the property of the Owner. Except to the extent that rights are reserved to others under valid patents for which the Owner is not given a license under the provisions of the Article entitled "ROYALTIES, PATENTED DEVICES, MATERIALS, AND PROCESSES", the Owner shall have the non-exclusive right to use or permit the use of all such drawings, data and other papers and any ideas or methods represented thereby for any purpose at any time without additional compensation. No such papers shall be deemed to have been given in confidence. Any statement or legend to the contrary in connection with such drawings, data or other papers and in conflict with the provisions of this paragraph shall be void and of no effect.

88. DISCREPANCIES AND OMISSIONS

Should anything which is necessary for a clear understanding of the work be omitted from the Contract Documents, or should it appear that various instructions are in conflict, the Contractor shall secure written instructions from the Engineer before proceeding with the work affected by such omissions or discrepancies.

In resolving inconsistencies among two (2) or more sections for the Contract Documents, precedence shall be given in the following order:

First	Executed Construction Agreement
Second	Proposal Section
Third	Plans
Fourth	Special Provisions
Fifth	General Conditions
Sixth	NJDOT Supplemental Specifications
Seventh	NJDOT Specifications
Eighth	Cited Standards for Materials or Testing

Figured dimensions on Plans and calculated dimensions shall take precedence over scale dimensions. Detailed Plans in the Contract Documents shall take precedence over general plans.

As the Work progresses, it is anticipated that the Contractor shall frequently apply to the Engineer relative to the interpretation and coordination of the Contract Documents. Such applications shall be in writing. Should it appear that the Work to be done or any of the matters relative thereto are not sufficiently detailed or explained in the Contract Documents, the Contractor shall apply to the Engineer for such further explanations as may be necessary and shall conform to them as part of the Contract.

Both parties realize that in performing the Work, field conditions may require modifications in the Plans and quantities of Work involved. Work under all Pay Items must be carried out to meet these field conditions to the satisfaction of the Engineer and in accordance with its directions and the Contract Documents.

The Contractor shall not take advantage of any apparent error or omission in the Contract Documents. In the event the Contractor discovers any discrepancy, error, or omission in the Plans, Specifications, or other Contract Documents, or if there is any doubt or question as to the intent or meaning of the Plans, Specifications, or other Contract Documents, the Contractor shall immediately notify the Engineer in writing. The Engineer will promptly make, in writing, such corrections and interpretations as deemed necessary.

89. VERIFICATION AND WARRANTY

The Contractor shall thoroughly examine and become familiar with all of the various parts of the Contract Documents and determine the nature and location of the work, the general and local conditions, and all other matters, which can in any way affect the work under this Contract. Failure to make an examination necessary for this determination shall not release the Contractor from the obligations of this Contract. The Contractor warrants that no verbal agreement or conversation with any officer, agent, or employee of the Owner, or Engineer, either before or after the execution of this Contract, has affected or modified any of the terms or obligations herein contained.

90. DOCUMENTS TO BE KEPT ON THE JOBSITE

The Contractor shall keep one (1) copy of the Contract Documents on the jobsite, in good order, available to the Engineer. The Contractor shall maintain on a daily basis at the jobsite, and make available to the Engineer on request, one (1) current record set of the Plans which have been accurately marked up to indicate all approved changes in the completed work that differ from the information shown on the Plans. Upon substantial completion of the work, the Contractor shall give the Engineer one (1) complete set of marked-up record Plans.

91. OWNERSHIP OF CONTRACT DOCUMENTS

The Contract Documents, and copies of parts thereof, furnished by the Engineer are the property of the Owner. They are not to be used on other work and, with the exception of the signed Contract set, are to be returned to him at his request. Any reuse of these materials without authorization by the Engineer will be at the risk of the user and without liability or legal expense to the Engineer or to the Owner. Any such authorization will entitle the Engineer to compensation at rates to be agreed upon by the user and the Engineer.

92. RESERVED

93. RESERVED

CONTROL OF MATERIAL

94. SOURCE OF SUPPLY AND QUALITY REQUIREMENTS

Unless otherwise stipulated, the Contractor shall provide and pay for all materials, labor, utility services, tools, equipment, and all appliances, machinery, transportation, and appurtenances necessary for the execution and completion of the work and such additional items not specifically indicated or described that can be reasonably inferred as belonging to the item described or indicated and as required by good practice to provide a complete and satisfactory system or structure.

All materials for the Project shall be furnished by the Contractor and shall be new, unless otherwise specifically prescribed in the Contract Documents and both workmanship and materials shall be of good quality, and fit for the particular purpose for which used. The materials shall conform to the requirements of the Contract Documents and shall be from approved sources. Only materials which have been approved by the Engineer shall be used.

Within 12 hours after receiving a shipment of materials, the Engineer shall be notified of the kind, size, quantity, and location thereof.

In any item of construction, the sources, brands, or types of materials shall not be changed without the consent of the Engineer. Request for such changes shall be filed with the Engineer 30 days prior to shipment or 30 days prior to the date needed, whichever is earlier, of such changes as required above. The request shall state the name and address of the owner, the location of the proposed source, the method of shipment, and the intended use of the material.

The foregoing provisions shall apply with regard to requests by Subcontractors for the sources of the materials they propose to use, such requests to be submitted through the Contractor.

The notice provisions of this Article shall not be so construed as to relieve the Contractor of his obligation to ensure that all materials required for the construction of the Project shall be available at the time and place necessary for their incorporation into the Work in order that the completion

date set forth in the Information to Bidders is met. If any doubt exists as to the timely availability of any material, the Engineer shall be immediately informed, in writing, of the potential problem and of the action to be taken to guarantee the availability of such material. Stockpiles of materials whose availability is or may be problematical shall be established at an early date.

95. LOCAL MATERIAL SOURCES

Possible sources of local materials may be designated on the Plans or in the Specifications. The quality of material in such deposits may be acceptable in general, but the Contractor shall determine for itself the amount of equipment and Work required to produce a material meeting the requirements of the Contract Documents. It shall be understood that it is not feasible to ascertain from samples the limits or quantity for an entire deposit, and that variations shall be considered as usual and are to be expected. The Engineer may order procurement of material from any portion of a deposit and may reject portions of the deposit as unacceptable.

The Owner may acquire, and make available to the Contractor, the right to take materials from the sources designated on the Plans or described in the Specifications, together with the right to use such property as may be specified, for plant site, stockpiles, and hauling roads.

If the Contractor desires to use material from sources other than those designated, the Contractor shall acquire the necessary rights to take materials from the sources and shall pay all costs related thereto, including any which may result from an increase in length of haul. All costs of exploring and developing such other sources shall be borne by the Contractor. The use of material from other than designated sources is not permitted until such preliminary samples as may be required by the Engineer have been obtained and tested at the expense of the Contractor. Additional samples may be required of the Contractor for inspection and testing by the Engineer prior to approval of and authorization to use the source.

When material sources are not described in the Specifications or where those designated provide insufficient material, the Contractor shall provide sources of acceptable material. When these sources are provided by the Contractor, the Owner assumes the cost of processing samples to determine the suitability of the material except as in GENERAL CONDITIONS Article “MATERIALS, INSPECTIONS, TESTS, AND SAMPLES”.

Unless otherwise permitted, borrow pits and quarries occupied by the Contractor, or his Subcontractor, or suppliers exclusively for the Project shall be so excavated that water does not collect and stand therein. Sites from which material has been removed shall be left in a neat and presentable condition before Completion. Where practicable, all pits and quarry sites shall be located so that they are not visible from the highway.

96. SUBMITTALS

Submittal requirements for shop drawings and other items to be submitted by the Contractor are, if applicable, set forth in GENERAL CONDITIONS Article “SUPPLEMENTING DRAWINGS, INSTRUCTIONS, WORKING DRAWINGS AND CATALOG CUTS” and the Specifications and/or Technical Provision.

97. RELEASE OF BITUMINOUS AND CEMENT CONCRETE

Material will be released from the plant when the Inspector notifies the plant that conditions at the job site are acceptable for incorporation of the material into the work. The Engineer shall be notified at least 24 hours in advance of any anticipated releases.

98. MATERIALS, INSPECTIONS, TESTS, AND SAMPLES

The Contractor shall furnish, without extra charge, the necessary test pieces and samples, including facilities and labor for obtaining the same, as requested by the Engineer. When required, the Contractor shall furnish certificates of tests of materials and equipment made at the point of manufacture by a recognized testing laboratory approved by the Engineer. All materials will be inspected, tested, and approved before incorporation in the Work. Unapproved materials may be used only with written permission of the Engineer. In the absence of such written permission, unapproved materials will not be paid for and shall be removed at no cost to the Owner.

All materials being used are subject to inspection, testing, or rejection at any time prior to Acceptance.

Samples will be taken by a representative of the Contractor in the presence of the Engineer. Results of tests, made with the Contractor's laboratory apparatus and conforming to the requirements specified in the prescribed methods of tests will be furnished to the Engineer. Testing will be performed in accordance with AASHTO or ASTM methods of tests or in accordance with specified New Jersey Department of Transportation test methods.

Nothing in this Article shall be construed to limit the right of the Engineer to order special inspection or tests as provided in GENERAL CONDITIONS Article "SPECIAL INSPECTION, TESTING, OR APPROVAL". If the Specifications, the Engineer's instructions, laws, or any public Owner require any work to be specially tested or approved, the Contractor shall give timely notice of his readiness for testing or inspection. Inspections to be conducted by the Engineer will be promptly made, and where practicable, at the source of supply.

The required number of samples and rate of sampling, or Certifications of Compliance for the various materials are as specified in the respective methods of test or in the Articles applicable to that particular material or Pay Item. Additional samples shall be required whenever, in the opinion of the Engineer, additional tests are required to determine the quality and suitability of materials for their respective uses.

The sampling and field testing of soil aggregates shall conform to the general requirements for sampling and testing specified in the Articles applicable to that particular material/Pay Item or the New Jersey Department of Transportation's Standard Specification Section 901, and with the following requirements, provided, however, that the following requirements shall govern where there is any conflict or inconsistency between them.

The Contractor shall determine initially, by means of proper sampling and laboratory tests that soil aggregate materials from proposed sources conform to the requirements of the Specifications. Written notice of the proposed sources of soil aggregate materials, as well as the results of the sampling and testing, shall be given to the Engineer by the Contractor after the initial determination as specified above, and not less than ten (10) days prior to the time of their intended use. The Engineer may request the Contractor to sample and test materials representative of that portion of the source intended to be used.

Approval by the Engineer of a proposed source of any aggregate materials does not constitute approval of materials delivered to the site of the Work from that source, but shall be deemed as permission to select and use materials from that source only so long as they conform to the Specifications. The Contractor shall progressively determine for itself by proper sampling and laboratory tests, while the sources are in use, that materials selected from approved sources conform to the Specifications. Should the source contain oversize material, the Engineer may require the Contractor to eliminate such oversize material.

The final and governing determination of conformance or nonconformance with the Contract Documents will be made based on sampling and testing of the materials after they have been placed in accordance with the Contract Documents. All materials in place in the Work which do not conform to the Contract Documents shall be removed and replaced with materials which do conform thereto, or their deficiencies shall be corrected. For those materials subject to density testing, conformance shall include compliance with the density requirement. After the initial corrective action has been taken, the Contractor will take an additional sample, and if necessary, one (1) check sample. If the materials still do not conform to the requirements of the Contract Documents after additional corrective action, the Contractor shall supply the Engineer with a gradation of the in-place material showing the size of sample, all calculations, final gradation, name of person performing the test, date, and location of sample taken. Further testing will not be performed by the Contractor until the Contractor certifies that the rejected material has been corrected. After this certification, the Engineer will analyze one (1) additional sample supplied by the Contractor, and if this sample does not meet the Contract Documents, the material shall be removed.

The Contractor shall excavate test pits and provide such facilities as the Engineer may require in order to properly sample the source and shall, if the source is approved, remove any overburden which would contaminate the material intended for use on the Project. If soil aggregate materials are obtained by dredging, the Contractor shall provide safe and adequate water transportation for the Engineer to and from the dredges or other boats and shall cooperate with the Engineer in every reasonable way to expedite inspection and sampling of the materials. The cost of such work, facilities, and transportation, in connection with sampling by the Engineer at the proposed source of soil aggregate materials, and the initial and progressive sampling and testing of materials at their sources, performed by the Contractor, shall be included in the prices bid for the various Pay Items scheduled in the Proposal as well as the sampling and testing of aggregates which meet the Specifications and are used in the Work.

The cost of sampling and testing by the Contractor of soil aggregates which do not conform to the Specifications for gradation and density and the cost of sampling and testing of soil aggregates which do conform to the Specifications but are not used in the Work shall be paid by the Contractor.

99. PERFORMANCE TESTING

Operating equipment and systems shall be performance tested in the presence of the Engineer to demonstrate compliance with the Specifications. Performance testing shall be conducted under the specified design operating conditions or under such simulated operating conditions as recommended or approved by the Engineer. Such testing shall be scheduled with the Engineer at least one (1) week in advance of the planned date of testing. Detailed test requirements are set forth in the Specifications.

100. CERTIFICATION OF COMPLIANCE

Materials or assemblies, as specified, will be accepted on the basis of Certificates of Compliance stating that such materials or assemblies fully comply with the requirements of the Contract. The form of Certificates of Compliance must be approved by the Engineer.

Materials or assemblies, used on the basis of Certificates of Compliance, may be sampled and tested at any time. If found not to be in conformance with the Contract requirements, materials and assemblies will be rejected whether in place or not. The Contractor shall require the manufacturer or supplier to furnish four (4) copies of Certificates of Compliance with each delivery of materials, components, and manufactured items that are acceptable by certification. The Engineer will be provided with three (3) copies and one (1) copy shall be retained by the Contractor.

Certificates of Compliance are to contain the following information:

A. Project to which the material is consigned.
B. Name of the Contractor to which the material is supplied.
C. Kind of material supplied.
D. Quantity of material represented by the certificate.
E. Means of identifying the consignment, such as label marking, seal number, etc.
F. Date and method of shipment.
G. Statement that the material has been tested and found in conformity with the pertinent Contract requirements stated in the certificate.
H. Signature of a person having legal Owner to bind the supplier.
I. Signature attested to by a notary public or other properly authorized person.

Payments will not be made for materials specified to be accepted on the basis of Certificates of Compliance until the Engineer has received the required Certificate of Compliance.

101. PLANT INSPECTION

The Engineer may undertake the inspection of materials at the source. Manufacturing plants may be inspected periodically for compliance with specified manufacturing methods. Material samples may be obtained for laboratory testing for compliance with materials quality requirements. Plant inspection may be the basis for the acceptability of manufactured lots as to quality.

In the event plant inspection is undertaken, the following conditions shall be met:

A. The Engineer will have the cooperation and assistance of the Contractor and the producer with whom the Contractor contracted for materials.
B. The Engineer will have full entry at all times to such parts of the plant as may concern the manufacture or production of the materials being furnished.
C. If required by the Engineer, the Contractor shall arrange for approved office space for the use of the inspector. Such space shall be located conveniently in or near the plant.
D. Adequate safety measures shall be provided and maintained. It is understood that the Owner reserves the right to retest all materials that have been tested and accepted at the source of supply after the same have been delivered and to reject all materials which, when retested, do not meet the requirements of the Contract Documents.

102. CONTRACTORS' AND MANUFACTURERS' COMPLIANCE WITH STATE SAFETY, OSHA, AND OTHER CODE REQUIREMENTS

The completed Work shall include all necessary permanent safety devices, such as machinery guards and similar ordinary safety items required by laws. Further, any features of the work (including Owner-selected equipment) subject to such safety regulations shall be fabricated, furnished, and installed in compliance with these requirements. The Contract shall include the provisions of this Article in his agreements with Subcontractors, suppliers, and manufacturers of equipment.

In selecting and/or accepting equipment for installation in the project, the Owner and Engineer assume no responsibility for any personal injury, property damage, or any other damages or claims resulting from failure of the equipment to comply with applicable safety codes or requirements, or the safety requirements of a recognized agency, or failure due to manufacturer's faulty design concepts, or defective workmanship and materials. The Contractor shall indemnify and hold the

Owner and Engineer harmless against any and all liability, claims, suits, damages, costs or expenses without limitation arising out of the installation or use of such equipment.

103. STORAGE AND HANDLING OF MATERIALS

Materials shall be stored to ensure the preservation of their quality and fitness. Stored materials, even though approved before storage, may again be inspected prior to their use on the Project. Stored materials shall be located so as to facilitate their prompt inspection. With the approval of the Engineer, portions of the right-of-way may be used for storage purposes and for the placing of the Contractor's plant and equipment, but any additional space must be provided by the Contractor at the Contractor's expense. Materials to be stored on Port property shall not create an obstruction to air navigation nor shall they interfere with the free and unobstructed movement of aircraft. Unless otherwise shown on the plans, the storage of materials and the location of the Contractor's plant and parked equipment or vehicles shall be as directed by the Engineer. No materials shall be stored within 4 yards, plus the extended boom length of the largest crane on site, of overhead high voltage power lines. The high voltage power line is defined as an aerial power line having a voltage differential in excess of 750 volts between any pairs of conductors or between any conductor and ground. The Contractor shall be responsible for any power outage or de-energization associated with the Contractor's activity in the vicinity of the power lines. Private property shall not be used for storage purposes without written permission of the owner or lessee. Copies of such written permission shall be furnished to the Engineer prior to storage. Storage sites shall be restored to their original condition at no cost to the Owner.

Materials shall be handled to ensure the preservation of their quality and fitness. Aggregates shall be transported from the storage site to the Project site in tight vehicles constructed to prevent loss or segregation of materials after loading and measuring in order that there shall be no inconsistencies in the quantities of materials intended for incorporation in the Project as loaded, and the quantities actually received at the place of operations.

104. UNACCEPTABLE MATERIALS

All materials, whether in place or not, which do not conform to the requirements of the Contract Documents shall be considered as unacceptable, and such materials will be rejected and shall be removed immediately from the site of the Work unless otherwise directed. Rejected material, the defects of which have been corrected, shall not be used until approval has been given.

105. OWNER FURNISHED MATERIAL

The Contractor shall furnish all materials required to complete the Work, except those specified to be furnished by the Owner. Material furnished by the Owner will be delivered or made available at the points specified in the Specifications.

The cost of handling and placing the materials after they are delivered or made available shall be considered as included in the Work for the Pay Item in connection with which they are used.

The Contractor is to be responsible for all material delivered to it, and deductions will be made from any monies due or that may become due the Contractor to make good any shortages and deficiencies, from any cause whatsoever, and for any damage which may occur after such delivery, and for any demurrage charges.

106. SUBSTITUTES OR “OR EQUAL” ITEMS

Whenever materials or equipment are specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular supplier, the naming of the item is

intended to establish the type, function, and quality required. Unless the name is followed by words indicating that no substitution is permitted, materials or equipment of other suppliers may be accepted if sufficient information is submitted by the Contractor to allow the Engineer to determine that the material or equipment proposed is equivalent or equal to that named. Requests for review of substitute items of material or equipment will not be accepted from anyone other than the Contractor. If the Contractor wishes to furnish or use a substitute item of material or equipment, the Contractor shall make written application to the Engineer for approval thereof, certifying that the proposed substitute performs adequately the functions and achieves the results called for by the general design, is similar and of equal substance to that specified, and is suited to the same use as that specified. The application shall state that the evaluation and approval of the proposed substitute does not prejudice the Contractor's achievement of Completion on time. It shall also state whether or not approval of the proposed substitute for use in the Work requires a change in any of the Contract Documents (or in the provisions of any other direct Contract with the Owner for Work on the Project) to adapt the design to the proposed substitute, and whether or not incorporation or use of the substitute in connection with the Work is subject to payment of any license fee or royalty. All variations of the proposed substitute from that specified shall be identified in the application, and available maintenance, repair, and replacement service shall be indicated. The application shall also contain an itemized estimate of all costs that result directly or indirectly from approval of such substitute, including costs of redesign, all of which will be considered in evaluating the proposed substitute. The Engineer may require the Contractor to furnish additional data about the proposed substitute.

If a specific means, method, technique, sequence, or procedure of construction is indicated in or required by the Contract Documents, the Contractor may furnish or use a substitute means, method, technique, sequence, or procedure of construction which is acceptable, if the Contractor submits sufficient information to allow the Engineer to determine that the substitute proposed is equivalent to that indicated or required by the Contract Documents. The procedure for review by the Engineer is to be similar to that described in the previous paragraph.

The Engineer is to be allowed a reasonable time within which to evaluate each proposed substitute. The Engineer will be the sole judge of acceptability, and no substitute shall be ordered, installed, or used without either a Construction Order or an approved working drawing. If approval is given, it is on the condition that the Contractor is fully responsible for producing Work in conformity with Contract requirements. If, after trial use of the substituted materials, equipment, means, method, technique, sequence, or procedure of construction, the Engineer determines that the Work produced does not meet Contract requirements, the Contractor shall discontinue the use of the substitute and shall complete the remaining Work with the specified materials, equipment, means, method, technique, sequence, or procedure of construction. The Contractor shall remove the deficient Work and replace it as specified, or take such other corrective action as the Engineer may direct. Changes will not be made in the basis of payment for the Pay Items involved, nor in the Contract Time as a result of authorized substitutes. The Engineer may require the Contractor to furnish at no cost to the Owner a special performance guarantee or other surety with respect to any substitute. The Engineer will document the time required by the Owner in evaluating proposed substitutions and in making changes in the Contract Documents.

If the Engineer shall disallow the requested substitute, for just cause, the Contractor shall abide by the Engineer’s decision. The Contractor shall have no claim of economic impact due to his reliance upon the substitute price as a basis for his bid. The Owner makes no guarantee of substitute approval by the Engineer and, therefore, will not entertain a claim for additional compensation due to rejection of any substitution request.

When the Contract Documents permit the use of more than one type of material, equipment, or product, only one type is to be used throughout the Project.

107. GUARANTEE

Unless specifically stated otherwise in the Contract Documents, all work provided under this contract by the Contractor or any of his Subcontractors shall be warranted to the Owner as follows:

All work shall be fit for the particular purpose for which used, and be guaranteed by the Contractor against all defects in workmanship and material for a period of one (1) year following contract completion or, if specifically called for in these Contract Documents and enumerated in the SUPPLEMENTAL CONDITIONS, for a period of one (1) year following the date of Substantial Completion as established by the Engineer for specified items of equipment or other designate parts of the work, as enumerated in each Certificate of Substantial Completion issued by the Engineer.

The Contractor shall make, at his own expense, all repairs and/or replacements necessitated by defects in materials or workmanship in work provided by him or any of his Subcontractors that become evident within the guarantee period.

The Contractor also agrees to hold the Owner and Engineer harmless from liability of any kind arising from damage due to said defects. The Contractor shall make all repairs and replacements promptly upon receipt of written orders for same from the Owner. If within ten (10) days (or such longer period as the Owner may allow) after the Owner has notified the Contractor of a defect, the Contractor has not started to make the necessary corrections, the Owner is hereby authorized to make the corrections or to order the work to be done by a third party, and the cost of the corrections shall be paid by the Contractor.

Repetitive malfunction of equipment shall be cause for equipment replacement and an extension of the guarantee period to a date one (1) year following acceptable replacement.

The Owner's rights under this Article shall be in addition to, and not a limitation of, any other rights and remedies available at law or in equity.

108. CORRECTION OF DEFECTIVE WORK AFTER CONTRACT COMPLETION

The Contractor hereby agrees to make, at his own expense, all repairs and replacements necessitated by defects in materials or workmanship in work provided by him or any of his Subcontractors, equipment manufacturers and suppliers, and pay for any damage to other works resulting from such defects, which become evidence within one (1) year after Contract Completion or within one (1) year after the date of Substantial Completion established by the Engineer for specified items of equipment, or within such longer period of time as may be prescribed by law or by the terms of any applicable special guarantee required by the Contract Documents.

The Contractor also agrees to hold the Owner and the Engineer harmless from liability of any kind arising from damage due to said defects. The Contractor shall make all repairs and replacements in the time specified in Article "OWNER'S RIGHT TO CORRECT DEFECTIVE WORK" of these GENERAL CONDITIONS upon receipt of written order for same from the Owner. If the Contractor fails to make the repairs and replacements promptly, the Owner may do the work and the Contractor and his Surety shall be liable for the cost thereof.

109. RESERVED

110. RESERVED

LEGAL RELATIONS AND RESPONSIBILITY TO PUBLIC

111. GOVERNING LAW

The terms and conditions of this Contract shall be construed and interpreted under, and all respective rights and duties shall be governed by, the laws of the State of New Jersey, to the extent not superseded by federal law. The Contractor's attention is called to the Federal Requirements provisions contained in the "Instructions to Bidders" portion of the bidding requirements comprising a portion of the Contract Documents.

Whenever applicable each provision of these Contract Documents shall be interpreted in such a manner as to be effective and valid under applicable law, but if any provision of these Contract Documents shall be prohibited by or invalid under applicable law, such provision shall be ineffective to the extent of such prohibition or invalidity, without invalidating the remainder of such provision or the remaining provisions of these Contract documents.

112. APPLICABLE LAWS

The Contractor shall keep fully informed of all Federal, State, and local laws, ordinances, and regulations, and all orders and decrees of bodies or tribunals having any jurisdiction or Owner, which in any manner affect those engaged or employed on the Work, or which in any way affect the conduct of the Work. The Contractor shall at all times observe and comply with, and shall cause its agents and employees to observe and comply with, all such laws, ordinances, regulations, orders, and decrees and shall protect and indemnify the Owner, Engineer, and their officers, employees, agent, and representatives against any claim or liability arising from or based on the violation of any such law, ordinance, regulation, order, or decree, whether by the Contractor or the Contractor's agents or employees, Subcontractors of any tier, suppliers, or materialmen. If any discrepancy or inconsistency is discovered between the Contract Documents and any such law, ordinance, regulation, order, or decree, the Contractor shall immediately report the same to the Engineer in writing.

113. PERMITS AND LICENSES

The Contractor shall procure all permits, grants, and licenses, pay all charges, fees, and taxes, and give all notices necessary and incidental to the due and lawful prosecution of the Work except where the Owner has procured such permits, grants, or licenses for temporary or permanent construction. The Contractor shall advise the issuing agency or party of its proposed operations and obtain their cooperation and such supplemental permission as may be necessary. Before submitting his bid, the Contractor should obtain from the Owner all available information on the permits, grants, and licenses the Owner has obtained. Charges incurred by the Contractor for permits, grants, and licenses in connection with the Work shall be paid by the Contractor and shall be included in the prices bid for the various Pay Items scheduled in the Proposal.

Before the Contractor performs dredging or channel excavation within tidal waterways for the procurement of materials, or performs therein other work of his own, when such work is not part of the permanent or temporary Work provided for in the Contract, the Contractor shall advise USACE, USCG, and NJDEP, Division of Marine Services and Division of Water Quality of its intended work. If the waterway is not navigable, the Contractor shall notify the Division of Water Quality only. The Contractor shall procure all necessary permits for such work from the above named agencies

having jurisdiction and interest and shall comply with their rules and regulations in the performance of the above mentioned work.

The Department of the Army, acting through the Corps of Engineers, is charged with the responsibility for the administration of laws for the protection and preservation of navigation and the navigable waters of the United States. Section 10 (33 USC 403) of the River and Harbor Act of 3 March 1899 specified that: "The creation of any obstruction not affirmatively authorized by Congress, to the navigable capacity of any of the waters of the United States is prohibited; and it shall not be lawful to build or commence the building of any wharf, pier, dolphin, boom, weir, breakwater, bulkhead, jetty, or other structures in any port, roadstead, haven, harbor, canal, navigable river, or other water of the United States, outside established harbor lines, or where no harbor lines have been established, except on plans recommended by the Chief of Engineers and authorized by the Secretary of the Army; and it shall not be lawful to excavate or fill, or in any manner to alter or modify the course, location, condition, or capacity of, any port, roadstead, haven, harbor, canal, lake, harbor of refuge, or enclosure within the limits of any breakwater, or of the channel of any navigable water of the United States, unless the work has been recommended by the Chief of Engineers and authorized by the Secretary of the Army prior to beginning the same" (30 Stat 1151; 33 USC 403). Failure to obtain a Department of Army Permit is a violation of Section 10 cited above, and penalties therefor may be adjudged. In addition, the owners of such non-authorized structures are considered legally responsible and liable for damages attributable thereto or occasioned thereby.

A pamphlet describing the procedures for applying for a permit together with a list of applicable waterways may be obtained free of charge from the various district offices of the Corps of Engineers.

Section 21 PL 91-224, The Water Quality Improvement Act 1970, requires a certification in connection with any permit application to conduct any activity, including but not limited to the construction or operation of facilities which may result in any discharge into the navigable waters of the United States. This certification must be made by the State or interstate agency responsible for water quality or by the Secretary of the Interior as the case may be to the effect that there is reasonable assurance that the permitted activity will not violate water quality standards.

Upon receipt of any application for such permit, a public notice is issued to all known interested parties and to the news media to provide an opportunity for individuals and Federal, State, and local governmental agencies to comment on the proposed work being considered. In known controversial cases, a public hearing will be held in order that all views may be presented for consideration. The period normally allowed for receipt of comments is 30 days. If the proposed work is not considered to adversely affect navigation, fish and wildlife, water quality, conservation, aesthetics, recreation, ecology, and other aspects of the public interest, and if no objections are received, the Department of the Army Permit is then issued. If objections to the proposed work are received, an attempt is made to resolve the differences between the objector and the applicant. If this attempt is unsuccessful, the application, objections, and all pertinent information, including the minutes of the public hearing if held, with the District Engineer's recommendations, are forwarded to the office of the Chief of Engineers for an ultimate decision, all of which requires additional time for final action.

Prior to submitting a bid based on utilizing hydraulically procured soil aggregate materials, Bidders shall assure themselves that the NJDEP will issue a permit to dredge such materials.

114. RESTORATION OF SURFACES OPENED BY PERMIT

The right to construct or reconstruct, or maintain any public or private utility service, FAA or NOAA facility or a utility service of another government agency in the highway, street or Port Facility, or to

grant permits for same, at any time, is hereby expressly reserved by the Owner for the public utilities and proper authorities of the municipality in which the Work is done, and the Contractor shall not be entitled to any damages either for the digging up of the street or for any delay occasioned thereby.

When an individual, firm, or corporation is authorized through a duly executed permit from the Owner, the Contractor shall allow parties bearing such permits, and only those parties, to make openings in the highway. When ordered by the Engineer, the Contractor shall make all necessary repairs due to such openings, and such necessary work will be paid for as Extra Work or as specifically provided elsewhere in the Contract Documents.

115. FEDERAL AID PARTICIPATION

For Federally funded contracts, the United States Government has agreed to reimburse the Owner for some portion of the contract costs. Such reimbursement is made from time to time upon the Owner's (sponsor's) request to the granting agency. In consideration of the United Sates Government's agreement with the Owner, the Owner has included provisions in this contract pursuant to the requirements of the Rules and Regulations of the grant that pertain to the work.

As required by the Act, the contract work is subject to the inspection and approval of duly authorized representatives of the Federal government, and is further subject to those provisions of the rules and regulations that are cited in the contract, plans, or specifications.

No requirement of the Act, the rules and regulations implementing the Act, or this contract shall be construed as making the Federal Government a party to the contract nor will any such requirement interfere, in any way, with the rights of either party to the contract.

116. ENVIRONMENTAL PROTECTION

The Contractor shall comply with all applicable Federal, State, and local laws and regulations, and all conditions of permits controlling pollution of the environment. Necessary precautions shall be taken to prevent pollution of streams, lakes, ponds, wetlands, groundwater, and reservoirs with fuels, oils, bitumens, chemicals, or other harmful materials and to prevent pollution of the atmosphere from particulate and gaseous matter.

All modifications to permits that are proposed by the Contractor shall be submitted to the Owner for approval prior to submitting them to the regulatory agencies having jurisdiction and interest. After receiving the Owner's approval, the Contractor shall obtain all other necessary approvals from the appropriate regulatory agencies. Any time required to obtain the approvals will not warrant extensions of contract time. The Contractor shall perform the Work in compliance with the terms and conditions of all permits procured for the Project. If the Contractor is not in compliance with permit provisions, corrective actions shall be taken immediately. The Engineer may suspend the Work, wholly or in part, in accordance with GENERAL CONDITIONS Article “TEMPORARY SUSPENSION OF WORK,” until such time as the Contractor is fully in compliance with all permits. All corrective and remedial work required to bring the Contractor into compliance shall be performed at no cost to the Owner.

The Contractor shall pay all fees and violation charges that arise out of or are alleged to arise out of its noncompliance or the noncompliance of its agents, employees, and Subcontractors with permit requirements. In its sole discretion, the Owner may determine to hold the Contractor responsible for all engineering, inspection, and administration costs (including overhead) incurred as a result of its noncompliance. If it so determines, the Owner will deduct the amount of such costs from the monthly estimate and payment due in accordance with GENERAL CONDITIONS Article “PARTIAL PAYMENTS.”

The Contractor shall provide to the Engineer, whenever requested, all documentation pertaining to the noncompliance and related corrective actions taken.
The Contractor shall also comply with the following:

A. Control of Soil Erosion and Water Pollution - The Contractor shall employ soil erosion and sediment control measures during the life of the Project to control erosion and minimize the sedimentation of rivers, streams, lakes, reservoirs, wetlands, floodplains, bays, and coastal waters in accordance with the current version of the "Standards for Soil Erosion and Sediment Control in New Jersey."

The Contractor is responsibility to provide the Engineer with documentation that a soil erosion and sediment control plan has been approved by the appropriate soil conservation district for off-Project borrow pits or storage areas that the Contractor uses or establishes to accomplish the Work of the Project.

B. Control of Noise and Air Pollution - The Contractor shall employ all possible methods to minimize noise and dust pollution caused by drilling, blasting, excavation, and hauling operations. These shall include, but shall not necessarily be limited to, use of dust collection devices or water injectors on drilling units.

All construction equipment powered by an internal combustion engine shall be equipped with a properly maintained muffler. Air-powered equipment shall be fitted with pneumatic exhaust silencers. Air compressors shall meet EPA noise emission standards.

Stationary equipment powered by an internal combustion engine shall not be operated within 50 yards of noise sensitive sites without portable noise barriers placed between the equipment and the noise sensitive sites. Noise sensitive sites include residential buildings, motels, hotels, schools, churches, hospitals, nursing homes, libraries, and public recreation areas. Portable noise barriers shall be constructed of plywood or tongue and groove boards with a noise absorbent treatment on the interior surface (facing the equipment).

All methods and devices employed to minimize noise and dust pollution are subject to the daily approval of the Engineer.

C. Historic Places - The Contractor will not be permitted to use as a disposal site or obtain borrow excavation from locations eligible for or listed on the State or National Registers of Historic Places. Copies of the State and National Registers of Historic Places are available from the New Jersey Department of Transportation's Bureau of Environmental Services.

D. Disposal Sites Beyond Project Limits - Material shall not be disposed of beyond the Project limits until the Engineer has approved the location of the disposal site and received a copy of the soil and sediment control plan certified by the soil conservation district in accordance with NJSA 4:24-39 *et seq*.

E. Borrow Pits - Material shall not be excavated from a borrow pit beyond the Project's limits until the Engineer has received a copy of the soil and sediment control plan certified by the soil conservation district in accordance with NJSA 4:24-39 *et seq*.

117. ARCHAEOLOGICAL AND HISTORICAL FINDINGS

Unless otherwise specified in this Article, the Contractor is advised that the site of the work is not within any property, district, or site, and does not contain any building, structure, or object listed in the current National Register of Historic Places published by the United States Department of Interior.

When excavating operations encounter prehistoric remains or artifacts of historical or archaeological significance, the operations shall be temporarily discontinued in that area and the Engineer shall immediately be notified. The Engineer will consult archaeological authorities and determine the disposition of the remains or artifacts.

The Contractor agrees to make no claim for additional payment or for an extension of Contract Time because of any delays in the progress or alteration of the prosecution of the Work due to such discontinuance of the work or removal of any such remains or artifacts for the first ten (10) days of such delay. Thereafter and beginning on the eleventh (11^{th}) day, compensation for such delay and an extension of Contract Time will be considered in accordance with the provisions of GENERAL CONDITIONS Article “SUSPENSION OF WORK”.

118. TAXES AND CHARGES

The Contractor shall withhold and pay all withholding taxes, whether State or Federal, and pay all Social Security taxes and also all State Unemployment Compensation taxes for his employees, and pay or cause to be withheld, as the case may be, any and all taxes, charges, or fees or sums whatsoever, which are now or may hereafter be required to be paid or withheld under any laws.

Pursuant to L. 1966, c. 30, §9, as amended (C.54:32B-9), the Owner is not subject to the sales and use taxes imposed under New Jersey's Sales and Use Tax Act. A Certificate to this effect can be obtained from the Owner. NJSA 54:32B-9 provides that any sale or service to the State of New Jersey, or any of its agencies, instrumentalities, public authorities, public corporations (including a public corporation created pursuant to agreement or compact with another State), or political subdivisions where the State is the purchaser, user, or consumer, is not subject to the sales and use taxes imposed under the Sales and Use Tax Act. NJSA 54:32B-8 provides that sales of materials, supplies, or services made to Contractors, Subcontractors, or repairmen for exclusive use in erecting structures, or building on, or otherwise improving, altering, or repairing real property of the above listed bodies are exempt from the tax on retail sales imposed by the Sales and Use Tax Act. The sales tax exemption does not apply for equipment used for Contract work or for force account work whether the equipment is to be purchased or rented. The exemption provided under NJSA 54:32B-8 is conditioned on the person seeking such exemption qualifying therefor pursuant to the rules and regulations and upon the forms prescribed by the New Jersey Division of Taxation. The required form, "Contractor's Exemption Purchase Certificate" (Form No. ST-13), can be obtained by writing or calling the New Jersey Division of Taxation, Tax Information Services (TIS), CN 269, Trenton, New Jersey 08625, or any New Jersey Division of Taxation Regional Office.

119. COMPLIANCE WITH LABOR STANDARDS AND RATE OF WAGE REQUIREMENTS

The requirements of the State of New Jersey relative to the payment of prevailing wages and, if this Contract is Federally funded, the Federal requirements for compliance with the wage determination of the U.S. Secretary of Labor, shall apply. In case of discrepancies between the two (2) lists of wage rates, the Contractor shall pay not less than the higher rate for the respective crafts. The minimum prevailing wage rates, current as of the date of assembly of these Documents are available from the State of New Jersey and, if applicable, from the U.S. Secretary of Labor.

There is no guarantee that labor can be obtained at these wages, or that the Federal and State minimum wage rates will remain the same for any specified period. Unless specific agreement is made otherwise, Contractors will not be allowed additional compensation under this Contract for any wage escalation that may become effective.

120. ROYALTIES, PATENTED DEVICES, MATERIALS, AND PROCESSES

The Contractor shall pay all royalty and license fees unless otherwise specified. The Contractor shall indemnify and hold harmless the Owner and the Engineer against any and all liability, claims, royalties, suits, damages, costs or expenses, without limitation arising out of any alleged use of patented or unpatented processes, products, materials or appliances used in the performance of this Contract.

If any design, device, material, or process covered by letters of patent or copyright is used in the Work, the Contractor shall provide for such use by suitable legal agreement with the patentee or owner. The Contractor shall assume all costs arising from the use of patented materials, equipment, devices, or processes used on or incorporated in the Work. The Contractor shall defend, indemnify, and save harmless the Owner, any affected third party, or political subdivision from any and all claims for infringement by reason of the use of any such patented design, device, material, or process, or any trademark or copyright, and shall indemnify the Owner for any costs, expenses, and damages which it may be obliged to pay by reason of an infringement, at any time during the performance of the Work or after Acceptance.

121. SANITARY, HEALTH, AND SAFETY PROVISIONS

The Contractor shall provide and maintain in a neat, sanitary condition such accommodations for the use of its employees and for Owner field offices as may be necessary to comply with the requirements of the State and local health departments, or of other bodies or tribunals having jurisdiction.

The Contractor shall ensure privacy to all employees and Owner personnel assigned to the Project by providing on site separate toilet facilities for male and female employees. These facilities shall be portable toilets and clearly marked MEN and WOMEN. They are in addition to the facilities provided in the field office.

The total number of facilities shall be determined by the chart listed below. A facility is defined as one (1) unit. A facility site is defined as a location that provides at least one (1) facility for each sex. The maximum distance between the location of facility sites and workers shall be no more than half a mile.

All toilet facilities shall be in compliance with OSHA Regulation 1926.51(c) with the exception that the Owner will require that separate toilet facilities be provided for males and females. The sewage disposal method shall not endanger the health of employees and shall be in compliance with all State and Federal regulations.

Toilet facilities shall be cleaned and sanitized a minimum of once per week except from May 15 through September 15 in which these facilities shall be cleaned and sanitized a minimum of twice per week.

Number of Male Employees	Minimum No. of Facilities for Male Use	Number Of Female Employees	Minimum No. of Facilities for Female Use
1 - 15	1	1 - 15	1
16 - 35	2	16 - 35	2
36 - 55	3	36 - 55	3
56 - 80	4	56 - 80	4
81 - 110	5	81 - 110	5
111 - 150	6	111 - 150	6
Over 150	6+(1)	Over 150	6+(1)

(1) - One (1) additional facility for each additional 40 employees or part thereof of each sex.

The Contractor shall observe all rules and regulations of the Federal, State, and local health officials. Attention is directed to Federal, State, and local laws, rules, and regulations concerning construction safety and health standards. The Contractor shall not require any worker to work in surroundings or under conditions that are unsanitary, hazardous, or dangerous to the worker's health or safety.

The Contractor shall admit, without delay and without the presentation of an inspection warrant, any inspector of OSHA or other legally responsible agency involved in safety and health administration upon presentation of proper credentials.

The Contractor shall make available to the Contractor's employees, Subcontractors, the Engineer, and the public, all information pursuant to OSHA 29 CFR Part 1926.59 of The Hazard Communication Standard 29 CFR 1910.1200, and shall also maintain a file on each job site containing all Material Safety Data Sheets (MSDS) for products in use at the Project. These Material Safety Data Sheets shall be made available to the Engineer upon request.

122. PUBLIC CONVENIENCE AND SAFETY

The Contractor shall at all times so conduct the Work as to ensure the least possible obstruction to traffic. The safety and convenience of the general public and the residents along the highway or Port facility and the protection of persons and property shall be provided for by the Contractor in accordance with the contract documents.

Precaution shall be exercised at all times for the protection of persons and property. The safety provisions of applicable laws, OSHA regulations, building and construction codes, and the rules and regulations of the New Jersey Department of Labor shall be observed.

The Contractor shall maintain the free and unobstructed movement of aircraft, pedestrian and vehicular traffic with respect to his own operations and those of his Subcontractors and all suppliers in accordance with the Article titled “MAINTENANCE OF TRAFFIC” and shall limit such operations for the convenience and safety of the traveling public as specified in the Article titled “LIMITATION OF OPERATIONS “.

123. RAILWAY HIGHWAY PROVISIONS

If the Contract Documents require that materials be hauled across the tracks of any railway, the Owner will arrange with the railway for any new crossings required or for the use of any existing crossings. If the Contractor elects to use crossings other than those designated, it shall make arrangements for the use of such crossings. Construction work performed on or near railroad right-

of-way shall be performed in accordance with GENERAL CONDITIONS Articles “COOPERATION WITH UTILITIES” and “COOPERATION BETWEEN CONTRACTORS.”

124. CONSTRUCTION OVER OR ADJACENT TO NAVIGABLE WATERS

All Work over, on, or adjacent to navigable waters shall be so conducted that free navigation of the waterways is not interfered with, and that the existing navigable depths are not impaired except as allowed by permit issued by USCG or USACE, as applicable.

125. BARRICADES, WARNING SIGNS AND HAZARD MARKINGS

The Contractor shall provide, erect, and maintain all necessary barricades, marking for hazards, suitable and sufficient lights, danger signals, signs, and other traffic control devices in accordance with the New Jersey Department of Transportation Standard Specifications Section 617, and shall take all necessary precautions for the protection of the Work and safety of the public.

On Port projects when the work requires closing an MARINE TERMINAL OPERATIONS area of the Port or portion of such area, the Contractor shall furnish, erect, and maintain temporary markings and associated lighting conforming to the requirements of AC 150/5340-1, Marking of Paved Areas on Ports. The Contractor shall furnish, erect, and maintain markings and associated lighting of open trenches, excavations, temporary stock piles, and his/her parked construction equipment that may be hazardous to the operation of emergency fire-rescue or maintenance vehicles on the Port in reasonable conformance to AC 150/5370-2, Operational Safety on Ports During Construction Activity. The Contractor shall identify each motorized vehicle or piece of construction equipment in reasonable conformance to AC 150/5370-2. The Contractor shall furnish and erect all barricades, warning signs, and markings for hazards prior to commencing work which requires such erection and shall maintain the barricades, warning signs, and markings for hazards until their dismantling is directed by the Engineer. Open-flame type lights shall not be permitted within the MARINE TERMINAL OPERATIONS areas of the Port.

126. USE OF EXPLOSIVES

When the use of explosives is necessary and approved by the Engineer for the prosecution of the Work, the Contractor shall exercise the utmost care not to endanger life or property, including new Work. The Contractor shall be responsible for all damage resulting from the use of explosives. A pre-blasting meeting will be scheduled by the Engineer with the Office of Safety Compliance. The Contractor shall attend the pre-blasting meeting. No blasting will be permitted prior to the pre-blasting meeting.

All Explosives shall be stored safely under lock and key. The storage places shall be marked plainly DANGEROUS EXPLOSIVES. The storing and handling of explosives and highly inflammable materials shall conform to the regulations of the New Jersey Department of Transportation Office of Safety Compliance, Mine Safety and Explosives, New Jersey Department of Labor, and to local regulations relating thereto. Proper means shall be used to avoid blasting damage to public and private property. Flaggers shall be provided, when necessary, who shall warn and keep traffic from the danger area, and all persons within the danger area shall be warned and given time to withdraw.

The Contractor shall notify each property owner and public utility company having structures or facilities in proximity to the site of the work of his/her intention to use explosives. Such notice shall be given sufficiently in advance to enable them to take such steps as they may deem necessary to protect their property from injury.

The use of electrical blasting caps shall not be permitted on or within 1,000 feet of the Port property.

127. PROTECTION AND RESTORATION OF PROPERTY MARKERS AND LAND MONUMENTS

The Contractor shall be responsible for the preservation of all public and private property markers and shall protect carefully from disturbance or damage all land monuments and property markers until the Engineer has referenced their location. Monuments and markers shall not be moved until directed. All Geodetic Control Markers such as monuments, disks, and benchmarks within the Project site shall be carefully protected and shall not be disturbed by construction activity. Where such markers are located within the Project and are in danger of destruction or disturbance, the Contractor shall retain qualified surveying personnel and shall ensure the markers' relocation prior to disturbing the original markers. All survey work shall be in accordance with the Geodetic Mark Preservation Guidebook as prepared by National Geodetic Survey. Copies of the guidebook are available from the Geodetic Control Survey Unit, New Jersey Department of Transportation, CN 600, Trenton, New Jersey 08625.

128. FOREST PROTECTION

In carrying out work within or adjacent to State or National Forests or Parks, the Contractor shall comply with all regulations of the State Fire Warden, State Division of Parks and Forestry, or other Owner having jurisdiction, governing the protection of forests and the carrying out of work within forests, and shall observe all sanitary laws and regulations with respect to the performance of work in forest areas. The Contractor shall keep the areas in an orderly condition, dispose of all refuse, obtain permits for the construction and maintenance of all construction camps, stores, warehouses, residences, latrines, cesspools, septic tanks, and other structures in accordance with the requirements of the Division or such other Owner.

The Contractor shall take all reasonable precautions to prevent forest fires and shall require its employees and Subcontractors, both independently and at the request of Forestry officials, to do all reasonably within their power to prevent and assist in preventing forest fires, and to make every possible effort to notify a Forestry official at the earliest possible moment of the location and extent of any fire seen by them.

129. OPENING SECTIONS OF PROJECT TO TRAFFIC

Opening sections of the Project to traffic prior to Completion may be desirable or may be necessary due to conditions inherent in the Work, changes in the Contractor's work schedule, or conditions or events unforeseen at the time the Project was bid. Such openings shall be made only when so directed by the Engineer. Under no condition shall such openings constitute Acceptance or a part thereof, or a waiver of any provisions of the Contract.

The Contract Documents indicate, insofar as possible, which sections are to be opened prior to Completion. The Contractor shall make no claim for and shall have no right to additional compensation or extension of Contract Time for opening sections of the Project to traffic as indicated in the Contract Documents or resulting from partial acceptance or changes in the Contractor's work schedule, or for reasons that are due to the fault of the Contractor or any other party, including utilities.

Additional compensation or extension of Contract Time for completion of other items of Work on sections of the Project opened to traffic for reasons other than those indicated in the preceding paragraph will be made as provided in GENERAL CONDITIONS Article “PAYMENT FOR MODIFICATIONS” or in a Supplementary Agreement.

If the Contractor is dilatory in completing shoulders, drainage structures, or other features of the Work, the Engineer may so notify the Contractor in writing and establish therein a reasonable period of time in which the Work is to be completed. If the Contractor is dilatory, or fails to make a

reasonable effort toward completion in this period of time, the Engineer may then order all or a portion of the Project opened to traffic. On such sections which are so ordered to be opened, the Contractor shall conduct the remainder of its construction operations so as to cause the least obstruction to traffic, and shall make no claim for and shall have no right to additional compensation or extension of Contract Time.

On sections of the Project opened to traffic whether indicated in the Contract Documents or not, maintenance of the roadway, runway or taxiway shall be in accordance with GENERAL CONDITIONS Article “MAINTENANCE DURING CONSTRUCTION”.

130. INDEPENDENT CONTRACTOR

The relationship of the Contractor to the Owner is that of an independent Contractor, and said Contractor, in accordance with his status as an independent Contractor, covenants and agrees that he shall conduct himself consistent with such status, that he shall neither hold himself out as nor claim to be an officer or employee of the Owner by reason hereof. The Contractor shall not, by reason hereof, make any claim, demand, or application to or for any right or privilege applicable to an officer or employee of the Owner, including, but not limited to, workers compensation coverage, unemployment insurance benefits, social security coverage, or retirement membership or credit.

131. THIRD PARTY BENEFICIARY CLAUSE

It is specifically agreed between the parties executing the Contract that no provision of the Contract is intended to make the public or any member thereof a third party beneficiary hereunder, or to authorize anyone not a party to the Contract to maintain a suit for personal injuries or property damage pursuant to the terms or provisions of the Contract.

It is the further intent of the Executive Director and the Contractor in executing the Contract that no individual, firm, corporation, or any combination thereof, that supplies materials, labor, services, or equipment to the Contractor for the performance of the Work becomes thereby a third party beneficiary of the Contract.

132. LIMITATIONS OF LIABILITY

In any event, whether under the provisions of the Contract, as a result of breach of Contract, tort (including negligence), or otherwise, the Owner will not be liable to the Contractor for any special, consequential, incidental, or penal damages including, but not limited to, loss of profit or revenues, loss of rental value for Contractor-owned equipment, damages to associated equipment, cost of capital, or interest of any nature.

133. ASSIGNMENT OF CONTRACT FUNDS AND CLAIMS

The Contractor shall not transfer or assign to any party any contract funds, due or to become due, or claims of any nature he has against the Owner, without the written approval of the Engineer having first been obtained. The Engineer, by sole discretion, considering primarily the interests of the Owner, may grant or deny such approval.

134. RISK ASSUMED BY THE CONTRACTOR

The Contractor assumes the following distinct and several risks, whether they arise from acts or omissions, whether negligent or not, of the Contractor, his Subcontractors, suppliers, materialmen, employees, agents, and all others working for the Contractor on the Project, of the Owner, or of third persons, or from any other cause, and whether such risks are within or beyond the control of the Contractor described in Subheadings A through C below. Excepted from this assumption of

risks are only those risks which arise from solely affirmative acts done by the Owner subsequent to the execution of the Contract with actual and willful intent to cause loss, damage, and injury. The risks are as follows:

A. Risks of Loss or Damage to the Permanent Construction - Until Acceptance, the Contractor shall bear the risk of loss or damage to the permanent construction, temporary construction, and to materials, whether or not the Contractor has received payment for such construction or materials under GENERAL CONDITIONS Article “PARTIAL PAYMENTS,” or “FINAL PAYMENT.” The Contractor shall take every precaution against injury or damage to any part of the construction or to materials by the action of the elements or from any other cause, whether arising from the execution or the non-execution of the Work. The Contractor shall promptly repair, replace, and make good any such loss or damage without cost to the Owner. However, the Contractor shall not bear such risk of loss or damage which arises from acts of war or floods, tidal waves, earthquakes, cyclones, tornadoes, hurricanes, or other cataclysmic natural phenomenon unless such loss or damage is covered by insurance.

The Contractor shall, in furtherance of the above paragraph, but not by way of limitation, at the Contractor's expense, provide suitable drainage for the Project and erect such temporary structures where necessary to protect the Work from damage. The risks for failure to take such actions shall be assumed by the Contractor.

In case of suspension of the Work from any cause whatever, the Contractor shall continue to be responsible for the Project as provided above and shall take such precautions as may be necessary to prevent damage to the Project, provide for drainage, and shall erect any necessary temporary structures, signs, or other facilities. During such period of suspension of the Work, the Contractor shall properly and continuously maintain in an acceptable growing condition all living material in newly established plantings, seedings, and soddings furnished under the Contract, and shall take adequate precautions to protect new tree growth and other important vegetative growth against injury. If ordered by the Engineer, the Contractor shall properly store, during such suspension of the Work, materials which have been partially paid for or furnished by the Owner. The Owner will be entitled to the possession of such materials, and the Contractor shall promptly return the same to the Project site when requested. The Contractor shall not dispose of any of the materials so stored except on written authorization. The Contractor shall be responsible for the loss of or damage to such materials.

B. Risks of Claims on Account of Injury, Loss, or Damage - The Contractor shall bear the risk of claims, just or unjust, by third persons made against the Contractor or the Owner, on account of injuries (including wrongful death), loss, or damage of any kind whatsoever arising or alleged to arise out of or in connection with the performance of the Work. The risk of claims, whether or not actually caused by or resulting from the performance of the Work or out of or in connection with the Contractor's operations or presence at or in the vicinity of the construction site or Owner premises, whether such claims are made and whether such injuries, loss, and damages are sustained, applies at any time both before and after Acceptance.

C. Risk of Loss to Property of Those Performing the Work - The Contractor shall bear the risk of loss or damage to any property of the Contractor, and of claims made against the Contractor or the Owner for loss or damage to any property of Subcontractors, materialmen, workers, and others performing the Work, and to

lessors. Said risk occurs at any time prior to completion of removal of such property from the construction site or the Owner's premises, or the vicinity thereof.

The Contractor shall indemnify and save harmless the Owner against all claims described in Subheadings B and C above, and for all expense incurred by the Owner in the defense, settlement, or satisfaction thereof including expenses of attorneys. If so directed, the Contractor shall at its own expense defend against such claims, in which event it shall not, without obtaining express advance permission from the Owner, raise any defense involving in any way jurisdiction of the tribunal, immunity of the Owner, governmental nature of the Owner, or the provisions of any statutes respecting suits against the Owner.

The provisions of this Article are also for the benefit of all officers, agents, and employees of the Owner so that they have all the rights which they would have under this Article if they were named at each place above at which the Owner is named, including a direct right of action against the Contractor to enforce the foregoing indemnity except, however, that the Owner may at any time in its sole discretion and without liability on its part cancel the benefit conferred on any of them by this Article, whether or not the occasion for invoking such benefit has already arisen at the time of such cancellation.

Neither Acceptance nor the making of final payment releases the Contractor from his obligations under this Article. Moreover, neither the enumeration in this Article nor the enumeration elsewhere in this Contract of particular risks assumed by the Contractor or of particular claims for which he is responsible shall be deemed:

A. To limit the effect of the provisions of this Article or of any other provision of the Contract relating to such risks or claims, or
B. To imply that the Contractor assumes or is responsible for risks or claims only of the type enumerated in this Article or in any Contract, or
C. To limit the risks which the Contractor would assume or the claims for which the Contractor would be responsible in the absence of such enumerations.

The Contractor expressly understands and agrees that any insurance protection required by the Contract, or otherwise provided by the Contractor, in no way limits the Contractor's responsibility to defend, indemnify, and save harmless the Owner as herein provided. Such insurance requirements are designed to provide greater assurance to the Owner that the Contractor is financially able to discharge his obligations under this Article and as to the risks assumed elsewhere in the Contract, and are not in any way construed as a limitation on the nature and extent of such obligations.

135. DISPUTES

Except for specific provisions otherwise set forth in the Contract Documents, any dispute concerning questions of fact or circumstance arising out of this Contract shall be mutually resolved through good faith mediation between the Contractor and the Owner. No work shall be delayed or postponed pending resolution of any disputes or disagreements, except as the Contractor and the Owner may otherwise agree in writing.

Any dispute arising under or relating to this Contract, which is not disposed by mutual agreement, may be submitted by the Contractor, for a hearing, before the Owner's Executive Director. The Contractor's right to request such a hearing is conditioned upon compliance with the requirements of Article "DUTIES AND RESPONSIBILITIES OF THE ENGINEER," of these GENERAL CONDITIONS. If the Contractor is not satisfied with the decision of the Engineer, the Contractor may, within fifteen (15) days from the receipt of the Engineer's final determination based upon the Contractor's written objection, file a request before the Owner's Executive Director.

The Owner's Executive Director, or his designee, shall hold a hearing of the dispute, and his decision shall be reduced to writing and a copy thereof mailed or otherwise furnished to the Contractor. The decision of the Executive Director or his designee, shall be considered final and conclusive unless, within fifteen (15) days of receipt of a copy of the decision, the Contractor notifies the Owner of his objections to such decision. Failure to file a written objection within the allotted time, shall be considered acceptance of the decision, and the decision shall become final and conclusive.

The request for such a hearing before the Owner's Executive Director, or his designee, the holding of the hearing, and the receipt of the decision shall be a condition precedent to the right to request arbitration or initiate court action.

136. ARBITRATION

If agreed upon in writing by the Contractor and Owner in an unsettled dispute, any controversy arising out of or relating to this Contract, or the breach thereof, may be settled by arbitration in accordance with Construction Industry Arbitration Rules of the American Arbitration Association and judgement upon the award rendered by the arbitrator or arbitrators may be entered in any court having jurisdiction thereof.

The Contractor shall not delay the work because arbitration proceedings are pending, unless he shall have written permission from the Owner to do so. Such delay shall not extend beyond the time when the arbitrators shall have opportunity to determine whether the work shall continue or be suspended pending decision by the arbitrators of such a dispute. Any request for arbitration shall be in writing and shall be delivered to the Engineer and any adverse party either by personal delivery or by registered mail addressed to the last known address of the parties in dispute.

137. HEADINGS

The headings of the various Articles contained herein are inserted for convenience of reference only and shall not constitute a part hereof, nor limit or define the terms and conditions hereof.

138. RESERVED

139. RESERVED

MAINTENANCE BOND, INSURANCE, AND INDEMNIFICATION

140. MAINTENANCE BOND

Upon completion of all required work and prior to final payment the Contractor shall provide a two (2) year Maintenance Bond to the Owner for 100% of the final contract price.

141. DEFAULT OF SURETY

If the Surety on any bond furnished by the Contractor is placed under any Federal or State rehabilitation, liquidation, receivership or bankruptcy proceedings, of any kind, the Owner, at his discretion, shall have the right to require the Contractor to take immediate steps to secure a replacement bond and Surety, both of which shall be acceptable to the Owner, at the sole expense of the Contractor. Failure by the Contractor to provide a replacement bond and Surety as required by the Owner within ten (10) days thereafter shall be cause for the Owner to exercise his rights under Article “SUSPENSION OF WORK” of these GENERAL CONDITIONS or terminate the

Contract for material breach. In addition, no further progress payments under the Contract shall be made by the Owner until the Contractor complies with the provisions of this Article.

142. INSURANCE AND LIABILITY

1. Prior to the commencement of any work or services and until completion / final acceptance of the work as described in the Scope of Services in this Contract, the Contractor will provide and maintain the following minimum levels of insurance at Contractor's own expense. The cost of the required insurance shall be included in the Contractor's bid price and no adjustment shall be made to the contract price on account of such costs unless such approval is provided. The term Contractor shall include "Professional Service Contractors" as well as Subcontractors and Sub-Subcontractors of every tier. Contractor shall furnish Certificates of Insurance evidencing and reflecting the effective date of coverage as outlined below. The Services shall not commence until the Contractor has obtained, at their own expense, all of the insurance as required hereunder and such insurance has been approved by the South Jersey Port Corporation (the "Owner").Approval of insurance required of the Contractor will be granted only after submission to the Owner of original certificates of insurance signed by the representatives of the insurers or, at the Owner's request, certified copies of the required insurance policies. If found to be non-compliant at any point during the Contract Term, the Owner may purchase the required insurance coverage(s) and the cost will be borne by the Contractor through direct payment/reimbursement to the Owner or the Owner may withhold payment to the Contractor for amounts owed to them. The required insurance shall not contain any exclusions or endorsements which are not acceptable to the Owner. Failure of the Owner to demand such certificate or other evidence of full compliance with these insurance requirements or failure of the Owner to identify a deficiency from evidence that is provided shall not be construed as a waiver of Contractor's obligation to maintain such insurance. With respect to insurance maintained after final payment in compliance with a requirement below, an additional certificate(s) evidencing such coverage shall be provided to the Owner with final application for payment and thereafter upon renewal or replacement of such insurance until the expiration of the time period for which such insurance must be maintained.

2. The Contractor shall require all Subcontractors to maintain during the term of the Contract Insurance of the type and in the minimum amounts as described below and required of the Contractor. Any obligations imposed upon the Contractor as part of this contract shall be so imposed upon any and all Subcontractors as well.

3. All insurance required herein, with the exception of the Professional Liability Insurance, shall be written on an "occurrence" basis and not a "claims-made" basis. For Professional Liability "claims-made" coverage:

    a. The retroactive date must be on or prior to the start of work under this contract; and
    b. The Contractor must purchase "tail coverage/an extended reporting period" or maintain coverage for a period of two (2) years subsequent to the completion of their work / final payment.

4. The South Jersey Port Corporation, its commissioners, agents, servants, employees and representatives shall be named as additional insured on the Contractor's liability insurance program (except Workers Compensation and Professional Liability policies) for ongoing operations and completed operations on a primary noncontributory basis. Coverage to include ongoing and completed operations using ISO Endorsements CG 2010 and CG 2037, or their equivalents. Each of the Additional Insured's respective members, employees, agents and representatives shall also be afforded coverage as an Additional Insured. Coverage should be provided for a period of two years subsequent to the completion of work/final payment. The Owner reserves the right to require the Contractor to name other parties as additional insureds as required by the Owner. There shall

be no “Insured versus Insured Exclusion” on any policies; all policies will provide for “cross liability coverage”.

5. All insurance policies required hereunder shall be endorsed to provide that the policy is not subject to cancellation, non-renewal, or material reduction in coverage until thirty (30) days prior written notice has been given to the Owner. In the event of cancellation or non-renewal of coverage(s), it is the Contractor’s responsibility to replace coverage to comply with the Contract requirements so there is no lapse of coverage for any time period. In the event the insurance carriers will not issue or endorse their policy(s) to comply with the above it is the responsibility of the Contractor to report any notice of cancellation or non-renewal at least thirty (30) days prior to the effective date of this notice.

6. No acceptance and/or approval of any insurance by the Owner shall be construed as relieving or excusing the Contractor or the Contractor’s Surety from any liability or obligation imposed upon either or both of them by provisions of this Contract.

7. Any deductibles or self-insured retention’s (SIR) of $10,000 or greater shall be disclosed by the Contractor, and are subject to the Owner’s written approval. Any deductible or retention amounts elected by the Contractor or imposed by the Contractor’s insurer(s) shall be the sole responsibility of the Contractor. In the event any policy includes an SIR, the Contractor is responsible for payment within the SIR of their policy(ies) and the Additional Insured requirements specified herein shall be offered within the SIR amount(s).

8. All insurance companies shall have an AM Best’s rating of at least “A-, Class VIII” or better and be permitted to do business in the State of New Jersey.

9. There shall be no liability upon the Owner, public officials, their employees, their authorized representatives, or agents either personally or as officials of the Owner in carrying out any of the provisions of the Contract nor in exercising any power or Owner granted to them by or within the scope of the Contract, it being understood that in all such matters they act solely as agents and representatives of the Owner.

10. Waiver of Rights of Recovery and Waiver of Rights of Subrogation:

    a. The Contractor waives all rights of recovery against the Owner and all the additional insureds for loss or damage covered by any of the insurance maintained by the Contractor.
    b. If any of the policies of insurance required under this contract require an endorsement to provide for the waiver of subrogation, then the named insured of such policies will cause them to be so endorsed.

11. Any type of insurance or any increase in limits of liability not described above which the Contractor requires for its own protection or on account of statute shall be its own responsibility and at its own expense.

12. The amount of insurance provided in the aforementioned insurance coverages, shall not be construed to be a limitation of the liability on the part of the Contractor.

13. Contractor shall promptly notify the Owner and the appropriate insurance company(ies) in writing of any accident(s) as well as any claim, suit or process received by the insured Contractor arising in the course of operations under the Contract. The Contractor shall forward such documents received to his/her insurance company(ies), as soon as practicable, or as required by his/her insurance policy(ies).

REQUIRED COVERAGE: the following may be provided through a combination of primary and excess policies in order to meet the minimum limits set forth below:

B. CONTRACTOR'S LIABILITY INSURANCE REQUIREMENTS:

1. Commercial General Liability insurance for bodily injury, personal injury, and property damage including loss of use, etc. with minimum limits of:

$1,000,000	each occurrence;
$1,000,000	personal and advertising injury;
$2,000,000	general aggregate; and
$2,000,000	products/completed operation aggregate.

This insurance shall include coverage for all of the following

- Coverage is to be provided on ISO CG 00 01 12 07 or an equivalent form ("Occurrence Form") including Premises/Operations, Independent Contractors, Products/Completed Operations, Broad Form Property Damage, Contractual Liability, and Personal Injury and Advertising Injury;
- General aggregate limit applying on a per project basis;
- Products/Completed Operations Coverage must be maintained for a period of at least two (2) years after final payment (including coverage for the Additional Insureds as set forth in these Insurance Requirements);
- No exclusions for development, construction, building conversion, etc. with respect to the project's location and/or where the work is to be completed by the Contractor;
- Coverage for "Resulting Damage";
- No sexual abuse or molestation exclusion;
- No amendment to the definition of an "Insured Contract".

2. Business Auto Liability insurance with a minimum combined single limit of $1,000,000 per accident and including, but not limited to, coverage for all of the following:
    - Liability arising out of the ownership, maintenance or use of any auto;
    - Auto non-ownership and hired car coverage
    - Contractual Liability Coverage (including Liability for Employee Injury assumed under a Contract as provided in the standard ISO policy form)
    - For Contractors involved in the transportation of hazardous material, include the following endorsements: MCS-90 and ISO-9948

3. Workers' Compensation insurance with statutory benefits as required by any state or federal law, including standard "other states" coverage; employer's liability insurance with minimum limits of:

$1,000,000	each accident for bodily injury by accident;
$1,000,000	each employee for bodily injury by disease; and
$1,000,000	policy limit for bodily injury by disease.

    1. United States Longshore & Harbor Workers Act Coverage, where applicable.
    2. Includes Sole Proprietorships and Officers of a Corporation who will be performing the work.
    3. Where applicable, if the Contractor is lending or leasing its employees to the Owner for the work under this contract (e.g. crane rental with operator), it is the Contractor's responsibility to provide the Workers Compensation and Employer's Liability coverage and to have their policy endorsed with the proper Alternate Employer Endorsement.

4. Professional Liability (If Designated by Contractor's Scope of Work): Contractors (such as, but not limited to Architects, Engineers, Attorneys, Financial Advisors, Marketing, Physicians and Risk Management Consultants) shall provide liability and/or malpractice insurance with minimum limits of $3,000,000. The definition of "covered services" shall include the services required in the scope of this contract.

5. Umbrella Liability or Excess Liability insurance with minimum limits of:

   $10,000,000 per occurrence;
   $10,000,000 aggregate for other than products/completed operations and auto liability; and
   $10,000,000 products/completed operations aggregate.

   Policy to apply on a Following Form basis of the Commercial General Liability, Commercial Automobile Liability and Employers Liability Coverage.

6. Pollution Liability Insurance **(If Designated by Contractor's Scope of Work)**:

   - Covering losses caused by pollution incidents that arise from the operations of the Contractor described under the scope of services of this contract. This is to include all work completed by the Contractor, including testing and / or removal of any and all pollutants.
   - Occurrence/Claims Made Limit: $1,000,000 per project
   - Insurance to be maintained for the duration of the work and for a period of two (2) years after completion of work / final payment.
   - No Exclusions for Silica, Asbestos, Lead, or Lead Based Paint Testing.
   - Include Mold Coverage for full policy limit of liability.
   - Shall include coverage for all pollutants as defined under the Resource Conservation and Recovery Act, as amended, 42 U.S.C. Section 6901 et. Seq. ("RCRA") or any related state or city environmental statute or the removal of any petroleum contaminated material.
   - All owned and / or 3rd Party disposal facilities must be licensed and maintain pollution liability insurance of not less than $1,000,000, if applicable.

7. Watercraft Liability **(If Designated by Contractor's Scope of Work):** If Contractor utilizes any owned, used, leased, hired or borrowed watercraft to complete their work in accordance with this Contract, the coverage shall be maintained.

   Minimum Limits of Liability:
   $2,000,000 Per Occurrence
   $2,000,000 Aggregate

8. Aircraft Liability and/or Unmanned Aircraft Systems (UAS, aka Drones) **(If Designated by Contractor's Scope of Work):** If Contractor utilizes any owned, leased, hired, or borrowed aircraft or UAS, coverage for bodily injury, property damage, personal and advertising injury arising out of the above shall be maintained.

   Minimum Limits of Liability:
   $10,000,000 Per Occurrence
   $10,000,000 Aggregate

   NOTE: If UAS are covered by the General Liability policy instead of an Aviation Policy, coverage must be provided by CG 24 50 (or its equivalent) for "any aircraft used in the Insured's operations" for "any operations or projects of the Insured".

9. Crime **(If Designated by Contractor's Scope of Work)**
    - Include the Employee Theft and Theft, Disappearance and Destruction coverage parts.
    - The Employee Theft Coverage part shall include the Clients' Property Endorsement (ISO Form CR 04 01, or its equivalent).
    - Minimum Limits of Liability: $1,000,000 Per Occurrence

10. Privacy Liability **(If Designated by Contractor's Scope of Work)**
    - Contractor shall maintain coverage for third party liability arising out of breach of privacy, inclusive of confidential and proprietary business information, HIPAA violations and other breaches of personally identifiable information and/or protected health information, which may arise from their work with this contract.
    - Minimum Limits of Liability: $1,000,000 Per Claim / $1,000,000 Aggregate
    - Privacy Breach Notification and Credit Monitoring: $250,000 Per Occurrence

11. Property Coverage **(If Designated by Contractor's Scope of Work)**
    - Contractor shall provide coverage for damage to their work, materials to be part of the project (on-site and off-site), and in transit.
    - Valuable Papers coverage is to be included with a minimum $500,000 Limit.

12. Owned, Leased, Rented or Borrowed Equipment **(If Designated by Contractor's Scope of Work):**
    - Contractor shall maintain Property Coverage for their owned, leased, rented or borrowed equipment, tools, trailers, etc.

INDEMNIFICATION

To the extent that state and/or federal laws limit the terms and conditions of this clause, it shall be deemed so limited to comply with such state and/or federal law. This clause shall survive termination of this contract. The Contractor shall protect, defend, indemnify and hold harmless the Owner, its commissioners, agents, servants, employees, and representatives (the "Indemnified Parties") from and against all liability, (including liability for violation of any law or any common law duty) claims, damages, losses, and expenses including attorneys' fees arising in connection with, out of, or resulting from the performance of the work, provided that any such liability, claim, damage, loss or expense (i) is attributable to bodily injury, sickness, disease, or death, or to any statutory or regulatory rule designed to protect against such conditions, or to injury to or destruction of tangible property (other than the work itself), and including the loss of the use resulting there from, and (ii) is caused by or results from, in whole or in part, any act or omission of the Contractor, or any Subcontractor, or anyone direct or indirectly employed by any of them or anyone for whose acts any of them may be liable, regardless of whether or not it is also caused by or results from any act or omission of any party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights, obligations or indemnity which would otherwise exist as to a party or person described in this Indemnification.

In any and all claims against the Indemnified Parties by an employee of the Contractor, or Subcontractor, or anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, the indemnification obligation shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for any Contractor, or Subcontractor under Workmen's Compensation Acts, Disability Benefits Acts, or other Employee Benefit Act.

These Indemnification provisions shall survive the termination of this contract.

PROSECUTION AND PROGRESS OF THE WORK

143. ASSIGNMENT

The Contractor shall not assign, transfer, convey or otherwise dispose of this Contract or any of the proceeds thereunder unless written consent of the Owner has been obtained. No right under this Contract or claim for any proceeds due or to become due hereunder shall be asserted against the Owner, or persons acting for the Owner, by reason of any so-called assignment, transfer or conveyance of this Contract or any part thereof unless such assignment, transfer or conveyance has been authorized by the written consent of the Owner. The instrument of assignment, transfer or conveyance shall contain a clause subordinating the claim of the assignee transferee or conveyee to all prior liens for services rendered for materials supplied for the execution of the work.

144. SUBCONTRACTING

The Contractor shall not employ any Subcontractor who was not named by the Contractor as a proposed Subcontractor as specified in the PROPOSAL SECTION, without written approval or authorization of the Owner.

The Contractor agrees that he is as fully responsible to the Owner for the acts and omissions of his Subcontractors or suppliers at any tier and of persons either directly or indirectly employed by them as he is for the acts and omissions of persons directly employed by him.

The Contractor shall include in his agreements with Subcontractors, including suppliers and manufacturers of equipment, the provisions and requirements of these Contract Documents as applicable to their part of the work included under this Contact, together with such provisions as may be required pursuant to applicable laws. Nothing contained in the Contract Documents shall create any contractual relationship between the Owner or the Engineer and any Subcontractor or sub-Subcontractor.

Subject to the provisions of this Article and to the consent of the Executive Director, Work may be subcontracted except that the item of mobilization or any part thereof shall not be subcontracted. It is understood, however, that any consent of the Owner for the subcontracting of any Work of the Contract in no way relieves the Contractor from its full obligations for all Work under the Contract, nor the surety of its obligations under the bond. The Contractor shall at all times give its personal attention to the fulfillment of the Contract and shall keep the Work under control. The Contractor shall be responsible for all work of Subcontractors which work shall conform to the provisions of the Contract Documents. The consent to the subcontracting of any part of the Work shall not be construed as an approval of the said subcontract or of any of its terms, but is to operate only as an approval of the Contractor's request for the making of a subcontract between the Contractor and its chosen Subcontractor.

The Contractor shall perform with his own organization Contract Work amounting to at least 50 percent of the original total contract price except as follows:

A. If the Contract Documents include Pay Items designated as "Specialty Items," the Contractor may deduct the value of these items from the original total Contract price before computing the amount of work to be performed by his own organization.
B. The Contractor may deduct from the amount of work to be performed by his own organization the value of all Pay Items subcontracted to certified D/WBE firms indicated on the original DBE Form approved by the Owner.

In no event shall the Contractor perform, with his own organization, work amounting to less than 30 percent of the original total Contract price reduced in accordance with Item A above.

Where an entire item is subcontracted, the value of Work subcontracted will be determined based on the Pay Item Contract price. When part of the quantity of a unit price item is subcontracted, the value of the work subcontracted will be determined by multiplying the Contract unit price by the quantity performed by the Subcontractor. If the Subcontractor performs part of the work of any unit of a unit price item, that entire unit will be considered to be subcontracted and the value of the work subcontracted will be determined by multiplying the Contract unit price by the number of units of the quantity considered to be subcontracted. When a portion of a lump sum item or an item which includes specialty work is subcontracted, the value of Work subcontracted will be determined based on the estimated cost of the Work to be subcontracted as determined from the breakdown of cost submitted by the Contractor. When part of a sign support structure is subcontracted, the provisions for a lump sum item govern.

Application for subcontracting any part of the Work shall be made by the Contractor on forms furnished by the Owner. That form, fully completed in quadruplicate, one (1) original and three (3) copies, shall be furnished to the Engineer. The Contractor shall attach to that form a certified copy of the executed subcontract between the Contractor and the Subcontractor. The copy of the subcontract will be used in the review of the application.

After review of the application, the consent of or rejection by the Owner of the subcontracting will be provided to the Contractor in writing. Prior to the receipt of the written consent from the Owner, Work shall not be performed on the Project under the subcontract.

Subcontracting will not be permitted to firms and individuals suspended or debarred by the State of New Jersey Department of Transportation or included in the Report of Suspensions, Debarments, and Disqualifications of Firms and Individuals as maintained by the New Jersey Department of the Treasury, Division of Building and Construction, Bureau of Contractor Prequalification.

Subcontracting of those electrical items, which require electricians will be permitted only to Subcontractors who are licensed electricians in the State of New Jersey regardless of the value of the subcontract.

The Subcontractor shall look only to the Contractor for the payment of any claims of any nature whatsoever arising out of the subcontract. The Subcontractor agrees, as a condition of the Owner's consent to the making of the subcontract, that the Subcontractor shall make no claims against the Owner or its agents or employees for any Work performed or thing done by reason of the subcontract, or for any other cause that may arise by reason of the relationship created between the Contractor and Subcontractor by the subcontract.

Additionally, the Contractor shall give assurances, prior to the Owner's giving consent, that when minimum wage rates are specified they shall apply to labor
performed on all subcontracted Work.

The Owner will not consent to the making of any subcontract unless the proposed Subcontractor furnishes a statement to the effect that the Subcontractor is acquainted with all of the provisions of the Contract.

145. OTHER CONTRACTS

The Owner may let other contracts in connection with the work. The Contractor shall afford other Contractors reasonable opportunity for the introduction and storage of their materials, and shall

cooperate as necessary to provide for the orderly and timely execution of their work, and shall properly connect and coordinate his work with theirs.

If any part of work under this Contract depends on the prior acceptable completion of work under separate contract(s), the Contractor for this Contract shall inspect the existing conditions that are to receive his work and promptly provide a written report to the Engineer describing any defects in such existing conditions that would adversely affect the satisfactory completion of the work under this Contract. The Contractor's failure to so inspect and report shall constitute acceptance of the work under separate contract(s) as being suitable for the proper reception and completion of the work under this Contract, excluding, however, those defects in the work by others that occur after the satisfactory completion of the work specified hereunder:

146. COMMENCEMENT OF WORK

Upon execution of the Contract by the Owner, a fully executed copy together with a Notice to Proceed will be provided to the Contractor. Receipt of the executed Contract and Notice to Proceed shall constitute the Contractor's Owner to enter upon the Project site, provided the Contractor has submitted to the Engineer, and the Engineer has accepted, the insurance certificates required under GENERAL CONDITIONS Article “INSURANCE AND LIABILITY” and a pre-construction conference has been held. Construction operations shall not begin until the Contractor has supplied, and the Engineer has accepted, the progress schedule and other certifications, forms, schedules, and any other information required by the Contract Documents, and until the Contractor has established a field office as required by Contract Documents. The Contractor shall begin the work to be performed under the contract within 14 calendar days of the date set by the Engineer in the written notice to proceed, but in any event, the Contractor shall notify the Engineer at least 24 hours in advance of the time actual construction operations will begin. Failure to begin construction operations within 14 calendar days shall constitute a default for which the Owner may take whatever action that is deemed appropriate under the Contract.

147. PROSECUTION OF THE WORK

It is expressly understood and agreed that the time of beginning, rate of progress, and time of completion of the work are the essence of this Contract and are the responsibility of the Contractor. The Contractor should schedule the work and provide proper resources, labor, equipment and material to complete the project within the Time of Completion. The work shall be executed as required in the Contract Documents.

At or prior to the pre-construction meeting, the Contractor shall furnish the name and location of the solid waste facilities to be used as well as the fee structure of each of the facilities. Failure to provide such information will make the Contractor ineligible for adjusted compensation as provided for in GENERAL CONDITIONS Article “CHANGES IN CHARACTER OR WORK.”

148. LIMITATION OF OPERATIONS

The Contractor shall conduct the Work at all times in such a manner and in such sequence that shall ensure the least interference with traffic. The Contractor shall have due regard for the location of detours and for the provisions for handling traffic. The Engineer may require the Contractor to finish a section on which Work is in progress before Work is started on any additional sections if the opening of such section is essential to public convenience.

When the work requires the Contractor to conduct his operations within an MARINE TERMINAL OPERATIONS AREA of the Port, the work shall be coordinated with Port management (through the Engineer) at least 48 hours prior to commencement of such work. The Contractor shall not close an OPERATIONS AREA until so authorized by the Engineer and until the necessary

temporary marking and associated lighting is in place as provided in the Article titled "BARRICADES, WARNING SIGNS, AND HAZARD MARKINGS."

When the contract work requires the Contractor to work within an MARINE TERMINAL OPERATIONS AREA of the Port on an intermittent basis (intermittent opening and closing of the MARINE TERMINAL OPERATIONS AREA), the Contractor shall maintain constant communications as hereinafter specified; immediately obey all instructions to vacate the MARINE TERMINAL OPERATIONS AREA; immediately obey all instructions to resume work in such MARINE TERMINAL OPERATIONS AREA. Failure to maintain the specified communications or to obey instructions shall be cause for suspension of the Contractor's operations in the MARINE TERMINAL OPERATIONS AREA until the satisfactory conditions are provided.

149. CHARACTER OF WORKERS

The Contractor shall at all times employ sufficient labor and equipment for prosecuting the several classes of Work to full completion in the manner and time required by the Contract Documents.

All workers shall competent and have sufficient skill and experience to properly perform the Work assigned to them. Workers engaged in special Work or skilled Work shall have sufficient experience in that Work and in the operation of the equipment required to perform the Work satisfactorily. The Contractor shall provide sufficient competent, skillful employees to complete the work in the allotted time by the Time of Completion.

Any person employed by the Contractor or by any Subcontractor who, in the opinion of the Engineer, does not perform Work in a proper and skillful manner or is intemperate or disorderly shall, at the written request of the Engineer, be promptly removed by the Contractor or Subcontractor employing the person and shall not be again employed in any portion of the Work without approval. Should the Contractor fail to remove such person or persons as required, or fail to furnish suitable and sufficient personnel for the proper prosecution of the Work, the Engineer may suspend the Work by written notice until compliance with such orders.

Except for regularly retired employees, the Contractor and its Subcontractors shall not, without the written consent of the public employer of such person, engage on a full, part-time, or other basis, during the period of the Contract, any of the professional or technical personnel of the South Jersey Port Corporation.

150. CONTRACTOR'S METHODS, TOOLS AND EQUIPMENT

The Contractor's tools and equipment used on the work shall be furnished in sufficient quantity and of a capacity and type that will perform the work specified and in the time allotted by the Time of Completion. All equipment which is proposed to be used on the Work shall be of sufficient size and in such mechanical condition as to meet the requirements of the Work and to produce a satisfactory quality of Work.

Tools and Equipment used on any portion of the Project shall not cause damage to the roadway, adjacent property, or other highways. They shall be maintained and used in a manner that will not create a hazard to persons or property or cause a delay in the progress of the work.

