

---

**Atlantic City Expressway  
2021 WEST MAINTENANCE ADDITION PROJECT**



---

**PROJECT MANUAL**

---

*Contract*

General Construction

**BIDS DUE**

**Tuesday, September 21, 2021 @ 1:00 P.M.**

Administration Building, Farley Service Plaza  
Atlantic City Expressway, M.P. 21.3  
Elwood, NJ 08217  
609-965-6060

---

*Prepared for*

**SOUTH JERSEY TRANSPORTATION AUTHORITY**



---

*Bid Documents*

**PROJECT MANUAL CONTENTS**

NOTICE TO BIDDERS.....NTB-1 to NTB-2

**PROPOSAL SECTION**

*THE CONTENTS OF THIS SECTION HAVE BEEN DIGITIZED ON TO BID EXPRESS. ALL FORMS SHALL  
BE COMPLETED ONLINE.*

INSTRUCTIONS TO BIDDERS .....ITB-1 to ITB-13

GENERAL CONDITIONS (TABLE OF CONTENTS – GC-1 to GC-5)..... GC-1 to GC-125

CONSTRUCTION AGREEMENT.....C-1 to C-16

**SPECIAL PROVISIONS**

CONSTRUCTION REQUIRED BY THE SPECIFICATIONS .....	SP-1
CONTRACT DRAWINGS .....	SP-1
CONSTRUCTION SEQUENCE .....	SP-2
APPROVALS BY ENGINEER .....	SP-2
ACCIDENTS AND FIRST AID PROVISIONS.....	SP-2
DAILY PROGRESS, EQUIPMENT AND LABOR REPORTS .....	SP-2
SIGNS.....	SP-3
UTILITY SERVICES.....	SP-3
CONSTRUCTION PHASING .....	SP-3
CONSTRUCTION OPERATION REQUIREMENTS .....	SP-3
CONSTRUCTION LIGHTING.....	SP-4
DAILY CONSTRUCTION PROGRESS MEETINGS.....	SP-4
REPORTS .....	SP-4
EQUIPMENT .....	SP-4
TEMPORARY DRAINAGE .....	SP-5
FITTING, MATCHING.....	SP-4
TOLLS & USE OF MEDIAN CROSSOVER/U-TURN.....	SP-4
STORAGE AREA.....	SP-5
RECORD DOCUMENTS.....	SP-5
EXISTING MATERIALS.....	SP-6
PERMITS.....	SP-6

**TECHNICAL SPECIFICATIONS**

011000	Summary of Work
017329	Cutting and Patching
024119	Selective Demolition
054000	Cold Formed Metal Framing
061053	Miscellaneous Rough Carpentry
074213	Metal Wall Panels
075323	Ethylene-propylene-Diene-Monomer Roofing (EPDM)

078413	Penetration Fire Stopping
079200	Joint Sealants
081113	Hollow Metal Doors and Frames
081416	Flush Wood Doors
085113	Aluminum Windows
087100	Door Hardware
088000	Glazing
092116	Gypsum Board Assemblies
095123	Acoustical Panel Ceilings
096513	Resilient Wall Base and Accessories
096519	Resilient Tile Flooring
099100	Painting
230529	Hangers and Supports for HVAC Piping and Equipment
230548	Vibration Controls for HVAC
230553	Identification for HVAC Piping and Equipment
230593	Testing, Adjusting and Balancing for HVAC
230713	Duct Insulation
230719	HVAC Piping Insulation
232300	Refrigerant Piping
233113	Metal Ducts
233300	Air Duct Accessories
238126	Split System Air-Conditioners
260505	Selective Demolition for Electrical
260519	Low Voltage Electrical Power Conductors and Cables
260526	Grounding and Bonding for Electrical Systems
260529	Hangers and Supports for Electrical Systems
260533	Raceways and Boxes for Electrical Systems
260544	Sleeves and Sleeve Seals for Electrical Raceways and Cabling
260553	Identification for Electrical Systems
262726	Wiring Devices
262813	Fuses
262816	Enclosed Switches and Circuit Breakers

## **APPENDICES**

APPENDIX 1	NEW JERSEY WAGE RATES
APPENDIX 2	BID EXPRESS

**SOUTH JERSEY TRANSPORTATION AUTHORITY  
NOTICE TO BIDDERS**

NOTICE is hereby given that sealed bids will be received by the South Jersey Transportation Authority for:

**ATLANTIC CITY EXPRESSWAY  
2021 WEST MAINTENANCE ADDITION PROJECT**

This project includes the construction of a new +/- 919 SF office, locker room and storage room addition to the existing maintenance building, generally constructed of cast-in-place concrete foundations and slab-on-grade, CFMF walls and roof, metal siding and EPDM roofing.

The project will be bid and awarded as a lump sum single-prime general contract.

Pursuant to certain specifications prepared by the South Jersey Transportation Authority, Department of Engineering, said bids will be opened and read aloud in public on **TUESDAY, SEPTEMBER 21, 2021 at 1:00 P.M.** via Go To Meeting at <https://global.gotomeeting.com/join/718702397>. Bidders can also dial into the meeting by phone at +1 (571) 317-3112, Access Code: 718-702-397. Bid form, contract, plans and specifications may be obtained from:

SOUTH JERSEY TRANSPORTATION AUTHORITY  
ADMINISTRATION BUILDING  
FARLEY SERVICE PLAZA  
ATLANTIC CITY EXPRESSWAY M.P. 21.3  
ELWOOD, NEW JERSEY 08217  
(609) 965-6060

In order to bid this project, the bidder shall be pre-qualified under at least one (1) of the following NJDPMC Trade Code(s) at the time of submission:

- DPMC Trade Code C008 – General Construction
- DPMC Trade Code C009 – General Construction / Alterations & Additions

In addition to the bidder prequalification, any subcontractor performing work on the project shall be pre-qualified, as applicable, under the following NJDPMC Trade Code(s) at the time of submission:

- Mechanical Work: DPMC Trade Code C032 – HVACR\*
- Electrical Work: DPMC Trade Code C047 – Electrical\*

\*To be declared on Page P-9 Subcontractor Declaration Page of the Proposal Section.

Specifications and Bid Documents are available upon the payment of a non-refundable sum of \$50.00 for each set. Checks should be made payable to the South Jersey Transportation Authority. The Specifications and Bid Documents will be available for purchase on **WEDNESDAY, SEPTEMBER 1, 2021 after 1:00 P.M.** Payment must be received prior to obtaining said Specifications and Bid Documents, either by mail or in person. All Bidders are encouraged to attend a non-mandatory pre-bid meeting on **WEDNESDAY, SEPTEMBER 8, 2021 at 1:00 P.M.** via Go To Meeting at <https://global.gotomeeting.com/join/718702397>. Bidders can also dial into the meeting by phone at +1 (571) 317-3112, Access Code: 718-702-397. There is no scheduled site visit. Bidders may schedule individual site visits by submitting a

request to [bids@sjta.com](mailto:bids@sjta.com) with the subject “West Maintenance Addition Project – Site Visit Request” and their requested date/time. Bidders are encouraged to make site visits before the question deadline.

The Authority, in accordance with applicable law, reserves the right to reject any or all bids and also to waive any minor informality or non-material exceptions in any bid or bids so received.

Bids must be made on the Bid Form contained in the contract documents in the manner designated therein and required by the specifications. Bids must be enclosed in sealed envelopes bearing the name and address of the bidder on the outside and also bearing on the outside reference to the particular work bid upon. Bid Security in the amount of ten percent (10%) of the TOTAL BID PRICE but not to exceed \$20,000.00, is required to accompany all bid submissions. Said bids will be addressed to the Purchasing Department, South Jersey Transportation Authority, Atlantic City Expressway – M.P. 21.3, Farley Service Plaza, Elwood, New Jersey 08217. 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 Mandatory Equal Employment Opportunity Regulations.

Electronic Bid submission is the preferred method for this solicitation through the Bid Express Electronic Bidding portal. If you are not already registered for electronic submissions, please visit <https://www.bidexpress.com/businesses/29894/home>. For further information on this process, see Section 43. Notice of New Process – Electronic Bidding located within the Instructions to Bidders.

By order of the Chief Engineer.

## **INSTRUCTIONS TO BIDDERS**

1. **INVITATION TO BID:** Bids submitted for **ATLANTIC CITY EXPRESSWAY 2021 WEST MAINTENANCE ADDITION PROJECT** for the South Jersey Transportation Authority (hereinafter referred to as the “Authority”), shall be completed and executed by the bidder and must be returned in a sealed envelope with the name of the bidder and the title of the project inscribed on the outside of the envelope.

**Location of Work:** 501 Old Erial Rd.  
Sicklerville, NJ 08081  
(GPS: 39.714693, -74.989343)

**Scope of Work:**

This project includes the construction of a new +/- 919 SF office, locker room and storage room addition to the existing maintenance building, generally constructed of cast-in-place concrete foundations and slab-on-grade, CFMF walls and roof, metal siding and EPDM roofing.

The project will be bid and awarded as a lump sum single-prime general contract.

**A NON-MANDATORY PRE-BID MEETING** has been established for this project. All Bidders are encouraged to attend a non-mandatory pre-bid meeting on **WEDNESDAY, SEPTEMBER 8, 2021 at 1:00 P.M.** via Go To Meeting at <https://global.gotomeeting.com/join/718702397>. Bidders can also dial into the meeting by phone at +1 (571) 317-3112, Access Code: 718-702-397. There is no scheduled site visit. Bidders may schedule individual site visits by submitting a request to [bids@sjta.com](mailto:bids@sjta.com) with the subject “West Maintenance Addition Project – Site Visit Request” and their requested date/time. Bidders are encouraged to make site visits before the question deadline.

2. **UNIT PRICES AND EXTENSIONS:** Where applicable, bidders shall state on such form a unit price 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 Authority. The total re-tabulated by the Authority will prevail.
3. **BID DISCREPANCIES:** 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 Authority 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 Authority will

provide the unit price by dividing the "Item Total" figure provided by the Bidder by the estimated quantity.

4. **DELIVERY AND DEFECTIVE MATERIALS:** Bidders must insert prices for furnishing all of the materials and/or labor required by these specifications. Prices shall be net, including any charges for packing, crating, containers, etc. All transportation shall be fully prepaid by the contractor F.O.B. destination and placement at locations specified by the Authority. As specified, placement may require inside deliveries. No additional charges will be allowed for any transportation costs resulting from partial shipments made at the contractor's convenience.

The vendor shall guarantee any or all materials supplied under these specifications. Defective or inferior items shall be replaced at the expense of the vendor. In case of rejected materials, the vendor will be responsible for return freight charges.

5. **BRAND NAMES:** Any reference to brand names and/or descriptions used in this bid are to acquaint bidders with the type of commodity desired and will be used as a standard by which alternate or competitive materials offered will be judged. Competitive items must be equal to the standard described and be of the same reputation for quality and workmanship. Variations between materials described and materials offered are to be fully explained by the bidder. In the absence of any changes by the bidder, it will be presumed and required that materials, as described in these specifications, shall be delivered.
6. **BID SECURITY OR GUARANTEE:** Each bid submitted must be accompanied by a bid security or guarantee in the form of a bid bond, certified check, or cashier's check in the amount of ten percent (10%) of the total base bid price but not to exceed \$20,000 payable to the Authority to be held as a guarantee that in the event a bid is accepted, a contract will be promptly executed, acknowledged and accepted by the bidder, and in default thereof, said bid security in the amount represented thereby shall be forfeited to the Authority as liquidated damages. **Please be advised that Consent of Surety is required with all Bid submissions.** All bid guarantees except those of the three (3) lowest responsible submitted bids shall be returned to bidders as soon as possible upon award of the contract.
7. **INSURANCE REQUIREMENTS:** For complete, detailed insurance requirements, please refer to the General Conditions Section, Pages GC-78 through GC-81. The South Jersey Transportation Authority is to be recognized as an additional insured with respect to General Liability and Umbrella Excess Liability insurance. The successful bidder must provide certificates of insurance satisfactory in form and content to the Authority, prior to the award of any contract to the bidder.
8. **FAMILIARITY WITH BID SPECIFICATIONS:** At the time of opening bids each bidder will be presumed to have read and to be thoroughly familiar with the detailed specifications and instructions to bidders. The failure or omission of any bidder to receive or examine any form, instrument or document or to familiarize itself with the specifications or, where applicable, with the site where delivery is to be made shall in no way relieve any bidder from any obligations in respect to its bid.
9. **QUESTIONS OR REQUESTS FOR CLARIFICATION:** All questions about the meaning or intent of the Bid/Proposal and Contract documents, including these instructions or the specifications, shall be submitted in writing to the Authority's Purchasing Department. Any questions or requests for clarification are to be emailed to [bids@sjta.com](mailto:bids@sjta.com).

**\*\*When submitting a question or request for clarification, the subject line of the email must contain the word “Question” followed by the title of the Bid. \*\***

Questions must be received by **MONDAY, SEPTEMBER 13, 2021 AT 4:00 P.M.** Questions received after the deadline may not be answered. Only questions answered by formal written addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.

The preferred method of submitting questions or requests for clarification is via email, however questions can also be submitted via fax to 609-965-7315, attention Purchasing Department.

10. **ISSUANCE OF ADDENDA:** Responses to all questions of substantive nature will be answered in the form of an addendum. The SJTA shall be the sole judge of the question viability. Any informal explanation, clarification, or interpretation will not bind SJTA, oral or written, by whoever made, that is not incorporated into an addendum.

Addenda will be issued and posted on the Authority’s website at [www.sjta.com](http://www.sjta.com), under “Bids & Contracts”. **There are no designated dates for release of addenda. Therefore interested proposers should check the Authority’s website on a daily basis from the time of the Bid/RFP issuance through the Bid/Proposal due date.** It is the sole responsibility of the Bidder/proposer to be knowledgeable of all addenda related to this procurement. The Bidder/proposer must complete the “Acknowledgement of Receipt of Changes To Bid Document” form, which is included in this Bid/RFP as a required Checklist item. Failure to acknowledge receipt of all addenda may render a bid/proposal as non-responsive.

A bidder’s/proposer’s failure to request a clarification, interpretation, correction or amendment will preclude such bidder/proposer from, thereafter, claiming any ambiguity, inconsistency or error.

11. **BID SUBMISSION: Important, please note revised shipping information below.** Bids submitted by United Parcel Service (UPS), Federal Express must be addressed as follows:

**\*\*FEDEX ONLY Address: \*\***

South Jersey Transportation Authority  
Farley Service Plaza  
Atlantic City Expressway, M. P. 21.3  
Elwood, NJ 08217  
Attn: Purchasing Department

**\*\*UPS ONLY Address: \*\***

South Jersey Transportation Authority  
Farley Service Plaza  
0 Atlantic City Expressway  
Hammonton, NJ 08037  
Attn: Purchasing Department

Any other correspondence should also be addressed to P.O. Box 351, Hammonton, NJ 08037.



**\*Please be advised that using Federal Express, UPS or any other overnight delivery service does not guarantee next day deliveries to our location.\***

12. **CHECKLIST:** Each bidder shall complete the required bid documents indicated on the attached Checklist, to the extent applicable, along with the Checklist itself. Failure to complete all documents in the bid package may be grounds for rejection.
13. **SIGNATURES:** On all forms contained in the bid where the signature of the bidder is required, only actual written signatures will be accepted, electronically signed documents will be deemed unacceptable.
14. **ASSIGNMENT:** Each bid form submitted by a bidder must be signed by a company official in order for it to be accepted by the Authority as a valid bid.
15. **BID WITHDRAWAL:** A bidder may withdraw any bid prior to the announced bid opening date and time. Requests for withdrawal must be made in writing, addressed to an authorized officer of the Authority and signed by an authorized officer of the vendor.
16. **LATE BIDS:** Bids received after the specified date and time of the bid opening shall be returned to the bidder unopened.
17. **TIE BIDS:** In the event of “tie” bids for the commodity(s) herein specified, the South Jersey Transportation Authority reserves the right to split the bid or award to one or more bidders.
18. **SPLIT BIDS:** The Authority will act to award this contract to one vendor for the lowest amount that is advantageous to the Authority. Only if it is not advantageous to the Authority, then the award may be split between one or more bidders.
19. **BOARD RIGHTS:** The Commissioners of the Authority, in accordance with applicable law, reserve the right in their discretion, to reject any and all bids, to waive any minor informalities or irregularities or non-material exceptions in the bids received, and to accept any bid which is deemed most favorable to the Authority at the time and under the conditions stipulated. Failure to observe the instructions set forth herein may be considered grounds for rejection of any bid. The decision of the Commissioners shall be final and binding on each Bidder and no Bidder shall have recourse from such decision.
20. **AWARD OF CONTRACT:** The Authority will act to award a contract to the successful bidder or to reject all bids within ninety (90) calendar days after receipt of bids as prescribed by law unless a time extension is obtained in accordance with Authority rules. At the time of the opening, the three (3) lowest bids cannot be withdrawn for a period of ninety (90) calendar days, unless with the express permission of the Authority.
21. **TRANSFER OF INTEREST:** No bidder shall assign its contract or transfer its interest therein to any other person, firm or corporation without first securing the written consent of the Commissioners of the Authority. Any such transfer or assignment without the prior written consent of the Authority shall be invalid.
22. **DISCRIMINATION:** There shall be no discrimination against any employee who is employed in the work covered by any contract resulting from this bid, or against any application for such

employment, because of age, race, creed, color, national origin, ancestry, marital status, affectional or sexual orientation, gender identity or expression, disability, nationality or sex.

23. **INVESTIGATION:** The Authority may make such investigation as is necessary to determine the ability of the bidder to perform under the contract. Each bidder shall furnish to the Authority such information and data for this purpose as the Authority may request within five (5) days of any such request. The Authority reserves the right to reject any bid if evidence submitted by, or investigation of such bidder fails to satisfy the Authority that such bidder is properly qualified to carry out the obligations of the contract and to complete the work therein contemplated. The Authority reserves the right to request such financial data and previous experience, as it may deem appropriate. Conditional bids will not be accepted. Bids that are incomplete, unbalanced or obscure may be rejected at the Authority's option.
24. **TITLE/RISK OF LOSS:** The title and risk of loss of the goods **shall not** pass to the AUTHORITY until the AUTHORITY actually receives, takes possession and accepts the goods at the point of delivery.
25. **TERMINATION OF AGREEMENT:** The Authority reserves the right to terminate this agreement with ten (10) days written notice if the successful Bidder fails to perform in a manner deemed acceptable to the Authority. Upon delivery of such notice by the Authority to the successful Bidder, the successful Bidder shall discontinue all services in connection with the performance of this agreement and shall proceed to cancel promptly all existing order and contracts insofar as such order or contracts are chargeable to this agreement. The Authority may also terminate the contract for the Contractor's failure to pay Expressway tolls (or other amounts due) when due and owing, or for any other matter as authorized by law.
26. **INDEMNITY:** The successful bidder shall at all times observe and comply with all federal, state and local laws, statutes, ordinances, regulations and codes, that in any manner affect the conduct of the work and shall indemnify and hold harmless the Authority and all of its officers and agents against any claim or liability arising out of the contract, or arising out of any violation of laws, ordinances, statutes or regulations.
27. **PUBLIC FUNDS:** No corporation, partnership, or limited liability company shall be awarded any contract nor shall any agreement be entered into for the performance of any work or the furnishing of any materials or supplies, the cost of which is to be paid with or out of any public funds, by the State, or any county, municipality or school district, or any subsidiary or agency of the State, or of any county, municipality or school district, or by any authority, board, or commission which exercises governmental functions, unless prior to the receipt of the bid or accompanying the bid, of said corporation, said partnership, or said limited liability company there is submitted a statement setting forth the names and addresses of all stockholders in the corporation who own 10 percent or more of its stock, of any class, or of all individual partners in the partnership who own a 10 percent or greater interest therein, or of all members in the limited liability company who own a 10 percent or greater interest therein, as the case may be. If one or more such stockholder or partner or member is itself a corporation or partnership or limited liability company, the stockholders holding 10 percent or more of that corporation's stock, or the individual partners owning 10 percent or greater interest in that partnership, or the members owning 10 percent or greater interest in that limited liability company, as the case may be, shall also be listed. The disclosure shall be continued until names and addresses of every noncorporate stockholder, and individual partner, and member, exceeding the 10 percent ownership criteria established in this act, has been listed.

To comply with this section, a 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.

28. **AVAILABILITY OF FUNDS:** The award of the contract will be made subject to the availability of funds. The contract to be executed by the successful bidder will provide that it shall not become effective until the necessary funds are available.
29. **TOLLS:** It is the policy of the South Jersey Transportation Authority **not to** offer toll free passage on the Atlantic City Expressway for its vendors; New Jersey Title 19:2-6.2(a) (Subchapter 6. Tolls).
30. **AFFIRMATIVE ACTION:**  
Proposers shall be required to comply with all applicable affirmative action and equal employment opportunity laws, orders, rules and regulations including, but not limited to N.J.S.A. 10:5-31 et seq., N.J.A.C. 17:27 (See Exhibit A). The successful proposer shall be required to submit the applicable Affirmative Action form as described in Exhibit A within seven (7) days after receipt of the SJTA's intent to award a contract.

Equal Employment Opportunity (EEO) Clause:

By the submission of its bid, each bidder acknowledges that he or she understands and agreed to be bound by the equal employment requirements, throughout the performance of work under any contract awarded pursuant to this solicitation. Each bidder agrees that if awarded a contract, it will similarly bind contractually each subcontractor. In implementation of the foregoing policies each bidder further understands and agrees that if awarded a contract, it must engage in affirmative action directed at promoting and insuring equal opportunity in the work force used under the contract (and that it must require contractually the same effort of all subcontractors whose contracts exceed \$100,000). The bidder understands and agrees that "Affirmative Action" as used herein shall constitute a good faith effort to achieve and maintain minority employment in each trade in the on-site work force used on the Contract.

Notification of Subcontractor:

The contractor and subcontractor shall include by reference the EEO clause and applicable bid conditions in all advertisements or other solicitations for Bids, and shall include the EEO clause and applicable bid conditions in all contracts. The contractor and subcontractor must provide written notice to each subcontractor of the specific reporting and record keeping requirements under the EEO clause and applicable bid conditions. Upon award of a subcontract, each contractor shall immediately notify the compliance agency of the contract number, the subcontractor's name, dollar amount of the contract, estimated state and completion dates, and the craft which will perform work under the subcontract.

### Law Against Discrimination

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 or sex. The Contractor will take affirmative action to ensure that such applicants are recruited and employed, and that employees are treated during employment without regard to their age, race, creed, color, national origin, ancestry, marital status or sex. Such action 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 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 contracting officer setting forth the 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 or sex.

The Contractor or Subcontractor where applicable, will send to each labor union or representative or workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided by the Agency Contracting Officer, advising the labor union or workers 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.

Each prospective Bidder on a public works contract and each Subcontractor must formulate and submit to the State Treasurer an affirmative action program of equal opportunity which guarantees minorities employment in all employment categories. The State Treasurer must approve or disapprove the affirmative action program within sixty (60) days of its submission. Any existing federally approved or sanctioned affirmative action program must be approved by the State Treasurer. Any violator of this law will be subject to a fine of up to \$1,000 for each violation for each day during which the violation continues.

31. **DIVISION OF REVENUE REGISTRATION (NJ BRC):** Pursuant to N.J.S.A. 52:32-44, the South Jersey Transportation Authority is prohibited from entering into a contract with an entity unless the bidders/proposer/contractor, and each subcontractor that is required by law to be named in a bid/proposal/contract has a valid Business Registration Certificate on file with the Division of Revenue and Enterprise Services within the Department of Treasury.

Prior to contract award or authorization, the contractor shall provide the South Jersey Transportation Authority with its proof of business registration and that of any named subcontractor(s).

Subcontractors named in a bid or other proposal shall provide proof of business registration to the bidder, who in turn, shall provide it to the South Jersey Transportation Authority prior to the time a contract, purchase order, or other contracting document is awarded on authorized.

If you are already registered go to [https://www1.state.nj.us/TYTR\\_BRC/jsp/BRCLLoginJsp.jsp](https://www1.state.nj.us/TYTR_BRC/jsp/BRCLLoginJsp.jsp) to obtain a copy of your Business Registration Certificate. Information for registering your business

with the New Jersey Division of Revenue can be obtained by visiting the following link:  
<https://www.state.nj.us/treasury/revenue/busregcert.shtml>

Questions regarding this requirement should be referred to the Division of Revenue hotline @ 609-292-9292.

32. **PUBLIC LAW 2005, CHAPTER 51/EXECUTIVE ORDER 117:** Public Law 2005, Chapter 51 (formerly Executive Order #134) and Executive Order 117 effective November 15, 2008, prohibit state departments, agencies and authorities from entering into a contract that exceeds \$17,500 with an individual or entity that has made a political contribution to gubernatorial candidates or to any state or county political party committee.

**Each bidder must complete the attached Ownership Disclosure Form. In addition, each individual owning 10% or more of Ownership Interest as indicated on Ownership Disclosure Form must complete a separate Certification and Disclosure Form.**

**Form DPPc51-C&D “Certification and Disclosure” must be completed and included with this bid package.**

33. **SMALL BUSINESS SET-ASIDE:** New Jersey’s Small Business Set-Aside Program obligates the Authority to make 25% of all purchases for goods and services from small businesses. Firms classified as a Small Business Enterprise must be registered with the New Jersey Department of Revenue and Enterprise Services. Registration instructions can be obtained by visiting the State’s website:  
<https://www.njportal.com/DOR/SBERegistry/Default/>

The South Jersey Transportation Authority requests the following for informational purposes only.

This is not a Set-Aside bid; however, please indicate below (if applicable).  
Our firm is certified/registered with the State of New Jersey Set-Aside Program.

Certification # \_\_\_\_\_

	Check here
MBE (Minority Business Enterprise)	_____
WBE (Women Business Enterprise)	_____
SBE (Small Business Enterprise)	_____
None of the Above	_____

### ***POLICY STATEMENT OF THE SOUTH JERSEY TRANSPORTATION AUTHORITY***

In accordance with Executive Order No. 84 signed by Governor James J. Florio on March 5, 1993 and Executive Order No. 71 signed by Governor James E. McGreevey on October 2, 2003, it is the policy of the South Jersey Transportation Authority (the “Authority” or “SJTA”) that Small Business Enterprises (“SBE”), as determined and defined by the Department of the Treasury, Division of Revenue and Enterprise Services (“Division of Revenue”) in N.J.A.C. 17:13 et seq., have the opportunity to compete for and participate in the performance of contracts to the purchase of goods and services and for construction services required by the Authority. The Authority

further requires that its contractors shall agree to take all necessary and responsible steps, in accordance with the aforementioned regulations, to ensure that SBE's have these opportunities.

It is the policy of the South Jersey Transportation Authority (SJTA) that small businesses (each a "small business enterprise" or "SBE"), as determined and defined by the New Jersey Department of the Treasury, Division of Purchase and Property, Contract Compliance and Audit Unit, EEO Monitoring Program ("EEO Monitoring Program") in N.J.A.C. 17:27 et seq. or other application regulation, should have the opportunity to participate in SJTA Contracts.

To the extent the Firm engages subcontractors or sub-consultants to perform Services for the SJTA pursuant to this Contract, the Firm must demonstrate to the SJTA's satisfaction that a **good faith effort** was made to utilize subcontractors and sub-consultants who are **registered with the EEO Monitoring Program as SBEs**.

Furthermore, Proposers and subcontractors shall be evaluated by the EEO Monitoring Program, based on its attainment of the Participation Goals set forth in N.J.A.C. 17:27-5.2

Please refer to the following link for current applicable procurement target(s) guidelines set forth by the NJ Department of Treasury:

[https://www.state.nj.us/treasury/contract\\_compliance/](https://www.state.nj.us/treasury/contract_compliance/)

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

1. Whether the vendor or subcontractor has agreed to make a good faith effort to adhere to targeted minority and women employment goals;
2. Whether the vendor or subcontractor has met or documented that it has made a good faith effort to meet targeted employment goals;
3. Whether the vendor or subcontractor has adopted an Equal Employment Opportunity (EEO) Policy;
4. Whether the vendor or subcontractor has posted an EEO Policy on the job site bulletin board;
5. Whether the vendor or subcontractor has disseminated the EEO Policy to its workers through various means including company meetings, preconstruction job meetings, written notices, etc.;
6. Whether the vendor or subcontractor has posted Federal or State issued EEO posters on the job site bulletin board;
7. Whether the vendor or subcontractor has identified an EEO Officer and established job duties in writing for such position;
8. Whether the vendor or subcontractor has developed a basic complaint procedure;
9. Whether the vendor or subcontractor has knowledge of and has considered the general availability of minorities and women having requisite skills in the immediate labor area;
10. Whether the vendor or subcontractor has knowledge of and has considered the percentage of minorities and women in the total workforce in the immediate labor area;
11. Whether, when the opportunity has presented itself, the vendor or subcontractor has considered promoting minority and women employees within its organization;
12. Whether the vendor or subcontractor attempted to hire minorities and women based upon the anticipated expansion, contraction and turnover of its workforce;

13. Whether the vendor or subcontractor has the ability to consider undertaking training as a means of making all job classifications available to minorities and women and whether it has done so;
14. Whether the vendor or subcontractor has utilized the available recruitment resources to attract minorities and women with requisite skills, including, but not limited to, public and private training institutions, job placement services, referral agencies, newspapers, trade papers, faith-based organizations, and community-based organizations;
15. Whether the vendor or subcontractor has requested qualified minorities and women from a labor union with whom it has an exclusive hiring or referral arrangement;
16. Whether the vendor or subcontractor has actively recruited beyond the traditional sources to attract minority and women applicants;
17. Whether the vendor or subcontractor has reviewed all personnel actions to ensure actions are taken in compliance with the company's EEO policy; and
18. Whether the vendor or subcontractor has retained records of employment and personnel actions and payroll records for a three year-period from the date of the contract or project closing.

#### **SOUTH JERSEY TRANSPORTATION AUTHORITY SUBSTITUTION POLICY**

The contractor or consultant must notify and obtain written approval from a small or women or minority-owned or Disadvantaged Business Enterprise (DBE) sub-contractor, sub-consultant, or vendor (SMWBE or DBE contractor) before including that contractor in a bid proposal or similar contract-related submission.

The contractor, consultant must notify and obtain written consent and obtain authorization from South Jersey Transportation Authority's Public Agency Compliance Officer/DBE Liaison Officer before it substitutes a SMWBE or DBE sub-contractor, sub-consultant named in a bid proposal or other contract related submission; and if the substitution is approved by the Public Agency Compliance Officer/DBE Liaison Officer, the contractor, consultant shall make a good faith effort to utilize another SMWBE or DBE sub-contractor sub-consultant to replace the previous SMWBE and/or DBE contractor, consultant.

The prime contractor or consultant must give the Public Agency Compliance Officer/DBE Liaison Officer five days to respond to the prime contractor's, consultant's notice and advise the contractor, consultant approval or the reasons, if any, why it objects to the proposed termination of its subcontract subconsultant and why you should not approve the prime contractor, consultant's action.

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

34. **PAYMENT and TAXES:** Payment to the successful Bidder will be made after satisfactory receipt of the product(s) and or service(s), as determined by the Authority, and receipt of invoices or other billing instrument used by the successful Bidder. The Authority is exempt from Federal Excise and State Tax; therefore tax **must not** be included in the bid price. All prices quoted shall include all charges, including delivery and set-up fees.

35. **JOINT VENTURES:** If a joint venture is submitting a bid or proposal, the agreement between the parties related to such joint venture should be submitted with the joint venture's bid or proposal. Authorized signatories from each party comprising the joint venture must sign the bid or proposal. A separate Ownership Disclosure Form, Chapter 51 and Executive Order 117 Certification and Disclosure forms, Affirmative Action Employee Information Report and NJ Business Registration Certificates must be supplied for each party in the joint venture.
36. **PRE-QUALIFICATION:** The bidder shall be pre-qualified under at least one of the following NJDPMC Trade Code(s) at the time of submission:

- DPMC Trade Code C008 – General Construction
- DPMC Trade Code C009 – General Construction / Alterations & Additions

In addition to the bidder prequalification, any subcontractor performing work on the project shall be pre-qualified, as applicable, under the following NJDPMC Trade Code(s) at the time of submission:

- Electrical Work: DPMC Trade Code C047 – Electrical \*
- Mechanical Work: DPMC Trade Code C032 – HVACR \*

\*To be declared on Page P-9 Subcontractor Declaration Page of the Proposal Section.

37. **TIME TO COMPLETE:** 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 the number of calendar days noted below from and including the date of the written notice to proceed unless the period of completion is extended otherwise pursuant to the Contract Documents:

**ONE HUNDRED FIFTY (150) CALENDAR DAYS**

**The Work Hours for this project shall be: Monday thru Friday, 7:00am to 3:30pm.**

38. **FAILURE TO COMPLETE WORK ON TIME:** Time of completion for this work is of the essence to the Contract. For each and every calendar day that the CONTRACTOR shall be in default in completing the work to be done under the Contract, the CONTRACTOR shall pay to the AUTHORITY the actual cost for engineering, inspection and other costs to the South Jersey Transportation Authority, estimated to be \$1,000 per day, which sum is agreed upon not as a penalty but as liquidated damages which the AUTHORITY shall suffer by reason of such default.
39. **SAFETY AND HEALTH REGULATIONS:** The CONTRACTOR shall comply with all applicable safety and health regulations to include, but not be limited to, the following:

U.S. Department of Labor regulations promulgated under Occupational Safety and Health Act of 1972 (P.L. 91-596) and under Section 107 of the Contract Work Hours and Safety Standards Act (P.L. 91-54) and all subsequent amendments thereto.



40. **PROMPT PAYMENT TO SUBCONTRACTORS:** The prime contractor agrees to pay each subcontractor under this prime contract for satisfactory performance of its contract no later than thirty (30) days from the receipt of each payment the prime contractor receives from South Jersey Transportation Authority. Any delay or postponement of payment from the above referenced time frame may occur only for good cause following written approval of the South Jersey Transportation Authority.
41. **CERTIFICATION OF NON-INVOLVEMENT IN PROHIBITED ACTIVITIES IN IRAN:** Pursuant to N.J.S.A. 52:32-58, the bidder must certify that neither the bidder, nor one of its parents, subsidiaries, and/or affiliates (as defined in N.J.S.A. 52:32-56(e)(3)), is listed on the Department of the Treasury's List of Persons or Entities Engaging in Prohibited Investment Activities in Iran and that neither is involved in any of the investment activities set forth in N.J.S.A. 52:32-56(f). If the bidder is unable to so certify, the bidder shall provide a detailed and precise description of such activities
42. **RIGHT TO AUDIT:** The Successful Contractor shall keep and maintain proper and adequate books, records and accounts accurately reflecting all costs and amounts billed to the SJTA with regard to this RFP/Bid. The SJTA, its employees, officers, or representatives shall have the right upon written request and reasonable notice, to inspect and examine all books and records related to the Successful Proposer's books and records specific to the Proposal and Agreement. Such records shall be retained by Successful Contractor for at least five (5) years after termination of the Service Agreement. In no event shall books and records be disposed of or destroyed prior to five (5) years or during any dispute or claim between the Contractor and the Successful Contractor with regard to the RFP/Bid.

In accordance with the New Jersey Office of the State Comptroller ("OSC") document retention policy N.J.A.C. 17:44-2.2, Contractor shall maintain all documentation related to products, transactions or services under this contract for a period of five years from the date of final payment. Such records shall be made available to the New Jersey Office of the State Comptroller upon request.

43. **NOTICE OF NEW PROCESS – ELECTRONIC BIDDING:** In an effort to make the bid solicitation process more efficient and cost effective for both vendors and the Authority, the Purchasing Department has adopted an electronic bidding process for most public bids. Electronic bids shall be submitted at the [bidexpress.com](http://bidexpress.com) website as the method of bid submission. **It is strongly recommended that vendors become familiar with the electronic process as soon as possible to prepare for the Authority's decision to accept only electronic bid submissions as of February 1, 2021.** All electronic Bidders must first register on [bidexpress.com](http://bidexpress.com) and create an Info Tech digital identification ("Digital ID") at no cost to the vendor. The Digital ID is used to sign bids and serves important functions including: a) assuring the Authority, that the digital signature is from the entity submitting the bid (forgery deterrence); b) ensuring that no one can alter a bid (non-falsification); c) preventing the information in a bid from disclosure to unauthorized parties (confidentiality); and d) safeguarding that even authorized parties cannot access the bid prior to the public bid opening (sealing). Since it can take up to five (5) business days to process your Digital ID, it is highly recommended that a Digital ID be enabled at least 48 hours in advance of submitting an electronic bid. Please plan accordingly. In lieu of paying the traditional paper bidding costs (overnight delivery costs), Bid Express charges a fee of \$35.00 to those who wish to bid electronically on a pay-per solicitation basis. Alternatively, you may subscribe for \$50.00 per month for unlimited electronic bid submission to all entities that

(nationally) post solicitations on the [bidexpress.com](https://bidexpress.com) website plus get email notifications by agency/work type/commodity code. Furthermore, for Bidders who are bidding online and wish to utilize the electronic bid bond option, please see the FAQs page regarding electronic bid bonds at <https://bidexpress.com>. For additional guidance on the electronic process, please contact the Bid Express team toll free at (888) 352-2439 (select option 1).

**Please Note:** During COVID-19, The South Jersey Transportation Authority is accepting Electronic Signatures. Please see [www.bidexpress.com](https://www.bidexpress.com) for more details.

44. **PUBLIC WORKS CONTRACTOR REGISTRATION ACT:** The “Public Works Contractor Registration Act” (PWCRA), N.J.S.A. 34:11-56.48 et seq., applies to all contractors (including subcontractors and lower tier subcontractors) who bid on or enter into SJTA contracts that are subject to the “New Jersey Prevailing Wage Act.”

To ensure compliance with the PWCRA, all contractors and subcontractors intending to bid or perform on SJTA contracts must have a valid and current public works registration certificate (PWRC) issued by the New Jersey Department of Labor and Workforce Development (Phone: 609-292-2305) at the time of the bid submission. Contractors that are not currently registered are advised to register as soon as possible, so that their ability to bid on or perform work on SJTA contracts is not affected.

Visit the New Jersey Department of Labor and Workforce Development web site at:  
<https://www.nj.gov/labor/wagehour/content/prevwageapplication.html>

**Contractors should take special note of the following requirements:**

Bidding - Effective August 16, 2003, bidders must be registered with the New Jersey Department of Labor and Workforce Development in accordance with the N.J.S.A. 34:11-56.48 et seq., at the time of bid. A contractor and/or subcontractor’s failure to have a valid, current public works registration certificate (PWRC) at the time required shall be cause for rejection of the bid. Proof of a contractor/subcontractor’s valid, current PWRC should be submitted at the time of the bid submission and must be submitted prior to the SJTA’s award of the contract.

Subcontracting - subcontractors (including lower tier subcontractors) must be registered with New Jersey Department of Labor and Workforce Development, Division of Wage and Hour Compliance and in accordance with N.J.S.A. 34:11-56.55 et seq. and must possess a valid PWRC at the time of the bid submission.

Submission of all subcontractor registration certificates by contractor - Each contractor shall, after the bid is made and prior to the awarding of the contract, submit to the public entity the PWRC for all subcontractors listed in the bid proposal. Applications for registration shall not be accepted as a substitute for a PWRC for the purposes of this section. Contractors must attach their PWRC as proof of the subcontractor’s valid, current New Jersey Department of Labor and Workforce Development registration. The Authority will not consent to the proposed subcontracting, and the subcontractor shall not perform any work under the Contract, unless the required proof of the subcontractor’s PWRC is first provided. Contractors should ensure full compliance with the PWCRA registration requirements by their subcontractors.

Effective May 1, 2019, all contractors and subcontractors applying for a new PWRC or applying to renew their PWRC must be compliant with the “registered apprenticeship program” requirements, as set forth under P.L. 2019, c.21.

**GENERAL CONDITIONS**  
**Table of Contents**

SECTION ARTICLE	Page
<b>GENERAL INFORMATION .....</b>	<b>6</b>
1. GENERAL .....	6
2. ABBREVIATIONS .....	6
3. DEFINITIONS .....	7
4. RESERVED .....	15
5. RESERVED .....	15
<b>BIDDING REQUIREMENTS AND CONDITIONS .....</b>	<b>15</b>
6. INQUIRIES REGARDING THE PROJECT .....	15
7. PREQUALIFICATION OF PROSPECTIVE BIDDERS .....	15
8. DISQUALIFICATION OF PREQUALIFIED PROSPECTIVE BIDDERS .....	16
9. CONTENTS OF THE PROPOSAL .....	16
10. INTERPRETATION OF QUANTITIES IN BID FORM .....	17
11. "IF AND WHERE DIRECTED" ITEMS .....	17
12. EXAMINATION OF CONTRACT DOCUMENTS AND SITE OF PROJECT .....	17
13. PREPARATION OF PROPOSAL .....	20
14. BALANCED BIDS .....	20
15. DELIVERY OF PROPOSALS .....	20
16. BID SECURITY .....	21
17. WITHDRAWAL OF PROPOSALS .....	21
18. COMBINATION OR CONDITIONAL PROPOSALS .....	21
19. ACKNOWLEDGEMENT OF REVISIONS .....	22
20. PUBLIC OPENING OF PROPOSALS .....	22
21. IRREGULAR PROPOSALS .....	22
22. DISQUALIFICATION OF BIDDERS .....	23
23. RESERVED .....	23
24. RESERVED .....	23
<b>AWARD AND EXECUTION OF CONTRACT .....</b>	<b>23</b>
25. CONSIDERATION OF PROPOSALS/BID DISCREPANCIES .....	23
26. AWARD OF CONTRACT .....	24
27. CANCELLATION OF AWARD .....	24
28. RETURN OF PROPOSAL BOND .....	24
29. EXECUTION AND APPROVAL OF CONTRACT .....	25
30. PERFORMANCE BOND AND PAYMENT BOND .....	25
31. FAILURE TO EXECUTE CONTRACT .....	25
32. RESERVED .....	26
33. RESERVED .....	26
<b>SCOPE OF WORK .....</b>	<b>26</b>
34. INTENT .....	26
35. CHANGES .....	26
36. MINOR CHANGES IN THE WORK .....	27
37. PROCEDURE AND PROTEST .....	27
38. INCREASED OR DECREASED QUANTITIES .....	28
39. ELIMINATED ITEMS .....	29
40. DIFFERING SITE CONDITIONS .....	30
41. CHANGES IN CHARACTER OF WORK .....	30

42. EXTRA WORK .....	31
43. NOTIFICATION OF CHANGES .....	31
44. RIGHTS IN AND USE OF MATERIALS FOUND ON THE WORK .....	33
45. MAINTENANCE OF TRAFFIC .....	33
46. VALUE ENGINEERING .....	34
47. FINAL CLEANUP .....	37
48. RESERVED .....	37
49. RESERVED .....	37
<b>CONTROL OF WORK .....</b>	<b>37</b>
50. COMMUNICATIONS .....	37
51. THE AUTHORITY'S PROJECT ADMINISTRATION .....	38
52. AUTHORITY OF THE ENGINEER .....	38
53. DUTIES AND RESPONSIBILITIES OF THE ENGINEER .....	38
54. INSPECTORS .....	39
55. INSPECTION BY CONTRACTOR .....	39
56. INSPECTION OF WORK .....	39
57. QUALITY CONTROL & QUALITY ASSURANCE TESTING .....	40
58. SPECIAL INSPECTION, TESTING, OR APPROVAL .....	41
59. CONFORMITY WITH CONTRACT DOCUMENTS .....	41
60. EXAMINATION OF QUESTIONED WORK .....	41
61. UNNOTICED DEFECTS .....	42
62. REMOVAL OF UNACCEPTABLE AND UNAUTHORIZED WORK .....	42
63. RIGHT TO RETAIN DEFECTIVE WORK .....	42
64. LATENT DEFECTS .....	42
65. PROJECT MEETINGS .....	42
66. INDEPENDENT CONTRACTOR .....	43
67. SUPERINTENDENCE .....	43
68. RECEPTION OF ENGINEER'S DIRECTIONS .....	43
69. ACCESS TO WORK .....	43
70. AUTOMATICALLY CONTROLLED EQUIPMENT .....	44
71. LOAD RESTRICTIONS .....	44
72. MAINTENANCE DURING CONSTRUCTION .....	44
73. FAILURE TO MAINTAIN ROADWAY .....	45
74. CONSTRUCTION STAKES, LINES, AND GRADES .....	45
75. COOPERATION BY CONTRACTOR .....	47
76. COOPERATION BETWEEN CONTRACTORS .....	47
77. COOPERATION WITH UTILITIES .....	48
78. SAFETY .....	51
79. PROTECTION OF WORK AND PROPERTY AND SECURITY .....	52
80. RESPONSIBILITY OF CONTRACTOR TO ACT IN EMERGENCY .....	52
81. PARTIAL ACCEPTANCE .....	52
82. SUBSTANTIAL COMPLETION DATE .....	52
83. COMPLETION AND ACCEPTANCE .....	53
84. RESERVED .....	54
85. RESERVED .....	54
<b>CONTRACT DOCUMENTS .....</b>	<b>54</b>
86. PLANS AND SPECIFICATIONS .....	54
87. ADDITIONAL CONTRACT DOCUMENTS .....	54
88. SUPPLEMENTING DRAWINGS, INSTRUCTIONS, WORKING DRAWINGS AND CATALOG CUTS .....	55
89. DISCREPANCIES AND OMISSIONS .....	56
90. VERIFICATION AND WARRANTY .....	57
91. DOCUMENTS TO BE KEPT ON THE JOBSITE .....	57

92. OWNERSHIP OF CONTRACT DOCUMENTS.....	57
93. RESERVED.....	57
94. RESERVED.....	57
<b>CONTROL OF MATERIAL .....</b>	<b>57</b>
95. SOURCE OF SUPPLY AND QUALITY REQUIREMENTS .....	57
96. LOCAL MATERIAL SOURCES .....	58
97. SUBMITTALS .....	59
98. RELEASE OF BITUMINOUS AND CEMENT CONCRETE .....	59
99. MATERIALS, INSPECTIONS, TESTS, AND SAMPLES.....	59
100. PERFORMANCE TESTING .....	61
101. CERTIFICATION OF COMPLIANCE .....	61
102. PLANT INSPECTION.....	61
103. CONTRACTORS' AND MANUFACTURERS' COMPLIANCE WITH STATE SAFETY, OSHA, AND OTHER CODE REQUIREMENTS.....	62
104. STORAGE AND HANDLING OF MATERIALS .....	62
105. UNACCEPTABLE MATERIALS .....	63
106. AUTHORITY FURNISHED MATERIAL.....	63
107. SUBSTITUTES OR "OR EQUAL" ITEMS .....	63
108. GUARANTEE .....	64
109. CORRECTION OF DEFECTIVE WORK AFTER CONTRACT COMPLETION.....	65
110. RESERVED.....	65
111. RESERVED.....	65
<b>LEGAL RELATIONS AND RESPONSIBILITY TO PUBLIC.....</b>	<b>65</b>
112. GOVERNING LAW.....	65
113. APPLICABLE LAWS .....	65
114. PERMITS AND LICENSES .....	66
115. RESTORATION OF SURFACES OPENED BY PERMIT .....	67
116. FEDERAL AID PARTICIPATION .....	67
117. ENVIRONMENTAL PROTECTION.....	68
118. ARCHAEOLOGICAL AND HISTORICAL FINDINGS.....	69
119. TAXES AND CHARGES .....	69
120. COMPLIANCE WITH LABOR STANDARDS AND RATE OF WAGE REQUIREMENTS .....	70
121. ROYALTIES, PATENTED DEVICES, MATERIALS, AND PROCESSES .....	70
122. SANITARY, HEALTH, AND SAFETY PROVISIONS .....	70
123. PUBLIC CONVENIENCE AND SAFETY.....	71
124. RAILWAY HIGHWAY PROVISIONS.....	72
125. CONSTRUCTION OVER OR ADJACENT TO NAVIGABLE WATERS.....	72
126. BARRICADES, WARNING SIGNS AND HAZARD MARKINGS.....	72
127. USE OF EXPLOSIVES.....	72
128. PROTECTION AND RESTORATION OF PROPERTY MARKERS AND LAND MONUMENTS.....	73
129. FOREST PROTECTION .....	73
130. OPENING SECTIONS OF PROJECT TO TRAFFIC .....	73
131. INDEPENDENT CONTRACTOR .....	74
132. THIRD PARTY BENEFICIARY CLAUSE .....	74
133. LIMITATIONS OF LIABILITY.....	75
134. ASSIGNMENT OF CONTRACT FUNDS AND CLAIMS .....	75
135. RISK ASSUMED BY THE CONTRACTOR.....	75
136. DISPUTES.....	77
137. ARBITRATION .....	77
138. HEADINGS .....	77
139. RESERVED.....	78
140. RESERVED.....	78

<b>MAINTENANCE BOND, INSURANCE, AND INDEMNIFICATION .....</b>	<b>78</b>
141. MAINTENANCE BOND .....	78
142. DEFAULT OF SURETY .....	78
143. INSURANCE AND LIABILITY .....	78
144. WAIVER OF SUBROGATION .....	80
145. PERSONAL LIABILITY OF PUBLIC OFFICIALS .....	80
146. INDEMNIFICATION .....	80
147. RESERVED .....	81
148. RESERVED .....	81
<b>PROSECUTION AND PROGRESS OF THE WORK .....</b>	<b>81</b>
149. ASSIGNMENT .....	81
150. SUBCONTRACTING .....	81
151. OTHER CONTRACTS .....	83
152. COMMENCEMENT OF WORK .....	83
153. PROSECUTION OF THE WORK .....	83
154. LIMITATION OF OPERATIONS .....	84
155. CHARACTER OF WORKERS .....	84
156. CONTRACTOR'S METHODS, TOOLS AND EQUIPMENT .....	85
157. AUTHORITY'S RIGHT TO CORRECT DEFECTIVE WORK .....	85
158. WORKING SITE / USE OF PREMISES .....	85
159. UNUSUAL SITE CONDITIONS .....	86
160. COMPLAINTS .....	87
161. TEMPORARY SUSPENSION OF WORK .....	87
162. SUSPENSION OF WORK .....	88
163. TERMINATION FOR DEFAULT, DAMAGES FOR DELAY, TIME EXTENSIONS .....	88
164. CLAIMS FOR ADDITIONAL TIME AND/OR COMPENSATION .....	89
165. TERMINATION FOR CONVENIENCE .....	90
166. AUTHORITY'S USE OF PORTIONS OF THE WORK .....	92
167. TIME OF COMPLETION .....	93
168. LIQUIDATED DAMAGES OR ACTUAL DAMAGES FOR DELAY .....	93
169. RESERVED .....	94
170. RESERVED .....	94
<b>PROGRESS SCHEDULE .....</b>	<b>94</b>
171. GENERAL .....	94
172. PROCEDURES .....	97
173. CONTENT AND PROJECT SCHEDULE .....	100
174. SCHEDULE REVIEW MEETINGS .....	101
175. UPDATING .....	102
176. SUBMITTALS .....	103
177. RECOVERY SCHEDULE .....	104
178. EXTENSION OF TIME .....	104
179. DRAWINGS .....	106
180. SUBMISSION LOG .....	107
181. MEASUREMENT AND PAYMENT .....	108
182. RESERVED .....	108
183. RESERVED .....	108
<b>PAYMENT .....</b>	<b>108</b>
184. PAYMENT FOR MODIFICATIONS .....	108
185. PAYMENT FOR CONTRACTOR'S EXPENSES DURING DELAYS .....	115
186. PARTIAL PAYMENTS .....	117
187. RELEASE OF LIENS OR CLAIMS .....	119

188. FINAL PAYMENT .....	119
189. NO WAIVER OF RIGHTS .....	120
190. ACCEPTANCE OF FINAL PAYMENT CONSTITUTES RELEASE .....	120
191. AUDIT: ACCESS TO RECORDS .....	120
192. RESERVED .....	122
193. RESERVED .....	122

**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	Prestressed 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 Transportation Authority, 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 OPERATIONS AREA (AOA)** – The term "air operations area" shall mean any area of the airport used or intended to be used for the landing, takeoff, or surface maneuvering of aircraft. An air operations area shall include such paved or unpaved areas that are used or intended to be used for the unobstructed movement of aircraft in addition to its associated runway, taxiway, or apron. Only persons with security clearance who are properly badged shall have access to the air operations area.

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

**AIRPORT** – “Airport” means an area of land or water which is used or intended to be used for the landing and takeoff of aircraft, and includes buildings and facilities, if any.

**AIRPORT IMPROVEMENT PROGRAM** - The “Airport Improvement Program, a grant-in-aid program, administered by the Federal Aviation Administration.

**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 Authority, acting directly for the Authority. 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."

**AUTHORITY** - The term "Authority" means the SOUTH JERSEY TRANSPORTATION AUTHORITY 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 Authority is referred to as singular in number and masculine in gender.

**AUTHORITY’S REPRESENTATIVE** - “Authority’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 Authority, acting directly for the Authority. The Authority’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 Authority 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 Authority on which the Authority 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 Authority 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 Authority 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 Authority 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 Authority acting directly for the Authority. 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 Authority 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 Authority 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 Authority 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 seq. 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 not 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 Authority and the Contractor with regard to the Work or Contract Documents.

**DRAWINGS** – See "PLANS"

**ENGINEER** - "Engineer" shall mean the Authority's Chief Engineer or the Chief Engineer's 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 Authority, acting directly for the Authority. 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 Authority 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 Airport 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.

**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 Transportation Authority 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 Authority; 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 airport, 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 Authority to perform the Work at the prices therein.

**PROPOSAL FORM** – The term "Proposal Form" means the approved form furnished by the Authority on which the Authority 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.

**RUNWAY** – The area on the airport prepared for the landing and takeoff or aircraft.

**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 that 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 that 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 Authority.

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 Authority, 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 Authority 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 "AUTHORITY'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 Authority 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.

**TAXIWAY** - For the purpose of this document, the term "taxiway" means the portion of the air operations area of an airport that has been designated by the competent airport authority for movement of aircraft to and from the airport's runway or aircraft parking areas.

**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 Authority.

**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 Authority 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 Authority; who have been prequalified in the areas so designated by the SJTA 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 SJTA, which may include: Construction Manager as Contractor, Design Build, or General Construction

As set forth in the Bid Specifications, the Authority may also require DPMC classification or DOT Pre-qualification for Subcontractors in the following areas: Plumbing, HVAC, Electrical, and Structural Steel. 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.

SJTA 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 Authority 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 Authority, 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 Authority.
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 Authority 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 Authority for monies owed.
9. Documented failure to comply with the conditions of permits.

#### 9. CONTENTS OF THE PROPOSAL

Upon request, the Authority 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 Authority 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 Authority for review upon written request to the South Jersey

Transportation Authority Administration Building, Purchasing Department, P.O. Box 351 Farley Service Plaza, Atlantic City Expressway Milepost 21.4.

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 Authority'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 Authority 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 Authority as to such investigations subject to and upon the conditions set forth herein. Such inspection of records may be made at the South Jersey Transportation Authority offices, Route 54 and Trooper Lane, Hammonton, New Jersey 08037, 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 Authority.

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 Transportation Authority offices, Route 54 and Trooper Lane, Hammonton, New Jersey 08037, or at such other locations as directed in response to the written request.

The records of the Authority'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 Authority 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 Authority 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 Authority 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 Authority, 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 Authority 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 Authority 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 Authority, review the plans at the South Jersey Transportation Authority offices, Route 54 and Trooper Lane, Hammonton, New Jersey 08037, or at such other locations as directed in response to the written request. The Authority 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 Authority.

### 13. PREPARATION OF PROPOSAL

The Bidder shall submit a Proposal on the forms furnished by the Authority. 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 therefore. 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 Authority. 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 Authority 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 Authority. 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 Authority 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 Authority 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 Authority, on the form furnished by the Authority, 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 authority 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 Authority, provided the request for such withdrawal is received by the Authority, 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 Authority, 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 Authority 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 Authority reserves the right to make awards on combination bids or separate bids to the best advantage of the Authority. 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 Authority 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 Authority 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 Authority, 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 "PREPERATION 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 Authority.

## 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 Authority 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 Authority that the bid is balanced.
- D. Uncompleted work which, in the judgment of the Authority, 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 Authority. The total re-tabulated by the Authority 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 Authority 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 Authority 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 Authority may reject any and all Proposals when the Authority determines that it is in the public interest to do so. The Authority 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 Authority will award the Contract or reject all bids 90 calendar days after the bids are received. The Authority 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 Authority and the lowest responsible Bidder and/or the second lowest responsible Bidder can agree to extend the time within which the Authority 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 Authority's recommendation to make such award and has approved the Authority'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 Authority, 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 Authority until the Contract has been executed by the Authority'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 Authority 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 Authority.

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 Authority. 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 Authority. If the Contract is not executed by the Authority 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 Authority. 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 Authority.

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 Authority 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 Authority 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 readvertised and constructed under contract, or otherwise, as the Authority may decide. The successful Bidder may file with the Authority 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 Authority) 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 Authority 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 Authority, 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 Authority 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 Authority's alterations, deviations, additions to, omissions from the Contract Documents, or directed Extra Work and prior to performing the work, submit to the Authority 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 authority 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 Authority 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 Authority, and the actual cost of any further handling will be paid for by the Authority. 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 Authority.

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 Authority 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 Authority 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 Authority.
- 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 Authority 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 Authority 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 Authority 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 Authority 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 Authority 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 Authority will respond.