When the methods and equipment to be used by the Contractor in accomplishing the construction are not specified, the Contractor is free to use any methods or equipment that accomplishes the Work. When the use of certain methods and equipment is specified, the specified methods and equipment shall be used unless otherwise authorized in accordance with GENERAL CONDITIONS Article "SUBSTITUTES OR "OR EQUAL" ITEMS."

151. OWNER'S RIGHT TO CORRECT DEFECTIVE WORK

If the Contractor should, in the opinion of the Engineer, neglect to execute the Work properly or should neglect or refuse at his own cost to take up and replace defective work that has been rejected by the Engineer, then the Owner will notify his Surety of the condition. After ten (10) days (or such longer period as the Owner may allow) written notice to the Contractor and the Surety, and without prejudice to any other right which the Owner may have under the contract, the Owner may take over that portion of the work that has been improperly executed and make good the deficiencies and deduct the cost thereof from the payments then or thereafter due the Contractor, and if such payments are not sufficient therefor, charge the cost to the Contractor and his Surety.

152. WORKING SITE / USE OF PREMISES

The Contractor shall confine his equipment, the storage of materials, and the operation of his workers to limits indicated in the Contract Documents or required by law, permits, or directions of the Engineer, and shall not unreasonably encumber the premises with his materials. The Contractor shall not use the decks of any completed bridges, or the areas including slopes under any completed bridges, as working sites or storage areas for materials or equipment. The Contractor shall provide, at his own expense, the necessary rights-of-way and access to the work which may be required outside the limits described above and provide evidence of such access rights to the Owner. Except as otherwise provided, any space that the Contractor may require for plant, equipment, storage, or other purposes in addition to that available at the Project site, shall be procured by the Contractor, and the cost thereof shall be included in the prices bid for the various Pay Items scheduled in the Proposal. In the event of default as set forth in GENERAL CONDITIONS Article “TERMINATION FOR DEFAULT, DAMAGES FOR DELAY, TIME EXTENSIONS,” the Owner has the right to take over and occupy such space, or cause it to be occupied, for the purpose of completing the Project, at the Contractor's expense. If the space is leased, the lease shall contain a provision that in event of default by the Contractor the lease may be assigned to the Owner or its nominee at their election. The Contractor agrees in event of said default, that it shall make such assignment.

The Contractor shall use every precaution to prevent injury or damage to all underground structures, such as pipes, wires and conduits; to all paved surfaces and to all turfed areas. He shall be responsible for injury or damage of any character resulting from any act, neglect, misconduct in his manner or method of execution or non-execution of said work, and such responsibility shall not be released until the work shall have been completed and accepted. Whenever any such damage or injury is done, the Contractor shall restore, at his own expense, the above to a condition similar or equal to that existing before such damage or injury is done.

The Contractor shall take particular care when new cables are being placed through existing duct banks, which contain existing cables. Any damage caused to existing cable by or during the operations of the Contractor must be repaired immediately at the sole expense of the Contractor.

The maintenance of Port Operations is of the utmost importance and priority on Port projects. The Contractor shall so schedule and conduct his operations and store his materials and equipment so that no unauthorized interference to normal Port operations will result therefrom.

Grading and stockpiling of materials or other construction operations shall not be conducted in a manner to cause malfunction of or interference with the Port traffic control. The Contractor shall plan and execute his work in such a manner that adequate access will be available for vehicular traffic at all times during the period of construction. No trucking or other heavy equipment will be allowed on the paved runways, and at no time shall the speed exceed the limits of the Port. It is expressly understood that the Owner will not be responsible for any deduction, interpretations,

delays, or conclusions made by the Contractor as to the difficulties, which will be encountered in this regard.

Existing lights shall be maintained in full operation throughout the period of this Contract. Where disconnections of lights are required, such work shall be made at such times and in such manner as approved by Port Management. The Contractor shall conduct his operations as required to maintain full use of existing lighting circuits, utilizing temporary cables and connections if necessary.

The Contractor shall secure the Port Operations Area (AOA) with temporary fencing in accordance with the dimensions and locations shown on the drawings.

The cost of maintaining Port operations shall be absorbed by the Contractor in the prices bid for the various items of work with the exception of items specified in the Schedule of Prices.

153. UNUSUAL SITE CONDITIONS

The Contractor shall promptly, and before such conditions are disturbed, notify the Engineer in writing of previously unknown physical conditions at the site of an unusual nature or differing materially from those ordinarily encountered and generally recognized as inherent in Work of the character provided for in the Contract. The Engineer will promptly investigate the conditions, and if the Engineer determines that such conditions are unusual, that they could not have been discovered by the Contractor through employing the high standard of care required under GENERAL CONDITIONS Article “EXAMINATION OF CONTRACT DOCUMENTS AND SITE OF PROJECT”, and that they cause an increase or decrease in the cost of, or the time required for, performance of any part of the Work under the Contract, an adjustment, as appropriate, will be made in the Contract Time pursuant to GENERAL CONDITIONS Articles “CLAIMS FOR ADDITIONAL TIME AND/OR COMPENSATION” and “EXTENSION OF TIME” and in compensation to the Contractor pursuant to GENERAL CONDITIONS Articles “CHANGES”, “MINOR CHANGES IN THE WORK”, “INCREASED OR DECREASED QUANTITIES”, “ELIMINATED ITEMS”, “EXTRA WORK”, “PAYMENT FOR MODIFICATIONS”, and “PAYMENT FOR CONTRACTOR’S EXPENSES DURING DELAY”.

Claims arising from unusual site conditions are barred unless the Contractor has given the required notice prior to disturbing such conditions.

154. COMPLAINTS

All complaints received by the Contractor shall be reported to the Engineer no later than the working day following receipt thereof. Such reports shall include the name, address, date, time received, date and time of action complained about, and a brief description of the alleged damages or other circumstances upon which the complaint is predicated. Each complaint shall be assigned a separate number, and all complaints shall be numbered consecutively in order of receipt. In the event more than one complaint is received from the same complainant, each later complaint shall show all previous complainant numbers registered by the same complainant. In addition, a summary report shall be made to the Engineer each month which shall indicate the date, time, and name of the person investigating the complaint and the amount of damages claimed (or estimate thereof), including the amount of settlement, if any. When settlement of a claim is made, the Engineer shall be furnished with a copy of the release of claim by the claimant. The Owner shall be notified immediately, throughout the statutory period of liability, of any formal claims or demands made by attorneys on behalf of claimants; of the serving of any notice, summons, subpoena, or other legal documents incidental to litigation; and for any out-of court settlement or court verdicts resulting from litigation.

155. TEMPORARY SUSPENSION OF WORK

The Engineer has the Owner to suspend the Work wholly or in part, for such period as deemed necessary, due to unsuitable weather, or to such other conditions as are considered unfavorable for the suitable prosecution of the Work, or for such time as deemed necessary due to the failure on the part of the Contractor to carry out orders given, or to perform any provision of the Contract. The Contractor shall promptly comply with the written order of the Engineer to suspend the Work wholly or in part. The suspended Work shall be resumed when conditions are favorable and methods are corrected, as ordered or approved in writing.

In the event that a suspension of Work is ordered as provided above, and should such suspension be ordered by reason of the failure of the Contractor to carry out orders or to perform any provision of the Contract; or by reason of weather conditions being unsuitable for performing any item or items of Work, which Work, in the sole opinion of the Engineer, could have been performed prior to the occurrence of such unsuitable weather conditions had the Contractor diligently prosecuted the Work when weather conditions were suitable; the Contractor, at its expense, shall do all the Work necessary to provide a safe, smooth, and unobstructed passageway through the construction area for use by public traffic during the period of such suspension. In the event that the Contractor fails to perform the Work above specified, the Owner will perform such Work and the cost thereof will be deducted from any monies due or that may become due the Contractor.

If the Engineer orders a suspension of all of the Work or a portion of the Work which is the current controlling operation or operations, due to unsuitable weather or to such other conditions as are considered unfavorable to the suitable prosecution of the Work, the days on which the suspension is in effect are not considered working days on working day contracts. If a portion of Work at the time of such suspension is not a current controlling operation or operations, but subsequently does become the current controlling operation or operations, the determination of working days will be made on the basis of the then current controlling operation or operations. Similarly, on calendar day and specified completion date contracts, extensions of Contract Time will be granted only if the suspension affects the overall completion of the Contract and the other requirements of GENERAL CONDITIONS Article “EXTENSION OF TIME” are satisfied.

If a suspension of Work is ordered by the Engineer due to the failure on the part of the Contractor to carry out orders given or to perform any provision of the Contract, the days on which the suspension order is in effect are to be considered working days if such days are working days within the meaning of the definition set forth in GENERAL CONDITIONS Article titled “DEFINITIONS”. On calendar day and specified completion date contracts, extensions of Contract Time will not be granted due to such suspension.

The Contractor shall have no claim for additional compensation as a result of suspension ordered for the reasons set forth in this Article, except as to the costs of providing a smooth and unobstructed passageway consistent with the above provisions.

156. SUSPENSION OF WORK

The Owner may order the Contractor in writing to suspend, delay or interrupt all or any part of the work for such period of time as he may determine to be appropriate for the convenience of the Owner.

If the performance of all or any part of the work is, for any unreasonable period of time, suspended, delayed, or interrupted by an act of the Owner in administration of this Contract or by his failure to act within the times specified in this Contract (or if no time is specified, within a reasonable time), an adjustment shall be made for any increase in the cost of performance of this Contract (excluding profit) necessarily caused by such unreasonable suspension, delay or interruption, and the

Contract modified in writing accordingly. However, no adjustment shall be made under this Article for any suspension, delay or interruption to the extent.

1. that performance would have been so suspended, delayed, or interrupted by any other cause, including the fault or negligence of the Contractor, or

2. for which an equitable adjustment is provided or excluded under any other provision of this Contract.

No claim under this Article shall be allowed:

1. for any costs incurred more than twenty (20) days before the Contractor shall have notified the Owner in writing of the act or failure to act involved (but this requirement shall not apply as to a claim resulting from a suspension order), and

2. unless the claim, in an amount stated, is asserted in writing within sixty (60) days after the termination of such suspension, delay, or interruption, but not later than the date of final payment under this Contract.

157. TERMINATION FOR DEFAULT, DAMAGES FOR DELAY, TIME EXTENSIONS

If the Contractor refuses or fails to prosecute the work, or any separable part of the work, with such diligence as will insure its completion within the time specified in this Contract, or any extension thereof, or fails to complete said work within such time, or in the event of substantial failure to fulfill his obligations under this contract through no fault of the Owner, the Owner may, by written notice to the Contractor, terminate his right to proceed with the work or such part of the work as to which there has been delay. In such event the Owner may take over the work and prosecute the same to completion by contract or otherwise, and may take possession of and use in completing the work such materials, appliances, and plant as may be on the site of the work and necessary therefor. Whether or not the Contractor's right to proceed with the work is terminated, he and his Sureties shall be liable for any damage to the Owner resulting from his refusal or failure to complete the work within the specified time.

If the Contract provides for liquidated damages, and if the Owner terminates the Contractor's right to proceed, the resulting damage will consist of such liquidated damages until the work is completed or accepted.

The Contractor's right to proceed shall not be terminated nor the Contractor charged with resulting damage if:

1. The delay in the completion of the work arises from causes other than normal weather beyond the control and without the fault or negligence of the Contractor, including, but not restricted to, acts of God, acts of the public enemy, acts of the Owner in either its sovereign or contractual capacity, acts of another Contractor in the performance of a contract with the Owner, fires, floods, epidemics, quarantine restrictions, unusually severe weather, or delays of Subcontractors or suppliers at any tier arising from causes other than normal weather beyond the control and without the fault or negligence of both the Contractor and such Subcontractors or suppliers; and

2. The Contractor within ten (10) days from the beginning of any such delay (unless the Owner grants a further period of time before the date of final payment under the Contract), notifies the Owner in writing of the causes of delay. Any claim for a time extension shall be asserted in writing within sixty (60) days after the termination of the delay and include detailed and documented justification as well as a Time Impact Schedule Analysis. The Owner shall

ascertain the facts and the extent of the delay and extend the time for completing the work when, in his judgement, the findings of fact justify such an extension. His findings of fact shall be final and conclusive on the parties, subject only to appeal as Article "DISPUTES" of these GENERAL CONDITIONS provide.

If, after notice of termination of the Contractor's right to proceed under the provisions of this Article, it is determined for any reason that the Contractor was not in default under this Article, or that the delay was excusable under this Article, the rights and obligations of the parties shall be the same as if the Notice of Termination has been issued under Article "TERMINATION FOR CONVENIENCE" of these GENERAL CONDITIONS. The rights and remedies of the Owner provided in this Article are in addition to any other rights and remedies provided by law or under this Contract.

158. CLAIMS FOR ADDITIONAL TIME AND/OR COMPENSATION

When the Contractor deems additional time and/or compensation is or may be due him for work or costs not clearly covered in the Contract Documents, or not ordered by the Owner according to the provisions of Article "CHANGES", of these GENERAL CONDITIONS, the Contractor shall notify the Engineer in writing of his intention to make a claim for such additional time and/or compensation before he begins the work or otherwise incurs costs upon which he intends to base the claim. The Contractor shall clearly state which of the following listed articles of these GENERAL CONDITIONS the claim shall be based upon: Article "SUSPENSION FOR WORK"; Article "TERMINATION FOR DEFAULT, DAMAGES FOR DELAY, TIME EXTENSIONS," Article "TERMINATION FOR CONVENIENCE"' Article "CHANGES"; or, Article "DIFFERING SITE CONDITIONS." Failure to comply in all respects to the notice and other filing provisions of these Articles may cause a rejection of the claim.

The Contractor shall also provide the Engineer with written information for keeping strict account of the actual costs of the work upon which the claim is based. Such costs shall be maintained in accordance with GENERAL CONDITIONS Article "PAYMENT FOR MODIFICATIONS" and "AUDIT: ACCESS TO RECORDS." If such notification or information is not provided by the Contractor, then he shall be deemed to have waived his right to claim for additional time and/or compensation. Such notice by the Contractor and the fact the Engineer has kept account of the cost shall not in any way be constructed as proving the validity of the claim. Claims for additional time and/or compensation shall be made in itemized detail based on a proper schedule analysis with the supporting documentation and submitted in writing in accordance with the Article of these GENERAL CONDITIONS under which the claim is being filed. The Engineer will carefully considered the claim and render a decision thereon in accordance with Article "DUTIES AND RESPONSIBILITIES OF THE ENGINEER" of these GENERAL CONDITIONS. If the Owner approves the claim, it will be paid for in accordance with Article "PAYMENT FOR MODIFICATIONS."

Claims for additional time and/or compensation for delays resulting from alterations or changes to the work that have been authorized by Modification Order will not be considered. All costs and time impacts for such altered or changed work shall have been included in the amount of compensation or time extension stipulated in the Modification Order prior to the signing of the Modification Order by the Owner and the Contractor.

159. TERMINATION FOR CONVENIENCE

A. The Owner may terminate the performance of the work under this Contract in accordance with this Article in whole, or from time to time in part, whenever the Owner shall determine that such termination is in the best interest of the Owner. Any such termination shall be effected by delivery to the Contractor of a Notice of Termination specifying the extent to

which performance of the work under the Contract is terminated, and the date upon which such termination becomes effective.

B. After receipt of a Notice of Termination and except as otherwise directed by the Owner, the Contractor shall:

1. Stop work under the contract on the date and to the extent specified in the Notice of Termination;

2. Place no further orders or subcontracts for materials, services, or facilities except as necessary to complete the portion of the work under the Contract which is not terminated;

3. Terminate all orders and subcontracts to the extent that they relate to the performance of the work terminated by the Notice of Termination;

4. Assign to the Owner, in the manner, at the times, and to the extent directed by the Owner, all of the right, title, and interest of the Contractor under the orders and subcontracts so terminated. The Owner shall have the right, in his discretion, to settle or pay any or all claims arising out of the termination of such orders and subcontracts;

5. Settle all outstanding liabilities and claims arising out of such termination of orders and Subcontractors, with the approval or ratification of the Owner to the extent he may require. His approval or ratification shall be final for all the purposes of this Article;

6. Transfer title to the Owner, and deliver in the manner, at the times, and to the extent, if any, directed by the Owner, (i) the fabricated or unfabricated parts, work in process, completed work, supplies and other material produced as a part of, or acquired in connection with the performance of, the work terminated by the Notice of Termination, and (ii) the completed or partially completed Plans, drawings, information, and other property which, if the Contract had been completed would have been required to be furnished to the Owner.

7. Use his best efforts to sell, in the manner, at the times to the extent, and at the price or prices that the Owner, directs or authorizes, any property of the types referred to in Paragraph B6 of this Article, but the Contractor (i) shall not be required to extend credit to any purchaser; and (ii) may acquire any such property under the conditions prescribed and at a price or prices approved by the Owner. The proceeds of any such transfer or disposition shall be applied in reduction of any payments to be made by the Owner to the Contractor under this Contract or shall otherwise be credited to the price or cost of the work covered by this Contract or paid in such other manner as the Owner may direct;

8. Complete performance of such part of the work as shall not have been terminated by the Notice of Termination; and

9. Take such action as may be necessary, or as the Owner may direct, for the protection and preservation of the property related to this Contract and in which the Owner has or may acquire an interest.

C. After receipt of a Notice of Termination, the Contractor shall submit to the Owner his termination claim in the form and with the certification the Owner prescribes. Such claim

shall be submitted promptly but in no event later than one (1) year from the effective date of termination, unless one (1) or more extensions in writing are granted by the Owner upon request of the Contractor made in writing within such 1-year period or extension. If the Contractor fails to submit his termination claim within the time allowed, the Owner may determine, on the basis of information available to him, the amount, if any due to the Contractor because of termination. The Owner shall then pay to the Contractor the amount so determined.

D. Subject to the provisions of Paragraph C, the Contractor and the Owner may agree upon the whole or any part of the amount or amounts to be paid to the Contractor because of the total or partial termination of work under this Article. The amount or amounts may include a reasonable allowance for profit on work done. However, such agreed amount or amounts, exclusive of settlement costs, shall not exceed the total Contract price as reduced by the amount of payment otherwise made and as further reduced by the Contract price of work not terminated. The contract shall be amended accordingly, and the Contractor shall be paid the agreed amount. Nothing in Paragraph E of this Article prescribing the amount to be paid to the Contractor in the event of failure of the Contractor and the Owner to agree upon the whole amount to be paid to the Contractor because of the termination under this Article, shall be deemed to limit, restrict, or otherwise determine or affect the amount or amounts which may be agreed upon to be paid to the Contractor pursuant to this Paragraph D.

E. If the Contractor and the Owner fail to agree, as Paragraph D provides, on the whole amount to be paid to the Contractor because of the termination of work under this Article, the Owner shall determine, on the basis of information available to him, the amount, if any, due to the Contractor by reason of the termination and shall pay to the Contractor the amounts determined as follows:

1. For all Contract work performed before the effective date of the Notice of Termination, the total (without duplication of any times) of (i) the cost of such work; (ii) the cost of setting and paying claims arising out of the termination of work under subcontracts or orders as Paragraph B5 of this Article provides. This cost is exclusive of the amounts paid or payable on account of supplies of materials delivered or services furnished by the Subcontractor before the effective date of the Notice of Termination. These amounts shall be included in the cost on account of which payment is made under (i) above; and (iii) a sum, as profit on (i), above, that the Owner determines to be fair and reasonable. But, if it appears that the Contractor would have sustained a loss on the entire contract had it been completed, no profit shall be included or allowed under this subdivision (iii) and an appropriate adjustment shall be made reducing the amount of the settlement to reflect the indicated rate of loss; and

2. The reasonable cost of the preservation and protection of property incurred under Paragraph B9 of this Article, and any other reasonable cost incidental to termination of work under this Contract. The total sum to be paid to the Contractor under Paragraph E1 of this Article shall not exceed the total sum to be paid to the Contractor under Paragraph E1 of this Article shall not exceed the total Contract price as reduced by the amount or payments otherwise made and as further reduced by the Contract price of the work not terminated. Except for the normal spoilage, and except to the extent that the Owner shall have otherwise expressly assumed the risk of loss, there shall be excluded from the amounts payable to the Contractor under Paragraph E1 above, the fair value, as determined by the Owner of property which is destroyed, lost stolen, or damaged, to the extent that it is undeliverable to the Owner, or to a buyer under Paragraph B7 of this Article.

F. The Contractor shall have the right to dispute under Article "DISPUTES" of these GENERAL CONDITIONS from any determination the Owner makes under Paragraph C or E of this Article. But, if the Contractor has failed to submit his claim within the time provided in Paragraph C of this Article and has failed to request extension of such time, he shall have no such right to appeal. In any case where the Owner has determined the amount due under Paragraph C or Paragraph E of this Article, the Owner shall pay to the Contractor the following: (i) if there is no right of appeal hereunder or if no timely appeal has been taken, the amount so determined by the Owner or (ii) if a Disputes proceeding is initiated, the amount finally determined in such Disputes proceeding.

G. In arriving at the amount due to the Contractor under this Article, there shall be deducted (i) all unliquidated advance or other payments on account theretofore made to the Contractor, applicable to the terminated portion of this contract, (ii) any claim which the Owner may have against the Contractor in connection with this Contract, and (iii) the agreed price for, or the proceeds of sale of, any materials, supplies or other things kept by the Contractor or sold, under the provisions of this Article, and not otherwise recovered by or credited to the Owner.

H. If the termination hereunder be partial, before the settlement of the termination portion of this Contract, the Contractor may file with the Owner a request in writing for an equitable adjustment of the price or prices specified in the Contract related to the continued portion of the Contract the portion not terminated by the Notice of Termination). Such equitable adjustment as may be agreed upon shall be made in the price or prices. Nothing contained herein shall limit the right of the Owner and the Contractor for the completion of the continued portion of the Contract when the Contract does not contain an established Contract price for the continued portion.

160. OWNER'S USE OF PORTIONS OF THE WORK

The Owner at anytime may request the Contractor, in writing, to permit the Owner to use any part of the work which the Owner may require and which may be so used without significant interference with construction of the other parts of the work. Within a reasonable time thereafter, the Owner, the Contractor, and the Engineer shall make an inspection of that part of the work to determine its status of completion. If the Engineer does not consider that part of the work to determine its status of completion. If the Engineer does not consider that part of the work to be substantially complete, the Engineer will notify the Owner and the Contractor in writing, giving his reasons therefore. If the Engineer considers that part of the work to be substantially complete, the Engineer will execute and deliver to the Owner and the Contractor a Certificate of Substantial Completion as set forth in Article "SUBSTANTIAL COMPLETION DATE" of these GENERAL CONDITIONS and fixing the date of Substantial Completion as to that part of the work, attaching thereto a tentative list of items to be completed or corrected before final payment. Such tentative list shall not be considered as a complete listing of Contractor's responsibilities for meeting the requirements for final acceptance of the work. The tentative listing of uncompleted items shall include the time within which the Contractor shall complete the items listed therein. The Owner will allow the Contractor reasonable access to complete or correct items on the tentative list.

In lieu of the issuance of a Certificate of Substantial Completion, the Owner may occupy and operate a facility constituting part of the work, whether or not it is substantially complete, if such facility is functionally and separately usable; provided that prior to any such takeover, the Owner and the Contractor have agreed as to the division of responsibilities between the Owner and the Contractor for security, operation, safety, maintenance, correction period, heat, utilities, and insurance with respect to such facility.

Such use shall not be considered as final acceptance of any portion of the work, nor shall such use be considered as cause for an extension of the Contract completion time unless authorized by a Contract Modification by the Owner.

161. TIME OF COMPLETION

The Contractor shall complete all or any portion of the Project called for under the Contract in all parts and requirements within the time or times for completion of the Contract set forth in the Information for Bidders. All time limits stated in the Contract Documents are of the essence of the Contract.

When the Contract Time is on a working day basis, the Engineer will furnish the Contractor a weekly statement showing the number of days charged to the Contract for the preceding week and the number of days specified for Completion. The Contractor is allowed one (1) week in which to file a written protest setting forth in what respect said weekly statement is incorrect. Otherwise, the statement is deemed to have been accepted by the Contractor as correct.

When the Contract Time is on a calendar day basis, it shall consist of the number of calendar days stated in the Contract counting from the date set forth in the Notice to Proceed in accordance with GENERAL CONDITIONS Article “COMMENCEMENT OF WORK,” including all Saturdays, Sundays, holidays, and non-work days.

When the Contract Time is a specified completion date, that is the date on which the Contract shall reach Completion.

162. LIQUIDATED DAMAGES OR ACTUAL DAMAGES FOR DELAY

A. GENERAL

Time is of the essence of this contract, and either, but not both, Liquidated Damages or Actual Damages for Delay will be assessed against the Contractor for failure to complete the work within the time(s) specified in these Contract Documents. The type of damages to be assessed for failure to complete the work on time is set forth in the Information for Bidders.

B. LIQUIDATED DAMAGES

Should the Contractor fail to complete the work, or any part thereof, in the time agreed upon in the Contract or within such extra time as may have been allowed for delay by extensions granted as provided in the Contract, the Contractor shall reimburse the Owner for the additional expense and damage for each calendar day, Sundays and legal holidays included, that the Contract remains uncompleted after the Contract completion date. It is agreed that the amount of such additional expense and damage incurred by reason of failure to complete the work is the actual cost to the Owner, which is estimated at a per-diem rate stipulated in the Information for Bidders. The said amounts are hereby agreed upon as liquidated damages for the loss to the Owner on account of expense due to the employment of Engineers, inspectors, and other employees after the expiration of the time of completion, and as applicable, expenses incurred by the Owner as a result of the impact of the Contractor on other Contractors under this project or other contracts, and on account of the value of the operation of the works dependent thereon. It is expressly understood and agreed that this amount is not to be considered in the nature of a penalty, but as liquidated damages, which have accrued against the Contractor. The Owner shall have the right to deduct such damages from any amount due, or that may become due the

Contractor, or the amount of such damages shall be due and collectible from the Contractor or his Surety.

C. ACTUAL DAMAGES FOR DELAY

Failure to meet the Contract Completion Date(s) by the Contractor will subject the Contractor to liability for all damages suffered by the Owner. Damages that might accrue to the Owner include, but are not limited to, the additional costs for project inspection, the Owner's project administration and overhead, the Engineer's project administration and overhead, loss of revenue from the completed facility, delay or impact damages from other Contractors on this Contract or other Contractors on the Contracts resulting from the delay, rental costs incurred by the Owner as a result of delay in completion of this Contract, value and use loss arising from this delay, and all legal costs associated with administration for this General Conditions or with any litigation arising out of this General Conditions. The Owner may, without prejudice to any other remedies that may be available, withhold from any monies due, or which may become due the Contractor, all damages sustained or which may be sustained in accordance with this Article. The rights and remedies of the Owner provided in this Article are in addition to any other remedies provided by law or under this Contract.

163. RESERVED

164. RESERVED

PROGRESS SCHEDULE

165. GENERAL

This work consist of the preparation and maintenance of a project control system using the Critical Path Method (CPM) of scheduling which shall be developed and used by the Contractor to demonstrate Contractor planning for the performance and progress of all activities, in accordance with this specification and contract documents.

By submitting a bid on the project, the Contractor is representing to the Owner that the project can be completed by the Required Completion Date and in accordance with all Project Milestone Dates, and that included in the Contract Price are any and all costs which may be incurred in order to meet all of the requirements of this Contract and to complete the Contract work by the Required Completion Date, and in accordance with all Project Milestone Dates.

At or prior to the pre-construction conference, the Contractor shall furnish, for approval, a progress schedule showing the order in which the Contractor proposes to prosecute the Work; the dates on which the various work stages, operations, and principal items of Work including procurement of materials and plant will begin; the quantity and kinds of equipment and character of the labor force; and the contemplated dates for completing the same. The progress schedule shall clearly outline the intended maintenance of traffic, the locations where temporary and permanent soil erosion and sediment control measures shall be installed, and such other information as required by the Contract documents or as deemed appropriate for the Project. The progress schedule shall give special consideration to sensitive areas such as wetlands, floodplains, waterways, and parklands to ensure that appropriate staging and seasonal constraints are considered in order to maximize the effectiveness of the soil erosion and sediment controls. The progress schedule shall also indicate any time frames when work is restricted in these sensitive areas as outlined in the permits issued by the regulatory agencies.

Construction operations shall not begin until the progress schedule has been approved. Once the progress schedule has been approved, the Contractor shall not deviate from it without first notifying the Engineer in writing. In scheduling and executing the Work, the following shall be considered:

A. Staging - The Contractor shall schedule the Work using such procedures and staging as may be specified in the Contract Documents. Work designated as part of separate stages may be performed simultaneously where provided by the Contract Documents or where approved.

When the Contract Documents provide for staging or specific procedures, the Contractor may, prior to submitting a progress schedule, present for written approval of the Engineer, a detailed, written alternate staging plan or procedure which incorporates the requirements of the Owner. As a condition of the Engineer's reviewing the alternate staging plan or procedure, the Contractor agrees that it is not entitled to additional Contract Time or compensation arising from possible delays to construction due to the time spent in reviewing the Contractor's staging plan or procedure, regardless of whether the Owner accepts or rejects it. If such staging plan or procedure is approved in writing, the Contractor may then prepare a progress schedule consistent with the approval.

Bituminous paving operations shall be staged to progress up to the bottom of the surface course. The bituminous concrete surface course for the full width of the traveled way, shoulder, and auxiliary lanes shall be paved as a single stage of construction and as the final paving operation.

B. Prosecution of the Work - The Contractor shall provide sufficient materials, equipment, and labor to guarantee the completion of the Project in accordance with the Contract Documents and within the time set forth under GENERAL CONDITIONS Article “TIME OF COMPLETION” and in the Information for Bidders.

Should the prosecution of the Work be discontinued by the Contractor for any reason, the Contractor shall notify the Engineer, in writing, prior to discontinuing work and at least 24 hours before resuming operations.

The Contractor shall arrange and prosecute the Work so that each successive construction operation at each location shall follow the preceding operation as closely as the requirements of the various types of construction permit.

The Engineer may revise stage construction and maintenance of traffic, if deemed necessary, due to unforeseen circumstances which may arise during construction.

Compensation for additional expense to the Contractor and allowance of additional time for completion of the Work shall be as set forth in a Change Order or Supplementary Agreement or in accordance with GENERAL CONDITIONS Articles “CLAIMS FOR ADDITIONAL TIME AND/OR COMPENSATION,” “EXTENSION OF TIME”, “PAYMENT FOR MODIFICATIONS”, and “EXTENSION OF TIME”.

When possible, the construction of subsurface structures adjacent to traffic shall be performed while traffic is being diverted from such areas. If traffic must be maintained in such areas, the Work shall be performed expeditiously in stages, as approved, and with minimum interference with traffic.

Subsurface structure excavation adjacent to traffic shall not remain open overnight unless adequately protected by approved safety devices.

The Contractor shall proceed with the Work of demolition of the various buildings that are identified with a demolition number as they become available for demolition. If any of the buildings that are to be demolished are not available for demolition at the time the Contractor begins Work on the Project, the Contractor shall temporarily defer its Work in the vicinity of the building and complete the Work when the building is available for demolition.

Operations adjacent to traffic shall be confined to only one (1) side of the traffic at any one (1) time unless otherwise specified in the Contract Documents.

Concrete curbs to be constructed adjacent to flexible base and surface courses shall be completed, cured, and backfilled before the flexible base and surface courses are constructed.

Underground structures for traffic signals, except for pressure detector installations, shall be constructed prior to completion of the intersecting road.

C. Intent, Responsibility, and Time - Scheduling of construction is the responsibility of the Contractor. Therefore, it is the Contractor's responsibility to determine the most feasible order of Work commensurate with the Contractor's abilities and the Contract Documents. The requirement for the progress schedule is included to ensure adequate planning and execution of the Work, to assist the Engineer in appraising the Contractor's compliance with the Contract Documents, and to evaluate progress of the Work. The progress schedule will be used for determining extensions or reductions of Contract Time pursuant to GENERAL CONDITIONS Articles “CLAIMS FOR ADDITIONAL TIME AND/OR COMPENSATION” and” EXTENSION OF TIME”.

It is not intended that the Engineer, by approving the progress schedule, agrees that it is reasonable in all respects or that following the progress schedule can result in timely completion of the Project. The progress schedule is not a part of the Contract.

If, in the preparation of the progress schedule, the Contractor projects a completion date that is different than that specified under GENERAL CONDITIONS “TIME OF COMPLETION,” the progress schedule in no way voids the date set by the Contract. The date as specified in that Article governs. Where the progress schedule reflects a completion date that is earlier than that specified as the Contract Time, the Engineer may approve the schedule with the Contractor specifically understanding that no claim for additional Contract Time or compensation shall be brought against the Owner as the result of failure to complete the Work by the earlier date shown on the progress schedule.

D. Acceleration and Default - If, in the opinion of the Engineer, the Contractor falls behind his progress schedule, and cannot complete the Work within the time prescribed under GENERAL CONDITIONS Article “TIME OF COMPLETION”, as modified pursuant to GENERAL CONDITIONS Articles “CLAIMS FOR ADDITIONAL TIME AND/OR COMPENSATION”, and “EXTENSION OF TIME”, the Contractor shall take such steps as may be necessary to improve his progress. The Engineer may require the Contractor to increase the number of shifts, begin overtime operations, work extra days including weekends and holidays, or

supplement his construction plant and to submit for approval such supplementary schedule or schedules, as may be deemed necessary to demonstrate the manner in which the agreed rate of progress shall be regained, all at no cost to the Owner.

Failure of the Contractor to comply with the requirements of the Engineer under this Subheading is grounds for the determination that the Contractor is not prosecuting the Work with such diligence as to ensure Completion within the time specified. Upon such determination, the Engineer may terminate the Contractor's right to proceed with the Work or any separable part thereof in accordance with GENERAL CONDITIONS Article "TERMINATION FOR DEFAULT, DAMAGES FOR DELAY, TIME EXTENSIONS."

The following definitions apply:

(1) Critical Activities: Activities that control the total duration of a Project, by forming a chain making up the longest sum of durations in a Project. This chain of critical activities forms the critical path of a Project.

(2) Float: The length of time the start or finish of an activity can be delayed without delaying the Project Milestone Date(s). Float is a shared commodity.

(3) Milestone Dates: Contractual Milestone Dates as defined in the Information to Bidders section titled "Time of Completion."

(4) Lag: The delay in number of time units, between an activity and its successor or predecessor. The delay period is from the start or finish of an activity to the start or finish of its successor or predecessor. Lag units can be positive or negative values.

The Contractor shall assign a person, with decision-making Owner, responsible to manage this work. Refer to the Milestone Dates referenced in the Information for Bidders section of the Contract.

166. PROCEDURES

A. "Scheduling Conference"

1. Attend a Scheduling Conference with the Engineer within seven (7) calendar days after the Award. The purpose of the Scheduling Conference is to review this specification.

2. At the conference, submit a list of all Required Completion Dates and Milestone Dates, as specified in this Contract. Be prepared to discuss concepts and the logic to be used in sequencing work activities for development of the Schedule.

3. In addition, designate a representative to serve as the CPM Scheduler and submit that individual's credentials for acceptance by the Engineer, as described in GENERAL CONDITIONS Article entitled PROCEDURES, Paragraph H of this specification.

B. "Preliminary Ninety-Day CPM Schedule"

Within fourteen (14) calendar days after the Notice of Award of the Contract, or fourteen (14) calendar days prior to the Pre-construction Conference (whichever occurs earlier), submit a "Preliminary Ninety-Day CPM Schedule" which itemizes the work and defines the Contractor's plan for the first ninety (90) days of Contract Time. This "Preliminary Ninety-Day CPM Schedule" will provide detail for the first ninety (90) days of the Contract Time, in full accordance with all requirements of this GENERAL CONDITIONS, PROGRESS

SCHEDULE, as well as summary logic for the remainder of the Contract Time. The use of lag lead times in the Preliminary Ninety-Day Schedule and the CPM Schedule is not permitted. All relationships shown are to be Finish to Start relationships. No work on the project will be permitted by the Contractor or any Subcontractors until the Engineer receives, reviews, issues comments and accepts this "Preliminary Ninety-Day CPM Schedule." Maintain and submit monthly a Ninety-Day Look Ahead Schedule until the "CPM Schedule" is accepted by the Engineer. Additionally, no extension of Contract Time will be allowed for any delays associated with the Contractor's preparation and the Engineer's review and acceptance of the "Preliminary Ninety-Day CPM Schedule." Until the "CPM Schedule" for the Contract is accepted, the Ninety-Day Schedule will be the basis for evaluating progress and coordinating the work.

C. "CPM Schedule"

Within fourteen (14) calendar days after Notice to Proceed with the Contract, prepare, complete, and submit to the Engineer for review, a Composite CPM Schedule, incorporating the schedules for all Subcontractors, interfaces with Contractors on adjacent Contracts, utilities, and railroads performing work in full accordance with this Contract. As such, it will comply fully with all Contract Provisions including, but not limited to, the requirements regarding contract time, milestones, coordination and cooperation with utility companies, governmental agencies, maintenance and protection of traffic, erosion and sedimentation control, construction noise restrictions and the requirements specified in Contract Provisions. Current estimate payments will not be released until the schedule is submitted in the format described in this section.

Acceptance of the Schedule does not approve the Contractor's estimate of resources (labor and equipment) or production rates. The Contractor is responsible to perform all work in accordance with the Schedule including all accepted revisions. However, nothing in the Schedule shall supersede the Contract Time requirements including the Required Completion Date, all Project Milestone Dates, and all coordination and cooperation requirements of the Contract.

D. The "CPM Schedule" will conform to the following:

1. The Schedule will be prepared as a Critical Path Method (CPM) schedule utilizing the Precedence Diagramming Method (PDM). The Schedule shall be at level of detail to be useful to field forces and to assure adequate planning, execution, monitoring, and recording of the progress of the work. Activity durations shall be limited to a maximum duration of fifteen (15) working days, as measured in accordance with the calendar applicable to that activity.

2. The Schedule shall be developed and used by the Contractor to: (a) schedule all work activities, (b) provide necessary and required coordination and cooperation logic between Contractors and utilities, (c) show all interdependent work activities, (d) phase construction, (e) stage construction, (f) provide traffic restrictions, (g) provide resource needs, (h) indicate time estimates for transmittal reviews for Contractor designs, shop drawings and other submissions, (is) provide all other controlling and subsequent operations. In addition to construction activities, the Contractor should include on the Schedule as a minimum, the procurement, fabrication and delivery of critical or special materials and equipment, and indicate restraints or relationships, means, method, sequences, and construction logic that may be required by the work, and that may be required by the Engineer. The Contractor's CPM Schedule shall integrate and meet the Milestone Dates as provided in the Contract.

3. The Engineer will be utilizing the most current version of Project Planner by Primavera for Windows or Primavera Suretrak. The Contractor may use one (1) of the following current Windows based versions of the approved scheduling software listed below, when approved by the Engineer. All data shall be submitted on disk(s) that are compatible with the Engineer's system and those disks will be provided to the Engineer by the Contractor.

   Approved Scheduling software includes:

   Project Planner by Primavera
   Suretrak by Primavera
   Aldegraf Scheduling System by Aldegraf System, Inc.

   Alternative software scheduling may be utilized if approved by the Engineer. Also, the Contractor is to provide training to the Engineer as recommended by the manufacturer for approved alternate software packages, if applicable.

E. Adjust Contract Time only in accordance with the requirements of Contract, GENERAL CONDITIONS and the Article entitled EXTENSION OF TIME of this Element.

F. Progress Reports will be required bi-weekly. They shall be subject to comments from the Engineer.

G. Requirements for initial submittal, review, and updating the CPM Schedule are included in GENERAL CONDITIONS Article of this Element entitled SUBMITTALS. Use the CPM Schedule for planning, organizing, and directing the Contractor's work and for reporting progress.

H. Designate an individual (or Subconsultant), to be available to the Engineer on an as-needed basis during the duration of the project, as the CPM Scheduler. Submit the CPM Scheduler's experience and credentials to the Engineer for review and acceptance prior to proceeding with any scheduling work under this Contract. Prior experience with resource-loaded CPM scheduling, knowledge of the specific scheduling software being used, and knowledge and experience shall be to administer the elements of this Project Schedule specification section. The Owner reserves the right to rescind such acceptance at any time during the Contract and to require the Contractor to provide a qualified replacement. The delegation of the CPM Scheduler's duties is not permitted, however, the Contractor may engage the services of qualified consultant to advise and provide staff assistance to the Construction Coordinator, if approved by the Owner.

I. Comply with all requirements of the Contract regarding coordination, cooperation, contract, and schedule.

167. CONTENT AND PROJECT SCHEDULE

A. The CPM Schedule shall consist of a pure logic CPM network diagram, activity sorts, printed reports, and digital data on disks, all of which will include the Required Completion Date and Milestone Dates. This shall include, but is not limited to, activities describing all work, the sequence of work, and all requirements of coordination and cooperation between Contractors, Subcontractors, Contractors on adjacent Contracts, Owner's work, utilities, governmental agencies, and other parties involved with the Work.

B. Diagrams shall show the order and interdependence of activities and the sequences in which the Work is to be accomplished. The basic concept of the network analysis diagram shall be followed to show how the start or finish of a given activity is dependent on other activities. Predecessor and successor activity restraints must be documented and provided in all reports to the Owner. The use of leads and lags in the Schedule and Contractor imposed constraint dates are prohibited.

C. The CPM Schedule shall be prepared in such a manner that the Contractor's Work sequence shall be optimized between early start and late start dates.

D. Detailed network activities shall include, in addition to construction activities, the submittal of samples, product data, shop drawings, fabrication, procurement and delivery of critical materials and equipment, and the manufacture, installation, and testing of special materials and equipment. Allow sufficient time for review, resubmittal, and/or resubmittal reviews, as required. Allow additional time for review by entities other than the Owner and its design consultants. Allow fourteen (14) calendar days for the review by the Engineer. Obtain concurrence of the Engineer for the duration in the Schedule for submission review activities by other entities. Owner activities, which affect progress, and milestone dates for completion of parts of the work, shall also be shown in accordance with Contract requirements.

E. The CPM Schedule Logic Diagram shall be based on areas of work and should show a continuous flow of activities from left to right. The CPM Schedule Diagram shall be sufficiently detailed to accurately depict the work. Activity numbers, activity descriptions, and activity duration in working days shall be shown on the diagram for each activity. The CPM Schedule (both logic diagrams and activity sorts and reports) should be coded by area, pay item, stage, responsibility, type of activity, and other relevant features through the use of activity codes. The following information shall be furnished for each activity:

1. Activity number
2. Activity description
3. Estimated duration of activity, in working days
4. Preceding and succeeding activity numbers

In conjunction with the CPM Schedule Diagram, provide the following information for each activity in the CPM Schedule:

1. Remaining duration of activity, in working days
2. Earliest start date, by calendar date
3. Earliest finish date, by calendar date
4. Actual start date, by calendar date
5. Actual finish date, by calendar date
6. Latest start date, by calendar date
7. Latest finish date, by calendar date
8. Total float
9. Estimated man-hours and shifts by classification
10. Estimated major equipment usage
11. Estimated cost
12. Estimated quantities of work

Be responsible for assuring that Subcontractor work and Contractor work is included in the network diagram, that work sequences are logical, and that the diagram shows a coordinated plan of work between the Contractor and Subcontractors and between Subcontractors.

Contractor imposed dates in the construction schedule do not bind the Owner. Only the Required Completion Date, and Milestone Completion Dates, and any contractually specified sequences shall be binding on the Owner in accordance with the Contract documents.

Consider, and make appropriate schedule and operational allowances, for weather conditions and the influence of high or low ambient temperatures on the completion of all Contract Work within the allotted Contract Time. The Owner assumes no responsibility for the impact of weather on the Contractor's Schedule.

Provide workday calendars, which address the specified and working requirements, which affect the project. Examples of calendars include a normal five (5) day week, weekend only work, holiday restrictions, traffic restrictions, shift requirements, duration of shifts, and seasonal restrictions.

Provide and document the correlation between each schedule activity and its corresponding pay item(s).

Clearly identify in the CPM Schedule network-diagram the activities illustrating accomplishment within the time for completion set forth in the Contract. Should the Schedule indicate an earlier completion than the time for completion set forth in the Contract, the difference between such an Early Completion Date and the Required Completion Date or any Milestone Date shall be defined as float. Show the float for the various activities on the computer-product printout. Define any float developed between an early completion point (i.e., prior to the contractual completion) and the contractual completion date as part of the project float. Float is the measure of an activity's ability to have its performance extended without affecting the critical path. Float is a commodity available to the Contractor and the Owner.

168. SCHEDULE REVIEW MEETINGS

Attend all Schedule Review Meetings on dates and times specified by the Engineer. Attendees at Schedule Review Meeting must include the CPM Scheduler, and, if requested by the Engineer, the Project Manager, Superintendent, and/or representatives from active, key Subcontractors. Schedule Review Meetings will be held bi-weekly. The attendees of the meeting shall review actual progress, planned progress for the next period, Change Order and any schedule changes since the previous update(s). Attendance is mandatory. Updated Progress Reports must be submitted to the Engineer for review in accordance with GENERAL CONDITIONS Article "SUBMITTALS."

Submit an updated disk and Progress Report three (3) days prior to every bi-weekly Progress Meeting. In the update for the Contractor, provide revised information based on progress to date. The data date will be equal to one (1) week prior to the Progress Meeting date. This information will be updated by the Contractor as described in GENERAL CONDITIONS Article titled UPDATING.

Incorporate all comments discussed at the Schedule Review Meeting into the next scheduled Progress Report submission.

169. UPDATING

The information described in GENERAL CONDITIONS paragraph E of the Article titled CONTENT AND PROJECT SCHEDULE shall be updated as follows. The activity percent complete and remaining duration are to be updated independently of each other.

Updates and Progress Reports shall be submitted bi-weekly. The Update shall provide revised information based on progress to date and logic changes incurred since the previous update. Bi-weekly updated Progress Reports shall show the activities completed during the reporting period. The Reports shall state the percentage of each activity the Contractor completed as of the reporting date, and the progress along each critical path in terms of days ahead or behind the latest allowable dates. The Report shall include a narrative description which includes, but is not limited to, a description of work activities completed, activities completed during this period, activities that are behind schedule, anticipated problems, delaying factors, their impact, and a description of corrective construction actions taken or contemplated. Changed work as a result of Change Orders shall be addressed in bi-weekly Progress Reports in full accordance with the Contract requirements. Change Orders shall be incorporated into the Schedule.

The Schedule will not be revised as long as the Contractor actually performs the work in the order and sequence shown on the Schedule. If the Contractor changes the order of his operations on the Project so that the Schedule no longer indicates reasonable logic for completing the Contract, the Contractor shall submit Schedule revisions to the Engineer for review, comment and acceptance. Comply with all comments issued by the Engineer as a result of such review without additional cost to Owner. Such a revision shall comply with all Contract Time requirements.

If the Owner revises the work and affects the sequence of operations or duration of time on work activities, the Schedule shall be revised promptly by the Contractor in accordance with the contract documents by adding, deleting or revising activities and/or changing restraints on the Schedule to indicate the Contractor's current plans for completing the work as revised. Submit such changes for the Engineer's review, comment and acceptance, as described above in this Article of the GENERAL CONDITIONS.

Immediately notify the Engineer if a problem arises requiring direction to the Contractor by the Engineer. Identify in writing all changes in activity durations or planned work sequences that impact the Required Completion Date or any Milestone Date and are caused by differing site conditions, changes in quantities, or alterations of the construction drawings. The Contractor shall completely identify the problem and describe "Who, What, When, Where, Why and How" the problem impacts the Schedule. The Engineer will verify the problem in accordance with the Contract and provide direction to the Contract. Submit a schedule report to the Engineer, outlining the effect that changes, or work directed by the Engineer might have on the Schedule, within seven (7) calendar days after receiving the change or direction. In cases where a Change Order is required, the Contractor shall revise the Schedule to accommodate the proposed change, the preparation of cost or credit estimates, issuance of the Change Order, negotiations, review and approval of samples, drawings, procurement of materials and the performance or deletion of work. Submit proposed Schedule revisions to the engineer for review, comment and acceptance.

Provide a Two (2) Week Look Ahead Schedule Bar Chart produced from the Schedule software on a weekly basis.

170. SUBMITTALS

Submit the Preliminary Ninety-Day CPM Schedule in accordance with the times stated in Article of the GENERAL CONDITIONS entitled PROCEDURES. Provide all information specified in the CONTENT AND PROJECT SCHEDULE of the GENERAL CONDITIONS for the detailed ninety-day portion of the Schedule. The Engineer will review and, if necessary, offer comments. Comply with the Engineer's comments. Update the Preliminary Ninety-Day CPM in accordance with Article titled UPDATING.

Submit the CPM Schedule to the Engineer for review within fourteen (14) days after Notice to Proceed. The initial submission must be made in digital format (3 ½ inch disk) and must be accompanied by three (3) sets of the following hard copy documents:

Pure Logic and Time Scaled Logic Diagram and Bar Chart Tabular Reports, sorted as follows:

by Activity Number
by Responsibility and Activity Number
by Total Float, Early Start
by Detailed Predecessor – Successor Analysis
by up to four (4) additional categories which may be requested by the Engineer

The Contractor's Schedule shall consist of the Schedule Diagram and the Tabular Reports. It shall include all comments on the Preliminary Schedule, and the schedules required from other Subcontractors, interfaces with the Contractors on adjacent Contracts, utilities, railroads, and governmental agencies. This Schedule shall become the original Schedule of record for planning, organizing and directing the work and for reporting progress. The Contractor's CPM Schedule and Tabular Reports shall be updated as the need arises and determined by the Engineer, but not less often then bi-weekly. Typically, updates shall be required whenever the work is affected by Change Orders, deviations from previously submitted schedules and development of schedules by Subcontractors, Contractors on adjacent Contracts, utilities, railroads, and governmental agencies. The updates are to be submitted with the Tabular Reports, or as directed by the Engineer in accordance with the Article entitled SCHEDULE REVIEW MEETINGS.

All data required by the Article of the GENERAL CONDITIONS titled CONTENT AND PROJECT SCHEDULES, must be included in this submission.

Submit the Two (2) Week Look Ahead Schedule required in Article titled UPDATING to the Engineer two (2) calendar days prior to the scheduled Progress Meeting.

Failure by the Contractor to submit a project schedule or any required revisions or updates thereto within the time limits specified, shall be sufficient cause for the Engineer to withhold processing of current estimates until such delinquent submittal is made. Should the Contractor fail to submit the schedule information within twenty-eight (28) calendar days, after the project schedule update, material breach of Contract shall result from failure to provide the Engineer with the required schedules and failure to implement such schedules immediately. Consider this material breach of Contract to be the Contractor's default of Contract, and as such, be subject to the provision GENERAL CONDITIONS Article "TERMINATION FOR DEFAULT, DAMAGES FOR DELAY, TIME EXTENSIONS."

The Engineer's review of a schedule shall in no way waive the requirements of this Contract nor shall it excuse the Contractor of any obligations under this Contract. Should a situation occur, such that an activity required by the Contract is not accurately depicted in the schedule, and its insertion impacts the project completion date, the Contractor must take the necessary action to recover the lost time. These efforts will be made at no additional cost to the Owner.

171. RECOVERY SCHEDULE

The Owner reserves the right to require a Recovery Schedule and implementation of such a Recovery Schedule. All statements regarding progress shall be subject to verification by the Engineer. Revise such statements if necessary, to reflect any changes identified by the Engineer. All changes identified in a schedule revision shall be reviewed by the Engineer and shall be subject to acceptance or rejection on the basis of compliance with the Contract and the GENERAL

CONDITIONS. Accept and comply with all comments issued by the Engineer as a result of any review of a schedule.

If the Engineer deems that the Contractor has fallen ten (10) working days behind the project schedule (as measured in relation to the Required Completion Date and the Milestone Dates) upon the Engineer's written request, submit a written and documented Recovery Schedule. This Schedule must be submitted within seven (7) calendar days of the date of the Engineer's request or within such other period as the Engineer may specify in writing. Implement the Recovery Schedule with no additional cost to the Owner and provide for completion of the work in accordance with the Required Completion Date and the Milestone Dates, without a time extension. Document in the Recovery Schedule all additional resources, including materials, equipment and labor, and modifications of operations which will be provided so as to meet the Recovery Schedule while maintaining construction restrictions listed in the Contract unless approved otherwise by the Engineer. Provide all such additional resources and modifications of operations without additional cost to the Owner. Such additional resources and modifications shall include but not be limited to:

1. Required overtime for the Contractor's personnel.
2. Increased construction manpower in such quantities as will substantially eliminate the backlog of work and put the project back on schedule.
3. Increased number of shifts per working day, working days per week, or the amount of construction equipment, or any combination of the foregoing which will put the project back on schedule.
4. Rescheduled activities to achieve the maximum practical concurrence of accomplishment of activities to put the project back on schedule.

Failure to provide the Engineer with the required Recovery Schedules and failure to implement such schedules within fourteen (14) calendar days of the Engineer's request shall be considered noncompliance by the Contractor in accordance with the Article titled SUBMITTALS. Continued failure to provide and implement a required Recovery Schedule for an additional fourteen (14) calendar days shall be the Contractor's default of Contract and, as such, shall be subject to the provision of GENERAL CONDITIONS Article "TERMINATION FOR DEFAULT, DAMAGES FOR DELAY, TIME EXTENSION."

172. EXTENSION OF TIME

The Owner shall have the right, at its discretion, by resolution to extend the time for completion of the Work beyond the time stated in this Contract (or as modified by any Change Order, Contract Modification, or Supplemental Agreement thereto), and may grant such an extension if the Contractor shall be actually and necessarily delayed by reason of any labor strike not caused, instituted, or provoked by the Contractor or any Subcontractor, agent or representative of the Contractor; by an injunction or interference of any public Owner; by Suspension of Work by the Owner; by any order, rule or regulation of any federal agency; or by any other cause deemed sufficient to the Owner, and not caused in whole or in part by the Contractor or any of his Subcontractors. Any extension of time shall be for the actual amount of such delay in such case. Such extension may not be allowed unless the Contractor has taken reasonable precautions to prevent such delays. During the occurrence of the cause of delay, within ten (10) calendar days after the commencement thereof, the Contractor shall present in writing to the Chief Engineer and Engineer a detailed claim therefore. Such written claim shall describe the circumstances of the delay. Furthermore, the information provided by such written claim shall be updated in writing, within thirty (30) calendar days after the end of the delay, and shall further specify the number of days actually delayed. Failure to submit both the initial and revised claims required by this Article will be sufficient cause for denying the requested time extensions. The extension of time granted under this Article shall not be the basis for additional compensation for any of the Contractor's costs incurred during the time of delay.

A. Extension of Total Contract Time.

Extension to the Total Contract Time will only be considered for actual, necessary, and justifiable delays impacting the actual critical path. Be responsible for any delays caused by failing to start work activities on the early start dates, inadequate or insufficient application of resources, or inability to complete the work within the Total Contract Time due to Contractor's approach to the work. Such delays shall not form the basis of any extension of time.

The Owner reserves the right, in its best interest, to negotiate the cost required to complete the Milestone work in accordance with the schedule dates, and not extend the Total Contract Time when justifiable delays are encountered.

In requesting an extension of time, furnish as part of the updated written claim specified in Article titled EXTENSION OF TIME, justification and supporting documentation as the Engineer deems necessary to determine whether the Contractor is entitled to an extension of time under the provisions of the Contract. This documentation shall include, but not be limited to, a schedule report illustrating the impact and net effect of the alleged delay on the critical path, diaries, timesheets and correspondence.

After a receipt of request for an extension of time the Engineer will make a decision based on facts and findings. Extensions of time will only be granted for justifiable delays, including those enumerated in the Article entitled EXTENSION OF TIME, when accepted, in writing, by the Engineer, as applied to the actual critical path of the project.

As specified in this Article, time extension requests accepted by the Engineer will result in extensions of time granted by the Owner upon completion of the work. Upon written notification of acceptance by the Engineer, the Owner will concurrently issue acknowledgement of entitlement to an extension of time. Unless stated otherwise therewith, submit a revised schedule incorporating the revised Contract Time and unless agreed otherwise, the Owner will not be responsible for any additional costs incurred as a result of work accelerated by the Contractor.

B. Adjustment of Interim Milestone Dates

Adjustment of Interim Milestone Dates will only be considered for justifiable delays involving the critical path and impact on Interim Milestone Dates by exceeding the positive float on the accepted Schedule. The Contractor shall be responsible for any delays caused by failing to start work activities on the early start dates, lack of continuous effort, inadequate planning and coordination of the work, inadequate or insufficient application of resources, or inability to meet the Interim Milestone due to Contractor's approach to the work. Such delays shall not form the basis of an extension of time to any of the Interim Milestone Dates. No adjustment of Interim Milestone Dates will be considered if such adjustment impacts the Total Contract Time, unless in addition to meeting the requirements of this Paragraph B, the requirements of Paragraph A, the Article titled Extensions of Total Contract Time, are also met.

The Owner reserves the right, in its best interest, to negotiate the cost required to complete the Interim Milestone work in accordance with the schedule dates, and not extend any Interim Milestone dates or the Contract Completion Date when justifiable delays are encountered.

In requesting an extension on listed elements or activities of an Interim Milestone Date, furnish justification and supporting documentation as the Engineer deems necessary to determine whether the Contractor is entitled to additional Interim Milestone Completion Time under the provisions of the Contract.

Submit, in writing, to the Engineer each request for change in any Interim Milestone Date within ten (10) calendar days after the beginning of the condition for which a time extension is requested.

After receipt of request for time extension to an Interim Milestone Date, the Engineer will make a decision based on facts and findings and will advise the Contractor of the approval or rejection of the Interim Milestone extension request, in writing. The Engineer's decision on the Interim Milestone extension request will be final.

Interim Milestone Time Extension will be granted for justifiable delays when accepted by the Engineer, on the actual critical path to that Interim Milestone.

C. Adjustment of Project Milestone Dates by Contract Modification

The EXTENSION OF TIME Article, Paragraphs A and B notwithstanding, extensions of time may be granted by Change Orders and/or Contract Modifications as defined in GENERAL CONDITIONS Article "CHANGES." The Milestone Dates will be adjusted only if upon the incorporation of activities for the work defined in the Change Order into the accepted Schedule, these activities impact the critical path by exceeding the projected milestone completion date at the start of the delay.

The Change Order procedure is modified as follows: the Contractor will be issued a draft Change Order for review. Within five (5) days, submit for review by the Engineer a schedule report incorporating all elements of the proposed Change Order, and its effect, if any, on the milestone dates. Upon acceptance of the report, the Contractor will be issued the Change Order indicating any additions or reductions to the Contract Time, which justifiably impacts the Milestone's critical path.

The Owner reserves the right, in its best interest, to negotiate the cost required to complete the work defined in the Change Order within the Project Milestone Dates, when that Change Order work justifiably impacts the Milestone's critical path.

173. DRAWINGS

The Contractor and Engineer shall maintain and monitor separate submission logs of all shop/work drawings, Contractor design drawings, and other drawing submissions affecting the work. In addition, the Contractor shall submit a copy of the transmittal for each submitted drawing to the Engineer. The Contractor and Engineer shall enter these submittal transactions into their respective submission logs.

In order to effectively use the submission log, include as a minimum the following information for each drawing and transmittal submitted, unless otherwise approved:

Project Name
Section Name
Owner Contract Number
Contractor
Engineer
Contractor's Shop Drawing Number

Submittal Number (1st submission, 2nd submission, etc.)
Specification Section
Item Number(s) Associated with the Submission
Shop Drawing Description
Date of Contractor's Submittal
The Schedule activity affected by the drawings

If the Contractor's drawing and/or his transmittal does not have this information, the drawing and/or its transmittal will be returned without review. Incomplete drawings, as determined by the reviewing party, will also be returned marked "Incomplete." The Contractor shall be responsible for any delays caused by incomplete drawing submissions.

After a drawing has been submitted once and has been reviewed, except as required to satisfy the review comments, do not add new information or details to that same drawing without the approval of the Engineer.

174. SUBMISSION LOG

The purpose of the submission log is to schedule and monitor the date of each shop/work drawing submittal, Contractor's designs and all other submissions required under this Contract, and the length of times for the Engineer's review, the number of times a submittal required resubmission by the Contractor and length of time taken by the Contractor to make re-submissions.

Submit an initial itemized submission log, together with Ninety (90) Day Work Plan, within fifteen (15) calendar days of the Notice of Award of the Contract or prior to the Pre-construction Conference, whichever occurs earlier. Submit a complete itemized submission log for the remainder of the Contract, together with the Detailed Construction Schedule, within forty-five (45) calendar days of the actual Notice to Proceed date. The itemized submission log shall conform to the Schedule and include all submittals required under this Contract.

Submittals shall be prioritized and shall be scheduled to allow the specified time for review. If the Engineer determines the number of concurrent submissions scheduled for review and acceptance is excessive, allow an additional amount of time for review that is acceptable to the Engineer.

The Submission log shall include the items listed in Section 10 of this specification plus the following information:

Date of Engineer's Reply to Contractor's Submittal
Action by the Engineer
Number of Calendar Days the Engineer has an Outstanding Drawing

The submittal date of each submission shall be incorporated into Schedule. Make submissions at least fourteen (14) calendar days prior to the date the Contractor needs the information for purchasing or fabricating material, equipment, etc. to allow for a minimum of fourteen (14) calendar days for in-house review by the reviewing party unless specified otherwise. This fourteen (14) calendar days period begins when the Engineer acknowledges receipt of the submission and ends when the Contractor is notified the review is complete.

Be responsible for all time required for re-submissions required to conform with the conditions set forth in this specification.

175. MEASUREMENT AND PAYMENT

Construction Schedule – Incidental

Payment for the construction schedule will be incidental to the Contract Unit Price bid for each and every item in the Contract. All costs for furnishing and updating the progress schedule shall be included in the prices bid for the various Pay Items scheduled in the Proposal.

176. RESERVED

177. RESERVED

PAYMENT

178. PAYMENT FOR MODIFICATIONS

Payment to the Contractor, or credit to the Owner for any modification to the work under the Contract covered by all Modification Orders shall be determined by the methods set forth herein:

A. UNIT PRICES

Unit prices stipulated in the Bid or provided by the Contractor in the Bid breakdown shall be utilized, where they are applicable and determined reasonable by the Owner. In the event that the Contract Modification results in a change in the original quantity by more than a twenty-five percent (25%) variation to Major Pay Items occurs, the Owner or the Contractor may in writing request a renegotiated unit price for the work in excess of 125%.

Major Pay Items are any Items having an original contract value equal to or in excess of 10 percent of the ORIGINAL Total Contract Price or 20 percent of the ORIGINAL Total Price for Port Improvement Program projects. The original contract value of a Pay Item equals the per unit price bid for said Pay Item multiplied by the estimated quantity of such item contained in the Proposal Form. All other Pay Items shall be considered Minor Pay Items. Minor Pay Items are not eligible for any adjustment in unit price regardless of how much the total quantity varies from the quantity contained in the Proposal.

When the Owner or the Contractor requests a renegotiated unit price for the work in excess of 125 percent of the work for Major Pay Items, the Contractor shall furnish a breakdown of the cost satisfactory to the Owner for review, for the proposed adjusted unit price, in accordance with C through L below. The basis for the adjustment will be agreed upon prior to the performance of the work. If the basis cannot be agreed upon, the work will be paid on a Force Account Payment basis as specified in C through L below.

When a Major Item experiences a decrease to below 75% of the original contract quantity, the actual quantity below the 75% of the approximate quantity may be paid at an adjusted price, as agreed upon with the Contractor and approved by the Owner; however, total compensation will not exceed the contract item's original value. Item value is defined as the original estimated contract quantity contained in the Proposal Form multiplied by the per unit price bid. The Contractor shall furnish a breakdown of the cost satisfactory to the Owner for review, for the proposed adjusted unit price, in accordance with C through L below. The basis for the adjustment will be agreed upon prior to the performance of the work. If the basis cannot be agreed upon, the work will be paid on a Force Account Payment basis as specified in C through L below.

Where Contract Modifications are determined on the basis of unit prices stipulated in the Bid or provided by the Contractor in the Bid Breakdown, that unit price shall constitute the total equitable adjustment including all overhead and profit due for the modification and no

further costs shall be owed under the contract for delay or impact to the unchanged portions of the Contract, or for any other reason.

A unit price for Extra Work shall be mutually determined by the Contractor and the Owner. The Contractor shall furnish a breakdown of the cost satisfactory to the Owner for approval, of the proposed unit price, in accordance with C through L below. The basis for the adjustment will be agreed upon prior to the performance of the work. If the basis cannot be agreed upon, the work will be paid on a Force Account Payment as specified in C through L below.

B. LUMP SUM

Lump Sum prices stipulated in the Bid or provided by the Contractor in the Bid breakdown shall be utilized, where they are applicable and determined reasonable by the Owner. The original contract price of a lump sum item may be adjusted only when the approximate quantities of a component items are designated on component item schedules incorporated in the bid proposal and the original component quantity variation is more than twenty-five percent (25%) for the component items of Major Pay Items. The Owner or the Contractor may in writing request a renegotiated unit price for component items.

Major Pay Items are any Items having an original contract value equal to or in excess of 10 percent of the ORIGINAL Total Contract Price or 20 percent of the ORIGINAL Total Price for Port Improvement Program projects. The original contract value of a Pay Item equals the per unit price bid for said Pay Item multiplied by the estimated quantity of such item contained in the Proposal Form. All other Pay Items shall be considered Minor Pay Items. Minor Pay Items are not eligible for any adjustment in unit price regardless of how much the total quantity varies from the quantity contained in the Proposal.

When the Owner or the Contractor requests a renegotiated unit price for the component items in excess of 125 percent of the work for Major Pay Items, the Contractor shall furnish a breakdown of the cost satisfactory to the Owner for approval, for the proposed adjusted unit price, in accordance with C through L below. The basis for the adjustment will be agreed upon prior to the performance of the work. If the basis cannot be agreed upon, the component item will be paid on a Force Account Payment basis as specified in C through L below.

When a Major Item experiences a component decrease to below 75% of the original component quantity, the actual quantity of work performed may be paid at an adjusted price, as agreed upon with the Contractor and approved by the Owner; however, total compensation will not exceed the component item’s original value. Component item value is defined as the original component quantity multiplied by the contract component unit price. The Contractor shall furnish a breakdown of the cost satisfactory to the Owner for review, for the proposed adjusted unit price, in accordance with C through L below. The basis for the adjustment will be agreed upon prior to the performance of the work. If the basis cannot be agreed upon, the work will be paid on a Force Account Payment basis as specified in C through L below.

A Lump Sum price for Extra Work shall be mutually determined by the Contractor and the Owner. The Contractor shall furnish a breakdown of the cost satisfactory to the Owner for review, of the proposed lump sum, in accordance with C through L below. The basis for the adjustment will be agreed upon prior to the performance of the work. If the basis cannot be agreed upon, the work will be paid on a Force Account Payment as specified in C through L below.

C. FORCE ACCOUNT PAYMENT

If the method or amount of payment cannot be agreed upon prior to beginning the work, and the Owner directs in writing that the work be done on a force Account payment basis, the Contractor shall furnish labor, equipment, and materials necessary to complete the work in a satisfactory manner and within a reasonable period of time. The total cost for labor, material, equipment, bonds, insurance, and tax as provided below, together with applicable markups constitute full compensation for all direct and indirect costs (including overhead) and profit, and are deemed to include all items of expense not specifically designated.

D. QUOTATIONS FOR PROPOSED MODIFICATIONS

The Owner's request for quotation on a proposed modification shall not be considered authorization to proceed with the work prior to issuance of a formal Modification Order, unless directed otherwise in writing by the Owner. Nor shall such request constitute justification for a delay or a timely extension under the Contract.

The Contractor's quotation for a proposed modification shall be supplied to the Owner in writing, and shall be submitted on the form required by the Owner. The quotation shall be considered firm for a period not less than sixty (60) days from the date of the Contractor's submittal. The Contractor shall submit a written quotation for a proposed modification not later than two (2) weeks after being requested to provide such quotation, unless the Owner allows more time. Time for submitting quotations shall not be cause for a delay or time extension under the Contract.

E. GENERAL

Any compensation paid under a Modification Order shall comprise the total compensation due the Contractor for the work or modification defined in the Modification Order. By signing the Modification Order, the Contractor acknowledges and agrees that the stipulated compensation includes payment for all work contained in the Modification Order, plus all payment for the interruption of schedules, extended overheads, delay and all impact or ripple effect. The signing of other Modification Order shall indicate that the Modification Order constitutes full mutual accord and satisfaction for the change, and that the time and/or cost under the Modification Order constitutes the total equitable adjustment owed the Contractor as a result of the change. No further claim or modification for any foreseeable cause shall arise out of or as a result of a signed Modification Order.

When Work that is paid on a Force Account basis is performed by forces other than the Contractor's organization, the Contractor shall reach an agreement with such other forces as to the distribution of payments made by the Owner for such Work. Additional payment therefor will not be made by reason of the performance of the Work by a Subcontractor or other forces.

It is understood that Force Account payments pursuant to the terms of the Contract are contractual in nature only and are not to be used for any other purpose. More specifically, but not by way of limitation, the Force Account provisions of this Contract are not to be used to prove damages in a court of law in an action for breach of Contract pursuant to the provisions of the New Jersey Contractual Liability Act.

Force Account payment will be based on the following:

F. LABOR

For all necessary labor and foremen in direct charge of the specific operations, whether the employer is the Contractor, Subcontractor, or another, the Contractor shall receive the rate of wage (or scale) actually paid as shown in its certified payrolls for each and every hour that said labor and foremen are actually engaged in such Work.

The Contractor shall receive the actual costs paid to, or on behalf of, workers by reason of health and welfare benefits or other benefits, when such amounts are required by collective bargaining agreements or other employment contracts generally applicable to the classes of labor employed on the Work.

G. BOND, INSURANCE, AND TAX

For bond premiums; property damage, liability, and workers compensation insurance premiums; unemployment insurance contributions; and social security taxes on the Force Account work, the Contractor shall receive the actual incremental cost thereof, necessarily and directly resulting from the Force Account work. The Contractor shall furnish satisfactory evidence of the rate or rates paid for such bond, insurance, and tax.

H. MATERIALS

The Owner reserves the right to furnish such materials as it deems advisable, and the Contractor shall have no claims for costs and markup on such materials.

Only materials furnished by the Contractor and necessarily used in the performance of the Work will be paid for. Sales tax will not be paid on materials which, qualify for an exemption under the Sales and Use Tax Act and the regulations issued thereunder, regardless of whether the exemption is used. The cost of such materials shall be the cost to the purchaser, whether Contractor, Subcontractor, or other forces from the supplier thereto, together with transportation charges actually paid by it, except as follows:

(1) If a cash or trade discount by the actual supplier is offered or available to the purchaser, it shall be credited to the State notwithstanding the fact that such discount may not have been taken.
(2) If materials are procured by the purchaser by any method which is not a direct purchase from and a direct billing by the actual supplier to such purchaser, the cost of such materials shall be the price paid to the actual supplier as determined by the Engineer, plus the actual costs, if any, incurred in the handling of such materials.
(3) If the materials are obtained from a supply or source owned wholly or in part by the purchaser, the cost of such materials shall not exceed the price paid by the purchaser for similar materials furnished from said source on Pay Items or the current wholesale price for such materials delivered to the job site, whichever price is lower.
(4) If the cost of such materials is, in the opinion of the Engineer, excessive, then the cost of such materials shall be the lowest current wholesale price at which such materials are available in the quantities concerned, delivered to the job site, less any discounts as provided in Item a above.
(5) If the Contractor does not furnish satisfactory evidence of the cost of such materials from the actual supplier thereof, the cost will be determined in accordance with Item d above.

I. EQUIPMENT AND PLANT

(1) Contractor Owned Equipment and Plant

The hourly rates for Contractor owned equipment and plant will be determined from the applicable volume of the Rental Rate Blue Book (referred to hereafter as the "Blue Book"), published by Nielsen/DATAQUEST, Inc. of Palo Alto, California.

The Blue Book will be used in the following manner:

a. The hourly rate will be determined by dividing the monthly rate by 176. The weekly, hourly, and daily rates will not be used.
b. The number of hours to be paid for will be the number of hours that the equipment or plant is actually used on a specific Force Account activity.
c. The current revisions will be used in establishing rates. The current revision applicable to specific Force Account work is as of the first day of work performed on that Force Account work and that rate applies throughout the period the Force Account work is being performed.
d. Area adjustment will be made. Equipment life adjustment will be made in accordance with the rate adjustment tables.
e. Overtime shall be charged at the same rate indicated in Item (a) above.
f. The estimated operating costs per hour will be used for each hour that the equipment or plant is in operation on the Force Account work. Such costs do not apply to idle time regardless of the cause of the idleness.
g. Idle time for equipment will not be paid for, except where the equipment has been held on the Project site on a standby basis at the request of the Engineer and, but for this request, would have left the Project site. Such payment will be made at one-half (.5) the rate established in Item (a) above.
h. The rates established above include the cost of fuel, oil, lubrication, supplies, small tools, necessary attachments, repairs, overhaul and maintenance of any kind, depreciation, storage, overhead, profits, insurance, all costs (including labor and equipment) of moving equipment or plant to, on, and away from the site, and all incidentals.
i. Operator costs will be paid only as provided in Subheading a above.

All equipment shall, in the opinion of the Engineer, be in good operating condition. Equipment used by the Contractor shall be specifically described and be of suitable size and suitable capacity required for the work to be performed. In the event the Contractor elects to use equipment of a higher rental value than that suitable for the Work, payment will be made at the rate applicable to the suitable equipment. The equipment actually used and the suitable

equipment paid for will be made a part of the record for Force Account work. The Engineer will determine the suitability of the equipment. If there is a differential in the rate of pay of the operator of oversize or higher rate equipment, the rate paid for the operator will be that for the suitable equipment.

If a rate is not established in the Blue Book for a particular piece of equipment or plant, a monthly rate will be computed on the basis of 6% of the manufacturer's list price for sale (new) of such equipment; the hourly rate in this case will be determined by dividing the monthly rate by 160, when actually operation, and by 352, when at work site but not operating, with no percentage added. For equipment used for maintenance and protection of traffic (signs, flashers, barricades, drums etc.), with no rate listed in the Rental Rate Blue Book, use a daily rate computed on the basis of 6% of the manufacturer's list price for the sale (new) of this equipment, divided by 22, with no percentage added.

The above provisions apply to the equipment and plant owned directly by the Contractor or by entities which are divisions, affiliates, subsidiaries, or in any other way related to the Contractor or its parent company.

(2) Rented Equipment and Plant

In the event that the Contractor does not own a specific type of equipment or plant and must obtain it by rental, the Contractor shall inform and obtain approval from the Engineer of the need to rent the equipment and of the rental rate for that equipment prior to using it on the Work. The Contractor will be paid the actual rental for the equipment for the time that the equipment is actually used to accomplish the Work, provided that rate is reasonable, plus the cost of moving the equipment to, on, and away from the Project site. The Contractor shall provide a copy of the paid receipt or canceled check for the rental expense incurred.

K. PROFIT

Profit shall be computed at five percent (5%) of the following:

(1) Total material cost (bare cost FOB).
(2) Total direct labor cost (actual hours worked multiplied by the regular hourly rate).

L. OVERHEAD

Overhead is defined to include the following:

(1) All salaries and expenses of executive officers, supervising officers, or supervising employees;
(2) All clerical or stenographic employees;
(3) All charges for minor equipment, such as small tools, including shovels, picks, axes, saws, bars, sledges, lanterns, jacks, cables, pails, wrenches, and other miscellaneous supplies and services; and
(4) All drafting room accessories such as paper, tracing cloth, and blueprinting.

Overhead costs for Force Account work shall be computed at ten percent of the following:

(1) Total material cost (bare cost FOB).

(2) Total direct labor cost (actual hours worked multiplied by the regular hourly rate).

(3) Specific extraordinary overhead expenses, such as hiring of additional supervisory personnel or the use of special minor equipment (as defined above), which the Contractor has to purchase specifically for the Force Account, may be allowed. In such instances, the Contractor will be paid only the reasonable costs of such extraordinary overhead expenses provided the Engineer has agreed to such costs prior to their being incurred.

(4) Total fringe benefits on total direct labor cost as computed above.

The Contractor will be allowed an additional ten percent (10%) for overhead on the total amount of all work performed by the Subcontractors.

M. RECORDS

The Contractor shall maintain his records in such a manner as to provide a clear distinction between the direct costs of Work paid for on a Force Account basis and the costs of other operations.

From the above records, the Contractor shall furnish to the Engineer completed daily Force Account work reports for each day's work to be paid for on a Force Account basis. Said daily Force Account work reports shall be signed by the Contractor and submitted daily. The daily Force Account work reports shall be detailed as follows:

(1) Name, classification, date, daily hours, total hours, rate, and extension for each worker and foreman.

(2) Designation, dates, daily hours, total hours, rental rate (including a copy of the Blue Book pages used), and extension for each unit of machinery and equipment.

(3) Quantities of materials, prices, and extensions.

(4) Transportation of materials.

(5) Cost of bonds; property damage, liability, and workers compensation insurance premiums; unemployment insurance contributions; and social security taxes.

Material charges shall be substantiated by valid copies of vendor's invoices. Such invoices shall be submitted with the daily Force Account work reports, or if not available, they shall be submitted with subsequent daily Force Account work reports. Should said vendor's invoices not be submitted within 60 days after the date of delivery of the material, or within 15 days after the Completion, whichever occurs first, the Owner reserves the right to establish the cost of such materials at the lowest current wholesale prices at which said materials are available, in the quantities concerned, delivered to the location of Work, less any discounts provided in Subheading H (1) above.

The Engineer's records will be compared with the completed daily Force Account work reports furnished by the Contractor, and any necessary adjustments will be made. When these daily Force Account work reports are agreed upon and signed by both parties, said reports become the basis of payment for the work performed but do not preclude subsequent adjustment based on a later audit by the Owner.

The Contractor's cost records pertaining to work paid for on a Force Account basis shall be open to inspection or audit by representatives of the Owner, during the life of the Contract and for a period of not less than three (3) years after Acceptance thereof, and the Contractor shall retain such records for that period. Where payment for materials or labor is based on the cost thereof to forces other than the Contractor, the Contractor shall ensure that the cost records of such other forces are open to inspection and audit by representatives of the Owner on the same terms and conditions as the cost records of the Contractor. If an audit is to be commenced more than 60 days after Acceptance, the Contractor will be provided a reasonable notice of the time when such audit is to begin. In case all or a part of such records are not made so available, the Contractor understands and agrees that any items not supported by reason of such unavailability of the records will not be allowed, or if payment therefore has already been made, the Contractor shall refund to the Owner the amount so disallowed.

N. PARTIAL PAYMENT FOR COST REIMBURSEMENT

To receive partial payments and final payment for Force Account Payment work, the Contractor shall submit to the Engineer detailed and documented verification of the Contractor's and any of the Subcontractors' actual costs incurred by the cost reimbursement work as set forth in M above. Such costs shall be submitted within thirty days (30) after said work has been satisfactorily completed.

179. PAYMENT FOR CONTRACTOR'S EXPENSES DURING DELAYS

If the Engineer finds that the Work was delayed on the entire Contract or any part thereof, because of conditions beyond the control and not the fault of the Contractor for causes as to which the provisions of the Contract authorize compensation, the Contractor will be paid its expenses during that period of delay by Change Order in the following manner:

A. LABOR

For all necessary nonproductive labor and foremen in direct charge of specific operations who must remain on the Project during such periods of delay due to collective bargaining contracts or other reasons approved by the Engineer, the Contractor is to receive the prevailing rate of wage as shown in its certified payrolls. The Contractor is also to receive the actual costs paid to, or in behalf of, workers by reason of health and welfare benefits, pension fund benefits, or other benefits, when such amounts are required by collective bargaining agreements or other employee contracts generally applicable to the classes of labor employed on the Work.

B. BOND, INSURANCE, AND TAX

For bond premiums; property damage, liability, and, workers compensation insurance premiums; unemployment insurance contributions; and social security taxes during the period of delay, the Contractor is to receive the actual incremental cost thereof, necessarily and directly resulting from the delay. The Contractor shall furnish satisfactory evidence of the rate or rates paid for such bond, insurance, and tax.

C. IDLE EQUIPMENT

For any idle machinery or special equipment other than small tools which must remain on the Project site, with approval of the Engineer, during delays, the Contractor is to receive compensation at one-half (.5) the rate calculated pursuant to Subheading 4 of the fifth paragraph of GENERAL CONDITIONS Article "PAYMENT FOR MODIFICATIONS."

Should the Engineer determine that it is not necessary for machinery or equipment to remain on the Project during delays, the Contractor is to receive transportation costs to remove the machinery or equipment and return it to the Project at the end of the delay period.

The time for which such compensation will be paid is the actual normal working time during which such delay condition exists, which in no case exceeds eight (8) hours in any one (1) day or 40 hours per week.

The days for which compensation will be paid are the calendar days, excluding Saturdays, Sundays, and holidays, during the existence of such delay.

D. MISCELLANEOUS

The Contractor further receives an amount equal to ten percent of the sum of the above items, which is full compensation for overhead, general superintendence, or other costs attributed to the delay for which no specific allowance is herein provided. Payment under this Article constitutes full compensation for all items of expense related to such delay.

E. PROFIT

Profit is not allowed under this Article.

F. RECORDS

Payment will not be made for delays until the Contractor has furnished the Engineer with duplicate itemized statements of the cost as hereinabove specified and detailed as follows:

1. Name, classification, date, daily hours, total hours, rate, and extension for each worker and foreman.
2. Designation, dates, daily hours, total hours, rental rate, and extension for each unit of machinery and equipment.
3. Transportation costs.
4. Cost of bonds; property damage, liability, and workers compensation insurance premiums; unemployment insurance contributions; and social security taxes.

The Engineer will compare the Owner's records with completed daily reports furnished by the Contractor and make any necessary adjustments. When these daily reports are agreed upon and signed by both parties, said reports become the basis of payment for the expenses incurred, but do not preclude subsequent adjustment based on a later audit by the Owner.

The Contractor's cost records pertaining to expenses under this Article shall be open to inspection or audit by representatives of the Owner during the life of the Contract and for a period of not less than three (3) years after Acceptance thereof, and the Contractor shall retain such records for that period. Where payment for materials, equipment, or labor is based on the cost thereof to forces other than the Contractor, the Contractor shall make every reasonable effort to ensure that the cost records of such other forces are open to inspection and audit by representatives of the Owner on the same terms and conditions as the cost records of the Contractor. Payment for such cost may be deleted if the records of such third parties are not made available to the Owner's representatives. If an audit is to be commenced more than 60 days after Acceptance, the Contractor is to be provided with a reasonable notice of the time when such audit is to begin. In case all or a part of such records are not made so available, the Contractor understands and agrees that any items not supported by reason of such unavailability of the records will not be allowed, or if

payment therefor has already been made, the Contractor shall refund to the Owner the amount so disallowed.

180. PARTIAL PAYMENTS

A. GENERAL

Nothing contained in this Article shall be construed to affect the right of the Owner to reject the whole or any part of the work found to be defective. All estimated quantities of work for which partial payments have been made are subject to review and correction prior to final payment. Payments by the Owner and acceptance by the Contractor or partial payments based on periodic estimates of quantities of work executed shall not, in any way, constitute acceptance of the estimated quantities used as the basis for computing the amounts of the partial payments.