If the Engineer confirms that Authority 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 Authority 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 Authority'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, bankfills, 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 highway or airport 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 Authority.

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 Airport projects it is the explicit intention of the contract that the safety of aircraft, 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 aircraft in the Air Operations Areas of the airport with respect to its own operations and the operations of all his Subcontractors as specified in the Article titled "LIMITATION OF OPERATIONS". It is further understood and agreed that the Contractor shall provide for the uninterrupted operation of visual and electronic signals (including power supplies thereto) used in the guidance of aircraft while operating to, from, and upon the airport.

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 aircraft, fire-rescue equipment, or maintenance vehicles at the airport.

The Contractor shall make his/her own estimate of all labor, materials, equipment, and incidentals necessary for providing the maintenance of aircraft and vehicular traffic as specified in this subsection.

The cost of maintaining the aircraft 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 with 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 Authority. 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 Authority 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 Authority and, if found to be conceptually acceptable, approval to submit a final proposal will be granted by the Authority. A finding of conceptual acceptability of the initial proposal in no way obligates the Authority to approve the final proposal. The Contractor shall have no claim against the Authority as a result of the rejection of any such final proposal.

- C. Submittal of Final Proposal - Final proposals will be considered only after Authority 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 Authority:

- (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 Authority ample time, usually a minimum of 60 days, for review and processing a Change Order or Supplementary Agreement. Should the Authority find that insufficient time is available for review and processing, it may reject the final proposal solely on such basis. If the Authority 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 Authority 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 Authority project or elsewhere and the conditions and results therewith. If the final proposal was previously submitted on another Authority project, indicate the date, the project, and the action taken by the Authority.

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 Authority 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 Authority and shall contain no restrictions imposed by the Contractor on their use or disclosure. The Authority will have the right to use, duplicate, and disclose in whole or in part any data necessary for the utilization of the proposal. The Authority 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 Authority already has under consideration certain revisions to the Contract which are subsequently incorporated in a proposal, the Authority 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 Authority for any costs or delays due to the Authority'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 Authority'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 Authority for delay or for any other costs.

- (7) The proposal shall not be experimental in nature but shall have been proven to the Authority's satisfaction under similar or acceptable conditions on another Authority project or at another location acceptable to the Authority.
- (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 ink, on polyester film such as Mylar or Herculene, 100 micrometers thick, matted on both sides except as follows:

- a. Structural drawings may be submitted in pencil.
- b. Electrical drawings may be matted on one side and may be submitted in pencil.
- c. Cross-section sheets may be 80 micrometers thick and may be matted on one side.

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 underclearance.
- 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 Authority 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 Authority 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 Authority'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 Authority 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 Authority. 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 Authority 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 Authority 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 AUTHORITY'S PROJECT ADMINISTRATION**

Information or services under the Authority's control shall be furnished by the Authority 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 Authority'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 authority 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 Authority'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 Authority's Executive Director, as provided for in Article "DISPUTES" of these GENERAL CONDITIONS. Thereafter, unless the Contractor and the Authority amicably resolve the matter, it shall be subject to the provisions of the Article "DISPUTES" of the GENERAL CONDITIONS.

**54. INSPECTORS**

The Authority may appoint (either directly or through the Engineer) such inspectors as the Authority 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 authority 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 authority of the place where fabrication, preparation, or manufacture is in progress, the authority 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 Authority 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 Authority 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 Authority 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 Authority. Costs associated with quality assurance testing when Work is deemed to be deficient shall be borne by the Contractor. The Authority shall deduct these costs from payments due the Contractor. Otherwise, all costs associated with quality assurance testing shall be borne by the Authority.

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 authority 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 authority to act under this Article, nor any decision made by the Engineer either to exercise or not to exercise such authority, 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 Authority 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 authority 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 Authority 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 Authority.

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 Authority.

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.

60. 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 Authority 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.

61. 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.

**62. 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 Authority. 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 authority 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 Authority. If the Contractor fails to comply promptly with any order of the Engineer made under the provisions of this Article, the Engineer will have authority 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.

**63. 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 Authority has the right and authority to retain such work and the Authority 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.

**64. LATENT DEFECTS**

The Authority 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.

**65. 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.

**66. 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 Authority or Engineer.

**67. 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 authority 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 authority 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 authority 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 Authority.

**68. 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.

**69. ACCESS TO WORK**

The Contractor shall provide to the Authority, 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.

**70. 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.

**71. 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, airport 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 Transportation Authority. The Contractor shall be responsible for all damage done by his hauling equipment.

The Authority 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.

## 72. 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 airport 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 Authority.

The Contractor shall not be responsible for removal of ice or snow from sections of roadways or airport 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 Authority 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.

**73. 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.

**74. CONSTRUCTION STAKES, LINES, AND GRADES**

The Authority 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 Authority. 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 Authority established survey points) and necessary for the performance of the work. The Authority 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 Authority. 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 Authority 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 Authority 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 Authority.

The Contractor shall provide and maintain offset stakes from each main roadway baseline, from each ramp, jughandle, 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 Authority.

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 bench marks 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 Authority 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 bench mark 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.

#### 75. 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 Authority'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 Authority's operations, and cooperatively coordinate his work with the work of other prime Contractors performing work for the Authority.

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 authority to represent and act for the joint venture.



**76. COOPERATION BETWEEN CONTRACTORS**

The Authority 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 Authority'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 Authority 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 Authority.

The provisions of this Article also apply to utilities and their Contractors working on the Project site or adjacent thereto.

**77. COOPERATION WITH UTILITIES**

The Contractor shall cooperate with the owner of any public or private utility service, FAA or NOAA, or a utility service of another government agency that may be authorized by the Authority 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, FAA, or NOAA facilities, 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 Authority 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 Authority'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 day's 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 Authority 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 Authority 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 Authority's ability to comply with the proposed schedules for utility work; and is cognizant of the limited ability of the Authority 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 Authority 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 Authority 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 Authority in accordance with the Railroad Utility Agreement. The Authority 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 Authority 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.

## 78. SAFETY

The Contractor shall be solely and completely responsible for conditions at he 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.

### AIRPORT SAFETY REQUIREMENTS

The Contractor shall adhere to the following airport safety requirements for airport 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 Airport 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 Airport 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 airport property.

Any signs, lights, signals, temporary walkways, traffic control, portable flashing lights, airport 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 Airport during the work under this Contract is begin 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 Airport as are not officially closed to air traffic, and must, at all times, conduct the work in conformance with the requirements of the Airport 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.

Airport hazard marking shall be furnished, installed and maintained by the Contractor, in accordance with "Safety on Airports During Construction Activities" contained in an Appendix in the Specifications.

The Contractor shall hold harmless the Authority, the Engineer, and their respective agents or representatives from any and all claims for damages, costs, expenses, judgment 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 Airport Safety Requirements shall be absorbed by the Contractor in the prices bid for the various items of work.

**79. 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.

Contractor shall be assigned designated gates through which to access the work site. The Contractor must have a gate guard on duty at all access gates whenever those gates are required to be opened for the Contractor's operations. The New Jersey State Police (NJSP) will act as Gate Guards. Costs associated with providing NJSP will be paid to NJSP by the South Jersey Transportation Authority (SJTA). Work involving punchlist items or rework due to non conformance to contract requirements shall be paid to NJSP by the Contractor at no additional charge to the Authority.

A State Police contact and phone number will be supplied to the Contractor at time of the award. The Contractor shall provide gate guards with radios (operating on frequency to be determined) for direct communication with Airport Operations. Guards shall comply with current security regulations for Atlantic City International Airport with regard to access to Airport Operations.

A "Special Employment Voucher" is provided in the Appendix of these specifications for documentation of NJSP hours. The Contractor shall be responsible for completing the form for all work in a given day and submitting the form to the Authority.

**80. 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 Authority 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 Authority may assign another Contractor or use his own forces to perform the emergency work.

**81. 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".

**82. SUBSTANTIAL COMPLETION DATE**

When the Contractor considers that the work, or a designated portion thereof which is acceptable to the Authority, 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 renotify 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 Authority 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 Authority 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 Authority are valid reasons for non-completion, the Authority 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 Authority may reasonably require, together with complete and legally effective releases or waivers (satisfactory to the Authority) of all liens arising out of or filed in connection with the work. In lieu thereof and as approved by the Authority, 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 Authority 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 Authority 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 Authority shall allow the Contractor reasonable access to complete or correct items required by the Contract Documents.

### **83. 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 Authority 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".

84. RESERVED

85. RESERVED

#### **CONTRACT DOCUMENTS**

86. 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.

87. 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.



**88. 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 as 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 of any reasonable size which best suits his needs, but having adopted such size, 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 drawn in ink, drafting lead, or similar writing material on 80 micrometers minimum thickness, polyester film, such as Mylar or Herculene, from any of which so as to produce clear and legible prints.

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 Authority. 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 Authority shall become the property of the Authority. Except to the extent that rights are reserved to others under valid patents for which the Authority is not given a license under the provisions of the Article entitled "ROYALTIES, PATENTED DEVICES, MATERIALS, AND PROCESSES", the Authority 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.

#### 89. 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.

90. 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 Authority, or Engineer, either before or after the execution of this Contract, has affected or modified any of the terms or obligations herein contained.

91. 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.

92. OWNERSHIP OF CONTRACT DOCUMENTS

The Contract Documents, and copies of parts thereof, furnished by the Engineer are the property of the Authority. 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 Authority. Any such authorization will entitle the Engineer to compensation at rates to be agreed upon by the user and the Engineer.

93. RESERVED

94. RESERVED

**CONTROL OF MATERIAL**

95. 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.

On Airport projects the Contractor shall furnish airport lighting equipment that conforms to the requirements of cited materials specifications. In addition, where an FAA specification for airport lighting equipment is cited in the plans or specifications, the Contractor shall furnish such equipment that is listed in FAA Advisory Circular (AC) 150/5345-1, Approved Airport Equipment, that is in effect on the date of advertisement.

#### 96. 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 Authority 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 Authority 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.

97. 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.

98. 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.

99. 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 Authority.

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 authority 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.

**100. 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.

**101. 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 authority 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.

**102. 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 Authority 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.

103. 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 Authority 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 Authority 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.

104. 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 airport 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 Authority.

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.

105. 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.

**106. AUTHORITY FURNISHED MATERIAL**

The Contractor shall furnish all materials required to complete the Work, except those specified to be furnished by the Authority. Material furnished by the Authority 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.

**107. 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 Authority 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 Authority a special performance guarantee or other surety with respect to any substitute. The Engineer will document the time required by the Authority 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 Authority 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.

#### 108. 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 Authority 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 Authority 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 Authority. If within ten (10) days (or such longer period as the Authority may allow) after the Authority has notified the Contractor of a defect, the Contractor has not started to make the necessary corrections, the Authority 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 Authority'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.

**109. 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 Authority 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 "AUTHORITY'S RIGHT TO CORRECT DEFECTIVE WORK" of these GENERAL CONDITIONS upon receipt of written order for same from the Authority. If the Contractor fails to make the repairs and replacements promptly, the Authority may do the work and the Contractor and his Surety shall be liable for the cost thereof.

**110. RESERVED****111. RESERVED****LEGAL RELATIONS AND RESPONSIBILITY TO PUBLIC****112. 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.

**113. 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 authority, 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 Authority, 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.

**114. 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 Authority 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 Authority all available information on the permits, grants, and licenses the Authority 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.

**115. 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 Airport Facility, or to grant permits for same, at any time, is hereby expressly reserved by the Authority 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 Authority, 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.

**116. FEDERAL AID PARTICIPATION**

For AIP contracts, the United States Government has agreed to reimburse the Authority for some portion of the contract costs. Such reimbursement is made from time to time upon the Authority's (sponsor's) request to the FAA. In consideration of the United States Government's (FAA's) agreement with the Authority, the Authority has included provisions in this contract pursuant to the requirements of the Airport Improvement Act of 1982, as amended by the Airport and Airway Safety and Capacity Expansion Act of 1987, and the Rules and Regulations of the FAA 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 Administrator, FAA, 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.

**117. 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 Authority for approval prior to submitting them to the regulatory agencies having jurisdiction and interest.

After receiving the Authority'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 Authority.

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 Authority 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 Authority 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 responsible 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.*

#### 118. 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<sup>th</sup>) 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".

#### 119. 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 Authority 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 Authority. 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.

120. 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.

121. 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 Authority 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 Authority, 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 Authority 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.

122. 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 Authority 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 Authority 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 Authority 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.

### 123. 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 airport 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 ".

**124. RAILWAY HIGHWAY PROVISIONS**

If the Contract Documents require that materials be hauled across the tracks of any railway, the Authority 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".

**125. 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.

**126. 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 Airport projects when the work requires closing an air operations area of the airport 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 Airports. 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 airport in reasonable conformance to AC 150/5370-2, Operational Safety on Airports 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 air operations areas of the airport.

**127. 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 airport property.

**128. 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.

**129. 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 authority 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 authority.

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.

**130. 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".

**131. INDEPENDENT CONTRACTOR**

The relationship of the Contractor to the Authority 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 Authority 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 Authority, including, but not limited to, workers compensation coverage, unemployment insurance benefits, social security coverage, or retirement membership or credit.

**132. 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.

**133. 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 Authority 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.

**134. 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 Authority, without the written approval of the Engineer having first been obtained. The Engineer, by sole discretion, considering primarily the interests of the Authority, may grant or deny such approval.

135. 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 Authority, 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 Authority 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 nonexecution of the Work. The Contractor shall promptly repair, replace, and make good any such loss or damage without cost to the Authority. 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 Authority. The Authority 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 Authority, 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 Authority 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 Authority 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 Authority's premises, or the vicinity thereof.

The Contractor shall indemnify and save harmless the Authority against all claims described in Subheadings B and C above, and for all expense incurred by the Authority 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 Authority, raise any defense involving in any way jurisdiction of the tribunal, immunity of the Authority, governmental nature of the Authority, or the provisions of any statutes respecting suits against the Authority.

The provisions of this Article are also for the benefit of all officers, agents, and employees of the Authority 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 Authority is named, including a direct right of action against the Contractor to enforce the foregoing indemnity except, however, that the Authority 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 Authority as herein provided. Such insurance requirements are designed to provide greater assurance to the Authority 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.

## 136. 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 Authority. No work shall be delayed or postponed pending resolution of any disputes or disagreements, except as the Contractor and the Authority 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 Authority'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 Authority's Executive Director.

The Authority'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 Authority 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 Authority'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.

137. **ARBITRATION**

If agreed upon in writing by the Contractor and Authority 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 Authority 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.

138. **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.

139. **RESERVED**

140. **RESERVED**

**MAINTENANCE BOND, INSURANCE, AND INDEMNIFICATION**

141. **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 Authority for 100% of the final contract price.

**142. 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 Authority, 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 Authority, at the sole expense of the Contractor. Failure by the Contractor to provide a replacement bond and Surety as required by the Authority within ten (10) days thereafter shall be cause for the Authority 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 Authority until the Contractor complies with the provisions of this Article.

**143. 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 Transportation Authority (the "Authority"). Approval of insurance required of the Contractor will be granted only after submission to the Authority of original certificates of insurance signed by the representatives of the insurers or, at the Authority's request, certified copies of the required insurance policies. If found to be non-compliant at any point during the Contract Term, the Authority may purchase the required insurance coverage(s) and the cost will be borne by the Contractor through direct payment/reimbursement to the Authority or the Authority 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 Authority. Failure of the Authority to demand such certificate or other evidence of full compliance with these insurance requirements or failure of the Authority 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 Authority 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 Transportation Authority, 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 Authority reserves the right to require the Contractor to name other parties as additional insureds as required by the Authority. 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 Authority. 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 Authority 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 Authority'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 Authority, public officials, their employees, their authorized representatives, or agents either personally or as officials of the Authority in carrying out any of the provisions of the Contract nor in exercising any power or authority 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 Authority.
10. Waiver of Rights of Recovery and Waiver of Rights of Subrogation:
  - a. The Contractor waives all rights of recovery against the Authority and all the additional insured's 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 Authority 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).
14. No Aviation or Aircraft related exclusions are permitted on any of the Contractor's insurance policies.

**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);
  - 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 Authority 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: 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 3<sup>rd</sup> Party disposal facilities must be licensed and maintain pollution liability insurance of not less than \$1,000,000, if applicable.

7. Watercraft and Aircraft Liability (If Designated by Contractor's Scope of Work): If Contractor utilizes any owned, used, leased, hired or borrowed watercraft or aircraft 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. 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

9. 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, that 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

10. Owned, Leased, Rented or Borrowed Equipment:

- 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 Authority, 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.

144. RESERVED

145. RESERVED

146. RESERVED

147. RESERVED

#### **PROSECUTION AND PROGRESS OF THE WORK**

148. 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 Authority has been obtained. No right under this Contract or claim for any proceeds due or to become due hereunder shall be asserted against the Authority, or persons acting for the Authority, 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 Authority. 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.

149. 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 Authority.

The Contractor agrees that he is as fully responsible to the Authority 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 Contract, 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 Authority 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 Authority 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 Authority.

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 Authority. 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 Authority of the subcontracting will be provided to the Contractor in writing. Prior to the receipt of the written consent from the Authority, 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 Authority's consent to the making of the subcontract, that the Subcontractor shall make no claims against the Authority 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 Authority's giving consent, that when minimum wage rates are specified they shall apply to labor performed on all subcontracted Work.

The Authority 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.

**150. OTHER CONTRACTS**

The Authority 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:

**151. COMMENCEMENT OF WORK**

Upon execution of the Contract by the Authority, 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 authority 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 Authority may take whatever action that is deemed appropriate under the Contract.

**152. 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".

**153. 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.

On Airport Projects the Contractor shall control his operations and the operations of his Subcontractors and all suppliers so as to provide for the free and unobstructed movement of aircraft in the AIR OPERATIONS AREAS of the airport.

When the work requires the Contractor to conduct his operations within an AIR OPERATIONS AREA of the airport, the work shall be coordinated with airport management (through the Engineer) at least 48 hours prior to commencement of such work. The Contractor shall not close an AIR 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 AIR OPERATIONS AREA of the airport on an intermittent basis (intermittent opening and closing of the AIR OPERATIONS AREA), the Contractor shall maintain constant communications as hereinafter specified; immediately obey all instructions to vacate the AIR OPERATIONS AREA; immediately obey all instructions to resume work in such AIR OPERATIONS AREA. Failure to maintain the specified communications or to obey instructions shall be cause for suspension of the Contractor's operations in the AIR OPERATIONS AREA until the satisfactory conditions are provided.

**154. 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 Transportation Authority.

**155. 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".

156. AUTHORITY'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 Authority will notify his Surety of the condition. After ten (10) days (or such longer period as the Authority may allow) written notice to the Contractor and the Surety, and without prejudice to any other right which the Authority may have under the contract, the Authority 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.

157. 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 Authority. 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 Authority 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 Authority 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 Airport Operations is of the utmost importance and priority on airport projects. The Contractor shall so schedule and conduct his operations and store his materials and equipment so that no unauthorized interference to normal airport 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 Airport 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 Airport. It is expressly understood that the Authority 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 airfield lights shall be maintained in full operation throughout the period of this Contract. Where disconnections of airfield lights are required, such work shall be made at such times and in such manner as approved by Airport Management, the FAA and the Control Tower Chief. 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 Airport Operations Area (AOA) with temporary fencing in accordance with the dimensions and locations shown on the drawings.

The cost of maintaining Airport 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.

**158. 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.

**159. 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 Authority 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.

160. TEMPORARY SUSPENSION OF WORK

The Engineer has the authority 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 Authority 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.

161. SUSPENSION OF WORK

The Authority 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 Authority.

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 Authority 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 Authority 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.

#### 162. 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 Authority, the Authority 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 Authority 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 Authority resulting from his refusal or failure to complete the work within the specified time.

If the Contract provides for liquidated damages, and if the Authority 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 Authority in either its sovereign or contractual capacity, acts of another Contractor in the performance of a contract with the Authority, 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 Authority grants a further period of time before the date of final payment under the Contract), notifies the Authority 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 Authority 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 Authority provided in this Article are in addition to any other rights and remedies provided by law or under this Contract.

#### 163. 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 Authority 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 consider the claim and render a decision thereon in accordance with Article "DUTIES AND RESPONSIBILITIES OF THE ENGINEER" of these GENERAL CONDITIONS. If the Authority 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 Authority and the Contractor.

## 164. TERMINATION FOR CONVENIENCE

- A. The Authority 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 Authority shall determine that such termination is in the best interest of the Authority. 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 Authority, 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 Authority, in the manner, at the times, and to the extent directed by the Authority, all of the right, title, and interest of the Contractor under the orders and subcontracts so terminated. The Authority 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 Authority 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 Authority, and deliver in the manner, at the times, and to the extent, if any, directed by the Authority, (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 Authority.
  7. Use his best efforts to sell, in the manner, at the times to the extent, and at the price or prices that the Authority, 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 Authority. The proceeds of any such transfer or disposition shall be applied in reduction of any payments to be made by the Authority 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 Authority 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 Authority may direct, for the protection and preservation of the property related to this Contract and in which the Authority has or may acquire an interest.
- C. After receipt of a Notice of Termination, the Contractor shall submit to the Authority his termination claim in the form and with the certification the Authority 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 Authority 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 Authority may determine, on the basis of information available to him, the amount, if any due to the Contractor because of termination. The Authority shall then pay to the Contractor the amount so determined.
- D. Subject to the provisions of Paragraph C, the Contractor and the Authority 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 Authority 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 Authority 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 Authority 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 Authority 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 Authority 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 Authority of property which is destroyed, lost stolen, or damaged, to the extent that it is undeliverable to the Authority, 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 Authority 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 Authority has determined the amount due under Paragraph C or Paragraph E of this Article, the Authority 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 Authority 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 Authority 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 Authority.
- H. If the termination hereunder be partial, before the settlement of the termination portion of this Contract, the Contractor may file with the Authority 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 Authority 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.

#### 165. AUTHORITY'S USE OF PORTIONS OF THE WORK

The Authority at anytime may request the Contractor, in writing, to permit the Authority to use any part of the work which the Authority 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 Authority, 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 Authority 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 Authority 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 Authority 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 Authority 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 Authority and the Contractor have agreed as to the division of responsibilities between the Authority 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 Authority.

166. 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.

167. 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 Authority 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 Authority, 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 Authority 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 Authority 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 Authority 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 Authority. Damages that might accrue to the Authority include, but are not limited to, the additional costs for project inspection, the Authority'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 Authority 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 Authority 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 Authority provided in this Article are in addition to any other remedies provided by law or under this Contract.

168. RESERVED

169. RESERVED

**PROGRESS SCHEDULE**

170. 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 Authority 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 Authority. 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 Authority 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 Authority 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 Authority.

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 authority, responsible to manage this work. Refer to the Milestone Dates referenced in the Information for Bidders section of the Contract.

## 171. 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, (i) 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 Authority 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 Authority.
- I. Comply with all requirements of the Contract regarding coordination, cooperation, contract, and schedule.

## 172. 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, Authority'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 Authority. 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 Authority 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. Authority 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 Authority. Only the Required Completion Date, and Milestone Completion Dates, and any contractually specified sequences shall be binding on the Authority 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 Authority 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 Authority.

#### 173. 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.

#### 174. 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 Authority. Such a revision shall comply with all Contract Time requirements.

If the Authority 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 Contractor. 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.

#### 175. 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 than 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 Authority.

#### 176. RECOVERY SCHEDULE

The Authority 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 Authority 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 Authority. 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".

#### **177. EXTENSION OF TIME**

The Authority 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 authority; by Suspension of Work by the Authority; by any order, rule or regulation of any federal agency; or by any other cause deemed sufficient to the Authority, 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 Authority 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 Authority upon completion of the work. Upon written notification of acceptance by the Engineer, the Authority 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 Authority 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 Authority 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 Authority 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.

**178. 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  
Authority Contract Number  
Contractor  
Engineer  
Contractor's Shop Drawing Number  
Submittal Number (1<sup>st</sup> submission, 2<sup>nd</sup> 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.

#### 179. 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.

#### 180. 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.

181. RESERVED

182. RESERVED

### **PAYMENT**

183. PAYMENT FOR MODIFICATIONS

Payment to the Contractor, or credit to the Authority 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 Authority. 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 Authority 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 Airport 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 Authority 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 Authority 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 Authority; 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 Authority 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 Authority. The Contractor shall furnish a breakdown of the cost satisfactory to the Authority 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 Authority. 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 Authority 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 Airport 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 Authority 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 Authority 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 Authority; 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 Authority 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 Authority. The Contractor shall furnish a breakdown of the cost satisfactory to the Authority 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 Authority 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 Authority'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 Authority. 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 Authority in writing, and shall be submitted on the form required by the Authority. 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 Authority 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 Authority 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 Authority 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 Authority 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 Authority.

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 Authority, 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 Authority 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 Authority 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.

184. 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 Authority'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 Authority.

The Contractor's cost records pertaining to expenses under this Article shall be open to inspection or audit by representatives of the Authority 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 Authority 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 Authority'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 Authority the amount so disallowed.

**185. PARTIAL PAYMENTS**

**A. GENERAL**

Nothing contained in this Article shall be construed to affect the right of the Authority 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 Authority 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 Authority 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 Authority. 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 with 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 Authority 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 Authority 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 Authority are valid reasons for noncompletion, the Authority 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 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 Authority 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 Authority 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 as 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 Authority 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.

186. RELEASE OF LIENS OR CLAIMS

The Contractor shall indemnify and save harmless the Authority from all claims for labor and materials furnished under this Contract. Before the Authority 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 Authority 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 be 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 Authority, 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 Authority all moneys that the latter may be compelled to pay in discharging such a lien or claim, including all costs and attorneys' fees.

187. 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 Authority 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 Authority has accepted the completed work, or formally waived nonconforming work to the extent of the nonconformity;
- B. The Authority 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 Authority with a release of all claims against the Authority 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.

188. NO WAIVER OF RIGHTS

Neither the inspection by the Authority, through the Engineer or any employees of the same, nor any order by the Authority for payment of money, nor any payment for, or acceptance of, the

whole or any part of the work by the Authority or Engineer, nor any extension of time, nor any possession taken by the Authority or his employees, shall operate as a waiver or any provision of this Contract, or any power herein reserved to the Authority, 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.

189. ACCEPTANCE OF FINAL PAYMENT CONSTITUTES RELEASE

The acceptance by the Contractor of the final payment shall release the Authority and the Engineer, as representative of the Authority, 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 Authority and others relating or arising out of the work. Within 30 days after Final Payment has been issued to the Contractor, 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.

190. 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 Authority. The Authority 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 exit 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 Authority 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.



**Page Intentionally Left Blank**



## CONSTRUCTION AGREEMENT

**THIS AGREEMENT** made this \_\_\_\_ day of \_\_\_\_, 20 \_\_\_\_, by and between the **SOUTH JERSEY TRANSPORTATION AUTHORITY**, having its principal offices located at Farley Service Plaza, Elwood, New Jersey, hereinafter referred to as “Authority,” and \_\_\_\_\_, having its principal offices located at \_\_\_\_\_, hereinafter referred to as “Contractor.”

### **WITNESSETH:**

The Authority operates and maintains the Atlantic City Expressway and Atlantic City International Airport and was established and created pursuant to the South Jersey Transportation Authority Act (the Act), N.J.S.A. 27:25A-1 et seq.; and

1. That for and in consideration of the sum of \$ \_\_\_\_\_ **DOLLARS**, Contractor agrees to construct the Atlantic City Expressway **2021 WEST MAINTENANCE ADDITION PROJECT** for which major work items include and are not limited to: the construction of a new +/- 919 SF office, locker room and storage room addition to the existing maintenance building, generally constructed of cast-in-place concrete foundations and slab-on-grade, CFMF walls and roof, metal siding and EPDM roofing.

Work shall be in accordance with the Contract Documents hereinafter set forth.

2. That for and in consideration of the amount payable under this Agreement by the Authority, 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 herein, namely, \$ \_\_\_\_\_, for the aforesaid. 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 Authority.

4. To prevent all disputes and litigation, it is agreed by and between the parties to this Agreement that the Authority 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 Authority, 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 150 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 Authority 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 Authority 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 Authority 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 Authority does not pay such undisputed amount in 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 Authority or Contractor as provided in the Contract Documents; the work may be suspended by the Authority as provided in the Contract Documents. Contract may be terminated by the Authority for failure to provide services in accordance with the contract. The Authority may also terminate the contract for the Contractor's failure to pay Expressway tolls (or other amounts due) when due and owing, or 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 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 3.6.

15. The Contractor shall execute the Mandatory Equal Employment Opportunity Language, Exhibit B attached hereto, which shall be incorporated herein by reference.

16. SMALL BUSINESS SET-ASIDE: New Jersey's Small Business Set-Aside Program obligates the Authority to make 25% of all purchases for goods and services from small businesses.

Firms classified as a Small Business Enterprise must be registered with the New Jersey Department of Revenue and Enterprise Services. Registration instructions can be obtained by visiting the State's website:

<https://www.njportal.com/DOR/SBERegistry/Default>

The South Jersey Transportation Authority requests the following for informational purposes only.

This is not a Set-Aside bid; however, please indicate below (if applicable).

Our firm is certified/registered with the State of New Jersey Set-Aside Program.

Certification # \_\_\_\_\_

	Check here
MBE (Minority Business Enterprise)	_____
WBE (Women Business Enterprise)	_____
SBE (Small Business Enterprise)	_____
None of the Above	_____

#### ***POLICY STATEMENT OF THE SOUTH JERSEY TRANSPORTATION AUTHORITY***

In accordance with Executive Order No. 84 signed by Governor James J. Florio on March 5, 1993 and Executive Order No. 71 signed by Governor James E. McGreevey on October 2, 2003, it is the policy of the South Jersey Transportation Authority (the "Authority" or "SJTA") that Small Business Enterprises ("SBE"), as determined and defined by the Department of the Treasury,

Division of Revenue and Enterprise Services (“Division of Revenue”) in N.J.A.C. 17:13 et seq., have the opportunity to compete for and participate in the performance of contracts to the purchase of goods and services and for construction services required by the Authority. The Authority further requires that its contractors shall agree to take all necessary and responsible steps, in accordance with the aforementioned regulations, to ensure that SBE’s have these opportunities.

It is the policy of the South Jersey Transportation Authority (SJTA) that small businesses (each a “small business enterprise” or “SBE”), as determined and defined by the New Jersey Department of the Treasury, Division of Purchase and Property, Contract Compliance and Audit Unit, EEO Monitoring Program (“EEO Monitoring Program”) in N.J.A.C. 17:27 et seq. or other application regulation, should have the opportunity to participate in SJTA Contracts.

To the extent the Firm engages subcontractors or sub-consultants to perform Services for the SJTA pursuant to this Contract, the Firm must demonstrate to the SJTA’s satisfaction that a **good faith effort** was made to utilize subcontractor’s and sub-consultants who are **registered with the EEO Monitoring Program as SBEs**.

Furthermore, Proposers and subcontractors shall be evaluated by the EEO Monitoring Program, based on its attainment of the Participation Goals set forth in N.J.A.C. 17:27-5.2

Please refer to the following link for current applicable procurement target(s) guidelines set forth by the NJ Department of Treasury:

[https://www.state.nj.us/treasury/contract\\_compliance/](https://www.state.nj.us/treasury/contract_compliance/)

**Evidence of a “good faith effort” includes, but is not limited to:**

- (a) Whether the vendor or subcontractor has agreed to make a good faith effort to adhere to targeted minority and women employment goals;
- (b) Whether the vendor or subcontractor has met or documented that it has made a

good faith effort to meet targeted employment goals;

(c) Whether the vendor or subcontractor has adopted an Equal Employment Opportunity (EEO) Policy;

(d) Whether the vendor or subcontractor has posted an EEO Policy on the job site bulletin board;

(e) Whether the vendor or subcontractor has disseminated the EEO Policy to its workers through various means including company meetings, preconstruction job meetings, written notices, etc.;

(f) Whether the vendor or subcontractor has posted Federal or State issued EEO posters on the job site bulletin board;

(g) Whether the vendor or subcontractor has identified an EEO Officer and established job duties in writing for such position;

(h) Whether the vendor or subcontractor has developed a basic complaint procedure;

(i) Whether the vendor or subcontractor has knowledge of and has considered the general availability of minorities and women having requisite skills in the immediate labor area;

(j) Whether the vendor or subcontractor has knowledge of and has considered the percentage of minorities and women in the total workforce in the immediate labor area;

(k) Whether, when the opportunity has presented itself, the vendor or subcontractor has considered promoting minority and women employees within its organization;

(l) Whether the vendor or subcontractor attempted to hire minorities and women based upon the anticipated expansion, contraction and turnover of its workforce;

(m) Whether the vendor or subcontractor has the ability to consider undertaking

training as a means of making all job classifications available to minorities and women and whether

it has done so;

(n) Whether the vendor or subcontractor has utilized the available recruitment resources to attract minorities and women with requisite skills, including, but not limited to, public and private training institutions, job placement services, referral agencies, newspapers, trade papers, faith-based organizations, and community-based organizations;

(o) Whether the vendor or subcontractor has requested qualified minorities and women from a labor union with whom it has an exclusive hiring or referral arrangement;

(p) Whether the vendor or subcontractor has actively recruited beyond the traditional sources to attract minority and women applicants;

(q) Whether the vendor or subcontractor has reviewed all personnel actions to ensure actions are taken in compliance with the company's EEO policy; and

(r) Whether the vendor or subcontractor has retained records of employment and personnel actions and payroll records for a three year-period from the date of the contract or project closing.

#### **South Jersey Transportation Authority Substitution Policy**

The contractor or consultant must notify and obtain written approval from a small or women or minority-owned or Disadvantaged Business Enterprise (DBE) sub-contractor, sub-consultant, or vendor (SMWBE or DBE contractor) before including that contractor in a bid proposal or similar contract-related submission.

The contractor, consultant must notify and obtain written consent and obtain authorization From South Jersey Transportation Authority's Public Agency Compliance Officer/DBE

Liaison Officer before it substitutes a SMWBE or DBE sub-contractor, sub-consultant named in a bid proposal or other contract related submission; and if the substitution is approved by the Public Agency Compliance Officer/DBE Liaison Officer, the contractor, consultant shall make a good faith effort to utilize another SMWBE or DBE sub-contractor sub-consultant to replace the previous SMWBE and/or DBE contractor, consultant.

The prime contractor or consultant must give the Public Agency Compliance Officer/DBE Liaison Officer five days to respond to the prime contractor's, consultant's notice and advise the contractor, consultant approval or the reasons, if any, why it objects to the proposed termination of its subcontract subconsultant and why you should not approve the prime contractor, consultant's action.

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.

17. 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 Authority employee, officer or official.

18. 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 Authority:

Mr. Stephen F. Dougherty, Executive Director  
SOUTH JERSEY TRANSPORTATION AUTHORITY



P.O. Box 351  
Hammonton, NJ 08037

As to the Contractor:

(insert address)

19. If it becomes necessary for the Contractor either as principal or by agent or employee to enter upon the premises or property of the Authority 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 Authority, 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 Authority, 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 Authority 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 Authority, its agents, servants or employees. The Contractor will carry insurance and will indemnify the Authority, 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 Authority.

20. 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).

21. 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 Authority, 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.

22. 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.

23. The Authority 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  
AUTHORITY**

\_\_\_\_\_  
**CYNTHIA A. BLASBERG**  
Board Secretary

By \_\_\_\_\_  
**STEPHEN E. DOUGHERTY**  
Executive Director

**SAMPLE  
AGREEMENT**

(Seal)

**WITNESS & ATTEST:**

**[CONTRACTOR]**

\_\_\_\_\_  
Secretary

By \_\_\_\_\_  
President or Owner

(Seal)

## **EXHIBIT B**

### **MANDATORY EQUAL EMPLOYMENT OPPORTUNITY LANGUAGE**

**N.J.S.A. 10:5-31 et seq.**

**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 workers' 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. 17:27-7.2; 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 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 sub-contractor 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 sub-contractor 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:

- (1) 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;
- (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 non-discrimination 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 contractor 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.

(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 apprentice-ship 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 web-site, 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.

SOUTH JERSEY TRANSPORTATION AUTHORITY  
MONTHLY PAYMENT REPORT

COPY OF THIS FORM MUST BE ATTACHED TO EACH PAYMENT  
VOUCHER/TASK ORDER

Prime Contractor/Consultant

Award Date: \_\_/\_\_/\_\_

Project Name:

Contract Amount: \$\_\_\_\_\_

Address:

Total Amt. Due This Invoice \$\_\_\_\_\_

Phone # (     )

Date of Invoice: \_\_\_\_\_

SUBCONTRACTOR/CONSULTANT INFORMATION

Name

Amt. Due Status

Ethnicity

FEIN (Tax ID #)

**SAMPLE**  
**AGREEMENT**

\$ _____	<input type="checkbox"/> SBE	<input type="checkbox"/> WBE	<input type="checkbox"/> MBE	<input type="checkbox"/> DBE	_____	_____
\$ _____	<input type="checkbox"/> SBE	<input type="checkbox"/> WBE	<input type="checkbox"/> MBE	<input type="checkbox"/> DBE	_____	_____
\$ _____	<input type="checkbox"/> SBE	<input type="checkbox"/> WBE	<input type="checkbox"/> MBE	<input type="checkbox"/> DBE	_____	_____
\$ _____	<input type="checkbox"/> SBE	<input type="checkbox"/> WBE	<input type="checkbox"/> MBE	<input type="checkbox"/> DBE	_____	_____

Is Project Completed? ☐ yes ☐ no

If yes, indicate completion date: \_\_\_\_\_

**Contractor/Consultant Certification**

The above information is true and complete to the best of my knowledge and belief. I understand that within 10 days from receipt of payment from South Jersey Transportation Authority for this payment application, the listed subcontractors/consultants are to be paid for the amount indicated above. The Authority reserves the right to confirm payment with the subcontractors/consultants as deemed necessary.

Completed By: \_\_\_\_\_  
Name & Title

Date: \_\_\_\_\_

Form MPR revised 12/22/09

SJTA Project Manager: Please forward Monthly Payment Report Forms immediately to the Affirmative Action Officer.



## **SPECIAL PROVISIONS**

### **CONSTRUCTION REQUIRED BY THE SPECIAL PROVISIONS**

These Special Provisions relate generally to the construction of the Atlantic City Expressway **2021 WEST MAINTENANCE ADDITION PROJECT**.

These Special Provisions require the doing of all things necessary or proper for or incidental to the matter referred to in the immediately preceding paragraph, as shown on the Contract Drawings in their present form. In addition, all things shown on the Contract Drawings even though not expressly mentioned in these Special Provisions, all things mentioned in these Special Provisions even though not shown on the Contract Drawings, and all things not specified either on the Contract Drawings or in the Project Manual but involved in carrying out their intent and in the complete and proper execution of the matter referred to in the immediately preceding paragraph, are required by these Special Provisions; and the Contractor shall perform the same as though they were specifically delineated, described and mentioned.

In the event any requirements of the Special Provisions appear to conflict with the requirements of the Contract Drawings, the requirements of the Special Provisions shall prevail.

### **CONTRACT DRAWINGS**

The Contract Drawings which accompany and form a part of these Special Provisions bear the general title **“South Jersey Transportation Authority – Atlantic City Expressway (ACE) – 2021 West Maintenance Addition Project”** and are separately numbered as follows:

<b><u>SHEET NUMBER</u></b>	<b><u>TITLE</u></b>
CS1	Cover Sheet
CA100	Code Review
A001	General Notes & Abbreviations
A002	General Notes & Fire Rated Penetration Details
A100	Overall Building Plan
A201	Demolition & New Work Plans
A202	Reflected Ceiling & Roof Plans
A301	Exterior Elevations & Schedules
A302	Building Sections & Wall Sections
A303	Enlarged Wall Sections
A304	Details
A401	Standard ADA Details 1
A402	Standard ADA Details 2
S200	Structural General Notes
S200a	Structural Special Inspections
S201	New Foundation & Framing Plans
S300	Foundation & Masonry Details
S500	Cold Formed Metal Framing Details
M001	Mechanical Symbols & Abbreviations
M101	Mechanical Partial Plans
M201	Mechanical Details
M202	Mechanical Details
M300	Mechanical Schedules & Controls
M400	Mechanical Specifications

E001	Electrical General Notes, Symbols & Abbreviations
E101	Electrical Power Partial Plans
E102	Electrical Reflected Ceiling Partial Plan
E201	Electrical Schedules

#### **STANDARD DRAWINGS**

The contract drawings for this project include the drawings listed above. The Contract Drawings do not show all of the details of the Work and are intended only to illustrate the character and extent of the Work to be performed. Accordingly, they may be supplemented during the performance of the Work by the Engineer or by the Contractor subject to the approval of the Engineer, to the extent necessary to further illustrate the Work.

#### **CONSTRUCTION SEQUENCE**

The Work shall be performed in the sequence as shown in the contract drawings, described in the Special Provisions or as directed by the SJTA Project Manager, or their Agent. Any modifications shall be submitted in writing and approved in advance by the SJTA Project Manager.

#### **APPROVALS BY ENGINEER**

Any approval by the Engineer of any materials, workmanship, plant, equipment, drawings, program, methods of procedure, or of any other act or thing done or furnished or proposed by the Contractor to be done or furnished in or in connection with the performance of the Contract shall be construed merely to mean that at the time the Engineer knows of no good reason for objecting thereto; and no such approval shall release the Contractor from his full responsibility for the accurate and complete performance of the Contract in accordance with the Contract Drawings and Special Provisions or from any duty, obligation or liability imposed upon him by the Contract or from responsibility for injuries to persons or damage to property.

#### **ACCIDENTS AND FIRST-AID PROVISIONS**

The Contractor shall promptly report in writing to the Engineer and to South Jersey Transportation Authority all accidents whatsoever arising out of or in connection with the performance of the Contract, whether on or adjacent to the construction site, which result in death, injuries or property damage, giving full details and statements of witnesses. In addition, if death or serious injuries or serious damage is caused, the accident shall be reported immediately by telephone to both of the said representatives of South Jersey Transportation Authority.

The Contractor shall provide at the construction site such equipment and medical facilities as are necessary to supply first aid service, in case of accident, to any who may be injured in the progress of the Contract.

If any claim is made by any third person against the Contractor or any subcontractor on account of any accident, the Contractor shall promptly report the fact in writing to the aforementioned representatives of South Jersey Transportation Authority, giving full details of the claim.

#### **DAILY PROGRESS, EQUIPMENT AND LABOR REPORTS**

The Contractor shall furnish to the Engineer at the end of each day, a memorandum showing for that day (a) a detailed narrative of all construction activities performed, (b) all equipment on-site with a description of activities performed, (c) a statement of any unusual happening that occurred, (d) the number of workers in each trade classification that were employed and the number of hours they worked, broken down by direct employing company, (e) the weather conditions for that day, (f) a list of all

---

#### **SPECIAL PROVISIONS**

deliveries, (g) any observed safety issues or concerns, (h) any discussions/conversations with the Owner, Project Manager, Airport Representative, etc. related to the work or execution of the work, (i) the name and title of the person writing the report, and (j) relevant photographs. Such memorandum shall not be deemed to be a substitute for the notices, time slips, memoranda or other data required under the clauses of the Form of Contract relating to compensation for extras. A daily report shall be generated for every calendar day from the Notice to Proceed until Final Acceptance and reports shall be submitted (at least) once a week.

### **SIGNS**

No advertisement or sign, other than the name and address of the Contractor, will be permitted on any fences, temporary structures or elsewhere on the construction site and such advertisement will be permitted only upon the condition that it is first approved by the Engineer. In any event, the advertisement shall not exceed six feet by eight feet in over-all dimensions.

The Contractor will be required to provide temporary construction signage, safety signage, regulation signage, and/or way finding signage as necessary to properly indicate the area as a construction area, warn public of any potential hazards and direct the flow of traffic. The type and quantity of signs that will be required shall be coordinated with the SJTA Project Manager and generally based on the location of the construction areas and layout of temporary walls/barricades. The contractor shall provide this signage at no additional cost.

### **UTILITY SERVICES**

The Contractor shall make arrangements for securing at his own expense any heat, light, power, water and other services which may be required for the performance of the Contract.

### **CONSTRUCTION PHASING**

Phasing will be generally, as proposed by the Contractor to complete the work within the contract duration, as coordinated with and approved by the SJTA Project Manager and Operations and, following the requirements listed in these Special Provisions.

### **CONSTRUCTION OPERATION REQUIREMENTS**

All work shall be performed during daytime hours from 7:00 a.m. to 3:30 p.m., Monday through Friday; unless otherwise directed by the engineer. In addition, **all work shall be coordinated with and scheduled around the Operations.**

The Contractor is required to maintain the building in a water-tight configuration and shall provide any/all necessary temporary constructions and protections to prevent water from infiltrating or damaging the building due to Contractor operations. If temporary constructions and protections are deemed inadequate, at the sole opinion of the Engineer, the Contractor shall improve said constructions and protections until deemed adequate.

Trash and debris shall be removed from the work area on a daily basis. Dumpsters are required to be fully covered with straps in suitable quantity and strength to keep the cover in place at the end of each shift and when not actively being used.

Any work requiring the closure of a facility or utility must be coordinated with the Engineer a minimum of 48 hours prior to the requested closure. The Engineer will perform the required coordination with Operations based on such requests. Authority to close any facility rests entirely with Operations.

The contractor is required to conduct his work and meet completion dates in accordance with the

contract provisions. In order to accommodate this schedule, the contractor will be required to supply sufficient men, material and equipment to complete the work on schedule. Any deviation from these work hour limits shall be requested in writing and approved by the SJTA.

Sufficient lighting of areas to be inspected shall be provided in accordance with the Special Provisions or as directed by the Authority.

### **CONSTRUCTION LIGHTING**

When construction is performed during nighttime hours the Contractor shall ensure the work areas are adequately illuminated. A minimum of 10 foot-candles of illumination shall be provided in the work areas, using maneuverable light plants with 1,000-watt metal halide floodlights. The light should be positioned to provide the most natural color illumination and contrast with a minimum of shadows. Lighting the pavement from both sides shall be preferred as lighting from only one side may result in objectionable shadows. All lighting arrangements, including the number, height and positions of floodlights, shall be as approved by the Engineer.

The Contractor shall equip all equipment with artificial illumination to safely illuminate the area immediately surrounding their work areas. The Contractor shall furnish additional lights when directed by the Engineer at no additional cost.

The Contractor shall install, operate, protect and maintain the temporary service for construction, light and power. The Contractor shall extend the temporary wiring throughout, properly grounded, insulated and installed in a safe manner.

No separate payment shall be made for construction lighting. Construction lighting costs shall be incidental to other items of associated work.

### **DAILY CONSTRUCTION PROGRESS MEETINGS**

A daily progress meeting shall be held between the Engineer and the Contractor. Test results from the previous and current work period will be reviewed. Work requirements for the next work period will be discussed. Arrangements for meeting these work requirements will be reviewed. The weather forecast will also be reviewed during this meeting. The contractor shall provide an asphalt laydown plan at this meeting showing the planned area to be paved during the following shift and the number and direction of lanes. Also the Contractor shall provide an as-built plan of the actual laydown from the previous paving shift.

Bi-weekly progress meetings will also be held. Representatives of Operations, the Engineer, and the Contractor will be present. The agenda for this meeting will include the work schedule for the coming week, any operational problems which, have been encountered or may be expected, and any other operational aspects of the project as noted in other Project Manual sections.

### **REPORTS**

Upon request of the Engineer, at the end of each normal work week, the Contractor shall furnish, for approval, his proposed operating schedule for the following week. This and locations of operations to be performed and the types of equipment to be used. After this schedule has been approved, the Contractor shall not deviate from it without receiving prior permission from the Engineer.

### **EQUIPMENT**

All equipment necessary for the proper construction of the work under this contract shall be on the project, in first class working condition.

---

### **SPECIAL PROVISIONS**

### **TEMPORARY DRAINAGE**

The Contractor will be required to insure adequate drainage from his area of operation including any runoff at all times. He shall also provide water pollution and erosion control in accordance with the Contract Drawings and Project Manual. No direct payment will be made for this work.

### **FITTING, MATCHING**

The Contractor shall do all the cutting and fitting required for the installation of this work and required to make his work come together properly and shall fit it to receive or be received by existing work or future work shown on the drawings or implied by the drawings and Special Provisions for the work. He shall properly condition his work as the Construction Manager may direct to meet the intent of the Project Manual. All cost caused by defective work shall be borne by the Contractor. The Contractor shall not endanger any existing installation by cutting, digging, or otherwise, nor shall he cut or alter existing work except with the consent of the Engineer. To insure the proper execution of his subsequent work, the Contractor shall measure work already in place either by the Contractor or by others and shall at once report to the Construction Manager any discrepancy between the executed work and the drawings.

### **TOLLS AND USE OF MEDIAN CROSSOVERS/U-TURN**

It is the policy of the South Jersey Transportation Authority **not to** offer toll free passage on the Atlantic City Expressway for its vendors; New Jersey Title 19:2-6.2(a) (Subchapter 6. Tolls) - contractor to pay all tolls. Simply notifying the toll collector they are working for the SJTA is not allowable. Furthermore, the contractor shall only use official Expressway exits to change travel direction along the Expressway. Median crossovers are for official use only and shall not be used by the contractor. Contractors will be ticketed by State Troopers if they use these crossovers. All costs for anticipated tolls shall be included in the various pay items of the bid. Unauthorized use of the median crossovers will also result in the removal of that individual from the project.

### **STORAGE AREA**

Equipment shall be stored in the staging area designated by the contract plans or at the preconstruction meeting. The Contractor shall be responsible for the care and protection of his materials, equipment and work. Stockpiled materials, equipment and tools must be constrained and secured.

### **RECORD DOCUMENTS**

The Contractor shall provide the Owner's Representative with a set of record documents at the completion of the project. The Owner's Representative will provide the Contractor with a set of reproducible contract drawings if needed. The documents shall be in the form of: one electronic copy of as-built drawings in PDF or AutoCAD showing any/all deviations as well as unknown underground utilities encountered; one hard copy of as-built drawings printed on the original document size; three bound copies of the Project Record Documents Manual.

In general, the Project Record Documents Manual shall include a cover, table of contents; contact sheet listing all subcontractors, materialmen and suppliers; certificate of substantial completion; bonds; consents from surety; final releases; permits and approvals; inspection reports; Guarantee; warranties; specific product data, shop drawings and operation and maintenance instructions; and any other documents that are significant for future reference. Coordinate exact requirements with Owner's Representative.

The Contractor shall submit a draft of the closeout documents electronically to the Owner's Representative for review and approval prior to final assembly. All costs for this work shall be included in the various items scheduled in the Proposal.

---

### **SPECIAL PROVISIONS**

**EXISTING MATERIAL**

The SJTA reserves the right of first refusal for any material that shall be removed from the project site. If the material is desired by the SJTA the contractor shall remove it from the site and deliver it to the nearest SJTA Maintenance Facility along the Atlantic City Expressway or the Atlantic City International Airport, as directed. Separate payment will not be made but the cost shall be included in the cost for demolition, clearing site and/or material removal.

**PERMITS**

Attention is called to General Conditions Article "Permits & Licenses" for the Contractors responsibility with respect to project permits. The following is a list of approvals and permits the Contractor shall procure/obtain:

- New Jersey Department of Community Affairs Building Permits

The Contractor shall also coordinate, facilitate, and comply with all requirements set forth in any Owner obtained permits.

**END OF SPECIAL PROVISIONS**

**SECTION 01 11 00  
SUMMARY OF WORK**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General Condition and Special Provisions, other Division 1 Specification Sections and Divisions 2 through 49 Sections, apply to this Section.
- B. Division 1, Section 01 73 29 Cutting and Patching
- C. Division 2, Section 02 41 19 Selective Demolition
- D. Division 5, Section 05 40 00 Cold Formed Metal Framing
- E. Division 6, Section 06 10 53 Miscellaneous Rough Carpentry
- F. Division 7, Section 07 42 13 Metal Wall Panel
- G. Division 7, Section 07 53 23 Ethylene-Propylene-Diene-Monomer Roofing (EPDM)
- H. Division 7, Section 07 84 13 Penetration Fire stopping
- I. Division 7, Section 07 92 00 Joint Sealants
- J. Division 8, Section 08 11 13 Hollow Metal Doors and Frames
- K. Division 8, Section 08 14 16 Flush Wood Doors
- L. Division 8, Section 08 51 13 Aluminum Windows
- M. Division 8, Section 08 71 00 Door Hardware
- N. Division 8, Section 08 80 00 Glazing
- O. Division 9, Section 09 21 16 Gypsum Board Assemblies
- P. Division 9, Section 09 51 23 Acoustical Panel Ceiling
- Q. Division 9, Section 09 65 13 Resilient Base and Accessories
- R. Division 9, Section 09 65 19 Resilient Tile Flooring
- S. Division 9, Section 09 91 00 Painting

**1.2 PROJECT DESCRIPTION**

**A. LOCATION OF WORK:**

- 1. The work under this contract will be performed at the following location, as identified on the contract documents and as follows:
  - a. Winslow Maintenance Garage (Base Bid)  
501 Old Erial Road, Sicklerville, Winslow Township,  
Camden County, New Jersey 08081

**B. PROJECT SCOPE SUMMARY:**

- 1. Project consists of approximately 919 SF, 1 story addition to the existing SJTA West Maintenance Facility Administration Office core. New work areas include a Men's Locker Room, Office, Storage Room and circulation corridor.

2. The 'Basis of Design' is to match the existing, adjacent Women's Locker room completed in 2013.
3. Exterior walls are to be horizontal metal profile panels on steel studs on concrete slab on grade, roofing to be EPDM over recovery board, continuous polyiso. insulation on steel joists. Reference contract drawings and specifications for information related to finishes, clerestory windows, HM & wood doors/frames, hardware and location of 3 hr. fire barrier, as well as additional information found on the drawings and in the specifications.
4. Items listed above and below, summarize the scope of work to be performed, however this is not an all-inclusive list. This list does not specify each individual component necessary to complete the required work but is meant to serve as a general scope of work description. All contractors are responsible for field verifying all conditions and are required to reference all contract documents, including the project manual, technical specifications and drawings to ascertain a complete scope of work necessary to provide full, complete pricing for labor and material necessary for the new West Maintenance Addition Project.
5. West Maintenance Addition Project:
  - a. All work associated with this project is located on the SJTA Winslow Maintenance Garage 501 Old Erial Road, Sicklerville, Winslow Township, Camden County, New Jersey 08081
    - 1) Contractors are required to field verify exact square footages, confirm existing conditions and associated work.

**General Scope Items:**

1. All work associated with the construction of a New 1 story, 919 (gross) SF addition. (Gross area includes the interior footprint and interior partitions).
2. Work includes all Civil work associated with this project.
3. Work includes all site and building utilities associated with this project.
4. Contractors are reminded that this work is being performed adjacent to the Atlantic City Expressway and is in close proximity to passenger vehicles. All precautions must be taken to insure that debris is contained or disposed of daily. Under no circumstances can debris be allowed to enter onto the Expressway and the adjacent areas.
5. Contractors are required to work out dumpster locations, debris haul routes and crane locations (if needed) with AC Expressway operations prior to beginning any work.
6. Crane specifications and schedules (if needed) will be required to be submitted to the SJTA Engineering and SJTA Maintenance Project Managers for review and approvals prior to beginning work.
7. A burn permit will be required and approved by the fire marshal prior to the use of any welding or open flame. Smoking is not permitted at any time.
8. The contractor is responsible for cleaning and restoration of the site to the pre-construction conditions.
9. All work to conform to the latest adoptive version of the New Jersey Uniform Construction Code (NJUCC)



### **1.3 CONTRACTS**

- A. The work shall be performed under a single prime contract.
- C. Work under Other Contracts:
  - 1. General: The owner reserves the right to perform work related to the project with his own forces, to award separate contracts for other work related to the project and to award separate contracts in connection with other work on the site.
  - 2. The Contractor shall coordinate the Work of this Project with other Projects presently under construction and/or which will be under construction during the period of this contract.

### **1.4 PUBLIC CONVENIENCE AND SAFETY**

- 1. The Contractor shall control their operations and those of their subcontractors and all suppliers to assure minimum inconvenience to the expressway traveling public and maintenance employees. Under all circumstances, safety shall be the most important consideration.

### **1.5 SAFETY AND HEALTH REGULATIONS**

- 1. The CONTRACTOR shall comply with all applicable safety and health regulations Including but not be limited to, the following:
  - 1.1. U.S. Department of Labor regulations promulgated under Occupational Safety and Health Administration.
  - 1.2. Health Act of 1972 (P.L. 91-596) and under Section 107 of the Contract Work
  - 1.3. Hours and Safety Standards Act (P.L. 91-54) and all subsequent amendments thereto.

### **1.6 SIGNS**

No advertisement or sign, other than the name and address of the Contractor, will be permitted on any fences, temporary structures or elsewhere on the construction site and such advertisement will be permitted only upon the condition that it is first approved by the SJTA Expressway Project Manager. In any event, the advertisement shall not exceed two feet by four feet in over-all dimensions.

### **1.7 SPECIAL CONDITIONS**

- 1. The Contractor shall be responsible for coordinating all work with South Jersey Transportation Authority so that all access and operations at these facilities remain continuous and are not affected by this construction.
- 2. The Contractor shall visit the site and include all costs for a complete building addition, including exterior metal wall panels, interior partitions, finishes, doors and windows, building systems, foundations and roofing system as noted in the plans and specifications. The owner is not responsible for additional costs based on the contractor failure to properly inspect the existing conditions and include all costs in their bid. This includes items related to the existing and new heights of insulation and related assemblies, parapet heights, flashings, copings, wood blockings, etc. as it related to the current NJ energy code, ASHRAE 90.1-2016 requirements.
- 3. Reference the SJTA "front end" Division 1 Contract Requirements and Specifications for additional information related to this project.