B. ESTIMATE FOR PARTIAL PAYMENT

All requests for partial payment must be received by the Owner no later than the 25th day of each calendar month. The Contractor shall submit to the Construction Manager, on the form provided, an estimate based on the approved cost breakdown of the amount earned for the separate portions of the work and request payment. The Construction Manager must approve the request for partial payment prior to forwarding to the Owner. Therefore, the Contractor shall allow a minimum of seven (7) calendar days for the approval of the request by the Construction Manager. As used in this Article, the words "amount earned" mean the value, on the date of the estimate for partial payment, of the work completed in accordance with the Contract Documents, including the value of approved materials delivered to and stored at the project site suitably stored and protected at an approved storage area prior to incorporation into the work. If the Contractor's estimate of the amount earned conforms to the Construction Manager's evaluation, the Construction Manager will make recommendation to the Engineer for payment. The Construction Manager’s approval does not constitute approval by the Engineer. The Engineer retains the right to overrule the Construction Manager with regard to approval of the request for partial payment.

If the Contractor's estimate of the amount earned does not agree with the Construction Manager’s and the Engineer's evaluations, the Contractor shall submit a revised estimate that will meet with their approvals; or, as an alternative, the Engineer will estimate the percentage of work completed and submit to the Owner and Contractor his recommendation as to the amount earned for partial payment.

Partial Payment requests will not be processed unless ALL of the following criteria have been met:

1. The requirements of the preceding two (2) paragraphs have been fulfilled.

2. The Contractor has fulfilled ALL the requirements contained in the Schedule and Sequence of Operations in the Specifications, for the period.

C. RETAINAGE

Retainage from the estimates of the amounts earned will be as described below.

The Owner will retain ten percent (10%) of the amount of each such estimate until fifty percent (50%) of the work has been completed. At fifty percent (50%) completion, further partial payments will be made in full to the Contractor and no additional amounts will be

retained unless the Engineer certifies that the work is not proceeding satisfactorily, but amounts previously retained will not be paid to the Contractor. At fifty percent (50%) completion or any time thereafter when the progress of the work is not satisfactory, additional amounts may be retained, but in no event will the total retainage be more than ten percent (10%) of the value of the work completed. Upon the Engineer's Certification of Substantial Completion, an amount retained may be paid to the Contractor. When the work has been substantially completed, except for work which cannot be completed because of weather conditions, lack of materials, or other reasons which in the judgment of the Owner are valid reasons for non-completion, the Owner may make additional payments, retaining at all times an amount sufficient to cover the estimated cost of the work still to be completed, or in the alterative may pay out the entire amount retained and received from the Contractor guarantees in the form of a bond or other collateral sufficient to ensure completion of the work. For the purposes of this Article, estimates will include any fabricated or manufactured materials and components specified and delivered to the work or properly stored and suitable for incorporation in the work embraced in the Contract.

D. QUALIFICATION FOR PARTIAL PAYMENT FOR MATERIALS DELIVERED OR STORED

Qualification for partial payment for materials delivered or suitably stored, but not yet incorporated into the work shall be as described below.

Materials, as used herein, shall mean fabricated and manufactured material and equipment. Only those materials for which the Contractor can transfer clear title to the Owner will be qualified for partial payment.

To receive partial payment for materials on hand at the jobsite or which are stockpiled in the vicinity of the jobsite at a location approved by the Engineer and that are adequately insured and protected through appropriate security measures, but not incorporated in the work, the Contractor shall submit to the Engineer, at the time of requesting partial payment, a list of such materials. The Engineer, after confirming that such materials are on hand or stockpiled and are adequately insured and protected will recommend to the Owner the items for which partial payment is to be made. The Contractor's actual net cost for the materials must be supported by paid invoices of suppliers. Final payment shall be made only for materials actually incorporated in the work and, upon acceptance of the work, all materials remaining for which partial payments had been made shall revert to the Contractor, unless otherwise agreed, and partial payments made for these items shall be deducted from the final payment or the work.

Partial payments for undelivered, specifically manufactured equipment to be incorporated into the work, excluding "off the shelf" or catalog items, will be made to the Contractor for payment to the equipment manufacturer when all of the following conditions exist.

1. The equipment is so designated in the Specifications.

2. The equipment to be specifically manufactured for the project could neither be readily utilized on nor diverted to another job, and,

3. A fabrication period of more than six (6) months is anticipated.

The first payment for undelivered, specifically fabricated equipment will be made following approval of the shop drawings for the equipment, but in no case will payment exceed fifteen percent (15%) of the quoted price of the equipment. Thereafter monthly payments will be made based on the progress of fabrication a determined by the Engineer, but in no case

will the total payments, prior to delivery exceed seventy five percent (75%) of the quoted price of the equipment.

E. PAYMENT

After deducting the retainages and the amount of all previous partial payments made to the Contractor, the amount earned as of the current month will be made payable to the Contractor as follows:

Not later than the 15th of each calendar month, the Owner will make partial payment to the Contractor on the basis of the Engineer's recommended estimate of the work executed during the preceding calendar month.

181. RELEASE OF LIENS OR CLAIMS

The Contractor shall indemnify and save harmless the Owner from all claims for labor and materials furnished under this Contract. Before the Owner pays the Contractor his final payment for the work, the Contractor shall submit satisfactory evidence that all persons, firms, or corporations who have done work or furnished materials under this Contract, for which the Owner may become liable under the laws of the State of New Jersey, have been fully paid or satisfactorily secured. If evidence is not furnished or is not satisfactorily secured. If evidence is not furnished or is not satisfactory, an amount shall retained from moneys due the Contractor which, in addition to any other sums that may be retained, will be sufficient, in the opinion of the Owner, to meet all liens or claims. Such sum or sums shall be retained until the liens or claims are fully discharged or satisfactorily secured.

If any lien or claim remains unsatisfied after all payments to the Contractor are made, the Contractor shall refund to the Owner all moneys that the latter may be compelled to pay in discharging such a lien or claim, including all costs and attorneys' fees.

182. FINAL PAYMENT

Upon completion of all of the work under this Contract, the Contractor shall notify the Engineer, in writing, that he has completed the work and make application for final payment. The Owner shall pay to the Contractor all moneys due him under the provisions of the Contract Documents after the following conditions have been met:

A. The Owner has accepted the completed work, or formally waived nonconforming work to the extent of the nonconformity;

B. The Owner has approved the Engineer's recommendation for acceptance of the work;

C. The Contractor has complied with all the requirements set forth in each Certificate of Substantial Completion;

D. The Contractor has furnished the Owner with a release of all claims against the Owner or the Engineer arising by virtue of this Contract other than claims in stated amounts as may be specifically accepted by the Contractor from the operation of the release;

E. The Contractor has complied with all other provisions of the Contract Documents;

F. Neither the final payment nor the partial payment shall operate to release the Contractor or his Sureties from any obligation under this Contract or any bond or warranty, as herein provided.

183. NO WAIVER OF RIGHTS

Neither the inspection by the Owner, through the Engineer or any employees of the same, nor any order by the Owner for payment of money, nor any payment for, or acceptance of, the whole or any part of the work by the Owner or Engineer, nor any extension of time, nor any possession taken by the Owner or his employees, shall operate as a waiver or any provision of this Contract, or any power herein reserved to the Owner, or any right to damages herein provided, no shall any waiver of any breach in this Contract be held to be a waiver of any other or subsequent breach.

184. ACCEPTANCE OF FINAL PAYMENT CONSTITUTES RELEASE

The acceptance by the Contractor of the final payment shall release the Owner and the Engineer, as representative of the Owner, from all claims and all liability to the Contractor for all things done or furnished in connection with the work, and every act of the Owner and others relating or arising out of the work. Within 30 days after Final Payment has been issued to the Contract, the Contractor shall submit to the Engineer a written acceptance of the Final Payment. The Contractor's failure to submit any written acceptance within 30 days will be construed as an acceptance of the Final Payment without exception or reservation.

185. AUDIT: ACCESS TO RECORDS

A. The Contractor shall maintain books, records, documents and other evidence directly pertinent to performance of work under this Contract in accordance with generally accepted accounting principles and practices consistently applied. The Contractor shall also maintain financial information and data used by the Contractor in the preparation or support of the cost submissions required for this Contract, or any Modification Order or claim, and a copy of the cost summary submitted to the Owner. The Owner and appropriate representative of the federal government (if this project is funded by federal monies) or their authorized representatives shall have access, at all times during normal business hours, to such books, records, documents and other evidence for the purpose of inspection, audit and copying. The Contractor will provide proper facilities for such access and inspection during normal business hours.

B. The Contractor agrees to make paragraph A through H of this Article applicable to this Contract and all Modification Orders or claims affecting the Contract price. The Contractor agrees to include paragraphs A through H of this Article in all his contracts and all their subcontracts in excess of $10,000, and to make paragraphs A through H of this Article applicable to all Modification Orders and claims related to project performance.

C. Audits conducted under this Article shall be in accordance with generally accepted auditing standards and established procedures and guidelines of the reviewing or audit agency.

D. The Contractor agrees to the disclosure of all information and reports resulting from access to records under paragraphs A and B of this Article, to the agencies referred to in paragraph A of this Article, provided that the Contractor is afforded the opportunity for an audit exist conference, and an opportunity to comment on and submit any supporting documentation on the pertinent portions of the draft audit report, and that the final audit report will include written comments of reasonable length, if any, of the Contractor.

E. Records under paragraphs A and B of this Article shall be maintained and made available during performance of work under this Contract until final payment, or until settlement of all disputes, claims, or litigation. In addition, those records which relate to any portion of this Contract, to any Modification Order, to any dispute, to litigation, to the settlement of claims arising out of such performance, or to costs or times to which an audit exception

have been taken, shall be maintained and made available until final payment or until final resolution of such dispute, litigation, claim or exception, whichever occurs later. As a minimum, the auditors shall have available to them the following documents:

1. Daily time sheets and foreman's daily reports.
2. Union agreements.
3. Insurance, welfare, and benefits records.
4. Payroll registers.
5. Earnings records.
6. Payroll tax forms.
7. Material invoices and/or requisitions.
8. Material cost distribution worksheet.
9. Equipment records (list of company equipment and rates).
10. Vendors', rental agencies', and Subcontractors' invoices.
11. Subcontractors' payment certificates.
12. Canceled checks (payroll and vendors).
13. Job cost report.
14. Job payroll ledger.
15. General ledger.
16. Cash disbursements journal.
17. Financial statements for all years reflecting the operations on the Project.
18. Income tax returns for all years reflecting the operations on the Project.
19. Depreciation records on all company equipment whether such records are maintained by the company involved, or its accountant, or others.
20. If a source other than depreciation records is used to develop costs for the Contractor's internal purposes in establishing the actual cost of owning and operating equipment, all such other source documents.
21. All documents which reflect the Contractor's actual profit and overhead during the years the Project was being performed and for each of the five (5) years prior to the commencement of the Project.
22. All documents related to the preparation of the Contractor's bid including the final calculations on which the bid was based.
23. All documents which relate to each and every claim together with all documents which support the amount of damages as to each claim.
24. Worksheets used to prepare the claim establishing the cost components for items of the claim including, but not limited to, labor, benefits and insurance, materials, equipment, Subcontractors, and all documents which establish the time periods, individuals involved, and the hours and rates for these individuals.

F. The right of access which this Article confers will generally be exercised with respect to financial records, on Modification Orders or claims in excess of $10,000 affecting the price of this Contract. Such right of access may be exercised with respect to records pertaining directly to Contract performance or claims, or if the Contract is terminated for default or convenience.

G. If the Owner determines that any price negotiated in connection with this Contract, or any cost reimbursable under this contract, was increased by any significant sums because the Contractor, or any tier Subcontractor, furnished incomplete or inaccurate cost or pricing data or data not current, then such price or cost or profit shall be reduced accordingly and the contract shall be modified in writing to reflect such reduction.

H. Failure to agree on a reduction under this Article shall be subject to Article "DISPUTES" of these GENERAL CONDITIONS.

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BALZANO MARINE TERMINAL
RAIL INFRASTRUCTURE REHABILITATION

Technical Specifications

South Jersey Port Corporation
101 Joesph A, Balzano Blvd.
Camden, NJ 08103

Issued For Bid
7/2/2022

Urban Engineers, Inc.
Project # : 2021500064.000

SECTION 000110 - TABLE OF CONTENTS

TECHNICAL SPECIFICATIONS:

- END OF SECTION -

Project Location: 101 Joseph A. Balzano Blvd, Camden, NJ 08103.

B. Owner: South Jersey Port Corporation, 2 Aquarium Drive, Suite 100, Camden NJ 08103.

Owner's Representative: Mr. Chris Perks, Director of Engineering,

C. Engineer: Urban Engineers, Inc., 530 Walnut Street, Philadelphia, PA 19106

Engineer's Representative: Mr. Michael Wagner, PE

D. Construction Manager: To Be Named.

1. Construction Manager will be engaged for this Project to serve as an advisor to Owner and to provide assistance in administering the Contract for construction between Owner and Contractor, according to a separate contract between Owner and Construction Manager.

1.4 WORK COVERED BY CONTRACT DOCUMENTS

A. The Work of his Project is divided into two distinct categories defined as those items that comprise the BASE BID work and those items that comprise the ALTERNATE ADDITIONAL BID.

B. The items identified as those to be included in the BASE BID is defined by the Contract Documents and includes, but is not limited to, the following:

1. Removal of existing track in concrete or bituminous pavement located on land side and on the reinforced pile supported concrete deck of the riverside docks including lawful disposal of all demolition debris so removed as indicated on the drawings.
2. Removal of seven (7) existing "Tongue and Mate" turnouts embedded in pavement.
3. Removal of two (2) Double Point Split Switch" turnouts embedded in pavement.
4. Removal and return to Owner of one (1) Hayes type Track Bumper located on track to be removed under this contract.
5. Removal of two 135CR/115RE crossing frogs at the location of the crossing of one dockside STS crane runway rail with an existing railroad sidetrack.
6. Supply and installation of fully welded track complete including new 136RE standard rail on timber crossties, or steel crossties, embedded in concrete or bituminous pavement or as embedded as the direct fixation sections located on the pile supported reinforced concrete deck portion of the riverside ship berths as indicated on the drawings.

7. Supply of and installation of four (4) new 136RE cast manganese steel #8 Double Tongue type manually operated railroad turnouts for installation in concrete pavement, including all components to provide a complete installation.

8. Design, fabrication, supply and installation of two new Flange Bearing Solid Manganese Steel 132RE to 135CR rail crossing frogs for direct fixation installation to replace those removed as noted in Item 4 above.

9. Drainage infrastructure improvements including video camera inspection of a portion of the existing stormwater drainage system between point of connection of new work to outfall at the Delaware River bulkhead.

10. Water supply system infrastructure modifications.

11. Renewal of one existing Bituminous Concrete at-grade single track railroad crossing of the Marine Terminal Main Entrance Gate Road, including removal of existing railroad track, pavement and other excavated materials and their removal from SJPC property including lawful disposal of all materials so removed and supply and installation of a new full depth, heavy duty, precast reinforced concrete grade crossing, eighty (80) total feet in length (measured along the centerline of track) including new 136RE CWR with all necessary field rail welding, restoration of pavement, application of pavement markings and signage in accordance with the requirements State and Federal regulations, supply of temporary traffic control measures and all other ancillary work required to complete the installation.

12. Milling and removal of portions of the existing bituminous paving located within designated areas and by sequential Phases as defined by the Project Documents

13. Removal of two (2) existing loading dock roll-up doors and the supply and installation of two (2) motor operated steel coiling type roll up doors, including supply of the electrical supply and control system, to be located as shown on the plans for work at Shed 1.

14. Selective demolition and removal of portions of the existing concrete floor and sections of the existing loading dock of Shed 1 and the supply, installation and finishing of new reinforced concrete floor and sections of the loading dock as shown on the plans for work at Shed 1.

15. Restoration of painted traffic directional pavement markings removed or otherwise rendered illegible by the construction activities performed under the scope of this project.

16. Other ancillary work in connection with the Base Bid portion as described and as indicated in the Project Documents.

17. Lawful disposal of all materials so removed not otherwise designated for reinstallation or rejected by the Engineer as unsuitable for reuse.

C. The ALTERNATE ADDITIONAL BID work of the Project is defined by the Contract Documents as “Building A Improvements” and includes the following

1. Supply and installation of 875 feet of fully welded track complete including new 136RE standard rail on timber or steel crossties and embedded in bituminous pavement and connection to the portion of track installed under the BASE BID portion as described above. Work shall include all necessary excavation, grading, compaction, supply of all required materials. Work will also include reinstallation of one existing Hayes Type railroad track bumper removed from existing track performed under work comprising the BASE BID items.
2. Removal of two (2) existing loading dock roll-up doors and the supply and installation of two (2) motor operated steel coiling doors including electrical supply and control system for installation in Building A.
3. Selective demolition of a portion of the existing concrete floor of Building A including removal of demolition debris from SJPC property and lawful disposal of all demolition materials removed in connection therewith.
4. Supply of all material and labor required to form and place reinforcing steel and concrete including the finishing of the surface including any ancillary work necessary to complete the installation of the section of floor of Building A removed as described above and as defined by the Project Documents.
5. Supply of all materials and the fabrication and installation of two (2) new exterior weather canopies and exterior lighting in connection with the installation of the two (2) railcar loading doors of Building A as noted above, and in accordance with that shown on the plans and as defined by the Project Documents.

D. Type of Contract:

1. Project will be constructed under a single prime contract.

1.5 PHASED CONSTRUCTION

A. The Work comprising the BASE BID items shall be conducted in five (5) phases to enable an orderly, uninterrupted transfer of Owner's operations to new facilities, with each phase substantially complete as indicated below:

1. Phase 1: Within the limits as designated on drawing #CP-1 of the Project Documents.
2. Phase 2: Within the limits as designated on drawing #CP-1 of the Project Documents.
3. Phase 3: Within the limits as designated on drawing #CP-1 of the Project Documents.
4. Phase 4: Within the limits as designated on drawing #CP-1 of the Project Documents.
5. Alternate Extra Item #1: Within the limits as designated on drawing #CP-1 of the Project Documents.

B. Before commencing Work of each phase, submit an updated copy of Contractor's construction schedule, showing the sequence, commencement, and completion dates for all phases of the Work.

1.6 OWNER-FURNISHED/CONTRACTOR-INSTALLED (OFCI) PRODUCTS

A. Owner's Responsibilities: Owner will furnish products indicated and perform the following, as applicable:

1. Provide access to Owner-furnished products at location where products are currently stored, at a time or times as agreed upon by Owner and Contractor.
2. Inspect and inventory, with Contractor present, Owner-furnished items prior to loading for transport.
3. Inform Contractor of earliest available date for access to storage location for loading of Owner-furnished products.

B. Contractor's Responsibilities: The Work includes the following, as applicable:

1. Designate dates required for access to Owner-furnished products in Contractor's construction schedule, utilizing Owner-furnished earliest available dates.
2. Receive, unload, handle, store, protect, and install Owner-furnished products.
3. Protect Owner-furnished products from damage during storage, handling, and installation and prior to Substantial Completion.
4. Repair or replace Owner-furnished products damaged following receipt.

C. Owner-Furnished/Contractor-Installed (OFCI) Products:

1. One hundred and fifty (150) each, 7” x 9” x 8’-6” treated timber railroad crossties with “Pandrol” type rail plates pre-installed.

1.7 CONTRACTOR'S USE OF SITE AND PREMISES

A. Restricted Use of Site: Contractor shall have limited use of Project site for construction operations as indicated on Drawings by the Contract limits and as indicated by requirements of this Section.

B. Limits on Use of Site:

1. Contractor shall submit a location plan indicating area(s) required for the support of Contractors work including “laydown or temporary materials and equipment storage, staging of work, and Contractor Project Office as defined in the Project Documents. Confine support construction operations to the area(s) depicted on the plan approved by Engineer.
2. Limit Work in areas as designated for each Phase of work as noted in Article 1.5 and as indicated on Drawing CP-1 of the Project Documents. Do not disturb portions of Project site beyond areas in which the Work is indicated until substantial completion of the work within that Area as is approved by Engineer.
3. Driveways, Walkways and Entrances: Keep driveways and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or for storage of materials.
4. Schedule deliveries to minimize use of driveways and entrances by construction operations.
5. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

C. Condition of Existing Buildings: Maintain portions of existing buildings affected by construction operations in a weathertight condition throughout construction period. Repair damage caused by construction operations.

D. Condition of Existing Grounds: Maintain portions of existing grounds affected by construction operations throughout construction period. Repair damage caused by construction operations.

1.8 COORDINATION WITH OCCUPANTS

A. Full SJPC Occupancy: SJPC will occupy Project site and existing building(s) during entire construction period. Cooperate with SJPC during construction operations to minimize conflicts and facilitate SJPC usage. Perform the Work so as not to interfere with SJPC's day-to-day operations. Maintain existing exits unless otherwise indicated.

1. Maintain access to existing walkways, vehicle corridors, and other adjacent occupied or used facilities. Do not close or obstruct

roadways, walkways, or other occupied or used facilities without written permission from Owner and approval of authorities having jurisdiction.

2. The Contractor shall minimize the use of the Project site to the Phases of work areas indicated on the drawings. The Contractor's presence on and the use of the areas outside of the indicated work areas shall be at the approval and discretion of the Construction Manager. Do not disturb portions of the Project site beyond areas in which the Work is indicated. Additional work and/or storage areas or parking for the Contractor's and sub-tier contractors that is beyond those provided by SJPC shall be provided by the Contractor at no additional cost to SJPC. Contractor shall make off-site provisions for parking and storage areas not explicitly depicted on the documents. There is no guaranteed on-site parking for the Contractor.

3. Notify Owner not less than 72 hours in advance of activities that will affect SJPC's operations.

B. Partial Owner Occupancy: SJPC will occupy the premises during entire construction period, with the exception of areas under construction. Cooperate with SJPC during construction operations to minimize conflicts and facilitate SJPC usage. Perform the Work so as not to interfere with SJPC's operations. Maintain existing exits unless otherwise indicated.

1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from SJPC and authorities having jurisdiction.

2. Provide not less than 72 hours notice to SJPC of activities that will affect SJPC's operations.

C. SJPC Limited Occupancy of Completed Areas of Construction: SJPC reserves the right to occupy and to place and install equipment in completed portions of the Work, prior to Substantial Completion of the Work, provided such occupancy does not interfere with completion of the Work. Such placement of equipment and limited occupancy shall not constitute acceptance of the total Work.

1.9 WORK RESTRICTIONS

A. Comply with restrictions on construction operations.

1. Comply with limitations on use of public streets, work on public streets, rights of way, and other requirements of authorities having jurisdiction.

2. Work located in the area defined as lying between the east wall of Shed 1 and west wall of Building A and from the northern most walls of aforesaid buildings to the southern most walls of aforesaid buildings may not be performed between the December 1st and April 30th of any year.

B. On-Site Work Hours: The proposed Contractor work hours shall be coordinated with SJPC and will minimize impacts to SJPC employees, facilities and Port operations. If at all possible, Contractor work hours should coincide with normal business working hours, Monday through Friday, except as limited by local ordinances or permits or as otherwise indicated outages may require night/early morning and/or weekend work.

C. No work shall be scheduled on observed holidays: New Year's Day, Martin Luther King Day, President's Day, Good Friday, Memorial Day, Independence Day, Labor Day, Veteran's Day, Thanksgiving, Christmas, and other special events specified by SJPC.

D. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by SJPC or others unless permitted under the following conditions and then only after arranging for temporary utility services according to requirements indicated:

1. Notify Owner not less than two days in advance of proposed utility interruptions.

2. Obtain Owner's written permission before proceeding with utility interruptions.

E. Employee Identification: All Contractors employees must obtain a valid Transport Worker Identification Credential (TWIC) and present such identification to gain entry to the Port Facilities or upon demand, by any SJPC Personnel or its Security Contractors, uniformed personnel of the U.S. Coast Guard, U.S. Customs and Border Protection or Transportation Security Administration at any time. Contractor personnel must display TWIC identification badging at all times.

1.10 SPECIFICATION AND DRAWING CONVENTIONS

A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:

1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.

2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.

B. Division 00 Contracting Requirements: General provisions of the Contract, including General and Supplementary Conditions, apply to all Sections of the Specifications.

C. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.

D. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on Drawings to identify materials and products:

1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.

2. Abbreviations: Materials and products are identified by abbreviations scheduled on Drawings and published as part of the U.S. National CAD Standard.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

- END OF SECTION 011000 -

SECTION 012000 – PRICE AND PAYMENT PROCEDURES

PART 1 : GENERAL

1.01 REFERENCE

A. The provisions of this section are applicable to the Bid Items as listed within the Schedule of Quantities, Prices, and Total Bid form.

B. The cost of all elements as described under each Bid Item shall be included within the price prosed for that Item.

C. The total of all items in Part 2 of this Section shall comprise the Total Value of the Contract. The Total Value of the Contract may be amended using these unit prices for additions or deletions in the scope of work.

D. The amount(s) bid on the supplementary item(s) in Section 3 shall only be paid if the indicated modifications to the work become necessary. The Total Value of the Contract will be amended using these rates for additions or deletions in the scope of work.

1.02 INCIDENTAL ITEMS

A. The scope of work for each pay item shall include providing all associated equipment, materials, labor, utilities, transportation, taxes and all other services and expenses as may be necessary to complete the work described.

B. Each bid item, where applicable, shall include the procurement, storage, handling, and installation of all materials described within the item.

C. Tasks that are incidental to the completion of the payment items shall be included in the cost of the associated item, unless specifically identified under another payment item(s).

D. The description of work in this section may not be exhaustive of all tasks necessary for completion of the overall payment item, and the omission of such tasks does not indicate that they are extra to the contract.

E. Where the Contractor deems that items in the scope of work are not incidental to the payment items, or additional work is required to complete the project scope, a request for clarification must be submitted with the Bid.

1.03 UNIT ABBREVIATIONS

A. CY = Cubic Yard

B. EA = Each

C. LF = Linear Feet

D. LS = Lump Sum

E. SF = Square Feet

PART 2 : BID ITEM DESCRIPTION

2.01 MOBILIZATION / DEMOBILIZATION

A. The amount of this item shall be limited to ten percent (10%) of the total lump sum price of the Contract Bid.

B. The Contractor shall mobilize all equipment, personnel, materials and supplies necessary for completing the work to the project site.

C. Notify the state One Call Center.

D. Notify the Coast Guard and local mariner's committee, as necessary. Make required notifications to the Army Corps and other permit agencies, as required.

E. Obtain necessary permits.

F. Comply with the Owner's site safety and security requirements.

G. Prepare and transmit submittals to the Engineer and/or Owner as required.

H. Attend meetings as required.

I. Transport material, equipment and tools to accommodate the Owner's operations when provided with at least 18 hours of notice.

J. Provide the Owner and Engineer access to the construction site during the work.

K. Prepare and submit As-Built Drawings.

L. Cleanup and dispose of material off-site.

M. Address items on project closeout punch list.

N. Demobilize.

2.02 SURVEYS

A. Provide all layout, and other surveys required to complete the project.

B. Field verification of existing conditions and geometry.

C. Prepare and transmit associated reports and drawings.

2.03 MISCELLANEOUS DEMOLITION

A. Demolish and dispose of all miscellaneous items and materials as indicated within the Contract.

B. Elements included in this pay item are the existing conc island, existing flag pole, existing utility pole and any other miscellaneous items that need to be demolished or removed in order to construct the project.

C. Include any falsework or temporary supports as may be required.

D. All work included within the following Technical Specifications sections shall be included, unless specifically included within another pay item.

2.04 REMOVAL OF EXISTING PAVEMENT AND RR TRACK FOR CONSTRUCTION OF NEW RR TRACK

A. Remove existing track and associated pavement in the areas that new track will be installed

2.05 SELECT CONCRETE DEMOLITION AND REMOVAL OF RAIL TRACK ON DOCK

A. Perform selected demolition of concrete on dock only as required to remove existing track and plates and provide room for new track construction.

2.06 EXCAVATION AND GRADING FOR PLACEMENT OF NEW TRACK

A. Perform all excavation necessary to the subgrade elevation for track and turnout construction

2.07 PLACEMENT OF NEW RR TRACK ON SOIL, INCLUDING SUB-BALLAST, BALLAST, TIES & NEW RAILROAD TRACK

A. Construct new track on soil

B. Include all compaction, sub-ballast, ballast, timber ties, plates and new track

2.08 PLACEMENT OF NEW RR TRACK ON DOCK EMBEDDED IN CONCRETE

A. Construct new track on dock that is to be embedded in concrete

2.09 NO. 8 DOUBLE TONGUE TURNOUT

A. Supply and construct new No. 8 double tongue turnouts.

2.10 TRACK CONCRETE TRANSITION SLAB AND ENCASEMENT

A. Provide necessary concrete transition slabs and encasements for construction of turnouts.

2.11 PRECAST GRADE CROSSING

A. Supply and construct new precast grade crossing at the main entrance to the terminal

2.12 CRANE RAIL CROSSING FROGS

A. Supply and install new manganese steel rail crossing frogs

2.13 RAIL TRACK BUMPER RELOCATION

A. Remove one rail track bumper and install bumper at the end of the track along Building A

2.14 RAIL DERAILS

A. Supply and install new rail derails.

2.15 REMOVE & ABANDONED STORM WATER INFRASTRUCTURE

A. Remove all stormwater infrastructure that interferes with new construction

B. Any stormwater infrastructure that does not interfere with new construction can be abandoned in place and filled with flowable fill.

2.16 STORMWATER INFRASTRUCTURE INCLUDING EXCAVATION, INLETS, STORM PIPING AND ASSOCIATED WORK

A. Supply, excavate, install and backfill all new stormwater infrastructure.

2.17 REMOVE AND RELOCATE EXISTING FIRE HYDRANTS & NEW BOLLARDS

A. Remove and relocated existing fire hydrants

B. Supply and install new bollards to protect hydrants

2.18 PAVING, INCLUDING GRADING, SUB-BASE, BASE COURSES AND WEARING COURSE

A. Grade, install subbase and asphalt & compact as required to finish all paving

2.19 REMOVE EXISTING LOADING DOCK & CONSTRUCT NEW LOADING DOCK AT SHED 1

A. Demolish existing loading dock in the vicinity of the new loading dock at Shed 1.

B. Construct new loading dock at Shed 1.

2.20 ROLL UP DOORS, INCLUDING REQUIRED DEMOLITION FOR NEW DOORS

A. Demolish existing doors or walls as required to construct new doors at Shed 1 and Building A

B. Supply and install new motor operated doors at Shed 1 and Building A

2.21 CANOPY AT BUILDING A

A. Perform selective demolition of the brick facing at Building A to access the building columns.

B. Notify the Engineer if the existing building columns can not accept the canopy members as indicated on the drawings.

C. Supply and install steel and decking for the canopies at Building A.

2.22 ELECTRICAL AT BUILDING A & SHED 1 FOR DOORS AND LIGHTS

A. Supply and install all electrical infrastructure necessary for the operation and control of the new lights and doors at Building A and Shed 1.

2.23 CONCRETE SLABS AT DOORS IN BUILDING A

A. Demolish existing floor to the limits of the new slabs at Building A.

B. Compact and install subbase under slab.

C. Pour and finish concrete slab at Building A.

2.24 CONCRETE SLABS AT DOORS IN SHED 1

A. Demolish existing floor to the limits of the new slabs at Shed 1.

B. Compact and install subbase under slab.

C. Pour and finish concrete slab at Shed 1.

2.25 REMOVAL OF ROOF DECKING AT SHED 1

A. Remove roof decking at Shed 1 in all areas except for the areas over the existing and new loading docks.

PART 3 : ADDITIONS AND DELETIONS ITEM DESCRIPTION

3.01 TURNOUT REMOVAL AND TRACK RECONSTRUCTION ON CLINTON ST SHED 5

A. Remove and reconstruct track embedded in asphalt along Clinton Street and to the east of Shed 5.

B. Includes the removal of the turnout on the west side of Clinton Street.

3.02 TRACK RECONSTRUCTION NORTH OF BUILDING F

A. Remove and reconstruct track embedded in asphalt to the North of Building F.

3.03 EMBED TRACK IN PCC PAVEMENT RATHER THAN ASPHALT

A. Provide cost to embed reconstructed track in PCC pavement rather than asphalt, refer to details on drawings.

3.04 TURNOUT REMOVAL AND TRACK RECONSTRUCTION IN PCC PAVEMENT ON CLINTON ST SHED 5

A. Provide cost to construct 3.01 in PCC pavement rather than asphalt, refer to details on drawings.

3.05 TRACK RECONSTRUCTION IN PCC PAVEMENT NORTH OF BUILDING F

A. Provide cost to construct 3.02 in PCC pavement rather than asphalt, refer to details on drawings.

- END OF SECTION -

SECTION 013200 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:

1. Contractor's Construction Schedule.
2. Construction schedule updating reports.

1.3 INFORMATIONAL SUBMITTALS

A. Format for Submittals: Submit required submittals in the following format:

1. Working electronic copy of schedule file.
2. PDF file.

B. Contractor's Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.

C. Construction Schedule Updating Reports: Submit with Applications for Payment.

1.4 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. Computer Scheduling Software: Prepare schedules using current version of a program that has been developed specifically to manage construction schedules.

B. Activities: Treat each phase of construction as a separate numbered activity for each main element of the Work. Comply with the following:

1. Activity Duration: Define activities so no activity is longer than 20 days, unless specifically allowed by Architect.

2. Submittal Review Time: Include review and resubmittal times indicated in Section 013300 "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's Construction Schedule with submittal schedule.

3. Substantial Completion: Indicate completion in advance of date established for Substantial Completion and allow time for Architect's and Construction Manager's administrative procedures necessary for certification of Substantial Completion.
4. Punch List and Final Completion: Include not more than 30 days for completion of punch list items and Final Completion.

C. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and Final Completion**.**

D. Upcoming Work Summary: Prepare summary report indicating activities scheduled to occur or commence prior to submittal of next schedule update. Summarize the following issues:

1. Unresolved issues.

E. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled progress meeting.

1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
3. As the Work progresses, indicate Final Completion percentage for each activity.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

- END OF SECTION -

SECTION 013300 – SUBMITTAL PROCEDURES

PART 1: GENERAL

1.01 SCOPE

A. The provisions of this section apply to the submittal of all information by the Contractor to the Engineer / Owner.

PART 2: PRODUCTS

Not used.

PART 3: SUBMITTALS

As specified in related sections.

PART 4: QUALITY ASSURANCE

Not used.

PART 5: EXECUTION

5.01 SUBMITTAL PROCEDURES

A. It is the Contractor's responsibility to make timely Submittals. The Contractor shall not initiate a construction activity prior to receiving ALL the submittals, reviewed by the Engineer, related to the construction activity, indicating an authorization to proceed with the construction activity. Any construction activity performed without this authorization shall be at Contractor's risk and cost. Delays arising due to the failure in making timely submittals shall be at Contractor's cost. The Contractor shall not be compensated for construction activities performed without the authorization of the Engineer.

B. The Contractor shall submit a Submittal Log, documenting the list of submittals to be made during the project, prior to mobilization.

C. Transmit each submittal with a letter of transmittal indicating the content of the submittal, quantity of submitted items and any special instructions.

D. Submittals are to be sequentially numbered. Mark revised submittals with original number and sequential alphabetic suffix.

E. Identify Project, Contractor, Subcontractor and Supplier; pertinent drawing and detail number, and specification section number, appropriate to submittal.

F. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with requirements of the Work and Contract Documents.

G. Schedule submittals to expedite Project. All materials shall be submitted electronically either through email. The Contractor shall coordinate with the Engineer and Owner as to the preferred submission procedures for the project.

I. For each submittal, allow for a 10-working-day review period excluding delivery time to and from Contractor.

J. Identify with highlighter and/or red ink variations from Contract Documents and product or system limitations, which may alter or be detrimental to successful performance of completed Work. Contractor shall provide an estimated cost for any proposed alternates.

K. Allow space on submittals for Contractor and Engineer review stamps.

L. When revised for resubmission, identify changes made since previous submission.

M. Distribute copies of reviewed submittals as appropriate. Instruct parties to promptly report inability to comply with requirements.

N. Submittals not requested will not be recognized or processed.

O. No materials, supplies, equipment or labor shall be ordered for an item until the Engineer has reviewed the submittal.

P. Contractor shall update the submittal log and submit to the Engineer every month at a minimum.

5.02. SUBMITTAL DATA

A. Product Data: Submit to the Engineer, for the purpose of review and checking the conformance with information given and design concept expressed in Contract Documents. Provide appropriate number of copies and distribute in accordance with the section “Submittal Procedures”.

B. Mark each copy to identify applicable products, models, options, and other

data. Supplement manufacturers' standard data to provide information specific to this Project. Record this information in the submittal matrix.

END OF SECTION 013300

SECTION 014000 - QUALITY REQUIREMENTS

PART 1: GENERAL

1.1 SCOPE

A. Quality control and control of installation.

B. Tolerances.

C. References.

D. Examination.

E. Operations.

PART 2: PRODUCTS

Not used.

PART 3: SUBMITTALS

The Contractor shall submit a quality assurance / quality control plan for the project.

PART 4: QUALITY ASSURANCE

As specified in related sections.

PART 5: EXECUTION

5.1. QUALITY CONTROL AND CONTROL OF INSTALLATION

A. Prior to ordering any material, the Contractor is responsible to verify all material quantities and dimensions in the field.

B. The contractor shall monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of Contract-specified quality.

C. The Contractor shall comply with all manufacturers' instructions, including performing all tasks in the instructed sequence.

D. When manufacturers' instructions conflict with Contract Documents, a

request of clarification shall be submitted to the Engineer 5 business days prior to the need.

E. The Contractor shall have a minimum of five (5) years of experience in performing similar work. The Contractor shall use qualified employees to produce the Contract-specified quality.

F. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.

5.2. TOLERANCES

A. Fabrication and installation tolerances shall be governed by the tolerances specified in applicable codes, standards, and the Contract Documents. Monitor fabrication and installation tolerance control of products to produce acceptable work. Tolerances are non-additive.

B. When tolerances mentioned in the Contract Documents conflict with codes and standards, request a written clarification from the Engineer before proceeding.

C. Adjust products to appropriate dimensions; position before securing products in place.

D. For items found to be installed or manufactured out of tolerance, the Contractor shall remove and install an acceptable replacement at no additional cost to the Owner.

5.3. REFERENCES

A. For products or workmanship specified by association, trade, or other consensus standards, comply with requirements of the standard, except when more rigid requirements are specified by this Contract or are required by applicable codes.

B. Obtain copies of standards where required by product and contract specification sections.

C. When specified reference standards conflict with the Contract Documents, request clarification from the Engineer before proceeding.

D. Neither the contractual relationships, duties, nor responsibilities of the parties to the Contract, shall be altered from the Contract Documents by mention or inference in reference documents. All changes, alterations and requirements of others shall be presented to the Engineer prior to initiation.

5.4. EXAMINATION

A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Beginning new work means acceptance of existing conditions.

B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.

C. Examine and verify specific conditions described in individual specification sections.

5.5. OPERATIONS

A. The Contractor shall submit a schedule of work to the Owner as required by the Contract. Daily time sheets including men, equipment, and material received shall be presented at the conclusion of each working day.

B. Construction and testing are to be scheduled to accommodate the Owner's operations.

C. Weekly Construction Progress Update meetings will be held to discuss and document the status of the project. It is mandatory that the Contractor or Contractor's representative, empowered to engage in Contract binding decisions, attend each meeting.

D. The Contractor shall submit to the Owner and the Engineer a copy of the updated work progress 1-week look-ahead schedule for review and comments 24 hours prior to each Construction Progress Update meeting.

E. Continuous coordination with the Owner / Engineer / Project Construction Inspector and other Contractors is the responsibility of the Contractor. Failure to coordinate will not relieve the Contractor from his responsibilities.

F. The Engineer will record and distribute meeting minutes for each Construction Progress Update meeting.

- END OF SECTION -

SECTION 017000 – EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1: GENERAL

1.1 SCOPE

The work shall consist of the mobilization and demobilization of the Contractor's forces, equipment, and materials necessary for performing the work required under the contract.

PART 2: PRODUCTS

The Contractor shall provide all equipment, materials, and labor required for this item.

PART 3: SUBMITTALS

Not used.

PART 4: QUALITY ASSURANCE

As specified in related sections.

PART 5: EXECUTION

5.1 Mobilization shall include all activities and associated costs for transportation and assembly of the Contractor's personnel, equipment, and operating supplies to the site; establishment of offices and other necessary general facilities for the Contractor's operations at the site as may be required by the Specifications, as well as by Federal, State and/or local law and regulation. The determination of the adequacy of the Contractor's facilities, except for those required by government laws and regulations, shall be made by the Engineer. The cost of required bonds, insurance, permits and/or any other initial expenses required for the start of the work shall be included in this item.

5.2 The Owner has available a small unoccupied trailer on site that is available if the contractor elects to use it. SJPC will not pay an extra if the contractor arrives and feels it does not meet his needs sufficiently.

5.3 Demobilization shall include all activities and costs for transportation of personnel, equipment, and supplies not required or included in the Contract from the site; including the disassembly, removal and site clean up of offices, buildings, and other facilities assembled on the site specifically for this contract. In addition, all storage areas and work areas shall be cleaned of all rubbish and discarded

materials. Storage and work areas must be left in a manner satisfactory to the Owner & Engineer. Any damage to the Owner's property and/or any other property of the project site shall be repaired to the satisfaction of the Owner & Engineer at no additional cost to the Owner. The project will not be considered complete until the above work has been completed and accepted by the Owner & Engineer.

5.4 This work includes mobilization and demobilization required by the contract at the time of award. If additional mobilization and demobilization activities and costs are required during the performance of the contract as a result of changed, deleted, or added items of work for which the Contractor is entitled to an adjustment in contract price, compensation for such costs will be included in the price adjustment for the item or items of work changed or added.

- END OF SECTION -

SECTION 017839 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for Project Record Documents, including the following:

1. Record Drawings.
2. Record Product Data.

B. Related Requirements:
1. Section 017000 "Execution & Closeout Requirements"

1.3 CLOSEOUT SUBMITTALS

A. Record Drawings: Comply with the following:

1. Number of Copies: Submit copies of Record Drawings as follows:

a. Submittal:
1) Submit PDF electronic files of scanned Record Prints.
2) Print each drawing, whether or not changes and additional information were recorded.

B. Record Product Data: Submit annotated PDF electronic files and directories of each submittal.

1. Where record Product Data are required as part of operation and maintenance manuals, submit duplicate marked-up Product Data as a component of manual.

1.4 RECORD DRAWINGS

A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued.

1. Preparation: Mark record prints to show the actual installation, where installation varies from that shown originally.

    a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
    b. Accurately record information in an acceptable drawing technique.
    c. Record data as soon as possible after obtaining it.
    d. Record and check the markup before enclosing concealed installations.
    e. Cross-reference record prints to corresponding photographic documentation.

2. Content: Types of items requiring marking include, but are not limited to, the following:

    a. Dimensional changes to Drawings.
    b. Revisions to details shown on Drawings.
    c. Depths of foundations.
    d. Locations and depths of underground utilities.
    e. Revisions to routing of piping and conduits.
    f. Revisions to electrical circuitry.
    g. Actual equipment locations.
    h. Duct size and routing.
    i. Locations of concealed internal utilities.
    j. Changes made following Engineer’s written orders.
    k. Details not on the original Contract Drawings.
    l. Field records for variable and concealed conditions.
    m. Record information on the Work that is shown only schematically.

3. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
4. Mark record prints with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
5. Mark important additional information that was either shown schematically or omitted from original Drawings.
6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.

B. Record Digital Data Files: Immediately before inspection for Certificate of Substantial Completion, review marked-up record prints with Architect and Construction Manager. When authorized, prepare a full set of corrected digital data files of the Contract Drawings, as follows:

1. Format: Annotated PDF electronic file with comment function enabled.

2. Incorporate changes and additional information previously marked on record prints. Delete, redraw, and add details and notations where applicable.

C. Format: Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.

1. Record Prints: Organize record prints into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
2. Format: Annotated PDF electronic file with comment function enabled.
3. Record Digital Data Files: Organize digital data information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each digital data file.
4. Identification: As follows:

a. Project name.
b. Date.
c. Designation "PROJECT RECORD DRAWINGS."
d. Name of Architect and Construction Manager.
e. Name of Contractor.

1.5 RECORD PRODUCT DATA

A. Recording: Maintain one copy of each submittal during the construction period for Project Record Document purposes. Post changes and revisions to Project Record Documents as they occur; do not wait until end of Project.

B. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.

C. Format: Submit Record Product Data as annotated PDF electronic file.

1. Include Record Product Data directory organized by Specification Section number and title, electronically linked to each item of Record Product Data.

1.6 MAINTENANCE OF RECORD DOCUMENTS

A. Maintenance of Record Documents: Store Record Documents in the field office apart from the Contract Documents used for construction. Do not use Project Record Documents for construction purposes. Maintain Record Documents in

good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to Project Record Documents for Architect's and Construction Manager's reference during normal working hours.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

- END OF SECTION -

SECTION 024117 – PAVEMENT REMOVAL

PART 1 - GENERAL

1.1 SUMMARY

A. The contractor shall furnish all plant, tools, materials, equipment, labor and supervision and perform all tasks to demolish, remove and lawfully dispose of bituminous concrete materials and/or asphalt pavements at the locations and to the elevations and/or depths as shown on, or required by, the drawings, as specified herein, and/or as directed by the engineer.

B. Demolition shall consist of the careful removal of pavements with such equipment as to leave undamaged adjacent pavements, utilities, etc.

1.2 SUBMITTALS

A. Section 013300 - Submittal Procedures: Requirements for submittals.

1.3 CLOSEOUT SUBMITTALS

A. Section 017000 - Execution Requirements: Requirements for submittals.

B. Project Record Documents: Accurately record actual locations of capped utilities, subsurface obstructions, and end of track locations.

1.4 QUALITY ASSURANCE

A. Conform to applicable building code for demolition of structures, safety of adjacent structures, dust control, runoff control, and disposal.

B. Conform to applicable building code for procedures when hazardous or contaminated materials are discovered.

C. Obtain required permits from authorities having jurisdiction.

1.5 QUALIFICATIONS

A. Demolition Firm: Company specializing in performing work of this section with minimum five years documented experience.

B. Design shoring, bracing, and underpinning under direct supervision of Professional Engineer experienced in design of this Work and licensed in the State where the project site is located.

1.6 PRE-INSTALLATION MEETINGS

A. Section 013100 – Project Management & Coordination: Pre-installation Conferences.

B. Convene minimum one week prior to commencing work of this section.

1.7 SEQUENCING

A. Section 011000 - Summary: Phased construction.

1.8 SCHEDULING

A. Section 013200 – Construction Progress Documentation: Contractor's Construction Schedule

B. Describe demolition removal procedures and schedule.

1.9 PROJECT CONDITIONS

A. Notify the Engineer upon discovery of hazardous materials.

B. Do not sell demolished materials on-site.

C. Maintain existing roadways to the greatest extent possible.

PART 2 - PRODUCTS

A. Not used

PART 3 - EXECUTION

3.1 PREPARATION

A. Do not close or obstruct roadways, sidewalks and hydrants without prior authorization from the Project Engineer.

B. Erect, and maintain detours, temporary barriers and security devices at locations indicated, including warning signs and lights, and similar measures, for protection of the Owner, and existing improvements indicated to remain.

C. Protect existing appurtenances, and structures indicated to remain.

D. Prevent movement or settlement of adjacent structures, tracks and paving.

3.2 DEMOLITION

A. Pavements shall be removed to its full depth unless otherwise directed by the engineer.

B. The contractor shall use suitable equipment, tools and methods for cutting and trimming as well as removing the pavement materials to the neat lines

set by the engineer and shall not in any manner disturb or damage the sections of base and/or pavement to remain.

C. All active underground utilities shall be braced and shored adequately and shall not be removed. If active piping is to be covered or backfilled, adequate precautions must be taken as to not cause damage to the existing service. After construction is complete, the active piping shall be left in a condition that will ensure proper function of the service.

D. Damage done by the contractor's equipment or methods to those areas of pavement designated to remain shall be repaired and restored at the contractor's sole expense.

E. Unless otherwise authorized by the engineer in writing, all pavement materials, resulting refuse and debris from the demolition will become the property of the contractor and must be properly and lawfully disposed of off site.

F. Rough grade and compact areas affected by demolition to maintain site grades and contours.

G. Continuously clean-up and remove demolished materials from site. Do not allow materials to accumulate in building or on site.

H. Do not burn or bury materials on site. Leave site in clean condition.

3.3 DISPOSAL

A. All demolition material is to be lawfully disposed of offsite by the contractor.

- END OF SECTION -

SECTION 024119 – SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Demolition and removal of selected portions of building or structure.

2. Demolition and removal of selected site elements.

3. Salvage of existing items to be reused or recycled.

1.2 MATERIALS OWNERSHIP

A. Unless otherwise indicated, demolition waste becomes property of Contractor.

1.3 INFORMATIONAL SUBMITTALS

A. Schedule of Selective Demolition Activities: Indicate the following:

1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity.

2. Interruption of utility services. Indicate how long utility services will be interrupted.

3. Coordination for shutoff, capping, and continuation of utility services.

4. Coordination of Owner's continuing occupancy of portions of existing building and of Owner's partial occupancy of completed Work.

1.4 FIELD CONDITIONS

A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.

B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.

D. Storage or sale of removed items or materials on-site is not permitted.

E. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

1. Maintain fire-protection facilities in service during selective demolition operations.

1.5 COORDINATION

A. Arrange selective demolition schedule so as not to interfere with Owner's operations.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that utilities have been disconnected and capped before starting selective demolition operations.

B. Review Project Record Documents of existing construction or other existing condition and hazardous material information provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in Project Record Documents.

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.

B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off utility services and mechanical/electrical systems serving areas to be selectively demolished.

1. Owner will arrange to shut off indicated services/systems when requested by Contractor.

2. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.

3. Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC

3.3 PROTECTION

A. Temporary Protection: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.

1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.

B. Remove temporary barricades and protections where hazards no longer exist.

3.4 SELECTIVE DEMOLITION, GENERAL

A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:

B. Removed and Reinstalled Items:

1. Clean and repair items to functional condition adequate for intended reuse.

2. Pack or crate items after cleaning and repairing. Identify contents of containers.

3. Protect items from damage during transport and storage.

4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

3.5 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

A. Concrete: Demolish in small sections. Using power-driven saw, cut concrete to a depth of at least 3/4 inch at junctures with construction to remain. Dislodge concrete from reinforcement at perimeter of areas being demolished, cut reinforcement, and then remove remainder of concrete. Neatly trim openings to dimensions indicated.

B. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, and then remove masonry between saw cuts.

C. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, and then break up and remove.

3.6 DISPOSAL OF DEMOLISHED MATERIALS

A. Remove demolition waste materials from Project Site.

1. Do not allow demolished materials to accumulate on-site.

2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

3.7 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

- END OF SECTION -

SECTION 031000 – CONCRETE FORMS & ACCESORIES

PART 1: GENERAL

1.01 SCOPE

A. All labor, materials, services, and equipment necessary for furnishing, installing, and removing all formwork for cast-in-place concrete.

PART 2: PRODUCTS

2.01 MATERIALS

A. Plywood: Exterior-type softwood plywood, PS 1-66.

B. Glass Fiber Fabric-Reinforced Plastic Forms: Shall be matched, tight fitting, stiffened to support the weight of wet concrete without deflections that exceed the structural tolerances or that are detrimental to the appearance of the finished concrete.

C. Lumber: Softwood framing lumber, PS 20-70. Grade markings shall be clearly visible and marked by grading rules approved by the American Lumber Standards Committee.

D. Steel: Minimum 16 gauge sheet, well matched, tight fitting, stiffened to support the weight of wet concrete without deflections that exceed the structural tolerances or that are detrimental to the appearances of the finished concrete.

A. Void Forms: Shall be moisture-resistant treated paper faces, seamless, laminated fiber material as approved by the Construction Manager. The forms shall be structurally sufficient to support the weight of a wet concrete mix and any construction or consolidation vibrations until the initial set.

2.02 FORMWORK ACCESSORIES

A. Form ties shall be left in place and equipped with swaged (waterproofing) washers or other approved devices to prevent seepage of moisture along the tie.

1. Minimum 1-inch depth of breakback.

B. Form release agent shall be a colorless material which will not stain concrete; absorb moisture; or impair finish, bonding, or color characteristics of coating intended for use on concrete.

C. Fillets shall be used for all exposed vertical and horizontal corners.

PART 3: SUBMITTALS

3.01 GENERAL

The Contractor shall submit the following items in accordance with Section 013300, Submittal Procedures.

A. Shop Drawings shall be prepared and submitted, and shall meet the requirements of ACI 315 “Details and Detailing of Concrete Reinforcement”

B. Shop Drawings must be submitted that show in detail the items of the form system affecting the appearance of architectural concrete surfaces such as joints, tie holes, liners, patterns, and textures. Items must be shown in relation to the entire form system.

C. Manufacturers’ literature must be submitted with descriptions and recommended installation instructions for form ties, spreaders, corner formers, form liners, and form coatings.

D. Submittals shall indicate pertinent dimensions, materials, and arrangement of joints and ties.

E. The following field samples shall be submitted, upon request:

1. Field samples of formed concrete must be submitted when the surface of the concrete is to receive a special architectural treatment.

2. Construct and erect a sample formwork panel for architectural concrete surfaces receiving special treatment or finish as a result of formwork. Formwork shall include a vertical and a horizontal form joint.

PART 4: QUALITY ASSURANCE

4.01 REFERENCES

The publications listed below form a part of these Specifications to the extent referenced. The publications are referred to in text by the basic description only.

A. American Concrete Institute (ACI) 301 - Specifications for Structural Concrete for Buildings.

B. ACI 347 - Recommended Practice for Concrete Formwork.

C. ACI 306R - Cold Weather Concreting

D. Product Standard (PS) 1 - Construction and Industrial Plywood.

4.02 QUALITY CONTROL

A. The Contractor shall be responsible for designing and constructing suitable and adequate false work which shall be designed in accordance with ACI 347 “Recommended Practice for Concrete Formwork.” When requested by the Owner or Engineer, formwork shall be designed and sealed by a Professional Engineer.

B. The design of forms will take into account the effect of construction loads during and after placement of concrete.

C. The forms shall be substantial, unyielding, and constructed mortar-tight and of sufficient rigidity to prevent distortion due to the pressures of concrete and other loads incidental to the construction operations.

D. Concrete shall not be cast against surfaces of existing structures, nor formwork be supported on existing structures, unless specifically indicated on the Drawings or approved by the Engineer.

PART 5: EXECUTION

5.01 SYSTEM DESCRIPTION

A. Design, engineer, and construct formwork, shoring, and bracing to meet design and all applicable code requirements so that the resultant concrete conforms to the required shapes, lines and dimensions as shown on the Drawings.

5.02 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle materials with care to prevent damage to or contamination of formwork.

5.03 INSPECTION

A. Verify lines, levels, and measurements before proceeding with formwork.

B. Notice shall be given 24 hours in advance of pour so that an inspection can be scheduled.

C. Forms shall be inspected by the Construction Manager prior to concreting.

D. No concreting shall be done in the absence of the Construction Manager without the written permission of the Construction Manager.

5.04 PREPARATION

A. Conform to ACI 347, expect as specified herein.

B. Initially and before re-use, forms shall be cleaned and a coat of non-staining form release agent applied per the manufacturer's instructions.

1. Care shall be taken to avoid splashing oil on reinforcing steel or existing concrete.

2. Do not apply form release agent where concrete surfaces are scheduled to receive special finishes which may be affected by agent.

5.05 ERECTION

A. Provide bracing to ensure stability of formwork. Strengthen all formwork liable to be overstressed by construction loads.

B. Camber slabs and beams to achieve ACI 301 tolerances.

1. ¼-inch in 15 feet of span.

C. Provide temporary ports in formwork to facilitate cleaning and inspection. Locate openings at bottom of forms to allow flushing water to drain. Close ports with tight fitting panels, flush with inside face of forms, neatly fitted so that joints will not be apparent in exposed concrete surfaces.

D. All form joints shall be backed up to assure that the edges of abutting panels are in the same plane, straight and true, and forced tightly together to minimize fins. The quality of the form contact surfaces shall be subject to the approval of the Construction Manager.

E. If installing void forms, protect them from moisture before concrete placement and protect from crushing during concrete placement.

F. Do not displace or damage vapor barriers previously placed.

G. Forms for exposed concrete shall be given special attention to provide a surface free from defects and form marks so that rubbing and finishing shall be kept to a minimum.

H. Construct formwork to maintain tolerances in accordance with ACI 301.

5.06 INSERTS, EMBEDDED PARTS, AND OPENINGS

A. Provide formed openings where required for Work embedded in or passing through concrete.

B. Coordinate Work of other sections in forming and setting openings, slots, recesses, chases, sleeves, bolts, anchors, and other inserts.

C. Install accessories in accordance with manufacturer's instructions, level and plumb. Ensure items are not disturbed during concrete placement.

5.07 COLD WEATHER CONCRETING

A. The Contractor shall adhere to the requirements of ACI 306R "Cold Weather Concreting".

B. All materials that are to come into contact with freshly cast concrete must have a temperature above freezing at the time of concrete pour. The Contractor shall make a pertinent effort to schedule the concrete pour on a day with temperatures in excess of 40 degrees Fahrenheit, based on the weather forecast. When not possible to schedule the pour when ambient temperatures are above freezing, it may be required to preheat the formwork, reinforcement & inserts immediately prior to pouring concrete.

5.08 FORM REMOVAL

A. Do not remove forms and shoring or bracing until concrete has sufficient strength to support its own weight, and construction and design loads which may be imposed upon it.

B. The following schedule shall be considered the minimum period before formwork can be removed under normal conditions with the use of Type II cement. Its use shall not relieve the Contractor of responsibility for the safety and appearance of the structure.

Type of Form	Above 60°F	50-60°F	40-50°F
Columns 5' high	24 hours	36 hours	72 hours
Columns 5'-10' high	3 days	5 days	7 days
Columns 10' high	5 days	7 days	10 days

Walls 5'	24 hours	36 hours	72 hours
Walls 5-10'	3 days	5 days	7 days
Walls 10'	5 days	7 days	10 days
Beam Side Forms	24 hours	36 hours	72 hours
Beam Bottom Forms	14 days	18 days	21 days
Slabs 6' Span*	5 days	7 days	14 days
Construction Joint	24 hours	36 hours	72 hours
Bulk Heads	24 hours	36 hours	72 hours

* For slabs of more than 6-foot span, add 12 hours for each additional foot over 5 feet.

1. When the temperature to which the forms or concrete surfaces are exposed to falls below 40 degrees F, the forms shall remain in place an additional time equal to the time of the sub-40 degrees F exposure. If form insulation is used, concrete surface temperature shall apply.

2. The Construction Manager may modify the form removal schedule if compressive tests indicate that the in-place concrete is of sufficient strength. Methods of field curing the cylinders shall simulate that of the concrete and shall be approved by the Construction Manager. All such tests shall be at the option and expense of the Contractor at no additional cost to the Owner.

3. When Type III cement or retarders are used, the form removal schedule above does not apply and may be modified by the Construction Manager.

C. Immediately following the removal of the forms, the projecting ties shall be removed and all holes filled with grout flush with the wall. Care shall be taken to use the same brand of cement and same mix proportions used in the wall to prevent color differences.

5.09 CLEANING

A. Clean forms to remove foreign matter as erection proceeds.

B. Ensure that water and debris drain to exterior through clean-out ports.

C. During cold weather, remove ice and snow from forms. Do not use deicing salts. Do not use water to clean out completed forms unless formwork and construction proceed within heated enclosure. Use compressed air to remove foreign matter.

- END OF SECTION -

SECTION 032000 – CONCRETE REINFORCEMENT

PART 1 - GENERAL

1.01 WORK SPECIFIED

A. Provide all labor, materials, equipment, and services necessary for furnishing and installing all steel reinforcement, welded steel wire fabric, and accessories for concrete required for the completion of the Work.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Reinforcing Steel:

a. General Applications: ASTM A615, 60 ksi yield grade billet-steel deformed bars, uncoated finish.

b. Welding Applications: ASTM A706, 60 ksi yield grade billet-steel deformed bars, uncoated finish,

B. Welded Steel Wire Fabric: ASTM A185 plain type; in flat sheets, coiled rolls, uncoated finish.

B. Stirrup Steel: ASTM A82.

C. Fiber Reinforcement
a. Synthetic Micro-Fiber: Fibrillated polypropylene micro-fibers engineered and designed for use in concrete, complying with ASTM C 1116/C 1116M, Type III, 1/2 to 1-1/2 long.
b. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
i. Euclid Chemical Company; an RPM company.
ii. FORTA Corporation.
iii. Grace Construction Products; W.R. Grace & Co. -- Conn.
iv. Nycon, Inc.
v. Propex.
vi. Sika Corporation.

2.02 ACCESSORY MATERIALS

A. Tie Wire: Minimum 16 gage annealed type.

B. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for strength and support of reinforcement during installation and placement of concrete, including load bearing pad on bottom to prevent vapor barrier puncture.

C. Chairs, Bolsters, Bar Supports, Spacers Adjacent to Architectural Concrete Surfaces: Plastic tipped-type, sized and shaped as required.

2.03 FABRICATION

A. Unless otherwise shown or directed, the following minimum concrete cover shall be provided for reinforcement.

		Minimum Cover (inches)
1.	Concrete cast against and permanently exposed to earth	3
2.	Concrete exposed to earth or weather:	
	No. 6 through No. 18 bar	2
	No. 5 bar and smaller	1-1½
3.	Concrete not exposed to weather or in contact with ground	
	Slabs, nails, joists:	
	No. 14 and No. 18 bars	1½
	No. 11 and smaller	¾
	Beams, columns:	
	Primary reinforcement, ties, stirrups, spirals	1½
4.	Concrete exposed to water or sewerage slabs, walls	2
5.	Concrete hooks or development bars	2½

D. Locate reinforcing splices not indicated on Drawings at points of minimum stress. Indicate the proposed location of splices on the Shop Drawings for approval. Splices shall be staggered such that adjacent bars located in the same plane of reinforcement are not lapped at the same location. The projecting ends of horizontal bars that extend across construction joints shall be furnished at different lengths, such that in no place will laps in adjoining bars occur in the same plane.

E. Unless noted otherwise, longitudinal reinforcing shall be closed off at end faces and cold joints of all concrete elements by 90 degree bends, U-stirrups, or some other engineer-approved method such that the faces of the element normal to the longitudinal reinforcing are laterally reinforced against cracking. In all cases, the lateral reinforcement shall be adequately developed or lapped with the longitudinal reinforcement. This provision may

not apply where longitudinal reinforcing is continued across the plane of construction joints.

PART 3: SUBMITTALS

3.01 GENERAL

The Contractor shall submit the following items, in accordance with Section 013300:

A. Shop Drawings that indicate sizes, spacings, locations, and quantities of reinforcing steel, wire fabric, bending and cutting schedules, splicing, stirrup spacing, supporting, and spacing devices.

B. Mill test certificates of supplied concrete reinforcing indicating physical and chemical analysis.

3.02 WELDING

A. Only AWS (American Welding Society) qualified welders shall be employed for welding. Submit a Welding Personnel Qualification Record (WPQR), containing all variables listed in AWS Table 6.2, to the Engineer for review at least three (3) weeks prior to using the welder. If the qualification test listed on the WPQR is more than six (6) months old, a detailed employment history and letter must accompany the WPQR to certify that the welder has been engaged in the welding process in question since the date of original qualification.

B. For each anticipated class of weld, submit Weld Procedure Specifications, containing joint geometries and all variables listed in AWS Table 4.12, to the Engineer for review at least three (3) weeks prior to welding. In general, only Welding Procedures that are prequalified, or have been qualified in accordance with AWS, shall be used.

PART 4: QUALITY ASSURANCE

4.01 REFERENCES

A. American Concrete Institute (ACI)

1. 301 Specifications for Structural Concrete for Buildings.

2. 315 Details and Detailing of Concrete Reinforcement.

3. 315R Manual of Engineering and Placing Drawings for Reinforced Concrete Structures.

4. 318 Building Code Requirements for Reinforced Concrete.

B. American Society for Testing and Materials (ASTM)

1. A185 Welded Steel Wire Fabric for Concrete Reinforcement.

2. A615 Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.

3. A706 Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement.

3. E329 Recommended Practice for Inspection Testing Agencies for Concrete, Steel, and Bituminous Materials as Used in Construction.

C. Concrete Reinforcing Steel Institute (CRSI)

1. CRSI Manual of Practice.

2. 63 Recommended Practice for Placing Reinforcing Bars.

3. 65 Recommended Practice for Placing Bar Supports, Specifications and Nomenclature.

D. American Welding Society (AWS)

1. D1.4 Reinforcing Steel Welding Code for Reinforcing Steel.

4.02 QUALITY CONTROL

A. Perform concrete reinforcement Work in accordance with referenced Standards.

B. Welders and Weld Procedure Specifications shall be qualified in accordance with AWS D1.4. Note that personnel qualification to AWS D1.1 alone does not satisfy this requirement.

PART 5: EXECUTION

5.01 INSTALLATION

A. Before placing concrete, clean reinforcement of foreign particles or coatings.

B. Place, support, and secure reinforcement against displacement. Do not deviate from alignment or measurement.

C. Do not displace or damage vapor barrier, if required.

D. The Contractor shall follow the requirements of ACI 306R “Cold Weather Concreting” when applicable.

F. Do not flame-cut rebar.

5.02 WELDING

A. All welds shall be performed in accordance with AWS D1.4 in accordance with a prequalified or approved qualified Weld Procedure Specification.

B. Except for tack welding, GMAW shall not be used for welding. When GMAW is used for tack welding, the electrode shall not be deposited by short circuit transfer.

C. All welding shall be in accordance with AWS D1.4, using low-hydrogen E80XX electrodes, unless noted otherwise on Contract Drawings or specifically approved by the Engineer.

D. In general, electrodes shall be new, or reconditioned, at the start of each work shift. The Contractor shall strictly adhere to the atmospheric exposure and baking requirements of Table 5.3 of AWS D1.4, and shall provide suitable holding and conditioning ovens onsite, as necessary.

E. Welds shall not be water quenched.

F. Field welds shall be permitted only at air temperatures above zero (0) degrees F. When welding, surfaces of pile within 3 inches, laterally and in advance of weld shall be preheated and maintained to the temperature recommended by AWS D1.4. Welding shall not be permitted during rain or snow, or when surfaces are wet.

G. The Contractor shall be responsible for the adequacy of welds in addition to the service life of the weld. The Contractor shall be responsible for visual inspection and necessary correction of all weld deficiencies in material and workmanship in conformance with AWS D1.4. The Contractor shall maintain records of these visual inspections and submit if requested by the Engineer.

H. All connections shall be welded unless noted otherwise on the Contract Drawings. Field fabricated members shall be cut to within 1/4” of required dimensions, fitted and welded completely along the perimeter of intersecting members on both sides using a 3/8” filet weld, unless shown otherwise on the Contract Drawings. No separate measurement or payment will be made for this work.

I. The Owner, at his own discretion, may perform visual and ultrasonic testing of up to 20 percent of the welds on the project, using an independent agency. The contractor shall not be compensated for any delays due to the testing of welds. Contractor shall cooperate and provide access to the welds to the testing agency. The Contractor shall correct the deficient welds at no cost to the Owner.

- END OF SECTION -

SECTION 033000 - CAST-IN-PLACE CONCRETE

PART 1: GENERAL

1.01 SCOPE

A. Provisions of this section apply to furnishing and placing all cast-in-place cement concrete indicated on the Drawings, described in these Specifications or otherwise required for proper completion of the Work.

B. This section does not include pre-cast, post-tensioned or pre-stressed concrete work.

PART 2: PRODUCTS

2.01 MATERIALS

A. Cement & Cementitious Materials

1. ASTM C 150, Portland Cement - Type II except as modified herein. The blended cement shall consist of a mixture of ASTM C 150, Type II, and ASTM C 618 Type F or C pozzolan or fly ash. The pozzolan or fly ash content shall not exceed 25% by weight of the total cementitous material. Use one manufacturer for each type of cement, fly ash, and pozzolan.

B. Admixtures

1. When required or permitted, use admixtures conforming to the following specifications:

a. Air Entertaining - ASTM C260

b. Water Reducing, Retarding and Accelerating - ASTM C494.

2. When concrete is to be placed underwater, whether by tremie or another method, an anti-washout admixture shall be included in the concrete mix design to minimize material loss and segregation.

C. Water

1. Water used in the mix shall conform to the requirements specified in ASTM C1602.

D. Aggregates

1. Normal-Weight Aggregates: ASTM C 33/C 33M, Class 4S coarse aggregate or better, graded. Provide aggregates from a single source with documented service record data of at least 10 years' satisfactory service in similar applications and service conditions using similar aggregates and cementitious materials.
1. Maximum Coarse-Aggregate Size: ¾ inch nominal.
2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

E. Curing Materials

1. Waterproof Sheets

a. Conform to the requirements specified in ASTM C171.

2. Liquid Membrane Forming Compounds

a, Conform to the requirements specified in ASTM C309.

F. Expansion Joint Filler

1. Conform to the requirements specified in ASTM D1751.

PART 3: SUBMITTALS

3.01 The Contractor shall submit the following for approval in accordance with the Contract:

A. Submit shop drawings of proposed construction two (2) weeks prior to fabrication of reinforcement. Shop drawings shall contain the following:

1. Meet requirements of applicable portions of “Details and Detailing of Concrete Reinforcement” by ACI 315, latest edition.

2. Show bending, assembly, splicing, sizes, bar lengths, and marking of bars. Indicate bar spacing by dimension.

3. Show reinforcing with necessary details in elevations, sections and plans. Locate sleeves, holes, accessories, and anchors by dimensions.

4. Furnish prints of approved shop drawings to trades that have items to be embedded in, or connected to concrete work.

B. Submit a plan showing the location and details of proposed construction joints two (2) weeks prior to fabrication of reinforcement.

C. Submit data on proposed concrete admixtures thirty (30) days before concrete placement.

D. Submit Samples of materials as requested by the Engineer, including names, sources, and descriptions.

E. Submit a brief plan stating the proposed method of pouring and testing concrete, providing details on site access for delivery trucks, staging area, means of conveyance, washout locations, testing and cylinder curing locations, and proposed curing procedures thirty (30) days before concrete placement.

F. Submit proposed concrete mix design and supporting laboratory test reports for concrete materials and mix design test for approval thirty (30) days before concrete placement. Provide materials certificates in lieu of materials laboratory test reports. Materials certificates shall be signed by the manufacturer and contractor, certifying that each material item complies with, or exceeds specified requirements.

G. Submit results of strength tests for samples taken at site within ten (10) days after test is completed

PART 4: QUALITY ASSURANCE

4.01 CODES, STANDARDS & PROVISIONS

A. Comply with the provisions specified in the latest revision of the following ASTM standards, including all supplements and addenda:

1. C31 - Standard Method of Making and Curing Concrete Test Specimens in the Field

2. C33 - Standard Specification for Concrete Aggregates.

3. C39 - Standard Method of Test for Compressive Strength of Cylindrical Concrete Specimens.

4. C94 - Standard Specification for Ready-Mixed Concrete

5. C138 - Standard Method of Test for Unit Weight, Yield, and Air Content (Gravi-metric) of Concrete.

6. C143 - Standard Method of Test for Slump of Portland Cement Concrete.

7 C150 – Portland Cement.

8. C171 - Standard Specification for Sheet Materials for Curing Concrete.

9. C172 - Standard Method of Sampling Fresh Concrete.

10. C173 - Standard Method of Test for Air Content of Freshly Mixed Concrete by the Volumetric Method.

11. C192 - Standard Method of Making and Curing Concrete Test Specimens in the Laboratory.

12. C231 - Standard Method of Test for Air Content of Freshly Mixed Concrete by the Pressure Method.

13. C260 - Standard Specification for Air-Entraining Admixtures for Concrete.

14. C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.

15. C494 - Standard Specification for Chemical Admixtures for Concrete.

16. C618 - Standard Specification for Fly Ash and Raw or Calcined Natural Pozzolans for Use in Portland Cement Concrete.

17. C685 - Specifications for Concrete Made by Volumetric Batching and Continuous Mixing.

18. C1064 - Standard Test Method for Temperature of Freshly Mixed Hydraulic-Cement Concrete

19. C1602 - Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete.

20. D1751 - Standard Specification for Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).

21. E329 - Standard Recommended Practice for Inspection and Testing Agencies for Concrete, Steel, and Bituminous Materials as Used in Construction.

B. Comply with the provisions specified in the latest revision of the following publications of the American Concrete Institute (ACI):

1. Committee 212 Report - Guide for Use of Admixtures in Concrete.

2. ACI 214 - Recommended Practice for Evaluation of Strength Test Results of Concrete.

3 ACI 301 - Specifications for Structural Concrete for Buildings.

4. ACI 302 - Recommended Practice for Concrete Floor and Slab Construction.

5. Committee 303 Report - Guide to Cast-In-Place Architectural Concrete Practice, 1974.

6. ACI 304 - Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete.

7. Committee 304 Report - Placing Concrete by Pumping Methods.

8. Committee 305 Report - Hot Weather Concreting.

9. Committee 306 Report - Cold Weather Concreting.

10. ACI 308 - Recommended Practice for Curing Concrete.

11. ACI 309 - Recommended Practice for Consolidation of Concrete

12. ACI 318 - Building Code Requirements for Reinforced Concrete.

13. ACI 347 - Guide to Formwork for Concrete.

14. ACI 357R - Design and Construction of Fixed Offshore Concrete Structures

15. ACI 546.2R - Guide to Underwater Repair of Concrete

16. SP-19 - Cement and Concrete Terminology (Report of ACI Committee 116).

C. Comply with the provisions specified in the following:

1. Concrete Plant Manufacturers Bureau: "Concrete Plant Mixer Standards of the Plant Mixer Manufacturers Division", 1970.

2. National Ready Mixed Concrete Association: Check List for Certification of Ready Mixed Concrete Production Facilities, 1967.

3. American Association of State Highway and Transportation Officials, "Standard Specification for Transportation Materials and Methods of Sampling and Testing". (AASHTO T260-78).

PART 5: EXECUTION

5.01 HANDLING

A. Storage

1. Store cement in weathertight buildings, bins or silos which will exclude moisture and contaminants.

2. Arrange and utilize aggregate stockpiles in a manner to avoid excessive segregation and to prevent contamination with other materials or with other sizes of like aggregates. To insure that this condition is met, perform any test for determining conformance to requirements for cleanness and grading on samples taken from the aggregates at the point of batching. Do not use frozen or partially frozen aggregates.

3. Allow stockpiles of natural or manufactured sand to drain to ensure a relatively uniform moisture content throughout the stockpile.

4. To prevent excessive variations in moisture content, allow predampened aggregates to remain in the stockpiles for a minimum of 12 hours before use.

5. Store admixtures in such a manner as to avoid contamination, evaporation or damage. For those used in the form of suspensions or non-stable solutions, provide agitating equipment to assure thorough distribution of the ingredients. Protect liquid admixtures from freezing and from temperature changes which would adversely affect their characteristics.

5.02 CONCRETE MIX

A. General

1. Concrete for all parts of the work shall be of the specified quality capable of being placed without excessive segregation and, when

hardened, of developing all characteristics required by these specifications.

B. Strength

1. The minimum compressive strength of the concrete shall be as indicated on the drawings.

C. Durability

1. Concrete shall be air-entrained and shall conform to the air content limits of the following table as measured by ASTM C 138 or ASTM C 173 or ASTM C231.

Nominal maximum size of coarse aggregate, in	Size number	Total air content percent by volume
3/8 ½ ¾ 1	8 7 67 57	6 - 10 5.5 – 7.5 5 - 7 4.5 – 6.5
Nominal maximum size of coarse aggregate, in	Size number	Total air content percent by volume
1-1/2 2 3	467 357 -	4.5 - 6 4 - 5.5 3.5 - 4.5

2. Concrete of normal weight shall have a water-cement ratio not exceeding 0.40.

3. For all concrete in which aluminum or galvanized metal is to be embedded, demonstrate by tests that the mixing water of the concrete, including that contributed by the aggregates and admixture used, will not contain a deleterious amount of chloride ion.

D. Slump

1. Except as specified for floors, proportion and produce concrete to have a slump of 4 in. or less if consolidation is to be by vibration, and 5 in. or less if consolidation is to be by methods other than vibration. A tolerance of up to 1 in. above the indicated maximum shall be allowed for individual batches provided the average for all batches or the most recent 10 batches tested, whichever is fewer, does not exceed the maximum limit. Concrete of lower than usual slump may

be used provided it is properly placed and consolidated. The slump shall be determined by ASTM C 143.

2. If concrete slabs are used, proportion and produce concrete to have a slump of 3 inches or less.

3. A slump of 6 to 9 inches is typically used for concrete that will be pumped or tremie-poured.

E. Aggregate

1. Normal-Weight Aggregates: ASTM C 33/C 33M, Class 4S coarse aggregate or better, graded. Provide aggregates from a single source with documented service record data of at least 10 years' satisfactory service in similar applications and service conditions using similar aggregates and cementitious materials.
2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.
3. The nominal maximum size of the aggregate shall be ¾ inch but shall not exceed one fifth of the narrowest dimension between sides of forms, one third of the depth of slabs, or three fourths of the minimum clear spacing between reinforcing bars.

F Fiber Reinforcement

1. Synthetic Micro-Fiber: Shall be included in all concrete utilized in construction of embedded track
2. Uniformly disperse in concrete mixture at manufacturer's recommended rate, but not less than a rate of 1.0 lb/cu. yd.

G. Admixtures

1. Except for air-entraining admixtures, or anti-washout admixtures for underwater placement, do not use admixtures unless specifically approved by the Engineer.

2. When its use is allowed by the Engineer, the amount of calcium chloride shall not exceed 2 percent by weight of cement. Determine the amount of calcium chloride by the method described in AASHTO T260-78.

3. When their use is permitted, use all admixtures in accordance with the manufacturer's instructions except as otherwise specified herein.

H. Proportions

1. Proportion the ingredients so as to produce a mixture which will work readily into the corners and angles of the forms and around reinforcement by the methods of placing and consolidation employed on the work, but without permitting the materials to segregate or excessive free water to collect on the surface.

2. Use of the proposed mixture proportions shall be subject to approval by the Engineer based on their demonstrated ability to produce concrete meeting all requirements of the specifications. Determine ability to produce the required average strength on the basis of the strength test record of 30 or more tests made during the past 24 months from a similar mix, representing similar materials and conditions to those expected, in accordance with section 5.3 of ACI 318.

   The strength test history used to determine standard deviation will be considered to comply with the above requirement for 30 consecutive strength tests if the tests represent either a group of 30 consecutive batches of the same class of concrete or the statistical average for two groups totaling 30 or more batches. The tests used in establishing the standard deviation shall represent concrete produced for a specified strength or strengths within 1000 psi of that required for the proposed work; changes in materials and proportions within the population of background tests shall not have been more closely restricted than will be the case for the proposed work.

H. Temperature

1. The temperature of concrete to be placed shall not exceed 90 degrees F.

2. The temperature of concrete to be placed in cold weather shall conform to the requirements of the following table.

Nominal Section Size, in	Minimum Concrete Temperature, as placed, F
<12	55
12-36	50
36-72	45
>72	40

3. The temperature of ready-mix concrete shall be determined in accordance with ASTM C 1064.

5.03 PRODUCTION OF CONCRETE

A. Batch, mix and transport ready-mixed concrete in accordance with ASTM C94, except as otherwise specified herein. Plant equipment and facilities shall conform the "Check List for Certification of Ready Mixed Concrete Production Facilities" of the National Ready Mixed Concrete Association.

B. Batch and mix concrete produced by on-site volumetric batching and continuous mixing in accordance with and conforming to all requirements of ASTM C 685.

C. Charge air-entraining admixtures, calcium chloride, and other chemical admixtures into the mixer as solutions and measure by means of an approved mechanical dispensing device. Consider the liquid a part of the mixing water. Admixtures that cannot be added in solution may be weighed or may be measured by volume if so recommended by the manufacturer.

D. If two or more admixtures are used in the concrete, add them separately to avoid possible interaction that might interfere with the efficiency of either admixture or adversely affect the concrete.

E. Complete the addition of retarding admixtures within 1 minute after addition of water to the cement has been completed, or prior to the beginning of the last three-quarters of the required mixing, whichever occurs first.

F. Mix concrete only in quantities for immediate use. Do not re-tamper concrete which has partially set.

G. When concrete arrives at the project with slump below that suitable for placing, as indicated by the specifications, water may be added only if neither the maximum permissible water-cement ratio nor the maximum slump is exceeded. Incorporate the water by additional mixing equal to thirty revolutions or more, if necessary, at mixing speed. Water shall not be added to the batch at any later time.

H. Cold Weather

1. Comply with the applicable requirements of “Cold Weather Concreting”, ACI 306.

2. Do not place concrete if temperature is below 40 degrees F, except with specific approval. For concrete placed or cured below 40 degrees F, provide heat, insulation and moisture to maintain concrete temperature and curing conditions as recommended by ACI 306.

3. Do not use frozen materials, or materials containing ice. Do not allow concrete to come into contact with frost.

I. Hot Weather

1. Comply with the applicable requirements of “Hot Weather Concreting”, ACI 305.

2. Cool the ingredients before mixing.

3. Flake ice or well-crushed ice of a size that will melt completely during mixing may be substituted for all or part of the mixing water if, due to high temperature, low slump, flash set or cold joints are encountered.

4. Reduce concrete temperatures to prevent rapid evaporation of water in hot weather.

5.04 PREPARATION BEFORE PLACING

A. Remove hardened concrete and foreign materials from the inner surfaces of the conveying equipment.

B. Complete the formwork and remove snow, ice, frost, water, dirt or other foreign materials.

C. All material that is to come in contact with the fresh concrete, including formwork, reinforcement and inserts, must be at a temperature above 32 Degrees Fahrenheit at the time the concrete is poured, in accordance with ACI 306 “Cold Weather Concreting”.

D. Place all sleeves, inserts, anchors and embedded items including reinforcing bars. Approved bar chairs shall be used where required to vertically position reinforcing bars. The use of large aggregate or brick will not be permitted to provide clearance between the formwork and reinforcing steel.

E. Give ample notice and opportunity to Engineer before starting to place concrete in any unit of the structure to permit proper inspection of forms and reinforcement by the Engineer.

F. Give ample notice and opportunity to all other contractors whose work is related to or supported by the concrete to furnish embedded items before the concrete is placed.

G. Sprinkle semiporous subgrades sufficiently to eliminate suction, and seal porous subgrades in a manner approved by the Engineer.

H. Do not place concrete on frozen ground or fill material, or on subgrades containing frost.

5.05 CONVEYING

A. Convey concrete from the mixer to the place of final deposit as rapidly as practicable by methods which will prevent segregation or loss of ingredients and in a manner which will assure that the required quality of the concrete is maintained.

B. Use conveying equipment which is approved by the Engineer and of a size and design such that detectable setting of the concrete does not occur before adjacent concrete is placed.

C. Clean conveying equipment at the end of each operation or work day.

D. For truck mixers, agitators and non agitating units, conform to the applicable requirements of ASTM C94.

E. For belt conveyors, use units which are horizontal or at a slope which will not cause excessive segregation or loss of ingredients. Protect concrete against undue drying or rise in temperature. Use an arrangement approved by the Engineer at the discharge end to prevent apparent segregations. Do not allow mortar to adhere to the return length of the belt. Discharge long runs into a hopper or through a baffle.