4. The above Scope of Work outlines the “general items” and distribution of work and shall not be construed as being all-inclusive.
5. All contractors shall be responsible for coordinating their work and that of all other contractors (including owner’s workers) on the project. Any costs related to their coordination shall be included in his proposal.
6. Contractors are responsible for maintaining a watertight building at all times. Contractors are required to review daily weather reports and schedule work around inclement weather. Contractors are required to schedule work so demolished areas can be replaced on the same day, maintaining a watertight building.

#### **1.8 CONTRACTOR'S USE OF PREMISES**

- A. General: Limit use of the premises to construction activities in areas indicated; Contractor must allow for Owner and tenant occupancy and use by the public at all times.
  1. Confine operations to areas within Contract limits indicated. Portions of the site beyond areas in which construction operations are indicated are not to be disturbed.
  2. The Contractor shall maintain the existing buildings in a weathertight condition throughout the construction period.
  3. Repair damage caused by construction operations.
  4. Take all precautions necessary to protect the building and its occupants during the construction period.
- B. Contractor will be assigned an area at grade, but not necessarily contiguous to the construction site area, for their use during construction for office and storage facilities. This area shall be under the control of the Contractor subject to approval of the SJTA Project Manager and in cooperation with other Contractors operating at the site.

#### **1.9 SPECIFICATIONS AND DRAWINGS**

- A. Specifications forming a part of the Contract Documents are listed in the Table of Contents of this Project Manual.
- B. Drawings forming a part of the Contract Documents are identified in the Special Provisions of this Project Manual.

#### **1.10 LAYOUT**

- A. The Contractor shall, as soon as practicable, verify the locations of the various work and establish exact locations of various features by marks on existing construction as a guide for all trades.

#### **1.11 MEASUREMENTS**

- A. Obtain measurements from parties responsible for other sections of the work and as soon as possible take necessary field measurements and field check dimensions previously obtained so that the various parts of the work will fit.

#### **1.12 OPENINGS FOR EQUIPMENT**

- A. Contractor shall provide adequate means of access onto the building from the outside, wherever provisions may be necessary, for bringing in large or heavy equipment, required by the Contractor, which cannot pass through existing openings in the structures.

**1.13 CHASES AND OPENINGS**

- A. Contractor shall provide all openings, recesses and chases in building construction, with lintels where required, necessary for the installation of their work. All openings and penetrations through fire/smoke walls, barriers, partitions and assemblies to be properly installed, sealed and rated per the identified minimum hourly rating and conform to the UL design number.

**1.14 EXAMINATION OF PREPARATORY WORK**

- A. Before starting the work of a section, Contractors shall carefully examine all preparatory work that has been executed to receive this Work. Check carefully, by whatever means are required, to insure that the work of this Section and adjacent, related work will finish to proper contours, planes and levels. Promptly notify the SJTA Project Manager in writing of any defects or imperfections in preparatory work which will, in any way, affect satisfactory completion of this Work. Absence of such notification will be construed as an acceptance of preparatory work and later claims of defects therein will not be recognized.
- B. Under no circumstances shall the Work of a Section proceed prior to preparatory work having been completed, cured, dried and/or otherwise made satisfactory to receive this Work. Responsibility for timely installation of all materials rests solely with Contractor, who shall maintain coordination at all times.

**1.15 MUTUAL COORDINATION OF TRADES**

- A. All Contractors and/or Subcontractors responsible for Work defined by individual Sections of the Specifications shall, jointly and severally, coordinate their various sections of work as to scheduling, installation procedures, shop drawings and installation of all related materials.
- B. Responsibility for enforcing coordination requirements and close adherence to time schedules of Subcontractors rests with the General Contractor.

**1.16 REFERENCE STANDARDS AND INDUSTRY SPECIFICATIONS**

- A. Unless otherwise specified, any material or operation specified by reference to published specifications of a manufacturer, society, association, code or other published standard, shall comply with requirements of the listed document which is current on the date of receipt of bids.
- B. Furnish, when requested by the SJTA Project Manager, an affidavit from manufacturer certifying that materials or products delivered to the Project meet requirements specified. Such affidavit shall not relieve the Contractor from responsibility of complying with any added requirement of the Specifications.
- C. When referenced Standard or Industry Specification refers to installation, obtain copies of such Standard or Specification before starting operations. At least one copy of each such Standard or Specification shall be maintained at the site in good condition and readily accessible until completion of the Work. All personnel in charge or operations to be performed in accordance with such Standards or Specifications will be held to have acquainted themselves with all such documents insofar as they may be applicable to the Work.

**1.17 OWNER OCCUPANCY**

- A. Full Owner Occupancy: The Owner will occupy the site and existing building during the entire construction period. Cooperate with the Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with the Owner's operations.
  - 1. Where work is in progress adjacent to an area open to the public or an occupied tenant space, maintain public access to such areas as approved by the SJTA Project Manager.
  - 2. Take all protective measures necessary to ensure the safety and well-being of tenants and the public.

3. The Contractor shall maintain direct, obstruction free, clearly marked and lighted access to all emergency exits at all times, 24 hours per day, 7 days per week.
- C. Beneficial Occupancy: Upon completion of a phase of work, the Owner shall have the right to assume beneficial occupancy of such area.

**1.18 CLEANING DURING CONSTRUCTION**

- A. The Contractor shall intermittently remove waste and rubbish so that at no time shall there be undue accumulations.
- B. The Contractor shall provide dumpsters or other containers for the removal of construction trash and debris. The contractor is responsible for ensuring that dumpsters or other containers are properly covered at all times to contain trash and debris in windy conditions.
- C. The Contractor shall immediately clean up any spillage of earth, roofing or other materials and on all paved surfaces.
- D. The Contractor shall be responsible for trash removal on a daily basis and at the completion of each work day.
- E. Contractors are reminded that this work is being performed adjacent to the Expressway and in close proximity to vehicles. All precautions must be taken to insure that debris is contained or disposed of daily. Under no circumstances can debris be allowed to enter onto the Expressway or adjacent surfaces.

**1.19 FINAL CLEANING**

- A. Final cleaning requirements are specified in Division 1 Section "Closeout Procedures".

**END OF SECTION 01 11 00**

**SECTION 01 73 29**  
**CUTTING AND PATCHING**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Divisions 1 thru 16 Specification Sections, apply to this Section.
- B. This Section includes procedural requirements for cutting and patching.
- C. Related Sections include the following:
  - 1. Division 2, Section 02 41 19 "Selective Demolition" for demolition of selected portions of the building for alterations.
  - 2. Divisions 2 through 16 Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.

**1.2 DEFINITIONS**

- A. Cutting: Removal of existing construction necessary to permit installation or performance of other Work.
- B. Patching: Fitting and repair work required to restore surfaces to original conditions after installation of other Work.

**1.3 SUBMITTALS**

- A. Cutting and Patching Proposal: Submit a proposal describing procedures at least 10 days before the time cutting and patching will be performed, requesting approval to proceed. Include the following information:
  - 1. Extent: Describe cutting and patching, show how they will be performed, and indicate why they cannot be avoided.
  - 2. Changes to Existing Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building's appearance and other significant visual elements.
  - 3. Products: List products to be used and firms or entities that will perform the Work.
  - 4. Dates: Indicate when cutting and patching will be performed.
  - 5. Utilities: List utilities that cutting and patching procedures will disturb or affect. List utilities that will be relocated and those that will be temporarily out of service. Indicate how long service will be disrupted.
  - 6. Structural Elements: Where cutting and patching involve adding reinforcement to structural elements, submit details and engineering calculations showing integration of reinforcement with original structure.

7. Architect's/Engineers Approval: Obtain approval of cutting and patching proposal before cutting and patching. Approval does not waive right to later require removal and replacement of unsatisfactory work.

#### **1.4 QUALITY ASSURANCE**

- A. Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio.
- B. Operational Elements: Do not cut and patch the following operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety.
  1. Primary operational systems and equipment.
  2. Air or smoke barriers.
  3. Fire-protection systems.
  4. Control systems.
  5. Communication systems.
  6. Conveying systems.
  7. Electrical wiring systems.
  8. Lightning Protection Systems.
  9. Security Cameras Systems.
  10. Alarm Systems.
  11. Operating systems of special construction in Division 13 Sections.
- C. Miscellaneous Elements: Do not cut and patch the following elements or related components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety.
  1. Water, moisture, or vapor barriers.
  2. Membranes and flashings.
  3. Exterior curtain-wall construction.
  4. Equipment supports.
  5. Piping, ductwork, vessels, and equipment.
  6. Noise- and vibration-control elements and systems.
- D. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.
  1. If possible, retain original Installer or fabricator to cut and patch exposed Work listed below. If it is impossible to engage original Installer or fabricator, engage another recognized, experienced, and specialized firm.
    - a. Processed concrete finishes.
    - b. Ornamental metal.
    - c. Preformed metal panels.
    - d. Roofing.
    - e. Waterproofing
    - f. Firestopping.
    - g. Window wall system.
    - h. HVAC enclosures, cabinets, or covers.

- E. Cutting and Patching Conference: Before proceeding, meet at Project site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

## **1.5 WARRANTY**

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during cutting and patching operations, by methods and with materials so as not to void existing warranties.

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

- A. General: Comply with requirements specified in other Sections of these Specifications.
- B. Existing Materials: Use materials identical to existing materials. For exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.
  - 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the visual and functional performance of existing materials.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.
  - 1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
  - 2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.
- B. Existing Conditions: Do not disturb existing structures, construction, materials or equipment unless required by the Contract.
  - 1. Do not cut, drill or remove structural members such as joists, beams or columns supporting construction that is to remain unless expressly required by the Contract Documents.

### **3.2 PREPARATION**

- A. Temporary Support: Provide temporary support of Work to be cut.
- B. Protection: Protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- C. Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
- D. Existing Services: Where existing services are required to be removed, relocated, or abandoned, bypass such services before cutting to avoid interruption of services to occupied areas.

**3.3 PERFORMANCE**

- A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
1. Cut existing construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Cutting: Cut existing construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
  2. Existing Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
  3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
  4. Excavating and Backfilling: Comply with requirements in applicable Division 2 Sections where required by cutting and patching operations.
  5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
  6. Proceed with patching after construction operations requiring cutting are complete.
- C. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections of these Specifications.
1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
  2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
  3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove existing floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
    - a. Where patching occurs in a painted surface, apply primer and intermediate paint coats over the patch and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.
  4. Ceilings: Patch, repair, or rehang existing ceilings as necessary to provide an even-plane surface of uniform appearance.
  5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition.

**END OF SECTION 01 73 29**



**SECTION 02 41 19  
SELECTIVE DEMOLITION**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Divisions 1 thru 16 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. This Section includes the following:
  - 1. Demolition and removal of selected portions of a building.
  - 2. Demolition and removal of roofing systems, membranes, insulation, base sheets, edgings and flashing.
  - 3. Patching and repairs.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
  - 1. Division 1 Section 01 73 29 "Cutting and Patching" for cutting and patching procedures for selective demolition operations.

**1.3 SUBMITTALS**

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections, for information only, unless otherwise indicated.
- B. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- C. Proposed dust-control measures.
- D. Proposed noise-control measures.
- E. Schedule of selective demolition activities indicating the following:
  - 1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity.
  - 2. Interruption of utility services.
  - 3. Coordination for shutoff, capping, and continuation of utility services.
  - 4. Use of elevator and stairs.
  - 5. Detailed sequence of selective demolition and removal work to ensure uninterrupted progress of Owner's on-site operations.
  - 6. Coordination of Owner's continuing occupancy of portions of existing building and of Owner's partial occupancy of completed Work.
  - 7. Locations of temporary partitions and means of egress.

8. Use of cranes or other equipment.
  9. Location of Dumpsters, cranes and haul routes.
- F. Inventory of items to be removed by Owner.
- G. Photographs or videotape, sufficiently detailed, of existing conditions of adjoining construction and site improvements that might be misconstrued as damage caused by selective demolition operations.
- H. Record drawings at Project closeout according to Division 1 Section "Contract Closeout."
1. Identify and accurately locate capped utilities and other subsurface or hidden structural, electrical, or mechanical conditions.

#### 1.4 QUALITY ASSURANCE

- A. Demolition Firm Qualifications: Engage an experienced firm that has successfully completed selective demolition work similar to that indicated for this Project.
- B. Regulatory Requirements: Comply with governing EPA notification regulations before starting selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- C. Pre-demolition Conference: Conduct conference at project site to comply with pre-installation conference requirements.
- D. Standard:
1. Comply with ANSI A10.6 and NFPA 241.
  2. NRCA (National Roofing Contractors Association) [www.nrca.net](http://www.nrca.net)
  3. UCC (Uniform Construction Code) of New Jersey

#### 1.5 PROJECT CONDITIONS

- A. The South Jersey Transportation Authority (SJTA) employees and their visitors will occupy buildings and areas adjacent to selective demolition area. Conduct selective demolition so that SJTA operations will not be disrupted. Provide not less than 72 hours' notice to SJTA of activities that will affect SJTA Maintenance Operations.
- B. Maintain access to existing walkways, and other adjacent occupied or used facilities. Do not close or obstruct walkways, or other occupied or used facilities without written permission from SJTA.
- C. SJTA assumes no responsibility for condition of areas to be selectively demolished.
- D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
1. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify SJTA Project Manager and Engineer. Hazardous materials will be removed by SJTA under a separate contract.
- E. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
- F. Standards:
1. Comply with ANSI A10.6 and NFPA 241.
  2. NRCA (National Roofing Contractors Association) [www.nrca.net](http://www.nrca.net)

1. UCC (Uniform Construction Code) of New Jersey

- G. Storage or sale of removed items or materials on-site will not be permitted.

**1.6 SITE VISIT**

- A. The contractor is required to visit the site prior to bid to familiarize themselves with all required demolition items and identify items which are not necessarily shown on plans, but are required to be removed in order to perform work. No additional compensation will be made to the contractor for any demolition item whether shown on the drawings or not.

**1.7 SCHEDULING**

- A. Arrange selective demolition schedule so as not to interfere with Owner's on-site operations.

**PART 2 - PRODUCTS**

**2.1 REPAIR MATERIALS**

- A. Use repair materials identical to existing materials.
1. Where identical materials are unavailable or cannot be used for exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.
  2. Use materials whose installed performance equals or surpasses that of existing materials.

**PART 3 - EXECUTION**

**3.1 EXAMINATION**

- A. Verify that utilities have been disconnected and capped.
- B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
- C. Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.
- D. When unanticipated mechanical, electrical, or structural elements that conflict with the intended function or design are encountered, investigate and measure the nature and extent of the conflict. Promptly submit a written report to the SJTA Project Engineer and Architect/Engineer.
- E. Survey the condition of the building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of the structure or adjacent structures during selective demolition.
- F. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.

**3.2 UTILITY SERVICES**

- A. Existing Utilities: Maintain services indicated to remain and protect them against damage during selective demolition operations.

- B. Do not interrupt existing utilities serving occupied or operating facilities unless authorized in writing by SJTA and authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to SJTA and to authorities having jurisdiction.
  - 1. Provide at least 72 hours' notice to SJTA if shutdown of service is required during changeover.
- C. Utility Requirements: Locate, identify, disconnect, and seal or cap-off indicated utilities serving areas to be selectively demolished.
  - 1. Arrange to shut off indicated utilities with utility companies.
  - 2. Where utility services are required to be removed, relocated, or abandoned, provide bypass connections to maintain continuity, of service to other parts of the building, before proceeding with selective demolition.
  - 3. Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal the remaining portion of pipe or conduit after bypassing.
- D. Utility Requirements: Refer to drawings and specifications for shutting off, disconnecting, removing, and sealing or capping utility services. Do not start selective demolition work until utility disconnecting and sealing have been completed and verified in writing.

### 3.3 PREPARATION

- A. Conduct demolition operations and remove debris to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.
  - 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from SJTA and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.
- B. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to SJTA employees, tenants, public, damage to adjacent buildings and facilities to remain.
  - 1. Provide protection to ensure safe passage around selective demolition area.
- C. Conduct demolition operations to prevent injury to people and damage to adjacent buildings and facilities to remain. Ensure safe passage of people around selective demolition area.
  - 1. Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by authorities having jurisdiction.
  - 2. Protect existing site improvements, appurtenances, and landscaping to remain.
  - 3. Erect a plainly visible fence around drip line of individual trees or around perimeter drip line of groups of trees to remain.
  - 4. Provide temporary weather protection, during interval between demolition and removal of existing construction, on exterior surfaces and new construction to ensure that no water leakage or damage occurs to structure or interior areas.
  - 5. Protect walls, ceilings, floors, and other existing finish work that are to remain and are exposed during selective demolition operations.
  - 6. Cover and protect furniture, furnishings, and equipment that have not been removed.
  - 7. Shoring, Bracing and Support: Provide and maintain shoring, bracing, or structural support to prevent movement, settlement or collapse of areas to be demolished and construction to remain. Strengthen or add new supports when required during progress of selective demolition.
  - 8. Protect and maintain benchmarks and survey control points from disturbances during construction.

9. Provide erosion control measures to prevent soil erosion and discharge of soil bearing water runoff or airborne dust to adjacent properties and walkways.
10. Protect existing site improvements to remain from damage during construction.
  - a. Restore damaged improvements to their original condition as acceptable to the Owner.
- D. Erect and maintain dustproof partitions and temporary enclosures to limit dust and dirt migration and to separate areas from fumes and noise.
  1. Construct dustproof partitions of not less than nominal 4-inch studs, 5/8-inch gypsum wall-board with joints taped on occupied side, and 1/2-inch fire-retardant plywood on the demolition side.
  2. Insulate partition to provide noise protection to occupied areas.
  3. Seal joints and perimeter. Equip partitions with dustproof doors and security locks.
  4. Protect air-handling equipment.
  5. Weatherstrip openings.
- E. Provide and maintain interior and exterior shoring, bracing, or structural support to preserve stability and prevent movement, settlement, or collapse of building to be selectively demolished.
  1. Strengthen or add new supports when required during progress of selective demolition.

### **3.4 POLLUTION CONTROLS**

- A. Use water mist, temporary enclosures, and other suitable methods to limit the spread of dust and dirt. Comply with governing environmental protection regulations.
  1. Do not use water when it may damage existing construction or create hazardous or objectionable conditions, such as ice, flooding, and pollution.
- B. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
  1. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level.
- C. Clean adjacent structures and improvements of dust, dirt and debris caused by selective demolition operations. Return adjacent areas to condition existing before start of selective demolition.
- D. Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete Work within limitations of governing regulations and as follows:
  1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition work above each floor or tier before disturbing supporting members on lower levels.
  2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. To minimize disturbance of adjacent surfaces, use hand or small power tools designed for sawing or grinding, not hammering and chopping. Temporarily cover openings to remain.
  3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
  4. A daily "Burn Permit" is required prior to the use of any flame or torches. Coordinate "burn Payment" application with SJTA/ACE Operations. Do not use cutting torches until work area

- is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.
5. Maintain adequate ventilation when using cutting torches.
  6. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
  7. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
  8. Locate selective demolition equipment throughout the structure and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
  9. Dispose of demolished items and materials promptly. On-site storage or sale of removed items is prohibited.
  10. Return elements of construction and surfaces to remain to condition existing before start of selective demolition operations.
- E. Demolish concrete and masonry in small sections. Cut concrete and masonry at junctures with construction to remain, using power-driven masonry saw or hand tools; do not use power-driven impact tools.
- F. Remove no more existing roofing than can be covered in one day by new roofing. See applicable Division 7 Section for new roofing requirements.
- G. Remove air-conditioning equipment without releasing refrigerants.

### **3.5 DISPOSAL OF DEMOLISHED MATERIALS**

- A. General: Promptly dispose of demolished materials. Do not allow demolished materials to accumulate on-site.
- B. Disposal: Transport and legally dispose of demolished materials.

### **3.6 PATCHING AND REPAIRS**

- A. Promptly patch and repair holes and damaged surfaces caused to adjacent construction by selective demolition operations.
- B. Patching is specified in Division 1 Section "Cutting and Patching."

### **3.7 CLEANING**

- A. Sweep the building, roof and adjacent areas broom clean on completion of selective demolition operation.

**END OF SECTION 02 41 19**

**SECTION 05 40 00**  
**COLD FORMED METAL FRAMING**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General Condition and Special Provisions and other Division 1 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. This Section includes the following:
1. Exterior non-load-bearing framing, back-up for exterior metal panels.
  2. Division 7, Section 07 42 13 "Metal Wall Panels" for exterior metal wall panels.
  3. Furnish and install cold formed steel framing, as indicated on the Drawings and as specified herein. Cold formed steel framing includes but is not necessarily limited to:
  4. Cold formed steel stud exterior and interior, load and non-load bearing vertical and horizontal framing, including cross-bridging, bracing, and anchoring to the building structure, complete in all respects.
  5. Cold formed steel 'Z' furring.
  6. Exterior non-load-bearing framing, back-up for exterior metal panels.

**1.3 DEFINITIONS**

- A. Minimum Uncoated Steel Thickness: Minimum uncoated thickness of cold-formed framing delivered to the Project site shall be not less than 95 percent of the thickness used in the cold-formed framing design. Lesser thicknesses shall be permitted at bends due to cold forming.
- B. Producer: Entity that produces steel sheet coil fabricated into cold-formed members.

**1.4 REFERENCES**

- A. Comply with applicable requirements of the following standards. Where these standards conflict with other specified requirements, the most restrictive requirement shall govern.
1. American Institute of Steel Construction (AISC)

Code	Code of Standard Practice for Steel Buildings and Bridges
Specification	Specification for the Design, Fabrication and Erection of Structural Steel for Buildings
  2. American Iron and Steel Institute (AISI):

## Specifications

Specifications for the Design of Light Gage Cold-  
Formed Steel Structural Members

3. American Society for Testing and Materials (ASTM):
  - A 446 Steel Sheet, Zinc-Coated (Galvanized) by the Hot- Dip Process, Structural (Physical) Quality
  - A 525 General Requirements for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process
  - A 570 Hot-Rolled Carbon Steel Sheet and Strip, Structural Quality
  - A 780 Repair of Damaged Hot-Dip Galvanized Coatings
4. American Welding Society (AWS):
  - D1.3 Structural Welding Code - Sheet Steel
5. Steel Structures Painting Council (SSPC):
  - Manual Painting Manual - Volumes 1 and 2

**1.5 SUBMITTALS**

- A. Shop Drawings and Design Computations:
  1. Engage the services of a Professional Engineer registered in the State of New Jersey to prepare complete shop drawings and structural design computations for work of this Section. Drawings and shall bear the engineer's professional seal.  
  
Note: Manufacturer's shop drawings stamped by the engineer are acceptable instead of those actually prepared by the engineer.
  2. The shop drawings shall show all pertinent details of construction, installation, and anchorage of the light gauge steel framing work.
  3. The structural design computations shall provide a complete structural analysis of all typical and special conditions of construction, and shall certify conformance to the governing laws and building code.
- B. Samples: Submit representative samples of all light gauge steel framing components to Architect for approval.
- C. Product Data: Submit manufacturer's product data for all components to be used in the construction and anchoring of the light gauge steel framing. Include specifications, installation instructions, and data substantiating that the materials comply with specified requirements.
- D. Do not order materials or begin fabrication or installation until Architect approves submittals.



## **1.6 PERFORMANCE REQUIREMENTS**

- A. Structural Performance: Provide cold-formed metal framing capable of withstanding design loads within limits and under conditions indicated. Drawings identify typical framing sizes, thicknesses and spacing that constitute the minimum design requirements for the project.
  - 1. Design Loads: As indicated on Structural Drawings
  - 2. Wind Loads: Meet or exceed hurricane force winds of 120 MPH.
  - 3. Deflection Limits: Design framing systems to withstand design loads without deflections greater than the following:
    - a. Exterior Non-Load-Bearing Wall Framing: Horizontal deflection of 1/360 of the wall height.
  - 4. Design framing systems to provide for movement of framing members without damage or overstressing, sheathing failure, connection failure, undue strain on fasteners and anchors, or other detrimental effects when subject to a maximum ambient temperature change of 120 deg F.
  - 5. Design framing system to maintain clearances at openings, to allow for construction tolerances, and to accommodate live load deflection of primary building structure as follows:
    - a. Upward and downward movement of 1/2 inch.
- B. Design exterior non-load-bearing wall framing to accommodate horizontal deflection without regard for contribution of sheathing materials.

## **1.7 SUBMITTALS**

- A. Product Data: For each type of cold-formed metal framing product and accessory indicated.
- B. Shop Drawings: Show layout, spacing, sizes, thicknesses, and types of cold-formed metal framing; fabrication; and fastening and anchorage details, including mechanical fasteners. Show reinforcing channels, opening framing, supplemental framing, strapping, bracing, bridging, splices, accessories, connection details, and attachment to adjoining Work.
  - 1. Coordinate with Mechanical, Electrical and Plumbing for spacing of framed openings.
  - 2. For cold-formed metal framing indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- C. Mill certificates signed by steel sheet producer or test reports from a qualified independent testing agency indicating steel sheet complies with requirements.
- D. Welding Certificates: Copies of certificates for welding procedures and personnel.
- E. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- F. Product Test Reports: From a qualified testing agency indicating that each of the following complies with requirements, based on comprehensive testing of current products:
  - 1. Expansion anchors.

2. Power-actuated anchors.
3. Mechanical fasteners.
4. Miscellaneous structural clips and accessories.

- G. Research/Evaluation Reports: Evidence of cold-formed metal framing's compliance with building code in effect for Project, from a model code organization acceptable to authorities having jurisdiction.

## **1.8 QUALITY ASSURANCE**

- A. Installer Qualifications: An experienced installer who has completed cold-formed metal framing similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
- B. Engineering Responsibility: Engage a qualified professional engineer to prepare design calculations, Shop Drawings, and other structural data.
- C. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of cold-formed metal framing that are similar to those indicated for this Project in material, design, and extent.
- D. Mill certificates signed by steel sheet producer or test reports from a qualified independent testing agency indicating steel sheet complies with requirements, including uncoated steel thickness, yield strength, tensile strength, total elongation, chemical requirements, ductility, and galvanized-coating thickness.
- E. Testing Agency Qualifications: An independent testing agency, acceptable to authorities having jurisdiction, qualified according to ASTM E 329 to conduct the testing indicated, as documented according to ASTM E 548.
- F. Welding: Qualify procedures and personnel according to AWS D1.1, "Structural Welding Code--Steel," and AWS D1.3, "Structural Welding Code-Sheet Steel."
- G. AISI Specifications: Comply with AISI's "Specification for the Design of Cold-Formed Steel Structural Members" for calculating structural characteristics of cold-formed metal framing:
1. CCFSS Technical Bulletin: "AISI Specification Provisions for Screw Connections."
- H. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Meetings."

## **1.9 DELIVERY, STORAGE, AND HANDLING**

- A. Protect cold-formed metal framing from corrosion, deformation, and other damage during delivery, storage, and handling.
- B. Store cold-formed metal framing, protect with a waterproof covering, and ventilate to avoid condensation.

## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURERS**

- A. Manufacturers: Subject to compliance with requirements, provide cold-formed metal framing by one of the following:
1. AllSteel Products, Inc.
  2. Clark Steel Framing.
  3. Craco Metals Manufacturing, LLC.
  4. Dale/Incor.
  5. Dietrich Metal Framing; a Worthington Industries Company.
  6. MarinoWare; a division of Ware Industries.
  7. Steel Construction Systems.
  8. United Metal Products, Inc.

## **2.2 MATERIALS**

- A. Steel Sheet: ASTM A 653, structural steel, zinc coated, of grade and coating as follows:
1. Grade: 33 for minimum uncoated steel thickness of 0.0428 inch and less; 50, Class 1 or 2 for minimum uncoated steel thickness of 0.0538 inch and greater, as required by structural performance.
  2. Coating: G90.

## **2.3 NON-LOAD-BEARING WALL FRAMING**

- A. Steel Studs: Manufacturer's standard C-shaped steel studs, of web depths indicated, punched, with stiffened flanges, complying with ASTM C 955, and as follows:
1. Minimum Uncoated-Steel Thickness: 16 gauge, 0.0598, inch minimum.
  2. Flange Width: 1-5/8 inches, designated type SW. 2 inches, designated type J.
  3. Stud sizes on drawings are designated by identifiers listing depth, flange width, and minimum steel thickness such as 4 SW 12 identifying a 4 inch deep, SW flange, 12 gage stud.
- B. Steel Track: Manufacturer's standard U-shaped steel track, of web depths indicated, unpunched, with unstiffened flanges, complying with ASTM C 955, and as follows:
1. Minimum Uncoated-Steel Thickness: Matching steel studs.
  2. Flange Width: 1-1/4 inches.
- C. Steel Hat Channels: Manufacturer's standard Hat -shaped channels, of web depths indicated, unpunched, with stiffened flanges, complying with ASTM C 955, and as follows:
1. Minimum Uncoated-Steel Thickness 18 GA.
- D. Single Deflection Track: Manufacturer's single, deep-leg, U-shaped steel track; unpunched, with unstiffened flanges, of web depth to contain studs while allowing free vertical movement, with flanges designed to support horizontal and lateral loads, and as follows:.
1. Minimum Uncoated-Steel Thickness: 0.0428 inch.
  2. Flange Width: 2 1/2 inches.

## **2.4 FRAMING ACCESSORIES**

- A. Fabricate steel-framing accessories of the same material and finish used for framing members, with a minimum yield strength of 33,000 psi.

- B. Provide accessories of manufacturer's standard thickness and configuration, unless otherwise indicated, as follows:

1. Supplementary framing.
2. Bracing, bridging, and solid blocking.
3. Web stiffeners.
4. End clips.
5. Gusset plates.
6. Stud kickers, knee braces, and girts.
7. Hole reinforcing plates.
8. Backer plates.

## **2.5 ANCHORS, CLIPS, AND FASTENERS**

- A. Steel Shapes and Clips: ASTM A 36, zinc coated by hot-dip process according to ASTM A 123.
- B. Anchor Bolts: ASTM F 1554, Grade 36, threaded carbon-steel hex-headed bolts and carbon-steel nuts; and flat, hardened-steel washers; zinc coated by hot-dip process according to ASTM A 153, Class C.
- C. Expansion Anchors: Fabricated from corrosion-resistant materials, with capability to sustain, without failure, a load equal to 5 times design load, as determined by testing per ASTM E 488 conducted by a qualified independent testing agency.
- D. Power-Actuated Anchors: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with capability to sustain, without failure, a load equal to 10 times design load, as determined by testing per ASTM E 1190 conducted by a qualified independent testing agency.
- E. Mechanical Fasteners: Corrosion-resistant-coated, self-drilling, self-threading steel drill screws.
1. Head Type: Low-profile head beneath sheathing, manufacturer's standard elsewhere.
- F. Welding Electrodes: Comply with AWS standards.

## **2.6 MISCELLANEOUS MATERIALS**

- A. Galvanizing Repair Paint: ASTM A 780.

## **2.7 FABRICATION**

- A. Fabricate cold-formed metal framing and accessories plumb, square, and true to line, and with connections securely fastened, according to manufacturer's written recommendations and requirements in this Section.
1. Fabricate framing assemblies using jigs or templates.
  2. Cut framing members by sawing or shearing; do not torch cut.
  3. Fasten cold-formed metal framing members by welding or screw fastening, as standard with fabricator. Wire tying of framing members is not permitted.
    - a. Comply with AWS D1.3 requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
    - b. Locate mechanical fasteners and install according to Shop Drawings, with screw penetrating joined members by not less than three exposed screw threads.

4. Fasten other materials to cold-formed metal framing by welding, bolting, or screw fastening, according to Shop Drawings.
- B. Reinforce, stiffen, and brace framing assemblies to withstand handling, delivery, and erection stresses. Lift fabricated assemblies to prevent damage or permanent distortion.
- C. Fabrication Tolerances: Fabricate assemblies level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet and as follows:
  1. Spacing: Space individual framing members no more than plus or minus 1/8 inch from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.
  2. Squareness: Fabricate each cold-formed metal framing assembly to a maximum out-of-square tolerance of 1/8 inch.

### **PART 3 - EXECUTION**

#### **3.1 EXAMINATION**

- A. Examine supporting substrates and abutting structural framing for compliance with requirements for installation tolerances and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions have been corrected.

#### **3.2 PREPARATION**

- A. Before sprayed fire-resistive materials are applied, attach continuous angles, supplementary framing, or tracks to structural members indicated to receive sprayed fire-resistive materials.
- B. After applying sprayed fire-resistive materials, remove only as much of these materials as needed to complete installation of cold-formed framing without reducing thickness of fire-resistive materials below that are required to obtain fire-resistance rating indicated. Protect remaining fire-resistive materials from damage.

#### **3.3 INSTALLATION, GENERAL**

- A. Cold-formed metal framing: Shop fabricated, field assembled.
- B. Install cold-formed metal framing according to ASTM C 1007, unless more stringent requirements are indicated.
- C. Install shop- or field-fabricated, cold-formed framing and securely anchor to supporting structure.
  1. Bolt or weld wall panels at horizontal and vertical junctures to produce flush, even, true-to-line joints with maximum variation in plane and true position between fabricated panels not exceeding 1/16 inch.
- D. Install cold-formed metal framing and accessories plumb, square, and true to line, and with connections securely fastened, according to manufacturer's written recommendations and requirements in this Section.
  1. Cut framing members by sawing or shearing; do not torch cut.
  2. Fasten cold-formed metal framing members by welding or screw fastening, as standard with fabricator. Wire tying of framing members is not permitted.

- a. Comply with AWS D1.3 requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
  - b. Locate mechanical fasteners and install according to Shop Drawings, with screw penetrating joined members by not less than three exposed screw threads.
- E. Install framing members in one-piece lengths, unless splice connections are indicated for track or tension members.
- F. Install temporary bracing and supports to secure framing and support loads comparable in intensity to those for which structure was designed. Maintain braces and supports in place, undisturbed, until entire integrated supporting structure has been completed and permanent connections to framing are secured.
- G. Do not bridge building expansion and control joints with cold-formed metal framing. Independently frame both sides of joints.
- H. Install insulation in built-up exterior framing members, such as headers, sills, boxed joists, and multiple studs at openings, that are inaccessible on completion of framing work.
- I. Fasten hole reinforcing plate over web penetrations that exceed size of manufacturer's standard punched openings.
- J. Erection Tolerances: Install cold-formed metal framing level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet and as follows:
  - 1. Space individual framing members no more than plus or minus 1/8 inch from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.

### **3.4 NON-LOAD-BEARING WALL INSTALLATION**

- A. Install continuous tracks sized to match studs. Align tracks accurately and securely anchor to supporting structure as indicated.
- B. Fasten both flanges of studs to top and bottom track, unless otherwise indicated. Space studs as follows:
  - 1. Stud Spacing: 16 inches on center maximum spacing, to be determined by curtain wall design engineer.
- C. Set studs plumb, except as needed for diagonal bracing or required for non-plumb walls or warped surfaces and similar requirements.
- D. Isolate non-load-bearing steel framing from building structure to prevent transfer of vertical loads while providing lateral support.
  - 1. Install single deep-leg deflection tracks and anchor to building structure.
- E. Install horizontal bridging in wall studs, spaced in rows indicated on Shop Drawings but not more than 54 inches apart. Fasten at each stud intersection.
  - 1. Top Bridging for Single Deflection Track: Install row of horizontal bridging within 12 inches of single deflection track. Install a combination of flat, taut, steel sheet straps of width and thickness indicated and stud or stud-track solid blocking of width and thickness matching studs. Fasten flat straps to stud flanges and secure solid blocking to stud webs or flanges.

- a. Install solid blocking at 48 inches on center.
- 2. Bridging: Cold-rolled steel channel, welded or mechanically fastened to webs of punched studs.
- F. Install miscellaneous framing and connections, including stud kickers, web stiffeners, clip angles, continuous angles, anchors, fasteners, and stud girts, to provide a complete and stable curtain-wall-framing system.

### **3.5 JOIST INSTALLATION**

- A. Install perimeter joist track sized to match joists. Align and securely anchor or fasten track to supporting structure at corners, ends, and spacing indicated on Shop Drawings.
- B. Install joists bearing on supporting frame, level, straight, and plumb; adjust to final position, brace, and reinforce. Fasten joists to both flanges of joist track.
  - 1. Install joists over supporting frame with a minimum end bearing of 1-1/2 inches.
  - 2. Reinforce ends and bearing points of joists with web stiffeners, end clips, joist hangers, steel clip angles, or steel-stud sections as indicated on Shop Drawings.
- C. Space joists not more than 2 inches from abutting walls, and as follows:
  - 1. Joist Spacing: As indicated.
- D. Frame openings with built-up joist headers consisting of joist and joist track, nesting joists, or another combination of connected joists if indicated.
- E. Install joist reinforcement at interior supports with single, short length of joist section located directly over interior support, with lapped joists of equal length to joist reinforcement, or as indicated on Shop Drawings.
- F. Install bridging at each end of joists and at intervals indicated on Shop Drawings. Fasten bridging at each joist intersection as follows:
  - 1. Bridging: Cold-rolled steel channel, welded or mechanically fastened to bottom flange of joists.
- G. Secure joists to bearing to prevent lateral movement of bottom flange.
- H. Install miscellaneous joist framing and connections, including web stiffeners, closure pieces, clip angles, continuous angles, hold-down angles, anchors, and fasteners, to provide a complete and stable joist-framing assembly.

### **3.6 FIELD QUALITY CONTROL**

- A. Testing: Owner will engage a qualified independent testing agency to perform field quality-control testing.
- B. Field and shop welds will be subject to inspection and testing.
- C. Testing agency will report test results promptly and in writing to Contractor and Architect.
- D. Remove and replace Work that does not comply with specified requirements.

- E. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of corrected Work with specified requirements.

**3.7 REPAIRS AND PROTECTION**

- A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on fabricated and installed cold-formed metal framing with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.
- B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer that ensure cold-formed metal framing is without damage or deterioration at time of Substantial Completion.

**END OF SECTION 05 40 00**



**SECTION 06 10 53**

**MISCELLANEOUS ROUGH CARPENTRY**

**PART 1 GENERAL**

**1.01 RELATED WORK SPECIFIED ELSEWHERE**

- A. Drawings and general provisions of the Contract, including General Condition and Special Provisions and other Division 1 Specification Sections, apply to this Section.
- B. Division 7, Section - Ethylene-Propylene-Diene-Monomer Roofing (EPDM)

**1.02 QUALITY ASSURANCE**

- A. Wood Nailers, blocking, metal edging and overall roofing system shall conform to theselected manufacturer's, IBC, NJUCC. NJIBC, FMG and NRCA standards, specifications and recommendations for conformance to all codes and installation requirements.
- B. Basis of Design, Carlisle's Design Reference Standards, published November 2011 which includes sections DR-01-11 through DR-12-11 and Factory Mutual Global (FMG) published design recommendations for the attachment of wood nailers to various substrates and for the attachment of perimeter flashing details to wood nailers. This information is contained in Factory Mutual's Property Loss Prevention Data Sheet 1-49.
- C. Mill and Producer's Stamp: Each piece of lumber shall bear a stamp indicating type, grade, mill, and grading agency.
  - 1. Pressure treated wood shall bear a stamp or tag indicating the name of the treating company, year treated, preservative used, the level of treatment, intended use (appropriate AWWPA Standard), and logo of inspecting company.
  - 2. Only lumber that has been pressure treated with salt preservatives be used. Lumber treated with any of the wood preservatives such as, Creosote, Pentachlorophenol, Copper Naphthenate and Copper 8-quinolinolate will adversely affect the membrane when in direct contact.
  - 3. Methods used to fasten the nailer vary with building conditions; however, it is essential that secure attachment of durable stock be accomplished. Factory Mutual Loss Prevention Data Bulletin 1-49 (Perimeter Flashing) contains options for the spacing and sizing of fasteners based on the project wind zone.
  - 4. Wood nailers that are anchored to steel, wood or masonry decking should not be less than 2" x 6" nominal (minimum 1-1/2" X 5-1/2"). The width of the nailers must exceed the width of the metal flange of edgings, scuppers, etc.
  - 5. Wood nailers should be Douglas Fir, Southern Yellow Pine or of wood having similar decay resistant properties.

**1.03 STORAGE**

- A. Store lumber a minimum of 6 inches off the ground, in a dry, well-ventilated place, protected from the weather.

**PART 2 PRODUCTS****2.01 MATERIALS**

- A. Lumber: "Standard" Grade Douglas Fir, Hem-Fir, White Pine, Southern Pine, or Spruce-Pine-Fir pressure preservative treated in accordance with the American Wood Preservers Association (AWPA) Standard U1, Commodity Specification A for the requirements listed under Use Category UC2 and kiln dried to 19 percent moisture content after treatment.
  - 1. Use Category UCFA and UCFB: Wood nailers and blocking intended for fire protection and is used in either interior weather protected (UCFA) or exterior construction, exposed to weather (UCFB), where required.
- B. Nails, Screws, and Bolts: ASTM A653 Class G185 hot dipped galvanized, zinc or cadmium plated, or silicon bronze.
  - 1. Screws and Bolts for fastening to Aluminum: Stainless steel, Type 304 or 316.
- C. Expansion Anchors: G185 Hot dipped galvanized steel wedge anchors, FS FF-S-325, Group II, Type 4, Class 1.
- D. Toggle Bolts: Cadmium or zinc plated tumble - wing type; FS FF-B-588.
- E. Self Threading Masonry Screws: Zinc Plated; "Tapcon" by Elco Industries, Inc., 1111 Samuelson Rd., PO Box 7009, Rockford, IL 61125-7009, (815) 397-5151.
- F. Separation Membrane For Aluminum Metals: Self adhering, self sealing, rubberized asphalt sheet membrane.
  - 1. Physical Properties:
    - a. Thickness: 40 mils minimum ASTM D 3767 Method A.
    - b. Tensile strength: 250 psi ASTM D 412.
    - c. Elongation (ultimate failure of the rubberized asphalt) 250% ASTM D 412 Die C Modified).
    - d. Permeance: 0.05 Perms max.) ASTM E 96.
  - 2. "Ice And Water Shield" by W.R. Grace Co., 62 Whittemore Ave., Cambridge, MA 02140, (800) 354-5414; "Deck Guard" by Polyguard Products Inc., P.O. Box 755, Ennis, TX 75120, (800) 541-4994; "MetalSeal" by NEI Advanced Composite Technology, 50 Pine Road, Brentwood, NH, (800) 998-4634.

**PART 3 EXECUTION****3.01 INSTALLATION**

- A. Install nailers and blocking true to line and plane within a tolerance of 1/8 inch in 10 feet.
- B. Fit joints neatly with no more than 1/16 inch space between abutting members.
- C. Do not install nailers or blocking across bonding expansion joints.
- D. Attach nailers and blocking securely as required to properly support the items that will be attached to them.

- E. Space fasteners equally at not more than 16 inches on center and 4 inches from each end of each member, unless noted otherwise. Secure the nailers and blocking with the following types of fasteners:
  - 1. To Cast-In-Place Concrete, Solid Concrete Masonry Units, and Brick: Use expansion anchors or self-threading masonry screws.
  - 2. To Faces of Hollow Concrete Masonry Units: Use toggle bolts.
  - 3. To Tops of Hollow Concrete Masonry Units: Use anchor bolts extending to course below, embedded in 3000 psi concrete filled cores.
  - 4. To Wood: Use nails or screws.
  - 5. To Metal: Use bolts or self-tapping screws.
- F. Countersink fasteners if they interfere with the proper installation of items to be attached to the nailers and blocking.

### **3.02 APPLICATION OF SEPARATION MEMBRANE**

- A. Installing Separation Membrane:
  - 1. Install 1 ply of underlayment over the entire horizontal and vertical surface of pressure treated wood nailers and blocking lapping each ply 2 inches over the preceding ply so that no aluminum material comes in contact with pressure treated wood.

**END OF SECTION 06 10 53**

THIS PAGE INTENTIONALLY LEFT BLANK.

**SECTION 07 42 13**  
**METAL WALL PANELS**

**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. Exposed fastener metal wall panels, as part of the assembly described in Section 2.1.
  - 2. Metal Wall Panel Accessories including, but not limited to, flashings, copings, trim.
- B. Related Sections:
  - 1. Section 05 40 00 Cold Formed Metal Framing
  - 2. Section 08 11 13 Hollow Metal Doors and Frames
  - 3. Section 08 51 13 Aluminum Windows

**1.3 REFERENCES**

- A. American Architectural Manufacturer's Association (AAMA):
  - 1. AAMA 620 - Voluntary Specification for High Performance Organic Coatings on Coil Coated Architectural Aluminum Substrates.
  - 2. AAMA 621 - Voluntary Specification for High Performance Organic Coatings on Coil Coated Architectural Hot Dipped Galvanized (HDG) and Zinc-Aluminum Coated Steel Substrates.
- B. American Society of Civil Engineers (ASCE):
  - 1. ASCE 7 - Minimum Design Loads for Buildings and Other Structures.
- C. ASTM International (ASTM):
  - 1. ASTM A 653/A 653M - Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
  - 2. ASTM A 666 – Standard specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
  - 3. ASTM A 755/A 755M - Specification for Steel Sheet, Metallic Coated by the Hot-Dip Process and Prepainted by the Coil-Coating Process for Exterior Exposed Building Products.
  - 4. ASTM A 792/A 792M – Standard specification for Steel Sheets, 55% Aluminum – Zinc Alloy. Coated by hot-dip process.
  - 5. ASTM B 209 - Specification for Aluminum and Aluminum Alloy Sheet and Plate.
  - 6. ASTM C 754 - Specification for Installation of Steel Framing Members to Receive Screw Attached Gypsum Panel Products.
  - 7. ASTM C 920 - Specification for Elastomeric Joint Sealants.
  - 8. ASTM E 72 - Standard Test Methods of Conducting Strength Tests of Panels for Building Construction.

9. ASTM E 283 - Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors under Specified Pressure Differences across the Specimen.
  10. ASTM E 331 - Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
- D. Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA):
1. Architectural Sheet Metal Manual.

#### 1.4 PERFORMANCE REQUIREMENTS

- A. General: Provide metal wall panel assemblies meeting performance requirements as determined by application of specified tests by a qualified testing agency on manufacturer's standard assemblies.
- B. Water Penetration, Static Pressure: When installed over Insulated Composite Backup Panels or Metal Liner Panels, no uncontrolled water penetration per ASTM E 331 at a minimum static differential pressure of 6.24 lbf/sq. ft. (299 Pa), using minimum 10-by-10 foot (3050-by-3050 mm) test panel that includes side joints.
- C. **New Jersey State Building Code Compliance:** Provide wall panels that comply with the requirements for installation and performance under the New Jersey State Building Code.
- D. Maximum allowable deflection limitation.
1. Single Skin Panels greater than 1-inch (25-mm) in Depth: Limited to L/120 deflection of panel perimeter normal to plane of wall.
- E. Secondary Metal Framing: Design secondary metal framing for metal wall panel assembly according to AISI's "Standard for Cold-Formed Steel Framing - General Provisions."
- F. Thermal Movements: Allow for thermal movements from variations in both ambient and internal temperatures. Accommodate movement of support structure caused by thermal expansion and contraction.

#### 1.5 QUALITY ASSURANCE

- A. Manufacturer/Source: Provide metal wall panel and panel accessories from a single manufacturer.
- B. Manufacturer Qualifications: Approved manufacturer listed in this Section with minimum 10 years experience in manufacture of similar products in successful use in similar applications.
1. Approval of Comparable Products: Submit the following in accordance with project substitution requirements, within adequate time allowed for substitution review, so as not to affect the project schedule:
    - a. Product data, including certified independent test data indicating compliance with requirements.
    - b. Samples of each component.
    - c. Project references: Minimum of 5 installations not less than 5 years old, with Owner and Architect contact information.
    - d. Sample warranty.
  2. Substitutions following award of contract are not allowed except as stipulated in Division 01 General Requirements.
  3. Approved manufacturers must meet separate requirements of Submittals Article.

- C. Wall Systems Installer Qualifications: Experienced Installer with minimum of 5 years experience with successfully completed projects of a similar nature and scope.

#### **1.6 ADMINISTRATIVE REQUIREMENTS**

- A. Pre-installation Meeting: Conduct pre-installation meeting at site attended by Owner, Architect, manufacturer's representative and other trade contractors.
  - 1. Coordinate building framing in relation to metal wall panel assembly.
  - 2. Coordinate window, door, louver, screens and other openings and penetrations of metal wall panel assembly.

#### **1.7 ACTION SUBMITTALS**

- A. Product Data: Manufacturer's data sheets, for specified products.
  - 1. Include data indicating compliance with performance requirements.
- B. Shop Drawings: Provide shop drawings prepared by manufacturer or manufacturer's authorized Installer. Include full elevations showing openings and penetrations. Include details of each condition of installation and attachment. Provide details at a minimum scale 1-1/2-inch per foot (1:8) of all required trim and extrusions needed for a complete installation.
  - 1. Indicate points of supporting structure that must coordinate with metal wall panel assembly installation.
  - 2. Show plan details of all corners, head jambs and sill.
  - 3. Provide details of all screening and louvers.
  - 4. Provide details of all "closure" strips to seal openings in metal panel.
- C. Samples for Initial Selection: For each product specified. Provide representative color chips of manufacturer's full range of colors.
- D. Samples for Verification: Provide 12-inch (300 mm) section of panel(s) showing finishes. Provide 12-inch (300 mm) long pieces of trim pieces and other exposed components. Include screening and closure strips.

#### **1.8 INFORMATIONAL SUBMITTALS**

- A. Product Test Reports: Indicating compliance of products with requirements, from a qualified independent testing agency.
- B. Qualification Information: For Installer firm.
- C. Manufacturer's warranty: Submit sample warranty.

#### **1.9 CLOSEOUT SUBMITTALS**

- A. Maintenance data.

#### **1.10 DELIVERY, STORAGE, AND HANDLING**

- A. Protect metal wall panel products during shipping, handling, and storage to prevent staining, denting, deterioration of components or other damage.

1. Deliver, unload, store, and erect metal wall panel products and accessory items without misshaping panels or exposing panels to surface damage from weather or construction operations.

#### 1.11 WARRANTY

- A. Special Manufacturer's Warranty: On manufacturer's standard form, in which manufacturer agrees to repair or replace components of metal wall panel assemblies that fail in materials and workmanship within two years from date of Substantial Completion.
- B. Special Panel Finish Warranty: On manufacturer's standard form, in which manufacturer agrees to repair or replace metal wall panels that display evidence of deterioration of finish within 20 years from the date of substantial completion.

### PART 2 - PRODUCTS

#### 2.1 SYSTEM DESCRIPTION

- A. **Metal Wall Panels over Uninsulated Framed Screen Wall System:** Single-skin exposed fastener metal wall panels applied as exterior barrier cladding over wall framing specified in Division 05 Section "Cold Formed Metal Framing". Metal wall panel installation specified in this Section may include secondary metal sub-girt framing for panel attachment.

#### 2.2 MANUFACTURERS

- A. Basis of Design: **CENTRIA, Exposed Fastener Series Metal Wall Panels.** Provide basis of design product or comparable product approved by Architect prior to bid.
  1. CENTRIA Architectural Systems; Blue Bell, PA 19477. Tel: (215) 643-6040 Fax: (215) 643-0629. Email: [rsterling@centria.com](mailto:rsterling@centria.com) Web: [www.CENTRIA.com](http://www.CENTRIA.com).

#### 2.3 METAL WALL PANEL MATERIALS

- A. **Metallic-Coated Steel Face Sheet:** Coil-coated, ASTM A 755/A 755M.
  1. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, G90 (Class Z275), structural steel.
  2. Face Sheet: Minimum 0.036 inch/18 gage (0.91 mm) nominal uncoated thickness.
  3. Surface: Smooth

#### 2.4 EXPOSED FASTENER PROFILE METAL WALL PANELS

- A. Metal Wall Panels, General: Factory-formed, Exposed fastener panels with interconnecting side joints, fastened to supports with exposed fasteners, with field-applied sealants in side laps when required to meet performance requirements.
- B. Symmetrical rib profile with lap joint **MWP 1** :
  1. Basis of Design: Intent is to match existing, adjacent 2013 Women's Locker Room Addition.
  2. Basis of Design Product: **CENTRIA, Style-Rib.**
  3. Panel Coverage: 36 inches (914 mm).
  4. Panel Depth: 1.50 inches (38 mm).



- 5. Rib Spacing: 5 at 7.2 inches (183 mm) o.c.
- 6. Gauge: 18GA
- A. Exposed Coil-Coated Finish System:
  - 1. Fluoropolymer Three-Coat System: 0.8 mil primer with 0.8 mil 70 percent PVDF fluoropolymer color coat, and a 0.8 mil 70 percent PVDF fluoropolymer clear coat, AAMA 621.
    - a. Basis of Design: **CENTRIA Duragard Plus.**
- B. Color:
  - 1. Exterior Surface: As selected by Architect from manufacturer's standard colors.
  - 2. Interior Surface: Manufacturer's standard primer color. Finish coat, as selected by Architect from manufacturer's standard colors.

## **2.5 METAL WALL PANEL ACCESSORIES**

- A. Metal Wall Panel Accessories, General: Provide complete metal wall panel assembly incorporating trim, copings, fasciae, parapet caps, soffits, sills, inside and outside corners, and miscellaneous flashings. Fabricate accessories in accordance with SMACNA Manual. Provide manufacturer's factory-formed clips, shims, flashings, gaskets, lap strips, closure strips, and caps for a complete installation as required for the following:
  - 1. Single-skin application over metal framing and secondary framing.
- B. Extruded Trim: Manufacturer's complementary aluminum extrusions for head, jamb, sill, base, flush, reveal, inside and outside corner, end wall, and expansion joint details. Finish to match metal wall panels.
  - 1. Basis of Design: **CENTRIA, Microline Extrusions.**
  - 2. Gauge: 20 Ga – minimum
  - 3. Color: Match wall panels in color and texture.
- C. Mitered Corners: Structurally-bonded horizontal interior and exterior trimless corners matching metal wall panel material, profile, and factory-applied finish, fabricated and finished by metal wall panel manufacturer.
  - 1. Welded, riveted, fastened, or field- fabricated corners do not meet the requirements of this specification.
  - 2. Basis of Design: **CENTRIA, MicroSeam Corners.**
- D. Formed Flashing and Trim: Match material, thickness, and color of metal wall panel face sheets.
- E. Sealants: Type recommended by metal wall panel manufacturer for application.
  - 1. Hidden sealant at all side laps, end laps, and flashing details shall be gun grade non-curing butyl or polymeric non-skinning butyl tape to ensure weather tightness.
  - 2. Exposed sealant shall be one-part moisture curing, gun grade polyurethane.
- F. Flashing Tape: 4-inch wide self-adhering butyl flashing tape.

- G. Fasteners: Self-tapping screws, bolts, nuts, and other acceptable fasteners recommended by panel manufacturer. All exposed fasteners must be stainless steel with heads matching color of metal wall panels by means of factory-applied coating.

## 2.6 WALL LOUVER UNITS

- A. Wall Louvers, General: Metal louvers, designed to integrate with metal wall panel profile and secondary support system without receptor channels or other flashing, of types and performance indicated. Provide manufacturer's standard louver blade clips matching panel color.
- B. Horizontal Fixed Louver:
  - 1. Louver Size: As indicated on Drawings.
  - 2. Louver Depth: Various options depending on free area requirements
  - 3. Free Area: Depending on profile and depth
  - 4. Air Performance: Not exceeding 0.10-inch wg (25-Pa) static pressure drop at 600-fpm (3.0-m/s) free area velocity.
- C. Base Metal and Finish:
  - 1. Match metal wall panel base metal, profile and finish.
- D. Louver Screens: Mounted in removable aluminum frame.
  - 1. Bird Screen: 1/2-inch (12 mm) mesh aluminum, crimped.
  - 2. Insect Screen: 14-18 mesh aluminum, crimped.

## 2.7 SECONDARY METAL FRAMING

- A. Miscellaneous Framing Components, General: Cold-formed metallic-coated steel sheet, ASTM A 653/A 653M, G90 (Z180).
  - 1. Hat Channels: 0.06 inch/16 ga. (1.52 mm) minimum – nominal thickness.
  - 2. Sill Channels: 0.06 inch/16 ga. (1.52 mm) minimum – nominal thickness.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine metal wall panel substrate with Installer present. Inspect for erection tolerances and other conditions that would adversely affect installation of metal wall panels.
- B. Wall Substrate: Confirm that wall substrate is within tolerances acceptable to metal wall panel system manufacturer.
  - 1. Maximum deviations acceptable:
    - a. 1/4-inch in 20 feet (6.4 mm in 6 m) vertically or horizontally from face plane of framing.
    - b. 1/2-inch (12.7 mm) across building elevation.
    - c. 1/8-inch in 5 feet (3.2 mm in 1.5 m).
- C. **Framing:** Inspect framing that will support metal wall panels to determine if support components are installed as indicated on approved shop drawings. Confirm presence of acceptable framing members at recommended spacing to match installation requirements of metal wall panels.
- D. **Openings:** Verify that windows, doors, louvers and other penetrations match layout on shop drawings.

- E. Advise G.C. in writing, of out-of-tolerance work and other deficient conditions prior to proceeding with metal wall panel system installation.
- F. Correct out of tolerance work and other deficient conditions prior to panel installation.

### **3.2 SECONDARY FRAMING INSTALLATION**

- A. Secondary Metal Framing: Install secondary metal framing components to tolerances indicated, as shown on approved shop drawings. Install secondary metal framing and other metal panel supports per ASTM C 1007 and metal wall panel manufacturer's recommendations.

### **3.3 METAL WALL PANEL INSTALLATION**

- A. General: Install metal wall panels in accordance with approved shop drawings and manufacturer's recommendations. Install metal wall panels in orientation, sizes, and locations indicated. Anchor metal wall panels and other components securely in place.
- B. Attach panels to metal framing using recommended screws, fasteners, sealants, and adhesives indicated on approved shop drawings.
  - 1. Fasteners for Steel Wall Panels: Stainless-steel for exterior locations and locations exposed to moisture; carbon steel for interior use only.
  - 2. Provide weatherproof escutcheons for pipe and conduit penetrating exterior walls.
  - 3. Dissimilar Materials: Where elements of metal wall panel system will come into contact with dissimilar materials, treat faces and edges in contact with dissimilar materials as recommended by manufacturer.
- C. Joint Sealers: Install joint sealants where indicated on approved shop drawings.

### **3.4 ACCESSORY INSTALLATION**

- A. General: Install metal wall panel accessories with positive anchorage to building. Coordinate installation with flashings and other components.
  - 1. Install related flashings and sheet metal trim per requirements of drawings & specifications.
  - 2. Install components required for a complete metal wall panel assembly, including trim, copings, corners, lap strips, flashings, sealants, fillers, closure strips, and similar items.
  - 3. Comply with performance requirements and manufacturer's written installation instructions.
  - 4. Set units true to line and level as indicated.

### **3.5 FIELD QUALITY CONTROL**

- A. Manufacturer's Field Service: Engage a service representative authorized by metal wall panel manufacturer to inspect completed installation. Submit written report.
- B. Correct deficiencies noted in manufacturer's report.

### **3.6 CLEANING AND PROTECTION**

- A. Remove temporary protective films. Clean finished surfaces as recommended by metal wall panel manufacturer. Clear weep holes and drainage channels of obstructions, dirt, and sealant. Maintain in a clean condition during construction.
- B. Replace damaged panels and accessories that cannot be repaired by finish touch-up or minor repair.

**END OF SECTION 07 42 13**

THIS SHEET INTENTIONALLY LEFT BLANK

**SECTION 07 53 23**

**ETHYLENE-PROPYLENE-DIENE-MONOMER ROOFING (EPDM)**

**PART 1 GENERAL**

**1.1 SECTION INCLUDES**

- A. Thermoset Membrane Roofing.
- B. Membrane Flashings.
- C. Metal Flashings.
- D. Roof Insulation.

**1.2 RELATED SECTIONS**

- A. Related Sections include the following:
  - 1. Drawings and general provisions of the Contract, including General Condition and Special Provisions, other Division 1 Specification Sections and Divisions 2 through 49 Sections, apply to this Section.
  - 2. Division 1, Section 01 73 29 Cutting and Patching. Additionally, Divisions 1 through 49 Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.
  - 3. Division 2, Section 02 41 19 Selective Demolition for demolition of selected portions of the building for alterations.
  - 4. Division 6, Section 06 10 53 Miscellaneous Rough Carpentry

**1.3 REFERENCES**

- A. American Society of Civil Engineers (ASCE) - ASCE 7 - Minimum Design Loads for Buildings and Other Structures, Current Revision.
- B. ANSI/SPRI WD-1 "Wind Design Standard for Roofing Assemblies".
- C. ASTM International (ASTM):
  - 1. ASTM C 208 - Standard Specification for Cellulosic Fiber Insulating Board.
  - 2. ASTM C 578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation.
  - 3. ASTM C 1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board.
  - 4. ASTM D 41 - Standard Specification for Asphalt Primer Used in Roofing, Damp proofing and Waterproofing.
  - 5. ASTM D 412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension.

6. ASTM D 624 - Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers.
  7. ASTM D 816 - Standard Test Methods for Rubber Cements 8.
  8. ASTM D 4263 - Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method.
  9. ASTM D 4637 - Standard Specification for EPDM Sheet Used In Single-Ply Roof Membrane.
  10. ASTM E 96 - Standard Test Methods for Water Vapor Transmission of Materials.
- D International Code Council (ICC):
1. International Building Code (IBC), New Jersey 2018
- E National Roofing Contractors Association (NRCA) - Low Slope Roofing and Waterproofing Manual, Current Edition.
- F Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA) - Architectural Sheet Metal Manual.
- G Underwriters Laboratories (UL):
1. TGFU R1306 - "Roofing Systems and Materials Guide".
  2. UL-790 - Standard Test Method for Fire Tests of Roof Coverings.
- H ANSI/ASHRAE/IESNA Standard 90.1 (2013): Energy Standard for Buildings, Except Low-Rise Residential Buildings
- I. New Jersey Uniform Construction Code (UCC)
1. New Jersey Building Code (NJBC) 2018

#### 1.4 DESIGN CRITERIA

- A. Wind Uplift Performance:
1. Roof system shall be designed to withstand wind uplift forces as calculated using the current version of ASCE-7 as referenced by NJ State adopted International Building Code.
  2. Roof System must be tested and installed to meet or exceed the current version ASCE 7 pressures based on the local wind speed for Risk Category II achieve a minimum wind speed of 125 mph wind zone.
- B. Fire Resistance Performance:
1. Roof System shall achieve a UL Class A rating when tested in accordance with UL-790.
- C. Thermal Performance: Roof System shall achieve a minimum R value not less than that of the existing roofing system. Roofing System shall meet or exceed the current NJ Energy Sub-Code for commercial buildings, ASHRAE 90.1 - 2016 minimum requirement for tapered Polyisocyanurate continuous above deck insulation roofing systems.

- D. Drainage: Provide a roof system with positive drainage where all standing water dissipates within 48 hours after precipitation ends.
- E. Building Codes:
  - 1. Roof system will meet the requirements of all federal, state and local code bodies having jurisdiction.
- F. SMACNA's "Architectural Sheet Metal Manual" details for fabrication of units, including flanges and cap flashing to coordinate with type of roofing indicated.
- G. NRCA's "Roofing and Waterproofing Manual" details for installing units.
- H. All associations and standards listed under 1.3 References, listed above.
- I. Selected Manufacturer's Specifications and Installation Instructions, including all Spec Supplements which represents the manufacturer's requirements for obtaining the specified roofing system warranty for **20 years**.

## 1.5 SUBMITTALS

- A. Product Data: Manufacturer's data sheets on each product to be used, including:
  - 1. Preparation instructions and recommendations.
  - 2. Storage and handling requirements and recommendations.
  - 3. Installation methods.
- C. Shop Drawings: Show fabrication and installation layouts of roofing, details of edge conditions, curbs, expansion joints, mechanical curbs, crickets, tapered insulation, corners, anchorages, trim, flashings, closures, and accessories; and special details. Distinguish between factory- and field-assembled work.
  - 1. Furnish shop drawings prepared by the product manufacturer, (not the roof contractor), complete with details of all major interfaces and periphery conditions.
  - 2. Shop drawings shall specify and indicate all materials furnished as well as finishes to be applied.
  - 3. These shop drawings shall also serve as field installation drawings and be complete with specific instructions for the application of the products, periphery trim, and all sealants, lap strips, etc., to insure a weathertight installation.
  - 4. Shop drawings shall be stamped and sealed by a licensed professional engineer in the State of New Jersey employed by the roof manufacturer.
  - 5. Accessories: Include details of the following items, at a scale of not less than 1-1/2 inches per 12 inches:
    - a. Flashings and trims
    - b. Roof Edges and Fascias
    - c. Downspouts and gutters
    - d. Mechanical curbs
    - e. Pipe boots & flashings
    - f. Copings
    - g. Typical field assembly
    - h. Inside corners
    - i. Outside corners

1. Submit approved plan, details, section, elevation or isometric drawings which detail the appropriate methods for all flashing conditions found on the project.
  2. Shop drawings showing layout, details of construction and identification of materials **applied to specific job conditions**, meeting the uplift ratings pressures and any warranty requirements. Shop drawings are to be reviewed, signed and sealed by an engineer registered in the State of New Jersey.
  3. Submit approved plan, details, section, elevation or isometric drawings which detail the appropriate methods for all tapered insulation conditions found on the project. Include drains, crickets, slopes, valleys, curbs, boots, downspouts, scuppers and gutters.
  4. Coordinate and show on plan drawing all the approved drawings with locations found on the Contract Drawings and locations found in field conditions.
- D. Selection Samples: For each finish product specified, two complete sets of chips representing manufacturer's full range of available colors, membranes, and thicknesses.
- E. Verification Samples: For each finish product specified, two samples, minimum size 4 inches (100 mm) square representing actual product, color, and patterns.
- F. Sample of the manufacturer's Total Systems Warranty covering all components of the roofing system.
- G. Submit a letter of certification from the manufacturer, which certifies the roofing contractor is authorized to install the manufacturer's roofing system and lists foremen who have received training from the manufacturer along with the dates training was received.
- H. Certification of the manufacturer's warranty reserve.
- I. Upon completion of the installed work, submit copies of the manufacturer's final inspection report to the SJTA Project Manager & specifier prior to the issuance of the manufacturer's warranty.
- J. Fire Hazard Certification: Written certification that the roof system, including the specific insulation, has been tested in conjunction with the type of structural roof deck and roof slope applicable to the project and has achieved an Underwriters Laboratories Class A external fire resistance rating.
- a. Acceptable Certification: Certification and assembly letter from the manufacturer a copy of the Underwriters Laboratories classification listing for the roofing system.
- K. Wind Uplift Certification: Submit written certification that the roof system, including the specific insulation and fasteners, has been tested in conjunction with the type of structural roof deck applicable to this project and has achieved a Factory Mutual Class 1-125 Wind Uplift rating.
- a. Acceptable Certification: Certification and assembly letter from the manufacturer.
- L. Delegated-Design Submittal: For total roofing assembly indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.



## **1.6 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: All products specified in this section will be supplied by a single manufacturer with a minimum of twenty (20) years experience.
- B. Installer Qualifications:
  - 1. All products listed in this section are to be installed by a single installer with a minimum of five (5) years demonstrated experience in installing products of the same type and scope as specified.
  - 2. Installer must be capable of extending the Manufacturer's Labor and Materials guarantee.
  - 3. Installer must be capable of extending the Manufacturer's No Dollar Limit guarantee.
- C. Standards: Comply with the following:
  - 1. SMACNA's "Architectural Sheet Metal Manual" details for fabrication of units, including flanges and cap flashing to coordinate with type of roofing indicated.
  - 2. NRCA's "Roofing and Waterproofing Manual" details for installing units.
  - 3. All applicable associations and standards listed under 1.3 References, listed above.
  - 4. Selected Manufacturer's Specifications, including all Spec Supplements which represents the manufacturer's requirements for obtaining a roofing system warranty.

## **1.7 DELIVERY, STORAGE, AND HANDLING**

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Store and dispose of hazardous materials, and materials contaminated by hazardous materials, in accordance with requirements of local authorities having jurisdiction.
- C. Store product and distribute loading so as to not overload the roofs structural system.

## **1.8 PROJECT CONDITIONS**

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.
- B. Refer to Carlisle's Roofing System specification, Part II - Application, for General Job Site Considerations.
- C. Material Safety Data Sheets (MSDS) must be on location at all times during the transportation, storage and application of materials.
- D. When positioning membrane sheets, exercise care to locate all field splices away from low spots and out of drain sumps. All field splices should be shingled to prevent buckling of water.
- E. When loading materials onto the roof, the Carlisle Authorized Roofing Applicator must comply with the requirements of the building owner to prevent overloading and possible disturbance to the building structure.

- F. Proceed with roofing work only when weather conditions are in compliance with the manufacturer's recommended limitations, and when conditions will permit the work to proceed in accordance with the manufacturer's requirements and recommendations.
- G. Proceed with work so new roofing materials are not subject to construction traffic. When necessary, new roof sections shall be protected and inspected upon completion for possible damage.
- H. Provide protection, such as 1/2 inch thick plywood, for all roof areas exposed to traffic during construction. Plywood must be smooth and free of fasteners and splinters.
- I. The surface on which the insulation or roofing membrane is to be applied shall be clean, smooth, dry, and free of projections or contaminants that would prevent proper application of or be incompatible with the new installation, such as fins, sharp edges, foreign materials, oil and grease.
- J. New roofing shall be complete and weathertight at the end of the work day.
- K. Contaminants such as grease, fats and oils shall not be allowed to come in direct contact with the roofing membrane.

## 1.9 WARRANTY

- A. Provide manufacturer's **20** year Total System Warranty covering both labor and all materials with no dollar limitation. The maximum wind speed coverage shall be peak gusts of 125 mph measured at 10 meters above ground level. Certification is required with bid submittal indicating the manufacturer has reviewed and agreed to such wind coverage.
- B. Warranty shall also cover leaks caused by accidental punctures: 32 man-hours per year for 60 mil, Sure-White membranes.
- C. Warranty shall also cover leaks caused by hail:
  - 1. Hail up to 1" or 2" diameter hail when 60 mil Sure-White is installed over Carlisle Securshield HD, Dens Deck Prime, or Securock.
- D. Pro-rated System Warranties shall not be accepted.
- E. At project closeout, provide to Owner or Owners Representative an executed copy of the manufacturer's Total-System warranty, outlining its terms, conditions, and exclusions from coverage.
- F. Special Weathertight Warranty: Manufacturer's standard weathertight form, without monetary limitation, in which manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within specified warranty period. Failure includes roof leaks and water penetration of the roof system, including flashing, curbs and seam conditions.
- G. Special weathertight warranty includes roof membrane, base flashings, roofing system membrane accessories, roof edges and caps, roof insulation fasteners, walkway products and other components of membrane roofing system.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

A. Provide materials and roofing systems from one of the following manufacturers that meet or exceed specified requirements:

1. Carlisle SynTec Systems. - Sure-White 60 mil Membrane Roofing System is the Basis of Design.
2. Firestone Building Products – Firestone Eco White Platinum 60 mil EPDM Roofing System.
3. John Mansville, EPDM, 20 year warrantied roofing system, meeting 125 mph wind speed and all requirements of the contract documents.

## **2.2 SCOPE / APPLICATION**

- A. Roof System: Provide a waterproof roof system, capable of withstanding uplift forces as specified in Design Criteria.
1. Membrane Attachment: Fully Adhered.
- B. Base Flashing: Provide a waterproof, fully adhered base flashing system at all penetrations, plane transitions and terminations.
- C. Insulation: Provide a roof insulation system beneath the finish membrane.
1. Insulation Attachment: Fully Adhered.
  2. Adhesion must be part of the tested assembly and meet the specified warranty criteria and capable of withstanding uplift forces as specified in Design Criteria of 125 mph.

## **2.3 MEMBRANE BASE SHEET**

- A. 725-TR: A 40-mil thick composite consisting of 32-mil self-adhering rubberized asphalt membrane laminated to an 8-mil spun bonded polyester fabric which has a permeability rating (ASTM E-96) of 0.05 perms and is fully compatible with urethane based insulation adhesive. Available in rolls 36 inch wide by 75' long (225 square feet).

## **2.4 INSULATION**

- A. Polyisocyanurate HP-H: Rigid board with fiber reinforced facers on both sides meeting or exceeding the requirements of ASTM C 1289. Carlisle HPH
1. Compressive Strength: 20 psi (138 kPa).
  2. Density: 2 lb per cubic foot (24 kg/cu m) minimum.
- B. Cover Board: Securock® Gypsum-Fiber Roof Board
- Acceptable product 5/8" Securock® Gypsum-Fiber Roof Board as supplied by Carlisle
- Composition: Impact-resistant, nonstructural, fiber-reinforced gypsum panels manufactured with a 95% certified recycled content, with moisture and mold resistance throughout the panel core and surface; manufactured to conform to ASTM C1278
- C. Thermal Barrier: Securock® Gypsum-Fiber Roof Board
- Acceptable product minimum 1/2" Securock® Gypsum-Fiber Roof Board as supplied by Carlisle
- Composition: Impact-resistant, nonstructural, fiber-reinforced gypsum panels manufactured with a 95% certified recycled content, with moisture and mold resistance throughout the panel core and surface; manufactured to conform to ASTM C1278

**2.5 INSULATION ADHESIVE**

- A. Sure-Seal FAST 100 or 100 LV Adhesive: A spray or extruded applied, two-component polyurethane, low-rise expanding foam adhesive used for attaching approved insulations to compatible substrates (concrete, cellular lightweight insulating concrete, gypsum, cementitious wood fiber, wood or steel) or existing smooth or gravel surfaced BUR, modified bitumen or cap sheets.
- B. Sure-Seal FAST Catalyst: Added to FAST Adhesive (Part B Side) to quicken adhesive reaction time.
- C. FAST Bag in a Box: A two-component, polyurethane construction grade, low-rise expanding adhesive designed for bonding insulation to various substrates, packaged for use with the PaceCart 2.

**2.6 ETHYLENE, PROPYLENE, DIENE TERPOLYMER (EPDM) MEMBRANE**

- A. Sure-White Membrane: Cured, non-reinforced EPDM membrane. Meets the requirements of ASTM D 4637 Type I.
  - 1. Color: White on Black.
  - 2. Membrane Thickness: 60 mil
  - 3. Sheet Dimensions:
    - a. Width: 10 feet (3.05 m) maximum.
    - b. Length: 100 feet (30.5 m) maximum.
  - 4. Performance:
    - a. Breaking Strength: 200 lbf (890 N) minimum.
    - b. Tear Strength: 45 lbf (200 N) minimum.
    - c. Elongation: 500 percent.

**2.7 FLASHING ACCESSORIES**

- A. Sure-White (white) Pressure-Sensitive Pipe Seals with Factory-Applied TAPE on the deck flange are available for use with Sure-Seal/Sure-White Roofing systems.
- B. Sure-White Pourable Sealer Pocket: Pre-fabricated Pourable Sealer Pocket consisting of a 2 inch (51 mm) wide plastic support strip with Factory-Applied, adhesive backed uncured Elastoform Flashing.
- C. Sure-White Pressure-Sensitive (PS) Inside/Outside Corner: A 7 inch by 9 inch precut 60-mil thick Elastoform Flashing with a 35-mil Factory-Applied TAPE.
- D. Sure-White Pressure-Sensitive (PS) Curb Flashing - A 60-mil thick, 20 inch (508mm) wide cured EPDM membrane with 5 inch (126 mm) wide Factory-Applied TAPE along one edge to be used to flash curbs/skylights, etc.
- E. Sure-Seal Pressure-Sensitive Overlayment Strip: A nominal 40-mil black, semi-cured EPDM membrane laminated to a nominal 35-mil cured, Factory-Applied TAPE for flashing gravel stops, metal edgings and Seam Fastening Plates.
- F. Sure-White Pressure-Sensitive Cured Cover Strip: Sure-Seal or Sure-White 60-mil cured EPDM membrane laminated to a nominal 35-mil cured Factory-Applied TAPE.
- G. Sure-White Pressure-Sensitive "T" Joint Covers: A factory cut uncured 60-mil thick EPDM flashing laminated to a nominal 35-mil Factory-Applied TAPE, used to overlay field splice intersections and to cover field splices at angle changes. Available in 6 inch

by 6 inch and 12 inch by 12 inch for Sure-Seal applications, and 7 inch by 9 inch for Sure-White applications.

- H. Sure-White Pressure-Sensitive Elastoform Flashing: 60-mil thick uncured EPDM Flashing laminated to a 35-mil Factory-Applied TAPE used in conjunction with Sure-Seal Primer as an option to Sure-Seal Elastoform Flashing.

## 2.8 CLEANERS, PRIMERS, ADHESIVES AND SEALANTS

- A. Carlisle Weathered Membrane Cleaner: Clear, solvent-based cleaner used to loosen and remove contaminants from the surface of exposed EPDM membrane prior to applying EPDM Primer.
- B. Sure-White SecurTAPE: A 6" inch (152.4 mm) wide by 100 foot (30.5 M) long, white colored splice tape used with Sure-White Systems.
- C. Sure-White Lap Sealant: A heavy-bodied material (trowel or gun-consistency) used to seal the exposed edges of a membrane splice. A pre-formed Lap Sealant tool is included in each carton of Lap Sealant.
  - 1. Sure-White Lap Sealant: White sealant for use with Sure-White (white-on-black) Roofing Systems.
- D. FAST 100 or 100-LV Adhesive: A spray or extruded applied, two-component, polyurethane, low-rise expanding foam adhesive used to securely bond FleeceBACK membranes to a variety of substrates.
- E. FAST Bag in a Box: A two-component, polyurethane construction grade, low-rise expanding adhesive designed for bonding insulation to various substrates, packaged for use with the PaceCart 2.
- F. Water Cut-Off Mastic: A one-component, low viscosity, self wetting, Butyl blend mastic used as a compression sealing agent between EPDM membranes and applicable substrates.
- G. One-Part Pourable Sealer: A one-component, moisture curing, elastomeric polyether sealant used as a sealant around hard-to-flash penetrations such as clusters of pipes, and is available in white or black.
- H. Cav-Grip: s a multi-purpose contact adhesive recommended for enhancing bond of CCW self-adhering sheet products and for bonding MiraDRAIN and board insulation to various substrates.

## 2.9 EDGINGS AND TERMINATIONS

- A. General: All metal edgings shall be tested and meet ANSI/SPRI ES-1 standards and comply with NJ International Building Code. All metal work is to be supplied and warranted by the manufacturer.
- B. Sure-Seal Termination Bar: 1 inch (13 mm) wide, .098 inch (2.5mm) thick extruded aluminum bar pre-punched 6 inches (152 mm) on center with sealant ledge to support Lap Sealant.
- C. **SecurEdge 2000:** a metal fascia system with an extruded aluminum anchor bar and .050 inch thick aluminum.
- D. Welded, Mitered inside and outside corners.

- E. Face Height: Closest manufacturer's standard dimension to face height shown on drawings.
- F. Color: As selected by the Director's Representative from manufacturer's standard colors. Kynar 500, 30 year warranty finish.
- G. **SecurEdge 200 Coping, Drip Edge, Gravel Stop and Industrial Gutter and one piece reg-let counter flashing** : incorporates a 20 gauge anchor cleat with 4 pre-slotted holes, a concealed joint cover and 10 foot continuous sections of coping cap; can accommodate minimum 5 inch wide parapet walls.
- H. Welded, Mitered inside and outside corners.
- I. Face Height: Closest manufacturer's standard dimension to face height shown on drawings.
- J. Color: As selected by the Director's Representative from manufacturer's standard colors. Kynar 500, 30 year warranty finish.

### **PART 3 EXECUTION**

#### **3.1 EXAMINATION**

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

#### **3.2 PREPARATION**

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Do not commence work until all other work trades have completed jobs that require them to traverse the deck on foot or with equipment.
- D. Install thermal barrier and fasten as required to meet uplift and warranty criteria
- E. A vapor retarder / temporary roof Carlisle 725 TR Air & Vapor Barrier/Temporary Roof shall be applied to protect the inside of the structure prior to the roof system installation.

#### **3.3 INSULATION - SYSTEM DESIGN**

- A. The total insulation thermal resistance averaged over the entire roof area shall produce an R- value equal to or greater than that required by the New Jersey UCC, IBC, Energy Sub-Code ASHRAE 90.1, 2013, UCC and all applicable energy codes.
- B. Provide Minimum R value of R-30. ( per Zone 4A, of the NJ Energy Sub-Code ASHRAE 90.1, 2013
- C. Provide continuous, above deck roofing Polyisocyanurate HP-H, Rigid board with fiber reinforced facers on both sides,
- D. Slope insulation as need to maintain ¼" per foot, positive roof slope.

### **3.4 INSULATION PLACEMENT**

- A. Install insulation or membrane underlayment in multiple layers over the substrate with boards butted tightly together with no joints or gaps greater than 1/4 inch (6 mm). Stagger joints both horizontally and vertically.
- B. Secure insulation to the substrate with the required mechanical fasteners or insulation adhesive in accordance with the manufacturer's current application guidelines.
- C. Do not install wet, damaged or warped insulation boards.
- D. Stagger joints in one direction unless joints are to be taped. Install insulation boards snug. Gaps between board joints shall not exceed 1/4 inch (6 mm). Fill all gaps in excess of 1/4 inch (6 mm) with same insulation material.
- E. Wood nailers must be at least 3 1/2 inches (89 mm) wide or 1 inch (25 mm) wider than adjacent metal flange. Thickness must equal that of insulation but not less than 1 inch (25 mm) thickness.
- F. Miter and fill the edges of the insulation boards at ridges, valleys and other changes in plane to prevent open joints or irregular surfaces. Avoid breaking or crushing of the insulation at the corners.
- G. Do not install any more insulation than will be completely waterproofed each day.

### **3.5 INSULATION ATTACHMENT**

- A. Securely attach insulation to the roof deck for Adhered or Mechanically Fastened Roofing Systems. Attachment must have been successfully tested to meet or exceed the calculated uplift pressure and warranty criteria.
- B. Enhance the perimeter and corner areas in accordance with the International Building Code (ASCE-7) and ANSI/SPRI WD-, if necessary.
- C. Install insulation layers, maximum 4 feet by 4 feet (1220 mm by 1220 mm), applied with adhesive, coverage rate as necessary to achieve the specified attachment and uplift rating. Press each board firmly into place after adhesive develops strings when touched, typically 1-1/2 to 2 minutes after adhesive was applied, and roll with a weighted roller. Add temporary weight and use relief cuts to ensure boards are well adhered. Stagger the joints of additional layers by a minimum of 6 inches (152 mm).

### **3.6 MEMBRANE PLACEMENT AND ATTACHMENT (Fully Adhered)**

- A. Unroll and position membrane without stretching. Allow the membrane to relax for approximately 1/2 hour before bonding. Fold the sheet back onto itself so half the underside of the membrane is exposed.
- B. Apply the Bonding Adhesive in accordance with the manufacturer's published instructions, to both the underside of the membrane and the substrate. Allow the adhesive to dry until it is tacky but will not string or stick to a dry finger touch.
- C. Roll the coated membrane into the coated substrate while avoiding wrinkles. Brush down the bonded half of the membrane sheet with a soft bristle push broom to achieve maximum contact.
- D. Fold back the unbonded half of the membrane sheet and repeat the bonding procedure.

- E. Install adjoining membrane sheets in the same manner, overlapping edges appropriately to provide for the minimum splice width. It is recommended that all splices be shingled to avoid bucking of water.

### **3.7 MEMBRANE SPLICING (Tape Splice)**

- A. Overlap adjacent sheets and mark a line 1/2 inch out from the top sheet.
- B. Fold the top sheet back and clean the dry splice area (minimum 2 1/2 inches (64 mm wide) of both membrane sheets with Sure-Seal Primer as required by the membrane manufacturer.
- C. Where Splice Tape is not Factory-Applied, apply Splice Tape to bottom sheet with the edge of the release film along the marked line. Press tape onto the sheet using hand pressure. Overlap tape roll ends a minimum of 1 inch (13mm).
- D. Remove the release film and press the top sheet onto the tape using hand pressure.
- E. Roll the seam toward the splice edge with a 2 inch (51 mm) wide steel roller.
- F. Install Pressure-Sensitive "T" Joint Cover, a 6 inch wide (152 mm) section of Pressure-Sensitive Flashing or Elastoform Flashing over all field splice intersections.
- G. When using non-Pressure-Sensitive Elastoform Flashing, seal edges of flashing with Lap Sealant.
- H. The use of Lap Sealant with tape splices is optional except at tape overlaps and cut edges of reinforced membrane where Lap Sealant is required.

### **3.8 FLASHING**

- A. Wall and curb flashing shall be cured EPDM membrane. Continue the deck membrane as wall flashing where practicable.
- B. Follow manufacturer's typical flashing procedures for all wall, curb, and penetration flashing including metal edging/coping and roof drain applications.

### **3.9 WALKWAYS**

- A. Install walkways at all traffic concentration points, such as roof hatches, access doors, rooftop ladders, RTU's. and all locations as identified on the Contract Drawings.
- B. Basis of design Carlisle SURE WHITE EPDM PRESSURE-SENSITIVE MOLDED WALKWAY PADS 30" x 30".
- C. Adhere walkways pads to the EPDM membrane in accordance with the manufacturer's current application guidelines.
  - 1. Use Weathered Membrane Cleaner to remove dirt or other contaminants from the area.
  - 2. Adhere Walkway Pads using Carlisle EPDM Primer. Apply primer to deck surface where tape will contact deck surface.
  - 3. Allow a 6" wide break between Walkway Pads. Discontinue Walkways over field splices allowing a minimum 1" space.



**3.10 DAILY SEALS**

- A. On phased roofing, when the completion of flashings and terminations is not achieved by the end of the work day, a daily seal must be performed to temporarily close the membrane to prevent water infiltration.
- B. Use Sure-Seal Pourable Sealer or other acceptable membrane seal in accordance with the manufacturer's requirements.

**3.11 CLEAN UP**

- A. Perform daily clean-up to collect all wrappings, empty containers, paper, and other debris from the project site. Upon completion, all debris must be disposed of in a legally acceptable manner.
- B. Prior to the manufacturer's inspection for warranty, the applicator must perform a pre-inspection to review all work and to verify all flashing has been completed as well as the application of all caulking.

**3.12 FIELD QUALITY CONTROL**

- A. As the joints are completed or at the end of each workday, in the presence of the Owner's Representative closely examine joints in the membrane and flashing. Cut out and repair areas of the joints that are not fully bonded or that contain "fishmouths" or "wrinkles". Repair the membrane so it is restored to its full waterproof integrity. Lap patches a minimum of 6 inches beyond cuts.

**3.13 PROTECTION**

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

**END OF SECTION 07 53 23**

THIS PAGE INTENTIONALLY LEFT BLANK

**SECTION 07 84 13  
PENETRATION FIRESTOPPING**

**PART 1 - GENERAL**

**1.1 GENERAL PROVISIONS**

- A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 1, GENERAL REQUIREMENTS, which are made a part of this Section of the Specifications.

**1.2 DESCRIPTION OF WORK**

- A. Provide firestop systems consisting of a material, or combination of materials, installed to retain the integrity of fire-rated construction by maintaining an effective barrier against the spread of flame, smoke, or gases through penetrations in fire-rated barriers. Firestops shall be used in locations including, but not limited to, the following:
  - 1. Penetrations for the passage of duct, cable, cable trays, conduit, piping, electrical busways, and electrical raceways through fire-rated vertical barriers (walls and partitions), horizontal barriers (floor slabs and floor/ceiling assemblies), and vertical service shafts.
  - 2. Above walls or partitions extending to underside of ceiling or roof assemblies above.
  - 3. Concealed furring spaces behind finishes.
  - 4. Where pipes, conduits, ducts, and other items pass through fire-rated assemblies.
  - 5. Openings for items mounted on or within fire-rated assemblies.

**1.3 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General Condition and Special Provisions, other Division 1 Specification Sections and Divisions 2 through 49 Sections, apply to this Section.
- B. Examine Contract Documents for requirements that affect Work of this Section. Other Specification Sections that relate directly to Work of this Section include, but are not limited to:
- C. Division 8, Section 08 11 13 Hollow Metal Doors and Frames
- D. Division 8, Section 08 51 13 Aluminum Windows
- E. Division 8, Section 08 80 00 Glazing
- F. Division 9, Section 09 21 16 Gypsum Board Assemblies
- G.

**1.4 REFERENCES**

- A. Test Requirements: ASTM E-814, "Standard Method of Fire Tests of Through Penetration Fire

Stops" (July 1983).

- B. Underwriters Laboratories (UL) of Northbrook, IL runs ASTM E-814 under their designation of UL 1479 and publishes the results in their "FIRE RESISTANCE DIRECTORY" that is updated annually with a midyear supplement.
  - 1. UL Fire Resistance Directory:
    - a. Through-Penetration Firestop Devices (XHCR)
    - b. Fire Resistance Ratings (BXUV)
    - c. Through-Penetration Firestop Systems (XHEZ)
    - d. Fill, Voids, or Cavity Material (XHHW)
    - e. Forming Materials (XHKU)
- C. Test Requirements: UL 2079, "Tests for Resistance of Building Joint Systems" (November 1994).
- D. International Firestop Council Guidelines for Evaluating Firestop Systems Engineering Judgments
- E. ASTM E-84, Standard Test Method for Surface Burning Characteristics of Building Materials.
- F. All major building codes: ICBO, SBCCI, BOCA, and IBC.
- G. NFPA 101 - Life Safety Code
- H. NFPA 70 - National Electric Code

#### **1.4 SUBMITTALS**

- A. Submit Product Data: Manufacturer's specifications and technical data for each material including the composition and limitations, documentation of UL firestop systems to be used and manufacturer's installation instructions to comply with Section 1300.
- B. Manufacturer's engineering judgment identification number and drawing details when no UL system is available for an application. Engineer judgment must include both project name and contractor's name who will install firestop system as described in drawing.
- C. Submit material safety data sheets provided with product delivered to job-site.
- D. Schedule of Firestopping: List each type of penetration and the proposed UL system number for firestopping each penetration, (see attached sample schedule).

#### **1.5 QUALITY ASSURANCE:**

- A. A manufacturer's direct representative (not distributor or agent) to be on-site during initial installation of firestop systems to train appropriate contractor personnel in proper selection and installation procedures. This will be done per manufacturer's written recommendations published in their literature and drawing details.
- B. Firestop System installation must meet requirements of ASTM E-814, UL 1479 or UL 2079 tested assemblies that provide a fire rating equal to that of construction being penetrated.
- C. Proposed firestop materials and methods shall conform to applicable governing codes having local jurisdiction.
- D. Firestop Systems do not reestablish the structural integrity of load bearing partitions/assemblies, or support live loads and traffic. Installer shall consult the structural engineer prior to penetrating any load bearing assembly.
- E. For those firestop applications that exist for which no UL tested system is available through a manufacturer, a manufacturer's engineering judgment derived from similar UL system designs or other tests will be submitted to local authorities having jurisdiction for their review and approval prior to installation. Engineer judgment drawings must follow requirements set forth by the International Firestop Council (September 7, 1994).
- F. Source: For each material type required for work of this Section, provide primary materials which are products of one manufacturer. Provide secondary or accessory materials which are acceptable to manufacturers of primary materials.
- G. Installer: A firm with a minimum of three years experience in type of work required by this Section and which is acceptable to manufacturers of primary materials.
- H. UL Listed Designs: Firestopping materials and systems shall be installed in each location and type of installation conforming to listed UL designs.
  - 1. Firestopping materials shall be UL Classified as "Fill, Void, or Cavity Material" for use in through-penetration firestop systems.
  - 2. Provide firestop systems that are UL listed with a fire-resistance rating equal to the hourly resistance rating of the fire-rated barrier being penetrated.

#### **1.6 PRODUCT DELIVERY, STORAGE AND HANDLING**

- A. Deliver materials in unopened factory-labeled packages.
- B. Store off floor in interior spaces, protected against damage.
- C. Schedule deliveries to minimize on-site storage.

#### **1.7 TESTS**

- A. Fire-Resistance: Provide materials and construction identical to fire-rated assemblies tested in compliance with ASTM E 119, ASTM E 814, UL 263, or NFPA 251, by independent agencies acceptable to Designer and governing authorities.
- B. Burning Characteristics: Provide products with maximum ASTM E 84 surface burning characteristics of flame spread 25 and smoke developed 25.
- C. Firestop systems shall have been tested in accordance with ASTM E 814 or UL 1479 under a minimum positive pressure of 0.01 in. of water.

## **1.8 PROJECT CONDITIONS**

- A. Do not use materials that contain flammable solvents.
- B. Schedule installation of firestopping after completion of penetrating item installation but prior to covering or concealing of openings.
- C. Verify existing conditions and substrates before starting work. Correct unsatisfactory conditions before proceeding.
- D. Weather conditions: Do not proceed with installation of firestop materials when temperatures exceed the manufacturer's recommended limitations for installation printed on product label and product data sheet.
- E. During installation, provide masking and drop cloths to prevent firestopping materials from contaminating any adjacent surfaces.

## **PART 2 PRODUCTS**

### **2.1 FIRESTOPPING, GENERAL**

- A. Provide firestopping composed of components that are compatible with each other, the substrates forming openings, and the items, if any, penetrating the firestopping under conditions of service and application, as demonstrated by the firestopping manufacturer based on testing and field experience.
- B. Provide components for each firestopping system that are needed to install fill material. Use only components specified by the firestopping manufacturer and approved by the qualified testing agency for the designated fire-resistance-rated systems.

### **2.2 ACCEPTABLE MANUFACTURERS**

- A. Subject to compliance with through penetration firestop systems (XHEZ) and joint systems (XHBN) listed in Volume II of the UL Fire Resistance Directory, provide products of the following manufacturers as identified below:

1. Hilti, Inc., Tulsa, Oklahoma; 800-879-8000
2. Tremco Sealants & Coatings, Beechwood, Ohio; (216) 292-5000
3. 3M Fire Protection Products, St. Paul, Minnesota; (612) 736-0203
4. Other manufacturers listed in the U.L. Fire Resistance Directory – Volume 2

## **2.3 MATERIALS**

- A. Use only firestop products that have been UL 1479, ASTM E-814, or UL 2079 tested for specific fire-rated construction conditions conforming to construction assembly type, penetrating item type, annular space requirements, and fire-rating involved for each separate instance.
- B. Sealants or caulking materials for use with non-combustible items including steel pipe, copper pipe, rigid steel conduit and electrical metallic tubing (EMT), the following products are acceptable:
  1. Hilti FS-ONE Intumescent Firestop Sealant
  2. 3M Fire Stop Sealant 2000
  3. 3M Fire Barrier CP25 WB
  4. Tremco Tremstop Fyre-Sil Sealant
  5. Equivalent products listed in the U.L. Fire Resistance Directory – Volume 2
- C. Sealants or caulking materials for use with sheet metal ducts, the following products are acceptable:
  1. Hilti CP 601s Elastomeric Firestop Sealant
  2. Hilti CP 606 Flexible Firestop Sealant
  3. Hilti FS-ONE Intumescent Firestop Sealant
  4. Equivalent products listed in the U.L. Fire Resistance Directory – Volume 2
- D. Sealants, caulking or spray materials for use with fire-rated construction joints and other gaps, the following products are acceptable:
  1. Hilti CP 672 Firestop Spray
  2. Hilti CP 601s Elastomeric Firestop Sealant
  3. Hilti CP 606 Flexible Firestop Sealant
  4. 3M Firestop Sealant 2000
  5. Tremco Tremstop Fyre-Sil Sealant
  6. Equivalent products listed in the U.L. Fire Resistance Directory – Volume 2
- E. Intumescent sealants or caulking materials for use with combustible items (penetrants consumed by high heat and flame) including insulated metal pipe, PVC jacketed, flexible cable or cable bundles and plastic pipe, the following products are acceptable:
  1. Hilti FS-ONE Intumescent Firestop Sealant
  2. 3M Fire Barrier CP25 WB
  3. Tremco Tremstop WBM Intumescent Firestop Sealant
  4. Equivalent products listed in the U.L. Fire Resistance Directory – Volume 2

- F. Intumescent sealants, caulking or putty materials for use with flexible cable or cable bundles, the following products are acceptable:
1. Hilti FS-ONE Intumescent Firestop Sealant
  2. Hilti CP 618 Firestop Putty Stick
  3. 3M Fire Barrier CP25 WB
  4. Tremco Tremstop WBM Intumescent Firestop Sealant
  5. Equivalent products listed in the U.L. Fire Resistance Directory – Volume 2
- G. Non curing, re-penetrable intumescent sealants, caulking or putty materials for use with flexible cable or cable bundles, the following products are acceptable:
1. Hilti CP 618 Firestop Putty Stick
  2. Equivalent products listed in the U.L. Fire Resistance Directory – Volume 2
- H. Wall opening protective materials for use with U.L. listed metallic and specified nonmetallic outlet boxes, the following products are acceptable:
1. Hilti CP 617 Firestop Putty Pad
  2. Equivalent products listed in the U.L. Fire Resistance Directory – Volume 1
- I. Firestop collar or wrap devices attached to assembly around combustible plastic pipe (closed and open piping systems), the following products are acceptable:
1. Hilti CP 642 Firestop Collar
  2. Hilti CP 643 Firestop Collar
  3. 3M Fire Barrier PPD Plastic Pipe Device
  4. Equivalent products listed in the U.L. Fire Resistance Directory – Volume 2
- J. Cast-in place firestop devices for use with non-combustible and combustible plastic pipe (closed and open piping systems) penetrating concrete floors, the following products are acceptable:
1. Hilti CP 680 Cast-In Place Firestop Device
  2. Equivalent products listed in the U.L. Fire Resistance Directory – Volume 2
- K. Materials used for large size/complex penetrations made to accommodate cable trays, multiple steel and copper pipes, electrical busways in raceways, the following products are acceptable:
1. Hilti FS 635 Trowelable Firestop Compound
  2. Hilti FS 657 FIRE BLOCK
  3. 3M Firestop Foam 2001
  4. 3M Fire Barrier CS-195 Composite Sheet
  5. Equivalent products listed in the U.L. Fire Resistance Directory – Volume 2
- L. Non curing, re-penetrable materials used for large size/complex penetrations made to accommodate cable trays, multiple steel and copper pipes, electrical busways in raceways,



the following products are acceptable:

1. Hilti FS 657 FIRE BLOCK
  2. Equivalent products listed in the U.L. Fire Resistance Directory – Volume 2
- M. Sealants or caulking materials used for openings between structurally separate sections of wall and floors, the following products are acceptable:
1. Hilti CP 672 Firestop Spray
  2. Hilti CP 601s Elastomeric Firestop Sealant
  3. Hilti CP 606 Flexible Firestop Sealant
  4. 3M Fire Barrier CP 25 WB
  5. Equivalent products listed in the U.L. Fire Resistance Directory – Volume 2
- N. Provide a firestop system with a "F" Rating as determined by UL 1479 or ASTM E814 which is equal to the time rating of construction being penetrated.
- O. Provide a firestop system with an Assembly Rating as determined by UL 2079 which is equal to the time rating of construction being penetrated.

## **2.4 FASTENERS**

- A. Provide anchorage accessories complying with UL designs and other components and accessories as needed.

## **PART 3 EXECUTION**

### **3.1 INSPECTION**

- A. Examine substrates, supports, and conditions under which work shall be performed. Report of conditions detrimental to performance of work in writing to Designer. Do not proceed with work until unsatisfactory conditions are corrected. Beginning work shall establish acceptance of substrates and conditions.

### **3.2 PREPARATION**

- A. Review extent and types of required firestopping with governing authorities before beginning work. Obtain approval of thicknesses and installation methods, including non-typical locations.

### **3.3 INSTALLATION**

- A. Comply with manufacturers' instructions and recommendations, except where more restrictive requirements are specified.
- B. Provide firestopping material and thickness as required to provide indicated ratings. Where not indicated otherwise, comply with UL standard designs. In multiple layer work, offset joints at least 6 in.

- C. Anchor with manufacturers' recommended system and in compliance with UL standard designs.
- D. Install without gaps and voids. Do not use damaged materials. Remove and replace nonfitting or disturbed work.

**3.4 FIELD QUALITY CONTROL**

- A. Coordinate installation of firestopping work with other work to minimize cutting and removal of installed fireproofing. As work of other Sections is completed, review firestopping work and repair or replace work which has been damaged or removed.

**3.5 PROTECTION**

- A. Provide temporary protection to protect work from damage and deterioration until final acceptance. Remove protection and rework as necessary immediately before final acceptance.

**END OF SECTION 07 84 13**

**SECTION 079200  
JOINT SEALANTS**

**PART 1 GENERAL**

**1.1 RELATED DOCUMENTS**

- A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 1, GENERAL REQUIREMENTS, which are made a part of this Section of the Specifications.

**1.2 WORK INCLUDED**

- A. Caulk and seal joints as indicated on the Drawings and as specified. Include, but do not limit to:
1. Sealing of joints in exterior construction.
  2. Sealing of interior perimeter joints.
  3. All other exterior and interior sealing called for, or reasonably inferred from the Drawings, and as required to provide weathertight conditions in exterior assemblies.

**1.3 RELATED WORK**

- A. Examine Contract Documents for requirements that affect work of this Section. Other Specification Sections that directly relate to work of this Section include, but are not limited to:
1. Division 7, Section 07 42 13 Metal Wall Panel
  2. Division 8, Section 08 11 13 Hollow Metal Doors and Frames
  3. Division 8, Section 08 51 13 Aluminum Windows
  4. Division 9, Section 09 21 16 Gypsum Board Assemblies
  5. Division 9, Section 09 91 00 Painting
  6. Division 9, Section 09 51 23 Acoustical Panel Ceiling

**1.4 REFERENCES**

- A. Comply with applicable requirements of the following standards. Where these standards conflict with other specified requirements, the most restrictive requirements shall govern.
1. American Association of State Highway and Transportation Officials (AASHTO):  

M 220	Preformed Elastomeric Compression Joint Seals for Concrete
-------	--
  2. American Society for Testing and Materials (ASTM):  

C 719	Adhesion and Cohesion of Elastomeric Joint Sealants under Cyclic Movement
-------	---

C 790	Use of Latex Sealing Compounds
C 834	Latex Sealing Compounds
C 920	Elastomeric Joint Sealants
C 962	Use of Elastomeric Joint Sealants
D 412	Test Methods for Rubber Properties in Tension
D 624	Test Method for Rubber Property - Tear Resistance
D 2628	Preformed Polychloroprene Elastomeric Joint Seals for Concrete Pavements

3. Federal Specifications (Fed. Spec.):

TT-S-00227	Sealing Compound: Elastomeric Type, Multi-Component (For Calking, Sealing, and Glazing in Buildings and Other Structures)
TT-S-001543A	Sealing Compound: Silicone Rubber Base (For Calking, Sealing, and Glazing in Buildings and Other Structures)

## 1.5 SUBMITTALS

- A. Product Data: Submit manufacturer's printed product data, specifications, standard details, installation instructions, use limitations and recommendations for each sealant material used. Provide certifications that sealant materials comply with specified requirements.
- B. Initial Selection Samples: Submit samples manufacturer's color charts showing complete range of colors, textures, and finishes available for each material used.
- C. Verification Samples: Submit actual representative samples of each sealant material that is to be exposed in the completed work. Show full color ranges and finish variations expected. Provide sealant samples having minimum size of 4 in. long.
- D. Test Reports: Provide certified reports for all specified tests.

## 1.6 COMPATIBILITY

- A. Provide sealant and sealant joint backing materials suitable for the use intended and compatible with the materials with which they will be in contact. Compatibility of sealant and accessories shall be verified by the sealant manufacturer.

## 1.7 QUALITY ASSURANCE:

- A. Source: For each sealant material type required for the work of this section, provide primary materials which are the product of one manufacturer. Provide secondary or accessory materials which are acceptable to the manufacturers of the primary materials.

- B. Installer: A firm with a minimum of five years experience in type of work required by this Section and which is acceptable to the manufacturers of the primary materials.

#### **1.8 MOCK-UPS**

- A. Provide joint sealant work for the following types of mock-ups for completion of the work of this Section:
  - 1. Field-Constructed Exterior Wall Mock-up. Refer to Drawings for extent of mock-ups
- B. Field-Constructed Exterior Wall Mock-Up: Prior to commencing primary work of this Section, provide all joint sealant work required as part of the exterior wall mock-up. Comply with requirements specified under Section 01410, MOCK-UPS, and as shown on Drawings. Obtain Architect's acceptance of visual qualities. Protect and maintain approved mock-up throughout the work of this Section.
  - 1. Provide additional mock-ups as directed by Architect.
- C. Mock-ups: Accepted mock-ups approved by Architect, shall remain on-site and be used as a standard of quality for all subsequent joint sealant work.

#### **1.9 PROJECT CONDITIONS**

- A. Weather: Perform work of this Section only when existing or forecasted weather conditions are within the limits established by manufacturers of the materials and products used.
- B. Substrates: Proceed with work only when substrate construction and penetration work is complete.

#### **1.10 PRODUCT DELIVERY, STORAGE, AND HANDLING**

- A. Materials under this Section shall be delivered to, and stored at, the job site in unbroken factory sealed containers with labels intact.

#### **1.11 WARRANTY**

- A. Furnish joint sealant manufacturer's written single-source performance warranty that joint sealant work will be free of defects related to workmanship or material deficiency for five years from date of Substantial Completion of the Project.

### **PART 2 PRODUCTS**

#### **2.1 GENERAL REQUIREMENTS**

- A. Before installation check each sealant for compatibility with adjacent materials and surfaces and with indicated exposures. Select sealers which are recommended by manufacturer for each application indicated. Where exposed to pedestrian or vehicular traffic, provide sealants which are non-tracking and are strong enough to withstand the traffic without damage.
- B. Provide colors as selected by Architect from manufacturer's standard and special (Tremco Fastpak) colors. Where specifically requested, provide custom color matches.

- C. VOC Content of Interior Sealants: Provide interior sealants and sealant primers that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):

1. Sealants: 250 g/L.
2. Sealant Primers for Nonporous Substrates: 250 g/L.
3. Sealant Primers for Porous Substrates: 775 g/L.

## **2.2 SELF-LEVELING POLYURETHANE SEALANT (Sealant Type 1)**

- A. Provide two or more part, self-leveling, polyurethane based elastomeric sealant, complying with ASTM C 920, Fed. Spec. TT-S-00227E Type 1 Class A, having Shore A hardness of not less than 30 when tested according to ASTM C 920, cured modulus of elasticity at 100% elongation of not more than 150 psi when tested according to ASTM D 412, and tear resistance of not less than 50 lbs./inch when tested according to ASTM D 624.
- B. Where joint surfaces contain bituminous materials, provide modified sealants which are compatible with bituminous materials encountered.
- C. Provide one of the following products that meet or exceed specified requirements:
1. Pecora Urexpan NR-200.
  2. Mameco Vulkem 245 or 255.
  3. Sika 2C, SL.
  4. Sonneborn Sonolastic PvJtSt.
  5. Tremco THC 900.
- D. Extent: Provide self-leveling polyurethane sealant for paving and floor joints not indicated to be sealed with another type of sealant.

## **2.3 NON-SAG POLYURETHANE SEALANT (Sealant Type 2)**

- A. Provide multi-part, non-sag, polyurethane based elastomeric sealant, complying with ASTM C 920 Type M, Grade NS, Class 25, Fed. Spec. TT-S-00227E Class A, having Shore A hardness of 20 to 30, cured modulus of elasticity at 100% elongation of not more than 75 psi, and tear resistance of not less than 50 lbs./inch when tested according to ASTM D 624.
- B. Provide one of the following products that meet or exceed specified requirements:
1. Mameco International Vulkem 227
  2. Sika Sikaflex 2c NS.
  3. Sonneborn Sonolastic NP 2.
  4. Tremco Dymeric
- C. Where joint requires 50% movement capabilities, provide Tremco Dymeric Plus, or equal product approved by Architect.
- D. Extent: Provide non-sag polyurethane sealant for all vertical applications in exterior walls.

**2.4 SILICONE RUBBER SEALANT** (Sealant Type 3)

- A. Provide one part, silicone rubber based elastomeric sealant, complying with ASTM C 920 Type S, Class 25, Grade NS and Fed. Spec. TT-S-001543A Class A.
- B. Provide mold and mildew resistant, sanitary interior type sealant.
- C. Provide one of the following products that meet or exceed specified requirements:
  - 1. Dow 786.
  - 2. General Electric 1702 Sanitary.
  - 3. Pecora 863.
  - 4. Rhodorsil 6b White.
  - 5. Sonneborn OmniPlus.
  - 6. Tremco Proglaze.
- D. Extent: Provide silicone rubber sealant for interior joints around plumbing fixtures and tile to tile joints in ceramic tile work.

**2.5 ACRYLIC LATEX SEALANT** (Sealant Type 4)

- A. Provide permanently flexible, latex rubber modified acrylic emulsion sealant, complying with ASTM C 834.
- B. Provide one of following products that meet or exceed specified requirements:
  - 1. Pecora AC-20
  - 2. Tremco Acrylic Latex 834
  - 3. Sonneborn Sonolac
- C. Extent: Provide acrylic latex sealant for use at mirrors, for exposed acoustical sealant, and for interior joints except where silicone rubber sealant is indicated.
- D. At interior joints greater than 1/2 in. in width or subjected to periodic building movement, substitute exterior type sealant specified above.

**2.6 METAL SEAM SEALANT** (Sealant Type 5)

- A. Provide metal seam sealant, specifically compounded to seal very thin joints in metal to metal joints and to match adjacent metal colors and finishes.
- B. Provide one of the following products:
  - 1. Protective Treatments, Inc. PTI 200.
  - 2. Tremco Seam Sealer
- C. Extent: Provide seam sealant for metal to metal joints in aluminum entrance and storefront, window and curtain wall systems.

**2.7 PREFORMED JOINT SEALER**

- A. Preformed Resilient Joint Sealer: Preformed Resilient Joint Sealer for use at building

expansion joints in exterior concrete and masonry walls where specifically called for on

Drawings shall be preformed, resilient, extruded polychlorophrene elastomeric joint sealer, conforming to ASTM D 2628 and AASHTO M 220 of indicated configuration(s), in continuous lengths, set in manufacturer's recommended primer-lubricating-adhesive consisting of moisture curing polyurethane and aromatic hydrocarbon solvent mixture (73% solid by weight) concrete gray color, equal to one of the following:

1. D.S. Brown Co.
2. Watson-Bowman & Acme Corp.

## **2.8 PREFORMED, PRECOMPRESSED, IMPREGNATED FOAM SEALANT**

- A. Provide the following product at exterior wall expansion joints where indicated, or Architect approved equal. Color shall be as selected by architect.

1. Emseal ColorSeal; Emseal Corp.

## **2.9 MISCELLANEOUS MATERIALS**

- A. Primer: Provide primer recommended by sealant manufacturer for surfaces to be adhered to.

- B. Bond Breaker Tape: Provide polyethylene or other plastic tape recommended by sealant manufacturer to prevent three-sided adhesion.

- C. Backer Rod: Provide compressible rod of durable nonabsorptive material recommended by sealant manufacturer for compatibility with sealant. Provide products of one of the following manufacturers:

1. Backer Rod Manufacturing and Supply Co.
2. Dow Chemical Co.
3. W. R. Meadows, Inc.
4. Williams Products, Inc.
5. Woodmont Products, Inc.

- D. Joint backing for general use at joints in horizontal surfaces shall consist of two rows of butyl rubber or neoprene foam rod in contact with one another, and each compressed to approximately 2/3 original width when in place.

- E. Provide miscellaneous materials of type that will not bleed through sealant, discolor surface, or produce other deleterious effects. Select size to provide compression to approximately 2/3 original width when in place. Provide backing material profile concave to the rear of the sealant, and equipped with a bond-breaking film.

## **PART 3 EXECUTION**

### **3.1 INSPECTION**

- A. The Installer shall examine substrates and conditions under which this work is to be performed and notify Contractor, in writing, of conditions detrimental to proper completion of work. Do not proceed with work until unsatisfactory conditions are corrected. Beginning of sealant work means Installer's acceptance of joint surfaces and conditions.



### **3.2 PREPARATION**

- A. Strictly comply with manufacturers' instructions and recommendations, except where more restrictive requirements are specified in this Section.
- B. Clean joint surfaces immediately before installation of sealants, primers, tapes and fillers. Remove substances which could interfere with bond. Etch or roughen joint surfaces to improve bond. Surfaces which have been given protective coatings and those that contain oil or grease shall be thoroughly cleaned with xylol or MEK solvent, with due precautions taken to minimize hazards.
- C. Unless otherwise indicated, use of sealants shall conform to the following: ASTM C 790 for latex sealants and ASTM C 1193 for other sealants.
- D. Tape or mask adjoining surfaces to prevent spillage and migration problems.
- E. Prime surfaces as recommended by sealant manufacturer.

### **3.3 INSTALLATION**

- A. Schedule work as long as possible after completion of concrete work and finished brick paving and granite work.
- B. Provide backer rods for liquid sealants except where specifically recommended against by sealant manufacturers.
- C. Prevent three sided adhesion by use of bond breaker tapes or backer rods.
- D. Force sealant into joints to provide uniform, dense, continuous ribbons free from gaps and air pockets. Completely wet both joint surfaces equally on opposite sides.
- E. Except in hot weather, make sealant surface slightly concave. Install sealants so that compressed sealants do not protrude from joints. Dry tool sealants to form a smooth dense surface. At horizontal joints form a slight cove to prevent trapping water.
- F. Provide sealants to depths indicated, or if not indicated, follow manufacturer's recommendations.

### **3.4 EXTENT OF SEALANT WORK**

- A. General Extent: Seal joints indicated, and all interior and exterior joints, seams, and intersections between dissimilar materials. Provide elastomeric sealant installation with backer rod in all interior and exterior control joints.
- B. Exterior Sealing: Without limitation, the work of this Section includes sealing the following:
  - 1. Masonry to masonry joints.
  - 2. Masonry to other exterior wall materials, including precast concrete, stone, metal, and
  - 3. wood.