F. For chutes, use metal or metal lined equipment having a slope not exceeding 1 vertical to 2 horizontal and not less than 1 vertical to 3 horizontal. Chutes more than 20 ft. long and chutes not meeting the slope requirements may be used provided they discharge into a hopper before distribution.

G. For pumping or pneumatic conveying, use equipment of suitable kind with adequate pumping capacity, and pump the concrete directly to the structure with no intermediate transfer points.

1. Do not convey concrete through pipe made of aluminum or aluminum alloy.

2. Control pneumatic placement so that segregation is not apparent in the discharged concrete.

3. When concrete is being conveyed to the pump by delivery trucks, the Contractor shall test the slump and entrained air of the first batch of concrete on each shift in which concrete will be poured. Tests will be conducted on the concrete being discharged from the truck into

the pump, and on the concrete being discharged from the end of the pumping line at the point of final placement. These tests shall be performed at no additional cost to the Owner.

a. The loss of slump due to the pumping or pneumatic conveying of concrete shall not exceed 3 inches. Concrete exhibiting larger slump losses, or a resulting slump outside the specified range shall not be accepted.

b. The loss of entrained air due to the pumping or pneumatic conveying of concrete shall not exceed 5%. Concrete with a resulting air entrainment below the specified range shall not be accepted.

4. The Contractor shall ensure that pump and pipeline washout-blowout procedures are performed safely and cleanly to prevent personnel injury and to prevent concrete contact with river water or other natural environments.

5.06 PLACING CONCRETE

A. Deposit concrete continuously, or in layers of such thickness that no concrete will be deposited on concrete which has hardened sufficiently to cause the formation of seams or planes of weakness within the section. If a section cannot be placed continuously, locate construction joints as shown on the drawings or as approved by the Engineer.

B. Deposit concrete at such a rate that the concrete which is being integrated with fresh concrete is still plastic.

C. Do not deposit concrete which has partially hardened or has been contaminated by foreign materials.

D. Remove temporary spreaders in forms when the concrete placing has reached an elevation rendering their service unnecessary. They may remain embedded in the concrete only if made of metal or concrete, and if prior approval has been obtained from the Engineer.

E. Do not begin placing of concrete in supported elements until the concrete previously placed in columns and walls is no longer plastic and has been in place at least two hours.

F. Deposit concrete as nearly as practicable in its final position to avoid segregation due to rehandling or flowing. Do not subject the concrete to any procedure which will cause segregation.

1. Do not allow concrete to drop free more than four feet. Where greater drops are required use a tremie or "elephant's trunk". Control the discharge of such devices so that the concrete can effectively be compacted in horizontal layers not more than 12 inches thick. Space the devices such that excessive segregation does not occur.

G. Consolidate all concrete by vibration, spading, rodding or forking so that the concrete is thoroughly worked around the reinforcement, around embedded items, and into corners of forms, eliminating all air or stone pockets which may cause honeycombing, pitting, or planes of weakness. Use international vibrators of the largest size and the most powerful that can be properly used in the work, as described in Table 5.1.4 of ACI 309. They shall be operated by competent workmen. Do not use vibrators to transport concrete within forms. Insert vibrators and withdraw at points approximately 18 in. apart. At each insertion, the duration shall be sufficient to consolidate the concrete but not sufficient to cause segregation, generally from 5 to 15 seconds. Keep a spare vibrator on the job site during all concrete placing operations. Where the concrete is to have an as-cast finish, bring a full surface of mortar against the form by the vibration process, supplemented if necessary by spading to work the coarse aggregate back from the formed surface.

H. Unless adequate protection is provided, do not place concrete during rain, sleet or snow.

I. Do not allow rainwater to increase the mixing water or damage the surface finish.

J. The temperature of the concrete as placed shall not be so high as to cause difficulty from loss of slump, flash set, or cold joints and should not exceed 90F. When the temperature of the concrete exceeds 90 F, use precautionary measures approved by the Engineer. When the temperature of steel forms is greater than 120 F, spray steel forms and reinforcement with water just prior to placing the concrete.

K. When required or permitted, deposit concrete underwater by an approved method in such a way that the fresh concrete enters the mass of previously placed concrete from within, causing water to be displaced with minimum disturbance at the surface of the concrete.

A tremie pipe (8 to 12 inches in diameter) shall be used to deposit the concrete. The tremie pipe shall be water tight. No water shall be allowed to enter the tremie pipe. The tremie pipe shall be sealed and lowered into the base of the formwork and filled with concrete. The tremie shall be raised no more than 6 inches off the bottom to break the seal and initiate the flow of concrete. The end of the tremie pipe shall remain embedded in the fresh concrete from 3 to 5 feet after pouring is started. The tremie pipe shall be

lifted slowly to avoid disturbance to the concrete. Concrete placement shall be as continuous as possible through each tremie.

The tremie pipe must remain fixed horizontally while concrete is flowing. Horizontal movement of the pipe will damage the surface of concrete already in place. Horizontal distribution of the concrete is accomplished by halting placement, moving the pipe, reestablishing the seal and resuming placement. A tremie pipe injection point spacing of 2 to 3 times the depth of concrete shall be used.

L. After the introduction of the mixing water to the cement and aggregates, each batch of concrete will be discharged within 1.5 hours, or before the mixing drum has completed 300 revolutions, whichever comes first.

1. These limitations may be waived by the Owner, or Engineer, if, after the limits stated above, the concrete slump remains sufficient to allow it to be placed without the addition of water to the batch.

2. These limitations may reduced by the Owner, or Engineer, if hot weather, or other conditions that may contribute to rapid stiffening of the concrete mix, are present.

M. Provide all material, manpower and equipment necessary for the safe washout and cleaning of all concrete-related equipment, including trucks, pumps, pipes, and forming tools. Dispose of all hardened washout concrete. Rivers and other aquatic environments shall not be used for washout or cleaning.

5.07 CONSTRUCTION JOINTS

A. Make construction joints only as shown on the Drawings, or as approved by the Engineer.

B. Locate joints not shown on the Drawings only as approved by the Engineer. Locate those joints as least to impair the strength of the structure. In general, locate construction joints near the middle of the spans of slabs, beams and girders. Locate joints in walls and columns at the underside of floors, slabs, beams or girders and at the tops of footings or floor slabs. Place beams, girders, brackets, column capitals, haunches and drop panels at the same time as slabs. Make joints perpendicular to the main reinforcement.

C. Continue reinforcement across joints unless shown otherwise on the drawings.

D. Provide keys and inclined dowels as directed by the Engineer.

E. For all transverse and longitudinal construction joints, provide a keyway 2 inches deep by 4 inches wide with a rubber dumbbell-type waterstop.

F. Clean the surface of concrete at all joints and remove all laitance before placing adjoining concrete.

G. Immediately before new concrete is placed, all construction joints shall be wetted and standing water removed.

H. Obtain bond by one of the following methods:

1. The use of an approved adhesive. Prepare and apply adhesive to joints receiving an adhesive in accordance with the manufacturer's recommendations.

2. The use of an approved chemical retarder which delays but does not prevent setting of the surface mortar. Remove mortar within 24 hours after placing to produce a clean exposed aggregate bonding surface. Prepare surfaces of joints to be treated in accordance with the manufacturer's recommendations.

3. Roughening the surface of the concrete in an approved manner which will expose the aggregate uniformly and will not leave laitance, loosened particles of aggregate or damaged concrete at the surface.

4. Dampen (but do not saturate) the hardened concrete of construction joints and of joints between footings and walls or columns, between walls or columns and beams or floors they support, joints in unexposed walls and all others not mentioned below immediately prior to placing of fresh concrete.

5. For horizontal construction joints in exposed work; horizontal construction joints in the middle of beams, girders, joists and slabs; and horizontal construction joints in work designed to contain liquids, dampen (but do not saturate) the hardened concrete and thoroughly cover the joint with a coat of cement grout of similar proportions to the mortar in the concrete. Place the fresh concrete before the grout has attained its initial set.

5.08 EMBEDDED ITEMS

A. Expansion Joints - Do not extend reinforcement or other embedded metal items bonded to the concrete (except dowels in slabs bonded on only one side of joints) continuously through any expansion joint.

B. Position expansion joint material, waterstops and other embedded items accurately, and support them against displacement. Fill voids in sleeves, inserts and anchor slots temporarily with readily removable material to prevent the entry of concrete into the voids.

5.09 SLABS

A. Set edge forms and intermediate screed strips accurately to produce the designated elevations and contours of the finished surface, and construct them sufficiently strong to support vibrating screeds or roller pipe screeds if the nature of the finish specified requires the use of such equipment. Align the concrete surface to the contours of screed strips by the use of strike-off templates or approved compacting type screeds.

B. Carefully coordinate mixing and placing with finishing. Do not place concrete on the subgrade or forms more rapidly than it can be spread, straightened, and darbied or bull floated. These operations must be performed before bleeding water has an opportunity to collect on the surface.

C. To obtain good surfaces and avoid cold joints, plan the size of finishing crews with due regard for the effects of concrete temperature and atmospheric conditions on the rate of hardening of the concrete.

D. If saw-cut joints are required or permitted, time cutting properly with the set of the concrete: start cutting as soon as the concrete has hardened sufficiently to prevent aggregates being dislodged by the saw, and complete before shrinkage stresses become sufficient to produce cracking.

E. Thoroughly consolidate concrete in slabs. Use internal vibration in beams and girders of framed slabs and along the bulkheads of slabs on grade. Obtain consolidation of slabs with vibrating screeds, roller pipe screeds, internal vibrators, or other approved means.

5.10 FINISHES

A. Provide the following finishes as applicable and in accordance with ACI 301 unless specified otherwise herein or shown otherwise on the Drawings:

1. Smooth Form Finish - for all formed concrete surfaces.

2. Broom or Belt Finish - for sidewalks, driveways, ramps and exterior platforms.

3. Provide smooth form finish where type of finish is not certain from above.

B. Smooth Form Finish - Use form facing materials which produce a smooth, hard, uniform texture on the concrete. it may be plywood, tempered concrete-form-grade hardboard, metal, plastic, paper, or other approved material capable of producing the desired finish. The arrangement of the facing material shall be orderly and symmetrical, with the number of seams kept to the practical minimum. Support it with studs or other backing capable of preventing excessive deflection. Do not use material with raised grain, torn surfaces, worn edges, patches, dents, or other defects which will impair the texture of the concrete surface. Patch tie holes and defects. Completely remove all fins.

C. Broom or Belt Finish - First, float finish the surface as described above. Do not trowel. Give the surface a coarse transverse scored texture by drawing a broom or burlap belt across the surface.

5.11 TOLERANCES

A. Tolerance in finished elevation shall be ¼ inch per 100 feet of length. This tolerance is non additive.

B. Produce formed surfaces which result in concrete outlines within the tolerances of applicable standards.

C. Depressions in slabs between high spots shall not be greater than 3/16 in. below a 10 ft. long straightedge.

5.12 CURING

A. Beginning immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury, and maintain the concrete with minimal moisture loss at a relatively constant temperature for the period necessary for hydration of the cement and hardening of the concrete.

B. For concrete surfaces not in contact with forms, apply one of the following procedures immediately after completion of placement and finishing:

1. Ponding or continuous sprinkling.

2. Application of absorptive mats or fabric kept continuously wet.

3. Application of sand kept continuously wet.

4. Continuous application of steam (not exceeding 150F) or mist spray.

5. Application of waterproof sheet materials conforming to ASTM C171.

6. River water and other non-potable water sources shall not be acceptable for use in curing.

7. Application of a curing compound conforming to ASTM C309. Apply the compound in accordance with the recommendations of the manufacturer immediately after any water sheen which may develop after finishing has disappeared from the concrete surface. Do not use on any surface against which additional concrete or other material is to be bonded unless it is proved that the curing compound will not prevent bond, or unless positive measures are taken to remove it completely from areas to receive bonded applications. Minimize moisture loss from surfaces placed against wooden forms or metal forms exposed to heating by the sun by keeping the forms wet until they can be safely removed. After form removal, cure the concrete for at least seven days.

C. Cold Weather - When the mean daily outdoor temperature is less than 40 F, maintain the temperature of the concrete between 50 and 70 F for seven days. When necessary, make arrangements for heating, covering, insulating, or housing the concrete work in advance of placement and maintain the required temperature without injury due to concentration of heat. Do not use combustion heaters during the first 24 hours unless precautions are taken to prevent exposure of the concrete to exhaust gases which contain carbon dioxide.

D. Hot Weather - When necessary, make provision for windbreaks, shading, fog spraying, sprinkling, ponding, or wet covering with a light colored material in advance of placement, and take such protective measures as quickly as concrete hardening and finishing operations will allow.

E. Rate of Temperature Change - Keep changes in temperature of the air immediately adjacent to the concrete during and immediately following the curing period as uniform as possible and do not exceed 5 F in any 1 hour or 50 F in any 24 hour period.

F. During the curing period, protect the concrete from damaging mechanical disturbances, such as load stresses, heavy shock, and excessive vibration. Protect all finished concrete surfaces from damage by construction equipment, materials, or methods, by application of curing procedures, and by rain or running water. Do not load self-supporting structures in such a way as to overstress the concrete.

G. Proper curing methods shall be maintained, including curing methods for side faces once forms are stripped, for a minimum of seven (7) days.

H. No external loads shall be applied to the concrete until seven (7) days after concrete is cast.

I. No piles shall be driven or vibrated within fifty feet (50 ft) of new concrete until seven (7) days after concrete is cast.

5.13 REPAIR OF SURFACE DEFECTS

A. Repair surface defects, including tie holes immediately after form removal.

B. Remove all honeycombed and other defective concrete down to sound concrete. If chipping is necessary, form the edges perpendicular to the surface or slightly undercut. No featheredges will be permitted. Dampen the area to be patched and an area at least 6 in. wide surrounding it to prevent absorption of water from the patching mortar. Prepare a bonding grout using a mix of approximately 1 part cement to 1 part fine sand passing a No. 30 mesh sieve, mixed to the consistency of thick cream, and then well brushed into the surface.

C. Make the patching mixture of the same materials and of approximately the same proportions as used for the concrete, except that the coarse aggregate shall be omitted and the mortar shall consist of not more than 1 part cement to 2 1/2 parts sand by damp loose volume. Substitute white portland cement for a part of the gray portland cement on exposed concrete in order to produce a color matching the color of the surrounding concrete as determined by a trial patch. Use no more mixing water than necessary for handling and placing. Mix the patching mortar in advance and allow it to stand with frequent manipulation with a trowel, without addition of water, until it has reached the stiffest consistency that will permit placing.

D. After surface water has evaporated from the area to be patched, brush the bond coat well into the surface. When the bond coat begins to lose the water sheen, apply the premixed patching mortar. Consolidate the mortar.

E. After cleaning and thoroughly dampening the tie holes, fill them solid with patching mortar.

F. If permitted or required, proprietary compounds for adhesion or as patching ingredients may be used in lieu of or in addition to the foregoing patching procedures. Use such compounds in accordance with the manufacturer's recommendations.

5.14 TESTING

A. Concrete materials and operations will be tested and inspected as the work progresses. Failure to detect any defective work or material shall not in any way prevent later rejection when such a defect is discovered, nor shall it obligate the Engineer for final acceptance.

B. Additional testing and inspection required by failure to meet specification requirements or by changes in materials or proportions requested by the Contractor shall be paid for by the Contractor.

C. Testing of concrete for mix design purposes shall be paid for by the Contractor.

D. All testing agencies shall meet the requirements of ASTM E 329.

E. Contractor shall engage an independent field and laboratory testing agency to perform all test required by the Contract Documents.

F. To facilitate testing and inspection,

1. Furnish any necessary labor to assist the designated testing agency in obtaining and handling samples at the project or other sources of materials.

2. Advise the designated testing agency sufficiently in advance of operations to allow for completion of quality tests and for the assignment of personnel.

3. Provide and maintain for the sole use of the testing agency adequate facilities for safe storage and proper curing of concrete test cylinders on the project site for the first 24 hours as required by ASTM C 31.

G. The first batch of concrete to be poured during a shift shall have its air content, slump and temperature tested, prior to initiating a pour, and will be rejected if values outside accepted ranges are obtained.

H. One strength test sampling shall be randomly taken from each 50 cu. yds. of concrete poured in a given shift. A minimum of five (5) strength test samplings shall be performed on randomly selected batches for each class of concrete on the project. If fewer than five (5) batches of concrete are used, strength test sampling shall be performed on each batch. If the total quantity of a given class of concrete is less than 50 cu. yds., strength tests may be waived at the engineer’s discretion.

I. A strength test sampling shall consist of enough cylinders to perform a minimum of two strength tests, as defined below in 5.14.I.1. All strength

test sampling shall be performed in accordance with ASTM C-172. Cylinders will be made and cured in accordance with ASTM C-31 and tested in accordance with ASTM C-39.

1. A valid strength test shall consist of the breaking of a minimum of two (2) 6”x12” concrete cylinders, or three (3) 4”x8” concrete cylinders. At a minimum, strength tests shall be performed after seven (7) days and twenty-eight (28) days.

2. Additional test cylinders may be taken at the time of sampling, at the Engineer’s or Contractor’s discretion, in order to:

    a. Perform an additional strength test after less than seven (7) days for consideration of form removal.

        i. Forms shall not be removed until the concrete has achieved at least 70% of the design strength.

    b. Perform an additional strength test after fourteen (14) days for evaluation of strength gain.

    c. Perform an additional strength test after either seven (7) days or twenty-eight (28) days to confirm those strength tests results.

    d. Perform an additional strength test after forty-five (45) days should the twenty-eight (28) day strength test results be below the specified strength.

    e. Allow for the discarding of outlying strength results for any strength test, in accordance with ACE 214R.

    f. Perform strength tests of cylinders cured under field conditions to demonstrate the adequacy of the curing and protection undertaken in the field.

        i. The strength test results of field-cured cylinders will not be used for evaluation and acceptance of the concrete strength. However, a field-cured strength test that results in less than 85% of the strength of companion laboratory-cured cylinders will necessitate the improvement of field protection and curing procedures. This 85% limitation will not apply if the field-cure strength exceeds the specified compressive strength by more than 500 psi.

ii. No additional compensation will be allowed to accommodate the requirement to perform the additional sampling and testing under this prevision, and to improve field curing and protection procedures as necessary.

J. The air content, temperature, and slump of the concrete shall be measured for each strength test sampling performed. All sampling shall be performed in accordance with ASTM C 172.

1. These properties tests may be conducted more frequently than the test strength sampling, and may be performed on every arriving batch prior to its placement, at the Engineers discretion.

2. If the measured slump, or air content, or both are found to be *above* the specified upper limit, a check test shall be immediately performed on a fresh sample. If the check test fails, the concrete shall be considered to have failed the requirements of this specification, and shall be rejected.

3. If the measured slump, or air content, or both are found to be *below* the specified upper limit, adjustments shall be permitted in accordance with ASTM C 94. If the adjusted concrete subsequently fails, a check test shall be immediately performed on a fresh sample. If the check test fails, the concrete shall be considered to have failed the requirements of this specification, and shall be rejected.

K. All concrete testing, whether properties testing or strength test sampling, shall be conducted on concrete at the point of placement. The Contractor shall take all necessary measures to efficiently and safely allow the representative of the testing agency to take samples at the point of placement. No additional compensation will be allowed to accommodate this requirement.

L. Representatives of the testing agency will inspect, sample and test the materials and the production of concrete as required by the Engineer. When it appears that any material furnished or work performed by the Contractor fails to fulfill specification requirements, the testing agency will report such deficiency to the Engineer and the Contractor.

M. The testing agency will report all test and inspection results to the Engineer and Contractor immediately after they are performed. All test reports will include the exact location in the work at which the batch represented by a test was deposited. Reports of strength tests will include detailed information on storage and curing of specimens prior to testing.

N. The testing agency and its representatives are not authorized to revoke, alter, relax, enlarge or release any requirement of the contract documents, nor to approve or accept any portion of the work.

5.15 EVALUATION AND ACCEPTANCE

A. Test results for standard molded and standard cured test cylinders will be evaluated separately for each portion of the structure.

B. The strength level of the concrete will be considered satisfactory so long as the averages of all sets of three consecutive strength test results equal or exceed the specified strength, and no individual strength test result falls below the specified strength by more than 500 psi, or one tenth the specified strength, whichever is greater.

C. Completed concrete work which meets all applicable requirements will be accepted without qualification.

D. Completed concrete work which fails to meet one or more requirements but which has been repaired to bring into compliance will be accepted without qualification.

E. Completed concrete work which fails to meet one or more requirements and which cannot be brought into compliance as determined by the Engineer may be accepted or rejected. Remove and replace (at Contractor's expense) all concrete work rejected by the Engineer.

F. Formed surfaces resulting in concrete outlines smaller than permitted by the allowable tolerances shall be considered potentially deficient in strength and subject to the requirements stated below for concrete of deficient strength.

G. Formed surfaces resulting in concrete outlines larger than permitted by the allowable tolerances may be rejected and the excess material shall be subject to removal. If removal of the excess material is permitted, it shall be accomplished in such a manner as to maintain the strength of the section and to meet all other applicable requirements of function and appearance.

H. Concrete members cast in the wrong location may be rejected if the strength, appearance or function of the structure is adversely affected or misplaced items interfere with other construction.

I. Inaccurately formed concrete surfaces exceeding the limits of applicable standards and which are exposed to view, may be rejected and shall be repaired or removed and replaced if required.

J. Finished slabs exceeding the tolerances of this section may be repaired provided that strength, durability or appearance is not adversely affected. High spots may be removed with a terrazzo grinder, low spots filled with a patching compound or other remedial measures performed as permitted.

K. Concrete with defects which adversely affect the appearance of the specified finish may be repaired, if possible. If, in the opinion of the Engineer, the defects cannot be repaired, the concrete may be either accepted or rejected.

L. Concrete not exposed to view is not subject to rejection for defective appearance, except in those cases where concrete finish is specified.

M. The strength of the structure in place will be considered potentially deficient if it fails to comply with any requirements which control the strength of the structure, including but not necessarily limited to the following conditions.

1. Low concrete strength.

2. Reinforcing steel size, quantity, strength, position, or arrangement at variance with the requirements of the contract drawings.

3. Concrete which differs from the required dimensions or location in such a manner as to reduce the strength.

4. Curing less than that specified.

5. Inadequate protection of concrete from extremes of temperature during early stages of hardening and strength development.

6. Mechanical injury, construction fires, accidents or premature removal of formwork likely to result in deficient strength.

7. Poor workmanship likely to result in deficient strength.

N. Structural analysis and/or additional testing may be required when the strength of the structure is considered potentially deficient.

O. Core tests may be required when the strength of the concrete in place is considered potentially deficient.

P. If core tests are inconclusive or impractical to obtain or if structural analysis does not confirm the safety of the structure, load tests may be required and their results evaluated in accordance with Chapter 20 of ACI 318.

Q. Concrete work judged inadequate by structural analysis or by results of a load test shall be reinforced with additional construction if so directed by the Engineer, or shall be replaced at the Contractor's expense.

- END OF SECTION -

SECTION 036000 - GROUTING

PART 1: GENERAL

1.01 SCOPE

A. Provide all labor, materials, equipment, and services necessary to furnish and place all grout as shown and specified in the contract documents or otherwise required for proper completion of the Work.

B. This specification covers the requirements for the furnishing and installation of non-shrink epoxy grout, sand-cement poured grout and sand-cement drypack grout, unless shown otherwise on the design drawings. The work shall include, but not be limited to the following:

1. Concrete surface preparation.

2. Furnishing and installation of all leveling plates, shims, wedges, and other approved adjusting materials.

3. Furnishing and installation of all grout.

PART 2: PRODUCTS

2.01 GENERAL REQUIREMENTS

A. Application of grout types shall be as follows unless noted otherwise on the drawings:

1. Non-shrink Epoxy Grout

a. Compressors, generators, blowers, pumps, motors and all other rotating equipment, including grout inside equipment bases.

b. Equipment with cast bases.

c. Equipment on base frames or skids up to base of skid (space between beams shall be filled with sand-cement grout)

d. Anchor bolts and structural elements, especially those mounted into existing concrete elements.

2. Sand-Cement Poured Grout

a. Vessels, heat exchangers and other miscellaneous equipment

b. Anchor bolts and structural elements subjected to static loading only.

3. Dry-pack Grout

a. Structural column base plates

b. Small equipment with flat plate bases

B. Manufacturer's printed instructions accompanying epoxy grout containers and the installation instructions given on vendor equipment drawings shall be reviewed together with this specification prior to commencing any grouting. Any conflict among these three sources of information will be resolved by the Engineer. The Construction Manager will issue a revision to this specification, documenting the resolution.

C. Work Prior to Setting Base Plates

1. Concrete foundations shall be at least 7 days old prior to surface preparation.

2. Concrete surfaces shall be prepared for grouting or drypacking by chipping back to sound concrete or to a dimension specified by the Engineer. The surface shall be clean with all laitance, grease, oil, dirt or loosened aggregate removed prior to setting the leveling plate and/or equipment to be grouted.

3. Water for surface soaking, mixing and curing cement-based grout or drypack shall be potable.

4. All leveling plates shall be set to the proper elevation prior to grouting. The number and type of leveling plates will be determined by the Construction Manager in accordance with the recommendations of the equipment manufacturer and other project documents. On subcontracted work, the number and type of leveling plates shall be submitted by the Equipment Installation Subcontractor to the Engineer for review two weeks prior to use. Leveling plates shall be removed after grout hardening and before tightening the anchor bolt nuts.

5. Concrete surfaces on which cement-based grout or drypack is to be placed shall be thoroughly soaked with water for 24 hours. Just prior to grouting, the water shall be removed. All standing water shall be removed from anchor bolt sleeves.

6. Concrete surfaces on which epoxy grout is to be placed shall be completely dry before grouting.

7. Metal surfaces in contact with the grout or drypack shall be clean and free of oil and grease, and foreign substances not associated with the grouting process.

D. Grout Formwork

1. Form work shall be provided for grout and shall be compatible with the method of placing grout specified herein.

2. Forms shall be designed for rapid, continuous and complete filling of space to be grouted. Forms shall be of adequate strength to withstand the forces of the fluid grout, and shall be caulked or sealed with tape to prevent excessive leakage. The forms shall be coated with form oil or heavy wax to prevent grout adherence and absorption.

3. For other than epoxy grout applications, form placement shall allow at least 1 inch (25 mm) of space all around base plates or equipment bases. The top of the forms shall be a minimum of 1 inch (25 mm) above the bottom of the adjacent base plate. Forms shall have a chamfer strip attached to form a chamfered edge at all corners.

4. For all epoxy grout applications, form placement shall be such that the epoxy grout extends 1 ½ inch (38 mm) beyond the outside edge of the foundation, and 4 inches (100 mm) below the top of the poured concrete surface. Grout thickness below the equipment base shall be a minimum of 1 ½ inch (38 mm) for foundations 3 feet (.9m) in width and less, increasing by 1 inch for each additional 3 feet in foundation width. Forms shall have a chamfer strip attached to form a chamfered edge at all corners.

5. For rotating equipment, leveling and alignment shall be performed and witnessed by the Engineer on the same day that the grout is placed.

E. Grout Material Storage

1. Epoxy grout materials shall be stored and handled in accordance with the manufacturer’s printed instructions.

2. Cement-based grouting materials which becomes damp or air-set, prior to use, shall not be used.

3. Epoxy grout aggregate shall be delivered to the jobsite in sound, dry bags and epoxy grout liquids in sealed hardener and resin containers. The Contractor shall be responsible for storing the grout in a dry, weatherproof shelter.

2.02 REQUIREMENTS FOR EPOXY GROUT

A. Materials

Nonshrink epoxy grout shall be a proportioned, factory packaged product consisting of specially formulated resin, hardener and aggregate. Approved epoxy grouts are HILTI, Carter Waters, Five Star, Sika, and Escoweld. Substitutes shall not be permitted unless specifically approved by the Engineer. Epoxy grout shall be designed for injection in anchor bolt applications.

B. Performance Characteristics

1. Epoxy grout shall have a minimum compressive strength of 5000 psi (350 kg/cm ^{2}) at 24 hours when tested in accordance with ASTM C579.

2. Epoxy grout shall have a minimum working time of 45 minutes at 75^o F (24 ^{o} C).

3. The grout shall show no shrinkage (0.0 percent) and a maximum of 2.5 percent expansion at all ages when tested in accordance with ASTM C827 (modified). The volume change test of epoxy grout, ASTM C827 (modified), requires an indicator ball with a specific gravity between 0.9 and 1.1.

4. The grout shall be flowable, or injectable, depending on the application.

2.03 REQUIREMENTS FOR SAND-CEMENT POURED GROUT

A. Materials

1. Grout is a mixture of cement and sand with pouring consistency. The mix shall consist of 1 part of Portland cement and 2 parts of sand by volume.

The water-cement ratio shall be limited to 0.45 by weight.

2. Portland cement shall conform to ASTM C150, Types I, II, IV, or V.

3. Sand shall conform to ASTM C33.

2.04 REQUIREMENTS FOR DRYPACK GROUT

A. Materials

1. Drypack shall be a mixture of one part cement and 2 ½ parts of sand by volume proportioned at the jobsite and mixed thoroughly with just enough water to produce a consistency such that when a sample is tightly squeezed in the hand only enough moisture will come to the surface to moisten the hand.

2. Portland cement shall conform to ASTM C150, Types I, II, IV or V.

3. Sand shall conform to ASTM C33.

PART 3: SUBMITTALS

3.01 Contractor shall submit the following in accordance with the Contract:

A. Submit with the bid, if not otherwise directed, copies of laboratory test reports, including all test data certifying that the selected products will produce grouts of the qualities specified herein. These certification documents shall be forwarded to the Engineer for review and authorization to proceed.

B. Certify that the grout conforms to the test reports submitted with the bid.

PART 4: QUALITY ASSURANCE

4.01 REFERENCE

Comply with the requirements of the latest edition of the following standards.

A. ASTM Standards

1. C33 Specification for Concrete Aggregates

2. C150 Specification for Portland Cement

3. C191 Test for Time of Setting Hydraulic Cement by Vicat Needle

4. C579 Test Method for Compressive Strength of Chemical-resistant Mortars and Monolithic Surfacing

5. C827 Test Method for Early Volume Change of Cementitious Mixtures

B. U.S. Army Corp. of Engineers (CRD) Standards

1. CRD-C79-77 Test Method for Flow of Grout Mixtures (Flow Cone Method)

PART 5: EXECUTION

5.01 EPOXY GROUT

A. Mixing

1. All epoxy grout components shall be conditioned to a temperature range between 70° F to 85° F (21° C to 30° C) prior to mixing. The entire hardener component shall then be added to the entire resin component and thoroughly mixed for 2 to 3 minutes with a low speed mixer. Mixed resin and hardener shall then be put into a clean mortar mixer or wheelbarrow and the entire bag of aggregate added. The combination shall be mixed until aggregate is completely wetted. Nothing else shall be added to the mixture.

2. Mixing shall be adjacent to area being grouted, with sufficient manpower and equipment available for rapid and continuous mixing and placing.

3. Grout shall not be mixed in quantities larger than that which can be placed during the working time specified herein.

B. Placing

1. Epoxy grout has a limited working time after mixing. This working time shall be specified by the grout manufacturer. The placing of grout shall be performed only during this specified working time and any unused grout remaining beyond this time shall be discarded.

2. Epoxy grout shall be injected for anchor bolt applications. In top-down vertical anchor bolt applications, grout may be gravity-poured with the Engineer's approval. Anchors shall be temporarily supported to prevent sagging until the grout is fully cured.

3. When placing epoxy grout, the temperature of the foundation, base plate and grout material shall be within the temporary range of 40° F

to 90° F (5° C to 32° C) or as recommended by the manufacturer, determined by a surface thermometer.

4. Epoxy grout shall be placed from one long side of an equipment base to the other, in one direction only. The grout shall be poured into movable head box having an inclined plane to direct the grout beneath the equipment base in a manner which minimizes trapped air and bubble formation. The head box should be about a 3 foot (1 m) cube to allow large volumes of grout to be poured continuously. The use of vibrators is not permitted. The use of steel straps is permitted to move grout into position but chaining is not permitted because of air entrapment between the links.

5. Pumping epoxy grout is permitted and may eliminate the requirement for a head box.

6. Epoxy grout placing shall be continued until it oozes out along the entire perimeter and up through every interior air relief hole and grout hole. An exception occurs when grouting such equipment as pumps having an elevated interior base plate. In these situations, grout shall be placed under the entire equipment base to the top of the exterior base plate and then the grouting stopped for a short period of time to allow the grout to seal the periphery and then the grouting completed through one of the interior grout holes.

7. Expansion joints shall be in stalled as indicated on the design drawings for epoxy grout placements of long length or large area. In no case shall the poured length in any direction exceed 10 feet (3m) without an expansion joint.

C. Finishing and Curing

1. Finishing and curing shall be in strict accordance with the manufacturer's printed instructions.

2. Epoxies cannot be trimmed after set. They must be left at the finished level with required chamfer strips built into the forms. Top surfaces may be trowelled with a steel trowel moistened with oil. Further finishing will require grinding.

3. The epoxy grout shall be maintained within the placing temperature range for a minimum of 24 hours after placing.

4. Epoxy grout shall not be wet-cured.

5. After 24 hours, the juncture between the equipment base or sole plate and the epoxy grout, and between the epoxy grout and the concrete foundation shall be sealed with a silicon such as R.T.V., as approved by the Engineer.

5.02 SAND-CEMENT POURED GROUT

A. Mixing

1. Ingredients shall be thoroughly dry-mixed before adding water. After adding water, the batch shall be mixed for 3 to 5 minutes.

2. Batches shall be sized to allow continuous placement of freshly mixed grout. Grout not used within one hour or in accordance with manufacturer's recommendation, whichever is less, after mixing, shall be discarded.

B. Placing

1. When placing grout the temperature of the foundation, base plate and grout shall be within the temperature range of 40° F to 90° F (5° C to 32° C) or as recommended by the manufacturer, determined by a surface thermometer. This temperature shall be maintained for 3 days following grouting. Preparations for maintaining this temperature shall be submitted to the Engineer.

5.03 DRYPACK GROUT

A. Mixing

1. Ingredients shall be thoroughly dry-mixed before adding water. After adding water, the batch shall be mixed for 3 to 5 minutes. Batches shall be sized to allow continuous placement of freshly mixed drypack. Drypack grout not used within one hour , or in accordance with manufacturer's recommendation whichever is less, after mixing shall be discarded. Re-tampering will not be allowed.

B. Placing

1. The space between the top of the flange of steel beam and the bottom of the concrete slab shall be filled with drypack grout by tamping with a bar until the voids are eliminated.

2. When placing drypack grout, the temperature of the concrete, steel, and drypack grout shall be within the temperature range of 40° F to

90° F (5° C to 32° C) or as recommended by the manufacturer, determined by a surface thermometer. This temperature shall be maintained for 3 days following grouting.

5.04 INSPECTION AND QUALITY CONTROL

A. For epoxy grouts, a manufacturer's technical representative shall be called to the field office for a pre-grouting conference to assure that all grouting steps are followed in accordance with the manufacturer's instructions. The representative should remain at the jobsite until the Construction Manager is assured that the correct procedures are being followed and the warranty is not in jeopardy. The Structural Engineer shall be advised if the manufacturer's representative recommends anything contrary to this specification.

B. The Construction Manager and Contractor shall implement contract document procedures for inspection, testing, and documentation. These procedures shall define the documentation that will be employed to assure that the certifications, examinations, tests and approvals required by the contract specifications are accomplished.

C. Vertical support for equipment having a structural steel base frame and a stiffened cover plate is provided by grouting under the base frame. Compliance with the installation procedure established herein will preclude unacceptable voids. Incidental voids under the cover plate may not be detrimental or witnessed and approved by the construction engineer. It is important that the cover plate is sealed by grout against foreign elements.

- END OF SECTION -

SECTION 039320 - CONCRETE REPAIR

PART 1: GENERAL

1.1 SCOPE

The work specified in this section consists of repairs to portions of the existing concrete surfaces as shown on the Contract Drawings and additional work as may be determined by the Owner on a unit price basis. Types of repairs to be made include but are not limited to:

A. Repair of existing cracks.

B. Removal and replacement of deteriorated structural concrete.

C. Repair of surface spalls and delaminations on existing concrete.

D. Removal of existing steel materials present on and within deteriorated concrete for the purpose of repairing the deteriorated concrete.

E. Existing track switches.

1.2. RELATED SECTIONS

A.	Submittal Procedures	Section 013300
B.	Quality Control	Section 014500
C.	Reinforcing Bars	Section 032100
D.	Cast-In-Place Concrete	Section 033000

1.3 JOB CONDITIONS

A. Do not perform any repair work without prior approval of the Owner for the location, limits and type of the repair.

B. Reinforcement may be encountered upon removal of deteriorated concrete.

C. When using water or abrasive blasting equipment, shield all work for the protection of the public and workers on the site.

PART 2: PRODUCTS

2.1 CONCRETE CRACK REPAIR

The Crack Repair Method shall be used to repair cracks wider than one-sixteenth

inch (1/16”) and less than one-quarter inch (1/4”).

A. Bond Breaker Tape: 502A clear polyethylene tape or approved equal or a recommended by the sealant manufacturer to suit application.

B. Crack Sealant: A cold-applied single-component type, polyurethane, non-sag elastomeric sealant, meeting the requirements of ASTM C920 and Federal Specifications, TT-S-00230C, Type II, Class A such as SikaFlex 15LM or approved equal which allows ± 25% joint movement.

2.2 TYPE 1 AND TYPE 2 CONCRETE REPAIR

A. Repair Concrete: Use a polymer-modified cementitious, component, self-consolidation concrete such as Sikaorete 211 SCC or approved equal.

2.3 REINFORCEMENT

A. Conform to Section 032100 - Reinforcing Bars

PART 3: SUBMITTALS

3.1 The Contractor shall submit the following for approval:

A. Product Data: Submit manufactures' product data and current specifications for materials proposed for the work of this section.

PART 4: QUALITY ASSURANCE

A. Manufacture’s Representative Services: The Contractor shall arrange for, and provide, the services of the product manufacture’s technical representative for the initial concrete repair operations. Services shall include detailed instruction to the Contractor’s personnel on the use of the concrete repair materials and witness the first application for each system. Services of the Manufacture’s Representative during construction for consultation, as needed, shall be arranged.

B. Perform mock-ups if required by the Scope of Work:

1. Provide a mock-up at each structure of the required concrete repairs and products.

2. A manufacture’s technical representative for proprietary products shall be present during the execution of the work on mock-ups.

3. The mock-ups at each structure or wall shall include as a minimum:

   a. 10 square feet each of Type 1 and 2 concrete repairs.

   b. 5 linear feet each of surface preparation crack repairs and sealant repairs.

4. Demonstration of work on mock-ups shall be completed prior to beginning production of the work represented by the mock-up.

5. Mock-ups will be used to judge the quality and finish of completed work. Preparation of mock-ups and work performed for demonstration of product application shall be observed by a representative of the product manufacture and Engineer to review and advise on proper application procedures and techniques.

6. Preparation of concrete repairs shall be in accordance with these specifications and the product manufacture's recommendations.

7. Selected mock-up locations shall be representative of typical repair conditions determined by the Engineer.

PART 5: EXCUTION

5.1 REPAIR OF EXISTING CRACKS

A. The Crack Repair Method shall be used to repair cracks wider than one-sixteenth inch (1/16") and less than one-quarter inch (1/4"). Perform surface preparation and placing in conformance with manufacture's specifications and recommendations. Also conform to the following as specifically applicable to this project:

1. Surface Preparation: Rout cracks to be sealed by sawing or grinding. Use oil-free compressed air or water under pressure as approved by the Engineer to remove all dirt, grease, and loose or other bond inhibiting material from inside the cracks.

2. Insert a bond breaker tape along the bottom of the slot.

3. Fill the slot with an Engineer approved polyurethane elastomeric sealant.

5.2 TYPE 1 CONCRETE REPAIRS

A. General: This work consists of the removal of unsound concrete and the

repair of spalled and delaminated concrete surfaces generally over an area of five square feet and two inches and less in depth, with no reinforcing bars exposed, using polymer-modified repair concrete. Surfaces preparation, mixing, and placement shall be in accordance with manufacturer's recommendations.

B. Repair Procedure:

1. Inspection: In the presence of the Engineer, inspect concrete surfaces to be repaired under work for this section to determine the exact limits and locations of all areas to be repaired as work of this section.

2. Make a minimum one inch deep saw cut around the perimeter of the repair area. Remove spalled, scaled, loose and deteriorated concrete to sound concrete. Use maximum 30 pound size pneumatic hammer or other approved method to remove deteriorated concrete. Thoroughly blast or pressure water clean and vacuum the newly exposed area prior to installing repair concrete.

3. Place the polymer-modified repair concrete. Restore the concrete surface to its original lines and finish to match the surrounding concrete surfaces.

4. Render all surfaced of exposed concrete free of oil solvent, grease, dirt, dust, bitumen, rust, loose particles and foreigner matter.

5.3 TYPE 2 CONCRETE REPAIRS

A. General: This work consists of the removal of unsound concrete and the repair of spalled and delaminated concrete surfaces in areas greater than or equal to five square feet and/ or greater that two inches deep where reinforcing bars may be present within the repair area limits. Surfaces preparation, mixing, and placement shall be in accordance with manufacturer's recommendations.

B. Repair Procedure:

1. Inspection: In the presence of the Engineer, inspect concrete surfaces intended to be repaired under work for this section to determine the exact limits and locations of all areas to be repaired as work of this section.

2. Make a minimum one inch deep saw cut around the perimeter of the repair area. Remove spalled, scaled, loose and deteriorated concrete to sound concrete. Use maximum 30 pound size pneumatic

hammer or other approved method to remove deteriorated concrete. Thoroughly blast or pressure water clean and vacuum the newly exposed area prior to installing repair concrete.

3. Remove unsound concrete material in a manner to facilitate uniform placement of fresh concrete; slope upper area of excavated voids evenly to within one inch of the face of the concrete to preclude entrapping air and forming hollow spots on the freshly placed concrete. Within an inch of the surface, the upper outline shall be essentially normal (perpendicular) to the surface.

4. Render all surfaced of exposed concrete free of oil solvent, grease, dirt, dust, bitumen, rust, loose particles and foreigner matter.

5. Use caution where reinforcing steel is uncovered so as not to damage the steel or is bond in the surrounding concrete. Do not use pneumatic tools in direct contact with reinforcing steel. Use maximum 30 pound size hammer for chipping behind reinforcing steel. Clean exposed reinforcing steel in accordance with SSPC-SP-6, Commercial Blast Cleaning, to remove all contaminants, rust and rust scale and coat with epoxy bonding compound.

    a. In areas where reinforcing steel is found to be surrounded by deteriorated concrete or has at least one-half its surface area exposed or has less than 1 inch cover, the depth of removal shall be such as to include all deteriorated concrete but not less than 1 inch below or behind the reinforcing steel.

    b. Where the existing reinforcing steel is severely corroded or damaged, cut out reinforcing steel and replace with new reinforcing steel or the same size and spacing. Where existing steel is determined by the Engineer to have insufficient cover. Either replace reinforcing or adjust as directed. Attach new steel behind existing steel with a minimum lap of 15 inches. Remove concrete a minimum depth of 1 inch behind the new steel.

    c. Provide and tie welded wire fabric to the existing reinforcement or concrete where existing bar spacing exceeds 12 inches.

6. Apply bonding compound to existing surfaces with brush or roller. Place fresh concrete while bonding compound is still tacky. If coating becomes glossy or loses tackiness, remove any surface contaminates then recoat. Follow manufacturer’s instructions for application. Observe all limitations and cautions.

7. Use forms on repair areas of vertical and overhead surfaces of concrete members. Coat forms with a plastic coating or similar type film. Do not use form release agents. Design forms so that placement access will be at the top of each formwork assembly for vertical surfaces.

    a. Prior to forming, install reinforcement as indicated on the Contract Drawings or as required and directed by the Engineer.

8. Use bonding compounds prior to placement of polymer-modified repair concrete.

    a. Place concrete in the maximum height lift possible and consolidate during placement with adequately sized vibrators.

    b. Small holes may be drilled into forms to permit air to escape during pouring and consolidation.

    c. Overhead repairs shall be made by the form and pump method. Design forms so that placement access will be by pumping through ports. Seal joints in the formwork to prevent leakage. Provide holes or vent tubes to prevent the entrapment of air during the pumping process. Support formwork adequately to resist expansive forces of concrete. Details of the pumping sequencing shall be submitted by the Contractor and approved by the Engineer prior to commencing work.

9. After curing and stripping of forms, blend the patched area to match the physical appearance of the adjacent area as close as possible.

    a. The Engineer will sound the patched areas to detect the presence of hollow spots. Remove and repair such defects to the satisfaction of the Engineer and at no additional cost to the Owner.

- END OF SECTION -

SECTION 051200 – STRUCTURAL STEEL FRAMING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings, Specifications and general provisions of the Contract, including General and Supplementary Conditions, all documents included within this contract and Division 00, 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This section includes fabrication and erection of structural steel work, as shown on drawings including schedules, notes, and details showing size and location of members, typical connections, and types of steel required.

1. Structural steel is that work defined in American Institute of Steel Construction (AISC) “Code of Standard Practice” and as otherwise shown on drawings.
2. Refer to Division 3 for anchor bolt installation in concrete.
3. Refer to Division 9 for touch-up and repair painting.

B. Related Sections:

1. Section 055000 – Metal Fabrications
2. Section 099113 – Exterior Painting
3. Section 099123 – Interior Painting
4. Section 033000 – Cast-In-Place Concrete

1.3 REFERENCES

A. American Institute of Steel Construction:

1. Steel Construction Manual.
2. AISC 303 – Code of Standard Practice for Steel Buildings and Bridges.

B. American Society for Testing Materials (ASTM):

1. ASTM C150 - Standard Specification for Portland Cement.
2. ASTM A6/A6M – Standard Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes and Sheet Piling
3. ASTM A36/A36M - Standard Specification for Carbon Structural Steel
4. ASTM A307 – Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60000 PSI Tensile Strength
5. ASTM A325 – Standard Specification for Structural Bolts, Steel, Heat Treated, 1020/105 ksi Minimum Tensile Strength

6. ASTM A500/A500M – Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes
7. ASTM A572/A572M – Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel
8. ASTM F959 – Standard Specification for Compressible-Washer-Type Direct Tension Indicators for Use with Structural Fasteners
9. ASTM F1554 – Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength

C. American Welding Society (AWS)

1. AWS D1.1 – Structural Welding Code – Steel.

1.4 SUBMITTALS

A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.

B. Product data or manufacturer's specifications and installation instructions for following products. Include laboratory test reports and other data to show compliance with specifications (including specified standards).

1. Structural steel (each type), including certified copies of mill reports covering chemical and physical properties.
2. High strength bolts (each type), including nuts and washers, including certified copy of mill reports.

a. Include Direct Tension Indicators.

C. Shop drawings prepared under supervision of a Structural Engineer licensed in the **State of New Jersey**, including complete details and schedules for fabrication and assembly of structural steel members, procedures, and diagrams.

1. Include details of cuts, connections, camber, holes, and other pertinent data. Indicate welds by standard AWS symbols and show size, length, and type of each weld.
2. Provide setting drawings, templates, and directions for installation of anchor bolts and other anchorages to be installed as work of other sections.

D. Certified copies of each survey conducted by a licensed Land Surveyor, showing elevations and locations of leveling plates and anchor bolts to receive structural steel and final elevations and locations for major members. Indicate discrepancies between actual installation and contract documents.

1.5 QUALITY ASSURANCE

A. Codes and Standards: Comply with provisions of following, except as otherwise indicated:

1. American Institute of Steel Construction (AISC) "Code of Standard Practice for Steel Buildings and Bridges", (AISC 303).

2. AISC "Specifications for Structural Steel Buildings," including "Commentary."
3. "Specifications for Structural Joints Using High-Strength Bolts" approved by the Research Council on Structural Connections.
4. American Welding Society (AWS) D1.1 "Structural Welding Code Steel."
5. ASTM A6 "General Requirements for Delivery of Rolled Steel Plates, Shapes, Sheet Piling and Bars for Structural Use."

B. Qualifications for Welding Work: Qualify welding procedures and welding operators in accordance with AWS "Qualification" requirements.

1. Provide certification that welders to be employed in work have satisfactorily passed AWS qualification tests.
2. If recertification of welders is required, retesting will be Contractor's responsibility.

C. High Strength Bolts:

1. High-strength bolts shall be preassembled and supplied directly by the manufacturer. Boxes shall be marked so that bolts may be traced to mill certificates.

1.6 INSPECTION

A. Material or workmanship will be subject to inspection in the shop and field.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to site at such intervals to ensure uninterrupted progress of work.

B. Deliver anchor bolts and anchorage devices, which are to be embedded in cast in place concrete or masonry, in ample time so as not to delay work.

C. Store materials to permit easy access for inspection and identification. Keep steel members off ground by using pallets, platforms, or other supports. Protect steel members and packaged materials from erosion and deterioration. If bolts and nuts become dry or rusty, clean and relubricate before use.

1. Do not store materials on structure in a manner that might cause distortion or damage to members or supporting structures. Repair or replace damaged materials or structures as directed.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Metal Surfaces, General: For fabrication of work that will be exposed to view, use only materials that are smooth and free of surface blemishes including pitting, rust and scale seam marks, roller marks, rolled trade names, and roughness. Remove such blemishes by grinding, or by welding and grinding, prior to cleaning, treating, and applying surface finishes.

B. Structural Steel Shapes, Plates, and Bars: ASTM A 36. High-Strength Structural Steel Shapes, Plates, and Bars: ASTM A 572, Grade 50.

C. Cold Formed Steel Tubing: ASTM A 500, Grade B (Round, Fy=46 ksi), Grade C (Square and Rectangular, Fy=50 ksi.)

D. Anchor Bolts: ASTM F 1554; Grade 36, non-headed type with double nuts and washer at each end unless otherwise indicated.

E. Concrete Anchors: Adhesive Anchors, unless noted otherwise on Contract Documents.

1. Available Products: Subject to compliance with requirements, products that may be incorporated in the work include, but are not limited to, the following:
2. Products: Subject to compliance with requirements, provide one of the following:

    a. HVA with HAS SS rods as manufactured by Hilti.
    b. EPCON Ceramic 6 as manufactured by ITW Ramset/Redhead with stainless steel rod.

F. Unfinished Threaded Fasteners: ASTM A 307, Grade A, regular low carbon steel bolts and nuts.

1. Provide hexagonal heads and nuts for all connections.

G. High Strength Threaded Fasteners: Heavy hexagon structural bolts, heavy hexagon nuts, and hardened washers, as follows:

1. Quenched and tempered medium carbon steel bolts, nuts, and washers, complying with ASTM A 325.

H. Direct Tension Indicators: ASTM F 959, type as required.

1. Shall be installed with each bolt.

I. Electrodes for Welding: Comply with AWS Code, E 70 Series.

J. Cement Grout: Portland cement (ASTM C 150, Type I or Type III) and clean, uniformly graded, natural sand (ASTM C 404, Size No. 2). Mix at a ratio of 1.0 part cement to 3.0 parts sand, by volume, with minimum water required for placement and hydration.

K. Nonmetallic Shrinkage Resistant Grout: Premixed, nonmetallic, noncorrosive, nonstaining product containing selected silica sands, Portland cement, shrinkage compensating agents, plasticizing and water reducing agents, complying with COE CRD C621.

1. Products: Subject to compliance with requirements, provide one of the following:
2. Products: subject to compliance with requirements, provide one of the following:

a. 100 Non Shrink Grout (Non Metallic); Conspec, Inc.
b. Supreme Grout; Cormix, Inc.
c. Sure Grip Grout; Dayton Superior.
d. Euco N.S.; Euclid Chemical Co.
e. Crystex; L & M Construction Chemicals, Inc.
f. Masterflow 713; Master Builders.
g. Sealtight 588 Grout; W. R. Meadows.
h. Propak; Protex Industries, Inc.
i. Set Non Shrink; Set Products, Inc.
j. Five Star Grout; U.S. Grout Corp.
k. Owner Approver Equal.

2.2 FABRICATIONS

A. Shop Fabrication and Assembly: Fabricate and assemble structural assemblies in shop to greatest extent possible. Fabricate items of structural steel in accordance with AISC Specifications and as indicated on final shop drawings. Provide camber in structural members where indicated.

1. Properly mark and match mark materials for field assembly. Fabricate for delivery sequence that will expedite erection and minimize field handling of materials.
2. Where finishing is required, complete assembly, including welding of units, before start of finishing operations. Provide finish surfaces of members exposed in final structure free of markings, burrs, and other defects.

B. Connections: Weld or bolt shop connections, as indicated.

C. Bolt field connections, except where welded connections or other connections are indicated.

1. Provide high strength threaded fasteners for all bolted connections, except where unfinished bolts are indicated.

D. High Strength Bolted Construction: Install high strength threaded fasteners in accordance with AISC "Specifications for Structural Joints Using High-Strength Bolts".

E. Welded Construction: Comply with AWS Code for procedures, appearance and quality of welds, and methods used in correcting welding work.

F. Assemble and weld built up sections by methods that will produce true alignment of axes without warp.

G. Holes for Other Work: Provide holes required for securing other work to structural steel framing and for passage of other work through steel framing members, as shown on final shop drawings.

H. Provide threaded nuts welded to framing and other specialty items as indicated to receive other work.

I. Cut, drill, or punch holes perpendicular to metal surfaces. Do not flame cut holes or enlarge holes by burning. Drill holes in bearing plates.

2.3 FINISH

A. Surface Preparation: After inspection and before shipping, clean steel work to be painted. Remove loose rust, loose mill scale, and spatter, slag, or flux deposits. Clean steel in accordance with Steel Structures Painting Council (SSPC) as follows:

1. SP 1 "Solvent Cleaning."
2. SP-6 "Commercial Blast Cleaning."

B. Galvanize all structural steel members to ASTM A123/A123M. Furnish minimum 1.25 oz/sq ft galvanized coating.

C. General: Shop paint structural steel as much as possible to reduce field painting. Paint embedded steel that is partially exposed on exposed portions and initial 2 inches of embedded areas only.

1. Do not paint surfaces to be welded or high strength bolted with slip critical-type connections.

2. Do not paint surfaces scheduled to receive sprayed on fireproofing.
3. Apply 2 coats of paint to surfaces that are inaccessible after assembly or erection. Change color of second coat to distinguish it from first.

2.4 SOURCE QUALITY CONTROL

A. Materials and fabrication procedures are subject to inspection and tests in mill, shop, and field, conducted by a qualified inspection agency. Such inspections and tests will not relieve Contractor of responsibility for providing materials and fabrication procedures in compliance with specified requirements.

1. Promptly remove and replace materials or fabricated components that do not comply.

B. Design of Members and Connections: Details shown are typical; similar details apply to similar conditions, unless otherwise indicated. Verify dimensions at site whenever possible without causing delay in the work.

1. Promptly notify Engineer whenever design of members and connections for any portion of structure are not clearly indicated.

PART 3 - EXECUTION

3.1 ERECTION

A. Surveys: Employ a surveyor for accurate erection of structural steel. Check elevations of concrete bearing surfaces, and locations of anchor bolts and similar devices, before erection work proceeds, and report discrepancies to Engineer. Do not proceed with erection until corrections have been made or until compensating adjustments to structural steel work have been agreed upon with Owner’s Representative.

B. Temporary Shoring and Bracing: Provide temporary shoring and bracing members with connections of sufficient strength to bear imposed loads. Remove temporary members and connections when permanent members are in place and final connections are made. Provide temporary guy lines to achieve proper alignment of structures as erection proceeds.

C. Temporary Planking: Provide temporary planking and working platforms as necessary to effectively complete work.

D. Grout under column baseplates using a shrinkage resistant cement grout. Grout inside anchor bolt sleeves using a flowable nonshrink grout.

E. Setting Bases and Bearing Plates: Clean concrete and masonry bearing surfaces of bond reducing materials and roughen to improve bond to surfaces. Clean bottom surface of base and bearing plates.

1. Set loose and attached base plates and bearing plates for structural members on wedges or other adjusting devices.
2. Tighten anchor bolts after supported members have been positioned and plumbed. Do not remove wedges or shims, but if protruding, cut off flush with edge of base or bearing plate prior to packing with grout.
3. Pack grout solidly between bearing surfaces and bases or plates to ensure that no voids remain. Finish exposed surfaces, protect installed materials, and allow to cure.
4. For proprietary grout materials, comply with manufacturer's instructions.

F. Field Assembly: Set structural frames accurately to lines and elevations indicated. Align and adjust various members forming part of complete frame or structure before permanently fastening. Clean bearing surfaces and other surfaces that will be in permanent contact before assembly. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.

G. Level and plumb individual members of structure within specified AISC tolerances.

H. Splice members only where indicated and accepted on shop drawings.

I. Erection Bolts: On exposed welded construction, remove erection bolts, fill holes with plug welds, and grind smooth at exposed surfaces.

1. Comply with AISC Specifications for bearing, adequacy of temporary connections, alignment, and removal of paint on surfaces adjacent to field welds.
2. Do not enlarge unfair holes in members by burning or by using drift pins. Ream holes that must be enlarged to admit bolts or fill with weld metal, grind smooth and field drill.

J. Gas Cutting: Do not use gas cutting torches in field for correcting fabrication errors in primary structural framing. Cutting will be permitted only on secondary members that are not under stress, as acceptable to Engineer. Finish gas cut sections equal to a sheared appearance when permitted.

K. Touch Up Painting: Cleaning and touch up painting of field welds, bolted connections, and abraded areas of shop paint and galvanizing on structural steel is included in Division 9 under painting work.

3.2 QUALITY CONTROL

A. Contractor will engage an independent testing and inspection agency to inspect high strength bolted connections and welded connections and to perform tests and prepare test reports.

B. Testing agency shall conduct and interpret tests, state in each report whether test specimens comply with requirements, and specifically state any deviations therefrom.

C. Provide access for testing agency to places where structural steel work is being fabricated or produced so that required inspection and testing can be accomplished.

D. Testing agency may inspect structural steel at plant before shipment.

E. Correct deficiencies in structural steel work that inspections and laboratory test reports have indicated to be not in compliance with requirements. Perform additional tests, at Contractor's expense, as necessary to reconfirm any noncompliance of original work and to show compliance of corrected work.

F. Shop Bolted Connections: Inspect or test in accordance with AISC specifications.

1. Verify that gaps of installed Direct Tension Indicators are less than gaps specified in ASTM F 959, Table 2.

G. Shop Welding: Inspect and test during fabrication of structural steel assemblies, as follows:

1. Certify welders, conduct inspections and tests and have testing agency submit reports. Record types and locations of defects found in work. Record work required and performed to correct deficiencies.
2. Perform visual inspection of all welds.
3. Perform non-destructive testing in accordance with the following:

    a. 10 percent of fillet welds.
    b. 25 percent of partial and full penetration welds.

H. Field Bolted Connections: Inspect in accordance with AISC specifications.

1. All Direct Tension Indicators, comply with requirements of ASTM F 959. Verify that gaps are less than gaps specified in Table 2.

I. Field Welding: Is prohibited.

END OF SECTION 051200

SECTION 083323 - OVERHEAD COILING DOORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Standard Contract Requirements, Special Provisions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes: Electric-motor operated overhead coiling doors, operators, controls and accessories.

1.3 REFERENCES

A. A. General: Standards listed by reference, including revisions by issuing authority, form a part of this specification section to the extent indicated. Standards listed are identified by issuing authority, authority abbreviation, designation number, title or other designation established by issuing authority. Standards subsequently referenced herein are referred to by issuing authority abbreviation and standard designation.

B. American Society for Testing and Materials (ASTM):
   1. 1. ASTM A 653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized).

1.4 PERFORMANCE REQUIREMENTS

A. Structural Performance:
   1. 1. System must meet or exceed applicable minimum wind load requirements.

1.5 SUBMITTALS

A. General: Submit listed submittals in accordance with Conditions of the Contract and Division 1 Submittal Procedures Section.

B. Product Data: Submit manufacturer’s product data and installation instructions.

C. Shop Drawings: Provide drawings indicating guide details, head and jamb conditions, clearances, anchorage, accessories, finish colors, patterns and textures, operator mounts and other related information.

D. Quality Assurance Submittals: Submit the following:
   1. Submit manufacturer's certificate that products meet or exceed specified requirements.
   2. Submit installer qualifications.

E. Closeout Submittals: Submit the following:
   1. Warranty documents.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: Utilize an installer having demonstrated experience on projects of similar size and complexity, and trained and authorized by the door dealer to perform the work of this section.

B. Manufacturer Qualifications: Company with a minimum of five-year experience in producing the specified type of doors.

C. Coordination: Verify project requirements, substrate conditions, manufacturer's installation instructions and manufacturer's warranty requirements.

1.7 DELIVERY, STORAGE & HANDLING

A. Comply with manufacturer's ordering instructions and lead time requirements to avoid construction delays.

B. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.

C. Storage and Protection: Store materials protected from exposure to harmful environmental conditions and at temperature and humidity conditions recommended by the manufacturer.

1.8 WARRANTY

A. Manufacturer shall provide a minimum of one (1) year warranty against defects in material and workmanship.

B. Manufacturer shall provide a minimum of two (3) year warranty on electrical operator and its component parts against defects in material and workmanship.

1.9 MAINTENANCE

A. Extra Materials: Provide additional material for use by owner in building maintenance. Package products with protective covering and identify with

descriptive labels. Comply with Closeout Submittals (Maintenance Materials) Section. Service and repair should be performed by an authorized supplier / installer.

B. Maintenance Service: Submit for Owner's consideration and acceptance maintenance service agreement for products installed.

PART 2 - PRODUCTS

2.1 MANUFACTURER

A. Raynor DuraCoil Door, model FP or Engineer approved equal.

2.2 DOOR OPERATORS

A. Provide doors designed for electric motor operation.
   1. Drive Orientation: For electric motor operated doors, coordinate installation conditions for drive orientation via shop drawing.

2.3 GUIDES

A. Guide Assemblies: To consist of three structural steel angles, minimum 3 inches by 2 inches by 3/16 inch and fitted with removable curtain stops. Steel guides to be provided with one coat of rust-inhibitive primer.

B. Weather Seal: Guide brush seal.

2.4 COUNTERBALANCE SYSTEM

A. Headplates: 3/16 inch steel plate, attached to wall angle of guide assembly with 1/2 inch diameter class 5 case hardened bolts. Inside of drive bracket fitted with sealed ball bearing. Provide head plates with one coat of rust-inhibitive primer

B. Barrel: Minimum 4-1/2 inches O.D. and 0.120 inch wall thickness structural steel pipe. Deflection of pipe under full load shall not exceed 0.03 inch per foot of span.

C. Counterbalance: Provide torsion counterbalance mechanism as follows: Torsion Spring: Oil-tempered, helical torsion springs, grease packed and mounted on a continuous steel torsion shaft.

2.5 ENCLOSURES

A. Hood: Round Hood: 24 gauge steel, finish-painted to match curtain.

B. Hood Baffle: With EPDM seal to inhibit air infiltration through hood cavity.

2.6 HARDWARE

A. Locks: Furnish door system with interlock switch with locking bar.

PART 3 - EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

A. Comply with instructions and recommendations of door manufacturer.

3.2 EXAMINATION

A. Site Verification of Conditions: Verify through direct observation and field measurement all site conditions for installation of doors, operators, controls and accessories. Ensure that opening is square, flush and plumb.

3.3 INSTALLATION

A. General: Install door, guide and operating equipment complete with all necessary accessories and hardware according to shop drawings and manufacturer's instructions.

3.4 FIELD QUALITY CONTROL

A. Manufacturer's Field Services: Provide manufacturer's field service consisting of product installation and use recommendations, and adequate site visits to observe and ensure product installation is done in accordance with manufacturer's recommendations.

3.5 ADJUSTING

A. General: Lubricate bearings and sliding parts and adjust doors for proper operation, balance, clearance and similar requirements.

3.6 CLEANING

A. Remove temporary coverings and protection of adjacent work areas. Repair or replace installed products damaged prior to or during installation.

B. Clean installed products in accordance with manufacturer's instructions prior to Owner's acceptance. Remove and legally dispose of construction debris from project site.

- END OF SECTION -

SECTION 099000 – PAINTING AND COATING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: Surface preparation and field application of paints, and other coatings.

B. Related Requirements:

1. Section 321723 - Pavement Markings: For traffic paint used for parking area stall delineations and other pavement marking.

2. Section 323913 – Bollards and Bollard Covers: For paint used on steel pipe protection bollards for yard hydrants and fire hydrants.

3. Section 331419 – Valves and Hydrants for Water Utility Service: Color coding and painting of Fire Hydrants and Yard Hydrants.

1.2 DEFINITIONS

A. Refer to ASTM D16 for definitions of terms used in this Section.

1.3 REFERENCE STANDARDS

A. American Society of Testing Materials (ASTM): Conform to ASTM D16 for interpretation of terms used in this Section.

B. National Paint and Coatings Association (NPCA): Guide to U.S. Government Paint Specifications.

C. Painting and Decorating Contractors of America (PDCA): Painting - Architectural Specifications Manual.

D. Steel Structures Painting Council (SSPC): Steel Structures Painting Manual.

E. ANSI A13.1: Scheme for Identification of Piping System.

F. OSHA safety color regulation.

1.4 SEQUENCING

A. Section 011000 - Summary: Requirements for sequencing.

1.5 SUBMITTALS

A. Section 013300 - Submittal Procedures: Requirements for submittals.

B. Product Data: For each type of product. Include preparation requirements and application instructions.

1. Indicate VOC content.

1.6 QUALITY ASSURANCE

A. MPI Standards:

1. Comply with indicated MPI standards.

2. Products: Listed in MPI - Approved Products List.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Delivery:

1. Schedule delivery of materials at the site at such time as required for proper coordination of the work. Receive materials in manufacturer's unopened packages and bearing manufacturer's label.

B. Storage:

1. General: Store materials in a dry and properly ventilated separate structure not less than 50 feet - 0 inch from any other structure on the site. Adequately protect from damage and exposure to the elements.

2. Temperature: Maintain minimum of 45 degrees F and a maximum of 90 degrees F.

3. Fire Prevention: Take necessary precautions to prevent fire; remove paint-soiled rags and waste from building each day or store in metal containers with covers in the paint storage structure.

1.8 AMBIENT CONDITIONS

A. Section 015000 - Temporary Facilities and Controls: Requirements for ambient condition control facilities for product storage and installation.

B. Storage Conditions:

1. Minimum Ambient Temperature: 45 degrees F.
2. Maximum Ambient Temperature: 90 degrees F

C. Application Conditions:

1. Do not apply materials when surface and ambient temperatures are outside temperature ranges required by paint manufacturer.
2. Do not apply exterior coatings during rain or snow, when relative humidity is outside humidity ranges, or when moisture content of surfaces exceeds those required by paint manufacturer.
3. Minimum Application Temperatures for Latex Paints: 45 degrees F for interiors and 50 degrees F for exteriors, unless otherwise indicated by manufacturer instructions.

PART 2 - PRODUCTS

A. PAINT, GENERAL

B. Material Compatibility:

1. Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.

2. For each coat in a paint system, products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.

C. Materials:

1. Coatings:

a. Ready mixed, except field-catalyzed coatings.

b. Capable of drying or curing free of streaks or sags.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Section 017300 - Execution: Requirements for application examination.

B. Verify that surfaces are ready to receive Work as recommended by product manufacturer.

C. Examine surfaces scheduled to be finished prior to commencement of Work, and report conditions capable of affecting proper application to Architect/Engineer.

D. Test shop-applied primer for compatibility with subsequent cover materials.

3.2 PREPARATION

A. Section 017300 - Execution: Requirements for application preparation.

B. Prepare coatings as follows:

1. To soft paste consistency, capable of being readily and uniformly dispersed to homogeneous coating.

2. For smooth flow and brushing properties.

C. Defects:

1. Correct defects and clean surfaces capable of affecting Work of this Section.

D. Asphalt, Creosote, or Bituminous Surfaces Scheduled for Paint application:

1. Remove foreign particles to permit adhesion of finishing materials.

E. Concrete and Unit Masonry Surfaces Scheduled to Receive Paint Finish:

1. Remove dirt, loose mortar, scale, salt or alkali powder, and other foreign matter.

2. Remove oil and grease with solution of tri-sodium phosphate, rinse well, and allow to dry.

3. Remove stains caused by weathering of corroding metals with solution of sodium metasilicate after thoroughly wetting with water, and allow to dry.

F. Uncoated Steel and Iron Surfaces:

1. Remove grease, mill scale, weld splatter, dirt, and rust.

2. If heavy coatings of scale are evident, remove by wire brushing or by sandblasting.

3. Clean by washing with solvent.

4. Apply treatment of phosphoric acid solution, ensuring that weld joints, bolts, and nuts are similarly cleaned.

5. Spot-prime paint after repairs.

G. Shop-Primed Steel Surfaces:

1. Sand and scrape to remove loose primer and rust.

2. Feather edges to make touch-up patches inconspicuous.

3. Clean surfaces with solvent.

4. Prime bare steel surfaces.

H. Existing Work:

1. Extend existing paint and coatings installations using materials and methods compatible with existing installations and as specified.

3.3 APPLICATION

A. Comply with MPI - Architectural Painting Manual.

B. Do not apply finishes to surfaces that are not dry.

C. Apply each coat to uniform appearance.

D. Apply each coat of paint slightly darker than preceding coat, unless specified otherwise.

E. Finishing Protection Bollards

1. Section 323913 – Bollards and Bollard Covers includes requirements for paint and primer used on concrete filled steel pipe protection bollards for installation at yard hydrants and fire hydrants.

F. Restoration of Traffic Markings

1. Section 321723 - Pavement Markings, includes requirements for traffic paint used for restoration or replacement of pavement markings removed or rendered illegible as a direct or indirect result of Contractors activities.

2. Restore existing pavement markings following the completion of water line installation, including testing, backfill, compaction and repaving where installation occurred through existing pavements. Restoration shall include pavement markings on areas immediately

adjacent to excavations or where existing pavement markings have been rendered illegible as a result of contractor's activities.

G. Fire Hydrants and Sanitary Yard Hydrants

1. Section 331419 – Valves and Hydrants for Water Utility Service includes requirements for paint and color coding of Fire Hydrants and Sanitary Yard Hydrants.

2. Paint shop-primed hydrants.

3. Where manufacturer applied finishes have been damaged during handling or installation, repaint as follows;

a. Where manufacturers applied finish color complies project specifications, prepare damaged surface area(s), reapply primer and paint affected area to match original finish color.

b. Where manufacturer applied finish color does not meet specified color(s), prepare damaged surface area(s), apply primer to affected area, and apply finish color(s) to entire hydrant complying with project specifications.

4. Color-Coding:

a. Color-code equipment according to indicated requirements.

3.4 FIELD QUALITY CONTROL

A. Section 017300 - Execution: Requirements for testing, adjusting, and balancing.

B. Inspecting and Testing: Comply with MPI - Architectural Painting Manual.

3.5 CLEANING

A. Section 017300 - Execution: Requirements for cleaning.

B. Collect waste material that may constitute fire hazards, place in closed metal containers, and remove daily from Site.

- END OF SECTION -

SECTION 260500 – COMMON WORK RESULTS FOR ELECTRICAL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Electrical equipment coordination and installation.
2. Grout.
3. Common electrical installation requirements.

1.3 DEFINITIONS

1.4 COORDINATION

A. Coordinate arrangement, mounting, and support of electrical equipment:

1. To allow maximum possible headroom unless specific mounting heights that reduce headroom are indicated.
2. To provide for ease of disconnecting the equipment with minimum interference to other installations.
3. To allow right of way for piping and conduit installed at required slope.
4. So connecting raceways, cables, wireways, cable trays, and busways will be clear of obstructions and of the working and access space of other equipment.

B. Coordinate installation of required supporting devices.

C. Coordinate location of access panels and doors for electrical items that are behind finished surfaces or otherwise concealed. Access doors and panels are specified in Division 08 Section "Access Doors and Frames."

1.5 SHOP DRAWING SUBMITTALS AND PRODUCT SUBSTITUTION

A. The following shall be considered an amendment to Specification section 012500 – SUBSTITUTION PROCEDURES.

B. If the Contract Documents state "basis of design product shall be used" the Contractor shall provide the specified or scheduled material or equipment.

C. If the Contract Documents list two or more acceptable products for an item of work, the choice shall be up to the contractor. However, should any product other than the specified or scheduled "Basis of Design" be submitted, the contractor shall be responsible for making any and all changes to the project required to accommodate that product. He shall also be responsible for paying all associated costs necessitated by the change including the costs incurred by other trades on the project, the fees for the Design Professionals for reviewing the product and performing any design work necessitated by the change, and for costs caused by schedule delays caused by the change.

D. If a Contractor intends to substitute an "or equal" that is not listed by name on the documents, he must do so at the time of bid. If the required notice is not provided and an "or equal" substitution is requested, the Design Professional and Owner, at their sole discretion, may refuse to consider the substitution unless the product specified is no longer commercially available. If the Design Professional and Owner allow the substitution to be proposed despite the lack of proper notice, the Contractor will be back-charged the professional fees incurred by the Design Professional and Owner in reviewing the proposed substitution.

E. Whenever in the Contract Documents any specific article, device, equipment, product, material, fixture, patented process, form, method, or type of construction is indicated or specified by name, make, trade name, or catalogue number, with or without the words "or equal", such specifications shall be used for the purpose of facilitating description of material, process, or article desired, and shall be deemed to be followed by the words "or equal". Contractor may, unless it is specifically stated that the basis of design shall be used, offer any material, process, or article which shall be substantially equal or better in every respect to that so indicated or specified, which will completely accomplish the purpose of the Contract Documents.

F. The Owner shall not incur additional responsibilities, including but not limited to, additional compensation to the Design Professional for redesign and evaluation services, increased cost of other construction to the Owner, or similar considerations as all such costs shall be borne by the Contractor proposing the change.

G. Electronic Submittals: Identify and incorporate information in each electronic submittal file as follows:

1. Assemble complete submittal package into a single indexed file incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.

2. Name file with submittal number or other unique identifier, including revision identifier.
3. File name shall use project identifier and Specification Section number followed by a decimal point and then a sequential number. Resubmittals shall include an alphabetic suffix after another decimal point.
4. Provide means for insertion to permanently record Contractor's review and approval markings and action taken by Design Professional.

5. Metadata: Include the following information as keywords in the electronic submittal file metadata:
   a. Project name.
   b. Number and title of appropriate Specification Section.
   c. Manufacturer name.
   d. Product name.

PART 2 - PRODUCTS

2.1 GROUT

A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107, factory-packaged, nonmetallic aggregate grout, noncorrosive, non staining, mixed with water to consistency suitable for application and a 30-minute working time.

PART 3 - EXECUTION

3.1 COMMON REQUIREMENTS FOR ELECTRICAL INSTALLATION

A. Comply with NECA 1.

B. Measure indicated mounting heights to bottom of unit for suspended items and to center of unit for wall-mounting items.

C. Headroom Maintenance: If mounting heights or other location criteria are not indicated, arrange and install components and equipment to provide maximum possible headroom consistent with these requirements.

D. Equipment: Install to facilitate service, maintenance, and repair or replacement of components of both electrical equipment and other nearby installations. Connect in such a way as to facilitate future disconnecting with minimum interference with other items in the vicinity.

E. Right of Way: Give to piping systems installed at a required slope.

3.2 FIRESTOPPING

A. Apply firestopping to penetrations of fire-rated floor and wall assemblies for electrical installations to restore original fire-resistance rating of assembly. Firestopping materials and installation requirements are specified in Division 07 Section "Penetration Firestopping."

- END OF SECTION -

SECTION 260519 – LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Copper building wire rated 600 V or less.
2. Metal-clad cable, Type MC, rated 600 V or less.
3. Mineral-insulated cable, Type MI, rated 600 V or less.
4. Fire-alarm wire and cable.
5. Connectors, splices, and terminations rated 600 V and less.

1.3 DEFINITIONS.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Product Schedule: Indicate type, use, location, and termination locations.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For testing agency.

B. Field quality-control reports.

1.6 QUALITY ASSURANCE

A. Testing Agency Qualifications: Member company of NETA.

1. Testing Agency's Field Supervisor: Certified by NETA to supervise on-site testing.

PART 2 - PRODUCTS

2.1 COPPER BUILDING WIRE

A. Description: Flexible, insulated and uninsulated, drawn copper current-carrying conductor with an overall insulation layer or jacket, or both, rated 600 V or less.

B. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. Encore Wire Corporation.
2. General Cable Technologies Corporation.
3. Southwire Company.

C. Standards:

1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
2. RoHS compliant.
3. Conductor and Cable Marking: Comply with wire and cable marking according to UL's "Wire and Cable Marking and Application Guide."

D. Conductors: Copper, complying with ASTM B3 for bare annealed copper and with ASTM B8 for stranded conductors.

E. Conductor Insulation:

1. Type USE-2 and Type SE: Comply with UL 854.
2. Type THHN and Type THWN-2: Comply with UL 83.
3. Type XHHW-2: Comply with UL 44.

2.2 METAL-CLAD CABLE, TYPE MC

A. Description: A factory assembly of one or more current-carrying insulated conductors in an overall metallic sheath.

B. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. Encore Wire Corporation.
2. General Cable Technologies Corporation.
3. Southwire Company.

C. Standards:

1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
2. Comply with UL 1569.
3. RoHS compliant.

4. Conductor and Cable Marking: Comply with wire and cable marking according to UL's "Wire and Cable Marking and Application Guide."

D. Circuits:

1. Single circuit.
2. Power-Limited Fire-Alarm Circuits: Comply with UL 1424.

E. Conductors: Copper, complying with ASTM B3 for bare annealed copper and with ASTM B8 for stranded conductors.

F. Ground Conductor: Insulated.

G. Conductor Insulation:

1. Type TFN/THHN/THWN-2: Comply with UL 83.
2. Type XHHW-2: Comply with UL 44.

H. Armor: Steel, interlocked.

I. Jacket: PVC applied over armor.

2.3 MINERAL-INSULATED CABLE, TYPE MI

A. Description: Solid copper conductors encased in compressed metal oxide with an outer metallic sheath, rated 600 V or less.

B. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. KME America, Inc.
2. Pentair.
3. Watlow Electric Manufacturing Company.

C. Standards:

1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
2. UL 2196 for fire resistance.

3. Conductor and Cable Marking: Comply with wire and cable marking according to UL's "Wire and Cable Marking and Application Guide."

D. Conductors: Copper, complying with ASTM B3 for bare annealed copper.

E. Insulation: Compressed magnesium oxide.

F. Sheath: Copper.

2.4 FIRE-ALARM WIRE AND CABLE

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. Allied Wire & Cable Inc.
2. CommScope, Inc.
3. Superior Essex Inc.

B. General Wire and Cable Requirements: NRTL listed and labeled as complying with NFPA 70, Article 760.

C. Signaling Line Circuits: Twisted, shielded pair, not less than No. 16 AWG size as recommended by system manufacturer.

1. Circuit Integrity Cable: Twisted shielded pair, NFPA 70, Article 760, Classification CI, for power-limited fire-alarm signal service Type FPL. NRTL listed and labeled as complying with UL 1424 and UL 2196 for a two-hour rating.

D. Non-Power-Limited Circuits: Solid-copper conductors with 600-V rated, 75 deg C, color-coded insulation, and complying with requirements in UL 2196 for a two-hour rating.

1. Low-Voltage Circuits: No. 16 AWG, minimum, in pathway.
2. Line-Voltage Circuits: No. 12 AWG, minimum, in pathway.

2.5 CONNECTORS AND SPLICES

A. Description: Factory-fabricated connectors, splices, and lugs of size, ampacity rating, material, type, and class for application and service indicated; listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.

B. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. 3M Electrical Products.
2. Hubbell Incorporated, Power Systems.
3. Ideal Industries, Inc.

C. Jacketed Cable Connectors: For steel and aluminum jacketed cables, zinc die-cast with set screws, designed to connect conductors specified in this Section.

D. Lugs: One piece, seamless, designed to terminate conductors specified in this Section.

1. Material: Copper.
2. Type: One hole with standard barrels.
3. Termination: Compression.

PART 3 - EXECUTION

3.1 CONDUCTOR MATERIAL APPLICATIONS

A. Feeders: Copper; solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.

B. Feeders: Copper for feeders smaller than No. 4 AWG; copper or aluminum for feeders No. 4 AWG and larger. Conductors shall be solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.

C. Branch Circuits: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.

3.2 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

A. Service Entrance: Type USE, single conductor in raceway.

B. Exposed Feeders: Type THHN/THWN-2, single conductors in raceway.

C. Feeders Concealed in Ceilings, Walls, Partitions, and Crawlspaces: Type XHHW, THHN/THWN-2, single conductors in raceway.

D. Feeders Concealed in Concrete, below Slabs-on-Grade, and Underground: Type XHHW-2, single conductors in raceway.

E. Exposed Branch Circuits, Including in Crawlspaces: Type XHHW, THHN/THWN-2, single conductors in raceway.

F. Branch Circuits Concealed in Ceilings, Walls, and Partitions: Type XHHW, THHN/THWN-2, single conductors in raceway or Metal-clad cable, Type MC.

G. Branch Circuits Concealed in Concrete, below Slabs-on-Grade, and Underground: Type XHHW-2, single conductors in raceway.

H. Cord Drops and Portable Appliance Connections: Type SO, hard service cord with stainless-steel, wire-mesh, strain relief device at terminations to suit application.

3.3 INSTALLATION OF CONDUCTORS AND CABLES

A. Conceal cables in finished walls, ceilings, and floors unless otherwise indicated.

B. Complete raceway installation between conductor and cable termination points according to Section 260533 "Raceways and Boxes for Electrical Systems" prior to pulling conductors and cables.

C. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.

D. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.

E. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.

F. Support cables according to Section 260529 "Hangers and Supports for Electrical Systems."

G. Complete cable tray systems installation according to Section 260536 "Cable Trays for Electrical Systems" prior to installing conductors and cables.

3.4 INSTALLATION OF FIRE-ALARM WIRING

A. Comply with NECA 1 and NFPA 72.

B. Wiring Method: Install wiring in metal pathway according to Section 270528.29 "Hangers and Supports for Communications Systems."

1. Install plenum cable in environmental airspaces, including plenum ceilings.
2. Fire-alarm circuits and equipment control wiring associated with fire-alarm system shall be installed in a dedicated pathway system. This system shall not be used for any other wire or cable.

C. Wiring Method:

1. Cables and pathways used for fire-alarm circuits, and equipment control wiring associated with fire-alarm system, may not contain any other wire or cable.
2. Fire-Rated Cables: Use of two-hour, fire-rated fire-alarm cables, NFPA 70, Types MI and CI, is permitted.
3. Signaling Line Circuits: Power-limited fire-alarm cables may be installed in the same cable or pathway as signaling line circuits.

D. Wiring within Enclosures: Separate power-limited and non-power-limited conductors as recommended by manufacturer. Install conductors parallel with or at right angles to sides and back of the enclosure. Bundle, lace, and train conductors to terminal points with no excess. Connect conductors that are terminated, spliced, or interrupted in any enclosure associated with fire-alarm system to terminal blocks. Mark each terminal according to system's wiring diagrams. Make all connections with approved crimp-on terminal spade lugs, pressure-type terminal blocks, or plug connectors.

E. Cable Taps: Use numbered terminal strips in junction, pull, and outlet boxes; cabinets; or equipment enclosures where circuit connections are made.

F. Color-Coding: Color-code fire-alarm conductors differently from the normal building power wiring. Use one color-code for alarm circuit wiring and another for supervisory circuits. Color-code audible alarm-indicating circuits differently from alarm-initiating circuits. Use different colors for visible alarm-indicating devices. Paint fire-alarm system junction boxes and covers red.

3.5 CONNECTIONS

A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A-486B.

B. Make splices, terminations, and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.

C. Wiring at Outlets: Install conductor at each outlet, with at least 12 inches of slack.

D. Comply with requirements in 284621.13 “Conventional Fire-Alarm Systems" for connecting, terminating, and identifying wires and cables.

3.6 IDENTIFICATION

A. Identify and color-code conductors and cables according to Section 260553 "Identification for Electrical Systems."

B. Identify each spare conductor at each end with identity number and location of other end of conductor, and identify as spare conductor.

3.7 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Section 260544 "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."

3.8 FIRESTOPPING

A. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly according to Section 078413 "Penetration Firestopping."

3.9 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. Perform tests and inspections.

1. After installing conductors and cables and before electrical circuitry has been energized, test service entrance and feeder conductors for compliance with requirements.

2. Perform each of the following visual and electrical tests:

    a. Inspect exposed sections of conductor and cable for physical damage and correct connection according to the single-line diagram.
    b. Test bolted connections for high resistance using one of the following:

        1) A low-resistance ohmmeter.
        2) Calibrated torque wrench.

3) Thermographic survey.

c. Inspect compression-applied connectors for correct cable match and indentation.
d. Inspect for correct identification.
e. Inspect cable jacket and condition.
f. Insulation-resistance test on each conductor for ground and adjacent conductors. Apply a potential of 500-V dc for 300-V rated cable and 1000-V dc for 600-V rated cable for a one-minute duration.
g. Continuity test on each conductor and cable.
h. Uniform resistance of parallel conductors.

C. Cables will be considered defective if they do not pass tests and inspections.

D. Prepare test and inspection reports to record the following:

1. Procedures used.
2. Results that comply with requirements.
3. Results that do not comply with requirements, and corrective action taken to achieve compliance with requirements.

- END OF SECTION -

SECTION 260529 - HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Steel slotted support systems.
2. Conduit and cable support devices.
3. Support for conductors in vertical conduit.
4. Structural steel for fabricated supports and restraints.
5. Mounting, anchoring, and attachment components, including powder-actuated fasteners, mechanical expansion anchors, concrete inserts, clamps, through bolts, toggle bolts, and hanger rods.
6. Fabricated metal equipment support assemblies.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for the following:

    a. Slotted support systems, hardware, and accessories.
    b. Clamps.
    c. Hangers.
    d. Sockets.
    e. Eye nuts.
    f. Fasteners.
    g. Anchors.
    h. Saddles.
    i. Brackets.

2. Include rated capacities and furnished specialties and accessories.

B. Shop Drawings: For fabrication and installation details for electrical hangers and support systems.

1. Hangers. Include product data for components.
2. Slotted support systems.
3. Equipment supports.

1.4 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Reflected ceiling plan(s) and other details, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:

1. Suspended ceiling components.
2. Ductwork, piping, fittings, and supports.
3. Structural members to which hangers and supports will be attached.
4. Size and location of initial access modules for acoustical tile.
5. Items penetrating finished ceiling, including the following:

a. Luminaires.
b. Air outlets and inlets.
c. Speakers.
d. Sprinklers.
e. Access panels.

B. Welding certificates.

1.5 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

2.2 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

A. Steel Slotted Support Systems: Preformed steel channels and angles with minimum 13/32-inch-diameter holes at a maximum of 8 inches o.c. in at least one surface.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

    a. ABB (Electrification Products Division).
    b. Atkore International (Unistrut).
    c. Eaton (B-line).

2. Standard: Comply with MFMA-4 factory-fabricated components for field assembly.
3. Material for Channel, Fittings, and Accessories: Galvanized steel.
4. Channel Width: Selected for applicable load criteria.
5. Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-4.

2.3 FABRICATED METAL EQUIPMENT SUPPORT ASSEMBLIES

A. Description: Welded or bolted structural-steel shapes, shop or field fabricated to fit dimensions of supported equipment.

B. Materials: Comply with requirements in Section 055000 "Metal Fabrications" for steel shapes and plates.

PART 3 - EXECUTION

3.1 APPLICATION

A. Comply with the following standards for application and installation requirements of hangers and supports, except where requirements on Drawings or in this Section are stricter:

1. NECA 1.
2. NECA 101

B. Comply with requirements in Section 078413 "Penetration Firestopping" for firestopping materials and installation for penetrations through fire-rated walls, ceilings, and assemblies.

C. Comply with requirements for raceways and boxes specified in Section 260533 "Raceways and Boxes for Electrical Systems."

D. Maximum Support Spacing and Minimum Hanger Rod Size for Raceways: Space supports for EMT, IMC, and RMC as required by NFPA 70. Minimum rod size shall be 1/4 inch in diameter.

E. Multiple Raceways or Cables: Install trapeze-type supports fabricated with steel slotted support system, sized so capacity can be increased by at least 25 percent in future without exceeding specified design load limits.

1. Secure raceways and cables to these supports with two-bolt conduit clamps.

F. Spring-steel clamps designed for supporting single conduits without bolts may be used for 1-1/2-inch and smaller raceways serving branch circuits and communication systems above suspended ceilings, and for fastening raceways to trapeze supports.

3.2 SUPPORT INSTALLATION

A. Comply with NECA 1 and NECA 101 for installation requirements except as specified in this article.

B. Raceway Support Methods: In addition to methods described in NECA 1, EMT and RMC may be supported by openings through structure members, according to NFPA 70.

C. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb.

D. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by code:

1. To Wood: Fasten with lag screws or through bolts.
2. To New Concrete: Bolt to concrete inserts.
3. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.
4. To Existing Concrete: Expansion anchor fasteners.
5. To Steel: Welded threaded studs complying with AWS D1.1/D1.1M, with lock washers and nuts.
6. To Light Steel: Sheet metal screws.
7. Items Mounted on Hollow Walls and Nonstructural Building Surfaces: Mount cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices on slotted-channel racks attached to substrate.

E. Drill holes for expansion anchors in concrete at locations and to depths that avoid the need for reinforcing bars.

3.3 INSTALLATION OF FABRICATED METAL SUPPORTS

A. Comply with installation requirements in Section 055000 "Metal Fabrications" for site-fabricated metal supports.

B. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor electrical materials and equipment.

C. Field Welding: Comply with AWS D1.1/D1.1M.

3.4 PAINTING

A. Touchup: Comply with requirements in Section 099113 "Exterior Painting" and Section 099123 "Interior Painting" for cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint on miscellaneous metal.

B. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A780.

- END OF SECTION -

SECTION 260533 - RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Metal conduits and fittings.
2. Nonmetallic conduits and fittings.
3. Metal wireways and auxiliary gutters.
4. Surface raceways.
5. Boxes, enclosures, and cabinets.
6. Handholes and boxes for exterior underground cabling.

B. Related Requirements:

1. Section 078413 "Penetration Firestopping" for firestopping at conduit and box entrances.
2. Section 270528 "Pathways for Communications Systems" for conduits, wireways, surface pathways, inner duct, boxes, faceplate adapters, enclosures, cabinets, and handholes serving communications systems.

1.3 DEFINITIONS

A. GRC: Galvanized rigid steel conduit.

1.4 ACTION SUBMITTALS

A. Product Data: For surface raceways, wireways and fittings, floor boxes, hinged-cover enclosures, and cabinets.

1.5 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Conduit routing plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of items involved:

1. Structural members in paths of conduit groups with common supports.
2. HVAC and plumbing items and architectural features in paths of conduit groups with common supports.

B. Source quality-control reports.

PART 2 - PRODUCTS

2.1 METAL CONDUITS AND FITTINGS

A. Metal Conduit:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

    a. Atkore International (Allied Tube & Conduit).
    b. Southwire Company.
    c. Wheatland Tube Company.

2. Listing and Labeling: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
3. GRC: Comply with ANSI C80.1 and UL 6.
4. EMT: Comply with ANSI C80.3 and UL 797.
5. FMC: Comply with UL 1; zinc-coated steel.
6. LFMC: Flexible steel conduit with PVC jacket and complying with UL 360.

B. Metal Fittings:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

    a. Atkore International (Allied Tube & Conduit).
    b. Southwire Company.
    c. Wheatland Tube Company.

2. Comply with NEMA FB 1 and UL 514B.
3. Listing and Labeling: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
4. Fittings, General: Listed and labeled for type of conduit, location, and use.
5. Conduit Fittings for Hazardous (Classified) Locations: Comply with UL 1203 and NFPA 70.
6. Fittings for EMT:

    a. Material: Steel.

b. Type: Setscrew.

7. Expansion Fittings: PVC or steel to match conduit type, complying with UL 651, rated for environmental conditions where installed, and including flexible external bonding jumper.
8. Coating for Fittings for PVC-Coated Conduit: Minimum thickness of 0.040 inch, with overlapping sleeves protecting threaded joints.

C. Joint Compound for GRC: Approved, as defined in NFPA 70, by authorities having jurisdiction for use in conduit assemblies, and compounded for use to lubricate and protect threaded conduit joints from corrosion and to enhance their conductivity.

2.2 NONMETALLIC CONDUITS AND FITTINGS

A. Nonmetallic Conduit:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

   a. Atkore International (AFC Cable Systems).
   b. Cantex Inc.
   c. Raco Taymac Bell; Hubbell Incorporated, Commercial and Industrial.

2. Listing and Labeling: Nonmetallic conduit shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
3. Fiberglass:

   a. Comply with NEMA TC 14.
   b. Comply with UL 2515 for aboveground raceways.
   c. Comply with UL 2420 for belowground raceways.

4. ENT: Comply with NEMA TC 13 and UL 1653.
5. RNC: Type EPC-40-PVC, complying with NEMA TC 2 and UL 651 unless otherwise indicated.
6. LFNC: Comply with UL 1660.

7. Rigid HDPE: Comply with UL 651A.
8. Continuous HDPE: Comply with UL 651A.
9. Coilable HDPE: Preassembled with conductors or cables, and complying with ASTM D3485.

B. Nonmetallic Fittings:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

    a. Atkore International (AFC Cable Systems).
    b. Cantex Inc.
    c. Raco Taymac Bell; Hubbell Incorporated, Commercial and Industrial.

2. Fittings, General: Listed and labeled for type of conduit, location, and use.
3. Fittings for ENT and RNC: Comply with NEMA TC 3; match to conduit or tubing type and material.

    a. Fittings for LFNC: Comply with UL 514B.

4. Solvents and Adhesives: As recommended by conduit manufacturer.

2.3 METAL WIREWAYS AND AUXILIARY GUTTERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. ABB (Electrification Products Division).
2. Eaton (B-line).
3. Schneider Electric USA (Square D).

B. Description: Sheet metal, complying with UL 870 and NEMA 250, Type 12 unless otherwise indicated, and sized according to NFPA 70.

1. Metal wireways installed outdoors shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

C. Fittings and Accessories: Include covers, couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings to match and mate with wireways as required for complete system.

D. Wireway Covers: Hinged type unless otherwise indicated.

E. Finish: Manufacturer's standard enamel finish.

2.4 BOXES, ENCLOSURES, AND CABINETS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. Appleton - O-Z/Gedney; Emerson Electric Co., Automation Solutions.
2. Hubbell Incorporated.
3. Wiremold; Legrand North America, LLC.

B. General Requirements for Boxes, Enclosures, and Cabinets: Boxes, enclosures, and cabinets installed in wet locations shall be listed for use in wet locations.

C. Sheet Metal Outlet and Device Boxes: Comply with NEMA OS 1 and UL 514A.

D. Nonmetallic Outlet and Device Boxes: Comply with NEMA OS 2 and UL 514C.

E. Luminaire Outlet Boxes: Nonadjustable, designed for attachment of luminaire weighing 50 lb. Outlet boxes designed for attachment of luminaires weighing more than 50 lb shall be listed and marked for the maximum allowable weight.

F. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.

G. Cast-Metal Access, Pull, and Junction Boxes: Comply with NEMA FB 1 and UL 1773, cast aluminum with gasketed cover.

H. Box extensions used to accommodate new building finishes shall be of same material as recessed box.

I. Device Box Dimensions: 4 inches square by 2-1/8 inches deep.

J. Gangable boxes are allowed.

K. Hinged-Cover Enclosures: Comply with UL 50 and NEMA 250, Type 12 with continuous-hinge cover with flush latch unless otherwise indicated.

1. Metal Enclosures: Steel, finished inside and out with manufacturer's standard enamel.
2. Nonmetallic Enclosures: Plastic.
3. Interior Panels: Steel; all sides finished with manufacturer's standard enamel.

L. Cabinets:

1. NEMA 250, Type 12 galvanized-steel box with removable interior panel and removable front, finished inside and out with manufacturer's standard enamel.
2. Hinged door in front cover with flush latch and concealed hinge.
3. Key latch to match panelboards.
4. Metal barriers to separate wiring of different systems and voltage.
5. Accessory feet where required for freestanding equipment.

6. Nonmetallic cabinets shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.5 HANDHOLES AND BOXES FOR EXTERIOR UNDERGROUND WIRING

A. General Requirements for Handholes and Boxes:

1. Boxes and handholes for use in underground systems shall be designed and identified as defined in NFPA 70, for intended location and application.
2. Boxes installed in wet areas shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Polymer-Concrete Handholes and Boxes with Polymer-Concrete Cover: Molded of sand and aggregate, bound together with polymer resin, and reinforced with steel, fiberglass, or a combination of the two.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

   a. Armorcast Products Company.
   b. Oldcastle Enclosure Solutions.
   c. Quazite; Hubbell Incorporated, Power Systems.

2. Standard: Comply with SCTE 77.
3. Configuration: Designed for flush burial with open bottom unless otherwise indicated.
4. Cover: Weatherproof, secured by tamper-resistant locking devices and having structural load rating consistent with enclosure and handhole location.
5. Cover Finish: Nonskid finish shall have a minimum coefficient of friction of 0.50.
6. Cover Legend: Molded lettering, "ELECTRIC."
7. Conduit Entrance Provisions: Conduit-terminating fittings shall mate with entering ducts for secure, fixed installation in enclosure wall.
8. Handholes 12 Inches Wide by 24 Inches Long and Larger: Have inserts for cable racks and pulling-in irons installed before concrete is poured.

PART 3 - EXECUTION

3.1 RACEWAY APPLICATION

A. Outdoors: Apply raceway products as specified below unless otherwise indicated:

1. Exposed Conduit: GRC.
2. Concealed Conduit, Aboveground: GRC.
3. Underground Conduit: RNC, Type EPC-40-PVC, direct buried.
4. Boxes and Enclosures, Aboveground: NEMA 250, Type 3R.

B. Indoors: Apply raceway products as specified below unless otherwise indicated:

1. Exposed, Not Subject to Physical Damage: EMT.
2. Exposed and Subject to Severe Physical Damage: GRC. Raceway locations include the following:
   a. Maintenance Areas.
   b. Storage Room.
3. Concealed in Ceilings and Interior Walls and Partitions: EMT.
4. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): FMC, except use LFMC in damp or wet locations.
5. Damp or Wet Locations: GRC.
6. Boxes and Enclosures: NEMA 250, Type 12, except use NEMA 250, Type 4 stainless steel in institutional and commercial kitchens and damp or wet locations.

C. Minimum Raceway Size: 3/4-inch trade size.

D. Raceway Fittings: Compatible with raceways and suitable for use and location.

1. Rigid Steel Conduit: Use threaded rigid steel conduit fittings unless otherwise indicated. Comply with NEMA FB 2.10.
2. EMT: Use setscrew, steel fittings. Comply with NEMA FB 2.10.
3. Flexible Conduit: Use only fittings listed for use with flexible conduit. Comply with NEMA FB 2.20.

E. Do not install nonmetallic conduit where ambient temperature exceeds 120 deg F.

3.2 INSTALLATION

A. Comply with requirements in Section 260529 "Hangers and Supports for Electrical Systems" for hangers and supports.

B. Comply with NECA 1 and NECA 101 for installation requirements except where requirements on Drawings or in this article are stricter. Comply with NECA 102 for aluminum conduits. Comply with NFPA 70 limitations for types of raceways allowed in specific occupancies and number of floors.

C. Do not install raceways or electrical items on any "explosion-relief" walls or rotating equipment.

D. Do not fasten conduits onto the bottom side of a metal deck roof.

E. Keep raceways at least 6 inches away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.

F. Complete raceway installation before starting conductor installation.

G. Arrange stub-ups so curved portions of bends are not visible above finished slab.

H. Install no more than the equivalent of three 90-degree bends in any conduit run except for control wiring conduits, for which fewer bends are allowed. Support within 12 inches of changes in direction.

I. Make bends in raceway using large-radius preformed ells. Field bending shall be according to NFPA 70 minimum radii requirements. Use only equipment specifically designed for material and size involved.

J. Conceal conduit within finished walls, ceilings, and floors unless otherwise indicated. Install conduits parallel or perpendicular to building lines.

K. Support conduit within 12 inches of enclosures to which attached.

L. Raceways Embedded in Slabs:

1. Run conduit larger than 1-inch trade size, parallel or at right angles to main reinforcement. Where at right angles to reinforcement, place conduit close to slab support. Secure raceways to reinforcement at maximum 10-foot intervals.
2. Arrange raceways to cross building expansion joints at right angles with expansion fittings.
3. Arrange raceways to keep a minimum of 2 inches of concrete cover in all directions.
4. Do not embed threadless fittings in concrete unless specifically approved by Architect for each specific location.
5. Change from ENT to GRC before rising above floor.

M. Stub-Ups to Above Recessed Ceilings:

1. Use EMT or RMC for raceways.

2. Use a conduit bushing or insulated fitting to terminate stub-ups not terminated in hubs or in an enclosure.

N. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive, or Outdoor Conditions: Apply listed compound to threads of raceway and fittings before making up joints. Follow compound manufacturer's written instructions.

O. Coat field-cut threads on PVC-coated raceway with a corrosion-preventing conductive compound prior to assembly.

P. Terminate threaded conduits into threaded hubs or with locknuts on inside and outside of boxes or cabinets. Install bushings on conduits up to 1-1/4-inch trade size and insulated throat metal bushings on 1-1/2-inch trade size and larger conduits terminated with locknuts. Install insulated throat metal grounding bushings on service conduits.

Q. Install raceways square to the enclosure and terminate at enclosures with locknuts. Install locknuts hand tight plus 1/4 turn more.

R. Do not rely on locknuts to penetrate nonconductive coatings on enclosures. Remove coatings in the locknut area prior to assembling conduit to enclosure to assure a continuous ground path.

S. Cut conduit perpendicular to the length. For conduits 2-inch trade size and larger, use roll cutter or a guide to make cut straight and perpendicular to the length.

T. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb tensile strength. Leave at least 12 inches of slack at each end of pull wire. Cap underground raceways designated as spare above grade alongside raceways in use.

U. Install raceway sealing fittings at accessible locations according to NFPA 70 and fill them with listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings according to NFPA 70.

V. Install devices to seal raceway interiors at accessible locations. Locate seals so no fittings or boxes are between the seal and the following changes of environments. Seal the interior of all raceways at the following points:

1. Where an underground service raceway enters a building or structure.
2. Conduit extending from interior to exterior of building.
3. Conduit extending into pressurized duct and equipment.
4. Conduit extending into pressurized zones that are automatically controlled to maintain different pressure set points.
5. Where otherwise required by NFPA 70.

W. Comply with manufacturer's written instructions for solvent welding RNC and fittings.

X. Expansion-Joint Fittings:

1. Install in each run of aboveground RNC that is located where environmental temperature change may exceed 30 deg F and that has straight-run length that exceeds 25 feet. Install in each run of aboveground RMC conduit that is located where environmental temperature change may exceed 100 deg F and that has straight-run length that exceeds 100 feet.
2. Install type and quantity of fittings that accommodate temperature change listed for each of the following locations:

    a. Outdoor Locations Not Exposed to Direct Sunlight: 125 deg F temperature change.
    b. Outdoor Locations Exposed to Direct Sunlight: 155 deg F temperature change.
    c. Indoor Spaces Connected with Outdoors without Physical Separation: 125 deg F temperature change.

3. Install fitting(s) that provide expansion and contraction for at least 0.00041 inch per foot of length of straight run per deg F of temperature change for PVC conduits. Install fitting(s) that provide expansion and contraction for at least 0.000078 inch per foot of length of straight run per deg F of temperature change for metal conduits.
4. Install expansion fittings at all locations where conduits cross building or structure expansion joints.
5. Install each expansion-joint fitting with position, mounting, and piston setting selected according to manufacturer's written instructions for conditions at specific location at time of installation. Install conduit supports to allow for expansion movement.

Y. Flexible Conduit Connections: Comply with NEMA RV 3. Use a maximum of 36 inches of flexible conduit for recessed and semirecessed luminaires, equipment subject to vibration, noise transmission, or movement; and for transformers and motors.

1. Use LFMC in damp or wet locations subject to severe physical damage.
2. Use LFMC or LFNC in damp or wet locations not subject to severe physical damage.

Z. Mount boxes at heights indicated on Drawings. If mounting heights of boxes are not individually indicated, give priority to ADA requirements. Install boxes with height measured to center of box unless otherwise indicated.

AA. Recessed Boxes in Masonry Walls: Saw-cut opening for box in center of cell of masonry block, and install box flush with surface of wall. Prepare block surfaces

to provide a flat surface for a raintight connection between box and cover plate or supported equipment and box.

BB. Horizontally separate boxes mounted on opposite sides of walls so they are not in the same vertical channel.

CC. Locate boxes so that cover or plate will not span different building finishes.

DD. Support boxes of three gangs or more from more than one side by spanning two framing members or mounting on brackets specifically designed for the purpose.

EE. Fasten junction and pull boxes to or support from building structure. Do not support boxes by conduits.

FF. Set metal floor boxes level and flush with finished floor surface.

GG. Set nonmetallic floor boxes level. Trim after installation to fit flush with finished floor surface.

3.3 INSTALLATION OF UNDERGROUND CONDUIT

A. Direct-Buried Conduit:

1. Excavate trench bottom to provide firm and uniform support for conduit. Prepare trench bottom as specified in Section 312000 "Earth Moving" for pipe less than 6 inches in nominal diameter.
2. Install backfill as specified in Section 312000 "Earth Moving."
3. After installing conduit, backfill and compact. Start at tie-in point, and work toward end of conduit run, leaving conduit at end of run free to move with expansion and contraction as temperature changes during this process. Firmly hand tamp backfill around conduit to provide maximum supporting strength. After placing controlled backfill to within 12 inches of finished grade, make final conduit connection at end of run and complete backfilling with normal compaction as specified in Section 312000 "Earth Moving."
4. Install manufactured rigid steel conduit elbows for stub-ups at poles and equipment and at building entrances through floor.

    a. Couple steel conduits to ducts with adapters designed for this purpose, and encase coupling with 3 inches of concrete for a minimum of 12 inches on each side of the coupling.
    b. For stub-ups at equipment mounted on outdoor concrete bases and where conduits penetrate building foundations, extend steel conduit horizontally a minimum of 60 inches from edge of foundation or equipment base. Install insulated grounding bushings on terminations at equipment.

5. Underground Warning Tape: Comply with requirements in Section 260553 "Identification for Electrical Systems."

3.4 INSTALLATION OF UNDERGROUND HANDHOLES AND BOXES

A. Install handholes and boxes level and plumb and with orientation and depth coordinated with connecting conduits to minimize bends and deflections required for proper entrances.

B. Unless otherwise indicated, support units on a level bed of crushed stone or gravel, graded from 1/2-inch sieve to No. 4 sieve and compacted to same density as adjacent undisturbed earth.

C. Elevation: In paved areas, set so cover surface will be flush with finished grade. Set covers of other enclosures 1 inch above finished grade.

D. Install handholes with bottom below frost line, below grade.

E. Install removable hardware, including pulling eyes, cable stanchions, cable arms, and insulators, as required for installation and support of cables and conductors and as indicated. Select arm lengths to be long enough to provide spare space for future cables but short enough to preserve adequate working clearances in enclosure.

3.5 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

A. Install 0sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Section 260544 "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."

3.6 FIRESTOPPING

A. Install firestopping at penetrations of fire-rated floor and wall assemblies. Comply with requirements in Section 078413 "Penetration Firestopping."

3.7 PROTECTION

A. Protect coatings, finishes, and cabinets from damage and deterioration.

1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
2. Repair damage to PVC coatings or paint finishes with matching touchup coating recommended by manufacturer.

- END OF SECTION -

SECTION 260544 - SLEEVES AND SLEEVE SEALS FOR ELECTRICAL RACEWAYS AND CABLING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Round sleeves.
2. Rectangular sleeves.
3. Sleeve seal systems.
4. Grout.
5. Pourable sealants.
6. Foam sealants.

B. Related Requirements:

1. Section 078413 "Penetration Firestopping" for penetration firestopping installed in fire-resistance-rated walls, horizontal assemblies, and smoke barriers, with and without penetrating items.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 ROUND SLEEVES

A. Wall Sleeves, Steel:

1. Description: ASTM A53/A53M, Type E, Grade B, Schedule 40, zinc coated, plain ends and integral waterstop.

2.2 RECTANGULAR SLEEVES

A. Sheet Metal Sleeves, Galvanized Steel, Rectangular:

1. Description:

a. Material: Galvanized sheet steel.
b. Minimum Metal Thickness:

1) For sleeve cross-section rectangle perimeter less than 50 inches and with no side larger than 16 inches, thickness must be 0.052 inch.
2) For sleeve cross-section rectangle perimeter not less than 50 inches or with one or more sides larger than 16 inches, thickness must be 0.138 inch.

2.3 SLEEVE SEAL SYSTEMS

A. Description: Modular sealing device, designed for field assembly, to fill annular space between sleeve and raceway or cable or between raceway and cable.

1. Sealing Elements: EPDM rubber interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.
2. Pressure Plates: Carbon steel.
3. Connecting Bolts and Nuts: Carbon steel, with corrosion-resistant coating, of length required to secure pressure plates to sealing elements.

2.4 GROUT

A. Description: Nonshrink; recommended for interior and exterior sealing openings in non-fire-rated walls or floors.

1. Standard: ASTM C1107/C1107M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.
2. Design Mix: 5000-psi, 28-day compressive strength.
3. Packaging: Premixed and factory packaged.

2.5 POURABLE SEALANTS

A. Description: Single-component, neutral-curing elastomeric sealants of grade indicated below.

1. Grade: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces that are not fire rated.

2.6 FOAM SEALANTS

A. Description: Multicomponent, liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam. Foam expansion must not damage cables or crack penetrated structure.

PART 3 - EXECUTION

3.1 INSTALLATION OF SLEEVES FOR NON-FIRE-RATED ELECTRICAL PENETRATIONS

A. Comply with NECA 1.

B. Sleeves for Conduits Penetrating Above-Grade, Non-Fire-Rated, Concrete and Masonry-Unit Floors and Walls:

1. Interior Penetrations of Non-Fire-Rated Walls and Floors:

a. Seal space outside of sleeves with mortar or grout. Pack sealing material solidly between sleeve and wall or floor so no voids remain. Tool exposed surfaces smooth; protect material while curing.
b. Seal annular space between sleeve and raceway or cable, using joint sealant appropriate for size, depth, and location of joint. Comply with requirements in Section 079200 "Joint Sealants."

2. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.
3. Size pipe sleeves to provide 1/4-inch annular clear space between sleeve and raceway or cable, unless sleeve seal system is to be installed.
4. Install sleeves for wall penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of walls. Cut sleeves to length for mounting flush with both surfaces of walls. Deburr after cutting.

C. Sleeves for Conduits Penetrating Non-Fire-Rated Wall Assemblies:

1. Use circular metal sleeves unless penetration arrangement requires rectangular sleeved opening.
2. Seal space outside of sleeves with approved joint compound for wall assemblies.

D. Roof-Penetration Sleeves: Seal penetration of individual raceways and cables with flexible boot-type flashing units applied in coordination with roofing work.

E. Aboveground, Exterior-Wall Penetrations: Seal penetrations using steel pipe sleeves and mechanical sleeve seal systems. Size sleeves to allow for 1-inch

annular clear space between pipe and sleeve for installing mechanical sleeve seals.

F. Underground, Exterior-Wall and Floor Penetrations:

3.2 INSTALLATION OF RECTANGULAR SLEEVES AND SLEEVE SEALS

A. Install conduits and cable with no crossings within the sleeve.

B. Fill opening around conduits and cables with expanding foam without leaving voids.

C. Provide metal sheet covering at both wall surfaces and finish to match surrounding surfaces. Metal sheet must be same material as sleeve.

3.3 INSTALLATION OF SLEEVE SEAL SYSTEMS

A. Install sleeve seal systems in sleeves in exterior concrete walls and slabs-on-grade at raceway entries into building.

B. Install type and number of sealing elements recommended by manufacturer for raceway or cable material and size. Position raceway or cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between raceway or cable and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

- END OF SECTION -

SECTION 260553 - IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Labels.
2. Bands and tubes.
3. Tapes and stencils.
4. Tags.
5. Signs.
6. Cable ties.
7. Miscellaneous identification products.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for electrical identification products.

B. Identification Schedule: For each piece of electrical equipment and electrical system components to be an index of nomenclature for electrical equipment and system components used in identification signs and labels. Use same designations indicated on Drawings.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Comply with NFPA 70.

B. Comply with 29 CFR 1910.144 and 29 CFR 1910.145.

C. Comply with ANSI Z535.4 for safety signs and labels.

2.2 COLOR AND LEGEND REQUIREMENTS

A. Raceways and Cables Carrying Circuits at 600 V or Less:

1. Black letters on an orange field.
2. Legend: Indicate voltage and system or service type.

B. Color-Coding for Phase- and Voltage-Level Identification, 600 V or Less: Use colors listed below for ungrounded service conductors.

1. Color shall be factory applied.
2. Colors for 208/120-V Circuits:

a. Phase A: Black.
b. Phase B: Red.
c. Phase C: Blue.

3. Colors for 240-V Circuits:

a. Phase A: Black.
b. Phase B: Red.

4. Colors for 480/277-V Circuits:

a. Phase A: Brown.
b. Phase B: Orange.
c. Phase C: Yellow.

5. Color for Neutral: White.
6. Color for Equipment Grounds: Green.
7. Colors for Isolated Grounds: Green with two or more yellow stripes.

C. Warning Label Colors:

1. Identify system voltage with black letters on an orange background.

D. Warning labels and signs shall include, but are not limited to, the following legends:

1. Multiple Power Source Warning: "DANGER - ELECTRICAL SHOCK HAZARD - EQUIPMENT HAS MULTIPLE POWER SOURCES."
2. Workspace Clearance Warning: "WARNING - OSHA REGULATION - AREA IN FRONT OF ELECTRICAL EQUIPMENT MUST BE KEPT CLEAR FOR 36 INCHES."

E. Equipment Identification Labels:

1. Black letters on a white field.

2.3 LABELS

A. Vinyl Wraparound Labels: Preprinted, flexible labels laminated with a clear, weather- and chemical-resistant coating and matching wraparound clear adhesive tape for securing label ends.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. Brady Corporation.
b. Panduit Corp.
c. Seton Identification Products; a Brady Corporation company.

B. Snap-around Labels: Slit, pretensioned, flexible, preprinted, color-coded acrylic sleeves, with diameters sized to suit diameters and that stay in place by gripping action.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. Brady Corporation.
b. Panduit Corp.
c. Seton Identification Products; a Brady Corporation company.

C. Self-Adhesive Wraparound Labels: Preprinted, 3-mil-thick, vinyl flexible label with acrylic pressure-sensitive adhesive.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. Brady Corporation.
b. Ideal Industries, Inc.
c. Seton Identification Products; a Brady Corporation company.

2. Self-Lamination: Clear; UV-, weather- and chemical-resistant; self-laminating, protective shield over the legend. Labels sized such that the clear shield overlaps the entire printed legend.
3. Marker for Labels:

a. Machine-printed, permanent, waterproof, black ink recommended by printer manufacturer.

D. Self-Adhesive Labels: Vinyl, thermal, transfer-printed, 3-mil-thick, multicolor, weather- and UV-resistant, pressure-sensitive adhesive labels, configured for intended use and location.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. Brady Corporation.
b. Ideal Industries, Inc.
c. Panduit Corp.

2. Minimum Nominal Size:

a. 1-1/2 by 6 inches for raceway and conductors.
b. 3-1/2 by 5 inches for equipment.
c. As required by authorities having jurisdiction.

2.4 BANDS AND TUBES

A. Snap-around, Color-Coding Bands: Slit, pretensioned, flexible, solid-colored acrylic sleeves, 2 inches long, with diameters sized to suit diameters and that stay in place by gripping action.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. Brady Corporation.
b. HellermannTyton.
c. Panduit Corp.

B. Heat-Shrink Preprinted Tubes: Flame-retardant polyolefin tubes with machine-printed identification labels, sized to suit diameter and shrunk to fit firmly. Full shrink recovery occurs at a maximum of 200 deg F. Comply with UL 224.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. Brady Corporation.
b. HellermannTyton.
c. Panduit Corp.

2.5 TAPES AND STENCILS

A. Marker Tapes: Vinyl or vinyl-cloth, self-adhesive wraparound type, with circuit identification legend machine printed by thermal transfer or equivalent process.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. HellermannTyton.
b. Ideal Industries, Inc.
c. Panduit Corp.

B. Self-Adhesive Vinyl Tape: Colored, heavy duty, waterproof, fade resistant; not less than 3 mils thick by 1 to 2 inches wide; compounded for outdoor use.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. Brady Corporation.
b. Carlton Industries, LP.
c. emedco.

C. Tape and Stencil: 4-inch-wide black stripes on 10-inch centers placed diagonally over orange background and are 12 inches wide. Stop stripes at legends.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. HellermannTyton.
b. LEM Products Inc.
c. Seton Identification Products; a Brady Corporation company.

D. Floor Marking Tape: 2-inch-wide, 5-mil pressure-sensitive vinyl tape, with yellow and black stripes and clear vinyl overlay.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. HellermannTyton.
b. Carlton Industries, LP.
c. Seton Identification Products; a Brady Corporation company.

E. Underground-Line Warning Tape:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

    a. Brady Corporation.
    b. Ideal Industries, Inc.
    c. Seton Identification Products; a Brady Corporation company.

2. Tape:

    a. Recommended by manufacturer for the method of installation and suitable to identify and locate underground electrical and communications utility lines.
    b. Printing on tape shall be permanent and shall not be damaged by burial operations.
    c. Tape material and ink shall be chemically inert and not subject to degradation when exposed to acids, alkalis, and other destructive substances commonly found in soils.

3. Color and Printing:

    a. Comply with ANSI Z535.1, ANSI Z535.2, ANSI Z535.3, ANSI Z535.4, and ANSI Z535.5.
    b. Inscriptions for Red-Colored Tapes: "ELECTRIC LINE, HIGH VOLTAGE"
    c. Inscriptions for Orange-Colored Tapes: "TELEPHONE CABLE, CATV CABLE, COMMUNICATIONS CABLE, OPTICAL FIBER CABLE".

2.6 TAGS

A. Metal Tags: Brass or aluminum, 2 by 2 by 0.05 inch, with stamped legend, punched for use with self-locking cable tie fastener.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

    a. Brady Corporation.
    b. emedco.
    c. Seton Identification Products; a Brady Corporation company.

B. Nonmetallic Preprinted Tags: Polyethylene tags, 0.015 inch thick, color-coded for phase and voltage level, with factory printed permanent designations; punched for use with self-locking cable tie fastener.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

    a. Brady Corporation.
    b. emedco.
    c. Seton Identification Products; a Brady Corporation company.

2. Polyester Tags: 0.015 inch thick, with corrosion-resistant grommet and cable tie for attachment.
3. Marker for Tags:

    a. Machine-printed, permanent, waterproof, black ink marker recommended by printer manufacturer.

2.7 SIGNS

A. Baked-Enamel Signs:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

    a. Carlton Industries, LP.
    b. emedco.
    c. Marking Services, Inc.

2. Preprinted aluminum signs, punched or drilled for fasteners, with colors, legend, and size required for application.
3. 1/4-inch grommets in corners for mounting.
4. Nominal Size: 7 by 10 inches.

B. Metal-Backed Butyrate Signs:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

    a. Brady Corporation.
    b. emedco.
    c. Marking Services, Inc.

2. Weather-resistant, nonfading, preprinted, cellulose-acetate butyrate signs, with 0.0396-inch galvanized-steel backing, punched and drilled for fasteners, and with colors, legend, and size required for application.
3. 1/4-inch grommets in corners for mounting.
4. Nominal Size: 10 by 14 inches.

C. Laminated Acrylic or Melamine Plastic Signs:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

   a. Brady Corporation.
   b. emedco.
   c. Marking Services, Inc.

2. Engraved legend.
3. Thickness:

   a. For signs up to 20 sq. in., minimum 1/16 inch thick.
   b. For signs larger than 20 sq. in., 1/8 inch thick.
   c. Engraved legend with black letters on white face.
   d. Punched or drilled for mechanical fasteners with 1/4-inch grommets in corners for mounting.
   e. Framed with mitered acrylic molding and arranged for attachment at applicable equipment.

2.8 CABLE TIES

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. HellermannTyton.
2. Ideal Industries, Inc.
3. Panduit Corp.

B. General-Purpose Cable Ties: Fungus inert, self-extinguishing, one piece, self-locking, and Type 6/6 nylon.

1. Minimum Width: 3/16 inch.
2. Tensile Strength at 73 Deg F according to ASTM D638: 12,000 psi.
3. Temperature Range: Minus 40 to plus 185 deg F.
4. Color: Black, except where used for color-coding.

C. UV-Stabilized Cable Ties: Fungus inert, designed for continuous exposure to exterior sunlight, self-extinguishing, one piece, self-locking, and Type 6/6 nylon.

1. Minimum Width: 3/16 inch.
2. Tensile Strength at 73 Deg F according to ASTM D638: 12,000 psi.
3. Temperature Range: Minus 40 to plus 185 deg F.
4. Color: Black.

D. Plenum-Rated Cable Ties: Self-extinguishing, UV stabilized, one piece, and self-locking.

1. Minimum Width: 3/16 inch.
2. Tensile Strength at 73 Deg F according to ASTM D638: 7000 psi.
3. UL 94 Flame Rating: 94V-0.
4. Temperature Range: Minus 50 to plus 284 deg F.
5. Color: Black.

2.9 MISCELLANEOUS IDENTIFICATION PRODUCTS

A. Paint: Comply with requirements in painting Sections for paint materials and application requirements. Retain paint system applicable for surface material and location (exterior or interior).

B. Fasteners for Labels and Signs: Self-tapping, stainless-steel screws or stainless-steel machine screws with nuts and flat and lock washers.

PART 3 - EXECUTION

3.1 PREPARATION

A. Self-Adhesive Identification Products: Before applying electrical identification products, clean substrates of substances that could impair bond, using materials and methods recommended by manufacturer of identification product.

3.2 INSTALLATION

A. Verify and coordinate identification names, abbreviations, colors, and other features with requirements in other Sections requiring identification applications, Drawings, Shop Drawings, manufacturer's wiring diagrams, and operation and maintenance manual. Use consistent designations throughout Project.

B. Install identifying devices before installing acoustical ceilings and similar concealment.

C. Verify identity of each item before installing identification products.

D. Coordinate identification with Project Drawings, manufacturer's wiring diagrams, and operation and maintenance manual.

E. Apply identification devices to surfaces that require finish after completing finish work.

F. Install signs with approved legend to facilitate proper identification, operation, and maintenance of electrical systems and connected items.

G. System Identification for Raceways and Cables under 600 V: Identification shall completely encircle cable or conduit. Place identification of two-color markings in contact, side by side.

1. Secure tight to surface of conductor, cable, or raceway.

H. Auxiliary Electrical Systems Conductor Identification: Identify field-installed alarm, control, and signal connections.

I. Emergency Operating Instruction Signs: Install instruction signs with white legend on a red background with minimum 3/8-inch-high letters for emergency instructions at equipment used for power transfer.

J. Elevated Components: Increase sizes of labels, signs, and letters to those appropriate for viewing from the floor.

K. Accessible Fittings for Raceways: Identify the covers of each junction and pull box of the following systems with the wiring system legend and system voltage. System legends shall be as follows:

1. "EMERGENCY POWER."
2. "POWER."
3. "UPS."

L. Vinyl Wraparound Labels:

1. Secure tight to surface of raceway or cable at a location with high visibility and accessibility.
2. Attach labels that are not self-adhesive type with clear vinyl tape, with adhesive appropriate to the location and substrate.

M. Snap-around Labels: Secure tight to surface at a location with high visibility and accessibility.

N. Self-Adhesive Wraparound Labels: Secure tight to surface at a location with high visibility and accessibility.

O. Self-Adhesive Labels:

1. On each item, install unique designation label that is consistent with wiring diagrams, schedules, and operation and maintenance manual.
2. Unless otherwise indicated, provide a single line of text with 1/2-inch-high letters on 1-1/2-inch-high label; where two lines of text are required, use labels 2 inches high.

P. Snap-around Color-Coding Bands: Secure tight to surface at a location with high visibility and accessibility.

Q. Heat-Shrink, Preprinted Tubes: Secure tight to surface at a location with high visibility and accessibility.

R. Marker Tapes: Secure tight to surface at a location with high visibility and accessibility.

S. Self-Adhesive Vinyl Tape: Secure tight to surface at a location with high visibility and accessibility.

1. Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for a minimum distance of 6 inches where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding.

T. Tape and Stencil: Comply with requirements in painting Sections for surface preparation and paint application.

U. Floor Marking Tape: Apply stripes to finished surfaces following manufacturer's written instructions.

V. Underground Line Warning Tape:

1. During backfilling of trenches, install continuous underground-line warning tape directly above cable or raceway at 6 to 8 inches below finished grade. Use multiple tapes where width of multiple lines installed in a common trench or concrete envelope exceeds 16 inches overall.
2. Install underground-line warning tape for direct-buried cables and cables in raceways.

W. Metal Tags:

1. Place in a location with high visibility and accessibility.
2. Secure using cable ties.

X. Nonmetallic Preprinted Tags:

1. Place in a location with high visibility and accessibility.
2. Secure using cable ties.

Y. Write-on Tags:

1. Place in a location with high visibility and accessibility.
2. Secure using cable ties.

Z. Baked-Enamel Signs:

1. Attach signs that are not self-adhesive type with mechanical fasteners appropriate to the location and substrate.
2. Unless otherwise indicated, provide a single line of text with 1/2-inch-high letters on minimum 1-1/2-inch-high sign; where two lines of text are required, use signs minimum 2 inches high.

AA. Metal-Backed Butyrate Signs:

1. Attach signs that are not self-adhesive type with mechanical fasteners appropriate to the location and substrate.
2. Unless otherwise indicated, provide a single line of text with 1/2-inch-high letters on 1-1/2-inch-high sign; where two lines of text are required, use labels 2 inches high.

BB. Laminated Acrylic or Melamine Plastic Signs:

1. Attach signs that are not self-adhesive type with mechanical fasteners appropriate to the location and substrate.
2. Unless otherwise indicated, provide a single line of text with 1/2-inch-high letters on 1-1/2-inch-high sign; where two lines of text are required, use labels 2 inches high.

CC. Cable Ties: General purpose, for attaching tags, except as listed below:

1. Outdoors: UV-stabilized nylon.
2. In Spaces Handling Environmental Air: Plenum rated.

3.3 IDENTIFICATION SCHEDULE

A. Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment. Install access doors or panels to provide view of identifying devices.

B. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, pull points, and locations of high visibility. Identify by system and circuit designation.

C. Accessible Raceways and Metal-Clad Cables, 600 V or Less, for Service, Feeder, and Branch Circuits, More Than 30 A and 120 V to Ground: Identify with self-adhesive raceway labels.

1. Locate identification at changes in direction, at penetrations of walls and floors, at 50-foot maximum intervals in straight runs, and at 25-foot maximum intervals in congested areas.

D. Accessible Fittings for Raceways and Cables within Buildings: Identify the covers of each junction and pull box of the following systems with self-adhesive

labels containing the wiring system legend and system voltage. System legends shall be as follows:

1. "EMERGENCY POWER."
2. "POWER."
3. "UPS."

E. Auxiliary Electrical Systems Conductor Identification: Marker tape that is uniform and consistent with system used by manufacturer for factory-installed connections.

1. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, and pull points. Identify by system and circuit designation.

F. Locations of Underground Lines: Underground-line warning tape for power, lighting, communication, and control wiring and optical-fiber cable.

G. Concealed Raceways and Duct Banks, More Than 600 V, within Buildings: Apply floor marking tape to the following finished surfaces:

1. Floor surface directly above conduits running beneath and within 12 inches of a floor that is in contact with earth or is framed above unexcavated space.
2. Wall surfaces directly external to raceways concealed within wall.
3. Accessible surfaces of concrete envelope around raceways in vertical shafts, exposed in the building, or concealed above suspended ceilings.

H. Workspace Indication: Apply floor marking tape to finished surfaces. Show working clearances in the direction of access to live parts. Workspace shall comply with NFPA 70 and 29 CFR 1926.403 unless otherwise indicated. Do not install at flush-mounted panelboards and similar equipment in finished spaces.

I. Instructional Signs: Self-adhesive labels, including the color code for grounded and ungrounded conductors.

J. Warning Labels for Indoor Cabinets, Boxes, and Enclosures for Power and Lighting: Self-adhesive labels.

1. Apply to exterior of door, cover, or other access.

- END OF SECTION -

SECTION 262726 - WIRING DEVICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Standard-grade receptacles, 125 V, 15 A.
2. GFCI receptacles, 125 V, 20 A.
3. Twist-locking receptacles.
4. Toggle switches, 120/277 V, 20 A.
5. Decorator-style devices, 20 A.
6. Wall plates.

1.3 DEFINITIONS

A. EMI: Electromagnetic interference.

B. GFCI: Ground-fault circuit interrupter.

C. Pigtail: Short lead used to connect a device to a branch-circuit conductor.

D. RFI: Radio-frequency interference.

E. SPD: Surge protective device.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: List of legends and description of materials and process used for premarking wall plates.

1.5 INFORMATIONAL SUBMITTALS

A. Field quality-control reports.

1.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For wiring devices to include in all manufacturers' packing-label warnings and instruction manuals that include labeling conditions.

PART 2 - PRODUCTS

2.1 GENERAL WIRING-DEVICE REQUIREMENTS

A. Wiring Devices, Components, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.

B. Comply with NFPA 70.

C. RoHS compliant.

D. Comply with NEMA WD 1.

E. Devices that are manufactured for use with modular plug-in connectors may be substituted under the following conditions:

1. Connectors shall comply with UL 2459 and shall be made with stranding building wire.
2. Devices shall comply with requirements in this Section.

F. Devices for Owner-Furnished Equipment:

1. Receptacles: Match plug configurations.

G. Device Color:
1. SPD Devices: Blue.

H. Wall Plate Color: For plastic covers, match device color.

I. Source Limitations: Obtain each type of wiring device and associated wall plate from single source from single manufacturer.

2.2 STANDARD-GRADE RECEPTACLES, 125 V, 20 A

A. Duplex Receptacles, 125 V, 20 A:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. Leviton Manufacturing Co., Inc.
b. Pass & Seymour; Legrand North America, LLC.
c. Wiring Device-Kellems; Hubbell Incorporated, Commercial and Industrial.

2. Description: Two pole, three wire, and self-grounding.
3. Configuration: NEMA WD 6, Configuration 5-20R.
4. Standards: Comply with UL 498 and FS W-C-596.

2.3 STANDARD-GRADE RECEPTACLES, 125 V, 15 A

A. Duplex Receptacles, 125 V, 15 A:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

a. Leviton Manufacturing Co., Inc.
b. Pass & Seymour; Legrand North America, LLC.
c. Wiring Device-Kellems; Hubbell Incorporated, Commercial and Industrial.

2. Description: Two pole, three wire, and self-grounding.
3. Configuration: NEMA WD 6, Configuration 5-15R.
4. Standards: Comply with UL 498 and FS W-C-596.

2.4 GFCI RECEPTACLES, 125 V, 20 A

A. Duplex GFCI Receptacles, 125 V, 20 A:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

a. Leviton Manufacturing Co., Inc.
b. Pass & Seymour; Legrand North America, LLC.
c. Wiring Device-Kellems; Hubbell Incorporated, Commercial and Industrial.

2. Description: Integral GFCI with "Test" and "Reset" buttons and LED indicator light. Two pole, three wire, and self-grounding.
3. Configuration: NEMA WD 6, Configuration 5-20R.
4. Type: Feed through.
5. Standards: Comply with UL 498, UL 943 Class A, and FS W-C-596.

B. Weather-Resistant, GFCI Duplex Receptacles, 125 V, 20 A:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

    a. Leviton Manufacturing Co., Inc.
    b. Pass & Seymour; Legrand North America, LLC.
    c. Wiring Device-Kellems; Hubbell Incorporated, Commercial and Industrial.

2. Description: Integral GFCI with "Test" and "Reset" buttons and LED indicator light. Two pole, three wire, and self-grounding. Integral shutters that operate only when a plug is inserted in the receptacle. Square face.
3. Configuration: NEMA WD 6, Configuration 5-15R.
4. Type: Feed through.
5. Standards: Comply with UL 498 and UL 943 Class A.
6. Marking: Listed and labeled as complying with NFPA 70, "Tamper-Resistant Receptacles" and "Receptacles in Damp or Wet Locations" articles.

2.5 TWIST-LOCKING RECEPTACLES

A. Twist-Lock, Single Receptacles, 120 V, 20A, 30A, 50A, 60A:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

    a. Leviton Manufacturing Co., Inc.
    b. Pass & Seymour; Legrand North America, LLC.
    c. Wiring Device-Kellems; Hubbell Incorporated, Commercial and Industrial.

2. Configuration: NEMA WD 6, Configuration L5-20R, L5-30R, L5-50R, L5-60R.
3. Standards: Comply with UL 498.

B. Twist-Lock, Single Receptacles, 250 V, 20A, 30A, 50A, 60A:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

    a. Hubbell Premise Wiring; Hubbell Incorporated, Commercial and Industrial.
    b. Leviton Manufacturing Co., Inc.
    c. Pass & Seymour; Legrand North America, LLC.

2. Configuration: NEMA WD 6, Configuration L6-20R, L6-30R, L6-50R, L6-60R.
3. Standards: Comply with UL 498.

C. Twist-Lock, Single Receptacles, 277 V:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

   a. Hubbell Premise Wiring; Hubbell Incorporated, Commercial and Industrial.
   b. Leviton Manufacturing Co., Inc.
   c. Pass & Seymour; Legrand North America, LLC.

2. Configuration: NEMA WD 6, Configuration L7-20R, L7-30R, L7-50R, L7-60R.
3. Standards: Comply with UL 498.

D. Twist-Lock, Isolated-Ground, Single Receptacles, 125 V, 20 A:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

   a. Hubbell Premise Wiring; Hubbell Incorporated, Commercial and Industrial.
   b. Leviton Manufacturing Co., Inc.
   c. Pass & Seymour; Legrand North America, LLC.

2. Grounding: Equipment grounding contacts shall be connected only to green grounding screw terminal of the device and with inherent electrical isolation from mounting strap. Isolation shall be integral to receptacle construction and not dependent on removable parts.
3. Configuration: NEMA WD 6, Configuration L5-20R, L5-30R, L5-50R, L5-60R.
4. Standards: Comply with UL 498.

2.6 TOGGLE SWITCHES, 120/277 V, 20 A

A. Single-Pole Switches, 120/277 V, 20 A:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

   a. Leviton Manufacturing Co., Inc.

b. Pass & Seymour; Legrand North America, LLC.
c. Wiring Device-Kellems; Hubbell Incorporated, Commercial and Industrial.

2. Standards: Comply with UL 20 and FS W-S-896.

B. Three-Way Switches, 120/277 V, 20 A:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

a. Leviton Manufacturing Co., Inc.
b. Pass & Seymour; Legrand North America, LLC.
c. Wiring Device-Kellems; Hubbell Incorporated, Commercial and Industrial.

2. Comply with UL 20 and FS W-S-896.

C. Four-Way Switches, 120/277 V, 20 A:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

a. Leviton Manufacturing Co., Inc.
b. Pass & Seymour; Legrand North America, LLC.
c. Wiring Device-Kellems; Hubbell Incorporated, Commercial and Industrial.

2. Standards: Comply with UL 20 and FS W-S-896.

D. Key-Operated, Single-Pole Switches, 120/277 V, 20 A:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

a. Leviton Manufacturing Co., Inc.
b. Pass & Seymour; Legrand North America, LLC.
c. Wiring Device-Kellems; Hubbell Incorporated, Commercial and Industrial.

2. Description: Factory-supplied key in lieu of switch handle.
3. Standards: Comply with UL 20 and FS W-S-896.

2.7 DECORATOR-STYLE DEVICES, 20 A

A. Decorator Single-Pole Switches, 120/277 V, 20 A:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

a. Leviton Manufacturing Co., Inc.
b. Pass & Seymour; Legrand North America, LLC.
c. Wiring Device-Kellems; Hubbell Incorporated, Commercial and Industrial.

2. Comply with UL 20.

B. Decorator Three-Way Switches, 120/277 V, 20 A:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

a. Leviton Manufacturing Co., Inc.
b. Pass & Seymour; Legrand North America, LLC.
c. Wiring Device-Kellems; Hubbell Incorporated, Commercial and Industrial.

2. Comply with UL 20 and FS W-S-896.

C. Decorator Four-Way Switches, 120/277 V, 20 A:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

a. Leviton Manufacturing Co., Inc.
b. Pass & Seymour; Legrand North America, LLC.
c. Wiring Device-Kellems; Hubbell Incorporated, Commercial and Industrial.

2. Standards: Comply with UL 20 and FS W-S-896.

2.8 OCCUPANCY SENSORS

A. Wall Switch Sensor Light Switch, Dual Technology:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

a. Leviton Manufacturing Co., Inc.
b. Pass & Seymour; Legrand North America, LLC.
c. Wiring Device-Kellems; Hubbell Incorporated, Commercial and Industrial.

2. Description: Switchbox-mounted, combination lighting-control sensor and conventional switch lighting-control unit using dual (ultrasonic and passive infrared) technology.
3. Standards: Comply with UL 20.
4. Rated 10 A at 277 V ac for LED lighting.
5. Adjustable time delay of 20 minutes.
6. Able to be locked to Automatic or Manual-On mode.
7. Automatic Light-Level Sensor: Adjustable from 2 to 200 fc.

B. Wall Sensor Light Switch, Passive Infrared:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

a. Hubbell Premise Wiring; Hubbell Incorporated, Commercial and Industrial.
b. Leviton Manufacturing Co., Inc.
c. Pass & Seymour; Legrand North America, LLC.

2. Description: Switchbox-mounted, combination, lighting-control sensor and conventional switch lighting-control unit using passive infrared technology.
3. Standards: Comply with UL 20.
4. Rated 10 A at 277 V ac for LED lighting.
5. Adjustable time delay of 20 minutes.
6. Able to be locked to Automatic or Manual-On mode.
7. Automatic Light-Level Sensor: Adjustable from 2 to 200 fc.

C. Wall Sensor Light Switch, Ultrasonic:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

a. Hubbell Premise Wiring; Hubbell Incorporated, Commercial and Industrial.
b. Leviton Manufacturing Co., Inc.
c. Pass & Seymour; Legrand North America, LLC.

2. Description: Switchbox-mounted, combination, lighting-control sensor and conventional switch lighting-control unit using ultrasonic technology.
3. Standards: Comply with UL 20.
4. Rated 10 A at 277 V ac for LED lighting.

5. Adjustable time delay of 20 minutes.
6. Able to be locked to Automatic or Manual-On mode.
7. Automatic Light-Level Sensor: Adjustable from 2 to 200 fc.

2.9 WALL PLATES

A. Single Source: Obtain wall plates from same manufacturer of wiring devices.

B. Single and combination types shall match corresponding wiring devices.

1. Plate-Securing Screws: Metal with head color to match plate finish.
2. Material for Finished Spaces: Steel with white baked enamel, suitable for field painting.
3. Material for Unfinished Spaces: Galvanized steel.
4. Material for Damp Locations: Thermoplastic with spring-loaded lift cover, and listed and labeled for use in wet and damp locations.

C. Wet-Location, Weatherproof Cover Plates: NEMA 250, complying with Type 3R, weather-resistant, die-cast aluminum with lockable cover.

D. Antimicrobial Cover Plates:

1. Contact surfaces treated with a coating that kills 99.9 percent of certain common bacteria within two hours when regularly and properly cleaned.
2. Tarnish resistant.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with NECA 1, including mounting heights listed in that standard, unless otherwise indicated.

B. Coordination with Other Trades:

1. Protect installed devices and their boxes. Do not place wall finish materials over device boxes, and do not cut holes for boxes with routers that are guided by riding against outside of boxes.
2. Keep outlet boxes free of plaster, drywall joint compound, mortar, cement, concrete, dust, paint, and other material that may contaminate the raceway system, conductors, and cables.
3. Install device boxes in brick or block walls so that the cover plate does not cross a joint unless the joint is troweled flush with the face of the wall.
4. Install wiring devices after all wall preparation, including painting, is complete.

C. Conductors:

1. Do not strip insulation from conductors until right before they are spliced or terminated on devices.
2. Strip insulation evenly around the conductor using tools designed for the purpose. Avoid scoring or nicking of solid wire or cutting strands from stranded wire.
3. The length of free conductors at outlets for devices shall comply with NFPA 70, Article 300, without pigtails.
4. Existing Conductors:

    a. Cut back and pigtail, or replace all damaged conductors.
    b. Straighten conductors that remain and remove corrosion and foreign matter.
    c. Pigtailing existing conductors is permitted, provided the outlet box is large enough.

D. Device Installation:

1. Replace devices that have been in temporary use during construction and that were installed before building finishing operations were complete.
2. Keep each wiring device in its package or otherwise protected until it is time to connect conductors.
3. Do not remove surface protection, such as plastic film and smudge covers, until the last possible moment.
4. Connect devices to branch circuits using pigtails that are not less than 6 inches in length.
5. When there is a choice, use side wiring with binding-head screw terminals. Wrap solid conductor tightly clockwise, two-thirds to three-fourths of the way around terminal screw.
6. Use a torque screwdriver when a torque is recommended or required by manufacturer.
7. When conductors larger than No. 12 AWG are installed on 15- or 20-A circuits, splice No. 12 AWG pigtails for device connections.
8. Tighten unused terminal screws on the device.
9. When mounting into metal boxes, remove the fiber or plastic washers used to hold device-mounting screws in yokes, allowing metal-to-metal contact.

E. Receptacle Orientation:

1. Install ground pin of vertically mounted receptacles up, and on horizontally mounted receptacles to the right.

F. Device Plates: Do not use oversized or extra-deep plates. Repair wall finishes and remount outlet boxes when standard device plates do not fit flush or do not cover rough wall opening.

G. Dimmers:

1. Install dimmers within terms of their listing.
2. Verify that dimmers used for fan-speed control are listed for that application.
3. Install unshared neutral conductors on line and load side of dimmers according to manufacturers' device, listing conditions in the written instructions.

H. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical and with grounding terminal of receptacles on top. Group adjacent switches under single, multigang wall plates.

I. Adjust locations of floor service outlets and service poles to suit arrangement of partitions and furnishings.

3.2 GFCI RECEPTACLES

A. Install non-feed-through GFCI receptacles where protection of downstream receptacles is not required.

3.3 IDENTIFICATION

A. Comply with Section 260553 "Identification for Electrical Systems."

B. Identify each receptacle with panelboard identification and circuit number. Use hot, stamped, or engraved machine printing with black-filled lettering on face of plate, and durable wire markers or tags inside outlet boxes.

3.4 FIELD QUALITY CONTROL

A. Test Instruments: Use instruments that comply with UL 1436.

B. Test Instrument for Receptacles: Digital wiring analyzer with digital readout or illuminated digital-display indicators of measurement.

C. Perform the following tests and inspections:

1. Test Instruments: Use instruments that comply with UL 1436.
2. Test Instrument for Receptacles: Digital wiring analyzer with digital readout or illuminated digital-display indicators of measurement.

D. Tests for Receptacles:

1. Line Voltage: Acceptable range is 105 to 132 V.

2. Percent Voltage Drop under 15-A Load: A value of 6 percent or higher is unacceptable.
3. Ground Impedance: Values of up to 2 ohms are acceptable.
4. GFCI Trip: Test for tripping values specified in UL 1436 and UL 943.
5. Using the test plug, verify that the device and its outlet box are securely mounted.
6. Tests shall be diagnostic, indicating damaged conductors, high resistance at the circuit breaker, poor connections, inadequate fault-current path, defective devices, or similar problems. Correct circuit conditions, remove malfunctioning units and replace with new ones, and retest as specified above.

E. Wiring device will be considered defective if it does not pass tests and inspections.

F. Prepare test and inspection reports.

- END OF SECTION -

SECTION 265619 - LED EXTERIOR LIGHTING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Luminaire-mounted photoelectric relays.
2. Luminaire types.
3. Materials.
4. Finishes.
5. Luminaire support components.

1.2 DEFINITIONS

A. Fixture: See "Luminaire."

B. Lumen: Measured output of lamp and luminaire, or both.

C. Luminaire: Complete lighting unit, including lamp, reflector, and housing.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of luminaire.

1. Arrange in order of luminaire designation.
2. Include data on features, accessories, and finishes.
3. Include physical description and dimensions of luminaire.
4. Lamps, include life, output (lumens), and energy-efficiency data.

a. Manufacturer's Certified Data: Photometric data certified by manufacturer's laboratory with a current accreditation under the NVLAP for Energy Efficient Lighting Products.
b. Testing Agency Certified Data: For indicated luminaires, photometric data certified by a qualified independent testing agency. Photometric data for remaining luminaires shall be certified by manufacturer.

5. Wiring diagrams for power, control, and signal wiring.
6. Photoelectric relays.
7. Means of attaching luminaires to supports and indication that the attachment is suitable for components involved.

B. Shop Drawings: For nonstandard or custom luminaires.

1. Include plans, elevations, sections, and mounting and attachment details.

2. Include details of luminaire assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
3. Include diagrams for power, signal, and control wiring.

C. Product Schedule: For luminaires and lamps, use same designations indicated on Drawings.

1.4 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:

1. Luminaires.
2. Structural members to which luminaires will be attached.

B. Qualification Data: For testing laboratory providing photometric data for luminaires.

C. Product Certificates: For each type of the following:

1. Luminaire.

D. Product Test Reports: For each luminaire, for tests performed.

E. Source quality-control reports.

F. Sample warranty.

1.5 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For luminaires include in operation and maintenance manuals.

1. Provide a list of all lamp types used on Project. Use ANSI and manufacturers' codes.
2. Provide a list of all photoelectric relay types used on Project; use manufacturers' codes.

1.6 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Lamps: of each type and rating installed. Furnish at least one of each type.
2. Glass, Acrylic, and Plastic Lenses, Covers, and Other Optical Parts.: Furnish at least one of each type.
3. Diffusers and Lenses: Furnish at least one of each type.
4. Globes and Guards: Furnish at least one of each type.

1.7 QUALITY ASSURANCE

A. Luminaire Photometric Data Testing Laboratory Qualifications:

1. Luminaire manufacturers' laboratory that is accredited under the NVLAP for Energy Efficient Lighting Products.

B. Provide luminaires from a single manufacturer for each luminaire type.

C. Each luminaire type shall be binned within a three-step MacAdam Ellipse to ensure color consistency among luminaires.

D. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Protect finishes of exposed surfaces by applying a strippable, temporary protective covering prior to shipping.

1.9 FIELD CONDITIONS

A. Verify existing and proposed utility structures prior to the start of work associated with luminaire installation.

B. Mark locations of exterior luminaires for approval by Architect prior to the start of luminaire installation.

1.10 WARRANTY

A. Warranty: Manufacturer and Installer agree to repair or replace components of luminaires that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Structural failures, including luminaire support components.
b. Faulty operation of luminaires and accessories.

c. Deterioration of metals, metal finishes, and other materials beyond normal weathering.

2. Warranty Period: 2 year(s) from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 LUMINAIRE REQUIREMENTS

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. NRTL Compliance: Luminaires shall be listed and labeled for indicated class and division of hazard by an NRTL.

C. FM Global Compliance: Luminaires for hazardous locations shall be listed and labeled for indicated class and division of hazard by FM Global.

D. UL Compliance: Comply with UL 1598 and listed for wet location.

E. Lamp base complying with ANSI C81.61.

F. Internal driver.

G. Nominal Operating Voltage: 277 V ac

H. Lamp Rating: Lamp marked for outdoor use

I. Source Limitations:

1. Obtain luminaires from single source from a single manufacturer.

2.2 LUMINAIRE TYPES

ions.

A. Canopy:

1. Manufacturers: Lithonia Model CNYLEDP240KMVOLTDDBM4
2. Shape: Square.
3. Dimensions: 10 inches square
4. Housings:

a. Cast-aluminum housing and heat sink.
b. polyester powder-coat finish.

2.3 MATERIALS

A. Metal Parts: Free of burrs and sharp corners and edges.

B. Sheet Metal Components: Corrosion-resistant aluminum Form and support to prevent warping and sagging.

C. Doors, Frames, and Other Internal Access: Smooth operating, free of light leakage under operating conditions, and designed to permit relamping without use of tools. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during relamping and when secured in operating position. Doors shall be removable for cleaning or replacing lenses.

D. Lens and Refractor Gaskets: Use heat- and aging-resistant resilient gaskets to seal and cushion lenses and refractors in luminaire doors.

E. Reflecting surfaces shall have minimum reflectance as follows unless otherwise indicated:

1. White Surfaces: 85 percent.
2. Specular Surfaces: 83 percent.
3. Diffusing Specular Surfaces: 75 percent.

F. Housings:

1. Rigidly formed, weather- and light-tight enclosure that will not warp, sag, or deform in use.
2. Provide filter/breather for enclosed luminaires.

G. Factory-Applied Labels: Comply with UL 1598. Include recommended lamps. Labels shall be located where they will be readily visible to service personnel, but not seen from normal viewing angles when lamps are in place.

1. Label shall include the following lamp characteristics:

a. "USE ONLY" and include specific lamp type.
b. Lamp diameter, shape, size, wattage and coating.
c. CCT and CRI for all luminaires.

2.4 FINISHES

A. Factory-Applied Finish for Aluminum Luminaires: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

1. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.

2.5 LUMINAIRE SUPPORT COMPONENTS

A. Comply with requirements in Section 260529 "Hangers and Supports for Electrical Systems" for channel and angle iron supports and nonmetallic channel and angle supports.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Examine roughing-in for luminaire electrical conduit to verify actual locations of conduit connections before luminaire installation.

C. Examine walls for suitable conditions where luminaires will be installed.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 GENERAL INSTALLATION REQUIREMENTS

A. Comply with NECA 1.

B. Install lamps in each luminaire.

C. Fasten luminaire to structural support.

D. Supports:

1. Sized and rated for luminaire weight.
2. Able to maintain luminaire position after cleaning and relamping.
3. Support luminaires without causing deflection of finished surface.
4. Luminaire-mounting devices shall be capable of supporting a horizontal force of 100 percent of luminaire weight and a vertical force of 400 percent of luminaire weight.

E. Wiring Method: Install cables in raceways. Conceal raceways and cables.

F. Coordinate layout and installation of luminaires with other construction.

G. Adjust luminaires that require field adjustment or aiming.

H. Comply with requirements in Section 260519 "Low-Voltage Electrical Power Conductors and Cables" and Section 260533.13 "Conduits for Electrical Systems" for wiring connections and wiring methods.

3.3 CORROSION PREVENTION

A. Aluminum: Do not use in contact with earth or concrete. When in direct contact with a dissimilar metal, protect aluminum by insulating fittings or treatment.

B. Steel Conduits: Comply with Section 260533.13 "Conduits for Electrical Systems."

C. IDENTIFICATION

D. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Section 260553 "Identification for Electrical Systems."

3.4 FIELD QUALITY CONTROL

A. Inspect each installed luminaire for damage. Replace damaged luminaires and components.

B. Perform the following tests and inspections:

1. Operational Test: After installing luminaires, switches, and accessories, and after electrical circuitry has been energized, test units to confirm proper operation.

    a. IES LM-79.
    b. IES LM-80.test standards apply.

C. Luminaire will be considered defective if it does not pass tests and inspections.

D. Prepare a written report of tests, inspections, observations, and verifications indicating and interpreting results. If adjustments are made to lighting system, retest to demonstrate compliance with standards.

- END OF SECTION -

SECTION 310516 - AGGREGATES FOR EARTHWORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Coarse aggregate materials.
2. Fine aggregate materials.

B. Related Sections:
1. Section 312316.13 - Trenching

1.3 REFERENCES

A. American Association of State Highway and Transportation Officials:
1. AASHTO M6 - Standard Specification For Fine Aggregate For Hydraulic Cement Concrete.
2. AASHTO M29 - Standard Specification For Fine Aggregate For Bituminous Paving Mixtures.
3. AASHTO M147 - Standard Specification for Materials for Aggregate and Soil-Aggregate Subbase, Base and Surface Courses.
4. AASHTO T96 - Standard Method Of Test For Resistance To Degradation Of Small-Size Coarse Aggregate By Abrasion And Impact In The Los Angeles Machine.
5. AASHTO T180 - Standard Specification for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in.) Drop.

B. American Railway Engineering and Maintenance-of-Way Association (AREMA) Manual for Railway Engineering.
1. Chapter 1, Part 2 - Ballast

C. ASTM International:

1. ASTM C136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
2. ASTM D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3 (600 kN-m/m3).

3. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN-m/m3).
4. ASTM D2487 - Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System).
5. ASTM D4318 - Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

D. New Jersey Department of Transportation (NJDOT)
1. Standard Specifications for Road and Bridge Construction, 2019.

1.4 SUBMITTALS

A. Section 013300 - Submittal Procedures: Requirements for submittals.

B. Materials Source: Supplier currently approved by New Jersey Department of Transportation

C. Manufacturer's Certificate: Submit materials certifications from suppliers stating materials meet or exceed specified requirements.

1.5 QUALITY ASSURANCE

A. Furnish each aggregate material from single source throughout the Work.

PART 2 - PRODUCTS

2.1 AGGREGATE FOR SUBGRADE

A. Comply with the requirements of NJDOT Specifications, Section 901.11.

2.2 DENSE GRADED AGGREGATE MATERIALS

2.3 Comply with the requirements of NJDOT Specifications, Section 901.10.

2.4 BACKFILLING PIPE TRENCHES

A. Comply with the requirements of NJDOT Specifications, Section 901.03.01.F.

2.5 SOURCE QUALITY CONTROL

A. Section 014000 - Quality Requirements: Testing and inspection services.

B. Aggregate materials shall meet the requirements of NJDOT Specifications, Section 106..

PART 3 - EXECUTION

3.1 STOCKPILING

A. Stockpile materials on site at locations designated by Engineer.

B. Stockpile in sufficient quantities to meet Project schedule and requirements.

C. Separate different aggregate materials with dividers or stockpile individually to prevent mixing.

D. Direct surface water away from stockpile site to prevent erosion or deterioration of materials.

E. Stockpile unsuitable or hazardous materials on impervious material and cover to prevent erosion and leaching, until disposed of.

3.2 STOCKPILE CLEANUP

A. Remove stockpile, leave area in clean and neat condition. Grade site surface to prevent free standing surface water.

- END OF SECTION -

SECTION 311000 – SITE CLEARING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Protecting existing vegetation to remain.
2. Removing existing vegetation.
3. Clearing and grubbing.
4. Stripping and stockpiling topsoil.
5. Stripping and stockpiling rock.
6. Removing above- and below-grade site improvements.
7. Disconnecting, capping or sealing, and removing site utilities abandoning site utilities in place.
8. Temporary erosion and sedimentation control.

B. Related Requirements:

1. Section 015000 "Temporary Facilities and Controls" for temporary erosion- and sedimentation-control measures.

1.3 DEFINITIONS

A. Subsoil: Soil beneath the level of subgrade; soil beneath the topsoil layers of a naturally occurring soil profile, typified by less than 1 percent organic matter and few soil organisms.

B. Surface Soil: Soil that is present at the top layer of the existing soil profile. In undisturbed areas, surface soil is typically called "topsoil," but in disturbed areas such as urban environments, the surface soil can be subsoil.

C. Topsoil: Top layer of the soil profile consisting of existing native surface topsoil or existing in-place surface soil; the zone where plant roots grow.

D. Plant-Protection Zone: Area surrounding individual trees, groups of trees, shrubs, or other vegetation to be protected during construction and indicated on Drawings.

E. Tree-Protection Zone: Area surrounding individual trees or groups of trees to be protected during construction and indicated on Drawings.

F. Vegetation: Trees, shrubs, groundcovers, grass, and other plants.

1.4 MATERIAL OWNERSHIP

A. Except for stripped topsoil and other materials indicated to be stockpiled or otherwise remain Owner's property, cleared materials shall become Contractor's property and shall be removed from Project site.

1.5 INFORMATIONAL SUBMITTALS

A. Existing Conditions: Documentation of existing trees and plantings, adjoining construction, and site improvements that establishes preconstruction conditions that might be misconstrued as damage caused by site clearing.

1. Use sufficiently detailed photographs or video recordings.
2. Include plans and notations to indicate specific wounds and damage conditions of each tree or other plant designated to remain.

B. Record Drawings: Identifying and accurately showing locations of capped utilities and other subsurface structural, electrical, and mechanical conditions.

1.6 QUALITY ASSURANCE

A. Preinstallation Conference: Conduct conference at Project Site.

1.7 FIELD CONDITIONS

A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
2. Provide alternate routes around closed or obstructed trafficways if required by Owner or authorities having jurisdiction.

B. Salvageable Improvements: Carefully remove items indicated to be salvaged and store on Owner's premises in a location to be specified by the owner. Retain one option in "Utility Locator Service" Paragraph below. First option is a generic term that is known in various states by different names listed in the other options.

C. Utility Locator Service: Notify Pennsylvania One Call for area where Project is located before site clearing.

D. Do not commence site clearing operations until temporary erosion- and sedimentation-control and plant-protection measures are in place.

E. Tree- and Plant-Protection Zones: Protect according to requirements in Section 015639 "Temporary Tree and Plant Protection."

F. Soil Stripping, Handling, and Stockpiling: Perform only when the soil is dry or slightly moist.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Satisfactory Soil Material: Requirements for satisfactory soil material are specified in Section 312000 "Earth Moving."

1. Obtain approved borrow soil material off-site when satisfactory soil material is not available on-site.

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect and maintain benchmarks and survey control points from disturbance during construction.

B. Verify that trees, shrubs, and other vegetation to remain or to be relocated have been flagged and that protection zones have been identified and enclosed.

C. Protect existing site improvements to remain from damage during construction.

1. Restore damaged improvements to their original condition, as acceptable to Owner.

3.2 TEMPORARY EROSION AND SEDIMENTATION CONTROL

A. Provide temporary erosion- and sedimentation-control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to erosion- and sedimentation-control Drawings and requirements of authorities having jurisdiction.

B. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross protection zones.

C. Inspect, maintain, and repair erosion- and sedimentation-control measures during construction until permanent vegetation has been established.

D. Remove erosion and sedimentation controls, and restore and stabilize areas disturbed during removal.

3.3 TREE AND PLANT PROTECTION

A. Protect trees and plants remaining on-site.

B. Repair or replace trees, shrubs, and other vegetation indicated to remain or be relocated that are damaged by construction operations.

3.4 EXISTING UTILITIES

A. Owner will arrange for disconnecting and sealing indicated utilities that serve existing structures before site clearing, when requested by Contractor.

1. Verify that utilities have been disconnected and capped before proceeding with site clearing.

B. Locate, identify, disconnect, and seal or cap utilities indicated to be removed or abandoned in place.

1. Arrange with utility companies to shut off indicated utilities.

C. Locate, identify, and disconnect utilities indicated to be abandoned in place.

D. Interrupting Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others, unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:

1. Notify Owner’s Representative not less than two days in advance of proposed utility interruptions.
2. Do not proceed with utility interruptions without Architect's written permission.

E. Excavate for and remove underground utilities indicated to be removed.

F. Removal of underground utilities is included in earthwork sections; in applicable fire suppression, plumbing, HVAC, electrical, communications, electronic safety and security, and utilities sections; and in Section 024116 "Structure Demolition" and Section 024119 "Selective Demolition."

3.5 CLEARING AND GRUBBING

A. Remove obstructions, trees, shrubs, and other vegetation to permit installation of new construction.

1. Only remove trees, shrubs, and other vegetation indicated as to be removed or relocated on the Drawings.
2. Grind down stumps and remove roots, obstructions, and debris to a full depth below exposed subgrade. Use only hand methods or air spade for grubbing within protection zones.
3. Chip removed tree branches and dispose of off-site .

B. Fill depressions caused by clearing and grubbing operations with satisfactory soil material unless further excavation or earthwork is indicated.

1. Place fill material in horizontal layers not exceeding a loose depth of 8 inches and compact each layer to a density equal to adjacent original ground.

3.6 TOPSOIL STRIPPING

A. Remove sod and grass before stripping topsoil.

B. Strip topsoil to depth of 6 inches in a manner to prevent intermingling with underlying subsoil or other waste materials.

1. Remove subsoil and nonsoil materials from topsoil, including clay lumps, gravel, and other objects larger than 2 inches in diameter; trash, debris, weeds, roots, and other waste materials.

C. Stockpile topsoil away from edge of excavations without intermixing with subsoil or other materials. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust and erosion by water.

1. Limit height of topsoil stockpiles to 72 inches .
2. Do not stockpile topsoil within protection zones.
3. Dispose of surplus topsoil. Surplus topsoil is that which exceeds quantity indicated to be stockpiled or reused.
4. Stockpile surplus topsoil to allow for respreading deeper topsoil.

3.7 STOCKPILING ROCK

A. Remove from construction area naturally formed rocks that measure more than 1 foot across in least dimension. Do not include excavated or crushed rock.

1. Separate or wash off non-rock materials from rocks, including soil, clay lumps, gravel, and other objects larger than 2 inches in diameter; trash, debris, weeds, roots, and other waste materials.

B. Stockpile rock away from edge of excavations without intermixing with other materials. Cover to prevent windblown debris from accumulating among rocks.

1. Limit height of rock stockpiles to 36 inches .
2. Do not stockpile rock within protection zones.
3. Dispose of surplus rock. Surplus rock is that which exceeds quantity indicated to be stockpiled or reused.
4. Stockpile surplus rock to allow later use by the Owner.

3.8 SITE IMPROVEMENTS

A. Remove existing above- and below-grade improvements as indicated and necessary to facilitate new construction.

B. Remove slabs, paving, curbs, gutters, and aggregate base as indicated.

1. Unless existing full-depth joints coincide with line of demolition, neatly saw-cut along line of existing pavement to remain before removing adjacent existing pavement. Saw-cut faces vertically.
2. Paint cut ends of steel reinforcement in concrete to remain with two coats of antirust coating, following coating manufacturer's written instructions. Keep paint off surfaces that will remain exposed.

3.9 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials including trash and debris, and legally dispose of them off Owner's property.

B. Separate recyclable materials produced during site clearing from other nonrecyclable materials. Store or stockpile without intermixing with other materials, and transport them to recycling facilities. Do not interfere with other Project work.

- END OF SECTION -

SECTION 312000 – EARTH MOVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Excavating and filling for rough grading the Site.
2. Preparing subgrades for slabs-on-grade,walks, pavements, turf and grasses and plants.
3. Excavating and backfilling for buildings and structures.
4. Drainage course for concrete slabs-on-grade.
5. Subbase course for concrete walks and pavements.
6. Subbase course and base course for asphalt paving.
7. Subsurface drainage backfill for walls and trenches.
8. Excavating and backfilling trenches for utilities and pits for buried utility structures.
9. Excavating well hole to accommodate elevator-cylinder assembly.
10. Geotextiles and Geogrids

B. Related Requirements:

1. Section 013200 "Construction Progress Documentation" Section 013233 "Photographic Documentation" for recording preexcavation and earth-moving progress.
2. Section 033000 "Cast-in-Place Concrete" for granular course if placed over vapor retarder and beneath the slab-on-grade.
3. Section 311000 "Site Clearing" for site stripping, grubbing, stripping and stockpiling topsoil, and removal of above- and below-grade improvements and utilities.
4. Section 312319 "Dewatering" for lowering and disposing of ground water during construction.
5. Section 315000 "Excavation Support and Protection" for shoring, bracing, and sheet piling of excavations.

1.3 DEFINITIONS

A. Backfill: Soil material or controlled low-strength material used to fill an excavation.

1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
2. Final Backfill: Backfill placed over initial backfill to fill a trench.

B. Base Course: Aggregate layer placed between the subbase course and hot-mix asphalt paving.

C. Bedding Course: Aggregate layer placed over the excavated subgrade in a trench before laying pipe.

D. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.

E. Drainage Course: Aggregate layer supporting the slab-on-grade that also minimizes upward capillary flow of pore water.

F. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.

1. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by Owner's Representative. Authorized additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.
2. Bulk Excavation: Excavation more than 10 feet in width and more than 30 feet in length.
3. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by Owner's Representative. Unauthorized excavation, as well as remedial work directed by Owner's Representative, shall be without additional compensation.

G. Fill: Soil materials used to raise existing grades.

H. Rock: Rock material in beds, ledges, unstratified masses, conglomerate deposits, and boulders of rock material 3/4 cu. yd. or more in volume that exceed a standard penetration resistance of 100 blows/2 inches when tested by a geotechnical testing agency, according to ASTM D 1586.

I. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

J. Subbase Course: Aggregate layer placed between the subgrade and base course for hot-mix asphalt pavement, or aggregate layer placed between the subgrade and a cement concrete pavement or a cement concrete or hot-mix asphalt walk.

K. Subgrade: Uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, drainage course, or topsoil materials.

L. Utilities: On-site underground pipes, conduits, ducts, and cables as well as underground services within buildings.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of the following manufactured products required:

1. Geotextiles.
2. Controlled low-strength material, including design mixture.
3. Geofoam.
4. Warning tapes.
5. Geogrids.

B. Samples for Verification: For the following products, in sizes indicated below:

1. Geotextile: 12 by 12 inches.
2. Warning Tape: 12 inches long; of each color.
3. Geogrids: 12 by 12 inches.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified testing agency.

B. Material Test Reports: For each on-site and borrow soil material proposed for fill and backfill as follows:

1. Classification according to ASTM D 2487.
2. Laboratory compaction curve according to ASTM D 1557.

C. Preexcavation Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including finish surfaces that might be misconstrued as damage caused by earth-moving operations. Submit before earth moving begins.

1.6 QUALITY ASSURANCE

A. Geotechnical Testing Agency Qualifications: Qualified according to ASTM E 329 and ASTM D 3740 for testing indicated.

B. Pre-excavation Conference: Conduct conference at Project Site.

1.7 FIELD CONDITIONS

A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during earth-moving operations.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
2. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.

B. Utility Locator Service: Notify NJ One Call for area where Project is located before beginning earth-moving operations.

C. Do not commence earth-moving operations until temporary site fencing and erosion- and sedimentation-control measures specified in Section 015000 "Temporary Facilities and Controls" and Section 311000 "Site Clearing" are in place.

D. Do not commence earth-moving operations until plant-protection measures specified in Section 015639 "Temporary Tree and Plant Protection" are in place.

E. The following practices are prohibited within protection zones:

1. Storage of construction materials, debris, or excavated material.
2. Parking vehicles or equipment.
3. Foot traffic.
4. Erection of sheds or structures.
5. Impoundment of water.
6. Excavation or other digging unless otherwise indicated.
7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.