4. Metal to metal joints.
  5. Wood to wood and wood to metal joints.
  6. Concrete to concrete joints.
  7. Joints and cracks in paving and walks.
  8. Joint fillers for all joints.
- C. Interior Sealing: Without limitation, the work of this Section includes sealing the following:
1. Perimeters of door frames, window frames, and metal and wood frames.
  2. Metal to gypsum drywall joints.
  3. Top of wall base along irregular walls.
  4. Between acoustical ceiling edge angle and irregular walls.
  5. Tile to tile joints inside corners, tile to metal joints, and tile to gypsum drywall joints.
  6. Splash to counter joints and splash to wall joints at countertops.
  7. Completely around plumbing fixtures, fittings, and trim to countertops, walls and floors.
  8. Exposed acoustical sealants, at tops and bottoms of stud partition walls around mechanical rooms, elevator machine rooms, toilet rooms, and at other acoustic partitions as indicated.
- D. Thresholds of exterior doors shall be set in full beds of exterior sealant, not less than 3/8 in. thick. At Contractor's option, a polybutene or polyisobutylene sealant by same manufacturer may be used at thresholds.

### **3.5 CURING**

- A. Cure sealants in strict compliance with manufacturers' instructions and recommendations to obtain highest quality surface and maximum adhesion. Make every effort to minimize accelerated aging effects and increase in modulus of elasticity.

### **3.6 CLEANING AND PROTECTION**

- A. Remove smears from adjacent surfaces immediately, as the work progresses. Exercise particular care to prevent smearing or staining of surrounding surfaces which will be exposed in the finished work, and repair any damage done to same as result of this work without additional cost to Owner.
- B. Remove and replace work that is damaged or deteriorated.
- C. Clean adjacent surfaces using materials and methods recommended by sealant manufacturer. Remove and replace work that cannot be successfully cleaned.
- D. Provide temporary protection to ensure work being without damage or deterioration at time of final acceptance. Remove protection immediately before final acceptance.

**END OF SECTION 07 92 00**

**SECTION 08 11 13**

**HOLLOW METAL DOORS AND FRAMES**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. Drawing and general provisions of the Contract, including General condition and special Provisions and other Division 1 Specification Sections, apply to this section.

**1.2 SUMMARY**

- A. This Section includes the following:
  - 1. Steel doors.
  - 2. Steel door frames.
  - 3. Door Hardware.
- B. Related Sections include the following:
  - 1.
  - 2. Section 08 71 00 Door Hardware
  - 3. Section 09 91 00 Painting

**1.3 DEFINITIONS**

- A. Steel Sheet Thicknesses: Thickness dimensions, including those referenced in ANSI A250.8, re minimums as defined in referenced ASTM standards for both uncoated steel sheet and the uncoated base metal of metallic-coated steel sheets.

**1.4 SUBMITTALS**

- A. Product Data: For each type of door and frame indicated, include door designation, type, level and model, material description, core description, construction details, label compliance, sound and fire-resistance ratings, and finishes.
- B. Shop Drawings: Show the following:
  - 1. Elevations of each door design.
  - 2. Details of doors including vertical and horizontal edge details.
  - 3. Frame details for each frame type including dimensioned profiles.
  - 4. Details and locations of reinforcement and preparations for hardware.
  - 5. Details of each different wall opening condition.
  - 6. Details of anchorages, accessories, joints, and connections.
  - 7. Coordination of glazing frames and stops with glass and glazing requirements.
  - 8. Weather stripping.
  - 9. Hardware; furnish a hardware schedule. List each item, item number, number of units, function and finish.

- C. Samples for Verification: For each type of exposed finish required, prepare a sample not less than 3 by 5 inches and of same thickness and material indicated for final unit of Work.
- D. Door Schedule: Use same reference designations indicated on Drawings in preparing schedule for doors and frames.

### **1.5 QUALITY ASSURANCE**

- A. Steel Door and Frame Standard: Comply with ANSI A 250.8, unless more stringent requirements are indicated.
- B. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated, based on testing according to NFPA 252.
  - 1. Test Pressure: Test at atmospheric pressure.

### **1.6 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver doors and frames cardboard-wrapped or crated to provide protection during transit and job storage. Provide additional protection to prevent damage to finish of factory-finished doors and frames.
- B. Inspect doors and frames on delivery for damage, and notify shipper and supplier if damage is found. Minor damages may be repaired provided refinished items match new work and are acceptable to Architect. Remove and replace damaged items that cannot be repaired as directed.
- C. Store doors and frames at building site under cover. Place units on minimum 4-inch high wood blocking. Avoid using non-vented plastic or canvas shelters that could create a humidity chamber. If door packaging becomes wet, remove cartons immediately. Provide minimum 1/4-inch spaces between stacked doors to permit air circulation.

## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURERS**

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Steel Doors and Frames:
    - a. Amweld Building Products, Inc.
    - b. Ceco Door Products; a United Dominion Company.
    - c. Curries Company.
    - d. Kewanee Corporation (The).
    - e. Pioneer Industries Inc.
    - f. Republic Builders Products.
    - g. Steelcraft; a division of Ingersoll-Rand.

### **2.2 MATERIALS**

- A. Hot-Rolled Steel Sheets: ASTM A 569, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.
- B. Cold-Rolled Steel Sheets: ASTM A 366, Commercial Steel (CS), or ASTM A 620, Drawing Steel (DS), Type B; stretcher-leveled standard of flatness.

- C. Metallic-Coated Steel Sheets: ASTM A 653, Commercial Steel (CS), Type B, with an A40 zinc-iron-alloy (galvannealed) coating; stretcher-leveled standard of flatness.

## **2.3 DOORS**

- A. General: Provide doors of sizes, thicknesses, and designs indicated.
- B. Interior Doors: Provide doors complying with requirements indicated below by referencing ANSI 250.8 for level and model and ANSI A250.4 for physical-endurance level:
  - 1. Level 2 and Physical Performance Level B (Heavy Duty), Model 2 (Seamless).
  - 2. Interior doors located in Fire Barrier to confirm to 3 hour UL fire rating.
- C. Exterior Doors: Provide doors complying with requirements indicated below by referencing ANSI A250.8 for level and model and ANSI A250.4 for physical-endurance level:
  - 1. Level 3 and Physical Performance Level A (Extra Heavy Duty), Model 2 (Seamless).

## **2.4 FRAMES**

- A. General: Provide steel frames for doors, transoms, sidelights, borrowed lights, and other openings that comply with ANSI A250.8 and with details indicated for type and profile. Conceal fastenings, unless otherwise indicated.
- B. Frames of 0.053-inch thick steel sheet for:
  - 1. Level 2 steel doors.
  - 2. Interior doors frames located in Fire Barrier to confirm to 3 hour UL fire rating.
- C. Frames of 0.067-inch thick steel sheet for:
  - 1. Level 3 steel doors, unless otherwise indicated.
- D. Door Silencers: Except on weather-stripped frames or frames to receive light-proof seals or acoustical seals, fabricate stops to receive three silencers on strike jambs of single-door frames and two silencers on heads of double-door frames.
- E. Plaster Guards: Provide 0.016-inch thick, steel sheet plaster guards or mortar boxes to close off interior of openings; place at back of hardware cutouts where mortar or other materials might obstruct hardware operation.
- F. Supports and Anchors: Fabricated from not less than 0.042-inch thick, electrolytic zinc-coated or metallic-coated steel sheet.
  - 1. Wall Anchors in Masonry Construction: 0.177-inch diameter, steel wire complying with ASTM A 510 may be used in place of steel sheet.
- G. Inserts, Bolts, and Fasteners: Manufacturer's standard units. Where zinc-coated items are to be built into exterior walls, comply with ASTM A 153, Class C or D as applicable.

## **2.5 HARDWARE**

- A. Door hardware to include all components need for weather stripping, hinges, emergency egress, locksets, closers, kick plates.

- B. Door hardware to confirm to 3 hour UL fire rating.
- C. Reference Section 08 71 00 Door Hardware. Manufacturers listed are "Basis of Design". Other manufacturers will be considered per the substitution requirements identified in Division 1 specifications.

## **2.6 FABRICATION**

- A. General: Fabricate steel door and frame units to comply with ANSI A250.8 and to be rigid, neat in appearance, and free from defects including warp and buckle. Where practical, fit and assemble units in manufacturer's plant. Clearly identify work that cannot be permanently factory assembled before shipment, to assure proper assembly at Project site.
- B. Exterior Door Construction: For exterior locations and elsewhere as indicated, fabricate doors, panels, and frames from metallic-coated steel sheet. Close top and bottom edges of doors flush as an integral part of door construction or by addition of 0.053-inch thick, metallic-coated steel channels with channel webs placed even with top and bottom edges.
- C. Interior Door Faces: Fabricate exposed faces of doors and panels, including stiles and rails of non-flush units, from the following material:
  - 1. Cold-rolled steel sheet, unless otherwise indicated.
  - 2. Metallic-coated steel sheet where indicated.
- D. Core Construction: Manufacturer's standard core construction that produces a door complying with SDI standards.
- E. Clearances for Non-Fire-Rated Doors: Not more than 1/8 inch at jambs and heads, except not more than 1/4 inch between pairs of doors. Not more than 3/4 inch at bottom.
- F. Clearances for Fire-Rated Doors: As required by NFPA 80.
- G. Single-Acting, Door-Edge Profile: Beveled edge.
- H. Tolerances: Comply with SDI 117, "Manufacturing Tolerances for Standard Steel Doors and Frames."
- I. Fabricate concealed stiffeners, reinforcement, edge channels, louvers, and moldings from either cold- or hot-rolled steel sheet.
- J. Exposed Fasteners: Unless otherwise indicated, provide countersunk flat or oval heads for exposed screws and bolts.
- K. Thermal-Rated (Insulating) Assemblies: At exterior locations and elsewhere as shown or scheduled, provide doors fabricated as thermal-insulating door and frame assemblies and tested according to ASTM C 236 or ASTM C 976 on fully operable door assemblies.
  - 1. Unless otherwise indicated, provide thermal-rated assemblies with U-value of 0.41 Btu/sq. ft. x h x deg F or better.
- L. Sound-Rated (Acoustical) Assemblies: Where shown or scheduled, provide door and frame assemblies fabricated as sound-reducing type, tested according to ASTM E 1408, and classified according to ASTM E 413.

1. Unless otherwise indicated, provide acoustical assemblies with STC sound ratings of 33 or better.
- M. Hardware Preparation: Prepare doors and frames to receive mortised and concealed hardware according to final door hardware schedule and templates provided by hardware supplier. Comply with applicable requirements in ANSI A250.6 and ANSI A115 Series specifications for door and frame preparation for hardware.
- N. Frame Construction: Fabricate frames to shape shown.
  1. Fabricate frames with mitered or coped and continuously welded corners and seamless face joints.
  2. Provide welded frames with temporary spreader bars.
- O. Reinforce doors and frames to receive surface-applied hardware. Drilling and tapping for surface-applied hardware may be done at Project site.
- P. Locate hardware as indicated on Shop Drawings or, if not indicated, according to ANSI A250.8.
- Q. Glazing Stops: Manufacturer's standard, formed from 0.032-inch thick steel sheet.
  1. Provide non-removable stops on outside of exterior doors and on secure side of interior doors for glass, louvers, and other panels in doors.
  2. Provide screw-applied, removable, glazing stops on inside of glass, louvers, and other panels in doors.

## **2.7 FINISHES**

- A. Prime Finish: Manufacturer's standard, factory-applied coat of rust-inhibiting primer complying with ANSI A250.10 for acceptance criteria.
- B. Finish Coat: Provide (2) two coats of finish paint as per exterior painting specification.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION**

- A. General: Install steel doors, frames, and accessories according to Shop Drawings, manufacturer's data, and as specified.
- B. Placing Frames: Comply with provisions in SDI 105, unless otherwise indicated. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is completed, remove temporary braces and spreaders, leaving surfaces smooth and undamaged.
  1. Except for frames located in existing walls or partitions, place frames before construction of enclosing walls and ceilings.
  2. In masonry construction, provide at least three wall anchors per jamb; install adjacent to hinge location on hinge jamb and at corresponding heights on strike jamb. Acceptable anchors include masonry wire anchors and masonry T-shaped anchors.

3. In metal-stud partitions, provide at least three wall anchors per jamb; install adjacent to hinge location on hinge jamb and at corresponding heights on strike jamb. Attach wall anchors to studs with screws.
  4. Install fire-rated frames according to NFPA 80.
  5. For openings 90 inches or more in height, install an additional anchor at hinge and strike jambs.
- C. Door Installation: Comply with ANSI A250.8. Fit hollow-metal doors accurately in frames, within clearances specified in ANSI A250.8. Shim as necessary to comply with SDI 122 and ANSI/DHI A115.1G.
1. Fire-Rated Doors: Install within clearances specified in NFPA 80.
  2. Smoke-Control Doors: Install to comply with NFPA 105.
  3. All doors to be installed per Accessibility Code ICC/ANSI A117.1, 2009.

### **3.2 ADJUSTING AND CLEANING**

- A. Prime-Coat Touchup: Immediately after installation, sand smooth any rusted or damaged areas of prime coat and apply touch up of compatible air-drying primer.
- B. Protection Removal: Immediately before final inspection, remove protective wrappings from doors and frames.

**END OF SECTION 08 11 13**



**SECTION 08 14 16  
FLUSH WOOD DOORS**

**PART 1 GENERAL**

**1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

**1.1 SUMMARY**

- A. This Section includes the following:
  - 1. Flush Wood doors
  - 2. Positive Pressure Fire Rated Wood Doors
  - 3. Factory Glazing for Fire Rated Doors
  - 4. Factory Machining for Hardware
  - 5. Factory Finishing

**1.2 RELATED SECTIONS**

- A. Section 08110 – Steel Doors and Frames
- B. Section 08710 - Door Hardware
- C. Section 08810 - Glazing

**1.3 REFERENCES**

- A. ASTM - American Society for Testing and Materials
  - 1. ASTM E 90 - Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions.
  - 2. ASTM E1408 - Standard Test Method for Laboratory Measurement of the Sound Transmission Loss of Door Panels and Door Systems
  - 3. ASTM E 413 - Classification for Rating Sound Insulation.
  - 4. ASTM F 476 Section 18 - Security Test of Swinging Door Assemblies - Door Impact Test  
ANSI - American National Standards Institute.
  - 5. ANSI/DHI A156.115W - Specifications for Hardware Preparation in Wood Doors and Frames.
  - 6. ANSI/DHI A115.IG - Installation Guide for Doors and Hardware.
  - 7. ANSI A156.7 - Hinge Template Dimensions.
  - 8. ANSI/HPVA HP-1 Standards for Hardwood and Decorative Plywood
  - 9. ANSI A208.1-Particleboard
  - 10. ANSI A208.2-Medium Density Fiberboard (MDF)
  - 11. ANSI-ASA S12.60 - Standard Acoustical Performance Criteria, Design Requirements, and Guidelines for Schools

## 12. ANSI/A117.1 – Accessible and Useable Buildings and Facilities

## B. WDMA – Window and Door Manufacturers Association

## 1. WDMA I.S. 1A, Industrial Standards for Architectural Flush Doors

- a. J-1 – Job Site Information “How to Store, Handle, Finish, Install, and Maintain Wood Doors”
- b. P-1 – Performance Standards for Architectural Wood Flush Doors
- c. T-1 – Test for Telegraphing
- d. T-2 – Test for Warp
- e. T-3 – Test for Squareness

## 2. WDMA Test Methods (TM)

- a. TM-5 – Split Resistance
- b. TM-6 – Adhesive Bond Durability
- c. TM-7 – Cycle Slam Test
- d. TM-8 – Hinge Loading
- e. TM-10 – Screwholding

## C. Building Code references

1. NFPA 80 - Standard for Fire Doors and Other Opening Protective's.
2. NFPA 101 – Life Safety Code
3. NFPA 105 - Standard for the Installation of Smoke Door Assemblies and Other Opening Protective's
4. NFPA 252 – Standard Method of Fire Tests of Door Assemblies
5. ANSI/UL 10C - Standard for Safety for Positive Pressure Fire Tests of Door Assemblies
6. UL 1784 - Air Leakage Tests of Door Assemblies
7. UL - Building Materials Directory; Underwriters Laboratories Inc
8. WH - Certification Listings; Warnock Hersey International Inc.
9. Consumer Products Safety Commission (CPSC) 16 CFR 1201 – Standard for Architectural Glazing

**1.4 REQUIREMENTS OF REGULATORY AGENCIES**

- A. Furnish Wood Doors in accordance with the requirements of the following recognized agencies. Wherever possible, all doors and their application are intended to comply with the latest edition of Window and Door Manufacturers Association (WDMA), ANSI A117.1, NFPA 80 and NFPA 101.
- B. It is the intent of this specification that all doors and their application shall comply with the standards as listed. The latest publication edition of each standard applies. Fire door assemblies in exit enclosures and exit passageways are to have maximum transmitted temperature end point of not more than 250° above ambient at the end of 30 minutes of the standard fire test exposure.

**1.5 SUBMITTALS**

- A. Submit for review electronic digital copies of the wood door shop drawings covering complete identification of items required for the project. Include manufacturer's names

and identification of product. Include six (6) complete copies of catalog cuts, technical data sheets and other pertinent data as required to indicate compliance with these specifications.

1. Shop Drawings: submit complete and detailed with respect to quantities, dimensions, specified performance, and design criteria, materials and similar data to enable the Architect to review the information as required.
- B. Indicate location of cutouts for hardware and blocking to ensure doors are properly prepared and coordinated to receive hardware.
- C. Indicate door elevations, internal blocking and cutouts for glass lights and louvers.
- D. Shop drawings, product data, and samples: stamp with Contractor's stamp verifying they have been coordinated and reviewed for completeness and compliance with the contract documents.
- E. Shop drawings submitted without the above requirements will be considered incomplete, will NOT be reviewed, and will be returned directly to the Contractor.
- F. Follow the same procedures for re-submittal as the initial submittal with the appropriate dates revised.
- G. Provide evidence of manufacturer's membership in the Window and Door Manufacturers Association

## **1.6 QUALITY ASSURANCE**

- A. Select a qualified wood door distributor who is a direct account of the manufacturer of the products furnished. In addition, that distributor must have in their regular employment an Architectural Hardware Consultant (AHC), a Certified Door Consultant (CDC) or an Architectural Openings Consultant (AOC), who will be available to consult with the Architect and Contractor regarding matters affecting the door and frame opening.
- B. Conform to requirements of the above reference standards. Submit test reports upon request by the Owner or Architect.
- C. Underwriters' Laboratories and Intertek Testing Services / Warnock Hersey, Positive Pressure - Category A labeled fire wood doors:
  1. Label fire doors listed in accordance with Underwriters Laboratories standard UL10C, Positive Pressure Fire Tests of Door Assemblies and Air Leakage Tests of Door Assemblies - UL 1784.
  2. Construct and install doors to comply with applicable issue of ANSI/NFPA 80.
  3. Manufacture Underwriters' Laboratories labeled doors under the UL factory inspection program and in strict compliance to UL procedures, and provide the degree of fire protection, heat transmission and panic loading capability indicated by the opening class.
  4. Manufacture Intertek Testing Services / Warnock Hersey labeled doors under the ITS/WH factory inspection program and in strict compliance to ITS/WH procedures, and provide the degree of fire protection capability indicated by the opening class. Affix physical label to fire doors at an authorized and licensed facility as evidence of compliance with procedures of the labeling agency. Labels to be metal. Labels are not

- to be removed, defaced or made illegible while the door is in service as covered in NFPA 80.
5. Conform to applicable codes for fire ratings. It is the intent of this specification that wood doors comply or exceed the standards for labeled openings. In case of conflict between door types required for fire protection, furnish the type required by NFPA.
  6. Validate the Smoke and Draft Control ("S") Label for hardware sets that include Category H smoke and draft control seals
  7. All Category G seals required will be concealed in the door or applied to the top rail. No Category G seals will be allowed on the door frame.
- D. Door Supplier shall provide one (1) extra door for the door/hardware combinations with the largest number of doors. Architect will select one door at random in the field for destructive sampling to inspect for proper internal construction.
- E. Manufacturer Qualifications: Member of WDMA.
- F. Warranty: Manufacturer's signed warranty covering manufacturing or material defects for life of original installation, including repair, replacement, machining, and pre-finishing, are required in the manufacturer's warranty for interior doors.

## **1.7 SAMPLES**

### **A. Sample Submittal**

1. Color samples for factory pre-finishing shall consist of four (4) sets of three (3) finish samples per set. Samples to be 5" x 8" size on specified veneer species. The sample should reasonably represent the color range of the veneer species selected.
  2. Construction samples. Furnish four (4) each door sections showing door faces, stiles, and core representative of each different door type specified. Samples shall be not less than 5" x 5".
- B. If requested by the Architect, submit an 18" X 24" cut-away sample door with provisions for lockset, hinge and top rail.

## **1.8 DELIVERY, STORAGE, AND HANDLING**

- A. Store and protect doors in accordance with manufacturer's recommendations and Section J-1 of WDMA I.S.1A - "How to Store, Handel, Finish, Install and Maintain Wood Doors"
1. Store doors flat and off the floor on a level surface in a dry, well-ventilated building. Do not store on edge. Protect doors from dirt, water and abuse.
  2. Most wood species are light sensitive. Protect all doors from exposure to light (artificial or natural) after delivery.
  3. Do not subject interior doors to extremes in either heat or humidity. HVAC systems must be operational and balanced, providing a temperature range of 50 to 80 degrees Fahrenheit and 30% to 60% relative humidity.
  4. When handling doors, do not drag across other doors or surfaces. Handle with clean hands or gloves.
  5. Each door will be marked on top rail and top hinge pocket with the opening number. Each door will be marked on the top rail with manufacture's name, factory order number, and order item number.

## **1.9 COORDINATION**

- A. Coordinate Work with other directly affected sections involving manufacture or fabrication of internal cutouts and reinforcement for door hardware, electric devices and recessed items. Install necessary blocking in mineral core doors to prevent door failure from surface applied hardware.
- B. Coordinate work with frame opening construction, door and hardware installation.

## **PART 2 PRODUCTS**

### **2.1 MANUFACTURERS**

- A. Acceptable manufacturers for wood doors specified are listed below. Only the products of the listed manufacturers will be accepted. No alternates will be accepted.
  - 1. Algoma Hardwoods, Inc.
  - 2. Eggers Industries
  - 3. Marshfield Door Systems
  - 4. Mohawk Flush Doors, Inc
  - 5. V.T. Industries
- B. The manufacturers listed are acceptable providing they adhere to the quality standards as noted herewithin. Any special door construction, noted, shall supersede the manufacturers and industry standard. Products that do not comply with these standards and special construction shall be rejected.

### **2.2 DOORS**

- A. All doors shall be constructed in accordance with WDMA, I.S. 1A.
- B. All doors to be assembled with Type I (waterproof) adhesive.
- C. Non-Fire Rated Wood Doors - All solid core flush wood doors shall meet WDMA Door Grade and Performance Level specified.
  - 1. Custom Grade, and Extra Heavy Duty Performance Level Door Type - PC-5 - Bonded Particle Core, Stiles and rails securely bonded to the core and entire unit abrasively planed prior to application of faces to assure uniform thickness of all components.
- D. Fire Rated Wood Doors: Where fire-resistance classifications are shown or scheduled, provide doors which are like the non-fire rated doors above but comply with the WDMA standards for fire rated doors. Doors will meet the requirements of NFPA 80 "Standard for Fire Doors and Windows". Fire rated doors shall bear the label of an inspection program in compliance with UL or ITS/WH procedures.
- E. Acoustical Doors
  - 1. Acoustical Doors shall conform to the American National Standard Acoustical Performance Criteria, Design Requirements and Guidelines for Schools, ANSI/ASA, S12.60, 4.5.5.
  - 2. Submit written certification from the manufacturer verifying acoustical performance by an independent accredited testing laboratory and classified in accordance with ASTM E-413.

3. Seals and gasketing provided shall meet the acoustical performance specified.
4. Coordinate door bottom mortise for Solid Wood Edge (SWE) as specified in Section 08710.

F. Veneer And Veneer Matching

1. Veneer Species and Cut: Plain Sliced Red Oak.
  - a. Veneer Face Grade WDMA: Grade "A" as described in WDMA I.S. 1A and HPVA Door Veneer tables ANSI/HPVA-1.
2. Matching Between Leaves: Book Match
3. Veneer match: Assembly of Spliced Veneer: Running Match
4. Pair match all pairs and set of pairs separated only by mullions.
5. Set match all groups of pairs and/or individual doors indicated on the door schedule or plans.
6. Veneer leaves shall be assembled with minimum Type II water resistant glue.

G. Non Fire Rated Door

1. Core will be Particleboard LD-2. Core will be securely bonded to the stiles and rails with Type I Adhesive.
  - a. Particleboard Core (PC) to comply with the minimum physical properties shown in ANSI 208.1 for Grade LD-2. Type II water resistant binder is permitted.
2. Crossbands are to be minimum thickness of 1/16". Composite crossbands of either MDF or particleboard are not permitted unless they meet the following minimum requirements.
  - a. Crossbands must extend the full width of the door and have no seams.
  - b. Minimum properties for composite crossband must meet physical and mechanical properties of thin MDF - Grade 230 as described in ANSI 208.2
    - (i) Internal bond minimum strength of 150 psi.
    - (ii) Linear expansion minimum of  $\leq 0.2$  % measured between 50% and 80% relative humidity.
3. Vertical Edges
  - a. Matching - same species as face veneer.
  - b. Vertical Edges to be two piece laminated with matching hardwood outer layer (outer stile) and hardwood lumber or SCL inner layer (inner stile), 1-1/8" minimum before trim.
  - c. Minimum width of outer stile shall be 1/4" after trim.
4. Horizontal Edges
  - a. Rails must be present on all doors. Rails are solid lumber, with grain running perpendicular to stiles. SCL is allowed for rails. MDF is unacceptable.
5. Side Panels
  - a. Fabricate matching panels with same construction as the door. Side panels will be pair matched to the associated door and receive the same finish.

H. Fire-Rated Doors: Provide Positive Pressure Label Doors

1. Positive Pressure labeled doors to be Category A
  - a. Validate the Smoke and Draft Control ("S") Label for hardware sets that include Category H smoke and draft control seals.
2. Core material shall be dictated by manufacturer's fire door approvals.
  - a. Provide 20 and 45 minute fire doors with particleboard core construction minimum LD-2, per ANSI 208.1 where allowed by manufacturers procedure. Mineral core construction is acceptable when requirements exceed particleboard label procedures.
3. Stiles (Vertical Edges) - Provide manufacturer's standard solid or laminated edge construction approved for each fire protection level with improved screw holding capability of not less than 600 lbs. and split resistance not less than 690 lbs.
4. Rails (Horizontal Edges) - Rails are solid lumber or other material contained in manufacturer's fire door approvals.
5. Blocking is required for doors with fire label construction for all surface mounted hardware.
  - a. Minimum 6 inch top rail after trim for all fire doors having surface mounted hardware.
  - b. Provide 2 lock blocks minimum 5" x 18" for exit devices,
  - c. Provide 1 lock block minimum 5" x 18" at all lock sets
6. Pairs of positive pressure doors shall be constructed with concealed intumescent seals.

## **2.3 DOOR FABRICATION**

- A. Factory pre-fit and pre-machine doors to receive hardware as specified under Section 08710.
  1. All doors shall be machined in accordance with manufacturer's procedures in order to maintain manufacturer's warranty and to avoid any machining conflicts.
  2. Doors are to be beveled at both hinge and lock edges.
  3. Factory pre-drill all hinge screw pilot holes.
  4. All fire doors shall be in compliance with NFPA80 for clearances and undercutting.
- B. Factory preparation for light openings and louvers - cut openings to comply with NFPA 80 requirements and to maintain door manufacturer's warranty.
  1. All fire label doors with lites and glass shall be factory installed, under the manufactures label service, and meet impact and labeling requirements of NFPA 80 and the Consumer Products Safety Commission (CPSC).
  2. Provide metal vision kits at all fire labeled doors. Vision kits shall be Anemostat LoPro, 20 gage, with tamperproof screws and beige baked enamel finish. Vision kits shall have UL or W/H classification markings visible for inspection.
  3. Provide solid wood glass molding of same species as face veneer for non-rated doors.

## **2.4 FACTORY FINISHING**

- A. All doors, including light beads and moldings, to be factory finished, with performance properties equivalent to WDMA Finish System using Catalyzed Polyurethane.

- B. Factory pre-finished doors to be individually poly-wrapped at the factory to protect finish during shipping.
- C. Transparent finish color selected by Architect.

### **PART 3 EXECUTION**

#### **3.1 INSTALLATION**

- A. Install all wood doors in accordance with door manufacturer's instructions and all tolerances outlined in WDMA I.S. 1A.
- B. Fire-Rated Assemblies: Upon completion of the installation, all fire door assemblies shall be tested to confirm proper operation and that it meets all criteria of a fire door assembly as per NFPA 80 2007 Edition. The inspection of the fire doors that are swinging doors with builders hardware shall be performed by individuals with knowledge and understanding of the operation components of the type of door being subjected to testing. A written record shall be maintained and given to the owner to be made available to the Authority Having Jurisdiction (AHJ). This report shall list the location of all fire door assemblies, including door number and hardware set. The contractor shall correct all deficiencies in order to be in compliance with the code.
- C. Install label doors in accordance with NFPA-80.
- D. Inspect doors prior to installation for any damage, manufacturing defects or pre-finish inconsistency.
- E. Should there be any door issues, do not proceed to installation. Contact appropriate supplier to correct unsatisfactory conditions, and proceed with installation only after corrections have been made.

#### **3.2 ADJUSTING**

- A. Final Adjustments: Adjust operating doors and hardware items just prior to final inspection and acceptance by the Owner and Architect. Leave work in complete and proper operating condition. Remove and replace defective work, including doors that are damaged or otherwise unacceptable.

#### **3.3 PROTECTION**

- A. Provide protective measures required throughout the construction period to ensure that doors will be without damage or deterioration at time of acceptance.

**END OF SECTION 08 14 16**



**SECTION 08 51 13**  
**ALUMINUM WINDOWS**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract including General and Supplemental Conditions and Division 1 Specifications, apply to this Section.

**1.2 RELATED WORK**

- A. Examine Contract Documents for requirements that affect Work of this Section. Other Specification Sections that directly relate to Work of this Section include, but are not limited to:
  - 1. Division 7, Section 07 92 00 Joint Sealants
  - 2. Division 8, Section 08 80 00, Glazing

**1.3 SUMMARY**

- A. This Section includes the following:
  - 1. Aluminum Windows in wall system (Exterior Units)
  - 2. Perimeter trims, stools, accessories, shims and anchors, and perimeter sealing of aluminum window units.

**1.4 SYSTEM DESCRIPTION**

- A. General: Provide aluminum thermally broke window systems capable of withstanding loads and thermal and structural movement requirements indicated without failure, based on testing manufacturer's standard units in assemblies similar to those indicated for this Project. Failure includes the following:
  - 1. Framing members transferring stresses, including those caused by thermal and structural movement, to glazing units.
- B. Glazing: Physically and thermally isolate glazing from framing members.
- C. Wind Loads: Provide window systems, including anchorage, capable of withstanding interior horizontal load design pressures calculated according to requirements of authorities having jurisdiction or the American Society of Civil Engineers' ASCE 7, "Minimum Design Loads for Buildings and Other Structures," 6.4.2, "Analytical Procedure," whichever are more stringent.
  - 1. Deflection of framing members in a direction normal to wall plane is limited to 1/175 of clear span or 3/4 inch whichever is smaller, unless otherwise indicated.
  - 2. Static-Pressure Test Performance: Provide window systems that do not evidence material failures, structural distress, failure of operating components to function normally, or permanent deformation of main framing members exceeding 0.2 percent of clear span when tested according to ASTM E 330.

- a. Test Pressure: 150 percent of inward and outward wind-load design pressures.
  - b. Duration: As required by design interior horizontal load requirements category.
- 3. Provide reinforcing or oversized members as required to meet design requirements.
- D. Dead Loads: Provide window system members that do not deflect an amount that will reduce glazing bite below 75 percent of design dimension when carrying full dead load.
  - 1. Provide a minimum 1/8-inch clearance between members and top of glazing or other fixed part immediately below.
- E. Live Loads: Provide window systems, including anchorage, that accommodate the supporting structures' deflection from uniformly distributed and concentrated live loads indicated without failure of materials or permanent deformation.
- F. Structural Support Movement: Provide structural-sealant-glazed system that accommodates structural movements including, but not limited to, sway, twist, column shortening, long-term creep, and deflection.
- G. Structural-Support Movement: Provide window systems that accommodate structural movements including, but not limited to, sway and deflection.
- H. Dimensional Tolerances: Provide window systems that accommodate dimensional tolerances of adjacent construction.

## 1.5 PERFORMANCE REQUIREMENTS

- A. Storefront System Performance Requirements
- B. General Performance: Aluminum-framed window system shall withstand the effects of the following performance requirements without exceeding performance criteria or failure due to defective manufacture, fabrication, installation, or other defects in construction:
  - 1. Design Wind Loads: Determine design wind loads applicable to the Project from basic wind speed indicated in miles per hour, according to ASCE 7, Section 6.5, "Method 2- Analytical Procedure," based on mean roof heights above grade indicated on Drawings.
    - a. Basic Wind Speed (MPH): 125 mph.
    - b. Importance Factor : II
    - c. Exposure Category : C
  - 2. Windloads: Provide window system, including anchorage, capable of withstanding wind load design pressures for inward and outward. These design pressures are based on the International Building Code 2018 (New Jersey Edition):
  - 3. Uniform pressure of 35 pounds per square foot.
  - 4. Water Resistance: The test specimen shall be tested in accordance with ASTM E 331. There shall be no leakage at a minimum static air pressure differential of 8 psf (383 Pa) as defined in AAMA 501.
  - 5. Uniform Load: A static air design load of 35 psf (1680 Pa) shall be applied in the positive and negative direction in accordance with ASTM E 330. There shall be no deflection in

excess of L/175 of the span of any framing member. At a structural test load equal to 1.5 times the specified design load, no glass breakage or permanent set in the framing members in excess of 0.2% of their clear spans shall occur.

6. Thermal transmittance (U-factor): When tested to AAMA Specification 1503, the thermal transmittance (U-factor) shall not be more than:
  - a. Glass to Exterior – 0.47 (low-e) or 0.61 (clear)
  - b. Glass to Center – 0.44 (low-e) or 0.61 (clear)
  - c. Glass to Interior – 0.41 (low-e) or 0.56 (clear)
7. Condensation Resistance: When tested to AAMA Specification 1503, the condensation resistance factor shall not be less than:
8. Sound Transmission Class (STC) and Outdoor-Indoor Transmission Class (OITC): When tested to AAMA Specification 1801 and in accordance with ASTM E1425 and ASTM E90, the STC and OITC Rating shall not be less than:
  - a. Glass to Exterior – 38 (STC) and 31 (OITC).
  - b. Glass to Center – 37 (STC) and 30 (OITC).
  - c. Glass to Interior – 38 (STC) and 30 (OITC).
9. Windborne-Debris-Impact-Resistance Performance: Shall be tested in accordance with ASTM E 1886 and information in ASTM E 1996 and /or TAS 201/203.
  - a. Large-Missile Impact: For aluminum-framed systems located within 30 feet (9.1 m) of grade.
  - b. Small-Missile Impact: For aluminum-framed systems located more than 30 feet (9.1 m) above grade.

**C. Vent Window Performance Requirements**

1. Performance Requirements: Provide aluminum windows of performance indicated that comply with AAMA/WDMA/CSA 101/I.S.2/A440 (NAFS)
  - a. Performance Class and Grade: AW-PG90-AP
2. Air Infiltration: The test specimen shall be tested in accordance with ASTM E 283 at a minimum window size of 36" x 60" (914 x 1524 mm). The air infiltration rate shall not exceed 0.10 cfm/ft<sup>2</sup> at a static air pressure differential of 6.24 psf (300 Pa).
3. Water Resistance: The test specimen shall be tested in accordance with ASTM E 547 and ASTM E 331 at a minimum window size of 36" x 60" (914 x 1524 mm). There shall be no leakage as defined in the test method at a static air pressure differential of 12 psf (574 Pa).
4. Uniform Load Deflection: A minimum static air pressure difference of 90 psf (4310 Pa) shall be applied in the positive and negative direction in accordance with ASTM E 330. There shall be no deflection in excess of L/175 of the span of any framing member.
5. Uniform Load Structural Test: A minimum static air pressure difference of 135 psf (6465 Pa) shall be applied in the positive and negative direction in accordance with ASTM E 330. The unit shall be evaluated after each load.
6. Component Testing: Window components shall be tested in accordance with procedures described in ANSI AAMA/WDMA/CSA 101/I.S.2/A440 (NAFS).
7. Thermal Transmittance Test (U-Factor): When tested in accordance with AAMA 1503, the conductive thermal transmittance (U-Factor) shall not be more than:

- a. Project-Out: U-Factor not more than .60 BTU/hr/sf/°F AAMA 507 or NFRC100 when using project specified glass.
- b. Project-In: U-Factor not more than .62 BTU/hr/sf/°F AAMA 507 or NFRC100 when using project specified glass.
- 8. Condensation Resistance Test (CRF): When tested in accordance with AAMA 1503, the condensation resistance factor (CRF) shall not be less than:
  - a. Project-Out: (CRF<sub>f</sub>) frame not less than 56 with clear glass.  
Project-Out: (CRF<sub>g</sub>) glass not less than 55 with clear glass.
  - b. Project-In: (CRF<sub>f</sub>) not less than 56 with clear glass.  
Project-In: (CRF<sub>g</sub>) not less than 55 with clear glass.
- 9. Windborne-Debris-Impact-Resistance Performance: Shall be tested in accordance with ASTM E 1886 and information in ASTM E 1996 and TAS 201/203.
  - a. Large – Missile Impact: For aluminum-framed systems located within 30 feet (9.1 m) of grade (Project-Out with 0.125" wall thickness).
  - b. Small – Missile Impact: For aluminum-framed systems located above 30 feet (9.1m) of grade (Project-Out with 0.125" wall thickness).
- 10. Forced Entry Resistance: All windows shall conform to ASTM F588, Grade 10.
- 11. Thermal Barrier Tests: Testing shall be in general accordance with AAMA 505 Dry Shrinkage and Composite Thermal Cycling test procedure, AAMA TIR-A8, Structural Performance of Composite Thermal Barrier systems.

## 1.6 SUBMITTALS

- A. Product Data: For each product specified. Include details of construction relative to materials, dimensions of individual components and profiles, hardware, finishes, performance data and installation instructions for each type of storefront system indicated.
- B. Shop Drawings: For window systems. Show details of fabrication and installation, including plans, elevations, sections, details of components including hardware, provisions for expansion and contraction, and attachments to other work.
- C. Samples for Verification: Of each type of exposed finish required in manufacturer's standard sizes. Where finishes involve normal color and texture variations, include Sample sets showing the full range of variations expected.
- D. Fabrication Sample: Of each vertical-to-horizontal framing intersection of aluminum framed systems, made from minimum 6-inch lengths of full-size components and showing details of the following:
  - 1. Joinery.
  - 2. Anchorage.
  - 3. Expansion provisions
  - 4. Glazing.
  - 5. Flashing and drainage.
- E. Installer Certificates: Signed by manufacturer certifying that installers comply with specified requirements.
- F. Field Test Reports: Indicate and interpret test results for compliance with storefront systems' performance requirements.

- G. Product Test Reports: Based on evaluation of tests performed by manufacturer and witnessed by a qualified independent testing agency, indicate compliance of window systems with requirements based on comprehensive testing of current systems.
- H. Manufacturer's Warranty: Sample warranty for Special warranties.

### **1.7 QUALITY ASSURANCE**

- A. Installer Qualifications: Engage an experienced installer to assume engineering responsibility and perform work of this Section who has specialized in installing window systems similar to those required for this Project and who is acceptable to manufacturer.
  - 1. Engineering Responsibility: Prepare data for window systems, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.
- B. Manufacturer Qualifications: A manufacturer capable of providing aluminum-framed window systems that meet or exceed performance requirements indicated and documenting this performance by inclusion of test reports and calculations.
- C. Source Limitations: Obtain window system one source from a single manufacturer.
- D. Product Options: Drawings indicate size, profiles, and dimensional requirements of window systems are based on the specific systems indicated. Other manufacturers' systems with equal performance characteristics may be considered.
  - 1. Do not modify size and dimensional requirements. Do not modify intended aesthetic effect, as judged solely by Architect, except with Architect's approval and only to the extent needed to comply with performance requirements. Where modifications are proposed, submit comprehensive explanatory data to Engineer for review.
- E. Welding Standards: Comply with applicable provisions of AWS D1.2, "Structural Welding Code--Aluminum."
- F. Pre-installation Conference: Conduct conference at Project site.
- G. Structural Sealant Glazing: Comply with ASTM C 1401, "Guide for Structural Sealant Glazing" for design and installation of structural sealant glazed systems.
- H. Structural sealant joints: design reviewed and approved by structural sealant manufacturer.

### **1.8 PROJECT CONDITIONS**

- A. Field Measurements: Verify dimensions by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

### **1.9 WARRANTY**

- A. Special Warranty: Submit a written warranty executed by the manufacturer agreeing to repair or replace components of window systems that fail in materials or workmanship within the specified warranty period. Failures include, but are not limited to, the following:
  - 1. Structural failures including, but not limited to, excessive deflection.
  - 2. Failure of system to meet performance requirements.

3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
4. Failure of operating components to function normally.

B. Warranty Period: 2 years from date of Substantial Completion.

## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURERS**

- A. Manufacturers: Basis-of-Design Products . Subject to compliance with requirements, provide the following products by Kawneer Company Inc.
1. Match existing clerestory windows located in the adjacent Women's Locker Room completed in 2013.
  2. Window (Storefront) System: Trifab VG 451T (Thermal) Framing System
    - a. System Dimensions: 2" x 4-1/2" (50.8 mm x 114.3 mm)
    - b. Glass: Center, Exterior
- B. Subject to compliance with requirements, provide either the named product or comparable product by one of the following manufacturers:
1. Kawneer Company Inc.
  2. Efco Corporation
  3. TRACO
  4. YKK AP America Inc.
  5. Or approved equal

### **2.2 DEFINITIONS**

- A. Definitions: For fenestration industry standard terminology and definitions refer to American Architectural Manufacturers Association (AAMA) – AAMA Glossary (AAMA AG).

### **2.3 MATERIALS**

- A. Aluminum Extrusions for window System: Alloy and temper recommended by manufacturer for strength, corrosion resistance, and application of required finish and not less than 0.070" (1.8 mm) wall thickness at any location for the main frame and complying with ASTM B 221: 6063-T6 alloy and temper.
- B. Aluminum Extrusions for Project-In Vent Windows: Alloy and temper recommended by aluminum window manufacturer for strength, corrosion resistance, and application of required finish and not less than 0.090" (2.3 mm) wall thickness at any location for the main frame and sash members.
- C. Fasteners: Aluminum, nonmagnetic stainless steel or other materials to be non-corrosive and compatible with aluminum framing members, trim hardware, anchors, and other components.
- D. Anchors, Clips, and Accessories: Aluminum, nonmagnetic stainless steel, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions or other suitable zinc coating; provide sufficient strength to withstand design pressure indicated
- E. Reinforcing Members: Aluminum, nonmagnetic stainless steel, or nickel/chrome-plated steel complying with ASTM B 456 for Type SC 3 severe service conditions, or zinc-coated steel or

iron complying with ASTM B 633 for SC 3 severe service conditions or other suitable zinc coating; provide sufficient strength to withstand design pressure indicated.

- F. Steel Reinforcement: Complying with ASTM A 36 for structural shapes, plates, and bars; ASTM A 611 for cold-rolled sheet and strip; or ASTM A 570 for hot-rolled sheet and strip.
- G. Sealant: For sealants required within fabricated storefront system, provide permanently elastic, non-shrinking, and non-migrating type recommended by sealant manufacturer for joint size and movement.
- H. Tolerances: Reference to tolerances for wall thickness and other cross-sectional dimensions of storefront members are nominal and in compliance with AA Aluminum Standards and Data.
- I. Glazing as specified in Division 8 Section "Glazing."
- J. Glazing Gaskets: Manufacturer's standard pressure-glazing system of black, resilient glazing gaskets, setting blocks, and shims or spacers, fabricated from an elastomer of type and in hardness recommended by system and gasket manufacturer to comply with system performance requirements. Provide gasket assemblies that have corners sealed with sealant recommended by gasket manufacturer.
- K. Framing system gaskets, sealants, and joint fillers as recommended by manufacturer for joint type.
- L. Sealants and joint fillers for joints at perimeter of entrance and storefront systems
- M. Bituminous Paint: Cold-applied asphalt-mastic paint complying with SSPC-Paint 12 requirements, except containing no asbestos, formulated for 30-mil thickness per coat.

## **2.4 ALUMINUM WINDOW (STOREFRONT) SYSTEM COMPONENTS**

- A. Thermal Barrier (Trifab VG 451T):
  - 1. Kawneer IsoLock Thermal Break with a 1/4" (6.4 mm) separation consisting of a two-part chemically curing, high-density polyurethane, which is mechanically and adhesively joined to aluminum storefront sections.
    - a. Thermal Break shall be designed in accordance with AAMA TIR-A8 and tested in accordance with AAMA 505.
- B. Brackets and Reinforcements: Provide manufacturer's standard high strength aluminum with non-staining, nonferrous shims for aligning system components. Brackets and reinforcements that are compatible with adjacent materials. Provide non-staining, nonferrous shims for aligning system components.
- C. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, non-staining, nonbleeding fasteners and accessories compatible with adjacent materials.
  - 1. Reinforce members as required to retain fastener threads.
  - 2. Do not use exposed fasteners, except for hardware application. For hardware application, use countersunk Phillips flat-head machine screws finished to match framing members or hardware being fastened, unless otherwise indicated.
- D. Perimeter Anchors: When steel anchors are used, provide insulation between steel material and aluminum material to prevent galvanic action
- E. Framing Members: Manufacturer's standard extruded-aluminum framing members of thickness required and reinforced as required to support imposed loads.

1. Construction: Non-thermal for interior members and Framing members, composite assemblies of two separate extruded-aluminum components permanently bonded by an elastomeric material of low thermal conductance for exterior members.
- A. Glass and Glazing Materials: Refer to Division 8 Section "Glazing" for glass units and glazing requirements applicable to glazed aluminum window units.
- B. Glazing System: Glazing method shall be wet/dry type in accordance with manufacturer's standards. Exterior glazing shall be silicone back bedding sealant. Interior glazing shall be snap in type glazing beads with an interior gasket in accordance with AAMA 702 or ASTM C864.

## **2.5 Glazing Systems for Storefront System**

- A. Glazing: As specified in Division 08 Section "Glazing".
- B. Glazing Gaskets: Manufacturer's standard compression types; replaceable, extruded EPDM rubber.
- C. Spacers and Setting Blocks: Manufacturer's standard elastomeric type.
- D. Bond-Breaker Tape: Manufacturer's standard TFE-fluorocarbon or polyethylene material to which sealants will not develop adhesion.
- E. Glazing Sealants: For structural-sealant-glazed systems, as recommended by manufacturer for joint type, and as follows:
  1. Structural Sealant: ASTM C 1184, single-component neutral-curing silicone formulation that is compatible with system components with which it comes in contact, specifically formulated and tested for use as structural sealant and approved by a structural-sealant manufacturer for use in aluminum-framed systems indicated.
    - a. Color: Black
  2. Weatherseal Sealant: ASTM C 920 for Type S, Grade NS, Class 25, Uses NT, G, A, and O; single-component neutral-curing formulation that is compatible with structural sealant and other system components with which it comes in contact; recommended by structural-sealant, weatherseal-sealant, and aluminum-framed-system manufacturers for this use.
    - a. Color: Matching structural sealant.

## **2.6 Glazing System for Fire Protective Glazing**

- A. See Glazing Section 08 80 00 for Fire Rated glass and framing system.

## **2.7 SEALANTS**

- A. General: Use neutral-cure silicone sealants with insulating-glass units.

## **2.8 FABRICATION**

- A. Framing Members, General: Fabricate components that, when assembled, have the following characteristics:
  1. Profiles that are sharp, straight, and free of defects or deformations.
  2. Accurately fit joints; make joints flush, hairline and weatherproof.
  3. Means to drain water passing joints, condensation within framing members, and moisture migrating within the system to exterior.



4. Physical and thermal isolation of glazing from framing members.
  5. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
  6. Provisions for field replacement of glazing.
  7. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.
- B. Mechanically Glazed Framing Members: Fabricate for flush glazing without projecting stops.
- C. Structural-Sealant-Glazed Framing Members: Include accommodations for using temporary support device to retain glazing in place while structural sealant cures.
- D. Storefront Framing: Fabricate components for assembly using manufacturer's standard installation instructions.
- E. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.
- F. Vent Windows - Window Frame Joinery: Screw-Spline, Factory sealed frame and vent corner Joints
- G. Vent Windows: Fabricate aluminum windows in sizes indicated. Include a complete system for assembling components and anchoring windows.
- H. Vent Windows: Fabricate aluminum windows that are re-glazable without dismantling sash or framing.
- I. Sub frames: Provide sub frames with anchors for window units as shown, of profile and dimensions indicated but not less than 0.093" (2.4 mm) thick extruded aluminum. Miter or cope corners, and join with concealed mechanical joint fasteners. Finish to match window units. Provide sub frames capable of withstanding design loads of window units.
- J. Vent Windows - Factory-Glazed Fabrication: Glaze aluminum venting windows in the factory where practical and possible for applications indicated. Comply with requirements in Division 08 Section "Glazing" and with AAMA/WDMA/CSA 101/I.S.2/A440 (NAFS).
- K. Vent Windows - Glazing Stops: Provide snap-on glazing stops coordinated with Division 08 Section "Glazing" and glazing system indicated. Provide glazing stops to match frame.
- L. General: Fabricate components that, when assembled, will have accurately fitted joints with ends coped or mitered to produce hairline joints free of burrs and distortion. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.
1. Fabricate components for shear-block frame construction.
- M. Forming: Form shapes with sharp profiles, straight and free of defects or deformations, before finishing.
- N. Prepare components to receive concealed fasteners and anchor and connection devices.
- O. Welding: Weld components to comply with referenced AWS standard. Weld before finishing components to greatest extent possible. Weld in concealed locations to greatest extent possible to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.
- P. Glazing Channels: Provide minimum clearances for thickness and type of glass indicated according to FGMA's "Glazing Manual."
- Q. Metal Protection: Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended

by manufacturer for this purpose. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

## **2.9 ALUMINUM FINISHES**

- A. General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations relative to applying and designating finishes.
- B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- C. Finish designations prefixed by AA conform to the system established by the Aluminum Association for designating aluminum finishes.
- D. Class I, Clear Anodic Finish: AA-M12C22A41 (Mechanical Finish: nonspecular as fabricated; Chemical clear No. 14. Finish: etched, medium matte; Anodic Coating: Architectural Class I, clear coating 0.018 mm or thicker) complying with AAMA 607.1.
- E. Factory Finishing:
  - 1. Kawneer Permacoat™ AAMA 2604, Powder Coating, Color: TBD, from manufacturer's standard color chart.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of entrance and storefront systems. Do not proceed with installation until unsatisfactory conditions have been corrected.

### **3.2 INSTALLATION**

- A. General: Comply with manufacturer's written instructions for protecting, handling, and installing storefront systems, venting windows, hardware, accessories, and other components. Do not install damaged components. Fit frame joints to produce hairline joints free of burrs and distortion. Rigidly secure non-movement joints. Seal joints watertight.
- B. Set sill members in bed of sealant or with gaskets, as indicated, for weather tight construction.
- C. Metal Protection: Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended by manufacturer for this purpose. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.
- D. Install system and components to drain water passing joints and condensation, water penetrating joints, and moisture occurring or migrating within the system to the exterior.

- E. Install framing components and window system level, plumb, square, true to line, without distortion or impeding thermal movement, anchored securely in place to structural support, and in proper relation to wall flashing and other adjacent construction.
- F. Install framing components plumb and true in alignment with established lines and grades without warp or rack of framing members.
- G. Install entrances plumb and true in alignment with established lines and grades without warp or rack. Lubricate operating hardware and other moving parts according to hardware manufacturers' written instructions.
  - 1. Install surface-mounted hardware according to manufacturer's written instructions using concealed fasteners to greatest extent possible.
- H. Install glazing to comply with requirements of Division 8 Section "Glazing," unless otherwise indicated.
  - 1. Install structural silicone sealant according to sealant manufacturer's written instructions.
- I. Install perimeter sealant to comply with requirements of Division 7 Section "Joint Sealants," unless otherwise indicated.
- J. Erection Tolerances: Install window systems to comply with the following maximum tolerances:
  - 1. Variation from Plane: Limit variation from plane or location shown to 1/8 inch in 12 feet; 1/4 inch over total length.
  - 2. Alignment: Where surfaces abut in line, limit offset from true alignment to 1/16 inch. Where surfaces meet at corners, limit offset from true alignment to 1/32 inch.
  - 3. Diagonal Measurements: Limit difference between diagonal measurements to 1/8 inch.

### **3.3 FIELD QUALITY CONTROL**

- A. Repair or remove and replace Work that does not meet requirements or that is damaged by testing; replace to conform to specified requirements.

### **3.4 ADJUSTING AND CLEANING**

- A. Adjust operating sashes, screens, hardware, and accessories for a tight fit at contact points and weather stripping for smooth operation and weather tight closure. Lubricate hardware and moving parts.
- B. Clean aluminum surfaces immediately after installing windows. Avoid damaging protective coatings and finishes. Remove excess sealants, glazing materials, dirt, and other substances.
- C. Clean glass immediately after installing windows. Comply with manufacturer's written recommendations for final cleaning and maintenance. Remove nonpermanent labels, and clean surfaces.
- D. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.
- E. Protect window surfaces from contact with contaminating substances resulting from construction operations. In addition, monitor window surfaces adjacent to and below exterior concrete and masonry surfaces during construction for presence of dirt, scum, alkaline deposits, stains, or other contaminants. If contaminating substances do contact window surfaces, remove contaminants immediately according to manufacturer's written recommendations.

- F. Remove excess sealant and glazing compounds, and dirt from surfaces.

**3.5 PROTECTION**

- A. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and installer that ensure window are without damage or deterioration at the time of Substantial Completion.

**END OF SECTION 08 51 13**

**SECTION 08 71 00  
DOOR HARDWARE**

**PART 1 GENERAL**

**1.1 GENERAL PROVISIONS**

- A. Attention is directed to the GENERAL REQUIREMENTS AND COVENANTS-DIVISION 1, the SPECIAL PROVISIONS-DIVISION II, and the SAMPLE CONTRACT FORMS-DIVISION IV, which are hereby made a part of this Specification Section.
- B. Examine all Drawings and all Sections of the Specifications for requirements and provisions affecting the work of this Section.

**1.2 WORK INCLUDED**

- A. Provide all labor, materials, equipment, services and accessories necessary to furnish the work of this Section, complete and functional, as indicated in the Contract documents and as specified herein.
- B. The principle work of this Section includes, but may not be limited to, the following:
  - 1. Furnish and deliver to the job site all finish hardware required for the Work under this Contract, as hereinafter specified and scheduled.
  - 2. Furnish all required templates and schedules.

**1.3 RELATED SECTIONS:**

- A. Section 08 11 13 Hollow Metal Doors and Frames
- B. Installation of Finish Hardware.
  - 1. Steel Doors and Frames.
- C. Section 08 14 16 Flush Wood Doors.

**1.4 SUBMITTALS**

- A. Schedules: Within 21 days after the award of the Contract, six (6) copies of a complete Hardware Schedule, in vertical format, shall be furnished through the General Contractor for approval by the Architect. The Schedule shall list the Specification Hardware Set number next to the Schedule Heading Number and shall include a numerical Door Index listing the Schedule Heading Number and a condensed list showing the name of the manufacturer, product series number and quantity of hardware items scheduled.
- B. Templates: All required templates shall be furnished in accordance with the schedule. Furnish templates to the door and frame manufacturer sufficiently in advance so as not to delay progress of the work. However, no templates shall be issued or materials ordered

until the schedule has been approved.

- C. Samples: Submit samples as requested by the Architect of any materials specified herein. Samples shall be clearly marked with the manufacturer's name and number and with the schedule number. Samples shall be returned to the supplier after being reviewed.
- D. Product Data: Include with the Finish Hardware Submittal for approval a complete set of catalogue cuts covering the products specified herein.

#### **1.5 PACKING AND MARKING**

- A. All hardware shall be delivered to the site in packages, which are legibly marked with labels indicating the manufacturers' numbers, types and sizes, and with the Hardware Schedule reference number.
- B. Each hardware item shall be wrapped together with all screws, bolts, and fastenings necessary for its proper installation.

#### **1.6 DELIVERY AND STORAGE**

- A. Delivery of hardware to the job shall be made in accordance with the Contractor's instructions. The Contractor shall receive, check against invoices, and store all hardware at the job. He shall furnish the supplier of the hardware with receipts for all hardware received.
- B. The Contractor shall provide adequate locked storage space with shelving, and shall be responsible for all items of hardware after receipt from the supplier. He shall replace all lost or damaged hardware at his own expense.

#### **1.7 SUPPLIER'S QUALIFICATIONS AND RESPONSIBILITIES**

- A. In order to qualify for work under this Section, hardware supplier must employ on a full time basis a regular member of the Society of Architectural Hardware Consultants or equal, to prepare detailed schedules, check shop drawings and supervise installation.
- B. Hardware Supplier shall be responsible for the accuracy of the quantities, sizes, finish and proper hardware to be furnished, whether specifically listed or not, and shall be responsible for determining all details, such as hand of doors, bevel of locks, etc.
- C. Hardware Supplier shall furnish all finish hardware required for the building and not furnished under another Section. Hardware not specifically listed for a particular opening shall be furnished under this Section and shall be same as hardware for similar openings elsewhere in the building.