F. Do not direct vehicle or equipment exhaust towards protection zones.

G. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.

B. Satisfactory Soils: Soil Classification Groups GW, GP, GM, SW, SP, and SM according to ASTM D 2487 , or a combination of these groups; free of rock or gravel larger than 3 inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.

C. Unsatisfactory Soils: Soil Classification Groups GC, SC, CL, ML, OL, CH, MH, OH, and PT according to ASTM D 2487 , or a combination of these groups.

1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.

D. Subbase Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940/D 2940M; with at least 90 percent passing a 1-1/2-inch sieve and not more than 12 percent passing a No. 200 sieve.

E. Base Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 294/D 2940M 0; with at least 95 percent passing a 1-1/2-inch sieve and not more than 8 percent passing a No. 200 sieve.

F. Engineered Fill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940/D 2940M; with at least 90 percent passing a 1-1/2-inch sieve and not more than 12 percent passing a No. 200 sieve.

G. Bedding Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940/D 2940M; except with 100 percent passing a 1-inch sieve and not more than 8 percent passing a No. 200 sieve.

H. Drainage Course: Narrowly graded mixture of washed crushed stone, or crushed or uncrushed gravel; ASTM D 448; coarse-aggregate grading Size 57; with 100 percent passing a 1-1/2-inch sieve and zero to 5 percent passing a No. 8 sieve.

I. Filter Material: Narrowly graded mixture of natural or crushed gravel, or crushed stone and natural sand; ASTM D 448; coarse-aggregate grading Size 67; with 100 percent passing a 1-inch sieve and zero to 5 percent passing a No. 4 sieve.

J. Sand: ASTM C 33/C 33M; fine aggregate.

K. Impervious Fill: Clayey gravel and sand mixture capable of compacting to a dense state.

2.2 GEOTEXTILES

A. Subsurface Drainage Geotextile: Nonwoven needle-punched geotextile, manufactured for subsurface drainage applications, made from polypropylene fibers; with elongation greater than 50 percent; complying with AASHTO M 288 and the following, measured per test methods referenced:

1. Grab Tensile Strength: ≥ 120 lbs; ASTM D 4632.
2. Mullen Burst Strength: ≥ 225 psi; ASTM D 3786.
3. Flow Rate: ≥95 gal/min/ft^2; ASTM D 4491.
4. UV Resistance: 70% after 500 hours; ASTM D 4355.
5. Heat-Set or Heat-Calendared fabrics are not permitted.

B. Separation Geotextile: Woven geotextile fabric, manufactured for separation applications, made from polyolefins or polyesters; with elongation less than 50 percent; complying with AASHTO M 288 and the following, measured per test methods referenced:

1. Survivability: Class 2; AASHTO M 288.
2. Grab Tensile Strength: 247 lbf; ASTM D 4632.
3. Sewn Seam Strength: 222 lbf; ASTM D 4632.
4. Tear Strength: 90 lbf; ASTM D 4533.
5. Puncture Strength: 90 lbf; ASTM D 4833.
6. Apparent Opening Size: No. 60 sieve, maximum; ASTM D 4751.
7. Permittivity: 0.02 per second, minimum; ASTM D 4491.
8. UV Stability: 50 percent after 500 hours' exposure; ASTM D 4355.

2.3 GEOGRID

A. Utility Trench Geogrid: Punched polypropylene geogrid, oriented in three substantially equilateral directions manufactured to provide a mechanically stabilized layer at the bottom of utility trenches; complying with ASTM D4759-02.

1. Junction Efficiency: 93% (as a percentage of ultimate tensile strength).
2. Aperature Stability, kg-cm/deg @ 5.0 kg-cm: 3.0
   Radial Stiffness at Low Strain, kN/m @ 0.5% Strain: 225 (ASTM D6637-01) lb/ft @ 0.5% Strain: 15,430
3. Resistance to chemical degradation: 100% (in accordance with EPA 9090).

4. Resistance to ultra-violet light and weathering: 10% (in accordance with ASTM D4355-05).

2.4 ACCESSORIES

A. Detectable Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches wide and 4 mils thick, continuously inscribed with a description of the utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches deep; colored as follows:

1. Red: Electric.
2. Yellow: Gas, oil, steam, and dangerous materials.
3. Orange: Telephone and other communications.
4. Blue: Water systems.
5. Green: Sewer systems.

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth-moving operations.

B. Protect and maintain erosion and sedimentation controls during earth-moving operations.

C. Protect subgrades and foundation soils from freezing temperatures and frost. Remove temporary protection before placing subsequent materials.

3.2 DEWATERING

A. Refer to Section 312319 Dewatering.

B. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.

C. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.

1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.

3.3 EXPLOSIVES

A. Explosives: Do not use explosives.

3.4 EXCAVATION, GENERAL

A. Unclassified Excavation: Shall consist of excavation and disposal of material, regardless of its nature.

3.5 EXCAVATION FOR STRUCTURES

A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch. If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.

1. Excavations for Footings and Foundations: Do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.
2. Pile Foundations: Stop excavations 6 to 12 inches above bottom of pile cap before piles are placed. After piles have been driven, remove loose and displaced material. Excavate to final grade, leaving solid base to receive concrete pile caps.
3. Excavation for Underground Tanks, Basins, and Mechanical or Electrical Utility Structures: Excavate to elevations and dimensions indicated within a tolerance of plus or minus 1 inch. Do not disturb bottom of excavations intended as bearing surfaces.

B. Excavations at Edges of Tree- and Plant-Protection Zones:

1. Excavate by hand or with an air spade to indicated lines, cross sections, elevations, and subgrades. If excavating by hand, use narrow-tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.
2. Cut and protect roots according to requirements in Section 015639 "Temporary Tree and Plant Protection."

3.6 EXCAVATION FOR WALKS AND PAVEMENTS

A. Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades.

3.7 EXCAVATION FOR UTILITY TRENCHES

A. Excavate trenches to indicated gradients, lines, depths, and elevations.

1. Beyond building perimeter, excavate trenches to allow installation of top of pipe below frost line.

B. Excavate trenches to uniform widths to provide the following clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches higher than top of pipe or conduit unless otherwise indicated.

1. Clearance: As indicated.

C. Trench Bottoms: Excavate trenches deeper than bottom of pipe and conduit elevations to allow for bedding course and/or pile caps as indicated on the Drawings. Retain "Trenches in Tree- and Plant-Protection Zones" Paragraph below if required.

D. Trenches in Tree- and Plant-Protection Zones:

1. Hand-excavate to indicated lines, cross sections, elevations, and subgrades. Use narrow-tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.
2. Do not cut main lateral roots or taproots; cut only smaller roots that interfere with installation of utilities.
3. Cut and protect roots according to requirements in Section 015639 "Temporary Tree and Plant Protection."

3.8 SUBGRADE INSPECTION

A. Notify Geotechnical Engineer when excavations have reached required subgrade.

B. If Geotechnical Engineer determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.

C. Proof-roll subgrade at the bottom of excavation with a self-propelled 20-ton vibratory compactor used in conjunction with a large pad roller to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.

1. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Owner's Representative, and replace with compacted backfill or fill as directed.

D. Authorized additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.

E. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Architect, without additional compensation.

3.9 UNAUTHORIZED EXCAVATION

A. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill, with 28-day compressive strength of 2500 psi, may be used when approved by Architect.

1. Fill unauthorized excavations under other construction, pipe, or conduit as directed by Owner's Representative.

3.10 STORAGE OF SOIL MATERIALS

A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.

1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

3.11 BACKFILL

A. Place and compact backfill in excavations promptly, but not before completing the following:

1. Construction below finish grade including, where applicable, subdrainage, dampproofing, waterproofing, and perimeter insulation.
2. Surveying locations of underground utilities for Record Documents.
3. Testing and inspecting underground utilities.
4. Removing concrete formwork.
5. Removing trash and debris.
6. Removing temporary shoring, bracing, and sheeting.
7. Installing permanent or temporary horizontal bracing on horizontally supported walls.

B. Place backfill on subgrades free of mud, frost, snow, or ice.

3.12 UTILITY TRENCH BACKFILL

A. Place backfill on subgrades free of mud, frost, snow, or ice.

B. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.

C. Trenches under Footings: Backfill trenches excavated under footings and within 18 inches of bottom of footings with satisfactory soil; fill with concrete to elevation of bottom of footings. Concrete is specified in Section 033000 "Cast-in-Place Concrete."

D. Backfill voids with satisfactory soil while removing shoring and bracing.

E. Final Backfill:

1. Soil Backfill: Place and compact final backfill of satisfactory soil to final subgrade elevation.
2. Controlled Low-Strength Material: Place final backfill of controlled low-strength material to final subgrade elevation.

3.13 SOIL FILL

A. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.

B. Place and compact fill material in layers to required elevations as follows:

1. Under grass and planted areas, use satisfactory soil material.
2. Under walks and pavements, use satisfactory soil material.
3. Under steps and ramps, use engineered fill.
4. Under building slabs, use engineered fill.
5. Under footings and foundations, use engineered fill.

C. Place soil fill on subgrades free of mud, frost, snow, or ice.

3.14 SOIL MOISTURE CONTROL

A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content.

1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.

2. Remove and replace, or scarify and air dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

3.15 COMPACTION OF SOIL BACKFILLS AND FILLS

A. Place backfill and fill soil materials in layers not more than 12 inches in loose depth for material compacted by heavy compaction equipment and not more than 4 inches in loose depth for material compacted by hand-operated tampers.

B. Place backfill and fill soil materials evenly on all sides of structures to required elevations and uniformly along the full length of each structure.

C. Compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D 1557:

1. Under structures, building slabs, steps, and pavements, scarify and recompact top 12 inches of existing subgrade and each layer of backfill or fill soil material at 98 percent.
2. Under walkways, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material at 98 percent.
3. Under turf or unpaved areas, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material at 90 percent.
4. For utility trenches, compact each layer of initial and final backfill soil material at 98 percent.

3.16 GRADING

A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.

1. Provide a smooth transition between adjacent existing grades and new grades.
2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.

B. Site Rough Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to elevations required to achieve indicated finish elevations, within the following subgrade tolerances:

1. Turf or Unpaved Areas: Plus or minus 1 inch.
2. Walks: Plus or minus 1/2 inch.
3. Pavements: Plus or minus 1/2 inch.

C. Grading inside Building Lines: Finish subgrade to a tolerance of 1/2 inch when tested with a 10-foot straightedge.

3.17 SUBSURFACE DRAINAGE

A. Subdrainage Pipe: Specified in Section 334600 "Subdrainage."

B. Install as indicated on the drawings.

3.18 SUBBASE AND BASE COURSES UNDER PAVEMENTS AND WALKS

A. Place subbase course and base course on subgrades free of mud, frost, snow, or ice.

B. On prepared subgrade, place subbase course and base course under pavements and walks as indicated on the Drawings as follows:

1. Install separation geotextile on prepared subgrade according to manufacturer's written instructions, overlapping sides and ends.
2. Place base course material over subbase course under hot-mix asphalt pavement as indicated on the Drawings.
3. Shape subbase course and base course (if required per Drawings) to required crown elevations and cross-slope grades.
4. Place subbase course and base course (If required per Drawings) 6 inches or less in compacted thickness in a single layer.
5. Place subbase course and base course (If required per Drawings) that exceeds 6 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches thick or less than 3 inches thick.
6. Compact subbase course and base course (If required per Drawings) at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 98 percent of maximum dry unit weight according to ASTM D 1557.

3.19 DRAINAGE COURSE UNDER CONCRETE SLABS-ON-GRADE

A. Place drainage course on subgrades free of mud, frost, snow, or ice.

B. On prepared subgrade, place and compact drainage course under cast-in-place concrete slabs-on-grade as follows:

1. Install subdrainage geotextile on prepared subgrade according to manufacturer's written instructions, overlapping sides and ends.
2. Place and compact drainage course as indicated on the Drawings. Revise percentage of compaction in subparagraph below and change compaction

test from ASTM D 698 to ASTM D 4254 or ASTM D 1557 if required. Replace the term "unit weight" with "density" if preferred. See Evaluations.

3. Compact each layer of drainage course to required cross sections and thicknesses to not less than 98 percent of maximum dry unit weight according to ASTM D 698.

3.20 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a qualified special inspector to perform the following special inspections:

1. Determine prior to placement of fill that site has been prepared in compliance with requirements.
2. Determine that fill material classification and maximum lift thickness comply with requirements.
3. Determine, during placement and compaction, that in-place density of compacted fill complies with requirements.

B. Testing Agency: Owner will engage a qualified geotechnical engineering testing agency to perform tests and inspections.

C. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earth moving only after test results for previously completed work comply with requirements.

D. Footing Subgrade: At footing subgrades, at least one test of each soil stratum will be performed to verify design bearing capacities. Subsequent verification and approval of other footing subgrades may be based on a visual comparison of subgrade with tested subgrade when approved by Architect.

E. Testing agency will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 2937, and ASTM D 6938, as applicable. Tests will be performed at the following locations and frequencies:

1. Paved and Building Slab Areas: At subgrade and at each compacted fill and backfill layer, at least one test for every 2000 sq. ft. or less of paved area or building slab but in no case fewer than three tests.
2. Foundation Wall Backfill: At each compacted backfill layer, at least one test for every 100 feet or less of wall length but no fewer than two tests.
3. Trench Backfill: At each compacted initial and final backfill layer, at least one test for every 150 feet or less of trench length but no fewer than two tests.

F. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil materials to depth required; recompact and retest until specified compaction is obtained.

3.21 PROTECTION

A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.

B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.

1. Scarify or remove and replace soil material to depth as directed by Architect; reshape and recompact.

C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.

1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.22 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Remove surplus satisfactory soil and waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.

B. Transport surplus satisfactory soil to designated storage areas on Owner's property. Stockpile or spread soil as directed by Architect.

1. Remove waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.

- END OF SECTION -

SECTION 312316.13 - TRENCHING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Excavating trenches for utilities from 5 feet outside building to undergrade water, sewer, wastewater, electrical, communication, fuel gas, compressed air or other services.
2. Protection of excavation including sheeting and shoring where required.
3. Compacted fill from top of utility bedding to subgrade elevations.
4. Backfilling and compaction.
5. Restoration of Paving where trenching passes through existing paved areas.

B. Related Sections:
1. Section 310516 - Aggregates for Earthwork
2. Section 321216 – Asphalt Paving

1.2 REFERENCES

A. American Railway Engineering and Maintenance of Way Association.

1. Manual for Railway Engineering – Chapter 1, Parts 3 & 4

B. ASTM International:
1. ASTM D1556 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
2. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3).
3. ASTM D2167 - Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.
4. ASTM D2922 - Standard Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
5. ASTM D3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).

C. New Jersey Department of Transportation (NJDOT)
1. Standard Specifications for Road and Bridge Construction, 2019

D. Occupational Safety and Health Administration:
1. 29 CFR Part 1929 - Safety and Health Regulations for Construction

SECTION 312316.13 - TRENCHING

1.3 DEFINITIONS

A. Utility: Any buried pipe, duct, conduit, or cable.

1.4 SUBMITTALS

A. Section 013300 - Submittal Procedures: Requirements for submittals.

B. Submit Site Specific Work Plan (SSWP) to Engineer for review seven (7) days in advance of scheduled commencement of each area of work under this section.

C. Excavation Protection Plan: Support trenches more than 5 feet deep in accordance with applicable OSHA requirements. Provide sheeting, shoring, bracing, or other protection to maintain stability of excavation. Submit sheeting and shoring plans and calculations prepared by a Professional Engineer, licensed in the State of New Jersey, for Engineer's review and approval at least 60 days prior to performing the work.

D. Where work will interfere with 45 degree bearing splay of foundations, catenary support structures or the Live Load Influence Line of adjacent railroad tracks comply with the requirements of the State of New Jersey. Submit sheeting and shoring plans and calculations prepared by a Professional Engineer, licensed in the State of New Jersey, for Engineer's review and approval at least 60 days prior to performing the work.

E. Product Data: Submit data for geotextile fabric indicating fabric and construction.

1.5 QUALIFICATIONS

A. Prepare required sheeting and shoring plans under direct supervision of Professional Engineer experienced in design of this Work and licensed in the State of New Jersey.

1.6 FIELD MEASUREMENTS

A. Verify field measurements prior to commencing work.

1.7 COORDINATION

A. Section 013100 - Administrative Requirements: Coordination.

B. Verify work associated with lower elevation utilities is complete before placing higher elevation utilities.

PART 2 - PRODUCTS

2.1 FILL MATERIALS

A. As specified in:

1. Section 310516 - Aggregates for Earthwork

PART 3 - EXECUTION

3.1 LINES AND GRADES

A. Lay pipes to lines and grades indicated on Drawings.

1. Engineer reserves right to make changes in lines, grades, and depths of utilities when changes are required for Project conditions.

B. Use laser-beam instrument with qualified operator to establish lines and grades.

3.2 PREPARATION

A. Coordinate with Engineer not less than five working days before performing work.

1. Request underground utilities to be located and marked within and surrounding construction areas.

2. Progress work in accordance with approved Site Specific Work Plan.

B. Identify required lines, levels, contours, and datum locations.

C. Protect bench marks, existing structures, fences, sidewalks, paving, railroad tracks and curbs from excavating equipment and vehicular traffic.

D. Maintain and protect above and below grade utilities indicated to remain.

E. Establish temporary traffic control and detours when trenching is performed in vehicular circulation roadways. Relocate controls and reroute traffic as required during progress of Work.

3.3 TRENCHING

A. Excavate subsoil required for utilities to locations of connections with existing facilities or as otherwise indicated on the plans.

B. Do not advance open trench more than 50 feet ahead of installed pipe.

C. Cut trenches to width indicated on Drawings or no more than necessary to enable installation and allow inspection of the installed utility. Remove water or materials that interfere with Work.

D. Saw cut a clean neat edge of trench through paved areas.

E. Excavate trenches to depth indicated on Drawings. Provide uniform and continuous bearing and support for bedding material and pipe.

F. Do not interfere with 45 degree bearing splay of foundations, support structures or the Live Load Influence Line of railroad tracks as defined in these specifications.

G. When Project conditions permit, slope side walls of excavation starting 2 feet above top of pipe. When side walls cannot be sloped, provide sheeting and shoring to protect excavation as specified in this section.

H. When subsurface materials at bottom of trench are loose or soft, notify Engineer, and request instructions.

I. Cut out soft areas of subgrade not capable of compaction in place. Backfill with Aggregate and compact to density equal to or greater than requirements for subsequent backfill material.

J. Trim excavation;
   1. Hand trim for bell and spigot pipe joints.
   2. Provide required additional excavated area for Clay Trench Plugs in accordance with the dimensions shown in the construction detail drawings.
   3. Remove loose matter.

K. Correct areas over excavated areas with compacted backfill as specified for authorized excavation or replace with fill concrete as directed by Engineer.

L. Remove excess subsoil not intended for reuse, from site.

M. Stockpile excavated material in area designated on site in accordance with Section 310516 - Aggregates for Earthwork

3.4 SHEETING AND SHORING

A. Install sheeting and shoring in accordance with plans previously submitted to, and approved by Engineer in accordance with Section 1.5 above.

B. Design sheeting and shoring to be removed at completion of excavation work.

C. Repair damage caused by failure of the sheeting, shoring, or bracing and for settlement of filled excavations or adjacent soil.

D. Repair damage to new and existing Work from settlement, water or earth pressure or other causes resulting from inadequate sheeting, shoring, or bracing.

3.5 BACKFILLING

A. Backfill trenches to contours and elevations with unfrozen fill materials.

B. Do not backfill over porous, wet, frozen, or spongy subgrade surfaces.

C. Pipe shall be installed on a Class B bed of compacted graded aggregate or sand bedding as indicated. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.

D. After laying pipe and insuring that the pipe is properly placed and supported by the bedding, unless other material is specified, backfill shall be placed in 6 inch lifts and compacted, to 12 inches above the top of pipe. The backfill shall be thoroughly rodded and tamped for compaction. Install warning tape 12 inches above the pipe, except 6 inches below subgrade under pavements and slabs. The remainder of the trench backfill shall be well graded clean granular soil having less than 20% by dry passing No. 200 US STD sieve. Maximum aggregate shall be size shall be ½”. Backfill shall be paced in uniform layers not to exceed 8" loose depth, each lift to be compacted to a minimum of 95 percent of Standard Density at within 2% of the optimum moisture content as determined in accordance with ASTM D15557. All earth backfill to be placed the next day or later after the pipe is laid.

E. Detectable Warning Tape:
   1. Install detectable warning tape directly above all piping, 12 inches below finished grade, except 6 inches below subgrade under pavements and slabs.
   2. If multiple pipes occur in common trench, locate tape above centerline of trench.

F. Employ placement method that does not disturb or damage, utilities in trench, and adjacent structures or railroad tracks.

G. Maintain optimum moisture content of fill materials to attain required compaction density.

H. Do not leave more than 50 feet of trench open at end of working day.

I. Protect open trench to prevent danger to personnel.

J. Where trenching has been progressed through asphalt paved areas, restore pavement in accordance with the plans and Section 321216.00 – Asphalt Paving.

K. Where trenching has been progressed through concrete paved areas, restore concrete paving in accordance with the plans and Section 033000 - Cast-In-Place Concrete.

3.6 TRENCH PLUGS

A. Where shown on the plans, trenches must have either a bentonite granular clay, or lean concrete, approved controlled strength material, plug, installed in accordance with the detail drawings, to reduce the transmission of ground water along the pipe.

B. The plug must extend 18” beneath utility trench into undisturbed soil. This portion of the clay plug must be installed prior to the installation of the utility pipe.

C. The plug must extend across the entire trench width and extend 18” into undisturbed soil beyond the trench width. Install bentonite clay plug and the utility pipe at the same time.

D. The plug must extend to within 12” of finished grade. A clay plug cap consisting of material with a plasticity index greater than 15 and a liquid limit in excess of 30 shall be placed on top of the bentonite granular clay plug. This clay plug cap shall fill the remaining 12” up to finished grade.

3.7 CONTAMINATED SOIL

A. Contractor shall remove, and segregate all soil removed from the ground that appears to be contaminated by petroleum parameter constituents. Clean and moderately contaminated soils shall be segregated and separated from heavily contaminated soils, impervious material, and from each other.

B. Stockpiled soil, possible for petroleum hydrocarbons but determined to be acceptable both structurally and environmentally should be considered for replacement back into an excavation.

C. Stockpiled soils deemed unsuitable as fill due to contamination shall be stockpiled and protected by barrier as directed by the Engineer. Material deemed suitable as backfill and not contaminated but not required for fill should be graded to promote drainage, seeded and mulched as directed by the Engineer.

D. The Owner shall be responsible for the final handling and disposal of all contaminated materials.

3.8 TOLERANCES

A. Section 014000 - Quality Requirements.

B. Top Surface of Backfilling Under Paved Areas: Plus or minus 1 inch from required elevations.

C. Top Surface of General Backfilling: Plus or minus 1 inch from required elevations.

3.9 FIELD QUALITY CONTROL

A. Section 014000 - Quality Requirements: Quality Assurance, Quality Control, Special Tests and Inspection.

B. Perform laboratory material tests in accordance with ASTM D1557.

C. Perform in place compaction tests in accordance with the following:

1. Density Tests: ASTM D2922.
2. Moisture Tests: ASTM D3017.

D. When tests indicate Work does not meet specified requirements, remove Work, replace, compact, and retest.

E. Frequency of Tests:
1. Under railroad tracks, structures, building slabs and pavements, scarify and recompact top 12 inches of existing subgrade and each layer of backfill or fill soil material at 95 percent.
2. Under walkways, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material at 92 percent.
3. Under unpaved areas, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material at 85 percent.

3.10 PROTECTION OF FINISHED WORK

A. Section 017700 - Closeout Procedures: Repair of the work.

B. Reshape and re-compact fills subjected to vehicular traffic during construction.

- END OF SECTION -

SECTION 312319 - DEWATERING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes provisions for pumping out stormwater and site dewatering during excavation and construction on the site. Dewatering consists of lowering and controlling groundwater and runoff levels and hydrostatic pressures to permit excavation and construction to be performed in near-dry conditions. This includes treatment to comply with any and all environmental requirements and the legal disposal of the collected materials during construction.

B. The altering or diversion of existing site surface stormwater runoff patterns will be necessary by the construction of berms, ditches, grading and piping as shown on the plans and approved by the Engineer or Owner's Representative. The maintenance of the dewatering system is required to be in accordance with the requirements of the Specification Section "Pollution Prevention and Environmental Requirements".

C. The contractor is required to pump the groundwater and stormwater flows to the outfall on the Delaware River in accordance with the Stormwater and/or Groundwater Discharge Permit.

1.3 DEWATERING OF THE CONSTRUCTION SITE

A. Subject to approval by the NJDEP, the Contractor may discharge pumped stormwater and/or ground water directly to the Delaware River. The owner will provide an applicable Stormwater Discharge Permit and/or Groundwater Discharge Permit.

1.4 SUBMITTALS

A. The Contractor shall submit to the Engineer or Owner's Representative a dewatering plan that includes working plans and specifications that identify the type of dewatering system proposed. The material to be submitted shall include, but not necessarily be limited to, the following:

1. Type and description of system.
2. Description of equipment and materials proposed.
3. Installation procedures.
4. Maintenance procedures.
5. Standby equipment and power supply.
6. Discharge locations.
7. Collection methods.
8. Storage methods.
9. Treatment methods.
10. Discharge method and location.
11. Method and measures for surface water control.
12. Sump layouts, pumps, piping and controls.

B. Prior to implementation, the Contractor shall obtain approval from both the Engineer or Owner's Representative and the City of Camden. Approval does not relieve the Contractor of the responsibility for adequacy of the system or providing equipment required to perform the operation. Should the Contractor's method of treatment prove to be ineffective in eliminating or significantly minimizing pollutants, the Contractor will be required to change the dewatering system to achieve an acceptable quality of discharge.

1.5 DOCUMENTATION

A. The Contractor shall provide the equipment manuals, documentation of equipment warranties and maintenance records for all dewatering system components.

1.6 CODE COMPLIANCE

A. Comply with the following Codes and Regulations:

1. International Building Code (IBC)
2. City of Camden Building Code.
3. Occupational Safety and Health Administration (OSHA) – As required by the state and federal regulations.
4. NJDEP requirements for erosion and sedimentation control.
5. City of Camden, New Jersey Department of Transportation, NJDEP and USEPA standards.
6. New Jersey Department of Transportation Soil and Erosion and Sediment Control Standards.

B. Comply with all local, state, and Federal laws, codes, and regulations applicable to the work specified in this Section including, but not limited to, the Federal Occupational Safety and health Act and the Construction Safety Act.

C. The more stringent provisions shall govern where provisions of pertinent codes and regulations are in conflict.

1.7 DESIGN CRITERIA

A. The Contractor shall provide a dewatering system that will remove rainfall and surface runoff and groundwater inflow for safe and proper execution of the work that will result in a stable, substantially dry base or subgrade for the execution of subsequent work.

B. The dewatering system shall be designed for continued operation through the contract.

C. The Contractor shall maintain adequate supervision and control to ensure that stability of excavated and constructed slopes are not adversely affected by water, erosion is controlled, and flooding of excavation or damage to structures does not occur.

1.8 PROJECT CONDITIONS

A. Permits.

1. Prior to discharging water, the Contractor shall obtain permits from the City and State as required.
2. The Contractor shall control the discharge of water with the General Requirements.

B. Responsibilities.

1. Design and install the dewatering system to perform removal of surface and groundwater and treatment as specified.
2. Monitor discharge from the dewatering system to determine that it meets the requirements identified in this specification. Modify the dewatering system as necessary during construction to meet the requirements.
3. Take all necessary measures to prevent damage to buildings, structures, utilities, pavements and other contractor work areas.
4. Repair and maintain the dewatering system during operation in accordance with the dewatering system plan and working drawings. Submit periodic maintenance records to the Engineer or Owner’s Representative.

PART 2 - PRODUCTS

2.1 PUMPING SYSTEMS.

A. All electrical components, equipment and installations shall meet the requirements of the NEC, NEMA and shall be UL listed.

B. All electrical control equipment shall be provided with and connected to a backup power source.

C. All pumping system shall be duplex type pumps. The pumping equipment shall be such that if one pump is not in service, the other pumps are capable of pumping the design flow and provide an ability to maintain a dry project site.

D. The pumping system controls and power sources shall be housed in a weatherproof structure with access in accordance with OSHA 29CFR, Parts 1910 and 1926.

E. Pumps shall be located to facilitate access for maintenance, removal and reinstallation.

F. Sumps, well points, and wet wells shall be constructed to provide unrestricted access for cleaning and maintenance.

G. The Contractor shall make his own assessment of existing conditions including adjacent activities and shall select and design such dewatering systems, methods and details and surface water control system as will assure safety to the public, adjacent activities, existing buildings, structures, and the competed work.

H. The cofferdam, sheet piling, and dewatering shall work as a system to provide a safe work area, dewater the project site, and permit the flow of the combined sewer to the river, passing the 550 cfs noted during storm events.

I. All excavations shall be kept continually free of water or mud from any source, including leaking utilities.

J. Leaking Utilities: Dewatering system shall accommodate all inflows of water into the excavation from whatever source, including any existing underground piping or utilities which may be leaking. If contractor notes leaking utilities, contact Engineer or Owner’s Representative immediately defining type and extent of leaking utility.

PART 3 - EXECUTION

3.1 DEWATERING

A. Coordinate dewatering installation with other construction activities to prevent conflicts with construction operations.

B. Provide and install a dewatering system to control stormwater runoff and lower and control groundwater in order to permit excavation, construction of support of excavation and future structures, and placement of fill materials under dry conditions. Install sufficient dewatering equipment to drain water-bearing strata above and below bottom of structure foundations, drains, sewers, and other excavations.

C. Install the dewatering system in accordance with the approved plans, procedures and documentation.

D. Prior to excavation, place system into operation to lower water levels as required and then operate it continuously 24 hours a day, 7 days a week.

E. Dispose of water removed from excavations in a manner approved by the Engineer or Owner's Representative and the City. Provide sumps, sedimentation tanks, and other flow control devices as required by NJDEP requirements.

F. Provide standby equipment for immediate operation if required to maintain dewatering on a continuous basis in event any part of system becomes inadequate or fails.

G. Monitor system and modify system to maintain dewatering on the site and meet the requirements of the specifications.

H. Maintain the dewatering system and submit periodic maintenance records to the Engineer or Owner's Representative.

I. The dewatering system shall be maintained in good working condition throughout the life of the contract.

3.2 SURFACE DRAINAGE AND DEWATERING

A. The contractor shall divert surface drainage by means of berms, dikes, curbs and ditches. Surface drainage shall be separated from the dewatering as possible during construction by the Contractor's grading and layout on the site.

B. The surface drainage system shall be designed to prevent erosion.

C. All surface drainage shall meet the requirements of Specification Section “Pollution Prevention and Environmental Requirements”.

PART 4 - CONTRACTOR’S QUALITY CONTROL REQUIREMENTS

4.1 GENERAL

A. Comply with applicable provisions of Division 01 Section "Quality Requirements".

B. The Contractor shall provide quality control for the dewatering in accordance with the Contractor Quality Control Program. In addition, the Contractor supplied quality control shall consist of:

1. Shop Drawings. Verify shop drawings are prepared as specified herein by or under the supervision of a qualified Professional Engineer registered in the State of New Jersey.
2. Verify qualifications of firms and persons specified in “Quality Assurance”.
3. Monitor dewatering activities and provide a weekly report to the Engineer or Owner’s Representative as specified herein.
4. Reports. Provide documentation and reports of the dewatering system as specified herein.

C. The Contractor or the Contractor’s quality control testing service shall take all samples and perform all tests required for quality control sampling and testing to be performed by the Contractor or the testing service and all quality assurance samples to be tested by the Owner’s Representative. All costs for all quality control and quality assurance sampling and quality control testing shall be included in the Contractor’s cost for the project. Unless otherwise noted, the number of samples for quality control testing and sampling shall be the same for quality assurance testing.

D. All of the Contractor’s or testing agency test results shall be provided to the Owner or Owner’s Representative.

- END OF SECTION -

SECTION 321216 - ASPHALT PAVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Asphalt materials.
2. Aggregate materials.
3. Asphalt paving base course and wearing course.
4. Hot-mix asphalt paving.
5. Asphalt paving restoration for utilities installation.

B. Related Requirement:
1. Section 312316.13 – Trenching
2. Section 321723 – Pavement Marking.
3. Section 330130.86 – Manhole, Inlet or Valve Box Rim Adjustment
4. Section 330597 - Identification and Signage For Utilities
5. Section 331419 – Valves and Hydrants

1.3 REFERENCE STANDARDS

A. American Association of State Highway and Transportation Officials:

1. AASHTO M17 - Standard Specification for Mineral Filler for Bituminous Paving Mixtures.
2. AASHTO M29 - Standard Specification for Fine Aggregate for Bituminous Paving Mixtures.
3. AASHTO M140 - Standard Specification for Emulsified Asphalt.
4. AASHTO M208 - Standard Specification for Cationic Emulsified Asphalt.
5. AASHTO M288 - Standard Specification for Geotextile Specification for Highway Applications.
6. AASHTO M320 - Standard Specification for Performance-Graded Asphalt Binder.
7. AASHTO M324 - Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements.
8. AASHTO MP1a - Standard Specification for Performance-Graded Asphalt Binder.

B. Asphalt Institute:

1. AI MS-2 - Mix Design Methods for Asphalt Concrete and Other Hot- Mix Types.
2. AI MS-19 - Basic Asphalt Emulsion Manual.
3. AI SP-2 - Superpave Mix Design.

C. ASTM International:

1. ASTM C1371-15 - Standard Test Method for Determination of Emittance of Materials Near Room Temperature Using Portable Emissometers.
2. ASTM C1549-16 - Standard Test Method for Determination of Solar Reflectance Near Ambient Temperature Using a Portable Solar Reflectometer.
3. ASTM D242 - Standard Specification for Mineral Filler For Bituminous Paving Mixtures.
4. ASTM D692 - Standard Specification for Coarse Aggregate for Bituminous Paving Mixtures.
5. ASTM D946 - Standard Specification for Penetration-Graded Asphalt Cement for Use in Pavement Construction.
6. ASTM D977 - Standard Specification for Emulsified Asphalt.
7. ASTM D1073 - Standard Specification for Fine Aggregate for Bituminous Paving Mixtures.
8. ASTM D1188 - Standard Test Method for Bulk Specific Gravity and Density of Compacted Bituminous Mixtures Using Coated Samples
9. ASTM D2027 - Standard Specification for Cutback Asphalt (Medium-Curing Type).
10. ASTM D2397 - Standard Specification for Cationic Emulsified Asphalt.
11. ASTM D2726 - Standard Test Method for Bulk Specific Gravity and Density of Non-Absorptive Compacted Bituminous Mixtures.
12. ASTM D2950 - Standard Test Method for Density of Bituminous Concrete in Place by Nuclear Methods.
13. ASTM D3381 - Standard Specification for Viscosity-Graded Asphalt Cement for Use in Pavement Construction.
14. ASTM D3515 - Standard Specification for Hot-Mixed, Hot-Laid Bituminous Paving Mixtures.
15. ASTM D3549 - Standard Test Method for Thickness or Height of Compacted Bituminous Paving Mixture Specimens.
16. ASTM D3910 - Standard Practices for Design, Testing, and Construction of Slurry Seal.
17. ASTM D6690 - Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements.
18. ASTM E408-13 - Standard Test Methods for Total Normal Emittance of Surfaces Using Inspection-Meter Techniques.
19. ASTM E903-12 - Standard Test Method for Solar Absorptance, Reflectance, and Transmittance of Materials Using Integrating Spheres.

20. ASTM E1918-16 - Standard Test Method for Measuring Solar Reflectance of Horizontal and Low-Sloped Surfaces in the Field.
21. ASTM E1980-11 - Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces.

D. State of New Jersey, Department of Transportation (NJDOT)

1. Standard Specifications for Road and Bridge Construction, 2019

1.4 SUBMITTALS

A. Section 013300 - Submittal Procedures: Requirements for submittals.

B. Product Data:

1. Submit product information for asphalt and aggregate materials.
2. Submit mix design with laboratory test results supporting design.

C. Manufacturer's Certificate: Certify Products and Hot Mix Asphalt mix designs meet or exceed specified requirements.

1.5 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Review methods and procedures related to hot-mix asphalt paving including, but not limited to, the following:

a. Review proposed sources of paving materials, including capabilities and location of plant that will manufacture hot-mix asphalt.
b. Review requirements for protecting paving work, including restriction of traffic during installation period and for remainder of construction period.

1.6 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include technical data and tested physical and performance properties.
2. Job-Mix Designs: Certification, by authorities having jurisdiction, of approval of each job mix proposed for the Work.

1.7 INFORMATIONAL SUBMITTALS

A. Qualification Data: For manufacturer and testing agency.

B. Material Certificates: For each paving material. Include a statement that mixes containing recycled materials will perform equal to mixes produced from all new materials.

C. Material Test Reports: For each paving material, by a qualified testing agency.

D. Field quality-control reports.

1.8 QUALITY ASSURANCE

A. Manufacturer Qualifications: A paving-mix supplier registered with and approved by NJDOT.

B. Testing Agency Qualifications: Qualified according to ASTM D 3666 for testing indicated.

C. Regulatory Requirements: Comply with materials, workmanship, and other applicable requirements of following NJDOT Specifications:
   1. Section 105 - Control of Work
   2. Section 401 – Hot Mix Asphalt (HMA) Courses
   3. Measurement and payment provisions and safety program submittals included in standard specifications do not apply to this Section.

1.9 FIELD CONDITIONS

A. Environmental and Weather Limitations:

   1. Comply with requirements of NJDOT Specifications, Section 401.03.

PART 2 - PRODUCTS

2.1 AGGREGATES

A. General: Comply with requirements of NJDOT Specifications, Section 901.

B. Coarse Aggregate: Comply with requirements of NJDOT Specifications, Section 901.05.01.

C. Fine Aggregate: Comply with requirements of NJDOT Specifications, Section 901.05.02.

2.2 ASPHALT MATERIALS

A. Asphalt Binder: Comply with requirements of NJDOT Specifications, Section 901.01.01.

B. Asphalt Cement: Comply with requirements of NJDOT Specifications, Section 902.

C. Cutback Prime Coat: Comply with requirements of NJDOT Specifications, Section 401.03.06.

D. Emulsified Asphalt Prime Coat: Comply with requirements of NJDOT Specifications, Section 902.

E. Tack Coat: Comply with requirements of NJDOT Specifications, Section 401.03.05

F. Water: Potable.

2.3 AUXILIARY MATERIALS

A. Not applicable.

2.4 MIXES

A. Hot-Mix Asphalt: Dense-graded, hot-laid, hot-mix asphalt plant mixes complying with the following requirements:
   1. Base Course: Hot Mix Asphalt 12.5M Base Course
   2. Surface Course: Hot Mix Asphalt 12.5M Surface Course

PART 3 - EXECUTION

3.1 EXAMINATION

A. Section 017300 - Execution: Requirements for examination of existing conditions.

B. Verify following:
   1. Utilities indicated under paving are installed with excavations and trenches backfilled and compacted in accordance with project specifications.
   2. Subgrade is dry and in suitable condition to begin paving.
   3. Gradients and elevations of base are correct.
   4. Inspect elevation of inlet frames and grates, valve boxes, trace wire test boxes, cleanouts and manhole frames and adjust to meet final pavement elevations and provide proper drainage upon completion of repaving.

C. Proceed with paving only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Joints:
   1. General: Comply with NJDOT Specifications, Section 401.03.04.
   2. Saw cut perimeter of utility trench openings and excavate existing pavement section extending 6 inches into perimeter of adjacent sound pavement, unless otherwise indicated. Cut excavation faces vertically.
   3. Remove excavated material.

B. Apply Tack Coat:
   1. Before placing asphalt material, apply tack coat uniformly to vertical asphalt surfaces abutting the area. Apply at a rate of 0.05 to 0.15 gal./sq. yd.
   2. The contact surfaces of manholes, catch basins, valve boxes or other appurtenant structures shall be painted thoroughly with a thin uniform coating of tack coat just before any mixture is placed against them.
   3. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.
   4. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings.
   5. Remove spillages and clean affected surfaces.

3.3 INSTALLATION

A. General: Comply with NJDOT Specifications, Section 401.03.

B. Joints: Seal joints with existing sound pavement in accordance with NJDOT Specifications, Section 401.03.04.

C. Repairs: Remove paved areas that are defective or contaminated with foreign materials and replace with fresh, hot-mix asphalt. Compact by rolling to specified density and surface smoothness.

D. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.

E. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

F. Re-apply or restore existing pavement markings that have been removed, destroyed or rendered illegible either directly or indirectly as a result of work under scope of the project.

3.4 INSTALLATION TOLERANCES

A. Pavement Thickness: Compact each course to produce the thickness indicated within the following tolerances:

1. Base Course: Plus or minus 1/2 inch.
2. Surface Course: Plus 1/4 inch, no minus.

B. Pavement Surface Smoothness: Compact each course to produce a surface smoothness within the following tolerances as determined by using a straightedge applied transversely or longitudinally to paved areas:

1. Base Course: 1/4 inch.
2. Surface Course: 1/8 inch.

3.5 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. Surface Smoothness: Finished surface of each hot-mix asphalt course will be tested for compliance with smoothness tolerances.

C. In-Place Density: Testing agency will test compacted pavement density and depths according to NJDOT Specifications, Section 401.03.07.C.

D. Remove and replace or install additional hot-mix asphalt where test results or measurements indicate that it does not comply with specified requirements.

3.6 WASTE HANDLING

A. General: Handle asphalt-paving waste according to approved waste management plan.

- END OF SECTION -

SECTION 321723 - PAVEMENT MARKINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Painted markings applied to asphalt paving.
2. Painted markings applied to concrete surfaces.

B. Related Requirements:

1. Section 014000 “Quality Requirements” for Quality Assurance requirements.
2. Section 099000 "Painting and Coating" for painting exterior and interior concrete surfaces other than pavement markings.

1.3 REFERENCE STANDARDS

A. American Association of State Highway and Transportation Officials:

1. NTPEP PMM-17-01 – Field Testing and Evaluation Procedures for Permanent Pavement Marking Materials

B. ASTM International:

1. ASTM D 93 - Standard Test Methods for Flash Point by Pensky-Martens Closed Cup Tester
2. ASTM D 562 - Standard Test Method for Consistency of Paints Measuring Krebs Unit (KU) Viscosity Using a Stormer-Type Viscometer
3. ASTM D 869 - Standard Test Method for Evaluating Degree of Settling of Paint

C. United States:

1. Federal Spec TT-P-85 – Paint, Traffic, and Airfield Markings, Solvent Based
2. Federal Test Method Standard – Adhesives: Methods of Testing

D. United States Environmental Protection Agency (EPA):

1. EPA Method 24 – Determination of Volatile Matter Content, Water Content, Density, Volume Solids, and Weight Solids of Surface Coatings

1.4 ACTION SUBMITTALS

A. Product Data: Include technical data and tested physical and performance properties.

1. Pavement-marking paint, acrylic.

B. Shop Drawings:

1. Indicate pavement markings, colors, lane separations, defined parking spaces, and dimensions to adjacent work.

1.5 QUALITY ASSURANCE

A. The paint shall not contain any hazardous material listed in the Environmental Protection Agency Code of Federal Regulations (CFR) 40, Section 261.24, Table 1.

1.6 FIELD CONDITIONS

A. Environmental Limitations: Proceed with pavement marking only on clean, dry surfaces and at a minimum ambient or surface temperature of 60 deg F for water-based materials.

PART 2 - PRODUCTS

2.1 PAVEMENT-MARKING PAINT

A. Pavement-Marking Paint, Acrylic: White and yellow paint material shall be a fast drying water based, nonleaded, acrylic resin paint suitable for use on both asphalt and Portland Cement Concrete surfaces.

2.2 PERFORMANCE REQUIREMENTS

A. Hiding Power: Paint shall show a dry hiding quality that will give a contrast ratio of at least 0.96 at 15 mil wet film thickness.

B. Settling Properties: Settling shall be no less than a rating of 8 when tested in accordance with ASTM D 869.

C. Freeze-Thaw and Heat Stability: Paint shall show no coagulation or change in viscosity greater than ± 5 KU.

D. Water Resistance: Paint shall show no:

1. Blistering
2. Peeling or wrinkling
3. Softening or loss of adhesion.

E. VOC: The Volatile Organic Compound (VOC) content shall be no greater than 150 grams/liter when tested in accordance with EPA Method 24.

F. Flash Point: Paint shall have a flash point of at least 140 deg F.

G. Total Solids: Total solids shall be a minimum of 70 percent by weight when tested in conformance with Federal Test Method 4041.1, Volatile and Nonvolatile Content (ordinary lab oven).

H. Color

1. Production: The color of the dry paint film of the production sample shall essentially match Federal Standard 595, color chips Nos. 37886 (white) or 33538 (yellow), when compared instrumentally
2. Control: Control sample color matching determinations will be made using a color machine and the CIE Chromaticity Coordinate Color Matching System under light source Illuminate C, with the following tolerances permitted between the standard chip and the dry paint film sample:

	WHITE Color No. 37886		YELLOW Color No. 33538	
	X	Y	X	Y
Standard Chip	0.32	0.33	0.49	0.44
Delta Tolerance	± 0.02	± 0.02	± 0.03	± 0.03

PART 3 - EXECUTION

3.1 EXAMINATION

A. Prior to any work survey the identified work zone for all existing pavement markings and document location, size, and color of existing pavement markings so that any removed pavement markings can be reapplied after construction is complete.

B. At the end of each construction stage, verify that pavement-marking substrate is dry and in suitable condition to begin pavement marking in accordance with manufacturer's written instructions.

C. Proceed with pavement marking only after unsatisfactory conditions have been corrected.

3.2 PAVEMENT MARKING

A. Do not apply pavement-marking paint until layout, colors, and placement have been verified with Engineer.

B. Allow asphalt paving or concrete surfaces to age for a minimum of 15 days before starting pavement marking.

C. Sweep and clean surface to eliminate loose material and dust.

D. Apply paint with mechanical equipment to produce pavement markings, of dimensions indicated, with uniform, straight edges. Apply at manufacturer's recommended rates to provide a minimum wet film thickness of 15 mils.

1. Apply graphic symbols and lettering with paint-resistant, die-cut stencils, firmly secured to asphalt paving or concrete surface. Mask an extended area beyond edges of each stencil to prevent paint application beyond stencil. Apply paint so that it cannot run beneath stencil.

3.3 PROTECTING AND CLEANING

A. Protect pavement markings from damage and wear during remainder of construction period.

B. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

- END OF SECTION -

SECTION 323913 – BOLLARDS AND BOLLARD COVERS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Steel Pipe Bollards
2. Thermoplastic Bollard Covers.

B. Related Requirements:

1. Section 033000 - Cast-in-Place Concrete.
2. Section 099000 - Painting and Coating.

1.2 REFERENCE STANDARDS

A. ASTM A500 – Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.

1.3 DESCRIPTION

A. The contractor shall furnish permanent bollards at the locations as shown on the plans.

1.4 SUBMITTALS

A. Product data for all products.

PART 2 - PRODUCTS

2.1 MATERIALS

A. PIPES

1. The permanent pipe bollards shall be concrete filled steel pipes. The pipes shall be six (6) inch nominal diameter steel pipe, round, and free of dents and of other irregularities above the ground line. Cuts at the ends shall be clean, free of burrs and made square to the longitudinal axis of the pipe.

B. CONCRETE

1. The concrete shall be 2000 p.s.i. Portland cement with a maximum aggregate size of two (2) inches.

C. FINISHES

1. PAINTS

a. The primer and finish paint shall be designed for outside use and for application to steel. Refer to Specification Section 099000 “Painting and Coating”.
b. Finish paint color shall be OSHA Yellow.

2. RETROREFLECTIVE TAPE

a. Retroreflective Tape: 2 strips of 3M Scotchlite® Reflective Sheeting Series tape, applied to bollard or bollard cover.
b. Color: White

D. THERMOPLASTIC BOLLARD COVERS

1. Materials:

a. High Density Polyethylene (HDPE).
b. Ultraviolet (UV) protection additive.
c. Thickness: Nominal wall thickness minimum 0.125 inch
d. Flexural modulus: 200,000 psi.
e. Tensile Strength: 4,000 psi.
f. Color: Solid color throughout.

2. Color:

a. OSHA Yellow

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine paving or other substrates for compliance with manufacturer’s requirements for placement and location of embedded items, condition of substrate, and other conditions affecting installation of bollards.

B. Identify and markout all underground utilities at proposed bollard locations prior to auguring holes for bollard installation. If the location of underground utilities results in conflicts which require adjustment of bollard location(s), install

bollards to avoid interference with clear access for fire hose connection to fire hydrant nozzles.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Apply primer and finish coat(s) of paint to bollards and allow to fully dry before installing Bollards.

B. Install Bollards at the locations and in numbers as indicated on the plans, and at distance from adjacent structure or fixture as indicated.

C. Install Bollards in pre-augured holes, at depth indicated and adequately braced to remain plumb during placement and curing of concrete fill and concrete footing. Do not install damaged, cracked, chipped, deformed or marred bollards.

D. Field touch-up minor imperfections in accordance with manufacturer’s instructions. Replace bollards that cannot be field repaired.

E. Plastic Bollard Covers: Install over foam strips in pattern indicated in manufacturer's instructions.

F. Retroreflective Tape: Install retroreflective tape on clean, fully dry painted surface or thermoplastic bollard cover cleaned and in accordance with manufacturer’s instructions

- END OF SECTION -

SECTION 330120 - ABANDONMENT OF UNDERGROUND UTILITIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Contractor shall furnish all materials, equipment, and labor necessary to abandon underground utilities in-place as specified herein or indicated on the Drawings. Work specified in this Section includes but is not limited to the abandonment of water mains, valve boxes, valve casings, meter boxes, valve and meter vaults, water service lines, stormwater inlets, and stormwater lines in accordance with the Contract Documents.

B. Related Sections:

1. Section 013100 - Project Management and Coordination: Requirements for coordination.
2. Section 013300 – Submittal Procedures: Requirements for submittals.
3. Section 014000 – Quality Requirements
4. Section 017700 – Closeout Procedures
5. Section 312316.13 – Trenching
6. Section 331413 - Water Distribution Piping
7. Section 334200 – Stormwater Conveyance

1.3 REFERENCES

A. American Society for Testing and Materials (ASTM):

1. ASTM C33: “Standard Specification for Concrete Aggregates”.
2. ASTM C1107: “Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink)”.

B. State of New Jersey, Department of Transportation (NJDOT)

1. Standard Specifications for Road and Bridge Construction 2019

C. SUBMITTALS

D. Product Data: Submit manufacturer product data for each product used.

1.4 COORDINATION

A. Coordinate Work of this Section with installation of new water distribution pipe and stormwater conveyance pipe.

1.5 CLOSEOUT SUBMITTALS

A. Project Record Documents: Record actual locations of pipe caps or plugs.

1.6 QUALITY ASSURANCE

A. Perform Work according to applicable standards as defined in these specifications.

PART 2 - PRODUCTS

2.1 NON-SHRINK GROUT:

A. Non-shrink grout shall be Cement-based dry-pack grout conforming to ASTM C1107.

2.2 MANUFACTURED PLUG:

A. Commercially available plug or cap specifically designed and manufactured to be used with the pipe being abandoned.

2.3 FLOWABLE FILL:

A. Flowable fill shall be general purpose backfill controlled low-strength material (CLSM)

PART 3 - EXECUTION

3.1 GENERAL:

A. Valve boxes, meter pits, fire hydrant riser pipes, yard hydrants, other water service appurtenances, stormwater inlets, and stormwater conveyance lines that are located at a depth less than three (3) feet below grade and that are a part of the existing water distribution system to be abandoned, shall be removed. Portions more than three (3) feet below subgrade shall be abandoned in

place in accordance with this Section unless noted otherwise on the Contract Drawings.

B. When a water or stormwater pipeline is to be abandoned, Contractor shall ensure that all existing mains and service connections are properly plugged or transferred to the new water or stormwater pipeline prior to decommissioning the existing pipeline.

C. Where indicated on the Contract Drawings, existing water pipelines, conduits, stormwater inlets, and stormwater pipelines, and/or appurtenances shall be removed by the Contractor. Removed materials shall be the property of the Contractor, unless otherwise noted on the Contract Drawings.

D. Existing out of service utilities within the limits of the trench excavation where new water service pipes are being placed shall not be abandoned in-place. In this situation, the existing utilities shall be removed to the limits of the trench and disposed of by the Contractor. The ends of existing utilities that extend beyond the trench limits will be abandoned as specified herein.

E. Existing utilities outside the limits of the trench excavation and shown on the Contract Drawings to be abandoned in-place shall be abandoned in-place in accordance with this Section.

F. During placement of flowable fill in piping being abandoned, protect the open ends of nearby piping that will remain in operation to prevent flowable fill from getting into it.

3.2 WATER SERVICE LINE ABANDONMENT:

A. Water service line abandonment includes water service lines up to and including two (2) inches in diameter.

B. Cut, drain and cap water service lines five (5) feet from the building envelope.

C. Cut, drain and cap water service lines immediately adjacent to the existing main line when the existing main line will remain active.

3.3 PIPELINE ABANDONMENT:

A. Pipelines 16 inches in diameter and smaller shall be drained and abandoned in-place. Except as noted otherwise in this Section and on the Contract Drawings each end shall be cut and plugged.

B. Plugs made of non-shrink grout shall extend into the pipe a minimum of 24 inches and form a solid waterproof plug completely bonded to the pipe.

C. When manufactured plugs are used to plug pipe, install concrete around plug and over pipe to ensure a waterproof plug.

D. All pipes, regardless of size, under structures, waterways, railroad tracks, rail right-of-way shall be abandoned in-place and completely filled with flowable fill, unless noted otherwise on the Contract Drawings.

E. If a utility line to be abandoned terminates in a manhole/vault that will remain in service, the existing main to be decommissioned shall be plugged from within the manhole and clearly marked on the Record Drawings.

F. Installation of flowable fill shall be performed by experienced crews with equipment to monitor the density of flowable fill and control pressure.

3.4 CONCRETE OR MASONRY STRUCTURE ABANDONMENT:

A. Concrete or masonry structures include, but are not limited to Junction Boxes, Regulator or Valve Vaults, Meter Pits, etc.

B. The top of each structure shall be removed to a minimum depth of three (3) feet below grade, or 12 inches below any crossing utility, whichever is greater.

C. The depth of structures removed shall not be deeper than 18 inches above the crown of an abandoned pipeline.

D. Piping or conduit entering a structure shall be plugged.

E. Break and perforate the bottom of the structure to allow water to drain through after installation of backfill material.

3.5 TEES, VALVES, VALVE CASINGS AND BOXES ABANDONMENT:

A. When main line is to remain active and branch connection is to be abandoned, plug mechanical joint tees and remove lead joint tees. Replace lead joint tees with new pipe and sleeve to keep main line active.

B. Remove existing valve casings and valve boxes to be abandoned to a depth of three (3) feet below grade. The remaining portion of the structure shall be filled with No. 57 stone per ASTM C33.

C. For valves that are abandoned in-place on lines that are to remain active, the Contractor shall remove all internal valve parts and install a blank on the valve prior to testing and backfilling.

D. Install plug or cap on abandoned valves when shown on Contract Drawings.

E. Valves abandoned in-place on lines to be abandoned shall be fully opened.

3.6 METER BOXES ABANDONMENT:

A. Water meter boxes shall be removed in their entirety.

3.7 STORMWATER INLETS:

A. Stormwater inlets shall be removed in their entirety.

3.8 BACKFILL, COMPACTION AND RESTORATION:

A. Backfill and compaction for utilities and all appurtenances abandoned in-place, shall be in accordance with the requirements of Division 312316.13 - Trenching.

B. Structures remaining in the ground shall be completely filled with flowable fill, crushed stone, or trench backfill unless otherwise specified or shown on the Contract Drawings.

- END OF SECTION -

SECTION 330130.11 – TELEVISION INSPECTION OF SEWERS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Pipeline flushing and cleaning.
2. Television inspection of sewer pipelines.
3. Audio-video recording of pipeline interior.

B. Related Requirements:

1. Section 334200.00 Stormwater Conveyance: Pipe materials, manholes, and accessories normally encountered with gravity sewerage piping.

1.2 DEFINITIONS

A. DVD: An optical disc storage format, offering higher storage capacity than compact discs (CDs) while having the same dimensions.

1.3 UNIT PRICE - MEASUREMENT AND PAYMENT

A. Section 012000 - Price and Payment Procedures: Contract Sum/Price modification procedures.

B. Television Inspection of Sewers:

1. Basis of Measurement: Lump Sum.
2. Basis of Payment: Includes pipeline television inspection, and audio-video recording of pipeline.

1.4 COORDINATION

A. Section 013000 - Administrative Requirements: Requirements for coordination.

B. Coordinate Work of this Section with S.J.P.C..

1.5 PREINSTALLATION MEETINGS

A. Section 013000 - Administrative Requirements: Requirements for preinstallation meeting.

B. Convene minimum one week prior to commencing Work of this Section.

1.6 SCHEDULING

A. Section 013216 - Construction Progress Schedule: Requirements for scheduling.

B. Schedule Work of this Section to follow Selective Demolition work in affected area and preceding installation of Stormwater System modifications

1.7 SEQUENCING

A. Section 011000 - Summary: Requirements for sequencing.

B. Sequence Work in following order:

1. Define limits of the existing stormwater management system between the point of discharge at the Delaware River and the point(s) of connection of the new stormwater collection system to be installed as part of the Project work.

2. Perform required selective demolition work in the area(s) as defined by the Phase(s) of the project and in accordance with the approved Schedule where portions of the existing stormwater system are located as identified in the above paragraph.

3. Upon completion of selective demolition and any other work that may affect the integrity of the portion(s) of the existing stormwater system slated to remain as identified in the paragraph above, perform video inspection of the pipe network to determine the integrity of the portion(s) of existing stormwater collection system as identified above.

1.8 SUBMITTALS

A. Section 013300 - Submittal Procedures: Requirements for submittals.

B. DVDs:

1. Submit three copies of completed narrated color DVDs identified by Project name, and section(s) of pipe(s) comprising and corresponding to that identified in paragraph 1.7B above.
2. DVDs become property of S.J.P.C.

C. Inspection Logs:

1. Submit television inspection logs for each section of line.
2. Include following minimum information:

    a. Stationing and location of lateral services, wyes, or tees.
    b. Date and clock time references.
    c. Pipe joints.
    d. Infiltration/inflow defects.
    e. Cracks.
    f. Leaks.
    g. Offset joints.
    h. Obstructions
    i. Collapsed pipe.

D. Submit spill plan to address any spills that might occur.

E. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.

1.9 QUALIFICATIONS

A. Applicator: Company specializing in performing Work of this Section with minimum three years' documented experience.

PART 2 - PRODUCTS

2.1 DVDs

A. Description: Digital video formatted discs.

B. Audio track containing simultaneously recorded narrative commentary and evaluations of videographer, describing in detail condition of pipeline interior.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Section 017000 - Execution and Closeout Requirements: Requirements for application examination.

B. Verify location of sewer pipelines to be inspected.

3.2 PREPARATION

A. Section 017000 - Execution and Closeout Requirements: Requirements for application preparation.

B. Flush and clean pipeline to remove sludge, dirt, sand, stone, grease, and other materials to ensure clear view of interior conditions.

C. Debris:

1. Intercept flushed debris at next downstream manhole using weir or screening device.
2. Remove and dispose of debris off Site.

D. Scheduling:

1. The existing stormwater system discharges to the Delaware River and is affected by the rise and fall of the tides. Schedule and perform inspection during period(s) where river elevation is below pipe invert of point of discharge to river for time required to complete television inspection.
2. Provide safety precautions, including barricades, lights, and flaggers as specified in Section 015000 - Temporary Facilities and Controls.

3.3 APPLICATION

A. Closed-Circuit Television (CCTV) Camera System:

1. Use cameras specifically designed and constructed for closed-circuit sewer line inspection.
2. Use camera equipment with pan-and-tilt capability to view each lateral connection at multiple angles.
3. Use camera capable of moving both upstream and downstream with minimum 1,000 feet horizontal distance within one setup and using direct-reading cable position meter.

3.4 FIELD QUALITY CONTROL

A. Section 014000 - Quality Requirements: Requirements for inspecting and testing.

B. Pipeline Inspection:

1. Audio-video record sections of sewer pipeline between designated manholes.
2. Identify and record locations of flat grades, dips, deflected joints, open joints, broken pipe, protrusions into pipeline, and points of infiltration.

3. Locate and record service connections.
4. Record locations of pipeline defects, connection horizontal distance in feet, and direction from manholes.
5. Video-record with pipe section plugged to view 100 percent of pipe ID.

- END OF SECTION -

SECTION 330130.86 – MANHOLE, INLET OR VALVE BOX RIM ADJUSTMENT

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Raising manhole, inlet or valve box frames and covers.
2. Replacing manhole, inlet or valve box frames and covers.

B. Related Requirements:

1. Section 033000 – Cast–In-Place Concrete: Execution requirements for concrete and mortar as specified in this Section.
2. Section 321216 - Asphalt Paving: Bituminous paving and pavement rehabilitation.

1.2 REFERENCE STANDARDS

A. American Association of State Highway and Transportation Officials:

1. AASHTO M306 - Standard Specification for Drainage, Sewer, Utility, and Related Castings.

B. ASTM International:

1. ASTM A48/A48M - Standard Specification for Gray Iron Castings.
2. ASTM C478 - Standard Specification for Circular Precast Reinforced Concrete Manhole Sections.
3. ASTM C877 - Standard Specification for External Sealing Bands for Concrete Pipe, Manholes, and Precast Box Sections.
4. ASTM C990 - Standard Specification for Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants.
5. ASTM F593 - Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs.
6. ASTM F1554 - Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength.

C. State of New Jersey, Department of Transportation (NJDOT)

1. Standard Specifications for Road and Bridge Construction, 2019

1.3 PREINSTALLATION MEETINGS

A. Section 013100 - Project Management and Coordination: Requirements for preinstallation meeting.

B. Convene minimum one week prior to commencing Work of this Section.

1.4 SUBMITTALS

A. Section 013300 - Submittal Procedures: Requirements for submittals.

B. Product Data: Submit manufacturer information for manhole frames and covers, inlet frames and grates, valve boxes and riser rings construction, features, configuration and dimensions.

C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

1.5 CLOSEOUT SUBMITTALS

A. Section 017700 - Closeout Procedures: Requirements for submittals.

B. Project Record Documents: Record actual grade-adjusted elevation of manholes.

1.6 QUALITY ASSURANCE

A. Perform Work according to NJDOT standards.

1.7 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum three years' documented experience.

B. Installer: Company specializing in performing Work of this Section with minimum three years' documented experience and approved by manufacturer.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Section 016000 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.

B. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.

C. Store materials according to manufacturer instructions.

D. Protection:

1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
2. Provide additional protection according to manufacturer instructions.

1.9 EXISTING CONDITIONS

A. Field Measurements:

1. Verify field measurements prior to fabrication.
2. Indicate field measurements on Shop Drawings.

PART 2 - PRODUCTS

2.1 MANHOLE FRAMES AND COVERS

1. Furnish materials according to NJDOT standards.

2.2 RISER RINGS

1. Furnish materials according to NJDOT standards.

B. Riser Rings:

1. Thickness of 4 Inches to 6 Inches:

a. Material: Precast concrete.
b. Comply with ASTM C478.

2. Thickness of Less than 4 Inches:

a. Material: Cast iron.
b. Comply with AASHTO M306.

3. Rubber Seal Wraps:

a. Wraps and Band Widths: Comply with ASTM C877, Type III.
b. Cone/Riser Ring Joint: Minimum 3-inch overlap.
c. Frame/Riser Ring Joint: 2-inch overlap.
d. Additional Bands: Overlap upper band by 2 inches.

C. Accessories:

1. Joint Sealant: Comply with ASTM C990.
2. Bolts: Galvanized steel; ASTM F1554.

2.3 SOURCE QUALITY CONTROL

A. Section 014000 - Quality Requirements: Requirements for testing, inspection, and analysis.

B. Certificate of Compliance:

1. If manufacturer is approved by authorities having jurisdiction, submit certificate of compliance indicating Work performed at manufacturer's facility conforms to Contract Documents.
2. Specified shop tests are not required for Work performed by approved manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Section 017300 - Execution: Requirements for installation examination.

B. Verify and locate manholes, inlets and valve boxes requiring:

1. Grade adjustment.
2. Replacement.

3.2 INSTALLATION

A. General

1. All manholes, covers, inlets, and catch basins shall be reset in accordance with these Specifications when the existing manholes, inlets catch basins or valve boxes are more than one- quarter inch (¼") over or under the grade shown on the Plans for the finished pavement or construction.
2. Cast Iron riser ring heights shall be in one quarter inch (¼") increments from 1 inch through 3 inches and shall be properly sized to afford a snug fit into the existing frame and receive the existing cover or grate.
3. Precast concrete raising rings shall be used where required height adjustment is between 4 and 6 inches.

B. Raising Manhole or Inlet Frames and Covers or Grates:

1. Locate and raise manholes to grade as indicated on Drawings.

2. Use flat or tapered concrete manhole rings or cast-iron riser rings to achieve indicated elevation for frame and cover.
3. Do not adjust elevation greater than 6 inches with concrete manhole rings.
4. Reinstall removed manhole frame and cover.

C. Lowering Manhole or Inlet Covers or Frames and Grates:

1. Remove the manhole or inlet frame and cover and lower the masonry top of the structure and reset on a cushion of cement mortar.

D. Adjust the height of existing two or three section circular valve boxes where a means of adjustment is incorporated into the original design. Where no adjustment is possible, remove and replace the valve box as directed by the Engineer.

E. Replacing Manhole or Inlet Frames and Covers:

1. Locate manholes for replacement of frames and covers as indicated on Drawings.
2. Remove existing manhole frames and covers.
3. Install new frames and covers for manholes as indicated on Drawings.
4. Adjust new frames and covers to match finished grade as indicated on Drawings.
5. Seal joints between manholes and manhole frames.

F. Paving Restoration:

1. Restore bituminous paving areas as specified in Section 321216 - Asphalt Paving.

- END OF SECTION -

SECTION 330509.33 - THRUST RESTRAINT FOR UTILITY PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Tied joint restraint system.
2. HDPE Wall Anchor Force Restraint Collar
3. HDPE Flex Coupling Restraint Device
4. Concrete Thrust Blocks

B. Related Requirements:

1. Section 013100 - Project Management and Coordination
2. Section 013300 - Submittal Procedures
3. Section 017700 - Closeout Procedures
4. Section 033000 – Cast-in-Place-Concrete
5. Section 312316.13 - Trenching
6. Section 331413 - Water Distribution Piping

1.3 REFERENCE STANDARDS

A. American Water Works Association:

1. AWWA C600 - Installation of Ductile-Iron Water Mains and Their Appurtenances

B. ASME International:

1. ASME B1.1 - Unified Inch Screw Threads, UN and UNR Thread Form

C. ASTM International:

1. ASTM A36/A36M - Standard Specification for Carbon Structural Steel
2. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
3. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware

4. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength
5. ASTM A325 - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength
6. ASTM A563 - Standard Specification for Carbon and Alloy Steel Nuts
7. ASTM A588/A588M - Standard Specification for High-Strength Low-Alloy Structural Steel, up to 50 ksi Minimum Yield Point, with Atmospheric Corrosion Resistance
8. ASTM B633 - Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel
9. ASTM D1248 - Standard Specification for Polyethylene Plastics Extrusion Materials for Wire and Cable
10. ASTM D3350 - ASTM D 3350-Standard Specification for Polyethylene Plastics Pipe and Fittings Materials
11. ASTM F436 - Standard Specification for Hardened Steel Washers

D. Plastics Pipe Institute, PPI

1. PPI Handbook of Polyethylene Pipe – 2009 (2nd Edition)

1.4 COORDINATION

A. Coordinate Work of this Section with installation of fittings and joints that require restraint.

1.5 SUBMITTALS

A. Product Data: Submit manufacturer catalog information for restrained joint details and installation instructions.

B. Shop Drawings:

1. Indicate restrained joint details and materials being used.
2. Submit layout drawings showing piece numbers and locations.
3. Indicate restrained joint locations.

C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

D. Delegated Design Submittals:

1. Submit joint restraint details.
2. Use joint restraint devices specifically designed for applications described in manufacturer information.

E. Manufacturer Instructions: Submit detailed instructions on installation requirements, including storage and handling procedures.

F. Qualifications Statement:

1. Submit qualifications for manufacturer.

1.6 CLOSEOUT SUBMITTALS

A. Project Record Documents: Record actual locations of joint restraints.

1.7 QUALITY ASSURANCE

A. Perform Work according to applicable standards as defined in these specifications.

1.8 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum three years' documented experience.

B. Fabricator: Company specializing in fabricating products specified in this Section with minimum three years' documented experience and approved by manufacturer.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.

B. Store materials according to manufacturer instructions.

C. Protection:

1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
2. Provide additional protection according to manufacturer instructions.

1.10 EXISTING CONDITIONS

A. Field Measurements:

1. Verify field measurements prior to fabrication.
2. Indicate field measurements on Shop Drawings.

PART 2 - PRODUCTS

2.1 PERFORMANCE AND DESIGN CRITERIA

A. Provide concrete thrust block at each location of Butt Fusion Tee, Mechanical Joint Branch Tee, Mechanical Tapping Tee or other mechanical connection fittings which result in change of direction of the pipeline or in accordance with Construction Detail drawings.

2.2 TIED JOINT RESTRAINT SYSTEMS

A. Manufacturers

1. American Cast Iron Pipe Co., 1501 31st Avenue North, Birmingham, AL 35207
2. EBAA Iron, Inc.,P.O. Box 877, Eastland, TX 76448
3. Star Pipe Products, 4018 Westhollow Pkwy, Houston, Texas 77082
4. Romac Industries, 21919 20th Avenue SE, Bothell, WA 98021
5. U.S. Pipe, Two Chase Corporate Drive, Suite 200, Birmingham, AL 35244

B. Tie Bolts:

1. Mechanical Joints on 2- and 3-Inch Pipe:

   a. Size:5/8 inch.
   b. Comply with ASTM A588/A588M, Grade B.
   c. Comply with ASTM A325, Type 3, except increase tensile strength of full-body threaded section to 40,000 lb. minimum for 5/8 inch and 60,000 lb. minimum for 3/4 inch by heat-treating (quenching and tempering) to manufacturer's reheat and hardness specifications.

2. Mechanical and Flanged Joints on 4- to 12-Inch Pipe:

   a. Size: 3/4 inch.
   b. Comply with ASTM A588/A588M, Grade B.
   c. Comply with ASTM A325, Type 3, except increase tensile strength of full-body threaded section to 40,000 lb. minimum for 5/8 inch and 60,000 lb. minimum for 3/4 inch by heat-treating (quenching and tempering) to manufacturer's reheat and hardness specifications.

C. Tie Nut:

1. Description: Hex nut for each tie bolt and tie rods.
2. Comply with ASTM A563, Grade C3.
3. Finish: zinc plated, or galvanized.

D. Tiepin:

1. Bends and Hydrants: 3/4-inch round bar stock.
2. Size and Shape: 6-inch hairpin.
3. Comply with ASME B1.1 and ASTM A588/A588M.
4. Finish: zinc plated, or galvanized.

E. Tie Coupling:

1. Description: Extension of continuous-threaded rods.
2. Provide with center stop to aid installation.
3. Comply with ASTM A588/A588M.
4. Finish: zinc plated, or galvanized.

F. Tie Clamp:

1. Description: Retainer clamp for ductile iron, asbestos-cement, and PVC push-on pipe.
2. Location: In front of bell.
3. Comply with ASTM A36/A36M, ASTM A307, Grade A, and ASTM A563, Grade A.
4. Finish: zinc plated, or galvanized.

G. Tie Rod:

1. Description: Continuous-threaded rod for cutting to desired lengths.
2. Comply with ASTM A588/A588M, Grade B, ASTM A325, Type 3, and ASME B1.1.
3. Finish: zinc plated, or galvanized.

H. Tie Bar:

1. Description: Steel bar used to restrain push-in plugs.
2. Comply with ASTM A36/A36M.
3. Finish: zinc plated, or galvanized.

I. Tie Washer:

1. Description: Round flat washers.
2. ASTM A588/A588M, ASTM F436, Type 1.
3. Finish: zinc plated, or galvanized.

2.3 CONCRETE ANCHORS

A. Furnish ready-mixed concrete in accordance with ASTM C 94 and QC-3. Use only Type 1 Portland cement of American manufacture. Use maximum one inch

coarse aggregate (size 5, 56, 57, 6, or 7). Slump shall not exceed 4 inches. No air entrainment. Compressive strength shall be at least 1500 psi after 28 days.

2.4 EXAMINATION

A. Verify that pipe and fittings are ready to receive Work.

B. Field measure and verify conditions for installation of Work.

2.5 PREPARATION

A. Clean surfaces of pipe and fittings that are to receive tied joint restraint systems.

2.6 INSTALLATION

A. According to AWWA C600.

B. Install joint restraint system such that joints are mechanically locked together to prevent joint separation.

C. Form and place concrete for thrust restraints in accordance with the Construction Detail drawings.

- END OF SECTION -

SECTION 330597 - IDENTIFICATION AND SIGNAGE FOR UTILITIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Detectable Warning Tape for placement above direct-buried utility.
2. Trace wire for placement above direct-buried utility.
3. Trace Wire Termination Boxes.
4. Signage

B. Related Requirements:

1. Section 013300 – Submittal Procedures
2. Section 017000 – Execution and Closeout Procedures
3. Section 017839 – Project Record Documents: Document actual installed locations of Tracer Wire access (termination) boxes
4. Section 312316.13 –Trenching: Backfilling considerations for installation of underground pipe markers.
5. Section 331413 – Water Distribution Piping: Piping, valves, and appurtenances requiring identification marking.

1.2 REFERENCE STANDARDS

1.3 SUBMITTALS

A. Section 013300 - Submittal Procedures: Requirements for submittals.

B. Product Data: Submit manufacturer catalog information for each specified product.

C. Samples: Submit one pipeline marker post, utility marker, 10 feet of ribbon tape, 10 feet of trace wire and one of each type of trace wire connectors.

D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

E. Qualifications Statement:

1. Submit qualifications for manufacturer.

1.4 CLOSEOUT SUBMITTALS

A. Section 017000 – Execution and Closeout Procedures: Requirements for submittals.

1.5 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum five years' documented experience.

PART 2 - PRODUCTS

2.1 DETECTABLE WARNING TAPE

A. Manufacturers:

1. ACP International, Arlington, TX
2. Marking Services Incorporated, Milwaukee, WI
3. Presco Products, Sherman, TX
4. Pro-Line Safety Products Co., West Chicago, IL
5. Reef Industries, Inc., Houston, TX

B. Description:

1. Detectable Warning Tape: Acid- and alkali-resistant, PE film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches wide and 4 mils thick, continuously inscribed with a description of utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches (750 mm) deep; colored in accordance with the American Public Works Association Uniform Color Codes using the ANSI standard Z535.1 Safety Colors as follows:

    a. Red: electric power lines, cables, conduit, and lighting cables.
    b. Orange: telecommunication, alarm or signal lines, cables, or conduit.
    c. Yellow: natural gas, oil, steam, petroleum, or other gaseous or flammable material.
    d. Green: sewers and drain lines.
    e. Blue: potable water.
    f. Purple: reclaimed water, irrigation, and slurry lines.

2.2 TRACE WIRE

A. Manufacturers:

1. Copperhead Industries, LLC, Monticello, MN
2. Kris-Tech Wire, Rome NY

B. Description:

1. Tracer Wire:

a. Open Trench - Trace wire shall be #12 AWG Copper Clad Steel, High Strength with minimum 450 lb. break load, with minimum 30 mil HDPE insulation thickness.
b. Directional Drilling/Boring - Trace wire shall be #12 AWG Copper Clad Steel, Extra High Strength with minimum 850 lb. break load, with minimum 30 mil HDPE insulation thickness.
c. Color: In accordance with the APWA Uniform Color Code for Underground Utility Lines.

2.3 TRACER WIRE TERMINATION BOX:

A. Manufacturers:

1. Bingham and Taylor
2. CP Test & Valve products
3. Cott Manufacturing Co.
4. Copperhead Industries
5. Handley Industries
6. Valvco
7. Or approved equivalent.

B. Description:

1. All trace wire termination points must utilize an approved trace wire access box specifically manufactured for this purpose. All tracer wire access boxes must include a manually interruptible conductive/connective link between the terminal for the tracer wire connection and the terminal for the ground rod wire connection. Grounding anode wire shall be connected to the identified (or bottom) terminal on all access boxes.
2. Design:

a. Flush Mount:

1) The Terminal box, or “fink box”, shall be flush mount type for installation at grade level in roadways or paved areas, H-20 highway rated. Terminal box shall be specifically manufactured for such application and shall consist of cast iron collar, tubular housing with flared bottom, terminal board with a minimum of two (2) terminals and removable lockable round lid.

b. Above Grade Mount:

1) The above grade access point s shall be specifically manufactured for such application and shall have a minimum of two (2) terminals, provision for mounting either on conduit, hydrant flange or drive–in ground stake.

C. Construction:

1. Flush mount type: Lid and terminal board material: High strength UV resistant HDPE, ABS or polycarbonate plastic. Lid to be molded in color according to type of service. Collar: Cast Iron ASTM A-48 Class 30. Tubular Housing: ABS or PVC with flared bottom.
2. Above grade type: Body to be UV resistant HDPE, ABS or polycarbonate plastic molded in color according to type of service.
3. Hardware:

   a. Flush Mount type: Locking mechanism with bronze, brass or anodized aluminum pentagon head bolt shall secure lid to base in a closed position.
   b. All types: Fasteners, Terminals and Jumper: All materials of construction shall be impervious to chemicals typically used for snow and ice removal and pavement and hardscape maintenance.
   c. Wire Connections: Separate tracer wire and ground rod wire connection points. Set screws or hex nuts shall secure tracer wire and ground wire to terminals.

4. Marking: All access boxes shall be appropriately identified and be color coded.
5. Color: In accordance with the APWA Uniform Color Code for Underground Utility Lines.

2.4 SIGNAGE

1. Weatherproof signage in shall be fabricated and provided in accordance with example(s) shown on the plans. Free standing signs shall be mounted on durable posts and located over the pipeline centerline.
2. Hydrant Identification Signs shall be fabricated in accordance with the example(s) shown on the plans. Signs shall be affixed to the body of the hydrant by means of aluminum or stainless steel strap and mounting hardware. Attachment hardware shall not require penetration or modification to hydrant body.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Pipeline Marker Posts, Utility Markers, and Marking Flags: According to manufacturer instructions.

B. Tracer Wire:

1. All conductive and non-conductive service lines shall include tracer wire. Install HMW-PE jacket coated #12 AWG tracer wire adjacent to pipe prior to backfilling. The tracer wire shall be laid within 6 inches of the plastic pipe where practical and directly above if possible. Do not tape or otherwise attach the trace wire directly to the pipe. The tracer wire shall be installed so that electrical continuity is maintained throughout the pipe system. All mainline trace wires must be interconnected in intersections, at mainline tees and mainline crosses. At tees, the three wires shall be joined using a single 3-way lockable connector. At crosses, the four wires shall be joined using a 4-way connector. Use of two 3-way connectors with a short jumper wire between them is an acceptable alternative.
2. Connections shall be made by:

    a. Direct bury wire connectors – shall include 3-way lockable connectors and mainline to lateral lug connectors specifically manufactured for use in underground trace wire installation. Connectors shall be dielectric silicon filled to seal out moisture and corrosion, and shall be installed in a manner so as to prevent any uninsulated wire exposure.
    b. Non locking friction fit, twist on or taped connectors are prohibited.

3. Termination/Access:

    a. All tracer wire termination points must utilize an approved tracer wire access box (above ground access box or grade level/in-ground access box as applicable), specifically manufactured for this purpose and installed as follows:

        1) Hydrants - Above-ground tracer wire access boxes will be installed on all fire hydrants. The tracer wire must terminate at the above-ground tracer wire access box, which shall be properly affixed to the hydrant grade flange utilizing 5/8” bolt for hydrants with 5/8” bolts, and ¾” for hydrants with ¾” bolts. Affixing with tape or plastic ties shall not be acceptable.
        2) Service Laterals - Tracer wire on all water service laterals must terminate at an approved at-grade, two-terminal tracer wire access box, color coded blue, and located directly above

the service lateral immediately adjacent to the waterline's entrance to the facility served.

b. At all dead-end mains, service laterals, and curb stops, tracer wire shall go to ground using an approved connection to a drive-in magnesium ground anode rod with a minimum of 20ft of #14 red HDPE insulated copper clad steel wire connected to anode (minimum 1.5 lb.) specifically manufactured for this purpose, and buried at the same elevation as the utility.

   1) When grounding the trace wire at dead ends/stubs, the grounding anode shall be installed in a direction 180 degrees opposite of the trace wire, at the maximum possible distance.
   2) When grounding the trace wire in areas where the trace wire is continuous and neither the mainline trace wire or the grounding anode wire will be terminated at/above grade, install grounding anode directly beneath and in-line with the trace wire.

c. Do not coil excess wire from grounding anode. In this installation method, the grounding anode wire shall be trimmed to an appropriate length before connecting to trace wire with a mainline to lateral lug connector.
d. Where the anode wire will be connected to a trace wire access box, a minimum of 2 ft. of excess/slack wire is required after meeting final elevation.

C. Installation Standards:

1. Trace wire installation shall be performed in such a manner that allows proper access for connection of line tracing equipment, proper locating of wire without loss or deterioration of low frequency (512Hz) signal for distances in excess of 1,000 linear feet, and without distortion of signal caused by multiple wires being installed in close proximity to one another.
2. Trace wire systems must be installed as a single continuous wire, except where using approved connectors. No looping or coiling of wire is allowed.

D. Detectable Warning Tape:

1. Install detectable warning tape directly above all piping, 12 inches below finished grade, except 6 inches below subgrade under pavements and slabs.
2. If multiple pipes occur in common trench, locate tape above centerline of trench.
3. Coordinate with trench Work as specified in Section 31 23 16.13 - Trenching.

E. Prohibited Products and Methods

1. The following products and methods shall NOT be allowed or acceptable:

    a. Uninsulated tracer wire
    b. Stainless steel tracer wire
    c. Tracer wire insulations other than HDPE
    d. Non-locking, friction fit, twist on, or taped connectors
    e. Brass or copper ground rods
    f. Wire connections utilizing taping or spray-on waterproofing
    g. Looped wire or continuous wire installations that have more than one wire laid side-by- side or in close proximity to one another
    h. Tracer wire wrapped around the corresponding utility
    i. Brass fittings with tracer wire connection lugs
    j. Wire terminations within the roadway in valve boxes, cleanouts, manholes, etc.
    k. Connecting tracer wire to existing conductive utilities

3.2 TESTING

A. All new tracer wire installations shall be located using typical low frequency (512 Hz) line tracing equipment, witnessed by the contractor, engineer, and facility owner as applicable, prior to acceptance of ownership.

B. This verification shall be performed upon completion of rough grading and again prior to final acceptance of the project.

C. Continuity testing in lieu of actual line tracing shall not be accepted.

3.3 RECORD DRAWINGS

A. Record actual locations of all trace wire access boxes on record drawings.

- END OF SECTION -

SECTION 331413 - WATER DISTRIBUTION PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Pipe and fittings for potable water line for installation in Utility Trench “A”.
2. Tapping sleeves and valves.
3. Pipe support systems.

B. Related Requirements:

1. Section 033000 - Concrete: Concrete for pipe cradles and encasements and reinforcing steel and required supports for cradles and encasements.
2. Section 312316.13 – Trenching: For excavation and backfill requirements.
3. Section 330509.33 - Thrust Restraint for Utility Piping: Tied joint restraint system to anchor and resist forces developed in underground closed pipeline systems.
4. Section 330597 - Identification and Signage for Utilities: Pipe markers, tracer wire, detectable warning tape and signage for buried piping.
5. Section 331419 - Valves and Hydrants for Water Utility Service: Yard hydrants, valves, and valve boxes for yard hydrant and water main installations.

1.3 REFERENCE STANDARDS

A. American Galvanizers Association (AGA):

1. Inspection of Products Hot-dip Galvanized After Fabrication.
2. The Design of Products to be Hot-dip Galvanized After Fabrication.
3. Recommended Details of Galvanized Structures.
4. Quality Assurance Manual.

B. American Society of Mechanical Engineers:

1. ASME B16.1 - Gray Iron Pipe Flanges and Flanged Fittings: Classes 25, 125, and 250.

C. ASTM International:

1. A36 - Standard Specification for Carbon Structural Steel.
2. A123 - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
3. A143 - Standard Practice for Safeguarding Against Embrittlement of Hot Dip Galvanized Structural Steel Products and Procedure for Detecting Embrittlement
4. A153 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
5. A384 - Standard Practice for Safeguarding Against Warpage and Distortion During Hot-Dip Galvanizing of Steel Assemblies
6. A385 - Standard Practice for Providing High-Quality Zinc Coatings (Hot-Dip)
7. A563 - Standard Specification for Carbon and Alloy Steel Nuts
8. A780 - Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings
9. E376 - Practice for Measuring Coating Thickness by Magnetic-Field or Eddy-Current (Electromagnetic) Test Methods.
10. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength.
11. ASTM A395 - Standard Specification for Ferritic Ductile Iron Pressure-Retaining Castings for Use at Elevated Temperatures

D. American Water Works Association:

1. AWWA C104 - Cement-Mortar Lining for Ductile-Iron Pipe and Fittings.
2. AWWA C110 - Ductile-Iron and Gray-Iron Fittings.
3. AWWA C111 - Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
4. AWWA C115 - Flanged Ductile-Iron Pipe with Ductile-Iron or Gray-Iron Threaded Flanges.
5. AWWA C151 - Ductile-Iron Pipe, Centrifugally Cast.
6. AWWA C153 - Ductile-Iron Compact Fittings.
7. AWWA C500 - Metal-Seated Gate Valves for Water Supply Service.
8. AWWA C600 - Installation of Ductile-Iron Mains and Their Appurtenances.
9. AWWA C606 - Grooved and Shouldered Joints.
10. AWWA C800 – Underground Service Line Valves and Fittings

E. Federal Specifications

1. DOD-P-21035 Paint, High Zinc Dust Content, Galvanizing Repair
2. MIL-P-26915 Primer Coating, Zinc Dust Pigmented

F. Manufacturers Standardization Society of the Valve and Fittings Industry:

1. MSS SP-60 - Connecting Flange Joints between Tapping Sleeves and Tapping Valves.

G. National Fire Protection Association:

1. NFPA 24 - Standard for the Installation of Private Fire Service Mains and Their Appurtenances.

H. NSF International:

1. NSF 61 - Drinking Water System Components - Health Effects.
2. NSF 372 - Drinking Water System Components - Lead Content.

1.4 SUBMITTALS

A. Section 013300 - Submittal Procedures: Requirements for submittals.

B. Product Data: Submit manufacturer information regarding pipe materials, pipe fittings, valves, service saddles, pipe supports, hangers and hardware.

C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

D. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.

E. Preconstruction Photographs: Submit digital files of color photographs of Work areas and material storage areas, as specified in Section 017000 – Execution Closeout Procedures.

F. Qualifications Statements:

1. Submit qualifications for manufacturer and installer.

1.5 CLOSEOUT SUBMITTALS

A. Section 017000 – Execution and Closeout Procedures: Requirements for submittals.

B. Project Record Documents: Record actual locations of piping mains, valves, connections, thrust restraints, and centerline elevations.

C. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

1.6 QUALITY ASSURANCE

A. Valves: Mark valve body with manufacturer's name and pressure rating.

B. Materials in Contact with Potable Water: Certified according to NSF 61 and NSF 372.

C. Perform Work according to Philadelphia Water Department standards.

1.7 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum five years' documented experience.

B. Installer: Company specializing in performing Work of this Section with minimum three years' documented experience in installation of liner materials.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Section 016000 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.

B. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.

C. Storage:

1. Store materials according to manufacturer instructions.
2. Block individual and stockpiled pipe lengths to prevent moving.
3. Do not place pipe or pipe materials on private property or in areas obstructing pedestrian or vehicle traffic.

D. Protection:

1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
2. Provide additional protection according to manufacturer instructions.

1.9 EXISTING CONDITIONS

A. Field Measurements:

1. Verify field measurements prior to fabrication.
2. Indicate field measurements on Shop Drawings.

1.10 WARRANTY

A. Section 017000 – Execution and Closeout Procedures: Requirements for warranties.

B. Furnish ten (10) -year manufacturer's warranty for valves.

PART 2 - PRODUCTS

2.1 BACKFILL

A. Furnish Sand Backfill for pipe zone in accordance with ASTM C 33 (fine aggregate) and the following:
   1. Gradation:

a. Sieve Number	200	100	50	16	4
b. Percent Passing	0-5	0-8	5-30	50-98	98-100

   2. pH: between 5.5 and 8.5.
   3. Electrical Resistivity: 10,000 ohm-centimeters, minimum.
   4. Character: clean, free from lumps of clay or other deleterious substances.

B. Ordinary Backfill Material may include all material excavated from the trench and free of objectionable matter, unless rejected by the Owner or Owner's Representative. The Contractor shall furnish any deficiency of Ordinary Backfill Material.

C. Furnish Select Backfill Material in accordance with the most recent revision or amendment to PennDOT Publication 408 Specifications, Section 703.3, Select Granular Material-2RC. The use of slag as Select Backfill Material is hereby prohibited.

2.2 DI PIPE

A. Furnish ductile iron push-on joint pipe in accordance with AWWA C151 and C150/A21.50. Furnish gaskets in accordance with AWWA C111. Furnish all pipe with double-thickness cement lining in accordance with AWWA C104.

B. Cast into, stamp or paint on each pipe: the manufacturer's mark; casting number; year of cast; "DI"; class of pipe. Markings shall be clear and legible.

C. Class, wall thickness, and weight per foot of barrel of DI pipe of the various sizes shall be as follows:

Nominal Diameter	Class	Thickness (in.)	Wt. of Barrel per ft. (lbs)
12 inch	56	0.49	59.9
8 inch	56	0.45	37.2
6 inch	56	0.43	26.7
4 inch	54	0.35	15.0

D. Where Polyethylene Encasement is required by the Contract Documents, furnish DI Pipe With Polyethylene Encasememt in accordance with ANSI/AWWA C105/A21.5, American National Standard for Polyethylene Encasement for Ductile Iron Piping for Water and Other Liquids.

2.3 DI FITTINGS

A. Furnish Compact DI Fittings in accordance with AWWA C153 for Crosses 3” through 16”; and Bends, Tees, Reducers and Sleeves 3" through 24".

B. Furnish DI Fittings (rated at least 350 psi) in accordance with AWWA C110 for Crosses 18” through 24”; Offsets, Caps and Plugs 3” through 12”.

C. Furnish gaskets, glands, nuts and bolts in accordance with AWWA C111. Furnish all fittings with double-thickness cement lining in accordance with AWWA C104 or furnish all fittings coating and lining with a thickness fusion bonded epoxy conforming to the requirements of ANSI/AWWA C550 and C116/A21.16. Bolts shall be high-strength, low-alloy steel.

D. Cast into, stamp or paint on each fitting: the manufacturer's mark; casting number; year of cast; "DI"; weight before cement lining; pressure rating. Markings shall be clear and legible.

E. Furnish fittings with mechanical joint bell ends at all openings unless otherwise directed. Furnish bell and spigot fittings where necessary for connection to existing mains; furnish lead and pure gum rubber scarfed packing gasket acceptable to the Owner or Owner’s Representative.

2.4 CONCRETE ANCHORS

A. Furnish ready-mixed concrete in accordance with ASTM C 94 and QC-3. Use only Type 1 Portland cement of American manufacture. Use maximum one inch coarse aggregate (size 5, 56, 57, 6, or 7). Slump shall not exceed 4 inches. No air entrainment. Compressive strength shall be at least 1500 psi after 28 days.

2.5 WATER SERVICE CONNECTIONS

A. Not Applicable

2.6 COMPOSITION BRONZE CASTINGS

A. Where copper-based component castings are required for fittings, valves, and corporation stop ferrules, furnish castings in accordance with AWWA C 800 and ASTM B 584. Use only Copper Alloy UNS No. C 83600 (Composition Bronze, commercial 85-5-5-5 alloy) in accordance with ASTM B 62 for this work. This alloy consists, nominally, of 85% copper, 5% tin, 5% lead, and 5% zinc. Do not use alloys containing more than 5% lead for castings which will come into contact with potable water.

2.7 ELECTROLYSIS CORROSION CONTROL

A. Furnish corrosion control materials in accordance with Section 331125 and W-23 except as modified below.

B. Attention is directed to the second paragraph of W-23.2.1. Thick-N-Quick Mastic as produced by Utility Products Company and Roskote Mastic R28 Rubberized as manufactured by Royston Laboratories, Inc. are acceptable protective coatings for mechanical joints, miscellaneous iron and steel, etc. However, Bitumastic 50 as manufactured by Koppers Company is no longer acceptable for this use, and Royston Laboratories, Inc. has discontinued production of Roskote A-938.

2.8 PIPE GASKET LUBRICANT

A. Furnish lubricant for lubricating rubber gaskets used in push-on joint or mechanical joint pipe assemblies. Pipe gasket lubricant shall be odorless and suitable for use in potable water systems. Furnish Blue Lube pipe gasket lubricant as manufactured by Whitlam Chemicals, 200 W. Walnut Street, P.O. Box 71, Wadsworth, Ohio 44281-0071 (1-800-321-8358) or approved equal. Alternatives to the Blue Lube lubricant must be approved by the Water Department’s Bureau of Laboratory Services.

2.9 PIPE END PLUGS

A. All DI pipe shall be capped upon delivery. Furnish commercially manufactured plugs for the purpose of plugging the ends of 8”pipe, which awaits installation at the job site. The plugs shall fit tightly so as to be secure in the ends of the pipe. The plug’s design shall prevent over insertion into the pipe.

B. Other sizes of pipe may be capped by securely tapping six-millimeter polyethylene plastic over their ends.

PART 3 - EXECUTION

3.1 MAINTENANCE AND PROTECTION OF TRAFFIC DURING CONSTRUCTION

A. Maintain and protect traffic during construction as required elsewhere in these Contract Documents.

3.2 EXCAVATING

A. Excavate in accordance with the Standard Specifications for Excavation, Refilling, Grading, Landscaping, and Repaving. Excavation will not be classified, whether by type of material encountered, or by type of equipment required.

B. Use sheathing and shoring sufficient to avoid damage to or settlement of adjacent paving and underground structures.

C. Use of a Hydro-Hammer or similar equipment for breaking existing paving is prohibited.

D. Where shown on the plans, remove existing CI water manhole frames and covers and deliver them to Water Department Storage Yard at 28th and Clearfield Streets. Remove existing water manhole structure two feet below surface elevation.

3.3 INSTALLING WATER MAINS

A. Install pipe, fittings, valves, hydrants, anchors, and all appurtenances in accordance with the Contract Documents, and in accordance with AWWA C600 and the manufacturer's recommendations as they apply.

B. Place 6 inches of Sand Backfill in trench before placing pipe, fittings, valves, etc. grade and compact to uniform bearing for full length of each pipe section. Use wood template to assure a straight trench bottom, free of humps and hollows, and at the required grade. Correct all irregularities by leveling, filling, and tamping. Use no blocking. Provide bell groove at each joint, with at least 2 inches clearance below bell.

C. Maintain at least 6 inches clearance between water mains and other underground structures.

D. Cut and plug existing water mains as directed by the Owner or Owner's Representative.

E. Install hydrants in accordance with standard details. At hydrant installations on 6" - 16" mains exclusively, install hydrant anchoring tees so hydrant line valves are near the main. Substitution of mechanical joint tees shall only be permitted if authorized by the Owner or Owner's Representative. After hydrant installation is completed, inspect the hydrant's painted riser surfaces for nicks and scratches and repaint as required to prevent further degradation of the painted surface. Tops of hydrants shall be painted green or red when connected to larger size mains to enable the Fire Department to quickly differentiate them from any others. The bonnets of hydrants shall be color coded as follows:

Main Size	Hydrant Bonnet Color
6" - 8"	Orange
10" - 14"	Green
> 16"	Red

The hydrant bonnets shall be painted with Rust-Oleum 7600 series of VOC industrial enamels. The following is a list of Rust-Oleum's color name and number for each color:

Color	Rust-Oleum Color Name	Number
Orange	Equipment Orange	7656
Green	Safety Green	7633

Do not install any new fire hydrant, nor relocate any existing fire hydrant, until location is approved in field by the Owner or Owner's Representative.

F. Between any two mechanical-joint fittings, use at most one piece of pipe shorter than standard length.

G. Furnish approved pipe gasket lubricant (Blue Lube or approved equal) in sufficient quantities to provide proper fitting for each connection. Apply lubricant to the gasket using a clean applicator brush kept free from soil, grease, coatings, or other potential contaminants.

H. Restrain all pipe joints within 12 feet of a bend, branch of a tee, valve, or hydrant.

I. Place Concrete Anchors in accordance with Standard Details for Water Mains.

J. Where the Corrosion Control plans require Electrolysis Corrosion Control work, perform such work as shown on the plan(s) and in accordance with W-23. Where polyethylene encasement is required by the Contract Documents, install DI Pipe with polyethylene encasement.

K. Disinfect all new water mains in accordance with W-22 and AWWA C651.

L. Test new water mains in accordance with AWWA C600, Section 4. Take all necessary precautions to prevent test pressure from entering adjoining distribution system. Test distribution mains at 150 psi for at least one hour. Hydrostatic test shall be completed with no measurable drop in pressure. Upon a drop in pressure, determine the amount of leakage by measuring the additional quantity of water that is pumped into the main to maintain pressure within 5 psi of the specified test pressure. Where the measured leakage exceeds the established allowable amounts then the Contractor shall, at his own expense, locate and make approved repairs as necessary until the leakage is within the specified allowance. Repair all visible leaks, regardless of the amount of leakage.

1. Set Valve Boxes to grade, true and plumb, with valve operating nut centered in box.

3.4 BACKFILLING AND COMPACTING

A. Place and compact backfill in accordance with the Standard Specifications for Excavation, Refilling, Grading, Landscaping and Repaving, except as herein modified.

B. Do not place backfill around any structure requiring time to gain strength (e.g., masonry or concrete), until so directed by the Owner or Owner's Representative.

C. Placement of Sand Backfill, Ordinary Backfill and Select Backfill Material-2RC for water mains, water services and abandoned water manholes:

1. Place Sand Backfill as described in the Standard Details for Water Mains (as amended).
2. Place Ordinary Backfill Material (with all stones and other objectionable material removed) around and to a depth of 6 inches over all water services.
3. Place Ordinary Backfill Material up to 12 inches below subgrade elevation over all water mains and services.
4. Place Select Backfill Material-2RC for remaining 12 inches up to subgrade elevation over all water mains and services.
5. Place Select Backfill Material-2RC into all abandoned water manholes from bottom of manhole up to subgrade elevation.
6. Compact sand backfill under pipes and fittings by mechanical tamping. Compact sand backfill around and over pipes and fittings by hand tamping in 8 inch layers. Compact all other backfill in 8 inch layers by mechanical tamping. Puddling is prohibited.

3.5 REPAVING

A. Restore all disturbed paving, curb, and grass areas as required elsewhere in the Contract Documents.

3.6 PIPE STORAGE

A. Pipes shall be inspected and verified to be clean immediately upon delivery and then plugged so soil, trash, and other contaminates cannot easily enter them while they await installation. Pipes brought to the site with debris shall be cleaned and swabbed before plugging. Inspect pipes for missing caps regularly and replace immediately. During installation inspect pipes upon removing the plugs in order to ensure no debris is present.

PART 4 CONTRACTOR'S QUALITY CONTROL REQUIREMENTS

3.7 GENERAL

A. Comply with applicable provisions of Division 01 Section "Quality Requirements".

B. Quality Certification Standards: Precast Concrete Products, Gray / Ductile Iron Castings, Ready-Mixed Concrete, Fire Hydrants, Ductile Iron Pipe & Fittings, and Resilient-Seated Gates Valves (3" to 12" Dia.) shall conform to QC-1, QC-2, QC-3, QC-5, QC-8, and QC-12 respectively.

C. DI Pipe and Fittings: Inspection by Purchaser at manufacturer's plant is hereby waived. In addition to the standard acceptance tests, the manufacturer shall perform a special test for ductility (either the ball impression test or the ring test).

D. In addition, the Contractor supplied quality control shall consist of:

1. Maximum Density-Optimum Moisture. The Contractor shall obtain a maximum density-optimum moisture curve in accordance with requirements specified herein for each material used a backfill.
2. Compaction Tests. The Contractor shall obtain in-place field densities, at the sampling rate of one test per 10 cubic yards or less for the full width of each layer of backfill placed.
3. Reports. A report of all preliminary test results and maximum density-optimum moisture curves shall be made and given to the Owner's Representative prior to use of the material as backfill. A report of all in-place densities shall be made and given to the Owner's Representative within 48 hours of making the tests.

- END OF SECTION -

SECTION 331419 - VALVES AND HYDRANTS FOR WATER UTILITY SERVICE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Valves.
2. Valve Boxes.
3. Fire Hydrants.
4. Sanitary Yard (Post) Hydrants.

B. Related Requirements:

1. Section 033000 - Cast-in-Place Concrete
2. Section 310516 - Aggregates for Earthwork
3. Section 330509.33 - Thrust Restraint for Utility Piping
4. Section 330597.00 Identification and Signage for Utilities
5. Section 331413 - Water Distribution Piping

1.3 REFERENCE STANDARDS

A. American Society of Sanitary Engineers (ASSE)

1. ASSE 1052 - Performance Requirements for Hose Connection Backflow Preventers.
2. ASSE 1057 - Performance Requirements for Freeze Resistant Sanitary Yard Hydrants with Backflow Protection.

B. ASTM

1. B61 Standard Specification for Steam or Valve Bronze Castings
2. B62 Standard Specification for Composition Bronze or Ounce Metal Castings.
3. D2683 Standard Specification for Socket-Type Polyethylene Fittings for Outside Diameter-Controlled Polyethylene Pipe and Tubing.
4. D3261 Standard Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing.

C. American Water Works Association:

1. AWWA C153-11 Ductile-Iron Compact Fittings
2. AWWA C216 Heat-Shrinkable Cross-Linked Polyolefin Coatings for Steel Water Pipe and Fittings
3. AWWA C500 - Metal-Seated Gate Valves for Water Supply Service.
4. AWWA C502 - Dry-Barrel Fire Hydrants.
5. AWWA C509 - Resilient-Seated Gate Valves for Water Supply Service.
6. AWWA C515 - Reduced-Wall, Resilient-Seated Gate Valves for Water Supply Service
7. AWWA C521 – Plastic Ball Valves
8. AWWA C550 - Protective Interior Coatings for Valves and Hydrants.
9. AWWA C901 - Polyethylene (PE) Pressure Pipe and Fittings, 4 In. Through 65 In. for Waterworks
10. AWWA C906 - Polyethylene (PE) Pressure Pipe and Fittings, 1/2 In. Through 3 In. for Waterworks

D. National Fire Protection Association:

1. NFPA 291 - Recommended Practice for Fire Flow Testing and Marking of Hydrants.

E. City of Camden Fire Department

F. NSF International:

1. NSF 61 - Drinking Water System Components - Health Effects.
2. NSF 372 - Drinking Water System Components - Lead Content.

1.4 COORDINATION

A. Section 013100 – Project Management and Coordination: Requirements for coordination.

B. Coordinate Work of this Section with installation of water mains.

1.5 PREINSTALLATION MEETINGS

A. Section 013100 – Project Management and Coordination: Requirements for preinstallation meeting.

1.6 SUBMITTALS

A. Section 013300 - Submittal Procedures: Requirements for submittals.

B. Product Data: Submit manufacturer information regarding component materials, fittings, assembly and parts diagram, and accessories.

C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

D. Manufacturer Instructions: Submit detailed instructions on installation requirements, including storage and handling procedures.

E. Source Quality-Control Submittals: Indicate results of factory tests and inspections.

F. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.

1.7 CLOSEOUT SUBMITTALS

A. Section 017000 - Execution: Requirements for submittals.

B. Project Record Documents: Record actual locations of valves and hydrants.

1.8 MAINTENANCE MATERIAL SUBMITTALS

A. Tools: Furnish three (3) tee wrenches of adequate length required for buried valves to Owner.

1.9 QUALITY ASSURANCE

A. Materials in Contact with Potable Water: Certified according to NSF 61 and NSF 372.

B. Cast manufacturer's name, pressure rating, and year of fabrication into valve body.

C. Maintain one copy of each standard affecting Work of this Section on Site.

1.10 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum five years' documented experience.

B. Installer: Company specializing in performing Work of this Section with minimum five years' documented experience.

1.11 DELIVERY, STORAGE, AND HANDLING

A. Delivery:

1. Seal valve and hydrant ends to prevent entry of foreign matter.
2. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.

B. Store materials according to manufacturer instructions.

C. Protection:

1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
2. Provide additional protection according to manufacturer instructions.

PART 2 - PRODUCTS

2.1 VALVES

A. Performance and Design Criteria:

1. Pressure Rating:

a. 12-inch Diameter and Smaller: 200 psig.
b. 14-inch Diameter and Larger: 150 psig.

2. End Connections:

a. Mechanical Joint with internal stiffener for connection to HDPE Pipe.
b. Male Barbed Spigot with pressed HDPE Stub for electrofusion or butt fusion with steel compression sleeve complying with AWWA C906.
c. PE 4710 molded end spigot integral with body for electrofusion or butt fusion (2 inch and smaller).

3. Hardware and Internal HDPE Stiffeners

a. 304 Stainless Steel

4. Coatings:

a. Valves:

1) Comply with AWWA C550.

a) Application: Interior and exterior.

b. Steel Compression Sleeves

1) Comply with AWWA C216.

B. Double-Disc Gate Valves:

1. Manufacturers:

a. McWane, Inc.; Clow Valve Co. Div.
b. McWane, Inc.; Kennedy Valve Div.
c. McWane, Inc.; M & H Valve Company Div.
d. Mueller Co.; Water Products Div.

2. Description:

a. Comply with AWWA C500.
b. Materials:

1) Body: Iron.
2) Trim: Bronze.

c. Seat Type: Double disc; parallel.
d. Stem:

1) Type: Non-rising.
2) Seals: O-ring.

e. Operation:

1) Square operating nut.
2) Opening Direction: Counterclockwise.

C. Resilient-Wedge Gate Valves:

1. Manufacturers:

a. McWane, Inc.; Clow Valve Co. Div.
b. McWane, Inc.; Kennedy Valve Div.
c. McWane, Inc.; M & H Valve Company Div.
d. Mueller Co.; Water Products Div.
e. Leemco, Inc.
f. American AVK Company
g. American Valve & Hydrant Co.

2. Description:

a. Comply with AWWA C509 or C515.
b. Body: Ductile iron.

c. Seats: Resilient.
d. Stem:

1) Type: Non-rising.
2) Material: Bronze.

e. Operation:

1) Square operating nut.
2) Opening Direction: Counterclockwise.

D. HDPE Ball Valves:

1. Manufacturers

a. Integrity Fusion Products.
b. American AVK Company
c. Kerotest Manufacturing Corp.

2. Description:

a. Design: Comply with AWWA 521
b. Materials:
1) Comply with AWWA C901 or C906
2) Body: High Density Polyethylene (PE 4710), flat base.
3) Ends: High Density Polyethylene (PE 4710), butt fusion or electrofusion.
4) Ball: Polypropylene.
5) Retainer: Polypropylene
6) Stem: Stainless Steel
7) Operating Nut: Polypropylene.
8) Ball Seat: EPDM
9) Weather Seal: EPDM
10) Stem Seals: EPDM
c. Operating Nut: 2” square nut
d. Seals: Dual O-ring.
e. Operation: Positive position indication, over-torque protection.
f. Opening Direction: Counterclockwise
g. Connections: Butt Fusion or Electrofusion
h. Bore: Full Port
i. SDR: 9.0

3. Certifications:
a. NSF 61

2.2 FIRE HYDRANTS

A. Manufacturers:

1. Clow Valve Company
2. Kennedy Valve Company
3. Mueller Company
4. Furnish materials complying with:

    a. City of Camden Fire Department requirements.

B. Dry-Barrel, Breakaway Type:

1. Comply with AWWA C502.
2. Body: Cast iron.
3. Valve: Compression type.
4. Burial Depth: As indicated on Drawings.
5. Inlet Connection Size: 6 inches.
6. Valve Opening: 5-1/4 inches in diameter.
7. End Connections:

    a. Mechanical Joint with internal stiffener for connection to HDPE Pipe.
    b. Male Barbed Spigot with pressed HDPE Stub for electrofusion or butt fusion with steel compression sleeve complying with AWWA C906.

8. Bolts and Nuts: 304 Stainless Steel
9. Interior Coating: Comply with AWWA C550.
10. Opening Direction: Counterclockwise.
11. Operating Nut: Pentagon or Triangular to comply with City of Camden Fire Department requirements.

C. Hose Connections:

1. One pumper, two hose nozzles.
2. Obtain thread type and size from City of Camden Fire Department.
3. Attach nozzle caps by separate chains.

D. Finishes:

1. Primer and two coats of enamel as specified in Section 099000 - Painting and Coating.
2. Body Color: Orange.
3. Bonnet Color: Color coded to identify the diameter of the water main feeding the fire hydrant in accordance with City of Camden Fire Code Requirements.

2.3 YARD (POST) HYDRANTS

A. Manufacturers

1. MIFAB, Inc.
2. Murdock Manufacturing.
3. Woodford Manufacturing.

B. Description:

1. Sanitary Post Hydrant – Self purging, non-freezing, compression type sanitary yard hydrant. Hydrant design shall include vacuum breaker or other means designed to prevent the flow of water, or other liquids, into the potable water supply from any source other than those intended. There shall be no potential cross-connections between the potable water supply and any hose or drain outlet. The hydrant freeze protection feature shall not require the disconnection or removal of the delivery hose from the outlet connection.

    a. Inlet:
        1) Size: 1 inch, 1 ½ inch or 2 inch
    b. Nozzle:
        1) Size: 3/4 inch or 1 inch.
        2) Material: Brass.
        3) Fitting: Male thread.
        4) Type: Removable.
        5) Equipped with Vacuum Breaker
    c. Casing:
        1) Description:
            a) Cast Iron.
            b) Galvanized Steel
            c) Stainless Steel
            d) Bronze
    d. Drain:
        1) Self flushing with integral self purging reservoir located below frost line discharging above ground. Hydrants discharging to gravel bed or other point below grade are not acceptable.
    e. Operating Rod:
        1) Description: Stainless Steel.
        2) Operation: Lever or Wheel Handle.
    f. Valve: Bronze or Brass conforming to ASTM B61and B62.
    g. Working Pressure: Min. 30 psig
        1) Delivery Volume: Min. 2.5 GPM @ 30 psig
    h. Bury Depth:
            a) Min. 48” below finished grade.
            b) In accordance with local building codes or other Authority having jurisdiction.

i. Certifications:
   1) ASSE 1057 - Type 1
   2) ASSE 1052
   3) NSF 372 & NSF 61
j. Identification:
   1) Section 220553 - Identification for Plumbing Piping and Equipment defines requirements.
      a) Body Color – Safety Green complying with APWA Uniform Color Code
      b) Lettering – “POTABLE WATER”

2.4 VALVE BOXES

A. Manufacturers:

1. Bingham and Taylor
2. East Jordan Iron Works
3. Star Pipe Products

B. Description:

1. 12-inch Diameter Valves and Smaller:

   a. Material: Cast Iron - Two or three section as required, including Cover, Top, Bottom and Intermediate section(s).
   b. Type: Screw type adjustable circular valve box, with flush fitting lid and oval or circular bell type base designed for use with applicable valve size.
   c. Cover type: Non Locking
   d. Diameter: As noted on plans.

2. Lid Inscription: WATER.

2.5 ACCESSORIES

A. Thrust Restraints: As specified in Section 330509.33 - Thrust Restraint for Utility Piping.

B. Valve Box Aligner: High-strength plastic device designed to automatically center valve box base and to prevent it from shifting off center during backfilling

C. Fire Hydrant Drainage Gravel: As specified in Section 310516 - Aggregates for Earthwork.

D. Signage: Comply with Section 330597.00 Identification and Signage for Utilities

2.6 WARRANTIES

A. Fire Hydrants: 10 Years.

B. Valves: 10 Years

2.7 SOURCE QUALITY CONTROL

A. Provide shop inspection and testing of completed assembly.

B. Certificate of Compliance:

1. If manufacturer is approved by authorities having jurisdiction, submit certificate of compliance indicating Work performed at manufacturer's facility conforms to Contract Documents.
2. Specified shop tests are not required for Work performed by approved manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Section 017000 - Execution: Requirements for installation examination.

B. Determine exact location and size of valves from Drawings.

C. Identify required lines, levels, contours, and datum locations.

D. Verify that elevations of existing facilities prior to excavation and installation of valves and hydrants are as indicated on Drawings.

3.2 PREPARATION

A. Section 017000 - Execution: Requirements for installation preparation.

B. Locate, identify, and protect from damage utilities to remain.

C. Do not interrupt existing utilities without permission and without making arrangements to provide temporary utility services.

1. Notify Engineer not less than seven days in advance of proposed utility interruption.
2. Do not proceed without written permission from Engineer.

3.3 INSTALLATION

A. Perform trench excavation, backfilling, and compaction as specified in:

1. Section 312316.13 - Trenching

B. Install valves and hydrants in conjunction with pipe laying.

C. Install tracer wire and install Tracer Wire Connection Boxes as shown on the plans.

D. Provide buried valves with valve boxes installed flush with finished grade. Paint water valve box cover blue in accordance with the APWA Uniform Color Codes

E. Provide support blocking and drainage gravel while installing fire hydrants; do not block drain hole.

F. Orientation:

1. Set valves and hydrants plumb.
2. Set fire hydrants with pumper nozzle facing roadway.
3. Set fire hydrants with centerline of pumper nozzle 18 inches above finished grade and with safety flange not more than 6 inches nor less than 2 inches above grade.

G. After main-line pressure testing, flush fire hydrants and check for proper drainage.

3.4 FIELD QUALITY CONTROL

A. Section 014000 - Quality Requirements: Requirements for inspecting and testing.

- END OF SECTION -

SECTION 334200 - STORMWATER CONVEYANCE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Stormwater drainage piping.
2. Manholes.
3. Catch basins (Inlets).
4. Cleanouts.
5. Underdrains.
6. Bedding and cover materials.

B. Related Requirements:

1. Division 03, Section 033000 “Cast-in-Place Concrete”: Concrete type for inlet or manhole base pad construction.
2. Division 31, Section 310516.00 “Aggregates for Earthwork”: Aggregate for backfill in trenches.
3. Division 31, Section 312316.13 “Trenching”: Execution requirements for trenching as required by this Section.
4. Division 33, Section 330597.00 “Identification and Signage for Utilities”: Underground pipe markers.

1.2 DEFINITIONS

A. ABS: Acrylonitrile butadiene styrene.

B. NBR: Acrylonitrile Butadiene Rubber. (Buna-N)

1.3 REFERENCE STANDARDS

A. American Association of State Highway and Transportation Officials:

1. AASHTO M252 - Standard Specification for Corrugated Polyethylene Drainage Pipe.
2. AASHTO M288 - Standard Specification for Geotextile Specification for Highway Applications.
3. AASHTO M294 - Standard Specification for Corrugated Polyethylene Pipe, 300- to 1500-mm (12- to 60-in.) Diameter.
4. AASHTO T 180 - Standard Method of Test for Moisture-Density Relations of Soils Using a 4.54-kg Rammer and a 457-mm Drop.

B. ASTM International:

1. ASTM A74 - Standard Specification for Cast Iron Soil Pipe and Fittings.
2. ASTM A123/.
3. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
4. ASTM A746 - Standard Specification for Ductile Iron Gravity Sewer Pipe.
5. ASTM C76 - Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe.
6. ASTM C443 - Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets.
7. ASTM C564 - Standard Specification for Rubber Gaskets for Cast Iron Soil Pipe and Fittings.
8. ASTM D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3 (600 kN-m/m3).
9. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN-m/m3).
10. ASTM D2235 - Standard Specification for Solvent Cement for Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe and Fittings.
11. ASTM D2321 - Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications.
12. ASTM D2564 - Standard Specification for Solvent Cements for Poly(Vinyl Chloride) (PVC) Plastic Piping Systems.
13. ASTM D2680 - Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) and Poly(Vinyl Chloride) (PVC) Composite Sewer Piping.
14. ASTM D2729 - Standard Specification for Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
15. ASTM D2855 - Standard Practice for the Two-Step (Primer and Solvent Cement) Method of Joining Poly (Vinyl Chloride) (PVC) or Chlorinated Poly (Vinyl Chloride) (CPVC) Pipe and Piping Components with Tapered Sockets.
16. ASTM D3034 - Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
17. ASTM D6938 - Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).
18. ASTM F405 - Standard Specification for Corrugated Polyethylene (PE) Pipe and Fittings.
19. ASTM F477 - Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.
20. ASTM F667/F667M - Standard Specification for 3 through 24 in. Corrugated Polyethylene Pipe and Fittings.

C. New Jersey, Department of Transportation (NJDOT):

1. Standard Specifications for Road and Bridge Construction, 2019.

1.4 COORDINATION

A. Division 01, Section 013100 “Project Management and Coordination”: Requirements for coordination.

B. Coordinate Work of this Section with termination of storm sewer connections outside building, trenching, and connections to existing stormwater collection system.

1.5 SUBMITTALS

A. Division 01, Section 013300 “Submittal Procedures”: Requirements for submittals.

B. Product Data: Submit manufacturer information describing pipe, pipe accessories, manholes, manhole accessories, pipe seals, cleanouts and utility castings.

C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

D. Manufacturer Instructions: Submit special procedures required to install specified products.

E. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.

F. Qualifications Statement:

1. Submit qualifications for manufacturer.

1.6 CLOSEOUT SUBMITTALS

A. Division 01, Section 017700 “Closeout Procedures”: Requirements for submittals.

B. Project Record Documents: Record actual locations of pipe runs, connections, catch basins, cleanouts, and rim and invert elevations.

C. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

1.7 QUALITY ASSURANCE

A. Perform Work according to NJDOT Specifications.

1.8 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum five years' documented experience and approved by:
   1. New Jersey, Department of Transportation:

1.9 DELIVERY, STORAGE, AND HANDLING

A. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.

B. Store materials according to manufacturer instructions.

C. Protection:

   1. Protect materials from damage, moisture and dust by storing in clean, dry location remote from construction operations areas.
   2. Provide additional protection according to manufacturer instructions.

1.10 EXISTING CONDITIONS

A. Field Measurements:

   1. Verify field measurements prior to installation.
   2. Indicate field measurements on Record Drawings.

PART 2 - PRODUCTS

2.1 STORM DRAINAGE PIPING

A. Ductile-Iron Piping:

   1. Pipe:

      a. Comply with ANSI/AWWA Standards C151/A21.51, Class 56.
      b. Type: Service.
      c. Inside Nominal Diameter: as noted on the plans.
      d. Ends: Bell and spigot with push on or mechanical joints - gasketed.

   2. Fittings:

      a. Ductile Iron Fittings shall conform to ANSI/AWWA Standards C110/A21.10 or ANSI/AWWA Standards C153/A21.53.

   3. Joints and Joint Components:

a. Ductile Iron in accordance with the requirements of ANSI/AWWA Standards C111/A21.11
b. Gaskets: Nitrile (Buna-N) Rubber gasket.

2.2 CATCH BASINS (INLETS)

A. Shaft and Top Section:

1. Material: Reinforced precast or cast-in-place concrete.
2. Joints: Lipped male/female.
3. Nominal Dimensions:
   a. Circular – 48 inches minimum interior.
   b. Rectangular or Square – 30 inches minimum interior.
4. Top Section: Concentric, Eccentric or Flat Top as noted on the plans.

B. Grates and Frames:

1. Manufacturers:
   a. Barry Pattern & Foundry, Birmingham, AL
   b. Campbell Foundry, Harrison, NJ
   c. East Jordan Iron Works, East Jordan, MI
   d. Emporia Foundry, Emporia, VA
   e. Neenah Foundry, Neenah, WI

2. Materials:
   a. Grey Iron, ASTM A48 Class35.
   b. Ductile Iron, ASTM A536

3. Cover or Grate:
   a. Design: As indicated on plans.
   b. Load Rating: Heavy Duty (HS-20), unless noted otherwise on plans.

4. Nominal Cover and Frame Size:
   a. As noted on plans.

C. Base Pad:

1. Material: Cast-in-place concrete, as specified in Division 03, Section 033000 “Cast-in-Place Concrete”.

2.3 MATERIALS

A. Bedding and Cover:

1. Refer to Specification Division 31, Section 312316.13 “Trenching”.

2.4 FINISHES

A. Steel Galvanizing:

1. Comply with ASTM A123/A123M.
2. Hot-dip galvanized after fabrication.

B. Galvanizing for Nuts, Bolts, and Washers: Comply with ASTM A153/A153M.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Division 01, Section 017700 “Closeout Procedures”: Requirements for installation examination.

B. Verify that excavation base is ready to receive Work of this Section.

C. Verify that excavations, dimensions, and elevations are as indicated on Drawings.

3.2 PREPARATION

A. Correct over-excavation with AASHTO No. 57 stone bedding.

B. Remove large stones and other hard matter that could damage piping or impede consistent backfilling or compaction.

3.3 INSTALLATION

A. Excavation and Bedding:

1. Excavate trench to depth below pipe invert, hand trim excavation for accurate placement of piping to indicated elevations and place bedding material at trench bottom as specified in Division 31, Section 312316.13 “Trenching”.

B. Pipe, Fittings, and Accessories:

1. General Locations and Arrangements: Drawing plans and details indicate general location and arrangement of underground piping. Location and arrangement of piping layout take design considerations into account. Install piping as indicated, to extent practical. Where specific installation is not indicated, follow piping manufacturer's written instructions.

2. Install piping beginning at low point, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions for using lubricants, cements, and other installation requirements.
3. Install manholes for changes in direction, unless fittings are indicated. Use fittings for branch connections, unless direct tap into existing sewer is indicated.
4. Install proper size increasers, reducers, and couplings where different sizes or materials of pipes and fittings are connected. Reducing size of piping in direction of flow is prohibited.
5. Install gravity-flow, nonpressure, drainage piping according to the following:
   a. Install piping pitched down in direction of flow, at minimum slope of 1 percent, unless otherwise indicated.
   b. Install piping at depths indicated on the plans.
   c. Install hub-and-spigot, ductile-iron piping according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook."
6. Clear interior of piping and manholes of dirt and superfluous material as work progresses. Maintain swab or drag in piping, and pull past each joint as it is completed. Place plug in end of incomplete piping at end of day and when work stops.
7. Backfilling and Compaction:
   a. Do not displace or damage pipe while compacting.

C. Catch Basins (Inlets) and Cleanouts:

1. Form bottom of excavation clean and smooth, and to indicated elevation.
2. Form and place cast-in-place concrete base pad, with provision for storm sewer pipe end sections.
3. Level top surface of base pad.
4. Sleeve concrete shaft sections to receive storm sewer pipe sections.
5. Establish elevations and pipe inverts for inlets and outlets as indicated on Drawings.
6. Mount lid and frame level in grout, secured to top section to indicated elevation.

3.4 TOLERANCES

A. Division 01, Section 014000 “Quality Requirements”: Requirements for tolerances.

B. Maximum Variation from Indicated Pipe Slope: 1/8 inch in 10 feet.

3.5 FIELD QUALITY CONTROL

A. Division 01, Section 014000 “Quality Requirements”: Requirements for testing, adjusting, and balancing.

B. Inspection:

1. Request inspection by Engineer prior to and immediately after placing aggregate cover over pipe.

C. Testing:

1. Compaction Test:

a. Comply with ASTM D1557.
b. Testing Frequency: in accordance with Division 31, Section 312316.13 “Trenching”.

2. If tests indicate that Work does not meet specified requirements, remove Work, replace, and retest.

3.6 PROTECTION

A. Division 01, Section 015000 “Temporary Facilities and Controls”: Requirements for protecting finished Work.

B. Protect pipe and aggregate cover from damage or displacement until backfilling operation is in progress.

PART 4 – MEASUREMENT AND PAYMENT

A. Pay item shall be measured and paid for on a per foot basis for each diameter of pipe to be installed. Tying new piping into an existing manhole is considered incidental to this work.

- END OF SECTION -

SECTION 341110 – CONTINUOUS WELDED RAIL (CWR)

PART 1 - GENERAL

1.1 SUMMARY

A. This Section specifies the material requirements and performance criteria for the supply and fabrication of Continuous Welded Rail (CWR) to be furnished in accordance with Contract Documents.

1.2 REFERENCES

A. American Railway Engineering and Maintenance of Way Association (AREMA):

1. Manual for Railway Engineering
2. Portfolio of Trackwork Plans
3. Specifications for Special Trackwork

B. Association of American Railroads (AAR)

1. AAR: Manual of Standards and Rec. Practices
2. AAR Section J: Quality Assurance M-1003

C. American Society for Testing and Materials (ASTM):

1. ASTM E10: Test Method for Brinell Hardness of Metallic Materials
2. ASTM E94: Recommended Practice for Radiographic Testing
3. ASTM E164: Standard Practice for Ultrasonic Contact Examination of Weldments

D. American Welding Society (AWS):

1. AWS B2.1: Standards for Welding Procedures and Performance Qualifications
2. AWS D1.1: Structural Welding Code

1.3 DEFINITIONS

A. Detail Fractures – A progressive fracture originating near the rail surface from a shell or head check

B. Rail Wear – The change in shape of the cross-sectional area of the rail head due to the passage of rail traffic and grinding

C. Shelling – A rail condition consisting of one or more horizontal separation that may originate in the rail head and may crack out at the gage side of the rail.

Shelling normally originates towards the gage side of the rail head and extends longitudinally

D. Spalling – A rail surface condition that is the direct result of micro-cracking, often with material separating from the surface of the rail head.

1.4 SUBMITTALS

A. INFORMATIONAL SUBMITTALS

1. Submit supporting information within 30 days of award documenting the past successful performance in furnishing and fabricating CWR.to Class 1 Freight, passenger or commuter railroads within the last ten (10) years including references and contact numbers at the railroads where the CWR has been placed in service.
2. Submit specifications of the proposed equipment, materials, methods and procedures to be used for the electric flash butt welding process for joining of rail.

B. ACTION SUBMITTALS

1. Submit for review and approval quality control and quality assurance plans and related certifications such as ISO 9001 or equivalent, demonstrating that the Contractor has the processes, personnel, and systems to produce high quality CWR.
2. Submit all material testing results and submittals stipulated in the AREMA Manual and as required by this specification.
3. Submit qualifications of welding supervisor documenting flash butt welding experience of no less than three years.

1.5 QUALITY ASSURANCE

A. Contractor's Quality Control Program (QCP) shall be in accordance with the AAR M- 1003 or Engineer approved equivalent quality control program. Comply with AREMA Portfolio of Trackwork Plans.

B. Equipment used for the manufacturing materials shall be in good operating condition, of adequate capacity and range, and accurately calibrated. Testing equipment shall be certified and traceable to national standards such as the National Institute of Standards and Technology.

C. Testing and inspection of CWR manufacture shall be performed by Contractor in conformance with AREMA Manual.

D. Material not meeting the requirements of this Specification shall not be used.

1.6 DELIVERY, STORAGE AND HANDLING

A. Section 016000 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.

B. The Contractor shall load, transport, and deliver rail in a manner which will prevent damage to the rail. Contractor shall submit to Engineer the procedures and equipment information for loading, unloading, handling, and storing rail.

C. The material is to be delivered to the project site at a place designated by the Engineer. The delivery must be coordinated with Engineer prior to shipping and loading. Orders can be combined and shipped on or before the delivery scheduled with approval by Engineer.

PART 2 - PRODUCTS

2.1 CWR

A. Rail furnished shall be new 136RE section conforming to AREMA Volume 1, Chapter 4, Section 2.1, Specifications for Steel Rails. and as follows:

1. Rail to be installed on tangent track and in curves equal to or less than 13 degrees (radius equal to or greater than 441.68') shall be Carbon Steel, Standard Strength and shall meet or exceed 310 HB (Brinell Hardness).
2. Rail to be installed in curves greater than 13 degrees (radius less than 441.68') shall be Carbon Steel, High Strength and shall meet or exceed 370 HB (Brinell Hardness).

B. If the Contractor furnished CWR are in sections of strings, CWR shall be manufactured on-site by welding rail sections of either 39 or 80 foot lengths into 1,400 feet strings. A maximum of 10 percent of the rails may be short lengths. For the 39-foot rail lengths acceptable shorts are 36, and 33 feet. For 80-foot rail lengths, acceptable shorts are 78, 74 and 70 feet.

2.2 SOURCE QUALITY CONTROL

A. Rail and welds shall be ultrasonically tested as per AREMA Section 2.1 8.

B. Surface and internal hardness shall be determined as per AREMA Section 2.1.3.

C. Perform ultrasonic testing on all welds in accordance with ASTM E164.

D. For fabrication of CWR, flash butt production welds shall be tested during the fabrication process by a qualified inspection agency as previously approved by the Engineer, using the dry powder method of magnetic particle inspection (or

ultrasonic method) in accordance with ASTM E709 and the AREMA Manual of Railway Engineering, Chapter 4.

PART 3 - EXECUTION

3.1 GENERAL

A. Flash butt welding and testing of rail shall conform to the current AREMA Manual, Chapter 4, Part 2, Section, "Specification for Fabrication of Continuous Welded Rail" unless otherwise specified herein.

B. Fabrication shall be in accordance with this specification.

C. Rejected welds shall be cut out and rewelded with a minimum of 19'-6” plugs at Contractor's expense.

D. Bolt holes at ends of CWR strings are only acceptable for use during loading and unloading of strings and must be cut out by approved methods following placement of the CWR in track prior to completing field welding. No payment for footage of CWR supplied shall be made to include any such footage removed as noted.

3.2 EQUIPMENT

A. The welding machine shall be capable of automatically recording pertinent data including pre-heating impulses, flashing time, upset current, time and platen travel during flashing and shall be capable of testing the welds during production using the ultrasonic testing method or the dry powder method of magnetic particle inspection. The Contractor shall maintain welding equipment in good working order at all times.

3.3 RAIL BENDING AND STRAIGHTENING

A. Straightened rail sections shall achieve the alignment tolerance as specified in AREMA Manual, Chapter 4.

B. Any rail sections that cannot be straightened shall be cut back a sufficient distance to achieve the specified tolerances.

C. If straightened rail does not meet specification tolerance in two passes through the straightener, it will be cut out of the string.

3.4 RAIL CUTTING AND END PREPARATION

A. Rails used for electric-flash butt welds shall have their ends saw-cut or abrasive disc-cut clean and square by means of accepted equipment.

B. Torch cutting of rail is prohibited.

C. The head and base of the rail for a length of approximately six inches from welding end shall have mill scale removed down to bright metal.

D. All burrs shall be removed from the area where the welding current carrying electrodes contact on the head and base of the rail.

E. Holes will not be permitted in the rail, except as approved by Engineer.

3.5 ELECTRIC FLASH BUTT WELDING

A. CWR strings shall be fabricated so that all of the branding appears on one side of the string.

B. Alignment of rail in the welding machine shall:

1. Be done on the head of the rail.
2. Vertical alignment shall provide for a flat running surface. Any difference in height of the rails shall be in the base.
3. Horizontal alignment shall be done in such a manner that any difference in the widths of heads of rails shall be divided equally on both sides of the head.
4. All electric flash butt welds shall be forged to point of refusal to further plastic deformation and have a minimum upset of 0.5 inches with 0.625 inches as standard.
5. The upset cylinder shall not bottom out during the upset portion of the weld cycle.
6. Post weld straightening may be permitted if performed before the surface temperature of the weld falls below 500 degrees Fahrenheit. Quenching the weld metal shall not be permitted on standard rail. Quenching of premium rail weld is permitted and shall be per the standard industry practice as accepted by class I railroad.

3.6 FINISHING AND ALIGNMENT

A. Jagged, notched or badly mismatched end faces shall be preflashed to an even or mated condition before setting up rails for preheating and final flashing to assure that the entire surfaces of rail ends are uniformly flashing immediately preceding upsetting.

B. All heavy grinding used in the finishing process shall be performed on the hot metal immediately following welding, to prevent metallurgical damage.

C. Finishing shall eliminate cracks visible to the unaided eye. Notches created by offset conditions shall be eliminated by grinding to blend variations.

D. All notches created by offset conditions or twisted rails shall be eliminated by grinding to blend the variations.

E. All fins on the weld due to grinding drag shall be removed prior to final inspection.

3.7 TOLERANCES IN ELECTRIC FLASH BUTT WELDS

A. Trimming and grinding of rail welds shall result in the weld being within the tolerances set forth in the AREMA Manual, Chapter 4, Part 2, Section "Specifications for Fabrication of Continuous Welded Rail."

3.8 RECORDS FOR ELECTRIC FLASH BUTT WELDING

A. A record shall be submitted to Engineer documenting the production of each string of CWR. Included shall be the following:

1. The CWR string designation number and station location in the field.
2. The heat numbers of each piece of rail in the string.
3. The heat numbers on each side of any weld which has been cut out and rewelded.
4. Record information produced by the welding equipment including the pre-heating impulses, flashing time, upset current, time and platen travel during flashing, a sketch or graph indicating the current flow during the production of each weld.

3.9 VISUAL INSPECTION

A. Production welds shall be visually inspected for surface cracks.

B. Welds with surface cracks visible to the eye will not be accepted.

3.10 REPLACEMENT OF DEFECTIVE WELDS

A. Flash butt production welds giving fault indication in magnetic particle inspection during production shall be cut, rewelded and retested and shall not be left for field welding.

PART 4 - MEASUREMENT AND PAYMENT

A. Work of this Section is considered incidental to work associated with project

- END OF SECTION -

SECTION 341123 - SPECIAL TRACKWORK

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes specifications for furnishing all labor, materials, and equipment for the designing, manufacturing, testing, fabricating, shipping, and unloading of double tongue switches, crossing frogs, restraining rail, direct fixation rail plates & other miscellaneous hardware. All special trackwork will be designed to be compatible with direct fixation fasteners and embedment in concrete or other pavement materials/.

B. Related Sections: The work of the following Sections is related to the work of this Section. Other Sections, not referenced below, may also be related to the proper performance of this work.

1. Section 341110.00 - Continuously Welded Rail (CWR)
2. Section 341129.00 – Construct Continuously Welded Rail Track
3. Section 341133.00- Timber Crossties.
4. Section 341133.22 – Steel Crossties.
5. Section 341190.00 – Track Appurtenances and Accessories
6. Section 347205.00 – Construct Turnouts
7. Section 347210.00 – Field Weld Rails
8. Section 347215.00 – Rail Connections
9. Section 347220.00 – Other Track Material (OTM)

1.2 REFERENCES

A. This Section incorporates by reference the latest revision of the following documents.

1. American Railway Engineering and Maintenance-of-Way Association (AREMA)
   a. AREMA Manual for Railway Engineering, Chapter 4, "Rail" (AREMA Manual)
   b. AREMA Portfolio of Trackwork Plans (AREMA Plan)
      1) Plan No. 100, Specifications for Special Trackwork" (AREMA Specifications)

B. This Section incorporates by reference the latest revision of the following documents. It is a part of this Section as specified and modified. In case of a conflict between the requirements of this Section and those of a listed document, the requirements of this Section shall prevail.

1. American Society for Testing and Materials (ASTM):
   a. ASTM A325 Specification for High Strength Bolts for Structural Steel Joints
   b. ASTM B633 Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel
   c. ASTM D2240 Standard Test Method for Rubber Property – Durometer Hardness
   d. ASTM E10 Standard Test for Brinell Hardness of Metallic Materials
   e. ASTM E94 Standard Test for Radiographic Testing
2. American Welding Society (AWS)
   a. AWS D1.1 Structural Welding Code - Steel
3. American Association of State Highway and Transportation Officials (AASHTO)
   a. Standard Specification for Highway Bridges
4. American Institute of Steel Construction (AISC)
   a. Steel Construction Manual
5. American Society of Mechanical Engineers (ASME)
   a. B18 Lock Washers Specification

1.3 SUBMITTALS

A. Procedures: Section 013300, Submittal Procedures.

1. Name(s) of supplier(s) and manufacturers for the special trackwork components
2. Shop drawings and supporting drawings for the various types of special trackwork.
3. Installation and maintenance instructions by the manufacturer for the various trackwork components.
4. Inspection results in accordance with the requirements of other Sections of these specifications and applicable A.R.E.M.A. Specifications including but not limited to the following:
   a. Tests for Frog Depth Hardening.
   b. Section 340110.00, Continuously Welded Rail (CWR)
   c. Section 341129.00 - Construct Continuously Welded Rail Track.
   d. Section 3472220.00 - Other Track Material

1.4 QUALITY ASSURANCE

A. Develop and maintain a quality control program regulating methods, procedures, and processes to ensure compliance with standards of quality required by the Contract Documents, as specified in Section 014000, Quality Requirements, including inspection and testing, samples and use of certificates of compliance.

B. Survey the special trackwork to determine the acceptability of the installation and provide the Engineer with a copy of the report. Correct deviations from the Contract Drawings that exceed specified tolerances at no additional cost to Owner.

PART 2 - PRODUCTS

2.1 GENERAL

A. Fabricate special trackwork components as indicated on Contract Drawings, approved Shop Drawings, and in accordance with AREMA Standards and these specifications.

B. For special trackwork use direct fixation construction as documented on the Contract Drawings.

C. Construct special trackwork with zero cant throughout the installation.

2.2 RAIL

A. Running rail for switch, frog and restraining rails for special trackwork and precurved rails:

1. 136RE in accordance with AREMA Manual
2. High strength head hardened in accordance with AREMA Chapter 4, including Supplemental Requirements,
3. Brinell hardness: 341 to 401.
4. Accompanied by manufacturer's records of rail inspection as described in AREMA Chapter 4 Part 2 Section 2.1.14.

B. Guard rails for turnouts.

1. 136RE Section machined and drilled to guard length indicated on Contract Drawings.
2. Type: Bolted
3. Brinell hardness: 341 Brinell minimum.

2.3 CROSSING FROGS

A. SM crossing frogs: Designed by the special trackwork manufacturer.

B. SM frog castings: Depth hardened in accordance with Article 3.3 A, herein.

C. Frog plates: Designed by the special trackwork manufacturer. Final design of the fasteners for the frogs and the crossing design will be coordinated between the special trackwork supplier and the fastener supplier.

D. Rail crossing frogs for STS Crane Runway shall be of the Solid Manganese Steel type, designed and fabricated in conformance with the Contract Drawings and approved Shop Drawings, AREMA Specifications Article M2. and AREMA Portfolio of Trackwork Plans.

1. Fishing area of crossing frogs shall be designed for connection to 136RE for the railroad siding track legs and 135CR of the dockside STS Crane runway legs and in configuration and horizontal track centerline geometry as indicated on the drawings.

2.4 SWITCH APPURTENANCES

A. Joint Bars: Section 347215.00 - Rail Connections defines requirements for joint bars.

B. Track bolts, hex head bolts, square head bolts, nutlocks, and washers:

1. Complying with AREMA Specifications.
2. Hex or square head bolts for use in restraining rail attachment: ASTM A325.

C. Metal components:

1. Corrosion-resistant and consistent with strength and hardness requirements.
2. Sufficiently ductile to withstand installation and maintenance activities.
3. For iron castings use ductile iron conforming to ASTM A-536.

D. Resilient spring clips: Pandrol e-Clip, non-insulated, or equal, right hand mounted and considered part of the switch plate or direct fixation plates.

E. Rail Plates

1. Standard Rail Plates: For fastening single rail:
   a. One punched hole for one-anchor bolt assembly at each end of the plate in accordance with the drawings.
   b. Hole diameter: elongated as shown on the drawings or as recommended by the Contractor's Supplier of anchor bolt assembly.
   c. Thickness 1/2inch, minimum.
   d. Weld-on shoulders for spring clips rail fastening: Pandrol #7299 Forged Weld-on Shoulder or equal.
   e. Compatible for placement of non-shrink epoxy levelling grout beneath the plate as indicated on drawings and as location requires.

F. Other Special Trackwork Plates: For fastening two rails, frogs, guard rail, and restraining rail for direct fixation special trackwork construction:
   a. For anchoring two rails: Two punched holes for two-anchor bolt assemblies at each end of the plate. If spacing between two rails

allows for two rail clips installation, punch two additional mounting holes at the center of the plates.

b. Hole diameter: elongated as shown on the drawings or as recommended by the Contractor's Supplier of anchor bolt assembly.
c. Thickness 1/2inch, minimum.
d. Weld-on shoulders for spring clips rail fastening: Pandrol #7299 Forged Weld-on Shoulder or equal.
e. Place non-shrink epoxy grout under the plate as indicated on drawings and as installation location requires.

G. Direct fixation special trackwork anchor bolts and other threaded elements:

1. Threaded elements: high strength steel conforming to ASTM A325, compatible with anchor inserts.
   a. Thread length may vary from that specified for structural bolts.
   b. Threaded elements in the fastener: Include a positive means of preventing the loosening of the element due to in-service vibrations.
   c. Furnish threaded element installation data for the use by others. Include, at the least, data on the bolt torque range in foot-pounds. For the torque range provide the minimum tension as specified by the AISC - Steel Construction Manual.
2. Anchor bolts:
   a. 7/8-inch diameter, 9 UNC, Class 2A thread and capable of providing a minimum of 1 inch of insert thread engagement with 1/2 inch of vertical shims under the rail fastener.
   b. Coated with a water-resistant coating as thread protection against rusting prior to shipment.
3. Washers: 7/8-inch diameter, zinc-plated in accordance with ASTM B 633, Type III, SC2.
   a. Lock: ASME B18.21.1, Type 302, extra duty.
   b. Circular: ASME B18.22.1, Type B, regular.
4. Direct Fixation Special Trackwork Anchor Inserts:
   a. Description: Female threaded anchor inserts with 7/8-inch anchor bolts used to secure the rail fastener to the concrete trackbed and include a feature to prevent rotation of the insert after the concrete or epoxy grout has reached its design strength.
   b. Material: ASTM A325
   c. 7/8-inch diameter, 9 UNC, Class 2B thread fit.
   d. Accessories: Threaded Plug, metal or plastic material to preclude the entrapment of moisture, concrete, or other foreign materials during transport, handling, and installation. Plug shall be easily removable by use of a socket or other common drive device, and capable of reinsertion with no reduction in integrity of seal.
   e. Coating: Epoxy resin, 100 percent dry powder epoxy insulating coating applied with following characteristics:

1) Provide coating of between 10 mils and 20 mils when tested by a magnetic mil gauge at not less than two areas of the insert. Epoxy coating with runs, sags, or chips will not be acceptable.
2) Hardness: No less than 85 nor more than 90 Shore D, in accordance with ASTM D2240.
3) Application: In accordance with the manufacturer's recommendations and meeting the following test requirements:
    a) Perform Holiday Test to detect pin holes and breaks in coating as follows:
        (1) Place coated insert in a weak electrolytic solution.
        (2) Apply a 100 volt dc electrical current between the electrolyte and the insert.
        (3) Acceptance: No measurable current when the insert is immersed in the electrolytic solution.
        (4) The above tests shall be performed by the epoxy coating applicator at a frequency specified in the sequential statistical quality control plan developed by the epoxy coating applicator and approved by the Engineer.
        (5) The plan shall ensure that the average defective rate shall not exceed two percent and that the maximum defective rate shall not exceed five percent. These defective rates shall be demonstrated at a 90 percent degree of confidence.
4) Acceptable products:
    a) Scotch Kote Fusion Bonded Epoxy No. 206N, manufactured by the Minnesota Mining and Manufacturing Company
    b) Corvel Epoxy ECB-1363A, manufactured by the Polymer Corporation,
    c) Approved equivalent.

2.5 FROG GUARD RAILS:

A. Manufactured in accordance with the Contract Drawings.

1. 136RE Section, machined and drilled to guard rail lengths as shown on the Contract Drawings.
2. Furnished with the accessories as indicated on the Contract Drawings.
3. Separator Blocks: malleable or ductile iron.

B. Flangeway:

1. In accordance with AREMA Standard Plan #502.
2. End block and separator blocks: Cast or fabricated.
3. Frog guard rail bolts:
   a. High strength, conforming to the requirements of ASTM A325, A490 or Grade 8, and class 2A and 2B thread fit.
   b. Thread length may vary as required for the specified structural bolts.
   c. Use a steel spring washer or equivalent spring device as positive means of preventing the loosening of the element due to in-service vibrations.
4. Fasteners: Designed as indicated in the Contract Drawings.

2.6 RESTRAINING RAILS

A. Restraining rail: Fabricated of new standard 136 RE rail section in accordance with the requirements specified in Section 341110.00, Continuously Welded Rail, and modified as noted in this specification, and as shown on the Contract Drawings.

B. Precurve restraining rail to match each curve as shown on the Contract Drawings. Precurve restraining rail in accordance with the requirements specified in Section 341110.00, Continuously Welded Rail.

C. Furnish end rails of precurved restraining rails with tangent extensions 13 feet in length and planed at one end. as shown on the drawings.

D. Furnish restraining end sections complete with 12-inch-long filler block and reinforcing bars, 1/2 inch thick in accordance with AREMA Plan #325 for 136 RE rail and having two circular bolt holes, 1 inch diameter, 4 inch spacing. Include bolts, nuts, spring washer, headlocks and tailocks.

E. Separator blocks for use between inside running rails and restraining rail at locations as shown on the plans shall provide flangeway in accordance with that designated for track centerline curvature as noted on AREMA plan #791. Blocks shall be 4 inches in length, with one circular bolt hole 1-7/16 inch diameter, furnished complete with headlock and tailock washers. Ensure washers bear fully against the rail web and provide flat bearing surfaces for bolts. Include 1-3/8 inch diameter bolts, nuts and spring washers. Furnish seven separator blocks for each 39-foot length of restraining rail, including tangent extensions.

F. Furnish end blocks (two per curve) 12 inches long with 1-7/16 inch circular holes with restraining rail for each curve. Use end blocks in accordance with AREMA Plan 504-89 to provide required flangeway width and no taper. Furnish each end block with two 1-3/8 inch diameter bolts complete with washers.

G. Restraining rail bolts:

1. High strength type conforming to the requirements of ASTM Designations A325, A490 or Grade 8, and with Class 2A and 2B thread fit.
2. Thread length: may vary as required from that specified for structural bolts.
3. Equipped with a double coil steel spring washer, elastomeric rebound washer or equivalent spring device as a positive means of preventing the loosening of the element due to in-service vibrations.
4. Furnish restraining rail joint, end block, and separator block assemblies with filler blocks and appropriate reinforcing bars or washers wired together to prevent loss of parts.

2.7 SWITCH LUBRICANT

A. Dry graphite or insulating film-type.

1. Acceptable products:
   a. Dixon 500
   b. Whitmore Easy Switch
   c. Superior Graphite Co.
   d. Approved equal.

PART 3 - EXECUTION

3.1 RAIL PRECURVING

A. Where the Contract Documents require, perform precurving of rail in accordance with conventional railroad industry frog and switch shop procedures and in accordance with the track centerline radii shown on the Contract Drawings and approved Shop Drawings.

B. Identify precurved rail with painted identity numbering of each rail in accordance with the approved Shop Drawings prepared and submitted by the contractor to the Engineer. Paint identity numbers so that they are visible from both the top and side of the rails.

C. Precurve rail such that after curving the base of rail lies level or flat when positioned on the switch or tie plate. Do not use the fastening to draw the base down.

D. Uniformly curve rail such that the deviation of the interior mid-ordinate offset from the theoretical offset is within the tolerances for straight rail using the appropriate chord distance required by the straight rail specification.

3.2 RAIL CUTTING, DRILLING, AND BEVELING

A. Cut rails square and clean by means of rail saws or abrasive cutting wheels in accordance with AREMA Manual Chapter 4, Part 2 Specifications.

B. Where required, drill rail ends as follows:

1. Running rail: Drill for 36-inch, 6-hole joint bars as shown on approved Shop Drawings and in accordance with the AREMA Manual chapter 4, Part 1.
2. Restraining rail: Drill for 24-inch, 4-hole joint bars as shown on approved Shop Drawings and in accordance with the AREMA Manual chapter 4, Part 1
3. Grind drilled bolt holes to remove sharp edges.

3.3 FROG DEPTH HARDENING

A. Explosive depth hardened or otherwise treat castings accordance with the AREMA Specifications, Article M2.7, except attain a minimum Brinell hardness of 350. After the castings are hardened, employ an approved testing agency to inspect each casting as follows:

1. Visually inspect or penetration test for cracks, flaws, or porosity.
2. Test hardness in accordance with ASTM E10.

B. On Shop Drawings specify the procedures to be used in the depth hardening process, the portions of each frog that are to be depth hardened, and the Brinell hardness pattern that the Contractor normally achieves with such procedures.

C. Submit reports of the tests and inspections to the Engineer for review. Repair defective castings damaged as a result of this inspection as specified in Article 3.04, herein. Reharden castings rejected for lack of hardness at no additional cost. Defects detected in the immediate wheel running surfaces of the castings will be rejected and not be repaired. Replace non-repairable castings at no additional cost.

D. Repair defects in the castings in accordance with the AREMA Specifications Article M2.6, as modified herein. Repair defects only by shielding manual arc welding or semi-automatic arc welding, in accordance with AWS D1.1. Use only manganese filler to repair defective areas.

E. After weld repairs, employ an independent testing agency procured by the Contractor to re- inspect the repaired areas of the castings in accordance with ASTM E94 and determine the acceptance of the castings.

F. The tolerance for Brinell hardness is minus 10 Brinell points. The maximum hardness is unlimited, but subject to metallurgical steel structure detriment to the product.

3.4 SHOP ASSEMBLY AND INSPECTION

A. Prior to shipment, completely assemble each turnout or diamond crossing with plates or direct fixation fasteners installed and all fastenings shop tightened. Mount each turnout or diamond crossing in a uniform plane throughout the length of the turnout or crossing to allow inspection and measurement. Assemble components designed for field welding to final alignment using appropriate plates and clamps. After satisfactory inspection and testing with the switch completed, disassemble the switch operating mechanism from the switch to the degree necessary for shipment. Package loose materials in the manufacturer's original containers.

B. Place special trackwork plates and standard plates or fasteners at locations shown on the Contract Drawings and approved Shop Drawings. Mark base of rail with paint to indicate design location of plates or fasteners.

C. Provide the Engineer with templates to check flangeways, rail end drilling, and switch rail planing. Design templates such that using the templates will be easy and quick, requiring only one person for the operation.

D. Note approved variations from the dimensions, lengths, or angles shown on the previously approved Shop Drawings on the final Shop Drawings submitted for subsequent installation.

E. Paint identification on the web of rails, clear of joint bar area, at both ends according to the rail layout details shown. Paint rail joint members on the head of each rail at every joint. Do not confuse installation identification numbers with internal shop work order numbering system. Only paint installation numbers on track items.

F. For inspection of the turnout switches on direct fixation or embedded track, include the operation (hand thrown at the switch rod) to confirm function and proper position of switch points in relation to the stock rail. Switch tongues should fit tight against body casting within the full length as required.

G. Check switches in both thrown positions for conformance with the approved switch geometry. Verify tolerances meet the applicable requirements as stated in the AREMA "Portfolio of Trackwork Plans, Plan No. 1011".

H. Notify the Engineer a minimum of 4 calendar weeks before the required date for shop inspection of the completed, assembled turnout with identification markings.

3.5 HANDLING, SHIPPING AND UNLOADING

A. Submit the proposed method of grouping, packaging, handling, and loading for items in this Contract to the Engineer for review during the submittal of Shop Drawings.

B. Carefully handle rail and special trackwork components to minimize the chance of damage. Do not drop or strike rails sharply. Handle and ship rail and special trackwork in accordance with AREMA Specifications, Chapter 4.

C. For components pre-assembled for inspection prior to shipment of including diamond crossing, ship in complete partial subassemblies.

D. Contractor is responsible for shipping special trackwork subassemblies in sizes that can be delivered without special permits to their proposed locations.

E. Ship small loose parts in secure shipping boxes and kegs. Do not ship in cardboard boxes or pallets that are not fully banded. Loose items for shipping will not be acceptable.

F. Clearly mark or tag assembled parts, pallets, bundles, boxes, and kegs in the appropriate turnout identification color with the following: Identify items contained, Contractor's name, shipping date, number of pieces, destination, gross weight, turnout letter designation, and special trackwork unit for which parts are intended.

- END OF SECTION -

SECTION 341126.16 – SUBBALLAST

PART 1 - GENERAL

1.1 SUMMARY

A. The work of this Section includes supplying and placing a layer of crusher run granite or limestone below the limits of the ballast section in the area of track construction. This section includes the careful placement, compaction and testing of the subballast to the limits and elevations shown on the Contract Drawings.

B. Related Requirements:

1. Section 312000 - Earth Moving: Preparation of site for base course.
2. Section 310513 - Soils for Earthwork
3. Section 310516 - Aggregates for Earthwork
4. Section 312316.13 - Trenching
5. Section 312500 - Erosion And Sedimentation Control
6. Section 341126.00 – Ballasted Track Construction
7. Section 347201.00 - Track Layout. Includes setting line and grade for track alignment.
8. Section 347230.00 - Ballast

1.2 REFERENCE STANDARDS

A. American Association of State Highway and Transportation Officials (AASHTO)

1. T191 Standard Method of Test for Density of Soil in-Place by the Sand Cone Method
2. T205 Standard Method of Test for Density of Soil in-Place by the Rubber Balloon Method
3. T238 Standard Method of Test for Density of Soil and Soil Aggregate in-Place by Nuclear Methods (Shallow Depth)
4. T239 Standard Method of Test of Moisture Content of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depths)

B. American Society for Testing Material (ASTM)

1. D2922Test Method for Density of Soil and Soil Aggregate in-Place by Nuclear Methods (Shallow Depth)
2. D3017Test Method for Moisture Content of Soil and Soil Aggregate in-Place by Nuclear Methods (Shallow Depth)

C. AREMA Manual for Railway Engineering.

1. Section 2.11 – Sub-Ballast Recommended Practices

1.3 SUBMITTALS

A. Test reports and samples of all materials to be used and compaction testing reports as described in Section 312000 Earth Moving.

B. The Contractor shall be required to submit for approval a minimum of two suppliers. All suppliers will be required to submit product samples for testing.

C. List of Vendors, primary and secondary.

1.4 QUALITY ASSURANCE:

A. AREMA Manual of Railway Engineering, Chapter 1, Part 2, Sections 2.11-Subballast Recommended Practices.

PART 2 - PRODUCTS

2.1 MATERIALS:

A. Aggregate for subballast at the time it is deposited on the prepared subgrade or subbase shall conform to the following requirements:
   1. A.R.E.M.A. specifications for subballast:
      a. ASTM designation: D 1241, Type 1, Gradation 'A'.

PART 3 - EQUIPMENT

3.1 Compaction shall be accomplished with one or more of the following:

A. Pneumatic-Tire Roller. Self-propelled type consisting of two axles equipped with pneumatic tires mounted so as to completely cover the area to be compacted in a single pass. The wheels on at least one axle shall oscillate vertically, either singly or in pairs. The roller shall have a width of not less than 5 feet. Wobble-wheel rollers shall not be permitted. The wheels shall be equipped with smooth, wide tread compactor tires of equal size and diameter, capable of producing a uniform, ground-contact pressure on a level, unyielding surface through a range of 60 to 95 PSI on all wheels. Operating tire contact pressure shall be maintained by the use of ballast, and tire inflation pressure combinations shall not exceed the recommendations of the Tire and Rim Association Incorporated for the tire applicable tire size and ply rating. All tires shall be uniformly inflated so that their respective tire pressures do not vary

more than 5 lbs. Charts and tabulations shall be furnished showing the contact areas and contact pressures for the full range of tire inflation pressures and for the full range of loading for the tires used.

B. Dynamic Compactor: Vibratory roller or vibratory pad type compactor capable of operating at the frequency of vibration required for the size and type of compactor used and the type of material being compacted. Vibratory pad type compactors shall be used only when access with a vibratory roller is not practical. Vibratory rollers shall be equipped with a readily visible instruction plate containing the manufacturers' recommended operating frequency, amplitude and roller speed. A calibrated reed tachometer shall be provided with each roller to permit a mechanical check of the roller vibration system.

PART 4 - EXECUTION

4.1 GENERAL

A. The general requirements, placement of subballast and surfaces tolerances shall comply with AREMA Manual Section 2.11.

B. Contractor shall establish and maintain survey stakes that are clearly marked indicating proposed top of rail elevation and offset to centerline of track throughout the process of placing and compacting subballast.

C. The subgrade or subbase to receive the subballast course, immediately prior to spreading, shall conform to the compaction and elevation tolerances specified and indicated for the material involved and shall be free of standing water, snow or ice, and loose or extraneous material.

4.2 COMPACTION

A. The uniformly spread subballast shall be compacted by means of approved equipment, as herein specified, to be not less than 95-percent of the maximum dry weight density.

B. Compaction shall progress gradually from the sides to the center, with each succeeding pass uniformly overlapping the previous pass, and shall continue until the entire area is satisfactorily shaped and compacted to the required lines and grades.

C. One density determination shall be made for each 1,000-square yards or less, as conditions warrant, on each layer of completed subballast.

D. Subballast shall not be placed on soft, muddy, or frozen areas, nor until irregularities in the prepared areas, including soft areas in the subgrade have

been satisfactorily corrected. To verify the stability of the subgrade surface before placement of subballast, the Construction Manager may direct Contractor to proof roll the prepared subgrade by use of approved loaded rubber tired vehicles with a minimum loaded weight of 30-tons at no additional cost to Railroad. Subgrade, which shows pronounced elasticity or deformation as determined by the Construction Manager, when so proof loaded, shall be recompacted, or excavated and replaced with suitable material.

E. The placement and compaction of subballast shall be in accordance with AREMA Manual Section 2.11, except that the material shall be placed in two uniform horizontal layers for the full width of the cross-section. Self-spreading vehicles of a type approved by the Construction Manager may be used. When self-spreading vehicles initially spread stone a power grader of a type approved by the Construction Manager may be used to assist the spreading operation. If results of spreading with the power grader are found unsatisfactory, permission for use of a grader may be withdrawn. This section of subballast shall be shaped to a true section conforming to the subballast section shown on the Contract Drawings and thoroughly compacted until the surface is true and unyielding.

F. Tolerance: The final grade shall be plus or minus 0.01-foot. Thickness of finished subballast course may not vary more than 1 inch from the indicated thickness at any point. Reshape, rework, water and recompact subballast to achieve compliance with specified requirements.

PART 5 - MEASUREMENT AND PAYMENT

5.1 The work under this section will not be measured or paid for separately. All costs for Section 341126.16 Subballast, shall be included in the lump sum bid item price for trackwork.

5.2 The bid item shall be full compensation for furnishing all labor, material, tools, equipment and other incidentals necessary to complete the specified task.

- END OF SECTION -

SECTION 341129 – CONSTRUCT CONTINUOUSLY WELDED RAIL TRACK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Construction of continuously welded rail (CWR) ballasted track located on compacted subgrade utilizing steel or timber crossties, including the furnishing of new rail, OTM, crushed stone ballast, placement and tamping of crushed stone ballast, installation and thermal adjustment of rails, and furnishing, placement and finishing of reinforced concrete and bituminous pavement as shown on the drawings.
2. Construction of continuously welded rail (CWR) fully embedded track located on compacted subgrade utilizing steel crossties or other approved means and methods of setting the alignment, grade and gauge of rails, grading, and compaction of subgrade, furnishing of new rail, OTM, welding and thermal adjustment of rails and the furnishing, forming, placement and finishing of reinforced concrete embedment and pavement as required by the drawings.
3. Construction of continuously welded rail (CWR) direct fixation track located on the existing reinforced concrete pile supported deck portion of the deepwater berths of the Marine Terminal, including drilling and setting of embedded rail plate anchors, installation and grouting of rail base plates and direct fixation hardware, placement of track rails, thermal adjustment of rails the furnishing, installation and finishing of reinforced concrete embedment and pavement as required by the drawings.

B. Related Requirements:

1. Section 024119 - Selective Demolition: for removal of embedded track located on the pile supports reinforced concrete deck of the Marine Terminal berths.
2. Section 033000 - Concrete: Concrete for fully embedded sections of track, pavement, rail base plate grout.
3. Section 032000 – Concrete Reinforcing: Steel and fiber reinforcing materials.
4. Section 321216 – Bituminous Pavement: Pavement adjacent to newly constructed embedded track.

5. Section 341110.00 – Continuously Welded Rail: Running rails and Restraining rail.
6. Section 341193 – Track Appurtenances and Accessories: Flush mount switch stands for installation in pavement, Sliding Derails, Track Bumper, and Restraining Rail attachment hardware
7. Section 347205 – Construct Turnouts: Double Tongue Switch type turnouts.
8. Section 347201 – Track Layout: Setting alignment and grade of tracks.
9. Section 347210 – Field Weld Rails: Thermite or Flash Butt Welding of track rails.
10. Section 347215 – Rail Connections: Temporary or permanent bolted rail connections.
11. Section 347220 – Other Track Materials.

C. DEFINITIONS

1. DRFF – Direct Rail Fixation Fastener
2. OTM – Other Track Material

1.3 MEASUREMENT AND PAYMENT

A. Measurement shall be the number of feet of track constructed and in place, as measured along the center line of the track.

B. Payment shall be at the unit price bid.

1.4 SUBMITTALS

A. Section 013300 - Submittal Procedures: Requirements for submittals.

B. Design Data: Submit manufacturer's latest published literature. Include illustrations, installation instructions, maintenance instructions, parts lists and shop drawings.

C. Manufacturer’s Certificates: Submit Statement of Compliance, supporting data, from material suppliers attesting that all components meet or exceed applicable A.R.E.M.A. Standards and specification requirements.

D. Submit Certificates of Compliance for all OTM. Include material qualification test reports for materials, components, and assemblies.

1.5 REFERENCES

A. American Railway Engineering and Maintenance of Way Association (AREMA):

1. Manual for Railway Engineering
2. Portfolio of Trackwork Plans

3. Specifications for Special Trackwork

B. American Welding Society (AWS):

1. AWS B2.1: Standards for Welding Procedures and Performance Qualifications
2. AWS D1.1: Structural Welding Code

C. American National Standards Institute, Inc. (ANSI)

1. ANSI B1.1: Unified Inch Screw Threads
2. ANSI B1.3M: Screw Threads Gaging System for Dimensional Acceptability
3. ANSI B18.22.1: Plain Washers

D. American Society for Testing of Materials (ASTM)

1. A36: Standard Specifications for Carbon Structural Steel
2. A123: Standard Specification for Zinc (Hot-Dip-Galvanized) Coating on Iron and Steel Products
3. A325: Standard Specifications for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
4. C881 - Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete.
5. F1554 - Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength.

PART 2 - PRODUCTS

2.1 MATERIAL

A. Rails shall be New 136RE rail section welded into strings in accordance with the requirements of Section 341110 - Continuously Welder Rail, of these specifications.

B. Steel crossties shall be provided in accordance with the specifications set forth under Section 341133.22 Railroad Steel Crossties, of these specifications and include a positive restraint rail fastening system provided by the manufacturer of the steel crossties specifically designed to be used with the steel crossties supplied.

C. Rail joint bars and hardware shall conform to Section 347215-Rail Connections,

D. Ballast and tamping shall conform to Section 347230.00-Railroad Ballasting, of these specifications and other parts of this specification section.

E. Rail Field Welds: As specified in Section 347210 - Field Weld Rails.

F. Rail Fixation and Fastening Assemblies: Fabricate, furnish and supply rail alignment and track gauge setting fixtures in accordance with that shown on the project plans, or furnish and supply commercially manufactured product(s) designed specifically for setting the alignment and gauge of track rails employed in construction of track embedded in concrete. All materials furnished shall be designed and manufactured to work collectively as a system and shall conform with the requirements of the Project Specifications and drawings.

G. Non-Shrink Epoxy Grout: For use under rail base plates of portions of track located on the pile supported reinforced deck of the marine terminal berths shall be Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107/C 1107M, factory-packaged, nonmetallic aggregate grout, noncorrosive and non-staining, mixed with water to consistency suitable for application and a 30-minute working time. Provide grout with a compressive strength of 3,500 psi at 1 day, 5,000 psi at 3 days and 6,800 psi at 28 days.

H. Epoxy Adhesive: Provide a two-component 100% solids non-sag epoxy adhesive suitable for anchoring threaded anchor rods into hardened concrete. Epoxy adhesive shall meet the requirements of ASTM C881, Type IV, Grade 3, and C. Two-component system shall come in prepackaged cartridge systems with a static mixing attachment. Cartridges shall be designed specifically to be used with drop-in dispensing guns. The minimum compressive strength, prior to load application to the anchor rods, shall be 5000 psi.

I. Hardware: Furnish and install high strength bolts, nuts, nutlocks, embedded anchors, and other miscellaneous hardware necessary for use in construction direct fixation embedded trackwork in accordance with the details shown on the Contract Drawings.

J. Rail Fastening Components: Furnish and install positive restraint rail fasteners, rail shoulders, restraining rail spacer blocks, track bolts, washers, nuts, locknuts and other miscellaneous hardware as indicated on the contract drawings.

K. Concrete: As specified in Section 033000 - Concrete.

L. Concrete Reinforcing: As specified in Section 032000 Concrete Reinforcing.

2.2 PREPARATION

A. The contractor shall notify the Engineer a sufficient time before starting the work so that adequate arrangements can be made to progress the work of each phase in accordance with the approved schedule.

B. The contractor shall commence construction of each section of track only after completing the following work of each Phase as applicable:

1. The selective demolition and removal of existing pavements, track or embedded rails is complete and condition of the area where new track is to be installed is prepared to receive new construction.
2. All underground utilities including new stormwater drainage infrastructure, water supply system modifications and casing pipes have been properly installed and tested in accordance with the specifications and found to be functioning properly.
3. The contractor has performed track layout in accordance with Section 347201, Track Layout, of these specifications.
4. The area to receive new track has been inspected by the Engineer and approved for installation of new track.

2.3 EXECUTION

A. The contractor shall supply and utilize rollers for the handling and distribution of the welded rail. The type of rollers used and their application must be approved by the Engineer prior to their use.