#### **1.8 KEYING AND KEY CONTROL (Keying to match owner's existing system)**

- A. Grandmaster Key, Master Key and Construction Masterkey all locks and cylinders to the existing system as directed by the Architect and/or Owner.
- B. After receipt of an approved Hardware Schedule and prior to ordering any locking devices, hardware supplier shall arrange through the General contractor for a meeting with the Architect and/or owner to discuss keying for this job. A Keying Schedule shall be submitted for review within ten days after such meeting.

**1.9      =SPECIAL REQUIREMENTS**

- A. Hardware Supplier shall determine conditions and materials of all doors and frames for proper application of hardware.
- B. The Hardware Schedule shall list the actual product series numbers. Supplier is required to follow manufacturer's catalogue requirements for the actual size of door closers, brackets, and door holders. All door sizes are to be noted on the Door Schedule and all hardware shall be in strict accordance with requirements of height, width and thickness.
- C. Tools for Maintenance: All special tools packed with hardware items shall be saved and turned over to the Owner upon completion of the Work.
- D. All lever or knob trim for door locks to hazardous areas such as Mechanical Rooms, Incinerator Rooms, etc., shall have a tactile surface to comply with requirements of the Authority Having Jurisdiction.
- E. Lock fronts, flush bolt faces, and strikes shall be beveled in accordance with manufacturer's standards.
- F. Handing of doors shall be verified by this Supplier.
- G. Refer to Hollow Metal, Wood and Aluminum Door Sections regarding adequate blocking and reinforcing for surface-applied hardware. The use of thru-bolts is prohibited.
- H. All electrified hardware items are to be interfaced with the Fire Alarm System.

**1.10     WARRANTIES**

- A. Attention is directed to provisions of the GENERAL CONDITIONS regarding guarantees and warranties for work under this Contract.
- B. Manufacturers shall provide their warranties for work under this Section. However, such warranties shall be in addition– to, and not in lieu of, all other liabilities which the manufacturers and Contractor may have by law or by other provisions of the Contract Documents.

**1.11     REFERENCES**

- A. Comply with applicable requirements of the following standards. Where these standards conflict with other specified requirements, the most restrictive requirements shall govern.

- 1. ADA and Massachusetts Access Barriers Regulations.
- 2. Door and Hardware Institute (DHI):

Ref. 1 Recommended Locations for Builders Hardware.

**PART 2    PRODUCTS**

**2.1      QUALITY ASSURANCE**

- A. Hardware shall be entirely free from imperfection in manufacture and finish.
- B. Interior door hardware occurring in the fire barrier to meet UL ratings for 3 hour rated partition.

- B Qualities, weights and sizes given are the minimum that will be accepted. It is the responsibility of the Hardware Supplier to follow the manufacturer's catalogue requirements for the proper size and weight of hardware in each case. All door sizes are to be noted on the door schedule and all hardware shall be in strict accordance with requirements of height, width, and thickness.

**C. ACCEPTABLE MANUFACTURERS**

The numbers used below to set a standard of quality for the major products for this project are taken from the catalogs of those manufacturers whose names appear in parentheses. Equivalent products of the other manufacturers are acceptable provided said products are equal to the items specified in quality, weight, design and function, and approved by the Architect. Where only one manufacturer is listed, no substitutions will be allowed.

<u>ITEM</u>	<u>MANUFACTURERS</u>
Butt Hinges	(Ives), Stanley, McKinney, Bommer
Locksets/Latchsets	(Corbin Russwin), Arrow, Schlage
Panic Devices	(Falcon), Von Duprin, Dorma, Precision
Door Closers	(Falcon), LCN Closers, Norton, Dorma
Pedestrian Power Operators	(Hunter Automatics), Dorma, LCN
Door Pulls	(Burns), Don-Jo, Rockwood
Protection Plates	Burns, Don-Jo, (Rockwood)
Floor & Wall Stops	Burns, Don-Jo, (Rockwood)
OH Stops & Stays	(ABH Mfg.), Corbin, Glynn Johnson
Flush Bolts	(Rockwood), Door Controls Intl., Ives, Glynn Johnson
Coordinator Systems	(Rockwood), Dorma or known equal
Thresholds	National Guard Products, Zero, (Pemko) (National
Auto. Door Bottoms	Guard Products), Zero, Pemko
Astragals	(National Guard Products), Zero, Pemko
Gasketing	(National Guard Products), Zero, Pemko

**2.02 HINGES AND PIVOTS**

- A. Number of hinges or pivots per door: Two hinges or pivots are to be provided for doors up to and including five feet in height, and an additional hinge for each two-and-one-half feet (2-1/2'), or fraction thereof, of the height of the door. Hinges for exterior doors shall be Stanley CB1961 Series, 5" x 4-1/2", NRP, x US32D..
- B. Hinges for interior doors shall be steel, Stanley CB Series, sized as follows:

<u>Door</u>			<u>Hinge</u>
<u>Thickness</u>	<u>Door Width</u>	<u>Hinge Weight</u>	<u>Height</u>
1-3/4 in.	Under 39 in.	Regular Weight CB1900 Series	4-1/2"
1-3/4 in.	39-in. and over	Heavy Weight CB1901 Series	5"

Width of hinges shall be determined by trim conditions.



- C. Hinges are to be of three-knuckle design, equipped with full radial thrust and lateral bearing assemblies. The bearing assemblies are to be permanently lubricated and sealed. All hinges are to have positive non-rising pins and a hole in the bottom tip for easy pin removal.

### **2.3 LOCKSETS AND LATCHSETS**

- A. Unless noted otherwise, locksets and latchsets shall be heavy duty mortise type, Corbin Russwin ML2000 Series x "PSA (Princeton)" lever and rose trim.
- B. Deadlocks shall be Corbin Russwin DL4000 Series in functions as noted.
- C. All locks shall be furnished with 2-3/4 in. backset and wrought box strikes.
- D. Furnish strike lips as required by details. Strikes at Prs. Doors shall be 7/8 in. Lip to Center.
- E. Furnish cylinders for all locking devices on this job.
- F. Power supplies for electric locksets shall be by Security.

### **2.4 PANIC DEVICES**

- A. Panic Devices shall be Falcon, in functions as noted in the HW Sets below or approved equal.
- B. Lever trim on panic devices shall match lockset trim or is Exit Only per hardware sets below. Furnish breakaway levers.
- C. Furnish fire rated devices where required. Furnish cylinder dogging for all non-rated devices.

### **2.5 CLOSERS**

- A. Overhead surface closers shall be Falcon as listed in the hardware sets below:
- B. Furnish closers with back plates. Plates shall not be visible when closer cover is installed.
- C. Unless specified otherwise, closers shall be mounted on that side of the opening least objectionable to public view. Provide parallel arm type at reverse bevel conditions.
- D. The Hardware Schedule shall note the degrees of opening for all doors with closers.

### **2.6 PROTECTION PLATES**

- A. Push Plate size, in general, shall be 16-in. x 8-in, stile permitting; otherwise, plates shall be 16-in. x 4-in.
- B. Kick Plates shall be 8-in. high; width of plate shall be determined by the width of the door: plates shall be 2" LWOD on single doors, and 1" LWOD on pairs of doors.
- C. Armor Plates shall be 34" high. Width shall be determined the same as for Kick Plates.

**2.7 FLUSH BOLTS AND COORDINATORS**

- A. Flush Bolts and coordinators shall be Rockwood as listed in the hardware sets below:
- B. Furnish dustproof strikes for all flush bolts.

**2.8 STOPS AND STAYS (INTERIOR DOORS)**

- A. Wall Stops shall be provided at 90-degree openings. Wall Stops shall be Rockwood 409.
- B. Floor Stops shall be provided where applicable and where conditions allow. Floor Stops shall be Rockwood.
- C. Where neither a wall stop nor a floor stop can be used, furnish an Overhead Stop equal to ABH Mfg. 3320-ADJ Series.

**2.9 THRESHOLDS**

- A. Thresholds for outswing exterior doors shall be equal to or Pemko 272 .
- B. Thresholds for inswing exterior doors shall be equal to NGP 422 x 82 x 17.
- C. Thresholds at curbs shall be equal to NGP 892S.

**2.10 GASKETING/AUTO. DOOR BOTTOMS/ASTRAGALS**

- A. Gasketing shall be National Guard Products 5050, applied at head and jambs.
- B. Automatic Door Bottoms shall be mortise type, NGP 423/320. If mortise type conflicts with material construction or other hardware, furnish surface type NGP 520.
- C. Where a set of astragals is scheduled, furnish one set (two pieces) of National Guard Products A605A x full height of opening. Where an overlapping astragal is specified, furnish NGP 178SA x full height of opening.

**2.11 MISCELLANEOUS**

- A. Door Silencers for hollow metal frames shall be equal to Rockwood 608 RKW.
- B. D Catches shall be Ives CL-21.

**2.12 FINISHES**

- A. Except as noted otherwise, Finish of hardware items shall be as follows:
  - 1. Butts (interior), Pivots, Deadlocks, Cylinders, Floor Stops, Wall Stops, Overhead Stops, Pulls, Flush Bolts, Push/Pull Latches, etc., shall be satin chrome, US26D (626) finish.
  - 2. Butts (exterior), Locksets, Latchsets, Panic Devices, Push Plates, Push/Pull Bar Assemblies, Kick Plates, and Armor Plates shall be satin stainless steel, US32D (630)

finish. Plates shall be BS .062 ga.

3. Closers and Pedestrian Power Operators shall be painted to match other hardware.
4. Thresholds shall be Aluminum.

### **PART 3 EXECUTION**

#### **3.1 MOUNTING POSITIONS**

- A. Heights given are centerline heights from finished floor.
- B. Comply with recommendations of Builders' Hardware Manufacturers Association (BHMA), subject to approval, for heights of items not indicated; height is to centerline unless otherwise indicated.
  1. Top Hinge: To jamb manufacturer's standard, but not greater than 10 in. from head of frame to centerline of hinge.
  2. Bottom Hinge: To jamb manufacturer's standard, but not greater than 12-1/2 in. from floor to centerline of hinge.
  3. Intermediate Hinge: Equally spaced between top and bottom hinges.
  4. Locks and Latches: 40 in. to center of lever.
- C. Set hardware plumb, level, and in exact alignment and location. Conceal and countersink fasteners wherever possible.

#### **3.2 ADJUSTING, CLEANING AND PROTECTION**

- A. Adjust hardware items to work smoothly, easily and correctly.
- B. Clean exposed surfaces using non-abrasive materials and methods recommended by the manufacturer of the hardware being cleaned. Remove and replace work which cannot be successfully cleaned, as judged solely by the Architect.
- C. Provide temporary protection to ensure work being done without damage or deterioration at time of final acceptance. Levers shall be kept covered with heavy cloth and other hardware shall be protected against damage until Substantial Completion of the Project. Remove protections and reclean as necessary immediately prior to final acceptance.

#### **3.3 COMPLETION AND CONTINUED MAINTENANCE**

- A. Before completion of work of this Section, inspect work with Architect and adjust and correct work to leave operating parts in perfect operating condition, jointing to adjacent material tight, surfaces without blemishes or stains, and defects or damaged work replaced or corrected.

#### **3.4 HARDWARE SETS**

- A. Door hardware to include all components need for weather stripping, hinges, emergency egress, locksets, closers, kick plates
- B. Manufacturers listed are "Basis of Design". Other manufacturers will be considered per the substitution requirements identified in Division 1 specifications.
- C.

- D. Each Hardware Set listed below represents the complete hardware requirements for one opening (single door or pair of doors). Furnish the quantities required of each set for the work.
- E. The numbers used opposite locksets to identify the function are Corbin Russwin lock numbers. Where "TO" is indicated at locksets, outside lever shall be furnished with a tactile surface on inside face.
- F. Security items are listed below the individual Hardware Sets for Hardware Set coordination and templating for doors and frames.

### **3.5 SPECIAL REQUIREMENTS SPECIAL REQUIREMENTS**

- B. Hardware Supplier shall determine conditions and materials of all doors and frames for proper application of hardware.
- C. The Hardware Schedule shall list the actual product series numbers. Supplier is required to follow manufacturer's catalogue requirements for the actual size of door closers, brackets, and door holders. All door sizes are to be noted on the Door Schedule and all hardware shall be in strict accordance with requirements of height, width and thickness.
- D. Tools for Maintenance: All special tools packed with hardware items shall be saved and turned over to the Owner upon completion of the Work.
- E. All lever or knob trim for door locks to hazardous areas such as Mechanical Rooms, Incinerator Rooms, etc., shall have a tactile surface to comply with requirements of the Authority Having Jurisdiction.
- F. Lock fronts, flush bolt faces, and strikes shall be beveled in accordance with manufacturer's standards.
- G. Handing of doors shall be verified by this Supplier.
- H. Refer to Hollow Metal, Wood and Aluminum Door Sections regarding adequate blocking and reinforcing for surface-applied hardware. The use of thru-bolts is prohibited.
- I. All electrified hardware items are to be interfaced with the Fire Alarm System, where applicable.

#### **Hardware Set - HW-1**

1 Single door 102B Exit Only Function LHR

3-0 x 7-0 x 1 3/4 - HM DR x HM FR (Exterior)

3 Standard Hinge	Ives 5BB1 4 1/2" x 4 1/2" 630 NRP	630
1 Exit Device	Falcon 19-R-EO US32D 930EO SP28 3-0 x 7-0 Door	SP28/US32D
1 Surface Closer	Falcon SC 71 STD Rw/ PA 689	689
1 Weatherstripping	Pemko 303AV-36" x 84"	A
1 Threshold	Pemko 272A36"	A
1 Rain Drip	Pemko 346A 40"	A
1 Door Sweep	Pemko 315CN36	C

### Hardware Set - HW-2

1 Single door 103, Privacy Function LH

3-0 x 7-0 x 1 3/4 - WD DR x HM FR

3 Standard Hinge	Ives 5BB1 4 1/2" x 4 1/2" 630 NRP	630
1 Lockset	Corbin-Russwin ML2068 PSA 630	630
1 Cylinder	Schlage 20-061 Open 626	626
1 301 - Wall Door Stop	Rockwood 409 US26D	US26D
3 Door Silencer	Rockwood 608-RKW	

### Hardware Set - HW-3

1 Single door 102A Passage Function RH

3-0 x 7-0 x 1 3/4 - WD DR x HM FR

3 Standard Hinge	Ives 5BB1 4 1/2" x 4 1/2" 630 NRP	630
1 Lockset	Corbin-Russwin ML2010 PSA 630 LH	630
1 Surface Closer	Falcon SC 71 STD Rw/ PA 689	689
1 Wall Door Stop	Rockwood 409 US26D	US26D
1 Kick Plate	Rockwood K1050 (Stock Size – 8"X34")	US32D
3 Door Silencer	Rockwood 608-RKW	

### Hardware Set - HW-4

1 Double door 101 Store Room Function RH

6-0 x 7-0 x 1 3/4 - WD DRS x HM FR

6 Standard Hinge	Ives 5BB1 4 1/2" x 4 1/2" 630 NRP	630
1 Lockset	Corbin-Russwin ML2057 PSA 630 LHR	630
1 Cylinder	Schlage 20-061 Open 626	626
2 Surface Closer	Falcon SC 71 STD Rw/ PA 689	689
2 Wall Door Stop	Rockwood 409 US26D	US26D
6 Door Silencer	Rockwood 608-RKW	
2 Kick Plate	Rockwood K1050 (Stock Size – 8"X34")	US32D
1 Flush Bolt	Rockwood 1842 US26D	US26D
1 Coordinator	Rockwood 1672"	

1 Dust Proof Strike	Rockwood 570 US26D	US26D
---------------------	--------------------	-------

**Hardware Set - HW-5**

1	Single door (3 HR)	100A, 102C	Passage Function	RH
---	--------------------	------------	------------------	----

3-0 x 7-0 x 1 3/4 - HM DR x HM FR (Door, Frame and Hardware to be 3-Hour Fire Rated)

3 Standard Hinge	Ives 5BB1 4 1/2" x 4 1/2" 630 NRP	630
1 Lockset	Corbin-Ruswin ML2010 PSA 630 RH	630
1 Surface Closer	Falcon SC 71 STD Rw/ PA 689	689
3 Door Silencer	Rockwood 608-RKW	

**Hardware Set - HW-6**

1	Double door	100B	Exit OnlyFunction	RH
---	-------------	------	-------------------	----

6-0 x 7-0 x 1 3/4 - HM DRS x HM FR (Exterior)

6 Standard Hinge	Ives 5BB1 4 1/2" x 4 1/2" 630 NRP	630
2 Exit Device	Falcon 19-R-EO US32D 930EO SP28 6-0 x 7-0 Double Door	SP28/US32D
2 Surface Closer	Falcon SC 71 STD Rw/ PA 689	689
1 Weatherstripping	Pemko 303AV-72" x 84"	A
1 Threshold	Pemko 272A72"	A
1 Rain Drip	Pemko 346A 76"	A
2 Door Sweep	Pemko 315CN36	C
1 Flush Bolt	Rockwood 1842 US26D	US26D
1 Coordinator	Rockwood 1672"	
1 Dust Proof Strike	Rockwood 570 US26D	US26D

**END OF SECTION 08 71 00**

**SECTION 08 80 00**  
**GLAZING**

**PART 1 GENERAL**

**1.1**

- A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 1, GENERAL REQUIREMENTS, which are made a part of this Section of the Specifications.

**1.2 WORK INCLUDED**

- A. Furnish and install glass and glazing, as indicated on Drawings and as specified herein. Include, but do not limit to glass and glazing for the following:
  - 1. Fixed Exterior Windows. Insulated Glass Units

**1.3 RELATED WORK**

- A. Examine Contract Documents for requirements that affect Work of this Section. Other Specification Sections that directly relate to Work of this Section include, but are not limited to:
  - 1. Section 01 40 00, Quality Requirements; Inspection and testing.
  - 2. Section 08 51 13, Aluminum Windows; Aluminum Windows to be glazed.

**1.4 REFERENCES**

- A. Comply with applicable requirements of the following standards. Where these standards conflict with other specified requirements, the most restrictive requirements shall govern.
  - 1. Architectural Aluminum Manufacturer's Association (AAMA):
    - 804.1 Voluntary Specification for Ductile Back-Bedding Glazing Tapes
  - 2. American National Standards Institute (ANSI):
    - Z97.1 Safety Glazing Materials Used in Buildings
  - 3. American Society for Testing and Materials (ASTM):
    - C 509 Cellular Elastomeric Preformed Gasket and Sealing Materials
    - C 719 Adhesion and Cohesion of Elastomeric Joint Sealants Under Cyclic Movements
    - C 794 Test Method for Adhesion-in-Peel of Elastomeric Joint Sealants

- C 864 Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers
- C 1036 Specifications for Flat Glass
- C 1048 Specifications for Heat Treated Flat Glass Kind HS, Kind FT Coated and Uncoated Glass
- E 163 Methods of Fire Test of Window Assemblies
- E 774 Specifications for Sealed Insulating Glass Units
- 4. Federal Specification (Fed. Spec.):
  - DD-G-451D Glass, Float or Plate Sheet, Figured (Flat for Glazing, Mirrors and Other Uses)
  - DD-G-1403B(1) Glass, Plate (Float) Sheet, Figured, and Spandrel (Heat Strengthened and Fully Tempered)
- 5. Flat Sealed Insulating Glass Manufacturer's Association (SIGMA): 65-7-2
- 6. Glass Marketing Association (FGMA): Manual Glazing Manual
- 7. American Society for Testing and Materials (ASTM):
  - 1. ASTM E119: Methods for Fire Tests of Building Construction and Materials.
  - 2. ASTM E152: Methods for Fire Tests of Door Assemblies.
  - 3. ASTM E163: Methods for Fire Tests of Window Assemblies.
  - 4. ASTM E2074: Standard Test Method for Fire Tests of Door Assemblies, including Positive Pressure Testing of Side-hinged and Pivoted Swinging Door Assemblies.
  - 5. ASTM E2010-1: Standard Test for Positive Pressure of Fire Tests of Window Assemblies.
- 8. National fire Protection Association (NFPA):
  - 1. NFPA 80: Fire Doors and Windows.
  - 2. NFPA 251: Fire Tests of Building Construction and Materials.
  - 3. NFPA 252: Fire Tests of Door Assemblies.
  - 4. NFPA 257: Fire Tests of Window Assemblies.
- 9. Underwrites Laboratories, Inc. (UL):
  - 1. UL 9: Standard for Safety of Fire Tests of Window Assemblies.
  - 2. UL 10 B: Standard for Safety of Fire Tests of Door Assemblies.
  - 3. UL 10 C: Standard for Safety of Positive Pressure Tests of Door Assemblies.
  - 4. UL 263: Fire Tests of Building Construction and Materials.
- 11. Consumer Product Safety Commission (CPSC):
  - 1. CPSC 16 CFR 1201: Safety Standard for Architectural Glazing Materials.
- 12. Glass Association of North America (GANA)
  - 1. GANA – Glazing Manual.



2. FGMA – Sealant Manual.
13. National Fenestration Rating Council (NFRC)
  1. NFRC 100: Procedure for Determining Fenestration Product U-Factors.
  2. NFRC 200: Procedure for Determining Fenestration Product Solar Heat Gain
14. Coefficient and Visible Transmittance at Normal Incidence
15. New Jersey UCC, IBC IFC and associated codes, latest editions.

### 1.3 DEFINITIONS

- A. Manufacturer: A firm that produces primary glass or fabricated glass as defined in referenced glazing publications.
- B. Interspace: Space between lites of an insulating-glass unit that contains dehydrated air or a specified gas.
- C. Deterioration of Coated Glass: Defects developed from normal use that are attributed to the manufacturing process and not to causes other than glass breakage and practices for maintaining and cleaning coated glass contrary to manufacturer's written instructions. Defects include peeling, cracking, and other indications of deterioration in metallic coating.
- D. Deterioration of Laminated Glass: Defects developed from normal use that are attributed to the manufacturing process and not to causes other than glass breakage and practices for maintaining and cleaning laminated glass contrary to manufacturer's written instructions. Defects include edge separation, delamination materially obstructing vision through glass, and blemishes exceeding those allowed by referenced laminated-glass standard.
- E. Deterioration of Insulating Glass: Failure of the hermetic seal under normal use that is attributed to the manufacturing process and not to causes other than glass breakage and practices for maintaining and cleaning insulating glass contrary to manufacturer's written instructions. Evidence of failure is the obstruction of vision by dust, moisture, or film on interior surfaces of glass.

### 1.4 PERFORMANCE REQUIREMENTS

- A. General: Provide glazing systems capable of withstanding normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, and installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.
- B. Glass Design: Glass thicknesses indicated are minimums and are for detailing only. Confirm glass thicknesses by analyzing Project loads and in-service conditions. Provide glass lites for various size openings in nominal thicknesses indicated, but not less than thicknesses and in strengths (annealed or heat treated) required to meet or exceed the following criteria:
  1. Glass Thicknesses: Select minimum glass thicknesses to comply with ASTM E 1300,

according to the following requirements:

2. Specified Design Wind Loads: As indicated.
3. Specified Design Snow Loads: As indicated, but not less than snow loads applicable to Project, required by ASCE 7, "Minimum Design Loads for Buildings and Other Structures": Section 7, "Snow Loads."
4. Probability of Breakage for Vertical Glazing: 8 lites per 1000 for lites set vertically or not more than 15 degrees off vertical and under wind action.

a. Load Duration: 60 seconds or less.

- C. Thermal Movements: Provide glazing that allows for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures acting on glass framing members and glazing components. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.

## **1.5 SUBMITTALS**

- A. Product Data: For each glass product and glazing material indicated.
- B. Samples: For the following products, in the form of 12-inch- (300-mm-) square Samples for glass.
1. Coated vision glass.
  2. Each etched vision glass.
  3. Fire-rated glazing products.
  4. Insulating glass for each designation indicated.
- D. Glazing Schedule: Use same designations indicated on Drawings for glazed openings in preparing a schedule listing glass types and thicknesses for each size opening and location.
- E. Product Certificates: Signed by manufacturers of glass and glazing products certifying that products furnished comply with requirements.
- F. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- G. Preconstruction Adhesion and Compatibility Test Report: From glazing sealant manufacturer indicating glazing sealants were tested for adhesion to glass and glazing channel substrates and for compatibility with glass and other glazing materials.
- H. SWRI Validation Certificate: For each elastomeric glazing sealant specified to be validated by SWRI's Sealant Validation Program.
- I. Warranties: Special warranties specified in this Section.

**1.6 QUALITY ASSURANCE**

- A. Installer Qualifications: An experienced installer who has completed glazing similar in material, design, and extent to that indicated for this Project; whose work has resulted in glass installations with a record of successful in-service performance; and who employs glass installers for this Project who are certified under the National Glass Association Glazier Certification Program as Level 2 (Senior Glaziers) or Level 3 (Master Glaziers).
- B. Source Limitations for Clear Glass: Obtain clear float glass from one primary-glass manufacturer.
- C. Source Limitations for Coated Glass: Obtain coated glass from one manufacturer for each type of coating and each type and class of float glass indicated.
- D. Source Limitations for Insulating Glass: Obtain insulating-glass units from one manufacturer using the same type of glass and other components for each type of unit indicated.
- E. Source Limitations for Glazing Accessories: Obtain glazing accessories from one source for each product and installation method indicated.
- F. Elastomeric Glazing Sealant Product Testing: Obtain sealant test results for product test reports in "Submittals" Article from a qualified testing agency based on testing current sealant formulations within a 36-month period.
  - 1. Sealant Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated, as documented according to ASTM E 548.
  - 2. Test elastomeric glazing sealants for compliance with requirements specified by reference to ASTM C 920, and where applicable, to other standard test methods.
- G. Preconstruction Adhesion and Compatibility Testing: Submit to elastomeric glazing sealant manufacturers, for testing indicated below, samples of each glass type, tape sealant, gasket, glazing accessory, and glass-framing member that will contact or affect elastomeric glazing sealants.
  - 1. Use manufacturer's standard test methods to determine whether priming and other specific preparation techniques are required to obtain rapid, optimum adhesion of glazing sealants to glass, tape sealants, gaskets, and glazing channel substrates.
    - a. Perform tests under normal environmental conditions replicating those that will exist during installation.
  - 2. Submit not fewer than nine pieces of each type and finish of glass-framing members and each type, class, kind, condition, and form of glass (monolithic, laminated, and insulating units) as well as one sample of each glazing accessory (gaskets, tape sealants, setting blocks, and spacers).
  - 3. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
  - 4. For materials failing tests, obtain sealant manufacturer's written instructions for corrective measures, including the use of specially formulated primers.
  - 5. Testing will not be required if elastomeric glazing sealant manufacturers submit data

based on previous testing of current sealant products for adhesion to, and compatibility with, glazing materials matching those submitted.

- L. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to NFPA 252.
- M. Fire-Rated Window Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to NFPA 257.
- N. Safety Glass: Category II materials complying with testing requirements in 16 CFR 1201 and ANSI Z97.1.
  - 1. Subject to compliance with requirements, permanently mark safety glass with certification label of Safety Glazing Certification Council or another certification agency acceptable to authorities having jurisdiction.
- O. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below, unless more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this Section or in referenced standards.
  - 1. GANA Publications: GANA'S "Glazing Manual" and "Laminated Glass Design Guide."
  - 2. SIGMA Publications: SIGMA TM-3000, "Vertical Glazing Guidelines," and SIGMA TB-3001, "Sloped Glazing Guidelines."
- P. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of the following inspecting and testing agency:
  - 1. Insulating Glass Certification Council.

#### **1.7 DELIVERY, STORAGE, AND HANDLING**

- A. Protect glazing materials according to manufacturer's written instructions and as needed to prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.

#### **1.8 PROJECT CONDITIONS**

- A. Environmental Limitations: Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturers and when glazing channel substrates are wet from rain, frost, condensation, or other causes.
  - 1. Do not install liquid glazing sealants when ambient and substrate temperature conditions are outside limits permitted by glazing sealant manufacturer or below 40 deg F.

## **1.9 WARRANTY**

- A. General Warranty: Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
- B. Manufacturer's Special Warranty on Coated-Glass Products: Written warranty, made out to Owner and signed by coated-glass manufacturer agreeing to furnish replacements for those coated-glass units that deteriorate as defined in "Definitions" Article, f.o.b. the nearest shipping point to Project site, within specified warranty period indicated below.
1. Warranty Period: 10 years from date of Substantial Completion.
- C. Manufacturer's Special Warranty on Laminated Glass: Written warranty, made out to Owner and signed by laminated-glass manufacturer agreeing to furnish replacements for laminated-glass units that deteriorate as defined in "Definitions" Article, f.o.b. the nearest shipping point to Project site, within specified warranty period indicated below.
1. Warranty Period: Five years from date of Substantial Completion.
- D. Manufacturer's Special Warranty on Insulating Glass: Written warranty, made out to Owner and signed by insulating-glass manufacturer agreeing to furnish replacements for insulating-glass units that deteriorate as defined in "Definitions" Article, f.o.b. the nearest shipping point to Project site, within specified warranty period indicated below.
1. Warranty Period: 10 years from date of Substantial Completion.

## **PART 2 PRODUCTS**

### **2.1 ACCEPTABLE MANUFACTURERS/FABRICATORS**

- A. Provide glass products of one of the following manufacturers/fabricators that meet or exceed the requirements of these specifications:
1. Viracon, Inc.
  2. PPG Industries, Inc.
  3. Pilkington Building Products North America.
  4. SuperLite II-XL
  5. Vitro

### **2.2 GLASS MATERIALS AND PRODUCTS – Exterior Window Units**

- A. Clear Float Glass: ASTM C 1036 ,Type I-Transparent, Flat, Class 1-Clear, Quality q3.
- B. Clear Heat Strengthened Glass: ASTM C 1048, Condition A-Uncoated, Type I-Transparent, Flat, Class 1-Clear, Quality q3, Kind HS.
- C. Clear Tempered Glass: ASTM C1048, Condition A-Uncoated, Type I-Transparent, Flat,

Class 1-Clear, Quality q3, Kind FT.

- D. Exterior Glass Type 1: Clear vision glass, equal to Viracon VE1-2M-Clear.
1. Exterior Lite: 1/4 in. Clear laminated glass, with Low E coating on #2 surface;
  2. 1/2 in. air space;
  3. Interior Lite: 1/4 in. Clear laminated glass.

## **2.3 LAMINATED GLASS**

- A. Glass Units: ASTM C 1172 and complying with other specified requirements.
- B. Laminated-Glass Interlayer: Of type and thickness indicated with a proven record of no tendency to bubble, discolor, or lose physical and mechanical properties after laminating glass plies and installation.
- C. Laminating Process: Fabricate laminated glass to produce glass free of foreign substances and air or glass pockets.
- D. Laminated-Glass Units: Consisting of two outer plies of glass with PVB or cured-resin interlayer and complying with other specified requirements.
1. Kind and Construction: Kind LHS, consisting of two plies of heat-strengthened glass.
  2. Glass Ply Thickness: As indicated in Glazing Schedule at the end of this Section.
  3. Interlayer Thickness: 0.030 inch (0.76 mm).
  4. Interlayer Material Color: Clear, except provide white translucent interlayer where indicated.

## **2.4 FIRE RATED GLAZING – Interior Window Unit in Fire rated wall.**

- A. Material: SuperLite II-XL 120 minute fire resistive glazing with hose stream.
- B. Manufacturer: SuperLite II-XL as manufactured and distributed by SAFTI *FIRST*.
1. Contact: 100 N Hill Drive, Suite 12, Brisbane, CA 94005; Telephone 888.653.3333; Fax 888.653.4444; email [info@safti.com](mailto:info@safti.com); Web site [www.safti.com](http://www.safti.com)
  2. Fire rated glass and framing must be provided by a single-source, US manufacturer. Distributors of fire rated glass and framing are not to be considered as manufacturers.
- C. Design Requirements:
1. Make-up: Must be comprised of an inboard and outboard lite of clear tempered glass Starphire Ultra-Clear® Glass by Vitro protecting a clear, fire resistive, intumescent interlayer.
  2. Thickness: 1-3/4" (45 mm) standard profile.
  3. Weight: 16 lbs/sq. ft. in 1-3/4" (45 mm) standard profile.
  4. Dimensions: Must meet max. clear view area of 4,876 sq. in., measuring at least 124 in. on the long side.
  5. Appearance: Must be tint-free, optically clear fire rated glazing.

6. Visible Transmittance: Must meet [0.777 with standard clear tempered] [0.878 with Starphire Ultra-Clear® glass by Vitro] make-up.
7. Fire Rating: Must be fire rated to 120 minutes with hose stream and meet ASTM E-119.
8. Impact Safety Resistance: CPSC 16 CFR 1201 Cat. I & II.
9. Hard Body Impact Classification: Must meet ASTM C1629/C1629M Level 3.
10. Soft Body Impact Classification: Must meet ASTM E695 Level 3.
11. Surface Abrasion Resistance: Must meet ASTM D4977 Level 3.
12. Customization: Available in insulated, energy performance, bullet-resistant, blast-resistant, hurricane-resistant, laminated, tinted, patterned, frosted, mirrored, reflective, segmented, decorative and more.

**D. Manufacturer's Fire Rating Glazing Material:**

1. Each piece of fire-rated glazing material shall be labeled with a permanent logo including name of product, manufacturer, testing laboratory, fire rating period and safety glazing standards.
2. Glazing materials installed in Hazardous Locations, subject to human impact, shall be certified and permanently labeled as meeting applicable requirements reference in NFPA 80:
  - a. CPSC 16 CFR 1201 Cat. I & II

**E. System Description:**

1. Performance Requirements: Provide a fire rated glazing manufactured, fabricated and installed to maintain performance criteria stated by manufacturer without defects, damage, or failure.
2. Fire Rating: 120 minutes with hose stream.
3. Fire resistive, safety rated glazing tested in accordance with ASTM E119, NFPA 80, NFPA 251, NFPA 252, NFPA 257, UL 9, UL 10B, UL 10C and UL 263.
4. Testing Laboratory: Fire tests shall be conducted by a nationally recognized independent testing laboratory.

**F. Listings and Labels:**

1. Fire rated glazing shall be under current follow-up services by a nationally recognized independent testing laboratory approved by OSHA and maintain a current listing or certification. Assemblies shall be labeled in accordance with limits of listings.

**G. Substitutions: As identified in division 1 specifications.**

## **2.5 MATERIALS**

**A. Glazing Accessories: Manufacturer recommended fire rated glazing accessory as follows:**

1. Glazing with EPDM tape or other listed flame resistant gasket material and calcium silicate setting blocks.

## **2.6 RELATED PRODUCTS**

Basis of design for fire rated framing system is GPX Framing as manufactured by SAFTI *FIRST*.

- A. Glazing shall be installed in an equally rated framing system.
- B. Pressure glazing is allowed.

## **2.7 SOURCE QUALITY**

- A. Obtain fire rated glazing products from a single manufacturer.
- B. Fabrication Dimensions: Fabricate to approved dimensions. The general contractor shall guarantee dimensions where practicable within required tolerances.

## **2.8 GLAZING MATERIALS AND PRODUCTS**

- A. General: Provide sealants and gaskets with performance characteristics suitable for applications indicated. Ensure compatibility of glazing sealants with insulated glass sealants, with laminated glass interlayers, and with any other surfaces in contact.
- B. General Glazing and Cap Bead Sealant: Provide sealant with maximum Shore A hardness of 50. Provide one of the following:
  - 1. Dow Corning 795.
  - 2. General Electric Silglaze N 2500 or Contractors SCS-1000.
  - 3. Rhodorsil 3B, 5C, or 6B.
  - 4. Tremco Proglaze.
- C. Weather Seal Sealant: Provide non-acid curing sealant with movement range  $\pm 50\%$ , ASTM C 719. Provide one of the following:
  - 1. Dow Corning 795.
  - 2. General Electric Silpruf.
  - 3. Rhodorsil 3B, 5C, or 6B.
  - 4. Tremco Spectrum 2.
- D. Structural Sealant: Provide one of the following structural sealants recommended by manufacturer for structural glazing applications.
  - 1. Dow Corning 795 or 983.
  - 2. General Electric Ultraglaze SSG 4000 or SSG 4200.
  - 3. Tremco Proglaze II.
  - 4. Rhodorsil 70, or 90.
  - 5. Dow Corning 999 for monolithic glass only.
  - 6. General Electric 1200 for monolithic glass only.
  - 7. Tremco Proglaze for monolithic glass only.
- E. Gaskets and Weatherstrip for Structural Glazing: Provide black cured silicone rubber glazing gaskets, sealant backers in glazing pockets, and continuous glass spacer pads. Provide Type I to prevent sealant adhesion and Type 2 where adhesion is desired.



- F. Dense Elastomeric Compression Seal Gaskets: Provide molded or extruded neoprene or EPDM gaskets, Shore A hardness of  $75 \pm 5$  for hollow profile, and  $60 \pm 5$  for solid profiles, ASTM C 864.
- G. Cellular, Elastomeric Preformed Gaskets: Provide extruded or molded closed cell, integral-skinned neoprene, Shore A  $40 \pm 5$ , and 20% to 35% compression, ASTM C 509.
- H. Preformed Glazing Tape: Provide solvent-free butyl-polyisobutylene rubber with 100% solids content complying with AAMA A 804.1. Provide preformed glazing tape in extruded tape form. Provide one of the following:
  - 1. Protective Treatments 303 or 606.
  - 2. Tremco Preshimmed 440.
  - 3. Woodmont Chem-Tape 40.
- I. Setting Blocks: Provide neoprene or silicone blocks with Shore A hardness of 80-90. Provide products certified by manufacturer to be compatible with silicone sealants.
  - 1. Shims: For shims used with setting blocks, provide same materials, hardness, length and width as setting blocks.
  - 2. Structural Silicone Glazing: Provide silicone setting blocks where structural silicone occurs at sills and at insulated units with silicone edge seals.
- J. Edge Blocks: Provide neoprene or silicone as required for compatibility with glazing sealants. Provide blocks with Shore A hardness of  $55 \pm 5$ .
- K. Miscellaneous Glazing Materials: Provide sealant backer rods, primers, cleaners, and sealers of type recommended by glass and sealant manufacturers.

## **PART 3 EXECUTION**

### **3.1 INSPECTION**

A. The Installer/Glazier shall examine substrates, supports, and conditions under which this work is to be performed. Notify Contractor in writing, outlining conditions detrimental to proper completion of work. Do not proceed with work until unsatisfactory conditions are corrected. Beginning of installation will be construed as glazier accepting substrates and conditions.

### **3.2 INSTALLATION**

- A. General Installation Requirements: Strictly comply with manufacturer's instructions and recommendations, except where more restrictive requirements are specified in this Section. Comply with FGMA Manual. Do not glaze when ambient temperature is below 40°F.
  - 1. Prior to installing glass, clean glazing channels and framing members.
  - 2. Remove coatings not completely bonded to substrates.
  - 3. Remove lacquer from metal surfaces where in contact with sealants.
  - 4. Protect glass from edge damage at all times. Use roller blocks and suction cups.
  - 5. Replace glass with edge damage or other imperfections which could weaken glass.
  - 6. Install setting and side blocks in locations recommended by referenced standards, and

- as required to prevent glass displacement.
7. Center glass in openings. Provide 1/2 in. minimum glass bite and 1/8 in. edge clearances.
  8. Install glass and glazing in such a manner as to allow for easy replacement of glass and glazing without dismantling of frames.
  9. Install glazing tapes and gaskets. Prepare for exterior cap seal.
  10. Prevent metal to glass contact at all times. Protect edges of insulated units from moisture and solvents.
  11. Clean, prime, and install stops.
- B. Mirrors: Adhere mirrors to walls plumb and level. Support mirror bottoms with stainless steel clips spaced at quarter-points.

### **3.3 CLEANING AND PROTECTION**

- A. Clean exposed surfaces using manufacturer recommended materials and methods. Remove and replace work which cannot be successfully cleaned. Clean glass and framing members frequently to protect from build-up of harmful construction contaminants.
- B. Touch-up damaged coatings and finishes. Eliminate visible evidence of repair.
- C. Re-clean glass within one week of final acceptance.
- D. Provide temporary protection at all times during course of work, and immediately after completion to ensure work of this Section is not damaged or deteriorated in any way at time of final acceptance. Remove temporary protections and re-clean as necessary immediately prior to final acceptance.
- E. Remove and replace broken, chipped, cracked, or otherwise damaged glass.

**END OF SECTION 08 80 00**

**SECTION 09 21 16**  
**GYPSUM BOARD ASSEMBLIES**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General Condition and Special Provisions and other Division 1 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. This Section includes the following:
  - 1. Gypsum board assemblies attached to steel framing.
  - 2. Nonload-bearing steel framing members for gypsum board assemblies.
- B. Related Sections include the following:
  - 1. Division 5, Section 05 40 00, Cold Formed Metal Framing.

**1.3 DEFINITIONS**

- A. Gypsum Board Terminology: Refer to ASTM C 11 f and GA-505 for definitions of terms for gypsum board assemblies not defined in this Section or in other referenced standards.

**1.4 ASSEMBLY PERFORMANCE REQUIREMENTS**

- A. Fire Resistance: Provide gypsum board assemblies with fire-resistance ratings indicated.

**1.5 SUBMITTALS**

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Product Data: For each type of product indicated.
- C. Samples: For the following products:
  - 1. Trim Accessories: Full-size sample in 12-inch long length for each trim accessory indicated.

**1.6 QUALITY ASSURANCE**

- A. Single-Source Responsibility for Steel Framing: Obtain steel framing members for gypsum board assemblies from a single manufacturer, unless otherwise indicated.

- B. Single-Source Responsibility for Panel Products: Obtain each type of gypsum board and other panel products from a single manufacturer.
- C. Single-Source Responsibility for Finishing Materials: Obtain finishing materials from either the same manufacturer that supplies gypsum board and other panel products or from a manufacturer acceptable to gypsum board manufacturer.
- D. Fire-Test-Response Characteristics: For gypsum board assemblies with fire-resistance ratings, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing and inspecting agency acceptable to authorities having jurisdiction.
  - 1. Fire-Resistance-Rated Assemblies: Indicated by design designations from UL's "Fire Resistance Directory" and GA-600, "Fire Resistance Design Manual."

## **1.7 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver materials in original packages, containers, or bundles bearing brand name and identification of manufacturer or supplier.
- B. Store materials inside under cover and keep them dry and protected against damage from weather, direct sunlight, surface contamination, corrosion, construction traffic, and other causes. Stack gypsum panels flat to prevent sagging.

## **1.8 PROJECT CONDITIONS**

- A. Environmental Conditions, General: Establish and maintain environmental conditions for applying and finishing gypsum board to comply with ASTM C 840 requirements or gypsum board manufacturer's recommendations, whichever are more stringent.
- B. Room Temperatures: For non-adhesive attachment of gypsum board to framing, maintain not less than 40 deg F (4 deg C). For adhesive attachment and finishing of gypsum board, maintain not less than 50 deg F (10 deg C) for 48 hours before application and continuously after until dry. Do not exceed 95 deg F (35 deg C) when using temporary heat sources.
- C. Ventilation: Ventilate building spaces as required to dry joint treatment materials. Avoid drafts during hot, dry weather to prevent finishing materials from drying too rapidly.

## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURERS**

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Steel Framing and Furring:
    - a. Dale Industries, Inc. - Dale/Incor.
    - b. Dietrich Industries, Inc.
    - c. MarinoWare; Division of Ware Ind.
    - d. National Gypsum Company.
    - e. Unimast, Inc.
  - 2. Gypsum Board and Related Products:

- a. G-P Gypsum Corp.
- b. National Gypsum Company.
- c. United States Gypsum Co.
- d. American Gypsum Co.

## **2.2 STEEL FRAMING FOR WALLS AND PARTITIONS**

- A. General: Provide steel framing members complying with the following requirements:
  - 1. Protective Coating: ASTM A 653, G 40 (ASTM A 653M, Z 90) hot-dip galvanized coating.
- B. Steel Studs and Runners: ASTM C 645, with flange edges of studs bent back 90 degrees and doubled over to form 3/16-inch- (5-mm-) wide minimum lip (return), and complying with the following requirements for minimum thickness of base (uncoated) metal and for depth:
  - 1. Thickness: 0.0179 inch (0.45 mm), unless otherwise indicated.
  - 2. Thickness: 0.0329 inch (0.84 mm) as follows:
    - a. For head runner, sill runner, jamb, and cripple studs at door and other openings.
    - b. Where indicated.
  - 3. Depth: 3-5/8 inches (92.1 mm), unless otherwise indicated.
- C. Deflection Track: Manufacturer's standard top runner designed to prevent cracking of gypsum board applied to interior partitions resulting from deflection of the structure above fabricated from steel sheet complying with ASTM A 653 (ASTM A 653M) or ASTM A 568 (ASTM A 568M). Thickness as indicated for studs, and width to accommodate depth of studs, and of the following configuration:
  - 1. Top runner with 2-1/2-inch- (63.5-mm-) deep flanges that either have V-shaped offsets that compress when pressure is applied from construction above or have slots 1 inch (25.4 mm) o.c. that allow fasteners attached to studs through the slots to accommodate structural movement by slipping.
    - a. Products: Subject to compliance with requirements, provide one of the following:
      - 1) Superior Flex Track System (SFT); Delta Star, Inc.
      - 2) SLP-TRK; Metal-Lite, Inc.
- D. Steel Rigid Furring Channels: ASTM C 645, hat shaped, depth and minimum thickness of base (uncoated) metal as follows:
  - 1. Thickness: 0.0179 inch (0.45 mm), unless otherwise indicated.
  - 2. Depth: 7/8 inch (22.2 mm).
- E. Furring Brackets: Serrated-arm type, adjustable, fabricated from corrosion-resistant steel sheet complying with ASTM C 645, minimum thickness of base (uncoated) metal of 0.0329 inch (0.84 mm), designed for screw attachment to steel studs and steel rigid furring channels used for furring.
- F. Z-Furring Members: Manufacturer's standard Z-shaped furring members with slotted or nonslotted web, fabricated from steel sheet complying with ASTM A 653 (ASTM A 653M) or ASTM A 568 (ASTM A 568M); with a minimum base metal (uncoated) thickness of 0.0179 inch (0.45 mm), face flange of 1-1/4 inch (31.8 mm), wall-attachment flange of 7/8 inch (22.2 mm), and of depth required to fit insulation thickness indicated.

- G. Steel Channel Bridging: Cold-rolled steel, 0.0598-inch (1.5-mm) minimum thickness of base (uncoated) metal and 7/16-inch- (11.1-mm-) wide flanges, 1-1/2 inches (38.1 mm) deep, 475 lb/1000 feet (45 kg/100 m), unless otherwise indicated.
- H. Steel Flat Strap and Backing Plate: Steel sheet for blocking and bracing complying with ASTM A 653 (ASTM A 653M) or ASTM A 568 (ASTM A 568M), length and width as indicated, and with a minimum base metal (uncoated) thickness as follows:
  - 1. Thickness: 0.0179 inch (0.45 mm), unless otherwise indicated.
- I. Fasteners for Metal Framing: Provide fasteners of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel framing and furring members securely to substrates involved; complying with the recommendations of gypsum board manufacturers for applications indicated.
- J. Firestop Track: Top runner manufactured to allow partition heads to expand and contract with movement of the structure while maintaining continuity of fire-resistance-rated assembly indicated; in thickness not less than indicated for studs and in width to accommodate depth of studs.
  - 1. Product: Subject to compliance with requirements, provide one of the following:
    - a. Fire Trak Corp.; Fire Trak attached to studs with Fire Trak Slip Clip.
    - b. Metal-Lite, Inc.; The System.

## 2.3 GYPSUM BOARD PRODUCTS

- A. Panel Size: Provide in maximum lengths and widths available that will minimize joints in each area and correspond with support system indicated.
  - 1. Widths: Provide gypsum board in widths of 48 inches (1219 mm).
- B. Gypsum Wallboard: ASTM C 36 and as follows:
  - 1. Type X:
    - a. Thickness: 5/8" or as indicated.
    - b. Long Edges: Tapered and featured (rounded or beveled) for prefilling.
    - c. Location: Vertical surfaces, unless otherwise indicated.

## 2.4 TRIM ACCESSORIES

- A. Interior Trim: ASTM C 1047.
  - 1. Material: Galvanized or aluminum-coated steel sheet, rolled zinc, plastic, or paper-faced galvanized steel sheet.
  - 2. Shapes:
    - a. Corner bead on outside corners, unless otherwise indicated.
    - b. LC-bead with both face and back flanges; face flange formed to receive joint compound. Use LC-beads for edge trim, unless otherwise indicated.
    - c. L-bead with face flange only; face flange formed to receive joint compound. Use L-bead where indicated.

- d. One-piece control joint formed with V-shaped slot and removable strip covering slot opening.
  - e. Expansion (Control) Joint: Use where indicated.
- B. Aluminum Accessories: Where indicated, provide manufacturer's standard extruded-aluminum accessories of profile indicated complying with the following requirements:
  - 1. Aluminum Alloy: Alloy and temper recommended by aluminum producer and finisher for type of finish indicated and with not less than the strength and durability properties of aluminum extrusions complying with ASTM B 221 (ASTM B 221M) for alloy and temper 6063-T5.
  - 2. Baked-Enamel Finish: AA-C12C42R1x (Chemical Finish: cleaned with inhibited chemicals; Chemical Finish: acid chromate-fluoride-phosphate conversion coating; Organic Coating: as specified below). Apply baked enamel according to paint manufacturer's specifications for cleaning, conversion coating, and applying organic coating.
    - a. Organic Coating: Manufacturer's standard thermosetting coating system with a minimum dry film thickness of 0.8 to 1.2 mils (0.02 to 0.03 mm).
    - b. Color: As selected by Engineer from manufacturer's standard colors.
  - 3. Manufacturer: Subject to compliance with requirements, provide aluminum accessories by one of the following:
    - a. Fry Reglet Corp.
    - b. Gordon, Inc.
    - c. MM Systems, Inc.
    - d. Pittcon Industries, Inc.

## **2.5 JOINT TREATMENT MATERIALS**

- A. General: Comply with ASTM C 475.
- B. Joint Tape:
  - 1. Interior Gypsum Wallboard: Paper.
- C. Joint Compound for Interior Gypsum Wallboard: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.
  - 1. Prefilling: At open joints, rounded or beveled panel edges, and damaged surface areas, use setting-type taping compound.
  - 2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use drying-type, all-purpose compound.
    - a. Use setting-type compound for installing paper-faced metal trim accessories.
  - 3. Fill Coat: For second coat, use drying-type, all-purpose compound.
  - 4. Finish Coat: For third coat, use drying-type, all-purpose compound.
  - 5. Skim Coat: For final coat of Level 5 finish, use drying-type, all-purpose compound.
- D. Joint Compound for Glass-Mat Water Resistant Backing Panels:
  - 1. Glass-Mat, Water-Resistant Backing Panel: As recommended by manufacturer for wall locations.

## **2.6 ACOUSTICAL SEALANT**

- A. Products: Subject to compliance with requirements, provide one of the following:

## 1. Acoustical Sealant for Exposed and Concealed Joints:

- a. Pecora Corp.; AC-20 FTR Acoustical and Insulation Sealant.
- b. United States Gypsum Co.; SHEETROCK Acoustical Sealant.

- B. Acoustical Sealant for Exposed and Concealed Joints: Non-sag, paintable, non-staining, latex sealant complying with ASTM C 834 that effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.

**2.7 AUXILIARY MATERIALS**

- A. General: Provide auxiliary materials for gypsum board construction that comply with referenced standards and recommendations of gypsum board manufacturer.
- B. Laminating Adhesive: Special adhesive or joint compound recommended for laminating gypsum panels.
- C. Spot Grout: ASTM C 475, setting-type joint compound recommended for spot-grouting hollow metal door frames.
- D. Fastening Adhesive for Metal: Special adhesive recommended for laminating gypsum panels to steel framing.
- E. Steel Hot Dipped Galvanized, drill screws complying with ASTM C 1002 for the following applications:
  - 1. Fastening gypsum board to steel members less than 0.033 inch (0.84 mm) thick.
  - 2. Fastening gypsum board to gypsum board.
- F. Steel drill screws complying with ASTM C 954 for fastening gypsum board to steel members from 0.033 to 0.112 inch (0.84 to 2.84 mm) thick.
- G. Asphalt-Saturated Organic Felt: ASTM D 226, Type I (No. 15 asphalt felt), nonperforated.
- H. Foam Gaskets: Closed-cell vinyl foam adhesive-backed strips that allow fastener penetration without foam displacement, 1/8 inch (3.2 mm) thick, in width to suit metal stud size indicated.
- I. Sound-Attenuation Blankets: Unfaced mineral-fiber blanket insulation produced by combining mineral fibers of type described below with thermosetting resins to comply with ASTM C 665 for Type I (blankets without membrane facing).
  - 1. Mineral-Fiber Type: Fibers manufactured from glass.
- J. Polyethylene Vapor Retarder: As specified in Division 7 Section "Building Insulation."

**PART 3 - EXECUTION****3.1 EXAMINATION**

- A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames, cast-in anchors, and structural framing, for compliance with requirements and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions have been corrected.



### **3.2 PREPARATION**

- A. Suspended Ceilings: Coordinate installation of ceiling suspension systems with installation of overhead structure to ensure that inserts and other provisions for anchorages to building structure have been installed to receive ceiling hangers at spacing required to support ceilings and that hangers will develop their full strength.
  - 1. Furnish concrete inserts and other devices indicated to other trades for installation in advance of time needed for coordination and construction.
- B. Coordination with Sprayed Fire-Resistive Materials:
  - 1. Before sprayed fire-resistive materials are applied, attach offset anchor plates or ceiling runners (tracks) to surfaces indicated to receive sprayed-on fire-resistive materials. Where offset anchor plates are required, provide continuous plates fastened to building structure not more than 24 inches o.c.
  - 2. After sprayed fire-resistive materials are applied, remove them only to extent necessary for installation of gypsum board assemblies and without reducing the fire-resistive material thickness below that which is required to obtain fire-resistance rating indicated. Protect remaining fire-resistive materials from damage.

### **3.3 INSTALLING STEEL FRAMING, GENERAL**

- A. Installation Standards: ASTM C 754, and ASTM C 840 requirements that apply to framing installation.
- B. Install supplementary framing, blocking, and bracing at terminations in gypsum board assemblies to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction. Comply with details indicated and with gypsum board manufacturer's written recommendations or, if none available, with United States Gypsum's "Gypsum Construction Handbook."
- C. Isolate steel framing from building structure at locations indicated to prevent transfer of loading imposed by structural movement.
  - 1. Isolate ceiling assemblies where they abut or are penetrated by building structure.
  - 2. Isolate partition framing and wall furring where it abuts structure, except at floor. Install slip-type joints at head of assemblies that avoid axial loading of assembly and laterally support assembly.
    - a. Use proprietary deflection track at non-rated walls that abut structure.
    - b. Use proprietary firestop track at rated walls that abut structure.
- D. Do not bridge building control and expansion joints with steel framing or furring members. Frame both sides of joints independently.

### **3.4 INSTALLING STEEL FRAMING FOR WALLS AND PARTITIONS**

- A. Install runners (tracks) at floors, ceilings, and structural walls and columns where gypsum board stud assemblies abut other construction.
  - 1. Where studs are installed directly against exterior walls, install asphalt felt strips or foam gaskets between studs and wall.

- B. Installation Tolerances: Install each steel framing and furring member so that fastening surfaces do not vary more than 1/8 inch (3 mm) from the plane formed by the faces of adjacent framing.
- C. Extend partition framing full height to structural supports or substrates above suspended ceilings, except where partitions are indicated to terminate at suspended ceilings. Continue framing over frames for doors and openings and frame around ducts penetrating partitions above ceiling to provide support for gypsum board.
  - 1. For STC-rated and fire-resistance-rated partitions that extend to the underside of floor/roof slabs and decks or other continuous solid structural surfaces to obtain ratings, install framing around structural and other members extending below floor/roof slabs and decks, as needed, to support gypsum board closures needed to make partitions continuous from floor to underside of solid structure.
- D. Terminate partition framing at suspended ceilings where indicated.
- E. Install steel studs and furring in sizes and at spacings indicated.
  - 1. Space studs 16 inches (406 mm) o.c., unless otherwise indicated.
- F. Install steel studs so flanges point in the same direction and leading edge or end of each gypsum board panel can be attached to open (unsupported) edges of stud flanges first.
- G. Frame door openings to comply with GA-600, and with applicable published recommendations of gypsum board manufacturer, unless otherwise indicated. Attach vertical studs at jambs with screws either directly to frames or to jamb anchor clips on door frames; install runner track section (for cripple studs) at head and secure to jamb studs.
  - 1. Install 2 studs at each jamb, unless otherwise indicated.
  - 2. Install cripple studs at head adjacent to each jamb stud, with a minimum 1/2-inch (12.7-mm) clearance from jamb stud to allow for installation of control joint.
  - 3. Extend jamb studs through suspended ceilings and attach to underside of floor or roof structure above.
- H. Frame openings other than door openings to comply with details indicated or, if none indicated, as required for door openings. Install framing below sills of openings to match framing required above door heads.

### **3.5 APPLYING AND FINISHING PANELS, GENERAL**

- A. Gypsum Board Application and Finishing Standards: ASTM C 840 and GA-216.
- B. Install sound attenuation blankets before installing gypsum panels, unless blankets are readily installed after panels have been installed on one side.
- C. Install ceiling board panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in the central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.
- D. Install gypsum panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch of open space between panels. Do not force into place.
- E. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.