B. The contractor shall place the welded rail onto the DRFF assemblies or on the steel crossties by use of a machine with a threader or rail tongs designed exclusively for that purpose. Under no circumstances shall rail be handled using a Prentiss log loader or “split-bucket” type excavator or loader. The rail shall be placed without expansion gaps.

C. Strings of welded rail shall only be pulled into position and not pushed. Bumping welded rail into position shall not be permitted.

D. The bottom of the rail and the top of the DRFF plate shall be clean and free of dirt and other foreign substances when the rail is laid.

E. The contractor shall perform field welding of running rails in accordance with Section 347210.00 – Field Weld Rails, of these specifications. Bolted rail connections shall conform to Section 347215 - Rail Connections, of these specifications.

F. The welded rail shall be properly adjusted, all DRFF assemblies shall be drawn tight, the alignment and surface of the track has been checked for compliance with the proposed geometry and has been inspected and approved by the Engineer prior to placing the final section of concrete and bituminous paving materials

- END OF SECTION -

SECTION 341133.16 - TIMBER CROSSTIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. The work of this Section consists of the supply of treated timber crossties and Switch Timbers for use in the designated track. The Engineer reserves final judgment as to whether cross ties presented for inspection meet the requirements of this Technical Provision and are free from any defects that may impair their strength or durability including, but not limited to decay, large splits, slanting grain or large or numerous holes or knots.

B. Related Requirements

1. Section 341129.00 – Construct Continuously Welded
2. Section 347201.00 - Track Layout.
3. Section 347230.00 - Ballast

1.2 QUALITY ASSURANCE

A. Reference Standards:

1. American Wood Preservers' Association (AWPA):
   a. C1 All Timber Products – Preservative Treatment by Pressure Processes.
   b. M1 Purchase of Treated Wood Products.
   c. M2 Standard for Inspection of Treated Timber Products.
   d. M3 Quality Control Procedures for Wood Preserving Plants.
   e. P2 Standard for Creosote Solutions.

2. American Railway Engineering Association (AREMA), Manual for Railway Engineering, Chapter 3

B. Quality Assurance Program:

1. Supplier's quality assurance program shall be subject to verification at any time. Verification shall include, but not be limited to, audit of quality assurance program; surveillance of operations to determine that practices, methods, and procedures of the program are being properly implemented; inspection to measure the quality of items offered for acceptance; and inspection of items before release for shipment to ensure compliance with the requirements of the Contract Documents.

2. Failure by supplier to promptly correct deficiencies discovered by either the Construction Manager or Engineer may be cause for rejection of crossties until corrective action has been taken or until conformance of the work to prescribed criteria has been demonstrated and approved by Engineer.

C. Provide certified test results or certificates of compliance.

D. Inspect crossties at the source locations designated on the purchase orders.

E. To ensure quality inspectors will make a close examination of the top, bottom, sides and end of each tie. Each tie will be judged independently, without regard for the decisions on other ties.

1.3 SUBMITTALS

A. Reports as required by AWPA M1 and M2 shall be maintained.

B. Manufacturer's certification.

PART 2 - PRODUCTS

2.1 MATERIALS

A. All crossties shall be new and manufactured of Oak, except that not more than 20 percent of the crossties may be of one other hardwood of the following species: Beech, Hickory, Birch, Sweet Gum, Locust, Hard Maples, Sycamore, Cherry, Mulberry, Walnut, Elm, Sassafras, Ashes and Hackberries. African hardwoods, such as Azobe, shall not be used.

B. All ties shall be new. Any tie that has been installed in track, other than for this project shall not be regarded as new.

2.2 MANUFACTURE

A. Thickness and Width:

1. All crossties shall be graded in accordance with the APWA standards.

2. Crossties shall be accepted with the following thickness and width measurements. A variation of minus 1/4-inch and plus 1/2-inch is acceptable.

Grade/Size	Thickness & Width of Wider Face	Width of Narrower

	(Bottom)	Face (Top)
1	6”x7”, 6”x8”, 7”x9” 7”x8”	6”
2	6”x8”, 6”x8”	7”
3	6”x8”	8”
3A	7”x8”, 7”x9”	7”
4	7”x8”, 7”x9”	8”
5	7”x9”	9”

3. Only Grade 4 or 5 crossties are acceptable.

B. Length: All crossties shall be no less than 8’-6” (eight foot and six inches in length) plus 1” and minus 1/2” tolerance.

C. Straightness:

1. A new crosstie will be considered straight when a straight line from a point on one end to a corresponding point on the other end is no more than 1 inch from the surface at all points in every eight (8) feet.

2. A crossties not well sawn when its surfaces are cut into with score marks more than 1/2-inch deep or when its surfaces are not even.

3. The top and bottom of a new crosstie will be considered parallel if any difference in the sides or ends does not exceed 1/8-inch.

4. Crosstie ends must be flat and will be considered square with a sloped end of up to 1/2-inch.

D. Incising: All new crossties will be incised on four sides. Incisor teeth shall penetrate 3/8-inch plus or minus 1/8-inch and shall conform to the standard industry pattern.

2.3 WOOD QUALITY

A. Except as hereinafter provided, all crossties shall be free from any defects that may impair their durability or strength as crossties such as decay, splits large shakes, slanting grain, large or numerous holes or knots, or excessive checking from seasoning. Amtrak or its representatives reserve the right to inspect all crossties at any time up to and including substantial completion and reject any crossties that they may consider defective or of inferior quality.

B. Decay: "Blue Stain" is not decay and is permissible in any wood.

C. Holes:

1. A large hole is one more than 1/2-inch in diameter and 3-inch deep within, or more than 1/4 the width of the surface on which it appears, and 3-inches deep outside the rail bearing area.

2. Numerous holes are any number equaling a large hole in damaging effects. Such holes may be caused during manufacture of at other times.

D. Knots:

1. A large knot is one whose average diameter exceeds 1/4 of the width of the surface on which it appears when it appears in the rail bearing area.

2. Numerous knots are any number equaling a large knot in damaging effects.

E. Shake: Shake must not be greater than 1/3 the width of the crosstie nor closer than 1-inch to any surface.

F. Slanting Grain: Except in woods with interlocking grain, slant in excess of 1 in 15 is not permitted.

G. Splits:

1. In seasoned crossties, splits may be no wider than 3/16-inch and no longer than 4-inches.

2. When anti-splitting devices are applied to seasoned crossties, the following shall apply. Splits no larger than 3/8-inch wide and nor longer than 8-inches long may be repaired as long as the split is parallel with the narrow face and contained within the center 50-percent of the crossties to provide sufficient anchoring surface. Crossties with splits the width of face shall not be repaired and must be rejected in all instances. Post treatment splits parallel to the wide face shall not be nail plated and must be rejected in all instances.

H. Season Checks: Crossties with checks more than 3/8-inch in width on any face or longer in aggregate than 1/3 of the crosstie length must be rejected. Nail plates may be used to repair checks, but must be used in conformance with these specifications.

I. Bark Seams:

1. Bark seams are not permitted in the crosstie plate area.

2. Bark seams on the end of the crosstie shall be contained on the face.

3. Bark seams in the gage area (middle 40-inches) shall not extend more than 2-inches into the crosstie as measured from any surface and /or more than 10 inches long.

4. Bark seams that are considered strength impairing shall be rejected.

2.4 ANTI-SPLITTING DEVICES

A. Dowels:

1. Dowels are anti-splitting devices that are driven or pushed into pre-bored holes.
2. Dowels shall be in accordance with AREMA Specification 3.1.6.2.1 Dowels. 7-3/4-inch dowels are standard for crossties and switch timbers.

3. Dowels 5-3/4-inches long shall be used to close splits parallel to wide faces.

4. Use of lubricants to facilitate the driving of dowels is prohibited.

5. Dowels must be applied to unseasoned material upon arrival at the treatment plant to prevent splitting and checking.

B. Multiple (Gang) Nail Plates:

1. Multiple (Gang) Nail, as described in the AREMA Specification 3.1.7.2. or latest revision, shall be used. Plates shall be galvanized after cutting and forming of nails. Plates to be used for crossties shall also comply as follows:
   a. They are to be constructed of 18-gauge galvanized steel.
   b. Teeth must be at least 9/16-inch long.
   c. Plate dimensions for 7-inch crossties – 5-inches by 7-inches in area.
   d. Plate dimension for 6-inch crossties – 5-inches by 6-1/4-inches.
   e. Nail plates used on larger dimension lumber must cover at least 75-percent of the end of the timber.

2. All crossties must have multiple nail plates. Crossties may be multi-nail plated either before treatment as a preventative measure or after treatment as a recovery process for splits and season checks only. After application the nail plate must be flush with the crosstie end and there must be no observed separation along the plane of the splitting.

3. The equipment and for application of anti-splitting devices must be submitted and approved by the Construction Manager before its use.

C. “S” Irons and “C” irons shall not be used.

2.5 SEASONING

A. All new crossties shall be conditioned in accordance with AWPA C6 with the following exceptions:

1. When air seasoning is used, the moisture content shall be based on the entire volume of a given piece.

2. When Boulton drying is used, under normal conditions, unseasoned materials must have recorded water removal of not less than 5-pcf of wood. All Boulton systems must be equipped with effective anti-surge devices. Final moisture contents shall be as specified by the AWPA for air seasoning.

3. Vapor drying shall produce moisture contents as specified by AWPA for air seasoning.

2.6 PRESERVATIVES

A. Wood products shall be preserved with a 60/40-percent creosote-coal tar solution in accordance with AWPA P2. An 80/20-percent creosote-coal tar mixture may be substituted on the written approval of the Engineer.

2.7 TREATMENT

A. Following seasoning, all crossties shall be treated by the Rueping process in accordance with AWPA C1, C6, M1, M2, and M3. Retentions shall be as specified.

PART 3 - EXECUTION

3.1 PREPARATION FOR TREATMENT

A. Handling of timber shall, in general, follow the procedures and practices as described in the AREMA Manual, Chapter 3, Part 5.

B. Incising shall be performed at the start of the seasoning period, not later than 30 days after the ties are cut to shape. All faces, except ends, shall be incised. Incising shall be to a depth of 3/4 inch and in a pattern the same or similar to that shown in the AREMA Manual, Chapter 3, Part 6.2 and 9.1.

C. Anti-Splitting Devices: All crossties shall have gang nail plates applied to both ends at the start of the seasoning period.

1. Gang nail plates shall be centered, plus or minus 1/2 inch on timber ends.

2. Gang nail plates shall be inserted by machines capable of holding the crosstie in a clamped position under pressure while the gang plate is pressed into position.

3. Gang nail plates shall be flush with the ends of tie. Plates not flush may be driven down.

4. If in excess of 5 percent of the nails fail to penetrate fully, the plate shall be removed and a new plate installed.

D. Holes shall be bored only for those spikes, anchor bolts or lag spikes that will actually be installed. Hole tolerance and diameters shall be as described in the AREMA Manual, Chapter 3, Part 1.4 or latest revision. Holes in ties for tracks in electrified territory shall not be bored through. Hole depth shall be between 4 inches and 6 inches.

E. Trimming to length and all other woodworking operations that can be reasonable performed prior to installation of track and associated hardware shall be performed prior to preservative treatment. New anti-splitting devices shall be applied to trimmed ends to ensure that all ends of timbers have anti-splitting devices in place.

F. Seasoning: Ties shall be seasoned in accordance with the AREMA Manual Chapter 3, Part 6.3 or latest revision. Seasoning may be by air drying, Boulton drying, or vapor drying. Steam conditioning shall not be used. Moisture content limits shall be achieved before machining or preservative treatment commences.

3.2 MACHINING OF TIES

A. Adzing, boring, trimming or dapping and other woodworking operations shall be performed subsequent to seasoning and insofar as practical, prior to preservative treatment.

B. Adzing, leveling, of the tie plates areas, shall be to the minimum depth needed to provide for the rail seats to all be in the same plane. If the adzing depth is required to exceed 1/2 inch than the tie shall be rejected. The leveled area shall extend to not less than 1 inch beyond all areas covered by the tie plates. Rail seat flatness shall be such that a straight edge laid across the rail seat shall be within 1/16 inch of the adzed seat at any point.

3.3 PRESERVATIVE TREATMENT

A. Preparation: Crossties shall have all bark, dirt; saw grease and mud and other material that may hinder the penetration of the preservative removed from the surface of the crossties.

B. Sterilize the heartwood:

1. Ties and timbers with a least dimension of 7 1/2 inches or less shall be preheated to ensure that all ties spend not less than 6 consecutive hours at a temperature of 190° F or higher. Of this time, not less than 3 hours shall immediately precede impregnation with preservative.

2. Ties and timber, with a least dimension of more than 7 1/2 inches, including 9 inch by 9 inch timber if dapped, shall be preheated to ensure that all ties spend not less than 8 consecutive hours at a temperature of 190° F or higher. Of this time, not less than 5 hours shall immediately precede impregnation with preservative.

C. Preservative Retention:

1. In oak: 8 pounds per cubic foot.

2. In other hardwoods: 10 pounds per cubic foot.

3.4 INSPECTION

A. Pre-Treatment:

1. Unseasoned crossties must not be used on this project.

2. All crossties shall be inspected and approved prior to installation by Engineer or Construction Manager. Crosstie shall be presented in a suitable manner and in sufficient quantity to allow an adequate number per day to be inspected and accepted according to current customary standards.

3. Crossties accepted shall be legibly branded as follows: Current Year, with letters for plant identification, not less than 3/4-inch high.

B. Post-Treatment: Crossties shall be inspected after treatment is completed. The inspection shall include all items previously examined during the pretreatment inspection. The inspector shall pay particular attention looking for its or shakes that may have occurred during the treating process.

PART 4 - MEASUREMENT AND PAYMENT

4.1 The work under this section will not be measured or paid for separately. All costs for Section 341133, Crossties, shall be included in the bid price for item [_____],

- END OF SECTION -

SECTION 341133.22 - STEEL CROSSTIES

PART 1 - GENERAL

1.1 SUMMARY

A. Requirements for design, manufacture, testing and delivery of Steel Crossties and Steel Switch Ties and their associated rail fastening components of the type(s) specified.

B. The component parts of the crossties to be furnished shall be the products of manufacturers regularly engaged in the manufacture of such products and shall essentially duplicate items that have been in satisfactory use at least 5 years prior to bid opening. The parts need not all be made by the same manufacturer, but the crosstie assemblies shall be supplied by a single firm.

C. Related Sections

1. Section 310516.00 – Aggregates for Earthwork.
2. Section 341116.22 – Construct Welded Track - Steel Crossties.
3. Section 341126.00 – Ballasted Track Construction.
4. Section 341193.00 – Track Appurtenances and Accessories.
5. Section 347201.00 - Track Layout. Includes setting line and grade for track alignment.
6. Section 347205.00 – Construct Turnouts.
7. Section 347210.00 – Field Weld Rails.
8. Section 347220.00 - Other Track Material.
9. Section 347230.00 - Railroad Ballasting: Supply and placement and distribution of ballast.

1.2 REFERENCES

A. American Society for Testing of Materials (ASTM)

1. ASTM A6: Standard Specification for General Requirements for Rolled Structural Steel Bars, plates, Shapes and Sheet Piling
2. ASTM A242: Standard Specification for High-Strength Low Alloy Structural Steel
3. ASTM A370 Standard Test Methods and Definitions for Mechanical Testing of Steel Products
4. ASTM A568: Standard Specification for Steel Sheet, Carbon, Structural, and High–Strength, Low Alloy, Hot- Rolled and Cold-Rolled, General Requirements.
5. ASTM G 101: Guide for Estimating the Atmospheric Corrosion Resistance of Low Alloy Steels

B. American Railway Engineering and Maintenance of Way Association (AREMA):

1. Manual for Railway Engineering

C. ISO 9001 Quality Management Systems

1.3 CLASSIFICATION AND APPLICATION

Crosstie	Gross Ton Mi.	Max. Speed	Application
Type 1	< 3 MGTM/YR	P-15, F-10	Industrial, Yard, Storage, Unloading Tracks
Type 2	3-10 MGTM/YR	P-30, F-25	Branch Lines, Running, Embedded Siding, Bulk Materials Handling Tracks
Type 3	10-25 MGTM/YR	P-60, F-40	Main Tracks, Yard Lead Tracks, Grade Crossings
Type 4	> 25 MGTM/YR	P-30, F-25	Heavy Haul Tracks, Tunnels, Ballast Deck Bridges, High Speed Tracks
Type E	N/A	N/A	For tracks embedded in concrete pavement

1.4 PERFORMANCE REQUIREMENTS

A. Steel Crossties shall be designed to meet the following criteria:

1. Railcar Gross Weight - 286,000 pounds/4 axles
2. Operating Speed – As noted by crosstie type.
3. Rail Section – 136RE
4. Rail Seat Cant:
   a. 1:40 for Type 1, 2, 3, & 4.
   b. Zero (no cant) for Type E.
5. Service Life (including fastenings) - 50+ years
6. Track Gauge applicable to installation of new rail:
   a. 56½” $\pm$1/16” for tangents and curves where degree of curve is less than 13 degrees.
   b. 57” for curves 13 degrees and greater.
7. Maximum Rail Seat Force - 22,000#
8. Maximum Rail Seat Moment - 7350 ft.lb.
9. Minimum Rail Clamping Force - 4400# at each rail seat.
10. Minimum Longitudinal Restraint - 2200# at each rail seat

PART 2 - PRODUCTS

2.1 CROSSTIE DIMENSIONS

A. Overall Dimensions

1. Minimum Length:
   a. Types 1, 2, 3 & 4 in conventional track - 8.25'
      1) Length to be increased as applicable for use beneath precast concrete grade crossing panels.
   b. Type E - 8.00'
2. Minimum Width at base – Types 1 & 2 – 10.00", Types 3 & 4 – 11.80"
3. Minimum Width at rail seat – 6.00"
4. Minimum Depth – Types 1 & 2 -3.85", Types 3 – 4.5", Type 4 – 4.7", Type E – 3.85"
5. Minimum Thickness at shoulder – Types 1 & E - 0.31", Types 2 & 3 – 0.39", Type 4 - 0.47"

2.2 SWITCH TIE DIMENSIONS

A. Overall Dimensions

1. Length – As prescribed by manufacturer for switch tie set applicable to each specific turnout geometry.
2. Minimum Width at base – 11.80"
3. Minimum Width at rail seat – 6.00"
4. Minimum Thickness at shoulder – 0.39"

2.3 RAIL FASTENINGS

A. Rail fastenings shall be of the elastic type consisting of two shoulders and two Pandrol® "E" Clips or equivalent, per rail seat. Fastenings shall be able to be installed without requiring the use of any special tools.

B. Rail clips suitable for application adjacent to joint bars where bolted or "Huck bolt®" type rail joints are utilized shall be provided.

C. Fastenings must meet the design requirements of Section 1.4 and be of a proven design with the specified rail clamping force.

D. Unless otherwise specified, rail seat electrical insulation is not required.

2.4 MANUFACTURING CRITERIA

A. General

1. The crosstie shall be manufactured either from either pre-formed section (hot rolled sections or cold formed strip profiles) or hot rolled strip steel conforming to the requirements of ASTM A242. The properties shall comply with these specifications and the standards referenced.
2. The crossties shall be free of defects, which are likely to initiate fatigue failure in service, e.g. pipe, non-metallic inclusions and visible surface damage.

B. Chemical Composition

1. The atmospheric corrosion-resistance index, calculated on the basis of heat analysis of the steel, as described in ASTM G 101 shall be 6.0 or higher.
2. The chemical composition of the steel shall be within the following limits:
   a. Carbon 0.15% (max.)
   b. Manganese 1.00% (max.)
   c. Phosphorus 0.15% (max.)
   d. Sulphur 0.05% (max.)
   e. Copper 0.20% (min.)

C. Mechanical Properties

1. Adequate testing shall be conducted by the Contractor to control the manufacturing process and to maintain the minimum tensile requirements specified in ASTM A242 Table 2.

D. Rail Seat

1. Where required by the specifications the rail seats shall be canted (inclined) towards the center to achieve required rail cant. The cant shall be 1:40 unless zero (0) cant is specified.

E. End Section

1. The end section of the steel crosstie shall be bent down from the rail seat area so that the end sections of the crosstie are not above the center of the crosstie. Not applicable for Type E crossties specified for use in embedded track.

F. End Spade

1. The top surface of the crosstie shall be bent down at both ends to provide a surface which will bear against the ballast shoulders for lateral stability. The angle of the end sections shall be approximately 65º from horizontal with the bottom edge level with the lower crosstie edge and no gap at the corners (from metal distortion). Not applicable for Type E crossties specified for use in embedded track.

G. Punching

1. The crossties shall have four (4) pre punched holes of suitable diameter to receive the “hook-in” type rail shoulders without requiring the use of any special tools where applicable to the rail fastening system utilized.
2. The switch ties shall be complete with rail fastening components attached as part of the shop fabrication process during which the entire turnout shall be assembled and inspected in accordance with other parts of these specifications and the approved shop drawings, prior to disassembly and shipping.
3. The crosstie shall have 4 pre punched ballast inspection holes each, a minimum diameter of 7/8”. The ballast inspection holes shall be punched so that there are two in the gauge and one each, on the field side of the rails and shall be spaced approximately 6” away from the rail fastenings. All holes shall be punched along the centerline of the long horizontal axis of the crosstie and symmetrical about the short horizontal axis of the top face of the crosstie. Ballast inspection holes are not required for Type E crossties specified for use in embedded track.

H. Finished Dimensional Tolerances

1. Track Gauge: ±1/16” utilizing new rail.
2. Overall Length of Crosstie: ± 3/8” (measured at the outside edge of the end spade)
3. Internal Width of Crosstie at section toe: ± 3/16”
4. Overall depth of Crosstie: ±1/16”
5. Rail Seat Width: ± 1/32”
6. Rail Seat Flatness: +0” to -1/32”
7. Minimum Width of Spaded End : Nominal Crosstie Width +1½”
8. Straightness (over nominally straight portion) 1/32” per foot
9. Cant: 1:39 to 1:41 unless specified as Zero.
10. Overall Width of Crosstie: ± 3/16”
11. Thickness of Crosstie Web: +0.10” to -0.00”
12. Distance between outer edges of pair of rail seat (hook in shoulder) holes: ± 1/32”
    (measured at a height of rail seat (hook-in shoulder) holes ¼” above rail seat)
13. Maximum Width Within 16” of rail centerline: Nominal Crosstie Width ±¼”

I. Identification

1. Crossties shall be marked for identification. Marking shall be in the form of raised or embossed marking on the top surface at the center both axis of the crosstie. The marking shall be in capital letters in a block style font, a minimum of ¾” in height and of a nature such that they will remain clearly legible for the life of the crosstie as specified in Section 1.3. Markings shall

be such that they will induce no inherent fatigue weakness zones. The crossties shall be marked, at a minimum, with the following information:

a. Manufacturers name
b. Product identification code
c. Rail section
d. Date of manufacture

J. Corrosion Allowance

1. The Contractor shall demonstrate to the satisfaction of the Engineer that adequate allowance has been made for the effects of corrosion during the life of the steel crosstie.
2. If required by the contract specifications, steel crossties shall be hot dipped galvanized in accordance with the specifications pertaining to such treatment, as included in other parts of the overall project Specifications.

K. Shipment and Handling

1. Crossties must be nestable for shipment and be free of burrs and sharp edges for efficient stacking and safe handling.
2. Steel Crossties must be packaged for shipment and handling at the manufacturing facility in uniform bundles utilizing steel banding or similar methods durable enough to endure rigors of shipping and handling and withstand breakage. Bundles of crossties should contain a minimum of 10 but no more than would encumber handling when utilizing conventional material handling equipment such as forklift trucks.
3. Unless otherwise noted above, fastening system components should be packaged in bags or other durable means of packaging with each bag or package containing the number of components required to make a complete assembly of each crosstie in one bundle.
4. Bags or packages of fasteners must be clearly marked with the manufacturers name, item number, date of manufacture and applicable steel crosstie type for which they are designed. Markings must be made by durable, weather resistant means that will remain legible during normal shipping, handling, exposure to weather and effects of UV light.
5. Bags may also be marked, as directed by the purchaser, with the purchaser’s name, purchase order number and project name to aid in inventory control and shipment tracking.

2.5 INSPECTION FREQUENCY

A. Inspection procedures should be in accordance with ISO 9001 Quality Management Systems - Requirements, except as indicated below:

1. The first steel crossties produced following any shutdown or delay in production (for more than 30 minutes) shall be examined.

2. If the steel crosstie is rejected, the batch from which the steel crosstie was selected shall be subjected to detailed examination. Initially 10 steel crossties shall be selected at random from the batch and submitted for inspection. If all 10 steel crossties are found satisfactory the batch shall be accepted, otherwise the batch will be rejected.
3. Batches found unacceptable shall be resubmitted for inspection only after all items or units or product are re-examined and all defective items or units of product are removed.

PART 3 - EXECUTION

A. Covered in following Sections:

1. Section 341116.22 – Construct Welded Track – Steel Crossties
2. Section 341129.00 – Construct Fully Embedded Track.
3. Section 347205.00 – Construct Turnouts

- END OF SECTION -

SECTION 341134 - FULL DEPTH PRECAST CONCRETE GRADE CROSSING

PART 1 - GENERAL

1.1 DESCRIPTION

A. Section includes:

1. Material requirements and performance criteria for the Precast Concrete Grade Crossing Panels to be furnished in accordance with Contract Documents or required by the Engineer.

B. Related Sections:

1. Section 341116.22 – Construct Welded Track – Steel Crossties
2. Section 341126.00 – Ballasted Track Construction
3. Section 331133.00 – Timber Crossties
4. Section 341133.22 – Steel Crossties
5. Section 347201.00 - Track Layout

1.2 REFERENCES

A. American Galvanizers Association (AGA):

1. Inspection of Products Hot-dip Galvanized After Fabrication.
2. The Design of Products to be Hot-dip Galvanized After Fabrication.
3. Recommended Details of Galvanized Structures.
4. Quality Assurance Manual.

B. American Railway Engineering and Maintenance of Way Association (AREMA):

1. Manual for Railway Engineering
2. Specifications for Special Trackwork

C. American Society for Testing of Materials (ASTM)

1. A36: Standard Specifications for Carbon Structural Steel
1. A123: Zinc (Hot-Dip Galvanized) Coating on Iron and Steel Products
2. A496 “Specification for Steel Wire, Deformed, for Concrete Reinforcement”.
3. A497 “Specification for Steel Welded Wire Fabric, Deformed, for Concrete Reinforcement”.
4. C33, “Specification for Concrete Aggregates”.
5. C94 “Specification for Ready-Mix Concrete”
6. C150, “Specification for Portland Cement”.
7. C227: Standard Test Method for Potential Alkali Reactivity of Cement Aggregates Combinations (Mortar-Bar Method)
8. C260 “Air-Entraining Admixtures for Concrete
9. C494 “Chemical Admixtures for Concrete”.

10. C615 “Specification for Deformed and Plain Billet Steel Bars for Concrete Reinforcement”.
11. C666: Standard test Method for Resistance of Concrete to Rapid Freezing and Thawing
12. C1260: Standard Test Method for Potential Alkali Reactivity of Aggregates (Mortar-Bar Method)
13. D257: Standard Test Methods for DC Resistance of Conductance of Insulating Materials
14. D395: Standard Test Methods for Rubber Property/Compression Test
15. D412: Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers Tension
16. D573: Standard Test Methods for Rubber Deterioration in an Air Oven
17. D624: Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers
18. D2137: Standard test Methods for Rubber Property- Brittleness Points of Flexible Polymers and Coated Fabrics
19. D2240: Standard Test Methods for Rubber Property-Durometer Hardness
20. D2628: Standard Specifications for Preformed Polychloroprene Elastomeric Joint Seals for Concrete Pavements

D. American Concrete Institute
   1. ACI-318 “Building Code Requirements for Reinforced Concrete.
   2. ACI 304 “Guide for Measuring, Mixing, Transporting and Placing Concrete

A. American Welding Society (AWS):
   1. AWS B2.1: Standards for Welding Procedures and Performance Qualifications
   2. AWS D1.1: Structural Welding Code

B. Association of American Railroads (AAR)
   1. M-1003: Manual, Specifications for Quality Assurance

C. Federal Specifications
   1. DOD-P-21035 Paint, High Zinc Dust Content, Galvanizing Repair
   2. MIL-P-26915 Primer Coating, Zinc Dust Pigmented

D. International Organization for Standardization (ISO)
   1. 9000: An International Consensus on Good Quality Management Practices

E. Prestressed Concrete Institute (PCI)
   1. MNL115: Fundamental of Prestressed Concrete Design
   2. MNL124: Design and Typical Details of Connection for precast and Prestressed Concrete

3. MNL138: PCI Connections Manual for Precast and Prestressed Concrete Construction

1.3 COORDINATION

A. Section 013100 - Project Management and Coordination:

B. Coordinate Work of this Section with installation of trackwork.

1.4 PREINSTALLATION MEETINGS

A. Section 013000 - Project Management and Coordination: Preinstallation conference

1.5 SUBMITTALS

A. Section 013300 - Submittal Procedures.

B. Product Data: Submit data documenting for manufacturers past performance within the last ten (10) years furnishing precast concrete grade crossing panels material to Class 1 Freight, passenger, or commuter railroads.

C. Shop Drawings: Indicate dimensions, general arrangement, installation instructions, hardware, accessories, and all other relevant details.

D. Manufacturer Instructions: Submit detailed documentation including:
1. Installation requirements, including storage and handling procedures.
2. Maintenance Schedules and Requirements.
3. Component Parts Lists.

1.6 QUALITY ASSURANCE

A. Materials or partially or fully assembled products not meeting the specifications shall be rejected.

B. Equipment used for the manufacturing materials shall be in good operating condition, of adequate capacity and range, and accurately calibrated. Testing equipment shall be certified and traceable to national standards such as the National Institute of Standards and Technology.

C. Submit Certificates of Compliance for all precast concrete grade crossing panels. Include material qualification test reports for materials, components, and assemblies.

1.7 DELIVERY, STORAGE AND HANDLING

A. Section 016000 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.

B. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.

1.8 WARRANTY

A. The manufacturer shall warranty the precast concrete grade crossing panels for a minimum ten (10) years against defects in materials and workmanship.

1.9 DEFINITIONS

A. Field Side – Portion of track or component designated as being located on the opposite side of the rails from the centerline of track.

B. Gage Side – Portion of track or component designated as being located on the side of the rails closest to the centerline of track.

C. OTM – A general term referring to all miscellaneous materials other than rail and ties.

PART 2 - PRODUCTS

2.1 GENERAL

A. Precast concrete grade crossing panels shall be new, manufactured to fit the rail section of the track to which the crossing panels are to be installed and conform to these Specifications.

B. Precast concrete grade crossing panels shall be designed to support AASHTO HS-20 vehicle loading when installed on tracks with crossties spaced in accordance with the panel manufacturer’s instructions.

2.2 CONCRETE PANELS

A. Precast concrete grade crossing panels shall be heavy duty full depth reinforced concrete panels between 10 and 12 feet in width, as measured perpendicularly to the centerline of track, which eliminate the need for crossties and include a positive restraint rail fastening system utilizing cast-in rail shoulders located along preformed troughs designed to receive the running rails. The rail fixation system shall be located so that the rails will be installed at proper track gauge of 4 feet –

8 ½ inches for tangent track. The fasteners shall be of such design that they may be installed or removed without the use of special tools.

B. Precast concrete grade crossing panels shall include separate EPDM or similar material rubber fillers incorporated in the design of the panels. The rubber fillers shall be installed such that they abut the rails on each side to fill the void between the rail head and the edge of the rail trough after the rails have been installed. The gauge side rubber filler shall be designed to prevent infiltration of stormwater yet provide the required 3 inch flangeway while compressed between the rail web and the gauge side of the rail trough in the correctly installed position. The field side panel rubber filler shall be designed to prevent infiltration of stormwater when compressed between the rail head and web and the field side of the rail trough in the correctly installed position. The panels shall be so designed that the preformed rubber flangeway fillers will be held captive by the installed rails and a continuous recess or ridge cast in the face of the rail trough wall and yet permit removal of the rubber fillers for maintenance without damaging the concrete panel, rubber flangeway filler, rails or the rail fastening system.

C. Precast concrete grade crossing panels shall be designed such that when the rails are fully installed, a level plane is created across the full width of the panels perpendicular to the centerline of the roadway without use of shims.

D. Precast concrete grade crossing panels shall incorporate four (4) lifting inserts per panel for use in handling and installation of the panels. The lifting inserts shall be mechanically galvanized or similarly protected against corrosion. Lifting devices shall be useable with Burke or Dayton 5-ton clutch systems. Lifting device shall be designed with a minimum safety factor of four and be OSHA certified.

E. Panels shall be provided incorporating End Ramps at each end of each grade crossing, capable of deflecting dragging railway equipment. The End Ramps shall be the full width of the grade crossing end panels and provide for proper flangeway as specified in this section, End ramps composed of formed bituminous concrete wedges placed at the ends of the grade crossing are not acceptable as end ramps.

2.3 CONCRETE MATERIALS

A. Concrete utilized in fabrication of the Grade Crossing Panels shall meet the following criteria;

1. Concrete compressive strength: Minimum 6000 psi.
2. A concrete sealant shall be used to prevent cracks and ion migration. Sealant shall be applied to fresh concrete as an aid in curing, hardening, water proofing, acid proofing and oil proofing each panel.

2.4 STEEL REINFORCEMENT

A. Reinforcing Bars: Reinforcing bars utilized in construction of Concrete Grade Crossing panels shall be as follows:

B. Galvanized Reinforcing Bars:
   1. Steel Bars: ASTM A615/A615M, Grade 60 deformed bars.
   2. Zinc Coating: ASTM A767/A767M, Class I zinc coated after fabrication and bending.

C. Epoxy-Coated Reinforcing Bars:
   1. Steel Bars: ASTM A615/A615M, Grade 60, deformed bars.
   2. Epoxy Coating: ASTM A934/A934M with less than 2 percent damaged coating in each 12-inch (305-mm) bar length.

2.5 RUBBER FLANGEWAY FILLER

1. Rubber flangeway filler shall meet the following requirements:
   a. Tensile strength – 850 psi
   b. Ultimate elongation – 400% minimum
   c. Tear strength at 25˚ Celsius – 150 psi minimum
   d. Shore A Durometer Hardness – 75
   e. Compression set 100˚ Celsius for 70 hours
   f. Accelerated aging test – 70 hours
   g. Ozone resistance test – 5- PPHM for 96 hours
   h. Electric resistance – 10 mega ohms minimum

2.6 RAIL FASTENING SYSTEM

A. The Rail Fastening System shall be of the positive restraint type, incorporating rail shoulders installed during the pre-casting process and shall apply sufficient longitudinal and vertical force upon the rails when fully installed, so as to prevent movement of the rails from thermal forces due to temperature variations or from dynamic loads created by movement of rail vehicles over the track section in which the crossing panels are located. The fastening system shall be of a design that will permit installation of the rails and fasteners without use of special tools or result in damage to the concrete panels during either installation or removal of the rails if required for future maintenance work.

2.7 FINISHES

A. All recess and minor concrete spalls are to be filled and finished to the panel dimensions using the proper bonding agent and repair material. Surface of the repaired area is to match the color and texture of the surrounding area.

B. The driving surface is to incorporate a herringbone pattern or other non-slip surface finish during the pre-casting and as approved by New Jersey State DOT. The use of non-slip surfaces or materials applied after the pre-casting process is not acceptable.

2.8 MARKING

A. Each precast concrete grade crossing panel shall be marked with concrete imprint for size of rail, weight of panel, Manufacturer's ID, month/day/year of manufacture and crossing type. End of each panel will be stenciled painted with size of rail, weight of panel and crossing type.

2.9 SOURCE QUALITY CONTROL

A. During precast concrete grade crossing panel fabrication, perform the tests and inspections specified in these Specifications.

PART 3 - EXECUTION

3.1 GENERAL

A. Track rails through the crossing area shall be fully welded and shall have no bolted rail connections (joints), field welds or bolt holes within the limits of the roadway surface nor within 15 feet of either edge of the roadway surface. Where a bolted joint falls within the limits of the crossing, the joint bars shall be removed, and the rail ends shall be flash butt welded in accordance with Section 347210.00 – Field Weld Rails

B. Before installing Grade Crossing Panels, a subdrain pipe system shall first be installed where called for on the plans and the subgrade material placed and fully compacted to grade within specified tolerances.

C. Contractor shall advise the Construction Manager when the portion of the track alignment to receive the Grade Crossing Panels has been completed. The Construction Manager shall then inspect the portion of the subgrade for compliance to tolerances and specifications and Contractor shall take any corrective action required at no additional costs or expense to Owner, prior to the installation of the Grade Crossing Panels.

D. Grade Crossing Panels shall be handled solely utilizing the incorporated lifting inserts and compatible clutch system, spreader bar and cables or chains. Handling with forklift, Prentis type log loader grapple, split bucket or fork attachments of backhoe or excavator or by dragging or shoving along ground is prohibited.

E. Where Grade Crossing Panels are to be installed adjacent to concrete paving, the panels shall be installed before the concrete paving is placed. The Grade Crossing Panels shall not be utilized as part of the concrete paving formwork in order to facilitate removal of the Grade Crossing Panels in the event of future required track maintenance activities. Formwork located along the edge of pavement abutting the Grade Crossing Panels track shall be of a design suitable to be left in place. Alternately a bond breaker or a reinforced precast concrete header curb designed and fabricated to become part of the finished roadway surface and installed prior to placing the concrete pavement may be utilized as approved by the Engineer.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. Work of this Section is considered incidental to work associated with project item in Section 347150, Highway-Rail Grade Crossings.

4.2 PAYMENT

A. No separate measurement and payment will be made to the Contractor for Work of this Section.

END OF SECTION

SECTION 341193.00 – TRACK APPURTENANCES AND ACCESSORIES

PART 1 - GENERAL

1.1 DESCRIPTION

A. Section Includes:

1. Track Bumpers.
2. Switch Stands.
3. Split Switch Point Derails
4. Sliding Derails.
5. Signage and Marking
6. Other associated miscellaneous fasteners and hardware.

B. Related Sections:

1. Section 099000.00 – Painting and Coating
2. Section 341123.00 – Special Trackwork
3. Section 341129.00 – Construct Continuously Welded Rail Track
4. Section 331133.00 – Timber Crossties
5. Section 331133.22 – Steel Crossties
6. Section 347201.00 - Track Layout
7. Section 347205.00 - Construct Turnouts
8. Section 347220.00 – Other Track Material

1.2 MEASUREMENT AND PAYMENT

A. Measurement or payment will be made as follows:

1. Track Bumpers – Payment will be on an each basis, installed complete and in accordance with these specifications and the manufacturer's instructions.
2. Switch stands **-** Payment will be incidental to bid item for Derails installed complete with operating rod, reflectorized target, latches (keepers) and supply and installation of the treated switch ties, on which the operating switch stand is installed, and all necessary hardware, and in accordance with these specifications and the manufacturer's instructions.
3. Derails - Payment will be on an each basis, installed complete with the derail appliance, rails, braces, tie plates rail fasteners, switch stand, operating rod, reflectorized target, latches (keepers), marker post or sign, supply and installation of the treated switch ties, on which the Split Switch Point or sliding derail is installed, and in accordance with these specifications in order to furnish an installed, fully operating derail.
4. Signage, Marking, Other Miscellaneous Fasteners and Hardware**.** - No separate payment will be made for these items. Payment will be made under the applicable track or other item that requires this work.

1.3 REFERENCE STANDARDS

A. American Railway Engineering and Maintenance of Way Association (AREMA):

1. Manual for Railway Engineering
2. Specifications for Special Trackwork
3. Portfolio of Trackwork Plans

B. American National Standards Institute, Inc. (ANSI)

1. ANSI B1.1: Unified Inch Screw Threads
2. ANSI B1.3M: Screw Threads Gaging System for Dimensional Acceptability
3. ANSI B18.22.1: Plain Washers

C. American Society for Testing of Materials (ASTM)

1. ASTM A36: Standard Specifications for Carbon Structural Steel
2. ASTM A123: Standard Specification for Zinc (Hot-Dip-Galvanized) Coating on Iron and Steel Products
3. ASTM A325: Standard Specifications for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.

D. American Welding Society (AWS):

1. AWS B2.1: Standards for Welding Procedures and Performance Qualifications
2. AWS D1.1: Structural Welding Code

E. Consolidated Rail Corp. (Conrail)

1. Industrial Sidetrack Construction Specifications

F. New Jersey Department of Transportation, (NJDOT)

1. Standard Specifications for Road and Bridge Construction

1.4 COORDINATION

A. Section 013100 - Project Management and Coordination:

B. Coordinate Work of this Section with installation of trackwork.

1.5 PREINSTALLATION MEETINGS

A. Section 013000 - Project Management and Coordination: Preinstallation conference

1.6 SUBMITTALS

A. Section 013300 - Submittal Procedures.

1. Product Data: Submit manufacturer information for all materials

B. Shop Drawings:

1. Indicate dimensions, general arrangement, installation instructions, finishes and all other relevant details.

C. Submit data documenting past performance and projects within the last ten (10) years furnishing to freight, passenger or commuter railroads:

1. Track Bumpers
2. Sliding Derails
3. Split Switch Point Derails
4. Switch Stands

D. Manufacturer Instructions: Submit detailed documentation including:

1. Installation requirements, including storage and handling procedures.
2. Maintenance Schedules and Requirements.
3. Repair Parts Lists.

1.7 QUALITY ASSURANCE

A. Materials or partially or fully assembled products not meeting the specifications shall be rejected.

B. Equipment used for the manufacturing materials shall be in good operating condition, of adequate capacity and range, and accurately calibrated. Testing equipment shall be certified and traceable to national standards such as the National Institute of Standards and Technology.

1.8 DELIVERY, STORAGE AND HANDLING

A. Section 01 60 00 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.

B. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.

1.9 WARRANTY

A. The Manufacturers shall warranty the items as follows:

1. Track Bumpers.- One Year
2. Switch Stands – One Year
3. Sliding Derails – One Year

PART 2 - PRODUCTS

2.1 MATERIALS

A. All material furnished and installed in accordance with this specification shall be NEW unless otherwise noted.

B. Track Bumpers:

1. Western Cullen Hayes Type WG with Middle Rails.
2. Approved equal.

C. Switch Stands for Sliding Derails shall be:

1. Racor 36E Tri-Handle “Non-trailable”.
2. National Track Model #1004ARS.
3. Bethlehem Model #51A with Bow type handle.
4. Equipped with fully adjustable operating rod.
5. Equipped with latches capable of:
   a. Securing the handle in either position.
   b. Accommodating a lock:
      1) Approved by the serving railroad
      2) Capable of preventing the switch stand from being operated when the operating lever is latched in either position.

D. Sliding Derails:

1. Model: Hayes type HB Series.
2. Hand: As noted on plans.
3. Shall be a size to fit the rail section on which installed.
4. Include an operating stand of one the types indicated above.
5. Shall be as installed on parent track incorporating crosstie materials as follows:
   a. Timber Crossties - Treated size 5, 14’-0” long treated switch timbers.
   b. Steel Crossties - Type 3, 15’0” steel crossties.
6. Include a red reflectorized target on the operating stand spindle.
7.

E. Signage and Marking:
   a. Derail Color: Blaze Orange (Safety Orange)
   2. Derail Signs shall be:
      a. Fabricated as shown the plans:
      b. Convey information as indicated on the plans.

PART 3 - EXECUTION

3.1 EXECUTION

A. Track bumpers shall be installed in accordance with the manufacturer's instructions, be equipped with "Middle Rails" and shall be painted High Visibility Orange.

B. Sliding Derails shall be painted High Visibility Orange.

C. Signs for or Marker Posts for Derails or to mark Clearance Points of tracks, shall be in accordance with that shown on the plans and installed in conformance with the Railroads requirements.

D. Switch Stands for Sliding type or Split Switch Point Derails as noted on the plans and shall be installed in accordance the manufacturer's or supplier's instructions and or plans and equipped with reflectorized red target as part of the switch stand. The target shall be affixed so that when the derail is in the "normal" or derailing position, the target is perpendicular the centerline of the track and parallel to the centerline of the track when the derail in in the "reverse" position.

E. Switch Stands for Sliding type or Split Switch Point Derails shall be equipped with latches and a lock approved by the railroad and affixed so that the derail may be locked in the "normal" or derailing position.

F. Switch Stands for Sliding type derails shall be installed on the far rail relative to the location of the derail appliance.

G. Sliding derails shall be supplied and installed so as to derail towards the outside of curved track when installed on curves and in the direction noted on the plans when installed on tangent track.

H. All derails shall be supplied and installed so as to prevent railcars located on industry owned or controlled tracks from unintended movement onto tracks owned or controlled by the operating railroad or across unprotected public or private grade crossings.

- END OF SECTION -

SECTION 341193.13 - CASING PIPES

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Casing pipes for pressurized pipes under tracks.

B. Casing pipe spacers (insulators).

C. Casing pipe end seals.

D. Casing pipe vents.

1.2 SUBMITTALS

A. Section 013000 - Submittals: Procedures for submittals.

B. Product Data: Provide data on casing pipe materials, spacers, end seals and vents.

1.3 SUBMITTALS FOR INFORMATION

A. Submit submittals to the Engineer for approval prior to proceed with installation.

B. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

C. Product Data: Provide data on casing pipe materials, spacers and end seals. Provide manufacturers catalog information.

1.4 PROJECT RECORD DOCUMENTS.

A. Submit to the Engineer following:
   1. Record actual locations of casing pipes.
   2. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, protect and handle products to site under provisions of Division 1.

PART 2 - PRODUCTS

2.1 CASING PIPE

A. Steel Pipe:

1. The steel casing pipe shall conform to ASTM Specification A-139.
2. Steel casing pipe, with a minimum cover of 5 ½ ft. (1.7m), shall have a minimum wall thickness as shown in the following table:

Pipe Diameter	Uncoated & Unprotected	Coated or Cathodically Protected
Nominal Pipe Size (in.)	Nominal Wall Thickness (in)	Nominal Wall Thickness (in)
10 and under	0.188	0.188
12 & 14	0.250	0.188
16	0.281	0.219
18	0.312	0.250

3. Ductile Iron Pipe:

1. The pipe shall have mechanical or restrained type joints.
2. Ductile iron pipe shall conform to the requirements of ANSI A21.51/AWWA C-151. Class 56 pipe shall be used.
3. Ductile Iron casing pipe, with a minimum cover of 5 ½ ft. (1.7m), shall have a minimum wall thickness as shown in the following table:

Pipe Diameter	Thickness Class	
	Wall thickness	Class
Inches	Inches	
6	0.25	50
8	0.27	50
10	0.32	51
12	0.34	51
14	0.39	52
16	0.40	52
18	0.44	53

2.2 CASING PIPE ISOLATORS

A. Factory made casing isolators/spacers of the following description shall be installed on any carrier pipe passing through a pipe casing. They are designed to protect the carrier pipe corrosion coating and electrically isolate the carrier pipe from the casing.

B. Upon completion of the installation of the steel pipe encasement, the contractor shall furnish and install casing spacers. Casing spacers shall be spaced a maximum of eight (8) feet apart along the length of the carrier pipe with one casing spacer within one (1) foot of each side of a pipe joint and the rest evenly spaced.

C. Wood skids are not an acceptable method of supporting the carrier pipe.

D. Casing spacers shall be all non-metallic (polypropylene) molded in segments, or PVC lined cold formed steel with glass reinforced polymer runners tools and shall be designed so as to prevent their displacement when inserting the carrier pipe into the casing. The PVC liner shall have a hardness of 85-90 Durometer “A”.

E. Casing spacers shall be designed for field assembly without any special tools. Spacer segments shall be secured around carrier pipe by threaded fasteners or other manufacturer specific means without requiring any special tools. All fastener hardware shall be 304 stainless steel.

F. The casing spacer polymer shall contain ultraviolet inhibitors and shall have a minimum compressive strength of 3,000 psi when tested in accordance with the requirements of ASTM D-695.

G. Dielectric strength shall be equal to or greater than 500 Volts/mil as tested according to requirements of ASTM D-149, Method B (Step method).

H. Impact strength shall be greater than or equal to 1.5 ft-lbs /inch as tested in accordance with the requirements of ASTM D-256.

I. Each casing spacer shall have full length legs extending beyond the bell or mechanical joint of the carrier pipe.

2.3 CASING PIPE END SEALS

A. Factory made casing pipe end seals of the one of the following descriptions shall be installed at the ends of any casing pipe passing beneath a track(s). They are designed to prevent the entry of water or soil into the annular space between the carrier pipe and the casing pipe.

B. Pull on end seals shall be custom made per application or sized for ANSI steel pipe specifications with a minimum 1/8” thick synthetic rubber. Banding clamps are to be 304 stainless steel with worm screws. Pull on end seals shall have locating ribs on the outside for banding clamps and ribs in the inside to prevent leakage. Seals shall be designed to fit the diameter of the casing pipe and the carrier pipe to which they are applied.

C. Wrap around end seals shall be made with a minimum 1/8” thick synthetic rubber and a self-curing seam. Seam shall have plastic backing release strip, to

protect self-curing rubber. Banding clamps are to be 304 stainless steel with worm screws.

2.4 VENTS

A. Sealed casings for flammable substances shall be properly vented. Vent pipes shall be of sufficient diameter, but in no case less than two inches (51mm) in diameter, and shall be attached near each end of the casing and project through the ground surface at right-of-way lines or not less than 45 feet (13.7m), measured at right angles from centerline of nearest track.

B. Vent pipes shall be steel tubing and shall extend not less than 4 feet (1.2m) above the ground surface. Top of vent pipe shall have a down-turned elbow, properly screened, or a relief valve. Vents in locations subject to high water shall be extended above the maximum elevation of high water and shall be supported and protected in a manner approved by the Engineer

C. Vent pipes shall be at least 4 feet (1.2m), vertically, from aerial electric wires or greater if required by national Electrical Safety Code (ANSI C2)..

PART 3 - EXECUTION

3.1 EXAMINATION

A. Coordinate work in accordance with section #013112 Project Coordination.

B. Provide temporary facilities where required in accordance with section #015000 Temporary Facilities and Controls.

3.2 INSTALLATION - CASING PIPES

A.

1. Casing pipe shall be so constructed as to prevent leakage of any substance from the casing throughout its length, except at ends of casing for non flammable fluids where ends are indicated to be left open. Casing shall be installed so as to prevent the formation of a waterway under the railroad, and with an even bearing throughout its length, and shall slope to one end (except for longitudinal occupancy).
2. After insertion of the carrier pipe into the casing, the ends of the casing shall be closed by installing 1/8" thick synthetic rubber end seals where specified.
3. The casing pipe and joints shall be steel and of leakproof construction when the pipeline is carrying liquid flammable products or highly volatile substances under pressure.

4. The inside diameter of the casing pipe shall be such as to allow the carrier pipe to be removed subsequently without disturbing the casing or the roadbed. For steel pipe casings, the inside diameter of the casing pipe shall be at least 3 inches greater than the largest outside diameter of the carrier pipe joints or couplings, for carrier pipe less than 6 inches in diameter, at least 4 inches greater for carrier pipe 6 inches and over in diameter.
5. Joints between the sections of steel pipe shall be fully welded around the complete circumference of the pipe.
6. Steel pipe may be installed by open cut, boring, directional drilling or jacking.
7. Ductile iron pipe may be used only when placed by the open cut method. Jacking or boring through the railroad embankment is not permitted due to the bell and spigot joints.

3.3 FIELD QUALITY CONTROL

A. Section 014000 Quality Requirments: Field inspection and testing.

B. Perform backfilling in accordance with section 312323.15 Trench Backfill Compaction testing will be performed in accordance with the provisions of Section 322323.15.

- END OF SECTION -

SECTION 347201 – TRACK LAYOUT

PART 1 - GENERAL

1.1 SUMMARY

A. The contractor shall field survey and stake the proposed horizontal and vertical track alignments. The alignments shall be the same as those shown on the plans.

B. The railroad plans will indicate survey coordinates for control points along the centerline of track on tangents, spirals, curves, and turnouts.

1.2 MEASUREMENT AND PAYMENT

A. No measurement or payment will be made for this item. Payment will be made under the applicable track or turnout item that requires this work.

PART 2 - PRODUCTS

A. This Section not applicable

PART 3 - EXECUTION

3.1 EXECUTION

A. Trackwork control points shall be offset and protected by the contractor. Lost or destroyed survey reference points, bench marks, and control points shall be restored by the contractor.

B. Staking shall be done a minimum of two times: Once after the subballast has been placed to ensure that the subballast has been placed in compliance with the plans; and again after final ballasting to ensure that the track has been placed in compliance with the plans.

C. Field staked points shall be a hard wood hub with a tack, or a center punched iron pin. Stakes shall be driven into the ground or ballast a minimum of 12 inches and shall not be easily disturbed.

D. Tangent track and curves flatter than 5 degrees shall be staked along the centerline of track at intervals of 50 feet or less.

1. Track with curves of 5 degrees or sharper shall be staked along the centerline of track at intervals of 25 feet or less.
2. Tracks with super elevation shall have their profile or vertical alignment follow the low rail. The low rail shall be the inside rail of the curve.

3. Spirals up to and including 124 feet in length shall be staked at both end points of the spiral, and at every other chord point of an A.R.EM.A. ten chord spiral. Spirals longer than 124 feet shall be staked at both end points of the spiral, and at every chord point of an A.R.E.M.A. ten chord spiral.
4. Super elevation shall be changed at a constant rate throughout the length of the spiral.

E. All turnouts must be staked on the centerline of track at the point of switch (P.S.), turnout point of intersection (T.O.P.I.), and half-inch point of frog (P.F.).

F. Equilateral turnouts and turnouts on curves shall be staked as described for all turnouts, and also as described for track on curves.

G. The top of rail elevation shall be set to within 0.01 feet of the designed profile elevation shown on the plans.

H. Horizontal control points shall be set to within 0.01 feet of the coordinates shown on the plans.

- END OF SECTION -

SECTION 347205.00 – CONSTRUCT TURNOUTS

PART 1 - GENERAL

1.1 SUMMARY

A. The contractor shall furnish and construct new, 136RE turnouts as indicated and designated at the locations shown on the plans.

B. Related Sections

1. Section 341126.16 – Subballast.
2. Section 341123.00 – Special Trackwork
3. Section 341133.22 – Steel Crossties
4. Section 341193.00 – Track Appurtenances and Accessories
5. Section 347201.00 - Track Layout.
6. Section 347205.00 - Construct Turnouts
7. Section 347210.00 – Field Weld Railroad Rails.
8. Section 347215.00 – Rail Connections
9. Section 347220.00 - Other Track Material
10. Section 347230.00 - Ballast

1.2 MEASUREMENT AND PAYMENT

A. Measurement shall be the number of turnouts of each rail weight and each frog number constructed and in place.

B. Payment shall be at the unit price(s) bid.

1.3 REFERENCE STANDARDS

A. American Railway Engineering and Maintenance of Way Association (AREMA):

1. Manual for Railway Engineering, Chapter 5, Part 4 – “Track Construction”.
2. Specifications for Special Trackwork
3. Portfolio of Trackwork Plans

1.4 SUBMITTALS

A. Section 013300 - Submittal Procedures: Requirements for submittals.

B. Materials:

1. Submit individual certifications that all materials furnished by the Contractor conform to the specified requirements.

C. Shop Drawings:

1. Submit Shop Drawing and product data for trackwork items not specifically defined by engineering standards.
2. Shop Drawings and Bill of Materials for each size and direction of Turnout will be required.
3. Where Steel Switch Tie Sets are specified for installation, submit Steel Switch Tie manufacturers scale layout drawing(s) for each size and hand of turnout to be supplied.

D. Product Data: Submit data on accessories, fittings, hardware and OTM.

PART 2 - PRODUCTS

2.1 MATERIALS

A. The contractor shall assume complete responsibility for unloading, inventorying, storing, and providing security for the turnout materials.

Turnout material shall be furnished by the contractor and shall conform to the AREMA Manual for Railway Engineering, Chapter 5, Part 4 – "Track Construction", Specifications for Special Trackwork and Portfolio of Trackwork Plans.

B. Each turnout shall include the complete double tongue switch, switch operating stand with pavement box, spring connecting rod, frog, frog guard rails, hardware, fillers, joint bars, track bolts for the switch and frog, and all other required items, including closure rails, rail fixation plates, and rail fasteners.

C. Turnout material shall be new.

D. Steel Switch Ties shall conform to the requirements of Section 341133.22 – Steel Crossties and details as shown on the project plans.

E. Frog Guard Rails and the Rail Fastening System shall conform to the requirements of Section 341123.00 – Special Trackwork of these specifications.

F. Rail connections shall conform to the requirements of Section 347215.00, Rail Connections, of these specifications.

G. Switch Frogs may be of the following types:

1. Rail Bound Manganese (RBM)
2. Solid Manganese.

H. Switch Stands and Connecting Rod for Double Tongue Switches shall be:
   1. #336EC Flush Mount Parallel Throw type enclosed in cast or ductile iron Pavement Box supplied with hinged access lid. Including spring-hydraulic type connecting rod enclosed in Pavement Box with hinged access lid.

   2. Approved Suppliers:
      a. Voestalpine Railway Systems Nortrak
      b. Irwin Transportation Products.

I. All material furnished by the contractor and condemned by the engineer shall be replaced by the contractor. Condemned material is considered scrap, remains the contractor's property, and shall be removed from the Owner's property by the contractor.

PART 3 - EXECUTION

3.1 EXECUTION

A. Turnouts shall be constructed in accordance with the project plans and approved shop drawings.

B. Track shall be gauged as specified in the project documents and specifications.

C. Rail connections shall be as specified in Section 347215.00, Rail Connections, of these specifications.

D. Switch operating stand and connecting rod pavement boxes shall be provided with means of positive stormwater drainage connected to the site stormwater system.

E. The contractor shall be responsible for and pay all costs for repairing finished work damaged through negligence.

- END OF SECTION -

SECTION 347210.00 – FIELD WELD RAILS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. The work specified in this Section consists of providing labor, materials, equipment and superintendence necessary and sufficient to field weld together abutting ends of railroad rails to create strings of CWR.

B. Related Sections:

1. Section 341126.00 – Ballasted Track Construction
2. Section 341126.22 – Construct Welded Track – Steel Crossties
3. Section 347201 - Track Layout. Includes setting line and grade for track alignment.
4. Section 347205 – Construct Turnouts
5. Section 347215 – Rail Connections

1.2 DEFINITIONS

A. CWR: Continuously Welded Rail.

B. Thermite: A mixture of finely-divided metallic aluminum and ferric oxide that when ignited produces extremely high temperatures as the result of the union of the aluminum with the oxygen of the oxide. The reaction, also called the Goldschmidt process, is used for thermite welding, often used to join rail tracks.

1.3 REFERENCE STANDARDS

A. American Railway Engineering and Maintenance of Way Association (AREMA):

1. Manual for Railway Engineering.
   a. Chapter 4, Part 3
      1) Section 3.10 Specification For The Quality Assurance of Electric-Flash Butt Welding of Rail.
      2) Section 3.11 Specification for Fabrication of Continuous Welded Rail
      3) Section 3.13 Specification For The Quality Assurance of Thermite Welding Of Rail.
2. Specifications for Special Trackwork
3. Portfolio of Trackwork Plans

B. American Society for Testing of Materials (ASTM)

1. E 164, Practice for Ultrasonic Contact Examination of Weldments

C. American Welding Society (AWS):

1. AWS B2.1: Standards for Welding Procedures and Performance Qualifications
2. AWS D1.1: Structural Welding Code

1.4 COORDINATION

A. Section 013100 - Project Management and Coordination specifies requirements for coordination.

1.5 PREINSTALLATION MEETINGS

A. Section 013100 - Project Management & Coordination specifies requirements for preinstallation conferences.

B. Convene minimum one week prior to commencing Work of this Section.

1.6 SUBMITTALS

A. Section 013300 - Submittal Procedures specifies requirements for submittals.

B. Contractor shall prepare for submission to and approval by the Engineer, a detailed specification covering procedures for making welds. A complete description of each of the following items and any other essential characteristics shall be included in the procedure submittal:

1. The manufacturer's trade name for the welding process.
2. The method used for cutting and cleaning of the rail ends. Flame cutting of rails will not be allowed.
3. The minimum and maximum spacing between abutting rail ends.
4. The method to be used for pre-heating, including time and temperature.
5. The tapping procedure, including the minimum time required to cool the weld under the mold insulation.
6. The method used, including a description of the special tools and equipment for removing the upset metal for finishing the contour of the weld.
7. A schedule of field welds to be made, their location in the finished track, including track number, survey station, and field cuts required to finish the weld. Each weld is to be individually and uniquely number in a system as approved by the Engineer. This welding schedule shall be updated daily as the work progresses so that there will be a single consolidated record of all field welds.

8. Quality Control procedures to be followed. This shall include the name, address and telephone number(s) of the independent testing laboratory to be used by the contractor for testing of the welds. It shall also include field quality control results.
9. Contractor agreement with any subcontractor or vendor employed by the Contractor in performing the work of this Section.
10. At the completion of all welding operations the Contractor shall submit to the Engineer a complete record of all the welds.

C. Qualifications Statements:

1. Submit qualifications certificates issued by the particular welding material and/or equipment supplier for each employee engaged in the performance of the welding process.
2. Submit manufacturer's approval of welding contractor.

1.7 CLOSEOUT SUBMITTALS

A. Section 017700 - Execution and Closeout Requirements specifies requirements for submittals.

B. Project Record Documents: Record weld information as required by this specification using form included at the end of this specification or other approved form.

1.8 QUALITY ASSURANCE

A. Welding shall be done in accordance with the following AREMA Specifications

1. Specification for Quality Assurance of Electric Flash Butt Welding of Rail
2. Thermite Welding – Rail Joints
3. Inspection and Classification of Secondhand rail for Welding
4. Specification for Fabrication of Continuous Welded Rail
5. Recommended Field Repairs to Pressure Butt Weld Failures, except as modified herein.

B. Welding Supervision: All welding shall be performed under the direct supervision of an experienced and manufacturer – qualified supervisor or foreperson.

1.9 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products and equipment specified in this Section with minimum five years' documented experience.

B. Welding Contractor: Company specializing in performing Work of this Section with minimum five years' documented experience and approved by the manufacturer of the Electric Flash Butt Welding equipment or Thermite Weld Kits.

1.10 DELIVERY, STORAGE, AND HANDLING

A. Section 016000 - Product Requirements specifies requirements for transporting, handling, storing, and protecting products.

B. Deliver materials in manufacturer's packaging including application instructions.

C. Store Weld Molds and related materials according to manufacturer's instructions.

D. Protect all Thermite Weld Kits from moisture.

1.11 AMBIENT CONDITIONS

A. Section 015000 - Temporary Facilities and Controls specifies ambient condition control facilities for product storage and installation.

B. Minimum Conditions: Do not perform welding when weather conditions do not comply with specific welding equipment and material manufacturer’s requirements.

1.12 EXISTING CONDITIONS

A. Verify that adequate laydown and material storage areas are available for execution of the work.

B. Performance of the welding will not interfere with existing Owners operations or other construction activities.

1.13 WARRANTY

A. Section 017700 - Execution and Closeout Requirements specifies requirements for warranties.

B. Furnish guarantee of all field welds made in accordance with the requirements of the AREMA Specifications noted in Section 1.8 of this Specification.

PART 2 PRODUCTS

A. FLASH BUTT WELDING EQUIPMENT:

1. Electric flash butt welds shall be made in the field using one of the following portable plants:
   a. Chemetron Portable Welding Plant by Chemetron Rail Products
   b. Holland Portable Flash Butt Welding Plants by Holland Company
   c. Railtech Schlatter AMS Superflex Mobile Welder by Railtech
   d. Or approved equal.

B. THERMITE WELDING EQUIPMENT AND MATERIALS

1. Thermite type rail welds shall be formed using one of the following brands of rail welding kits:
   a. Boutet, as distributed by Railtech Boutet, 25 Interstate Drive, Napolean, OH 43545.
   b. Orgo-Thermit®, 3500 Colonial Drive, Manchester, NJ 08759
   c. Or approved equal.
2. Substitutions: Specified in Section 016000 - Product Requirements, comparable products.

2.2 SOURCE QUALITY CONTROL

A. Section 014000 - Quality Requirements specifies testing, inspection, and analysis requirements.

B. Certificate of Compliance: When Welding Contractor is approved by the manufacturer of the Electric Flash Butt Welding equipment or Thermite Weld Kits, submit proof of certificate of compliance indicating past work performed conforms to Contract Documents.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 017300 - Execution specifies requirements for installation examination.

B. Verify rails conform to the requirements of the AREMA Manual, Section 3.11 Specification for Fabrication Of Continuous Welded Rail

3.2 PREPARATION

A. Rails used for electric-flash butt welds shall have their ends saw-cut or abrasive disc-cut clean and square by means of accepted equipment.

B. Torch cutting of rail is prohibited.

C. The head and base of the rail for a length of approximately six inches from welding end shall have mill scale removed down to bright metal.

D. All burrs shall be removed from the area where the welding current carrying electrodes contact on the head and base of the rail.

E. Holes will not be permitted in the rail, except as approved by the Engineer.

F. Rail ends for thermite welding shall be prepared in accordance with the recommendations of the welding kit manufacturer.

G. For thermite welding, the rail ends shall be preheated prior to welding to a sufficient temperature and for sufficient time to ensure full fusion of the weld metal to the rail ends without cracking of the rail or weld.

H. The completed weld shall be finished by mechanically controlled grinding to conform to the same requirements specified for shop welding.

I. Thermite welds shall not be made at the following locations:

1. Within 5 inches of the edge of any bolt hole in the rail.
2. Within 2 inches of a Cadweld® or copper bond wire (If this type of bond exists, remove any presence of copper by grinding. The rail ends must be inspected and cleaned after grinding is complete).
3. Closer than 2 feet from an existing plant weld.
4. Closer than 6 feet to an existing thermite weld.
5. On both ends of a rail plug simultaneously unless the rail is 15 feet or longer on tangent track and 24 feet long or longer on curved track.

J. Follow Manufacturer recommendations for compromise welds.

K. Follow recommendations of rail manufacturer for welding high strength (alloy or heat-treated) rails.

L. Thermite welds shall be located in cribs between ties. The edge of the weld must be no closer than 3 inches from the edge of the nearest tie.

M. Electric Flash Butt welds with the base of the rail smoothly ground may be located anywhere.

3.3 PERFORMANCE OF WORK

A. Perform work according to the AREMA Manual for Railway Engineering, Chapter 4, Part 3, Section 3.11, Specification for Fabrication Of Continuous Welded Rail.

B. The contractor shall supply rollers for the fabrication of the welded rail strings. The type of rollers used, and their application must be approved by the engineer prior to their use.

C. Fabrication of Continuous Welded Rail:

1. Fabricate continuous welded rail using the Electric-Flash Butt Welding process in accordance with AR.E.M.A. Manual for Railway.
2. Weld all rail lengths with the brand facing the same side for the entire length of each welded string.
3. Use abrasive saw for cropping rail. Torch cutting will not be permitted.
4. Inspection and Tests:
   a. The Contractor shall provide, at his expense, an approved, Independent Testing Agency to provide the following tests after welding:
      1) Perform testing of all rails in accordance with A.R.E.M.A. Manual for Railway Engineering:
         a) Section 3.10 Specification For The Quality Assurance of Electric-Flash Butt Welding of Rail.
         b) Section 3.11 Specification for Fabrication of Continuous Welded Rail.
5. Record of Welds:
   a. Provide records of all welds giving pertinent details of the welds such as current values, travel time, and any other data pertinent to the welds utilizing the form attached to this specification or other approved form.
   b. Group records for each rail string and location. Furnish plans indicating installed location of each string. Mark each rail string at the center of the string, with the string number. Submit records to the Project Manager.

3.4 TOLERANCES

A. As specified in the AREMA Manual:

1. Section 3.11 Specification for Fabrication Of Continuous Welded Rail.
2. Section 3.13 Specification for the Quality Assurance of Thermite Welding of Rail.

3.5 FIELD QUALITY CONTROL

A. Weld Inspection: All welds shall be visually inspected at the time of welding and ultrasonically tested once the rail has been laid in final position in the track. Ultrasonic inspection shall be in accordance with ASTM E 164. Ultrasonic test equipment shall be capable of detecting 3/64 inch discontinuity,

6 ½ inches below the top of the rail. The sensitivity and resolution of the proposed testing equipment shall be demonstrated using appropriate area amplitude and distance amplitude reference blocks made of material similar to the steel rails being tested. All equipment shall be equipped with a distance amplitude correction feature. The equipment shall be calibrated daily using an 11W correction block, also made of steel. All equipment and calibration methods will be submitted to the Engineer for approval. All inspection personnel shall be technicians qualified in accordance with AWS D1.1. All welds giving fault indication in ultrasonic inspection shall be cut out and re-welded according to these Technical Provisions.

B. REPLACEMENT OF DEFECTIVE WELDS

Welds in installed track that the Engineer determines to be unacceptable shall be cut out of the rail and replaced by a section of new rail and two new welds. The minimum length of a new rail shall be 13-feet and shall be installed with rail gaps as specified in Article 3.01 above. Saw cuts shall be made at least six inches from the centerline of the faulty weld. Replacement welds and replacement rails shall be at the sole expense of Contractor. Replacement welds shall be renumbered as indicated. Replacement welds made in track shall be ultrasonically tested as specified herein.

C. ATTACHMENTS

1. Record of Field Weld Form

- END OF SECTION -

Record of Field Weld			
Contractor:			
Weld Number: _____			
Date :_____ __	Time: _____ _	AM/PM Track_____ ___	Station: _____
Air Temperature: _____°F		Weather: _____ _____	
Rail Temperature: _____°F		Track Alignment & Construction: _____ _____	
Rail Gap:_____ _____ (Nearest 1/16")		Rail Cut Required? (Circle) YES NO	
Back Rail: Year/Month Rolled: _____/_____ _	Heat No.: _____	Rail Type: CC HT OH (Circle)	_____ _____ Shop Curved Rail
CC = Control Cooled; HT = Heat Treated; OH = Open Hearth			
Ahead Rail: Year/Month Rolled: _____/_____ ____	Heat No.:_____ __	Rail Type: CC HT O H (Circle)	_____ _____ Other
Remarks: _____ _____ _____ _____ _____ _____			
Kit Manufacturer Representative Present: _____ _____		Welding Supervisor _____ _____	

Engineering Representative Present: _____	
Recorder: _____ _____ (Signed)	Recorder: _____ ____ (Signed)

SECTION 347215.00 - RAIL CONNECTIONS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Furnishing and installing rail connections

B. Related Sections
   1. Section 341126.00 – Ballasted Track Construction
   2. Section 341116.22 – Construct Steel Track – Steel Crossties
   3. Section 347205.00 – Construct Turnouts
   4. Section 347210.00 – Field Weld Railroad Rails
   5. Section 347220.00 – Other Track Material

1.2 DESCRIPTION

A. Bolted Rail Joints
   1. Bolted Rail Joints consist of either head free or head contact standard bars and head contact compromise joint bars held in position by track bolts.

B. Temporary Rail Connections
   1. Temporary rail connections consist of rail joints it that are intended to be welded into CWR where becomes necessary to apply joint bars temporarily. These connections will not have the end holes of the rails drilled to permit subsequent prompt field welding. The temporary joints will have proper joint bars with four bolts, nuts and lock washers applied to the joint until such time that the joint can be welded and the track is placed into service. It may be necessary to apply additional rail anchors to prevent pull apart prior to field weld being made. These additional anchors should be removed after field welds have been made.

A. Compromise Joint Bars
   1. Compromise joints shall be designed to adequately connect different sections of rail and provide a smooth rail surface over the top and gauge face of the rail head at the joint.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Joint Bars
   1. Joint bars shall conform to the A.R.E.M.A. Manual Volume 1, Chapter 4, Part 3 “Joining of Rail” sections 3.1, 3.2, 3.3 and 3.4.

2. Joint bars may be new or second hand (fit).

B. Compromise Joint Bars
   1. Compromise joints shall be specifically designed for the rail sections they are meant to connect and provide a smooth rail surface over the top and gauge face of the rail head at the joint.
   2. Compromise joint bars shall be new and shall be factory manufactured.
   3. Correct compromise bars shall be used as determined by the weight and section of the rail, wear on the rail, whether the joint is designated right hand, left hand, or no hand, and whether the joint bar is gage side or field side.

C. Joint bars shall be free from all cracks or breaks after installation.

D. Track Bolts, Spring Washers and Nuts
   1. Track Bolts and Nuts shall conform with the A.R.E.M.A. Manual Volume 1, Chapter 4, Part 3 section 3.5 “Specification For Heat Treated Carbon Steel Track Bolts and Carbon Steel Nuts.
   2. Spring Washers shall comply with the A.R.E.M.A. Manual Volume 1, Chapter 4, Part 3 section 3.6 Specification For Spring Washers**”**.

PART 3 - EXECUTION

3.1 LOCATION

A. Where joints in conventional track are required, they shall be located, as nearly as possible, to the third point of the opposite rail, except through turnouts, and shall not vary more than 72 inches in either direction from the third point of the opposite rail.

B. Compromises may not be made except at connections to existing track and at connections to fit material removed from this project and re-used on this project.

3.2 TOLERENCES

A. The tops of the heads and the gauge faces of adjoining rails shall match within one eighth (1/8) inch of each other.

B. Abutting rail ends shall be fastened together by fully bolted standard or compromise joints, insulated joints or glued joints, except where butt welded.

C. Holes for bolting of cut rails shall be drilled by an approved type of rail drill. The use of a torch for cutting bolt holes is **prohibited**.

D. All rail cut in the field shall be cut squarely with a rail saw. Cutting rail with a torch is **prohibited.**

E. The ends of field cut rail for permanent bolted joints shall be de-burred, beveled chamfered or peened, and end hardened.

F. Bolted rail joints consist of either head free or head contact standard bars and compromise joint bars held in position by track bolts having sufficient tension to firmly support abutting rail ends, but not too tight to prevent longitudinal movement in joints to accommodate expansion and contraction due to variation in rail temperature.

G. Head free bars must have the inner surface of the head of the bar held tightly against the rail head fillet with the heel of the bar standing out the proper distance from the base fillet, where all of the "draw-in" for wear is concentrated.

H. Head contact bars must have the top surface of the bar held tightly against the fishing surface under the rail head outside of the rail head fillet area. Bars must be secured in a vertical position without "cocking".

3.3 INSTALLATION

A. The contractor shall install joint bars in accordance with the following procedures:

1. Before applying bolted rail joints, the contractor shall coat the joint bars and rail ends within the joint bar areas including webs, fishing surfaces, bolt holes and inside surfaces, with an approved oil or grease.
2. Joint bars shall be applied with their full number of bolts, nuts and nut locks according to standard plans and specifications.
3. New bolts, nuts and spring washers should be used when new or reformed joint bars are applied or renewed out-of-face.
4. When initially applying joint bars, the bolt tension should be brought in the range of 20,000 to 25,000 pounds, and for subsequent retightening from 15,000 pounds to 20,000 pounds. This may be approximated by an average man with a 36 inch track wrench.

B. Head Free Joints.

1. The following procedure should be followed in applying nut locks and nuts.
    a. Set bars in position, insert all bolts and apply nut locks and nuts by hand.
    b. Run up the No.3 and No.4 nuts with a power track wrench in high gear, without fully tightening to avoid locking the bars in an improper position.
    c. Strike the bead on the heads of both the inside and outside bars at both ends with a hammer to force the inside faces of bars tightly against rail head fillets. Do not strike the toe of the bar as this tends to force the head of the bar outwards.
    d. Tighten remainder of bolts from center of joint bars outward in high gear.

e. Tighten all bolts in low gear, working from center of joint bars outward. During this final tightening, drive the toe of the bars inward by tapping with a spike maul or sledge.

By following the above procedure, proper contact will be obtained between the inner face of the head of bar and the rail head fillet. Also, the heel of the bar will stand out the proper distance from the rail base fillet.

C. Head Contact Joints.

1. The following procedure should be followed in applying head contact joint bars:
   a. Set bars in position on rail, insert all the bolts and apply nut locks and nuts by hand.
   b. See that the bars are in a vertical (uncocked) position as one of the center bolts is tightened by:
      1) Inserting a bar in the bolt hole (necessary when applying 131 lb. or 152 lb. joint bars only)
      2) Tapping toes of joint bars as bolt is tightened.
   c. Tighten all bolts in low gear, working from center of joint bars towards ends, tapping toes of joint bars with a spike maul or sledge so that their vertical position is maintained.

D. Joint bars shall be applied with their full number of bolts, nuts and washers.

E. All defective joint bars shall be removed and replaced before work will be accepted.

- END OF SECTION -

SECTION 347230 – BALLAST

PART 1 - GENERAL

1.1 DESCRIPTION

A. The contractor shall furnish and place ballast under all proposed tracks and other specified locations shown on the plans.

B. Ballast shall consist of crushed stone which is angular fragments resulting from crushing by mechanical means the following types of rocks quarried from undisturbed, consolidated deposits: granite and similar phanero-crystalline igneous rocks, extrusive igneous rocks, or massive metamorphic quartzite or similar rocks. No crushed gravel shall be allowed. Material for ballast shall be sourced from a quarry that is currently an approved supplier to Norfolk Southern, CSXT or Amtrak.

C. The contractor shall supply, unload, haul, place, and compact the ballast.

1.2 RELATED SECTIONS

1. Section 341110.00 - Continuously Welded Rail (CWR)
2. Section 341126.16 – Subballast
3. Section 341129.00 – Construct Continuously Welded Rail Track
4. Section 341133.00- Timber Crossties.
5. Section 341133.22 – Steel Crossties.
6. Section 341190.00 – Track Appurtenances and Accessories
7. Section 347201.00 - Track Layout.
8. Section 347205.00 - Construct Turnouts

1.3 REFERENCE STANDARDS

A. American Railway Engineering and Maintenance-of-Way Association (AREMA) Manual for Railway Engineering.

B. American Society for Testing and Materials (ASTM):

1. C 88 Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate.
2. C 117 Test Method for Material Finer than 75-µm (No. 200) Sieve in Mineral Aggregates by Washing.
3. C 127 Test Method for Specific Gravity and Absorption of Coarse Aggregate.
4. C 136 Method for Sieve Analysis of Fine and Coarse Aggregates
5. C 142 Test Method for Clay Lumps and Friable Particles in Aggregates.

6. C 535 Test Method for Resistance to Degradation of Large Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
7. D4791 Standard Test Method for Flat Particles, Elongated Particles, or
8. Flat and Elongated Particles in Coarse Aggregate.
9. D3744 Standard Test Method for Aggregate Durability Index.
10. E11 Standard Specification for Wire Cloth and Sieves for Testing Purposes.

1.4 DELIVERY, STORAGE AND HANDLING

A. Prepared ballast shall be handled in such a manner that it is kept clean and free from segregation, and when delivered, the ballast shall be clean and free from rubbish or any substance, which might foul the ballast.

B. Blending, stockpiling, and other production and handling operations must be managed by the Contractor minimize segregation of finished product.

C. Stockpiling operations shall minimize breakage or excessive fall in stockpiling operations.

D. The movement of wheeled or tracked machines over stockpiled or installed Materials shall be limited.

1.5 MEASUREMENT AND PAYMENT

A. Measurement and payment will not be on a separate basis, but will be included in the cost per foot of constructing track and included in the cost on a per each basis of constructing turnouts.

PART 2 - PRODUCTS

2.1 SUBMITTALS

A. Section 013300 - Submittal Procedures: Requirements for Submittals.

B. Submit Certificate of Compliance and supporting data, from material suppliers attesting that components meet or exceed applicable A.R.E.M.A. Standards and these project specification requirements. Include material qualification test reports for materials. Contractor shall furnish a certification of compliance stating that the material meets or exceeds the requirements of the specification.

C. Graded aggregates subject to on site stockpiling prior to placement shall be reblended as directed by the Engineer to ensure compliance with the original gradation specified.

2.2 MATERIALS

A. Mainline ballast shall conform to A.R.E.M.A. specifications for stone ballast size #4. Ballast used in the construction of yard tracks and sidetracks shall conform to A.R.E.M.A. specifications for stone ballast size #5. (A.R.E.M.A. size #5 Gradation is also known as “Walkway” stone.) Yard leads, and ladder switches shall have size #4 material with walkway stone applied on top as necessary for walking conditions.

B. Gradation, as determined using ASTM C 136, using square opening sieves conforming to ASTM E11. One test shall be performed each 1000 tons or fraction thereof of material loaded for delivery.

1. Clay lumps and friable material percentage as determined by ASTM C 142 shall not exceed 0.5%.
2. Material finer than #200 sieve -percentage as determined by ASTM test C 117 shall not exceed 0.5%
3. Absorption -as determined by ASTM C 127 shall not exceed 1.0%.
4. Sodium sulfate soundness -average weighted loss after five (5) cycles shall not exceed 2.5%, as determined by ASTM C 88.
5. Resistance to degradation -as determined by ASTM C 535, grading type 2, (Los Angles Abrasion Test 535-2) shall not result in a wear percentage greater than 27.5% for granite.
6. Flat and/or elongated particles -as determined by U.S. Army Corps of Engineers' Test CRD-C-119, using a 3:1 ratio shall not exceed 5.0%.

C. Slag material, crushed concrete, dolomite or limestone will not be accepted as ballast.

PART 3 - EXECUTION

3.1 PRE-BALLASTING

A. Vehicles used for spreading of ballast must be approved by the project engineer in writing. If stone is initially spread by a self-spreading vehicle, the use of a power grader to assist the spreading operation is permissible only where approved in writing by the project engineer.

B. Ballast shall not be spread over snow or ice.

C. All rutting and pocketing of the roadbed shall be corrected by restoring the roadbed to a smooth surface.

D. The ballast shall be placed in loose lifts which are no thicker than 5 inches, and then compacted.

E. Minimum requirements for ballast compaction are as follows:

1. Compaction equipment shall be a minimum 10 ton vibratory roller capable of generating 1100 to 1500 cycles per minute.
2. Compaction equipment shall be operated as directed by the project engineer, but in no case shall the speed exceed four (4) feet per second, and the normal operating speed shall be two-and-one-half (2-1/2) feet per second.
3. A minimum of six (6) complete passes with the compaction equipment shall be made over each lift, and each lift shall be compacted until no deformation under load is observed.

3.2 FINAL BALLASTING

A. The contractor shall furnish and place ballast on the track and uniformly distribute it in sufficient quantities to properly raise the track to the proposed top of rail profile shown on the plans. The raise shall be approximately 2 inches. The ballast shall be placed and the track raised and tamped after the tracks are installed, spiked, and anchored.

B. To the extent possible, ballast shall be unloaded in position for use with a minimum of redistribution and dressing. Special ballast cars shall be used when available.

C. Ballast must be distributed or immediately dressed so that ample clearance is provided for rolling equipment, and so that switches and guard rails are unobstructed

D. Track cross level shall be maintained, and both rails shall be raised simultaneously when track is being raised.

E. Track shall not be lifted above the established profile when lining. Ballast at the ends of the ties shall be replaced immediately after lining the track.

F. The grades and alignments of each complete track shall conform to the design shown on the plans. The grade rail on all curves shall be the inside rail of the curve.

G. Tamping shall be done with approved multiple tamping machines.

H. The contractor shall neatly dress the ballast and add or remove quantities of ballast as required to provide a uniform appearance that conforms to the typical after the track has been tamped. Surplus ballast shall be stockpiled at the direction of the engineer.

l. If the contractor contaminates the ballast with foreign material, then the contractor shall replace and re-compact the contaminated ballast. The contractor shall re-compact all previously compacted ballast which is disturbed.

- END OF SECTION -