- F. Attach gypsum panels to steel studs so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.
- G. Attach gypsum panels to framing provided at openings and cutouts.
- H. Form control and expansion joints with space between edges of adjoining gypsum panels.
- I. Cover both faces of steel stud partition framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.
  - 1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. in area.
  - 2. Fit gypsum panels around ducts, pipes, and conduits.
  - 3. Where partitions intersect open concrete coffers, concrete joists, and other structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by coffers, joists, and other structural members; allow 1/4 to 3/8-inch wide joints to install sealant.
- J. Isolate perimeter of non-load-bearing gypsum board partitions at structural abutments, except floors. Provide 1/4 to 1/2-inch wide spaces at these locations, and trim edges with U-bead edge trim where edges of gypsum panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.
- K. STC-Rated Assemblies: Seal construction at perimeters, behind control and expansion joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C 919 and manufacturer's written recommendations for locating edge trim and closing off sound-flanking paths around or through gypsum board assemblies, including sealing partitions above acoustical ceilings.
- L. Space fasteners in gypsum panels according to referenced gypsum board application and finishing standard and manufacturer's written recommendations.
  - 1. Space screws a maximum of 12 inches o.c. for vertical applications.
- M. Space fasteners in panels that are tile substrates a maximum of 8 inches o.c.

### **3.6 PANEL APPLICATION METHODS**

- A. Single-Layer Application:
  - 1. On ceilings, apply gypsum panels before wall/partition board application to the greatest extent possible and at right angles to framing, unless otherwise indicated.
  - 2. On partitions/walls, apply gypsum panels vertically (parallel to framing), unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.
    - a. Stagger abutting end joints not less than one framing member in alternate courses of board.
    - b. At stairwells and other high walls, install panels horizontally, unless otherwise indicated or required by fire-resistance-rated assembly.
- B. Multilayer Application on Ceilings: Apply gypsum board indicated for base layers before applying base layers on walls/partitions; apply face layers in same sequence. Apply base layers at right angles to framing members and offset face-layer joints 1 framing member, 16 inches minimum,

from parallel base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly.

- C. Multilayer Application on Partitions/Walls: Apply gypsum board indicated for base layers and face layers vertically (parallel to framing) with joints of base layers located over stud or furring member and face-layer joints offset at least one stud or furring member with base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly. Stagger joints on opposite sides of partitions.
- D. Single-Layer Fastening Methods: Apply gypsum panels to supports with steel drill screws.
- E. Multilayer Fastening Methods: Fasten base layers and face layers separately to supports with screws.
- F. Laminating to Substrate: Where gypsum panels are indicated as directly adhered to a substrate (other than studs, joists, furring members, or base layer of gypsum board), comply with gypsum board manufacturer's written recommendations and temporarily brace or fasten gypsum panels until fastening adhesive has set.
- G. Curved Partitions:
  - 1. Install panels horizontally and unbroken, to the extent possible, across curved surface plus 12-inch long straight sections at ends of curves and tangent to them.
  - 2. Wet gypsum panels on surfaces that will become compressed where curve radius prevents using dry panels. Comply with gypsum board manufacturer's written recommendations for curve radii, wetting methods, stacking panels after wetting, and other preparations that precede installing wetted gypsum panels.
  - 3. On convex sides of partitions, begin installation at one end of curved surface and fasten gypsum panels to studs as they are wrapped around curve. On concave side, start fastening panels to stud at center of curve and work outward to panel ends. Fasten panels to framing with screws spaced 12 inches o.c.
  - 4. For double-layer construction, fasten base layer to studs with screws 16 inches o.c. Center gypsum board face layer over joints in base layer, and fasten to studs with screws spaced 12 inches o.c.
  - 5. Allow wetted gypsum panels to dry before applying joint treatment.
- H. Backing Panels:
  - 1. Glass-Mat, Water-Resistant Backing Panel: Comply with manufacturer's written installation instructions and install at showers, and where indicated. Install with 1/4-inch gap where panels abut other construction or penetrations.
  - 2. Where backing and ceiling panels abut other types of panels in the same plane, shim surfaces to produce a uniform plane across panel surfaces.

### **3.7 INSTALLING TRIM ACCESSORIES**

- A. General: For trim accessories with back flanges, fasten to framing with the same fasteners used to fasten gypsum board. Otherwise, fasten trim accessories according to accessory manufacturer's directions for type, length, and spacing of fasteners.
- B. Install cornerbead at external corners.
- C. Install edge trim where edge of gypsum panels would otherwise be exposed. Provide edge trim type with face flange formed to receive joint compound, except where other types are indicated.

1. Install LC-bead where gypsum panels are tightly abutted to other construction and back flange can be attached to framing or supporting substrate.
  2. Install L-bead where edge trim can only be installed after gypsum panels are installed.
  3. Install U-bead where indicated.
  4. Install aluminum trim and other accessories where indicated.
- D. Control Joints: Install control joints according to ASTM C 840 and in specific locations approved by Architect for visual effect.

### **3.8 FINISHING GYPSUM BOARD ASSEMBLIES**

- A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.
- B. Prefill open joints, rounded or beveled edges, and damaged surface areas.
- C. Apply joint tape over gypsum board joints, except those with trim having flanges not intended for tape.
- D. Gypsum Board Finish Levels: Finish panels to levels indicated below, according to ASTM C 840, for locations indicated:
1. Level 1: Embed tape at joints in ceiling plenum areas, concealed areas, and where indicated, unless a higher level of finish is required for fire-resistance-rated assemblies and sound-rated assemblies.
  2. Level 2: Embed tape and apply separate first coat of joint compound to tape, fasteners, and trim flanges where panels are substrate for tile and where indicated.
  3. Level 4: Embed tape and apply separate first, fill, and finish coats of joint compound to tape, fasteners, and trim flanges at panel surfaces that will be exposed to view, unless otherwise indicated.
  4. Level 5: Embed tape and apply separate first, fill, and finish coats of joint compound to tape, fasteners, and trim flanges, and apply skim coat of joint compound over entire surface at exposed walls in with wall height over 12 feet.
- E. Glass-Mat, Water-Resistant Backing and Ceiling Panels: Finish according to manufacturer's written instructions at wall locations.

### **3.9 FIELD QUALITY CONTROL**

- A. Above-Ceiling Observation: Before Contractor installs gypsum board ceilings, Architect will conduct an above-ceiling observation and report deficiencies in the Work observed. Do not proceed with installation of gypsum board to ceiling support framing until deficiencies have been corrected.
1. Notify Architect seven days in advance of date and time when Project, or part of Project, will be ready for above-ceiling observation.
  2. Before notifying Architect, complete the following in areas to receive gypsum board ceilings:
    - a. Installation of 80 percent of lighting fixtures, powered for operation.
    - b. Installation, insulation, and leak and pressure testing of water piping systems.
    - c. Installation of air-duct systems.
    - d. Installation of air devices.
    - e. Installation of ceiling support framing.

**3.10 CLEANING AND PROTECTION**

- A. Promptly remove any residual joint compound from adjacent surfaces.
- B. Provide final protection and maintain conditions, in a manner acceptable to Installer that ensures gypsum board assemblies are without damage or deterioration at the time of Substantial Completion.

**END OF SECTION 09 21 16**

**THIS PAGE INTENTIONALLY LEFT BLANK**

**SECTION 09 51 23**  
**ACOUSTICAL PANEL CEILINGS**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General Condition and Special Provisions and other Division 1 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. This Section includes the following acoustical panel ceiling work:
  - 1. Installation of new acoustical panel ceiling with exposed suspension systems.
- B. Related Sections: The following sections contain requirements that relate to this section:
  - 1. Division 23 Section "HVAC" for grilles, registers, and diffusers in acoustical ceilings.
  - 2. Division 26 Section "Electrical" for lighting fixtures, speakers and other electrical devices mounted in or on acoustical ceilings.

**1.3 SUBMITTALS**

- A. General: Submit the following in accordance with Division 1 Specification Sections.
- B. Product data for each type of product specified.
- C. Coordination drawings for reflected ceiling plans drawn accurately to scale and coordinating penetrations and ceiling-mounted items. Show the following:
  - 1. Ceiling suspension members.
  - 2. Method of attaching hangers to building structure.
  - 3. Ceiling-mounted items including light fixtures; air outlets and inlets; speakers; sprinkler heads; and special moldings at walls, expansion joints, column penetrations, and other junctures with adjoining construction.
    - a. Scale: 1/4 inch = 12 inches.
- D. Samples for verification purposes of each type of exposed finish required, prepared on samples of size indicated below and of same thickness and material indicated for final unit of Work. Where finishes involve normal color and texture variations, include sample sets showing full range of variations expected.
  - 1. 12-inch square samples of each acoustical panel type, pattern, and color.
  - 2. Full size samples of each panel pattern and color required.
  - 3. Set of 12-inch long samples of exposed suspension system members, including moldings, for each color and system type required.
- E. Product test reports from qualified independent testing laboratory that are based on its testing of current products for compliance of acoustical ceiling systems and components with requirements.



**1.4 QUALITY ASSURANCE**

- A. Installer Qualifications: Engage an experienced Installer who has successfully completed acoustical ceilings similar in material, design, and extent to those indicated for Project.
- B. Fire Performance Characteristics: Provide acoustical ceilings that are identical to those tested for the following fire performance characteristics, per ASTM test method indicated below, by UL or other testing and inspecting organizations acceptable to authorities having jurisdiction. Identify acoustical ceiling components with appropriate markings of applicable testing and inspecting organization.
  - 1. Surface Burning Characteristics: As follows, tested per ASTM E 84 and complying with ASTM E 1264 for Class A products.
    - a. Flame Spread: 25 or less.
    - b. Smoke Developed: 50 or less.
- C. Single Source Responsibility for Ceiling Units: Obtain each type of acoustical ceiling unit from a single source with resources to provide products of consistent quality in appearance and physical properties without delaying progress of the Work.
- D. Single Source Responsibility for Suspension System: Obtain each type of suspension system from a single source with resources to provide products of consistent quality in appearance and physical properties without delaying progress of the Work.
- E. Coordination of Work: Coordinate layout and installation of acoustical ceiling units and suspension system components with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression system components (if any), and partition system (if any).

**1.5 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver acoustical ceiling units to project site in original, unopened packages and store them in a fully enclosed space where they will be protected against damage from moisture, direct sunlight, surface contamination, and other causes.
- B. Before installing acoustical ceiling units, permit them to reach room temperature and a stabilized moisture content.
- C. Handle acoustical ceiling units carefully to avoid chipping edges or damaging units in any way.

**1.6 PROJECT CONDITIONS**

- A. Space Enclosure: Do not install interior acoustical ceilings until space is enclosed and weatherproof, wet-work in space is completed and nominally dry, work above ceilings is complete, and ambient conditions of temperature and humidity will be continuously maintained at values near those indicated for final occupancy.

**1.7 EXTRA MATERIALS**

- A. Deliver extra materials to Owner. Furnish extra materials described below that match products installed, are packaged with protective covering for storage, and are identified with appropriate labels.
  - 1. Acoustical Ceiling Units: Furnish quantity of full-size units for each panel type and size, equal to 5.0 percent of amount installed, or a minimum of one box.
  - 2. Exposed Suspension System Components: Furnish quantity of each exposed component equal to 5.0 percent of amount installed.

## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURERS**

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Acoustical Panels:
    - a. Armstrong World Industries, Inc.
    - b. USG Interiors, Inc.
    - c. BPB Celotex.
  - 2. Suspension Systems:
    - a. Armstrong World Industries, Inc.
    - b. USG Interiors, Inc.
    - c. Celotex Corporation; Architectural Ceilings Marketing Dept.

### **2.2 ACOUSTICAL CEILING UNITS, GENERAL**

- A. Standard for Acoustical Ceiling Units: Provide manufacturers' standard units of configuration indicated that comply with ASTM E 1264 classifications as designated by reference to types, patterns, acoustical ratings, and light reflectances, unless otherwise indicated.
  - 1. Mounting Method for Measuring NRC: Type E-400 (plenum mounting in which face of test specimen is 15 3/4 inches away from the test surface) per ASTM E 795.
- B. Colors and Patterns: Provide products to match appearance characteristics indicated under each product type.
  - 1. For acoustical ceiling units whose appearance characteristics are indicated by reference to ASTM E 1264 designations for pattern and not by limiting to the naming of one or more products or manufacturers, provide Engineer's selections from each named manufacturer's full range of standard products of type, color, pattern, and light reflectance indicated.

### **2.3 ACOUSTICAL PANELS**

- A. **Type "ACT-1":**
  - 1. Basis of Design: Armstrong, "1850 Dune - White"
  - 2. Surface Texture: Fine
  - 3. Composition: Mineral Fiber
  - 4. Color: White
  - 5. Size: 24 in x 24 in x 3/4 in
  - 6. Edge Profile: Square Lay in with Prelude XL 15/16" Exposed Tee.
  - 7. Noise Reduction Coefficient (NRC): ASTM C 423; Classified with UL label on product carton, 0.75.
  - 8. Ceiling Attenuation Class (CAC): ASTM C 1414; Classified with UL label on product carton, 35
  - 9. Articulation Class (AC): ASTM E 1111; Classified with UL label on product carton 170.
  - 10. Emissions Testing: Section 01350 Protocol, < 13.5 ppb of formaldehyde when used under typical conditions required by ASHRAE Standard 62.1-2004, "Ventilation for Acceptable Indoor Air Quality"
  - 11. Flame Spread: ASTM E 1264; Class A (UL)
  - 12. Light Reflectance (LR): ASTM E 1477; White Panel: Light Reflectance: 0.88.

13. Dimensional Stability: HumiGuard Plus - Temperature is between 32°F (0° C) and 120°F (49° C). It is not necessary for the area to be enclosed or for HVAC systems to be functioning. All wet work (plastering, concrete, etc) must be complete and dry.
14. Antimicrobial Protection: BioBlock Plus - Resistance against the growth of mold/mildew and gram positive and gram negative odor and stain causing bacteria.
15. Acceptable Product: Dune Square Lay in, 1850 Dune -White as manufactured by Armstrong World Industries.

## **2.4 METAL SUSPENSION SYSTEMS, GENERAL**

- A. Standard for Metal Suspension Systems: Provide manufacturer's standard metal suspension systems of types, structural classifications, and finishes indicated that comply with applicable ASTM C 635 requirements.
- B. Finishes and Colors: Provide manufacturer's standard factory-applied finish for type of system indicated. For exposed suspension members and accessories with painted finish, provide color indicated or, if not otherwise indicated, as selected by Engineer from manufacturer's full range of standard colors.
- C. Attachment Devices: Size for 5 times design load indicated in ASTM C 635, Table 1, Direct Hung unless otherwise indicated.
- D. Wire for Hangers and Ties: ASTM A 641, Class 1 zinc coating, soft temper.
  1. Gage: Provide wire sized so that stress at 3 times hanger design load (ASTM C 635, Table 1, Direct Hung), will be less than yield stress of wire, but provide not less than 0.106-inch diameter (12 gage).
- E. Edge Moldings and Trim: Metal or extruded aluminum of types and profiles indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations that fit type of edge detail and suspension system indicated.

## **2.5 EXPOSED METAL DIRECT-HUNG SUSPENSION SYSTEMS**

- A. Type "GRD-1" (for ceiling system ACT-1):
- B. Basis of Design: Armstrong "Prelude XL," 15/16" exposed tee.
- C. Components: Main beams and cross tees In accordance with the International Building Code, Section 1621 for Category C as described in ESR-1308.
  1. Structural Classification: ASTM C 635, (Intermediate Duty) (Heavy Duty).
  2. Color: White and match the actual color of the selected ceiling tile, unless noted otherwise.
  3. Represented Systems: Prelude XL 15/16" Exposed Tee System as manufactured by Armstrong World Industries.
- D. Attachment Devices: In accordance with the International Building Code, Section 1621 for Category C.
- E. Wire for Hangers and Ties: In accordance with the International Building Code, Section 1621.
- F. Wall Moldings: In accordance with the International Building Code, Section 1621 for Category C or method as described in ESR-1308.
  1. Nominal 15/16 inch x 15/16 inch hemmed, pre-finished angle molding (7809)
- G. Accessories:

1. BERC - Beam End Retaining Clip, 0.034 inch thick, hot-dipped galvanized cold-rolled steel ASTM A568 - used to join main beam or cross tee to wall molding.
2. BERC2 - 2 inch Beam End Retaining Clip, 0.034 inch thick, hot-dipped galvanized cold-rolled steel per ASTM A568 - used to join main beam or cross tee to wall molding.

## **2.6 MISCELLANEOUS MATERIALS**

- A. Concealed Acoustical Sealant: Nondrying, nonhardening, nonskinning, nonstaining, nonbleeding, gunnable sealant.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Examine substrates and structural framing to which ceiling system attaches or abuts, with Installer present, for compliance with requirements specified in this and other sections that affect installation and anchorage of ceiling system. Do not proceed with installation until unsatisfactory conditions have been corrected. Do not proceed with installation until all wet work such as concrete, terrazzo, plastering and painting has been completed and thoroughly dried out, unless expressly permitted by manufacturer's printed recommendations. (Exception: HumiGuard Max Ceilings)

### **3.2 PREPARATION**

- A. Coordination: Furnish layouts for preset inserts, clips, and other ceiling anchors whose installation is specified in other sections.
- C. Measure each ceiling area and establish layout of acoustical units to balance border widths at opposite edges of each ceiling. Avoid use of less than half width units at borders, and comply with reflected ceiling plans. Coordinate panel layout with mechanical and electrical fixtures.

### **3.3 INSTALLATION (Category C)**

- A. General: Install acoustical ceiling systems to comply with installation standard referenced below, per manufacturer's instructions and Cisca "Ceiling Systems Handbook."
  1. Standard for Installation of Ceiling Suspension Systems: Comply with ASTM C 636.
- B. Arrange acoustical units and orient directionally patterned units in a manner shown by reflected ceiling plans.
- C. Suspend ceiling hangers from building structural members and as follows:
  1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structural or ceiling suspension system. Splay hangers only where required to miss obstructions and offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
  2. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with the location of hangers at spacing required to support standard suspension system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards.
  3. Secure wire hangers by looping and wire tying, either directly to structures or to inserts, eyescrews, or other devices that are secure and appropriate for substrate, and in a manner that will not cause them to deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.

4. Secure flat, angle, channel, and rod hangers to structure, including intermediate framing members, by attaching to inserts, eyescrews, or other devices that are secure and appropriate for structure to which hangers are attached as well as for type of hanger involved, and in a manner that will not cause them to deteriorate or fail due to age, corrosion, or elevated temperatures.
  5. Do not attach hangers to steel roof deck. Attach hangers to structural members.
  6. Space hangers not more than 4 feet o.c. along each member supported directly from hangers, unless otherwise shown, and provide hangers not more than 8 inches from ends of each member.
- D. Install edge moldings of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical units.
1. Sealant Bed: Apply continuous ribbon of acoustical sealant, concealed on back of vertical leg before installing moldings.
  2. Screw attach moldings to substrate at intervals not over 16 inches o.c. and not more than 3 inches from ends, leveling with ceiling suspension system to tolerance of 1/8 inch in 12 feet. Miter corners accurately and connect securely.
- D. Install acoustical panels in coordination with suspension system, with edges concealed by support of suspension members. Scribe and cut panels to fit accurately at borders and at penetrations.
- E. Install suspension system and panels in accordance with the International Building Code, Section 1621, except as noted in Section 4.4.3.2 of ESR-1308, and with the authorities having jurisdiction.
- F. ESR-1308, Section 4.4.3.2, Seismic Design Category C Installation:
- Terminal ends of the runners are secured by attaching the BERC clip to the wall molding and attaching the runners to the BERC clip. The runners have zero clearance at the perimeter on two adjacent walls and with 3/8-inch (9.5 mm) clearance on the opposite walls. The clip is attached to the wall molding by sliding the locking lances over the hem of the vertical leg of the wall molding. BERC clips installed in this manner are an acceptable means of preventing runners from spreading, in lieu of spacer bars required in CISCA 0-2, which is referenced in ASCE 7, Section 9.6.2.6.2.1, which is referenced in IBC Section 1621. Except for the use of the BERC clip as noted above, installation of the ceiling system must be as prescribed by the applicable code. Maximum ceiling weight permitted is 3.35 pounds per square foot (16.35 kg/m<sup>2</sup>). This construction is equivalent to that required by CISCA 0-2, which is referenced in ASCE-7, Section 9.2.6.2.1, and which is referenced in IBC Section 1621.
- Alternate #2: If Acceptable to architect, fixed attachment may be accomplished by pop-riveting the runner to the wall molding.
- G. The presence of a hanger wire within 3 inches of an expansion relief joint as called for in ASTM C 636 shall be required in addition to the requirements of the International Building Code, Section 1621.2.5 and with the authorities having jurisdiction.
- a. Only applies when using (Prelude XL Fire Guard 15/16") (Prelude Plus XL Fire Guard 15/16") (Suprafine XL Fire Guard 9/16") Exposed Tee Systems.
- H. Install acoustical panels in coordination with suspended system, with edges resting on flanges of main runner and cross tees. Cut and fit panels neatly against abutting surfaces. Support edges by wall moldings.
- 3.4 CLEANING**
- A. Clean exposed surfaces of acoustical ceilings, including trim, edge moldings, and suspension members. Comply with manufacturer's instructions for cleaning and touch-up of minor finish damage

1. Ceiling Touch-Up Paint, (Item #5760, 8oz. bottles) (Item #5761, quart size cans), "global white" latex paint should be used to hide minor scratches and nicks in the surface and to cover field tegularized edges that are exposed to view.
- B. Remove and replace work that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.
- C. Replace damaged and broken panels.

### **3.5 WARRANTY**

- A. Acoustical Panel: Submit a written warranty executed by the manufacturer, agreeing to repair or replace acoustical panels that fail within the warranty period. Failures include, but are not limited to:
  1. Acoustical Panels: Sagging and warping as a result of defects in materials or factory workmanship.
  2. Grid System: Rusting and manufacturer's defects
  3. Acoustical Panels with BioBlock Plus or designated as inherently resistive to the growth of micro-organisms installed with Armstrong suspension systems: Visible sag and will resist the growth of mold/mildew and gram positive and gram negative odor and stain causing bacteria.
- B. Warranty Period Humiguard:
  1. Acoustical panels: Ten (10) years from date of substantial completion.
  2. Grid: Ten (10) years from date of substantial completion.
  3. Acoustical panels and grid systems with HumiGuard Plus or HumiGuard Max performance supplied by one source manufacturer is thirty (30) years from date of substantial completion.
- C. The Warranty shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and will be in addition to and run concurrent with other warranties made by the Contractor under the requirements of the Contract Documents.

**END OF SECTION 09 51 23**

THIS PAGE INTENTIONALLY LEFT BLANK

**SECTION 09 65 13**  
**RESILIENT WALL BASE AND ACCESSORIES**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. This Section includes the following:
  - 1. Wall base.
  - 2. Molding accessories.
- B. Related Sections include the following:
  - 1. Division 9 Section "Resilient Tile Flooring" for resilient floor requiring, base, reducer strips, and other accessories.

**1.3 SUBMITTALS**

- A. Product Data: For each type of product indicated.
- B. Samples for Verification: For each type of product indicated, in manufacturer's standard-size Samples but not less than 12 inches long, of each resilient product color, texture, and pattern required.

**1.4 QUALITY ASSURANCE**

- A. Fire-Test-Response Characteristics: Provide resilient stair accessories with a critical radiant flux classification of Class I, not less than 0.45 W/sq. cm, as determined by testing identical products per ASTM E 648 by a testing and inspecting agency acceptable to authorities having jurisdiction.

**1.5 DELIVERY, STORAGE, AND HANDLING**

- A. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F or more than 90 deg F.

**1.6 PROJECT CONDITIONS**

- A. Maintain temperatures within range recommended by manufacturer, but not less than 70 deg F or more than 95 deg F, in spaces to receive floor tile during the following time periods:
  - 1. 48 hours before installation.



2. During installation.
  3. 48 hours after installation.
- B. After post installation period, maintain temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 95 deg F Insert temperature.
- C. Install resilient products after other finishing operations, including painting, have been completed.

## **1.7 EXTRA MATERIALS**

- A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
1. Furnish not less than 10 linear feet for every 500 linear feet or fraction thereof, of each type, color, pattern, and size of resilient product installed.

## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURERS**

- A. Basis-of-Design Product: Design is products, as manufactured by Endura and Roppe. Subject to compliance with requirements, provide either the named product or a comparable product of one of the following:
1. Burke Mercer Flooring Products.
  2. Johnsonite.
  3. Nora Rubber Flooring, Freudenberg Building Systems, Inc.
  4. Pirelli Rubber Flooring.
  5. Armstrong Commercial Flooring.

### **2.2 RESILIENT WALL BASE**

- A. Product: Design is based on rubber wall base, as manufactured by Roppe. .
- B. Wall Base: ASTM F 1861 with the following requirements:
1. Type (Material Requirement): TS (rubber, vulcanized thermoset).
  2. Group (Manufacturing Method): I (solid).
  3. Style: Cove (with top-set toe) for resilient flooring and straight (toeless) for carpet.
  4. Minimum Thickness: 0.125 inch.
  5. Height: 4 inches.
  6. Lengths: Coils in manufacturer's standard length.
  7. Outside Corners: Job formed.
  8. Inside Corners: Job formed.
  9. Surface: Smooth.
  10. Colors: Submit Manufacturers full line of colors for selection by architect.

### **2.3 RESILIENT MOLDING ACCESSORY**

- A. Description: Cap for cove resilient sheet floor covering, carpet edge for glue-down applications and reducer strip for resilient floor covering.
- B. Material: Rubber.

- C. Profile and Dimensions: As indicated.

## **2.4 INSTALLATION MATERIALS**

- A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic cement based formulation provided or approved by resilient product manufacturers for applications indicated.
- B. Adhesives: Water-resistant type recommended by manufacturer to suit resilient products and substrate conditions indicated.
- C. Stair-Tread-Nose Filler: Two-part epoxy compound recommended by resilient tread manufacturer to fill nosing substrates that do not conform to tread contours.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Examine substrates, with Installer present, for compliance with requirements for installation tolerances, moisture content, and other conditions affecting performance.
  - 1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.
  - 2. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.2 PREPARATION**

- A. Prepare substrates according to manufacturer's written recommendations to ensure adhesion of resilient products.
- B. Concrete Substrates for Stair Accessories: Prepare according to ASTM F 710.
  - 1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
  - 2. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrates pass testing.
  - 3. Moisture Testing:
    - a. Perform anhydrous calcium chloride test, ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. in 24 hours.
    - b. Perform tests recommended by manufacturer. Proceed with installation only after substrates pass testing.
- C. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.
- D. Use trowelable leveling and patching compound to fill cracks, holes, and depressions in substrates.
- E. Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.

1. Do not install resilient products until they are the same temperature as the space where they are to be installed.
- F. Sweep and vacuum clean substrates to be covered by resilient products immediately before installation. After cleaning, examine substrates for moisture, alkaline salts, carbonation, and dust. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.3 RESILIENT WALL BASE INSTALLATION**

- A. Apply wall base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.
- B. Install wall base in lengths as long as practicable without gaps at seams and with tops of adjacent pieces aligned.
- C. Tightly adhere wall base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.
- D. Do not stretch wall base during installation.
- E. On masonry surfaces or other similar irregular substrates, fill voids along top edge of wall base with manufacturer's recommended adhesive filler material.
- F. Job-Formed Corners:
  1. Outside Corners: Use straight pieces of maximum lengths possible. Form without producing discoloration (whitening) at bends. Shave back of base at points where bends occur and remove strips perpendicular to length of base that are only deep enough to produce a snug fit without removing more than half the wall base thickness.
  2. Inside Corners: Use straight pieces of maximum lengths possible. Form by cutting an inverted V-shaped notch in toe of wall base at the point where corner is formed. Shave back of base where necessary to produce a snug fit to substrate.

### **3.4 RESILIENT ACCESSORY INSTALLATION**

- A. Resilient Stair Accessories:
  1. Use stair-tread-nose filler to fill nosing substrates that do not conform to tread contours.
  2. Tightly adhere to substrates throughout length of each piece.
- B. Resilient Molding Accessories: Butt to adjacent materials and tightly adhere to substrates throughout length of each piece. Install reducer strips at edges of floor coverings that would otherwise be exposed.

### **3.5 CLEANING AND PROTECTION**

- A. Perform the following operations immediately after completing resilient product installation:
  1. Remove adhesive and other blemishes from exposed surfaces.
  2. Sweep and vacuum surfaces thoroughly.
  3. Damp-mop surfaces to remove marks and soil.
    - a. Do not wash surfaces until after time period recommended by manufacturer.

- B. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period. Use protection methods recommended in writing by manufacturer.
  - 1. Apply protective floor polish to stair accessory surfaces that are free from soil, visible adhesive, and surface blemishes if recommended in writing by manufacturer.
    - a. Use commercially available product acceptable to manufacturer.
    - b. Coordinate selection of floor polish with Owner's maintenance service.
  - 2. Cover stair accessory products with undyed, untreated building paper until Substantial Completion.
  - 3. Do not move heavy and sharp objects directly over stair accessories. Place plywood or hardboard panels over surfaces and under objects while they are being moved. Slide or roll objects over panels without moving panels.

**END OF SECTION 09 65 13**

THIS PAGE INTENTIONALLY LEFT BLANK

**SECTION 09 65 19**  
**RESILIENT TILE FLOORING**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. This Section includes the following:
  - 1. Vinyl composition tile (VCT).
- B. Related Sections include the following:
  - 1. Division 9 Section "Resilient Wall Base and Accessories" for resilient wall base, reducer strips, and other accessories installed with resilient floor tile.

**1.3 SUBMITTALS**

- A. Product Data: For each type of product indicated.
- B. Samples for Verification: Full-size units of each color and pattern of resilient floor tile required.
- C. Maintenance Data: For resilient products to include in maintenance manuals.

**1.4 QUALITY ASSURANCE**

- A. Fire-Test-Response Characteristics: Provide products identical to those tested for fire-exposure behavior per test method indicated by a testing and inspecting agency acceptable to authorities having jurisdiction.

**1.5 DELIVERY, STORAGE, AND HANDLING**

- A. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F or more than 90 deg F. Store tiles on flat surfaces.

**1.6 PROJECT CONDITIONS**

- A. Maintain temperatures within range recommended by manufacturer, but not less than 70 deg F or more than 95 deg F, in spaces to receive floor tile during the following time periods:

1. 48 hours before installation.
  2. During installation.
  3. 48 hours after installation.
- B. After post installation period, maintain temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 95 deg F.
- C. Close spaces to traffic during floor covering installation.
- D. Close spaces to traffic for 48 hours after floor covering installation.
- E. Install resilient products after other finishing operations, including painting, have been completed.

## **1.7 EXTRA MATERIALS**

- A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
1. Floor Tile: Furnish 1 box for every 50 boxes or fraction thereof, of each type, color, and pattern of floor tile installed.

## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURERS**

- A. Products: Subject to compliance with requirements, provide one of the products listed in other Part 2 articles.

### **2.2 COLORS AND PATTERNS**

- A. Colors and Patterns: As selected by Architect from manufacturer's full product range.

### **2.3 VINYL COMPOSITION TILE**

- A. Vinyl Composition Tile Schedule.
1. Basis-of-Design Product (VCT-1): Design is products, as manufactured by Armstrong World Industries, Inc., Commercial Flooring, Imperial Texture Standard Excelon. Subject to compliance with requirements, provide either the named product or a comparable product of one of the following.
- B. Vinyl Composition Tile (VCT): ASTM F 1066.
1. Armstrong Commercial Flooring.
  2. Azrock Commercial Flooring
  3. Mannington Mills, Inc.
  4. Tarkett Inc.
- C. Class: 2 (through-pattern tile).
- D. Wearing Surface: Smooth.
- E. Thickness: 0.125 inch.
- F. Size: (VCT-1): 12 by 12 inches

G. Fire-Test-Response Characteristics:

1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm per ASTM E 648.

**2.4 INSTALLATION MATERIALS**

- A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic cement based formulation provided or approved by resilient product manufacturer for applications indicated.
- B. Adhesives: Water-resistant type recommended by manufacturer to suit resilient products and substrate conditions indicated.

**PART 3 - EXECUTION**

**3.1 EXAMINATION**

- A. Examine substrates, with Installer present, for compliance with requirements for installation tolerances, moisture content, and other conditions affecting performance.
1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.
2. Proceed with installation only after unsatisfactory conditions have been corrected.

**3.2 PREPARATION**

- A. Prepare substrates according to manufacturer's written recommendations to ensure adhesion of resilient products.
- B. Concrete Substrates: Prepare according to ASTM F 710.
1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
2. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrates pass testing.
3. Moisture Testing:
  - a. Perform anhydrous calcium chloride test, ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. in 24 hours.
  - b. Perform tests recommended by manufacturer. Proceed with installation only after substrates pass testing.
- C. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.
- D. Use trowelable leveling and patching compound to fill cracks, holes, and depressions in substrates.
- E. Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.
1. Do not install resilient products until they are same temperature as space where they are to be installed.



- F. Sweep and vacuum clean substrates to be covered by resilient products immediately before installation. After cleaning, examine substrates for moisture, alkaline salts, carbonation, and dust. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.3 TILE INSTALLATION

- A. Lay out tiles from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths that equal less than one-half tile at perimeter.
  - 1. Lay tiles square with room axis.
- B. Match tiles for color and pattern by selecting tiles from cartons in the same sequence as manufactured and packaged, if so numbered. Discard broken, cracked, chipped, or deformed tiles.
  - 1. Lay tiles in pattern of colors and sizes indicated.
- C. Scribe, cut, and fit tiles to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, edgings, door frames, thresholds, and nosings.
- D. Extend tiles into toe spaces, door reveals, closets, and similar openings.
- E. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on floor tiles as marked on substrates. Use chalk or other nonpermanent, nonstaining marking device.
- F. Adhere tiles to flooring substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.

### 3.4 CLEANING AND PROTECTION

- A. Perform the following operations immediately after completing resilient product installation:
  - 1. Remove adhesive and other blemishes from exposed surfaces.
  - 2. Sweep and vacuum surfaces thoroughly.
  - 3. Damp-mop surfaces to remove marks and soil.
    - a. Do not wash surfaces until after time period recommended by manufacturer.
- B. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period. Use protection methods recommended in writing by manufacturer.
  - 1. Apply protective floor polish to horizontal surfaces that are free from soil, visible adhesive, and surface blemishes if recommended in writing by manufacturer.
    - a. Use commercially available product acceptable to manufacturer.
  - 2. Cover products installed on horizontal surfaces with undyed, untreated building paper until Substantial Completion.

3. Do not move heavy and sharp objects directly over surfaces. Place hardboard or plywood panels over flooring and under objects while they are being moved. Slide or roll objects over panels without moving panels.

**END OF SECTION 09 65 19**

THIS PAGE INTENTIONALLY LEFT BLANK

**SECTION 09 91 00**

**PAINTING**

**PART 1 GENERAL**

**1.1 GENERAL PROVISIONS**

- A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 1, GENERAL REQUIREMENTS, which are made a part of this Section of the Specifications.

**1.2 WORK INCLUDED**

- A. Provide painting and finishing work throughout exterior and interior of Project as indicated and scheduled on the Drawings and as specified.
- B. Examine Contract Documents to determine full extent of painting and finishing work required. Materials provided under other Sections that need painting or finishing and are left unfinished under requirements of other Specification Sections, shall be painted and finished to completion under work of this Section, unless specifically scheduled herein to be left unfinished.
- C. Preparatory work of materials and surfaces to receive paint beyond that specified to be done as work of other Sections, shall be included as work of this Section.

**1.3 RELATED WORK**

- A. Examine Contract Documents for requirements that affect work of this Section. Other Specification Sections that relate directly to work of this Section include, but are not limited to:
  - 1. Section 06 10 53 Rough Carpentry
  - 2. Section 07 92 00 Joint Sealants
  - 3. Section 08 11 13 HM Doors and Frames
  - 4. Section 09 21 16 Gypsum Board Assemblies

**1.4 REFERENCES**

- A. Comply with applicable requirements of the following standards. Where these standards conflict with other specified requirements, the most restrictive requirements shall govern.
  - 1. Federal Specifications (Fed. Spec.):

TT-D-65	Drier; Paint, Liquid
TT-T-801	Turpentine, Gum Spirits, Steam Distilled, Sulfate Wood, and Destructively Distilled
  - 2. Steel Structures Painting Council (SSPC):

SP 2  
SP 3Hand Tool Cleaning  
Power Tool Cleaning**1.5 SUBMITTALS**

- A. Product Data: Submit manufacturer's printed product data, specifications, use limitations and recommendations for each material used. Provide certifications that materials and systems comply with specified requirements.
- B. Initial Color Selection Samples: Submit manufacturer's standard color charts or chips showing complete range of colors, textures, and finishes available for each paint system used.
- C. Verification Samples: After initial selection of colors, submit representative samples of each paint system color that is to be exposed in the completed work. Show full color ranges and finish variations expected. Provide texture to simulate actual conditions. Define each separate coat, including block fillers and primers. Resubmit samples until required sheen, color, and texture have been approved. Provide samples as follows:
  - 1. Paint Samples for Smooth Surfaces: Provide samples of painted finishes on gypsum drywall or Masonite board having minimum size of 144 sq. in.
  - 2. Paint Samples for Concrete Masonry Units: Provide samples of painted finishes on actual concrete masonry units having minimum size of 4 in. x 8 in.
  - 3. Stained or Natural Finished Wood: Provide samples of stained or natural finished wood on actual samples of wood to be used in the completed work.

**1.6 QUALITY ASSURANCE**

- A. Source: Provide primers and undercoat paint produced by same manufacturer of finish coats for each substrate.
- B. Coordination: Review other Specification Sections where primers are provided to ensure compatibility with finish coatings provided under this Section.
- C. Mock-Ups: Prior to commencing work of this Section, provide 100 sq. ft. mock-ups of each color, paint system, and substrate at locations acceptable to the Architect. Obtain Architect's acceptance of visual qualities. Refinish mock-ups until Architect's acceptance is obtained. Maintain acceptable mock-ups throughout the remainder of the work to serve as criteria for acceptance of the work. Acceptable mock-ups may be incorporated into the finish work.

**1.7 TESTS**

- A. The Owner may employ an independent testing agency to perform tests, evaluations, and certifications of products used. Cooperate and permit samples of materials to be taken as they are used.

**1.8 PROJECT CONDITIONS**

- A. Weather, Temperature, and Humidity: Perform work only when existing and forecasted weather conditions fall within limits established by manufacturers of materials used.
  - 1. Indoor Temperature: Maintain indoor temperature at 65°F. during application and drying of paints.
  - 2. Outdoor Temperature and Conditions: Air and surface temperature shall be between 50°F. and 90°F. Surfaces shall be dry within limits of finish system manufacturer.
  - 3. Do not paint exterior surfaces while surfaces are exposed to the hot sun.
- B. Substrates: Proceed with work only when substrate construction and penetration work is complete.
- C. Lighting: Since lighting conditions can alter appearances of finish painting work, perform work of this Section under lighting conditions simulating permanent lighting system to the greatest extent possible.

**1.9 PRODUCT DELIVERY, STORAGE, AND HANDLING**

- A. Deliver materials in unopened original containers bearing manufacturer's labels.
- B. Store materials in fully sealed containers, outside the building, preferably in exterior storage shed, well ventilated, and with a minimum ambient temperature of 45°F. Oily rags and waste must be removed from the building every night, and under no circumstances will be allowed to accumulate. Each space containing stored paint materials shall be provided with UL labeled fire extinguisher of suitable type, class, and capacity.

**PART 2 PRODUCTS**

**2.1 ACCEPTABLE MANUFACTURERS**

- A. Latex Based Paints: Provide products of one of the following manufacturers that meet or exceed specified requirements:
  - 1. Benjamin Moore and Co. (Moore).
  - 2. Sherwin-Williams Company (S-W)
  - 3. Pittsburg Paints (PPG)
  - 4. Valspar Corporation (Valspar).
- B. High Performance Paint Coatings: Provide products of one of the following manufacturers that meet or exceed specified requirements:
  - 1. PPG – Pittsburg Paints (PPG)
  - 2. BASF / Master Builders (MB)
  - 3. SW – Sherwin-Williams Co. (S-W)
  - 4. Tnemec Corporation (Tnemec).
  - 5. Valspar Corporation (Valspar).
  - 6. Benjamin Moore and Co. (Moore).
- C. Materials used shall be best grade products of their respective kinds. The Painting Schedule is based on products the above named manufacturers. These are specified to

establish a standard of quality and kind of material desired. Provide these products, or equals as approved by Architect.

- D. Note: If substitutes are proposed, submit complete schedule showing materials specified and equivalent materials proposed as substitutes. Provide complete manufacturer's product data on proposed materials. Substitutes must be approved by Architect before commitment for materials is made.
- E. Assume full responsibility for proper performance of materials, for method of application, and for compatibility of materials applied over shop coats or other coats previously applied, including but limited to primers, sealers, preservative treatments, etc. Notwithstanding specific schedules in this Section, select primers which have been verified to be appropriate for each of the substrates and finishes encountered.
- F. Provide miscellaneous painting materials such as linseed oil, shellac, turpentine, and thinner of the highest quality.
- G. Material Compatibility:
  - 1. Provide materials for use within each paint system that are 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, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.
- H. Chemical Components of Field-Applied Interior Paints and Coatings: Provide products that comply with the following limits for VOC content, exclusive of colorants added to a tint base, when calculated according to 40 CFR 59, Subpart D (EPA Method 24) and the following chemical restrictions; these requirements do not apply to primers or finishes that are applied in a fabrication or finishing shop:
  - 1. Flat Paints and Coatings: VOC content of not more than 50 g/L.
  - 2. Nonflat Paints and Coatings: VOC content of not more than 150 g/L.
  - 3. Aromatic Compounds: Paints and coatings shall not contain more than 1.0 percent by weight of total aromatic compounds (hydrocarbon compounds containing one or more benzene rings).

## **2.2 COLORS**

- A. Provide colors in accordance with schedule provided by Architect. Tint and match colors to the satisfaction of Architect. Provide facilities for comparison and adjustment of colors. No limit is placed on number of colors that may be required.

## **2.3 FILLERS, SOLVENTS, AND MISCELLANEOUS MATERIALS**

- A. Turpentine: Pure gum spirits of turpentine conforming to Fed Spec. TT-T-801.
- B. Drier: Conform to Fed. Spec. TT-D-65.
- C. Tinting Materials: Best quality, ground in pure boiled linseed oil, limeproof, and non-fading.

### **PART 3 EXECUTION**

#### **3.1 INSPECTION AND GENERAL PREPARATION**

- A. Inspect surfaces to receive finishes to ensure they are in proper condition to receive work under this Section.
- B. If surfaces are not thoroughly dry, or if surfaces cannot be put in proper condition to receive paint or other finish by customary cleaning methods, sanding, or spackling, notify Architect in writing.
- C. Commencing work on any surface will be construed as acceptance of the surface as being satisfactory to properly receive the work of this Section.
- D. Furnish and lay drop cloths in all rooms and areas where painting and finishing is being done, to adequately protect flooring and other work from all damage during the painting work.
- E. Remove hardware, accessories, device plates, lighting fixtures, factory finished work, and similar items; or provide ample in-place protection. Use skilled mechanics for removal, resetting, and protection.
- F. Cleaning: Do not paint over dirt, dust, rust, grease, moisture, or other contaminants detrimental to the formation of a durable paint finish. Clean surfaces thoroughly prior to painting in any given area.
- G. Touch up bare or abraded spots on surfaces with shop or existing finishes scheduled to be painted under this Section. Use same material used for shop coat. Substrate shall be smooth, free from raised grain; putty sags, cracks, rust, grease, dirt, or other foreign matter or defect.
- H. Incompatible Shop Primers: Remove incompatible shop primers and reprime surfaces, or provide barrier coats in compliance with finish paint manufacturer's instructions.

#### **3.2 SURFACE PREPARATION**

- A. Prepare surfaces to receive work of this Section in strict accordance with manufacturer's instructions applicable to each material, condition, and finish.
- B. Gypsum Wallboard: Fill holes, dents, and similar flaws in gypsum wallboard with plaster of Paris or spackling compound. Cut out and fill cracks. Sand surface of patch smooth and flush with adjacent surfaces. Do not abrade adjacent surfaces. Patched areas shall not be detectable in finished work.
- C. Concrete and Masonry: Prepare concrete and masonry surfaces prior to painting. Allow a minimum of 60 to 90 days curing time prior to painting poured or precast concrete. Allow a minimum of 30 to 60 days curing time prior to painting concrete masonry. Determine substrate alkalinity and moisture content and take appropriate remedial actions as recommended by paint material manufacturer. Do not paint surfaces which are sufficiently alkaline to cause blistering or peeling until remedial action is taken. Do not paint surfaces where moisture content exceeds that permitted in manufacturer's printed instructions.



1. Wire-brush clean previously painted concrete and masonry surfaces.
  2. Thoroughly clean of dirt, grit, loose materials, mortar drippings, and other deleterious substances.
  3. Concrete floor which is to receive sealer shall be thoroughly washed with a cleaning and degreasing solution, in accordance with the recommendations of the sealer manufacturer.
  4. The first coat for masonry is a fill coat. Thoroughly brush fill coat into the surface in accordance with manufacturer's directions. Preliminary coats on masonry are to be absorbed into the surface. Provide additional undercoats as necessary to achieve perfect uniformity of finish coats.
- D. Wood to be Painted: Sand surfaces smooth and free of marks prior to applying first coat. Wash sap spots and knots with mineral spirits. When dry, touch-up spots and knots with an approved sealer for exterior work, and with two coats of shellac for interior work.
1. Fill nail holes, cracks, open joints, and other defects, with putty or plastic wood filler. Sand smooth when dry.
  2. Prime tops, edges, and bottoms, of unprimed wood doors immediately upon delivery. Prime hardware cut-outs in similar manner prior to installation of butts, locks, and closers.
  3. Prime wood edges, ends, faces, undersides, backsides, including cabinets, casework, paneling, and mouldings and trim.
  4. Prime wood glazing rabbets and sealant slots before glazing or sealant work is begun.
- E. Wood to be Transparent Finished: Sand smooth and free of marks before applying the first coat. Wash sap spots and knots with mineral spirits. When dry, touch-up spots and knots with two coats of shellac.
1. Backprime work with an approved spar varnish.
  2. Fill nail holes, cracks, open joints, and other defects after first coat is dry, using an exterior filler compatible with the finishing specified and tinted to camouflage repairs.
  3. Seal tops, edges, and bottoms, of unfinished wood doors immediately upon delivery. Seal cut-outs in similar manner prior to installation of butts, locks, and closers. If stained finish is required obtain alternate instructions from Architect. After being fitted by the carpenter, seal cut edges again, in similar manner, and then top and bottom edges shall be given an additional seal coat.
  4. Seal wood glazing rabbets and sealant slots before glazing or sealant work begins.
- F. Field-Welded Ferrous Metal: After installation, field-welding, and grinding, and immediately before painting, remove rust, loose mill scale, dirt, weld flux, weld spatter, weld smoke stains, burnt primer, and other foreign material with wire brushes and/or steel scrapers. Power tool clean in accordance with SSPC SP 3. Remove grease and oil by use of solvent recommended by paint manufacturer. Sand exposed surfaces, and between coats, as required to produce smooth, even finishes.
1. Sand smooth and spot prime welded areas, and areas where prime coat has been damaged or abraded, using rust inhibitive primer scheduled in this Section.

- G. Other Ferrous Metal: Remove rust, mill scale, and foreign materials. Wire brush or sand damaged or rusted area to bright metal. Remove grease or dirt with solvents recommended by paint manufacturer just prior to applying paint.
  - 1. Spot prime all areas where shop coat has been damaged or abraded, using same type paint as used for shop coat.
- H. Field-Welded Galvanized Metal: After installation, field-welding, and grinding, and immediately before painting, remove rust, loose mill scale, dirt, weld flux, weld spatter, weld smoke stains, and other foreign material with wire brushes and/or steel scrapers. Power tool clean in accordance with SSPC SP 3. Remove grease and oil with solvents recommended by paint manufacturer. Sand exposed surfaces, and between coats, as required to produce smooth, even finishes.
  - 1. Sand smooth welded areas, and areas where galvanized coating has been damaged or abraded. Spot prime using zinc primer scheduled in this Section.
- I. Other Galvanized Metal: Prior to installation, remove corrosion and foreign materials by sanding or other appropriate method. Remove grease or dirt with solvent recommended by paint manufacturer just prior to applying primer.
- J. Other Non-Ferrous Metal: Prepare shop primed non-ferrous metals similarly to ferrous metals, specified above.
  - 1. Prepare unprimed non-ferrous metals by thoroughly cleaning of oil, grease, and temporary protective coatings using solvent recommended by primer manufacturer. Provide additional pretreatment recommended by primer manufacturer to assure permanent adhesion of paint coats.
- K. Other Materials: Prepare other materials in strict accordance with recommendations of manufacturers of materials to be finished, and primers and finishes to be applied.
- L. Materials Preparation: Mix and prepare paint materials in accordance with manufacturer's printed instructions. Use only thinners approved by paint manufacturer, and only within recommended limits.

### **3.3 APPLICATION**

- A. Painting Schedule in this Section lists minimum number of coats required. If specified minimum number of coats does not completely cover or hide base materials, provide additional coats required for coverage and uniform finish appearance, without additional cost to Owner.
- B. Apply paint in strict accordance with manufacturer's instructions. Use applicators and techniques best suited for substrates and types of materials being applied. No material shall be thinned in any way except as directed by manufacturer.
- C. Apply paints and coatings at coverage rates and dry film thicknesses scheduled at the end of this Section. Each coat applied must be inspected and approved by Architect prior to application of succeeding coat, otherwise no credit for the coat

applied will be given and work in question shall be recoated without additional expense to Owner. Notify Architect when each coat is ready for inspection.

- D. Additional Coats: Provide additional coats necessary to eliminate show through and bleed through conditions.
- E. Drying Time: Allow manufacturer's recommended drying time between successive coats. However, allow each coat to thoroughly dry prior to application of subsequent coat.
- F. Sanding: Lightly sand finishes between coats using #00 sandpaper.
- G. Tinting: Tint prime coat on gypsum wallboard and plaster to approximate color of final shade.
- H. Closets: Finish closets inside the same as adjoining rooms, unless otherwise specified or scheduled.
- I. Doors and Panels: Paint all doors, panels, access panels, etc., in the "open" position. Paint all edges, tops, bottoms, and both faces. Paint back face of access panels and removable or hinged covers to match adjacent exposed surfaces.
- J. Movable Equipment and Furnishings: Paint surfaces behind movable equipment and furnishings same as adjacent exposed surfaces.
- K. Permanently Fixed Equipment: Paint surfaces behind permanently fixed equipment with prime coat only.
- L. Duct Interiors: Paint interior surfaces of ducts where visible through registers, grilles, or louvers with flat black, non-specular paint.
- M. Field-Finished Casework: Finish interior of wall and base cabinets and other field finished casework to match exterior.
- N. Finished work shall be free from runs, sags, hairs, defective brushing, and clogging of lines and angles. Flaws visible in the completed work shall be removed and the area satisfactorily repaired.
- O. Concrete Floor to Receive Sealer: Apply sealer at a rate not to exceed 200 sq. ft./gal.
  - 1. Allow first coat to cure not less than 24 hours, but not more than 72 hours.  
Apply second coat at a rate not to exceed 400 sq. ft./gal.
- P. Block Fillers: Apply block fillers to concrete masonry units at rates to ensure complete coverage with pores completely filled.
- Q. Completed Work: Provide finishes that match approved samples and mock-ups for color, texture, and coverage. Remove, refinish, or repaint work not in compliance with specified requirements.

### 3.4 COMPLETION

- A. Cleaning: At completion of work of this Section, remove paint and varnish spots, and oil, grease, and other stains caused by this work from exposed surfaces. Leave finishes in a satisfactory condition.
- B. At completion of work of this Section, remove masking materials and other debris. Reinstall or replace fixtures, plates, etc., removed to facilitate application of paint.
- C. Retouching: Touch-up and repair applied finishes which, for any reason have been damaged during construction work. All finished work applied under this Section shall have finished surfaces as approved by finish material manufacturer.
- D. Final Inspection: Protect painted surfaces against damage until date of Substantial Completion. Architect will conduct final inspection of painting work. Areas that do not comply with requirements of these Specifications shall be repainted or retouched to satisfaction of Architect at no additional cost to Owner.

### 3.5 SURFACES NOT TO BE FINISHED

- A. Finishes for the following items are either included under other appropriate Sections or require no painting, except as otherwise specifically scheduled with subsequent Exterior and Interior Schedules.
  - 1. Chrome or nickel plating, stainless steel, bronze, brass, and aluminum other than mill finished, unless otherwise specified.
  - 2. Factory finished mechanical and electrical equipment, pumps, and machinery, which occur in mechanical or equipment rooms or areas.
  - 3. Galvanized ducts, pipes, conduits, etc., occurring within mechanical areas or spaces. Also all such items fully concealed from view in the finished work.
  - 4. Factory finished materials, specialties, and accessories unless otherwise specified.
  - 5. Ceramic and clay products, glass, plastic, and other surfaces with "integral" finishes, except as otherwise scheduled herein below.
  - 6. Architectural woodwork specified as shop finished.

### 3.6 PAINT SCHEDULE

- A. Number of coats scheduled is minimum, 1 primer and 2 finish. Refer to Paragraph 3.3: A., herein before.
- B. Painting of Interior Surfaces: Important Note: Notwithstanding anything in the following schedule to the contrary, interior painting and finishing shall conform to the applicable laws and building code regarding fire hazard classifications of finish materials.

#### **Interior Gypsum Wallboard** for Latex Eggshell, or Satin Finish:

- |          |  |
|----------|--|
| One Coat | <ul style="list-style-type: none"><li>1. Benjamin Moore; Eco-Spec Interior Latex Primer No. 231: Applied at a dry film thickness of not less than 1.2 mils (0.030 mm).</li><li>2. Duron Equal</li><li>3. S-W Equal</li></ul> |
|----------|--|

- |           |    |   |
|-----------|----|---|
| Two Coats | 1. | Benjamin Moore; Eco-Spec Latex Eggshell Enamel No. 223: Applied at a dry film thickness of not less than 1.3 mils (0.033 mm). |
|           | 2. | Duron Equal   |
|           | 3. | S-W Equal   |

**Interior Gypsum Wallboard Ceilings** for Latex Flat Finish:

- |           |    |   |
|-----------|----|---|
| One Coat  | 1. | Benjamin Moore; Eco-Spec Interior Latex Primer No. 231: Applied at a dry film thickness of not less than 1.2 mils (0.030 mm). |
|           | 2. | Duron Equal   |
|           | 3. | S-W Equal   |
| Two Coats | 1. | Benjamin Moore; Eco-Spec Latex Flat No. 219: Applied at a dry film thickness of not less than 1.3 mils (0.033 mm).            |
|           | 2. | Duron Equal   |
|           | 3. | S-W Equal   |

**Interior Finish Carpentry** for Latex Semi-Gloss Paint Finish (softwoods, paint grade hardwoods, MDO, and hardwood veneers):

- |           |  |   |
|-----------|--|---|
| One Coat  |  | Benjamin Moore; Eco-Spec Interior Latex Primer No. 231: Applied at a dry film thickness of not less than 1.2 mils (0.030 mm).   |
|           |  | Duron Equal   |
|           |  | S-W Equal   |
| Two Coats |  | Benjamin Moore; Eco-Spec Latex Semi-Gloss Enamel No. 224: Applied at a dry film thickness of not less than 1.3 mils (0.033 mm). |
|           |  | Duron Equal   |
|           |  | S-W Equal   |

- |                     |    |  |
|---------------------|----|--|
| One Coat            | 1. | Primer in shop, under Section 08110.   |
| After Installation: |    |  |
| Barrier Coat:       | 1. | As recommended by manufacturer for compatibility between shop coats and field coats. |

**METAL Ferrous - (Structural Steel, Beams, Miscellaneous & Ornamental Iron, Sashes,**

**Doors, Partitions, Trim)**

**1. Latex Systems, Semi-Gloss Finish**

- 1st Coat: S-W Pro Industrial Pro-Cryl Universal Primer, B66-1310 Series  
(5.0 mils wet, 2.0 mils dry)
- 2nd Coat: S-W Solo Acrylic Semi-Gloss, A76 Series
- 3rd Coat: S-W Solo Acrylic Semi-Gloss, A76 Series  
(4.0 mils wet, 1.5 mils dry per coat)
- One Coat Approved primer, in shop under other Sections 05 52 00  
Metal Handrails and Guardrails Section 05 50 00, Metal Fabrications  
081113, HM Doors and Frames
- One Coat Field Primer (only where shop primer is not specified):
1. Benjamin Moore; Moore's IMC Alkyd Metal Primer No. M06: Applied at a dry film thickness of not less than 2.0 mils (0.051 mm).  
Devoe Equal  
S-W Equal  
PPG Equal OR, at non-ferrous metals only,
  2. Benjamin Moore; Moore's IMC Acrylic Metal Primer No. M04: Applied at a dry film thickness of not less than 2.0 mils (0.051 mm). Devoe Equal  
S-W Equal  
PPG Equal

Note: One prime coat only is required at interior metal work, except touch-up of areas which have become rusted or damaged prior to finish painting.

- Two Coats
1. Benjamin Moore; Moorcraft Super Spec Alkyd Semi-Gloss Enamel No. 271: Applied at a dry film thickness of not less than 1.4 mils (0.036 mm).  
Devoe Equal  
S-W Equal  
PPG Equal

**Interior CMU Walls:** (Surface Preparation: Cured, clean & dry, free of surface contaminants)

- a. Prime and paint interior and exterior walls per manufacturer's specifications & recommendations as follows:

- One Coat:  
(Primer) Sherwin Williams Loxon Masonry Coating Sytem Block Surfacers or approved equal
- Two Coats:  
(Finish) Sherwin Williams Pro Industrial Water Based Catalyzed Epoxy or approved equal - color: white

**END OF SECTION 09 91 00**

THIS PAGE INTENTIONALLY LEFT BLANK

## **SECTION 23 05 29**

### **HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT**

#### **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 pipe hangers and supports.
  - 2. Trapeze pipe hangers.
  - 3. Fastener systems.
  - 4. Pipe stands.
  - 5. Equipment supports.
- B. Related Sections:
  - 1. Section 230548 "Vibration Controls for HVAC Piping and Equipment" for vibration isolation devices.
  - 2. Section 233113 "Metal Ducts" for duct hangers and supports.

##### **1.3 DEFINITIONS**

- A. MSS: Manufacturers Standardization Society of The Valve and Fittings Industry Inc.

##### **1.4 PERFORMANCE REQUIREMENTS**

- A. Delegated Design: Design trapeze pipe hangers and equipment supports, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
- B. Structural Performance: Hangers and supports for HVAC piping and equipment shall withstand the effects of gravity loads and stresses within limits and under conditions indicated according to ASCE/SEI 7.
  - 1. Design supports for multiple pipes, including pipe stands, capable of supporting combined weight of supported systems, and system contents.
  - 2. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.
  - 3. Design seismic-restraint hangers and supports for piping and equipment and obtain approval from authorities having jurisdiction.



## **1.5 ACTION SUBMITTALS**

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Signed and sealed by a qualified professional engineer. Show fabrication and installation details and include calculations for the following; include Product Data for components:
  - 1. Trapeze pipe hangers.
  - 2. Metal framing systems.
  - 3. Pipe stands.
  - 4. Equipment supports.
- C. Delegated-Design Submittal: For trapeze hangers indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
  - 1. Detail fabrication and assembly of trapeze hangers.
  - 2. Design Calculations: Calculate requirements for designing trapeze hangers.

## **1.6 INFORMATIONAL SUBMITTALS**

- A. Welding certificates.

## **1.7 QUALITY ASSURANCE**

- A. Structural Steel Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- B. Pipe Welding Qualifications: Qualify procedures and operators according to ASME Boiler and Pressure Vessel Code.

## **PART 2 - PRODUCTS**

### **2.1 METAL PIPE HANGERS AND SUPPORTS**

- A. Carbon-Steel Pipe Hangers and Supports:
  - 1. Description: MSS SP-58, Types 1 through 58, factory-fabricated components.
  - 2. Galvanized Metallic Coatings: Pregalvanized or hot dipped.
  - 3. Padded Hangers: Hanger with fiberglass or other pipe insulation pad or cushion to support bearing surface of piping.
  - 4. Hanger Rods: Continuous-thread rod, nuts, and washer made of carbon steel.

## **2.2      TRAPEZE PIPE HANGERS**

- A.    Description: MSS SP-69, Type 59, shop- or field-fabricated pipe-support assembly made from structural carbon-steel shapes with MSS SP-58 carbon-steel hanger rods, nuts, saddles, and U-bolts.

## **2.3      FASTENER SYSTEMS**

- A.    Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.
- B.    Mechanical-Expansion Anchors: Insert-wedge-type, zinc-coated steel anchors, for use in hardened portland cement concrete; with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

## **2.4      EQUIPMENT SUPPORTS**

- A.    Description: Welded, shop- or field-fabricated equipment support made from structural carbon-steel shapes.

## **2.5      MISCELLANEOUS MATERIALS**

- A.    Structural Steel: ASTM A 36/A 36M, carbon-steel plates, shapes, and bars; black and galvanized.
- B.    Grout: ASTM C 1107, factory-mixed and -packaged, dry, hydraulic-cement, nonshrink and nonmetallic grout; suitable for interior and exterior applications.
  - 1.    Properties: Nonstaining, noncorrosive, and nongaseous.
  - 2.    Design Mix: 5000-psi, 28-day compressive strength.

# **PART 3 - EXECUTION**

## **3.1      HANGER AND SUPPORT INSTALLATION**

- A.    Metal Pipe-Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Install hangers, supports, clamps, and attachments as required to properly support piping from the building structure.
- B.    Metal Trapeze Pipe-Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Arrange for grouping of parallel runs of horizontal piping, and support together on field-fabricated trapeze pipe hangers.
  - 1.    Pipes of Various Sizes: Support together and space trapezes for smallest pipe size or install intermediate supports for smaller diameter pipes as specified for individual pipe hangers.

2. Field fabricate from ASTM A 36/A 36M, carbon-steel shapes selected for loads being supported. Weld steel according to AWS D1.1/D1.1M.
- C. Metal Framing System Installation: Arrange for grouping of parallel runs of piping, and support together on field-assembled metal framing systems.
- D. Fastener System Installation:
  1. Install powder-actuated fasteners for use in lightweight concrete or concrete slabs less than 4 inches thick in concrete after concrete is placed and completely cured. Use operators that are licensed by powder-actuated tool manufacturer. Install fasteners according to powder-actuated tool manufacturer's operating manual.
  2. Install mechanical-expansion anchors in concrete after concrete is placed and completely cured. Install fasteners according to manufacturer's written instructions.
- E. Install hangers and supports complete with necessary attachments, inserts, bolts, rods, nuts, washers, and other accessories.
- F. Equipment Support Installation: Fabricate from welded-structural-steel shapes.
- G. Install hangers and supports to allow controlled thermal and seismic movement of piping systems, to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends, and similar units.
- H. Install lateral bracing with pipe hangers and supports to prevent swaying.
- I. Install building attachments within concrete slabs or attach to structural steel. Install additional attachments at concentrated loads, including valves, flanges, and strainers, NPS 2-1/2 and larger and at changes in direction of piping. Install concrete inserts before concrete is placed; fasten inserts to forms and install reinforcing bars through openings at top of inserts.
- J. Load Distribution: Install hangers and supports so that piping live and dead loads and stresses from movement will not be transmitted to connected equipment.
- K. Pipe Slopes: Install hangers and supports to provide indicated pipe slopes and to not exceed maximum pipe deflections allowed by ASME B31.9 for building services piping.

### **3.2 EQUIPMENT SUPPORTS**

- A. Fabricate structural-steel stands to suspend equipment from structure overhead or to support equipment above floor.
- B. Grouting: Place grout under supports for equipment and make bearing surface smooth.
- C. Provide lateral bracing, to prevent swaying, for equipment supports.

### **3.3 METAL FABRICATIONS**

- A. Cut, drill, and fit miscellaneous metal fabrications for trapeze pipe hangers and equipment supports.

- B. Fit exposed connections together to form hairline joints. Field weld connections that cannot be shop welded because of shipping size limitations.
- C. Field Welding: Comply with AWS D1.1/D1.1M procedures for shielded, metal arc welding; appearance and quality of welds; and methods used in correcting welding work; and with the following:
  - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
  - 2. Obtain fusion without undercut or overlap.
  - 3. Remove welding flux immediately.
  - 4. Finish welds at exposed connections so no roughness shows after finishing and so contours of welded surfaces match adjacent contours.

### **3.4 ADJUSTING**

- A. Hanger Adjustments: Adjust hangers to distribute loads equally on attachments and to achieve indicated slope of pipe.
- B. Trim excess length of continuous-thread hanger and support rods to 1-1/2 inches.

### **3.5 PAINTING**

- A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.
  - 1. Apply paint by brush or spray to provide a minimum dry film thickness of 2.0 mils.
- B. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

### **3.6 HANGER AND SUPPORT SCHEDULE**

- A. Specific hanger and support requirements are in Sections specifying piping systems and equipment.
- B. Comply with MSS SP-69 for pipe-hanger selections and applications that are not specified in piping system Sections.
- C. Use hangers and supports with galvanized metallic coatings for piping and equipment that will not have field-applied finish.
- D. Use nonmetallic coatings on attachments for electrolytic protection where attachments are in direct contact with copper tubing.
- E. Use carbon-steel pipe hangers and supports metal trapeze pipe hangers and metal framing systems and attachments for general service applications.

- F. Use corrosion-resistant attachments for hostile environment applications.
- G. Use padded hangers for piping that is subject to scratching.
- H. Horizontal-Piping Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
  - 1. Adjustable, Steel Clevis Hangers (MSS Type 1): For suspension of noninsulated or insulated, stationary pipes NPS 1/2 to NPS 30.
  - 2. Steel Pipe Clamps (MSS Type 4): For suspension of cold and hot pipes NPS 1/2 to NPS 24 if little or no insulation is required.
  - 3. Pipe Hangers (MSS Type 5): For suspension of pipes NPS 1/2 to NPS 4, to allow off-center closure for hanger installation before pipe erection.
  - 4. U-Bolts (MSS Type 24): For support of heavy pipes NPS 1/2 to NPS 30.
  - 5. Clips (MSS Type 26): For support of insulated pipes not subject to expansion or contraction.
  - 6. Pipe Saddle Supports (MSS Type 36): For support of pipes NPS 4 to NPS 36, with steel-pipe base stanchion support and cast-iron floor flange or carbon-steel plate.
- I. Vertical-Piping Clamps: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
  - 1. Extension Pipe or Riser Clamps (MSS Type 8): For support of pipe risers NPS 3/4 to NPS 24.
  - 2. Carbon- or Alloy-Steel Riser Clamps (MSS Type 42): For support of pipe risers NPS 3/4 to NPS 24 if longer ends are required for riser clamps.
- J. Hanger-Rod Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
  - 1. Steel Turnbuckles (MSS Type 13): For adjustment up to 6 inches for heavy loads.
  - 2. Steel Clevises (MSS Type 14): For 120 to 450 deg F piping installations.
  - 3. Swivel Turnbuckles (MSS Type 15): For use with MSS Type 11, split pipe rings.
  - 4. Malleable-Iron Sockets (MSS Type 16): For attaching hanger rods to various types of building attachments.
  - 5. Steel Weldless Eye Nuts (MSS Type 17): For 120 to 450 deg F piping installations.
- K. Building Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
  - 1. Steel or Malleable Concrete Inserts (MSS Type 18): For upper attachment to suspend pipe hangers from concrete ceiling.
  - 2. Top-Beam C-Clamps (MSS Type 19): For use under roof installations with bar-joist construction, to attach to top flange of structural shape.
  - 3. Side-Beam or Channel Clamps (MSS Type 20): For attaching to bottom flange of beams, channels, or angles.
  - 4. Center-Beam Clamps (MSS Type 21): For attaching to center of bottom flange of beams.
  - 5. Welded Beam Attachments (MSS Type 22): For attaching to bottom of beams if loads are considerable and rod sizes are large.
  - 6. C-Clamps (MSS Type 23): For structural shapes.

7. Top-Beam Clamps (MSS Type 25): For top of beams if hanger rod is required tangent to flange edge.
  8. Side-Beam Clamps (MSS Type 27): For bottom of steel I-beams.
  9. Steel-Beam Clamps with Eye Nuts (MSS Type 28): For attaching to bottom of steel I-beams for heavy loads.
  10. Linked-Steel Clamps with Eye Nuts (MSS Type 29): For attaching to bottom of steel I-beams for heavy loads, with link extensions.
  11. Malleable-Beam Clamps with Extension Pieces (MSS Type 30): For attaching to structural steel.
  12. Welded-Steel Brackets: For support of pipes from below or for suspending from above by using clip and rod. Use one of the following for indicated loads:
    - a. Light (MSS Type 31): 750 lb.
    - b. Medium (MSS Type 32): 1500 lb.
    - c. Heavy (MSS Type 33): 3000 lb.
  13. Side-Beam Brackets (MSS Type 34): For sides of steel or wooden beams.
  14. Plate Lugs (MSS Type 57): For attaching to steel beams if flexibility at beam is required.
  15. Horizontal Travelers (MSS Type 58): For supporting piping systems subject to linear horizontal movement where headroom is limited.
- L. Comply with MSS SP-69 for trapeze pipe-hanger selections and applications that are not specified in piping system Sections.
- M. Comply with MFMA-103 for metal framing system selections and applications that are not specified in piping system Sections.
- N. Use powder-actuated fasteners or mechanical-expansion anchors instead of building attachments where required in concrete construction.

END OF SECTION 230529

## SECTION 230548

### VIBRATION AND CONTROLS FOR HVAC PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
  - 1. Restrained-spring isolators.
  - 2. Spring hangers.
  - 3. Snubbers.
  - 4. Restraint channel bracings.
  - 5. Restraint cables.
  - 6. Mechanical anchor bolts.

#### 1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.

#### 1.3 INFORMATIONAL SUBMITTALS

- A. Welding certificates.
- B. Field quality-control reports

#### 1.4 QUALITY ASSURANCE

- A. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

### PART 2 - PRODUCTS

#### 2.1 PERFORMANCE REQUIREMENTS

- A. Wind-Restraint Loading:
  - 1. Basic Wind Speed: 120 mph.
  - 2. Building Classification Category: II.
  - 3. Minimum 10 lb/sq. ft. multiplied by maximum area of HVAC component projected on vertical plane normal to wind direction, and 45 degrees either side of normal.

#### 2.2 RESTRAINED-SPRING ISOLATORS

- A. Freestanding, Laterally Stable, Open-Spring Isolators with Vertical-Limit Stop

Restraint:

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - 1) CADDY; a brand of nVent
  - 2) Ace Mountings Co. Inc.
  - 3) Kinetics Noise Control.
2. Housing: Steel housing with vertical-limit stops to prevent spring extension due to weight being removed.
  - a. Base with holes for bolting to structure with an elastomeric isolator pad attached to the underside. Bases shall limit floor load to 500 psig.
  - b. Top plate with threaded mounting holes.
  - c. Internal leveling bolt that acts as blocking during installation.
3. Restraint: Limit stop as required for equipment and authorities having jurisdiction.
4. Outside Spring Diameter: Not less than 80 percent of the compressed height of the spring at rated load.
5. Minimum Additional Travel: 50 percent of the required deflection at rated load.
6. Lateral Stiffness: More than 80 percent of rated vertical stiffness.
7. Overload Capacity: Support 200 percent of rated load, fully compressed, without deformation or failure.

## 2.3 SPRING HANGERS

- A. Combination Coil-Spring and Elastomeric-Insert Hanger with Spring and Insert in Compression:
  1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - 1) CADDY; a brand of nVent
    - 2) Ace Mountings Co. Inc.
    - 3) Kinetics Noise Control.
  2. Frame: Steel, fabricated for connection to threaded hanger rods and to allow for a maximum of 30 degrees of angular hanger-rod misalignment without binding or reducing isolation efficiency.
  3. Outside Spring Diameter: Not less than 80 percent of the compressed height of the spring at rated load.
  4. Minimum Additional Travel: 50 percent of the required deflection at rated load.
  5. Lateral Stiffness: More than 80 percent of rated vertical stiffness.
  6. Overload Capacity: Support 200 percent of rated load, fully compressed, without deformation or failure.
  7. Elastomeric Element: Molded, oil-resistant rubber or neoprene. Steel-washer-reinforced cup to support spring and bushing projecting through bottom of frame.
  8. Adjustable Vertical Stop: Steel washer with neoprene washer "up-stop" on lower threaded rod.
  9. Self-centering hanger-rod cap to ensure concentricity between hanger rod



and support spring coil.

## **2.4 RESTRAINT CABLES**

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - 1. CADDY; a brand of nVent
  - 2. Vibration Mountings & Controls
- B. Restraint Cables: ASTM A 603 galvanized-steel cables. End connections made of steel assemblies with thimbles, brackets, swivel, and bolts designed for restraining cable service; with a minimum of two clamping bolts for cable engagement.

## **PART 3 - EXECUTION**

### **3.1 VIBRATION CONTROL DEVICE INSTALLATION**

- A. Installation of vibration isolators must not cause any change of position of equipment, piping, or ductwork resulting in stresses or misalignment.
- B. Comply with requirements in Section 077200 "Roof Accessories" for installation of roof curbs, equipment supports, and roof penetrations.
- C. Equipment Restraints:
  - 1. Install resilient bolt isolation washers on equipment anchor bolts where clearance between anchor and adjacent surface exceeds 0.125 inch.
- D. Piping Restraints:
  - 1. Comply with requirements in MSS SP-127.
  - 2. Space lateral supports a maximum of 40 feet o.c., and longitudinal supports a maximum of 80 feet o.c.
  - 3. Brace a change of direction longer than 12 feet.
- E. Install cables so they do not bend across edges of adjacent equipment or building structure.
- F. Install bushing assemblies for anchor bolts for floor-mounted equipment, arranged to provide resilient media between anchor bolt and mounting hole in concrete base.
- G. Install bushing assemblies for mounting bolts for wall-mounted equipment, arranged to provide resilient media where equipment or equipment-mounting channels are attached to wall.
- H. Attachment to Structure: If specific attachment is not indicated, anchor bracing to

structure at flanges of beams, at upper truss chords of bar joists, or at concrete members.

I. Drilled-in Anchors:

1. Identify position of reinforcing steel and other embedded items prior to drilling holes for anchors. Do not damage existing reinforcing or embedded items during coring or drilling. Notify the structural engineer if reinforcing steel or other embedded items are encountered during drilling. Locate and avoid prestressed tendons, electrical and telecommunications conduit, and gas lines.
2. Do not drill holes in concrete or masonry until concrete, mortar, or grout has achieved full design strength.
3. Wedge Anchors: Protect threads from damage during anchor installation. Heavy-duty sleeve anchors shall be installed with sleeve fully engaged in the structural element to which anchor is to be fastened.
4. Set anchors to manufacturer's recommended torque, using a torque wrench.
5. Install zinc-coated steel anchors for interior and stainless-steel anchors for exterior applications.

### 3.2 FIELD QUALITY CONTROL

A. Perform tests and inspections.

B. Tests and Inspections:

1. Provide evidence of recent calibration of test equipment by a testing agency acceptable to authorities having jurisdiction.
2. Schedule test with Owner, through Architect, before connecting anchorage device to restrained component (unless postconnection testing has been approved), and with at least seven days' advance notice.
3. Obtain Architect's approval before transmitting test loads to structure. Provide temporary load-spreading members.
4. Test at least four of each type and size of installed anchors and fasteners selected by Architect.
5. Test to 90 percent of rated proof load of device.
6. Measure isolator restraint clearance.
7. Measure isolator deflection.
8. Verify snubber minimum clearances.

C. Remove and replace malfunctioning units and retest as specified above.

D. Prepare test and inspection reports.

### 3.3 ADJUSTING

A. Adjust isolators after piping system is at operating weight.

B. Adjust limit stops on restrained-spring isolators to mount equipment at normal operating height. After equipment installation is complete, adjust limit stops so they

are out of contact during normal operation.

**3.4 HVAC VIBRATION-CONTROL DEVICE SCHEDULE**

- A. Provide vibration control devices for all mechanical equipment that has a fan or pump in accordance with all applicable codes and the manufacturer's recommendations.

END OF SECTION 230548

## **SECTION 230553**

### **IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT**

#### **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. Equipment labels.
  - 2. Warning signs and labels.
  - 3. Pipe labels.
  - 4. Duct labels.
  - 5. Stencils.
  - 6. Warning tags.

##### **1.3 ACTION SUBMITTALS**

- A. Product Data: For each type of product indicated.
- B. Samples: For color, letter style, and graphic representation required for each identification material and device.
- C. Equipment Label Schedule: Include a listing of all equipment to be labeled with the proposed content for each label.

##### **1.4 COORDINATION**

- A. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.
- B. Coordinate installation of identifying devices with locations of access panels and doors.
- C. Install identifying devices before installing acoustical ceilings and similar concealment.

## **PART 2 - PRODUCTS**

### **2.1 EQUIPMENT LABELS**

- A. Plastic Labels for Equipment:
  - 1. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/16 inch thick, and having predrilled holes for attachment hardware.
  - 2. Letter Color: Black.
  - 3. Background Color: White.
  - 4. Maximum Temperature: Able to withstand temperatures up to 160 deg F.
  - 5. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
  - 6. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
  - 7. Fasteners: Stainless-steel rivets or self-tapping screws.
  - 8. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.
- B. Label Content: Include equipment's Drawing designation or unique equipment number, Drawing numbers where equipment is indicated (plans, details, and schedules).
- C. Equipment Label Schedule: For each item of equipment to be labeled, on 8-1/2-by-11-inch bond paper. Tabulate equipment identification number and identify Drawing numbers where equipment is indicated (plans, details, and schedules), plus the Specification Section number and title where equipment is specified. Equipment schedule shall be included in operation and maintenance data.

### **2.2 WARNING SIGNS AND LABELS**

- A. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/16 inch thick, and having predrilled holes for attachment hardware.
- B. Letter Color: White.
- C. Background Color: Red.
- D. Maximum Temperature: Able to withstand temperatures up to 160 deg F.
- E. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
- F. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
- G. Fasteners: Stainless-steel rivets or self-tapping screws.

- H. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.
- I. Label Content: Include caution and warning information, plus emergency notification instructions.

## **2.3 PIPE LABELS**

- A. General Requirements for Manufactured Pipe Labels: Preprinted, color-coded, with lettering indicating service, and showing flow direction.
- B. Pretensioned Pipe Labels: Precoiled, semirigid plastic formed to cover full circumference of pipe and to attach to pipe without fasteners or adhesive.
- C. Self-Adhesive Pipe Labels: Printed plastic with contact-type, permanent-adhesive backing.
- D. Pipe Label Contents: Include identification of piping service using same designations or abbreviations as used on Drawings, pipe size, and an arrow indicating flow direction.
  - 1. Flow-Direction Arrows: Integral with piping system service lettering to accommodate both directions, or as separate unit on each pipe label to indicate flow direction.
  - 2. Lettering Size: At least 1-1/2 inches high.

## **2.4 DUCT LABELS**

- A. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/16 inch thick, and having predrilled holes for attachment hardware.
- B. Letter Color: Black.
- C. Background Color: White.
- D. Maximum Temperature: Able to withstand temperatures up to 160 deg F.
- E. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
- F. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
- G. Fasteners: Stainless-steel rivets or self-tapping screws.
- H. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.
- I. Duct Label Contents: Include identification of duct service using same designations or abbreviations as used on Drawings, duct size, and an arrow indicating flow direction.
  - 1. Flow-Direction Arrows: Integral with duct system service lettering to accommodate both directions, or as separate unit on each duct label to indicate flow direction.

2. Lettering Size: At least 1-1/2 inches high.

## **2.5 WARNING TAGS**

- A. Warning Tags: Preprinted or partially preprinted, accident-prevention tags, of plasticized card stock with matte finish suitable for writing.
  1. Size: 3 by 5-1/4 inches minimum.
  2. Fasteners: Brass grommet and wire.
  3. Nomenclature: Large-size primary caption such as "DANGER," "CAUTION," or "DO NOT OPERATE."
  4. Color: Yellow background with black lettering.

## **PART 3 - EXECUTION**

### **3.1 PREPARATION**

- A. Clean piping and equipment surfaces of substances that could impair bond of identification devices, including dirt, oil, grease, release agents, and incompatible primers, paints, and encapsulants.

### **3.2 EQUIPMENT LABEL INSTALLATION**

- A. Install or permanently fasten labels on each major item of mechanical equipment.
- B. Locate equipment labels where accessible and visible.

### **3.3 PIPE LABEL INSTALLATION**

- A. Piping Color-Coding: Paint exposed piping in mechanical equipment rooms to correspond with the color in the label schedule below.
- B. Locate pipe labels where piping is exposed or above accessible ceilings in finished spaces; machine rooms; accessible maintenance spaces such as shafts, tunnels, and plenums; and exterior exposed locations as follows:
  1. Near penetrations through walls, floors, ceilings, and inaccessible enclosures.
  2. At access doors, manholes, and similar access points that permit view of concealed piping.
  3. Near major equipment items and other points of origination and termination.
  4. Spaced at maximum intervals of 50 feet along each run. Reduce intervals to 25 feet in areas of congested piping and equipment.
  5. On piping above removable acoustical ceilings. Omit intermediately spaced labels.
- C. Pipe Label Color Schedule:
  1. Refrigerant Piping:

- a. Background Color: Black.
- b. Letter Color: White.

### **3.4 DUCT LABEL INSTALLATION**

- A. Install plastic-laminated duct labels with permanent adhesive on air ducts.
- B. Locate labels near points where ducts enter into concealed spaces and at maximum intervals of 50 feet in each space where ducts are exposed or concealed by removable ceiling system.

### **3.5 WARNING-TAG INSTALLATION**

- A. Write required message on, and attach warning tags to, equipment and other items where required.

END OF SECTION 230553



**SECTION 23 05 93**

**TESTING, ADJUSTING, AND BALANCING FOR HVAC**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Section Includes:
  - 1. Balancing Air Systems:
    - a. Constant-volume air systems.
    - b. Variable-air-volume systems.

**1.2 DEFINITIONS**

- A. AABC: Associated Air Balance Council.
- B. NEBB: National Environmental Balancing Bureau.
- C. TAB: Testing, adjusting, and balancing.
- D. TABB: Testing, Adjusting, and Balancing Bureau.
- E. TAB Specialist: An entity engaged to perform TAB Work.

**1.3 INFORMATIONAL SUBMITTALS**

- A. Strategies and Procedures Plan: Within 30 days of Contractor's Notice to Proceed, submit TAB strategies and step-by-step procedures as specified in "Preparation" Article.
- B. Certified TAB reports.

**1.4 QUALITY ASSURANCE**

- A. TAB Contractor Qualifications: Engage a TAB entity certified by AABC, NEBB or TABB.
  - 1. TAB Field Supervisor: Employee of the TAB contractor and certified by AABC, NEBB or TABB.
  - 2. TAB Technician: Employee of the TAB contractor and who is certified by AABC, NEBB or TABB as a TAB technician.
- B. Certify TAB field data reports and perform the following:

1. Review field data reports to validate accuracy of data and to prepare certified TAB reports.
  2. Certify that the TAB team complied with the approved TAB plan and the procedures specified and referenced in this Specification.
- C. TAB Report Forms: Use standard TAB contractor's forms approved by Architect.
- D. Instrumentation Type, Quantity, Accuracy, and Calibration: As described in ASHRAE 111, Section 5, "Instrumentation."

## **PART 2 - PRODUCTS (Not Applicable)**

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Examine the Contract Documents to become familiar with Project requirements and to discover conditions in systems' designs that may preclude proper TAB of systems and equipment.
- B. Examine systems for installed balancing devices, such as test ports, gage cocks, thermometer wells, flow-control devices, balancing valves and fittings, and manual volume dampers. Verify that locations of these balancing devices are accessible.
- C. Examine the approved submittals for HVAC systems and equipment.
- D. Examine design data including HVAC system descriptions, statements of design assumptions for environmental conditions and systems' output, and statements of philosophies and assumptions about HVAC system and equipment controls.
- E. Examine ceiling plenums and underfloor air plenums used for supply, return, or relief air to verify that they meet the leakage class of connected ducts as specified in Section 233113 "Metal Ducts" and are properly separated from adjacent areas. Verify that penetrations in plenum walls are sealed and fire-stopped if required.
- F. Examine equipment performance data including fan curves.
1. Relate performance data to Project conditions and requirements, including system effects that can create undesired or unpredicted conditions that cause reduced capacities in all or part of a system.
  2. Calculate system-effect factors to reduce performance ratings of HVAC equipment when installed under conditions different from the conditions used to rate equipment performance. To calculate system effects for air systems, use tables and charts found in AMCA 201, "Fans and Systems," or in SMACNA's "HVAC Systems - Duct Design." Compare results with the design data and installed conditions.
- G. Examine system and equipment installations and verify that field quality-control testing, cleaning, and adjusting specified in individual Sections have been performed.
- H. Examine test reports specified in individual system and equipment Sections.

- I. Examine HVAC equipment and filters and verify that bearings are greased, belts are aligned and tight, and equipment with functioning controls is ready for operation.
- J. Examine terminal units, such as variable-air-volume boxes, and verify that they are accessible and their controls are connected and functioning.
- K. Examine operating safety interlocks and controls on HVAC equipment.
- L. Report deficiencies discovered before and during performance of TAB procedures. Observe and record system reactions to changes in conditions. Record default set points if different from indicated values.

### **3.2 PREPARATION**

- A. Prepare a TAB plan that includes strategies and step-by-step procedures.
- B. Complete system-readiness checks and prepare reports. Verify the following:
  - 1. Permanent electrical-power wiring is complete.
  - 2. Automatic temperature-control systems are operational.
  - 3. Equipment and duct access doors are securely closed.
  - 4. Balance and fire dampers are open.
  - 5. Ceilings are installed in critical areas where air-pattern adjustments are required and access to balancing devices is provided.
  - 6. Windows and doors can be closed so indicated conditions for system operations can be met.

### **3.3 GENERAL PROCEDURES FOR TESTING AND BALANCING**

- A. Perform testing and balancing procedures on each system according to the procedures contained in AABC's "National Standards for Total System Balance" and in this Section.
- B. Cut insulation, ducts, and equipment cabinets for installation of test probes to the minimum extent necessary for TAB procedures.
  - 1. After testing and balancing, patch probe holes in ducts with same material and thickness as used to construct ducts.
  - 2. Install and join new insulation that matches removed materials. Restore insulation, coverings, vapor barrier, and finish according to Section 230713 "Duct Insulation," Section 230716 "HVAC Equipment Insulation."
- C. Mark equipment and balancing devices, including damper-control positions, valve position indicators, fan-speed-control levers, and similar controls and devices, with paint or other suitable, permanent identification material to show final settings.
- D. Take and report testing and balancing measurements in inch-pound (IP) units.

### **3.4 GENERAL PROCEDURES FOR BALANCING AIR SYSTEMS**

- A. Prepare test reports for both fans and outlets. Obtain manufacturer's outlet factors and recommended testing procedures. Crosscheck the summation of required outlet volumes with required fan volumes.
- B. Prepare schematic diagrams of systems' "as-built" duct layouts.
- C. For variable-air-volume systems, develop a plan to simulate diversity.
- D. Determine the best locations in main and branch ducts for accurate duct-airflow measurements.
- E. Check airflow patterns from the outdoor-air louvers and dampers and the return- and exhaust-air dampers through the supply-fan discharge and mixing dampers.
- F. Locate start-stop and disconnect switches, electrical interlocks, and motor starters.
- G. Verify that motor starters are equipped with properly sized thermal protection.
- H. Check dampers for proper position to achieve desired airflow path.
- I. Check for airflow blockages.
- J. Check condensate drains for proper connections and functioning.
- K. Check for proper sealing of air-handling-unit components.
- L. Verify that air duct system is sealed as specified in Section 233113 "Metal Ducts."

### **3.5 PROCEDURES FOR CONSTANT-VOLUME AIR SYSTEMS**

- A. Adjust fans to deliver total indicated airflows within the maximum allowable fan speed listed by fan manufacturer.
  - 1. Measure total airflow.
    - a. Set outside-air, return-air, and relief-air dampers for proper position that simulates minimum outdoor-air conditions.
    - b. Where duct conditions allow, measure airflow by Pitot-tube traverse. If necessary, perform multiple Pitot-tube traverses to obtain total airflow.
    - c. Where duct conditions are not suitable for Pitot-tube traverse measurements, a coil traverse may be acceptable.
    - d. If a reliable Pitot-tube traverse or coil traverse is not possible, measure airflow at terminals and calculate the total airflow.
  - 2. Measure fan static pressures as follows:
    - a. Measure static pressure directly at the fan outlet or through the flexible connection.
    - b. Measure static pressure directly at the fan inlet or through the flexible connection.
    - c. Measure static pressure across each component that makes up the air-handling system.

- d. Report artificial loading of filters at the time static pressures are measured.
- 3. Review Record Documents to determine variations in design static pressures versus actual static pressures. Calculate actual system-effect factors. Recommend adjustments to accommodate actual conditions.
- 4. Obtain approval from Engineer for adjustment of fan speed higher or lower than indicated speed. Comply with requirements in HVAC Sections for air-handling units for adjustment of fans, belts, and pulley sizes to achieve indicated air-handling-unit performance.
- 5. Do not make fan-speed adjustments that result in motor overload. Consult equipment manufacturers about fan-speed safety factors. Modulate dampers and measure fan-motor amperage to ensure that no overload occurs. Measure amperage in full-cooling, full-heating, economizer, and any other operating mode to determine the maximum required brake horsepower.
- B. Adjust volume dampers for main duct, submain ducts, and major branch ducts to indicated airflows.
  - 1. Measure airflow of submain and branch ducts.
  - 2. Adjust submain and branch duct volume dampers for specified airflow.
  - 3. Re-measure each submain and branch duct after all have been adjusted.
- C. Adjust air inlets and outlets for each space to indicated airflows.
  - 1. Set airflow patterns of adjustable outlets for proper distribution without drafts.
  - 2. Measure inlets and outlets airflow.
  - 3. Adjust each inlet and outlet for specified airflow.
  - 4. Re-measure each inlet and outlet after they have been adjusted.

### **3.6 PROCEDURES FOR VARIABLE-AIR-VOLUME SYSTEMS**

- A. Compensating for Diversity: When the total airflow of all terminal units is more than the indicated airflow of the fan, place a selected number of terminal units at a minimum set-point airflow with the remainder at maximum airflow condition until the total airflow of the terminal units equals the indicated airflow of the fan. Select the reduced-airflow terminal units so they are distributed evenly among the branch ducts.
- B. Pressure-Independent, Variable-Air-Volume Systems: After the fan systems have been adjusted, adjust the variable-air-volume systems as follows:
  - 1. Set outdoor-air dampers at minimum, and set return- and exhaust-air dampers at a position that simulates full-cooling load.
  - 2. Select the terminal unit that is most critical to the supply-fan airflow and static pressure. Measure static pressure. Adjust system static pressure so the entering static pressure for the critical terminal unit is not less than the sum of the terminal-unit manufacturer's recommended minimum inlet static pressure plus the static pressure needed to overcome terminal-unit discharge system losses.
  - 3. Measure total system airflow. Adjust to within indicated airflow.

4. Set terminal units at maximum airflow and adjust controller or regulator to deliver the designed maximum airflow. Use terminal-unit manufacturer's written instructions to make this adjustment. When total airflow is correct, balance the air outlets downstream from terminal units the same as described for constant-volume air systems.
5. Set terminal units at minimum airflow and adjust controller or regulator to deliver the designed minimum airflow. Check air outlets for a proportional reduction in airflow the same as described for constant-volume air systems.
  - a. If air outlets are out of balance at minimum airflow, report the condition but leave outlets balanced for maximum airflow.
6. Remeasure the return airflow to the fan while operating at maximum return airflow and minimum outdoor airflow.
  - a. Adjust the fan and balance the return-air ducts and inlets the same as described for constant-volume air systems.
7. Measure static pressure at the most critical terminal unit and adjust the static-pressure controller at the main supply-air sensing station to ensure that adequate static pressure is maintained at the most critical unit.
8. Record final fan-performance data.

### **3.7 PROCEDURES FOR MOTORS**

- A. Motors, 1/2 HP and Larger: Test at final balanced conditions and record the following data:
  1. Manufacturer's name, model number, and serial number.
  2. Motor horsepower rating.
  3. Motor rpm.
  4. Efficiency rating.
  5. Nameplate and measured voltage, each phase.
  6. Nameplate and measured amperage, each phase.
  7. Starter thermal-protection-element rating.
- B. Motors Driven by Variable-Frequency Controllers: Test for proper operation at speeds varying from minimum to maximum. Test the manual bypass of the controller to prove proper operation. Record observations including name of controller manufacturer, model number, serial number, and nameplate data.

### **3.8 PROCEDURES FOR CONDENSING UNITS**

- A. Verify proper rotation of fans.
- B. Measure entering- and leaving-air temperatures.
- C. Record compressor data.

### **3.9 TOLERANCES**

- A. Set HVAC system's air flow rates within the following tolerances:
  - 1. Supply, Return, and Exhaust Fans and Equipment with Fans: Plus or minus 10 percent.
  - 2. Air Outlets and Inlets: Plus or minus 10 percent.

### **3.10 REPORTING**

- A. Initial Construction-Phase Report: Based on examination of the Contract Documents as specified in "Examination" Article, prepare a report on the adequacy of design for systems' balancing devices. Recommend changes and additions to systems' balancing devices to facilitate proper performance measuring and balancing. Recommend changes and additions to HVAC systems and general construction to allow access for performance measuring and balancing devices.

### **3.11 FINAL REPORT**

- A. General: Prepare a certified written report; tabulate and divide the report into separate sections for tested systems and balanced systems.
  - 1. Include a certification sheet at the front of the report's binder, signed and sealed by the certified testing and balancing engineer.
  - 2. Include a list of instruments used for procedures, along with proof of calibration.
- B. Final Report Contents: In addition to certified field-report data, include the following:
  - 1. Fan curves.
  - 2. Manufacturers' test data.
  - 3. Field test reports prepared by system and equipment installers.
  - 4. Other information relative to equipment performance; do not include Shop Drawings and product data.
- C. General Report Data: In addition to form titles and entries, include the following data:
  - 1. Title page.
  - 2. Name and address of the TAB contractor.
  - 3. Project name.
  - 4. Project location.
  - 5. Architect's name and address.
  - 6. Engineer's name and address.
  - 7. Contractor's name and address.
  - 8. Report date.
  - 9. Signature of TAB supervisor who certifies the report.
  - 10. Table of Contents with the total number of pages defined for each section of the report. Number each page in the report.
  - 11. Summary of contents including the following:
    - a. Indicated versus final performance.

- b. Notable characteristics of systems.
  - c. Description of system operation sequence if it varies from the Contract Documents.
- 12. Nomenclature sheets for each item of equipment.
- 13. Data for terminal units, including manufacturer's name, type, size, and fittings.
- 14. Notes to explain why certain final data in the body of reports vary from indicated values.
- 15. Test conditions for fans performance forms including the following:
  - a. Settings for outdoor-, return-, and exhaust-air dampers.
  - b. Conditions of filters.
  - c. Cooling coil, wet- and dry-bulb conditions.
  - d. Face and bypass damper settings at coils.
  - e. Fan drive settings including settings and percentage of maximum pitch diameter.
  - f. Inlet vane settings for variable-air-volume systems.
  - g. Settings for supply-air, static-pressure controller.
  - h. Other system operating conditions that affect performance.
- D. System Diagrams: Include schematic layouts of air systems. Present each system with single-line diagram and include the following:
  - 1. Quantities of outdoor, supply, return, and exhaust airflows.
  - 2. Duct, outlet, and inlet sizes.
  - 3. Terminal units.
  - 4. Balancing stations.

### **3.12 ADDITIONAL TESTS**

- A. Within 90 days of completing TAB, perform additional TAB to verify that balanced conditions are being maintained throughout and to correct unusual conditions.
- B. Seasonal Periods: If initial TAB procedures were not performed during near-peak summer and winter conditions, perform additional TAB during near-peak summer and winter conditions.

END OF SECTION 230593



**SECTION 230713**  
**DUCT INSULATION**

**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 insulating the following duct services:
  - 1. Indoor, concealed supply and outdoor air.
  - 2. Indoor, concealed return located in unconditioned space.
- B. Related Sections:
  - 1. Section 230719 "HVAC Piping Insulation."
  - 2. Section 233113 "Metal Ducts" for duct liners.

**1.3 ACTION SUBMITTALS**

- A. Product Data: For each type of product indicated. Include thermal conductivity, water-vapor permeance thickness, and jackets (both factory- and field-applied if any).
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
  - 1. Detail application of protective shields, saddles, and inserts at hangers for each type of insulation and hanger.
  - 2. Detail insulation application at elbows, fittings, dampers, specialties and flanges for each type of insulation.
  - 3. Detail application of field-applied jackets.
  - 4. Detail application at linkages of control devices.

**1.4 INFORMATIONAL SUBMITTALS**

- A. Qualification Data: For qualified Installer.
- B. Material Test Reports: From a qualified testing agency acceptable to authorities having jurisdiction indicating, interpreting, and certifying test results for compliance of insulation materials, sealers, attachments, cements, and jackets, with requirements indicated. Include dates of tests and test methods employed.

- C. Field quality-control reports.

## **1.5 QUALITY ASSURANCE**

- A. Installer Qualifications: Skilled mechanics who have successfully completed an apprenticeship program or another craft training program certified by the Department of Labor, Bureau of Apprenticeship and Training.
- B. Surface-Burning Characteristics: For insulation and related materials, as determined by testing identical products according to ASTM E 84, by a testing agency acceptable to authorities having jurisdiction. Factory label insulation and jacket materials and adhesive, mastic, tapes, and cement material containers, with appropriate markings of applicable testing agency.
  - 1. Insulation Installed Indoors: Flame-spread index of 25 or less, and smoke-developed index of 50 or less.
  - 2. Insulation Installed Outdoors: Flame-spread index of 75 or less, and smoke-developed index of 150 or less.

## **1.6 DELIVERY, STORAGE, AND HANDLING**

- A. Packaging: Insulation material containers shall be marked by manufacturer with appropriate ASTM standard designation, type and grade, and maximum use temperature.

## **1.7 COORDINATION**

- A. Coordinate sizes and locations of supports, hangers, and insulation shields specified in Section 230529 "Hangers and Supports for HVAC Piping and Equipment."
- B. Coordinate clearance requirements with duct Installer for duct insulation application. Before preparing ductwork Shop Drawings, establish and maintain clearance requirements for installation of insulation and field-applied jackets and finishes and for space required for maintenance.
- C. Coordinate installation and testing of heat tracing.

## **1.8 SCHEDULING**

- A. Schedule insulation application after pressure testing systems and, where required, after installing and testing heat tracing. Insulation application may begin on segments that have satisfactory test results.
- B. Complete installation and concealment of plastic materials as rapidly as possible in each area of construction.

## PART 2 - PRODUCTS

### 2.1 INSULATION MATERIALS

- A. Comply with requirements in "Duct Insulation Schedule, General," "Indoor Duct and Plenum Insulation Schedule," and "Aboveground, Outdoor Duct and Plenum Insulation Schedule" articles for where insulating materials shall be applied.
- B. Products shall not contain asbestos, lead, mercury, or mercury compounds.
- C. Mineral-Fiber Blanket Insulation: Mineral or glass fibers bonded with a thermosetting resin. Comply with ASTM C 553, Type II and ASTM C 1290, Type III with factory-applied FSK jacket. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.
  - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include the following or equal:
    - a. CertainTeed Corp.; SoftTouch Duct Wrap.
    - b. Johns Manville; Microlite.
    - c. Knauf Insulation; Friendly Feel Duct Wrap.
    - d. Owens Corning; SOFTR All-Service Duct Wrap.
- D. Mineral-Fiber Board Insulation: Mineral or glass fibers bonded with a thermosetting resin. Comply with ASTM C 612, Type IA or Type IB. For duct and plenum applications, provide insulation without factory-applied jacket.
  - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include the following or equal:
    - a. CertainTeed Corp.; Commercial Board.
    - b. Johns Manville; 800 Series Spin-Glas.
    - c. Knauf Insulation; Insulation Board.
    - d. Owens Corning; Fiberglas 700 Series.

### 2.2 ADHESIVES

- A. Materials shall be compatible with insulation materials, jackets, and substrates and for bonding insulation to itself and to surfaces to be insulated unless otherwise indicated.
- B. Mineral-Fiber Adhesive: Comply with MIL-A-3316C, Class 2, Grade A.
  - 1. For indoor applications, adhesive shall have a VOC content of 80 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- C. ASJ Adhesive, and FSK Jacket Adhesive: Comply with MIL-A-3316C, Class 2, Grade A for bonding insulation jacket lap seams and joints.
  - 1. For indoor applications, adhesive shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

## **2.3 MASTICS**

- A. Materials shall be compatible with insulation materials, jackets, and substrates; comply with MIL-PRF-19565C, Type II.
  - 1. For indoor applications, use mastics that have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- B. Vapor-Barrier Mastic: Water based; suitable for indoor use on below ambient services.

## **2.4 LAGGING ADHESIVES**

- A. Description: Comply with MIL-A-3316C, Class I, Grade A and shall be compatible with insulation materials, jackets, and substrates.
  - 1. For indoor applications, use lagging adhesives that have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
  - 2. Fire-resistant, water-based lagging adhesive and coating for use indoors to adhere fire-resistant lagging cloths over duct insulation.
  - 3. Service Temperature Range: 0 to plus 180 deg F.
  - 4. Color: White.

## **2.5 SEALANTS**

- A. Metal Jacket Flashing Sealants:
  - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include the following or equal:
    - a. Childers Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; CP-76.Eagle Bridges - Marathon Industries; 405.
    - b. Foster Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; 95-44.
    - c. Mon-Eco Industries, Inc.; 44-05.
  - 2. Materials shall be compatible with insulation materials, jackets, and substrates.
  - 3. Fire- and water-resistant, flexible, elastomeric sealant.
  - 4. Service Temperature Range: Minus 40 to plus 250 deg F.
  - 5. Color: Aluminum.
- B. ASJ Flashing Sealants, and Vinyl and PVC Jacket Flashing Sealants:
  - 1. For indoor applications, sealants shall have a VOC content of 420 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

## **2.6 FACTORY-APPLIED JACKETS**

- A. Insulation system schedules indicate factory-applied jackets on various applications. When factory-applied jackets are indicated, comply with the following:

1. ASJ: White, kraft-paper, fiberglass-reinforced scrim with aluminum-foil backing; complying with ASTM C 1136, Type I.
2. FSK Jacket: Aluminum-foil, fiberglass-reinforced scrim with kraft-paper backing; complying with ASTM C 1136, Type II.

## **2.7 TAPES**

- A. ASJ Tape: White vapor-retarder tape matching factory-applied jacket with acrylic adhesive, complying with ASTM C 1136.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include the following or equal:
  - a. ABI, Ideal Tape Division; 428 AWF ASJ.
  - b. Avery Dennison Corporation, Specialty Tapes Division; Fasson 0836.
  - c. Compac Corporation; 104 and 105.
  - d. Venture Tape; 1540 CW Plus, 1542 CW Plus, and 1542 CW Plus/SQ.
2. Width: 3 inches.
3. Thickness: 11.5 mils.
4. Adhesion: 90 ounces force/inch in width.
5. Elongation: 2 percent.
6. Tensile Strength: 40 lbf/inch in width.
7. ASJ Tape Disks and Squares: Precut disks or squares of ASJ tape.

- B. FSK Tape: Foil-face, vapor-retarder tape matching factory-applied jacket with acrylic adhesive; complying with ASTM C 1136.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include the following or equal:
  - a. ABI, Ideal Tape Division; 491 AWF FSK.
  - b. Avery Dennison Corporation, Specialty Tapes Division; Fasson 0827.
  - c. Compac Corporation; 110 and 111.
  - d. Venture Tape; 1525 CW NT, 1528 CW, and 1528 CW/SQ.
2. Width: 3 inches.
3. Thickness: 6.5 mils.
4. Adhesion: 90 ounces force/inch in width.
5. Elongation: 2 percent.
6. Tensile Strength: 40 lbf/inch in width.
7. FSK Tape Disks and Squares: Precut disks or squares of FSK tape.

## **2.8 SECUREMENTS**

- A. Bands:

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include the following or equal:

- a. ITW Insulation Systems; Gerrard Strapping and Seals.
  - b. RPR Products, Inc.; Insul-Mate Strapping, Seals, and Springs.
- 2. Stainless Steel: ASTM A 167 or ASTM A 240/A 240M, Type 304 or Type 316; 0.015 inch thick, 1/2 inch wide with wing seal.
- B. Staples: Outward-clinching insulation staples, nominal 3/4-inch- wide, stainless steel or Monel.
- C. Wire: 0.062-inch soft-annealed, stainless steel.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Examine substrates and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of insulation application.
  - 1. Verify that systems to be insulated have been tested and are free of defects.
  - 2. Verify that surfaces to be insulated are clean and dry.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.2 PREPARATION**

- A. Surface Preparation: Clean and dry surfaces to receive insulation. Remove materials that will adversely affect insulation application.

### **3.3 GENERAL INSTALLATION REQUIREMENTS**

- A. Install insulation materials, accessories, and finishes with smooth, straight, and even surfaces; free of voids throughout the length of ducts and fittings.
- B. Install insulation materials, vapor barriers or retarders, jackets, and thicknesses required for each item of duct system as specified in insulation system schedules.
- C. Install accessories compatible with insulation materials and suitable for the service. Install accessories that do not corrode, soften, or otherwise attack insulation or jacket in either wet or dry state.
- D. Install insulation with longitudinal seams at top and bottom of horizontal runs.
- E. Install multiple layers of insulation with longitudinal and end seams staggered.
- F. Keep insulation materials dry during application and finishing.
- G. Install insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by insulation material manufacturer.

- H. Install insulation with least number of joints practical.
- I. Where vapor barrier is indicated, seal joints, seams, and penetrations in insulation at hangers, supports, anchors, and other projections with vapor-barrier mastic.
  - 1. Install insulation continuously through hangers and around anchor attachments.
  - 2. For insulation application where vapor barriers are indicated, extend insulation on anchor legs from point of attachment to supported item to point of attachment to structure. Taper and seal ends at attachment to structure with vapor-barrier mastic.
  - 3. Install insert materials and install insulation to tightly join the insert. Seal insulation to insulation inserts with adhesive or sealing compound recommended by insulation material manufacturer.
- J. Apply adhesives, mastics, and sealants at manufacturer's recommended coverage rate and wet and dry film thicknesses.
- K. Install insulation with factory-applied jackets as follows:
  - 1. Draw jacket tight and smooth.
  - 2. Cover circumferential joints with 3-inch- wide strips, of same material as insulation jacket. Secure strips with adhesive and outward clinching staples along both edges of strip, spaced 4 inches o.c.
  - 3. Overlap jacket longitudinal seams at least 1-1/2 inches. Clean and dry surface to receive self-sealing lap. Staple laps with outward clinching staples along edge at 4 inches o.c.
    - a. For below ambient services, apply vapor-barrier mastic over staples.
  - 4. Cover joints and seams with tape, according to insulation material manufacturer's written instructions, to maintain vapor seal.
  - 5. Where vapor barriers are indicated, apply vapor-barrier mastic on seams and joints and at ends adjacent to duct flanges and fittings.
- L. Cut insulation in a manner to avoid compressing insulation more than 75 percent of its nominal thickness.
- M. Finish installation with systems at operating conditions. Repair joint separations and cracking due to thermal movement.
- N. Repair damaged insulation facings by applying same facing material over damaged areas. Extend patches at least 4 inches beyond damaged areas. Adhere, staple, and seal patches similar to butt joints.

### **3.4 PENETRATIONS**

- A. Insulation Installation at Roof Penetrations: Install insulation continuously through roof penetrations.
  - 1. Seal penetrations with flashing sealant.
  - 2. For applications requiring only indoor insulation, terminate insulation above roof surface and seal with joint sealant. For applications requiring indoor and outdoor insulation,

- install insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.
- 3. Extend jacket of outdoor insulation outside roof flashing at least 2 inches below top of roof flashing.
- 4. Seal jacket to roof flashing with flashing sealant.
- B. Insulation Installation at Interior Wall and Partition Penetrations (That Are Not Fire Rated): Install insulation continuously through walls and partitions.

### **3.5 INSTALLATION OF MINERAL-FIBER INSULATION**

- A. Blanket Insulation Installation on Ducts and Plenums: Secure with adhesive and insulation pins.
  - 1. Apply adhesives according to manufacturer's recommended coverage rates per unit area, for 50 percent coverage of duct and plenum surfaces.
  - 2. Apply adhesive to entire circumference of ducts and to all surfaces of fittings and transitions. Adhesive is not required on the top of the ductwork.
  - 3. Install either capacitor-discharge-weld pins and speed washers or cupped-head, capacitor-discharge-weld pins on sides and bottom of horizontal ducts and sides of vertical ducts as follows:
    - a. On duct sides with dimensions 18 inches and smaller, place pins along longitudinal centerline of duct. Space 3 inches maximum from insulation end joints, and 16 inches o.c.
    - b. On duct sides with dimensions larger than 18 inches, place pins 16 inches o.c. each way, and 3 inches maximum from insulation joints. Install additional pins to hold insulation tightly against surface at cross bracing.
    - c. Pins may be omitted from top surface of horizontal, rectangular ducts and plenums.
    - d. Do not overcompress insulation during installation.
    - e. Impale insulation over pins and attach speed washers.
    - f. Cut excess portion of pins extending beyond speed washers or bend parallel with insulation surface. Cover exposed pins and washers with tape matching insulation facing.
  - 4. For ducts and plenums with surface temperatures below ambient, install a continuous unbroken vapor barrier. Create a facing lap for longitudinal seams and end joints with insulation by removing 2 inches from one edge and one end of insulation segment. Secure laps to adjacent insulation section with 1/2-inch outward-clinching staples, 1 inch o.c. Install vapor barrier consisting of factory- or field-applied jacket, adhesive, vapor-barrier mastic, and sealant at joints, seams, and protrusions.
    - a. Repair punctures, tears, and penetrations with tape or mastic to maintain vapor-barrier seal.
    - b. Install vapor stops for ductwork and plenums operating below 50 deg F at 18-foot intervals. Vapor stops shall consist of vapor-barrier mastic applied in a Z-shaped pattern over insulation face, along butt end of insulation, and over the surface. Cover insulation face and surface to be insulated a width equal to two times the insulation thickness, but not less than 3 inches.



5. Overlap unfaced blankets a minimum of 2 inches on longitudinal seams and end joints. At end joints, secure with steel bands spaced a maximum of 18 inches o.c.
  6. Install insulation on rectangular duct elbows and transitions with a full insulation section for each surface. Install insulation on round and flat-oval duct elbows with individually mitered gores cut to fit the elbow.
  7. Insulate duct stiffeners, hangers, and flanges that protrude beyond insulation surface with 6-inch- wide strips of same material used to insulate duct. Secure on alternating sides of stiffener, hanger, and flange with pins spaced 6 inches o.c.
- B. Board Insulation Installation on Ducts and Plenums: Secure with adhesive and insulation pins.
1. Apply adhesives according to manufacturer's recommended coverage rates per unit area, for 50 percent coverage of duct and plenum surfaces.
  2. Apply adhesive to entire circumference of ducts and to all surfaces of fittings and transitions.
  3. Install either capacitor-discharge-weld pins and speed washers or cupped-head, capacitor-discharge-weld pins on sides and bottom of horizontal ducts and sides of vertical ducts as follows:
    - a. On duct sides with dimensions 18 inches and smaller, place pins along longitudinal centerline of duct. Space 3 inches maximum from insulation end joints, and 16 inches o.c.
    - b. On duct sides with dimensions larger than 18 inches, space pins 16 inches o.c. each way, and 3 inches maximum from insulation joints. Install additional pins to hold insulation tightly against surface at cross bracing.
    - c. Pins may be omitted from top surface of horizontal, rectangular ducts and plenums.
    - d. Do not overcompress insulation during installation.
    - e. Cut excess portion of pins extending beyond speed washers or bend parallel with insulation surface. Cover exposed pins and washers with tape matching insulation facing.
  4. For ducts and plenums with surface temperatures below ambient, install a continuous unbroken vapor barrier. Create a facing lap for longitudinal seams and end joints with insulation by removing 2 inches from one edge and one end of insulation segment. Secure laps to adjacent insulation section with 1/2-inch outward-clinching staples, 1 inch o.c. Install vapor barrier consisting of factory- or field-applied jacket, adhesive, vapor-barrier mastic, and sealant at joints, seams, and protrusions.
    - a. Repair punctures, tears, and penetrations with tape or mastic to maintain vapor-barrier seal.
    - b. Install vapor stops for ductwork and plenums operating below 50 deg F at 18-foot intervals. Vapor stops shall consist of vapor-barrier mastic applied in a Z-shaped pattern over insulation face, along butt end of insulation, and over the surface. Cover insulation face and surface to be insulated a width equal to two times the insulation thickness, but not less than 3 inches.
  5. Install insulation on rectangular duct elbows and transitions with a full insulation section for each surface. Groove and score insulation to fit as closely as possible to outside and inside radius of elbows. Install insulation on round and flat-oval duct elbows with individually mitered gores cut to fit the elbow.

6. Insulate duct stiffeners, hangers, and flanges that protrude beyond insulation surface with 6-inch- wide strips of same material used to insulate duct. Secure on alternating sides of stiffener, hanger, and flange with pins spaced 6 inches o.c.

### **3.6 FINISHES**

- A. Insulation with ASJ, Glass-Cloth, or Other Paintable Jacket Material: Paint jacket with paint system identified below."
  1. Flat Acrylic Finish: Two finish coats over a primer that is compatible with jacket material and finish coat paint. Add fungicidal agent to render fabric mildew proof.
    - a. Finish Coat Material: Interior, flat, latex-emulsion size.
- B. Color: Final color as selected by Engineer. Vary first and second coats to allow visual inspection of the completed Work.
- C. Do not field paint stainless-steel jackets.

### **3.7 FIELD QUALITY CONTROL**

- A. Perform tests and inspections.
- B. Tests and Inspections:
  1. Inspect ductwork, randomly selected by Architect, by removing field-applied jacket and insulation in layers in reverse order of their installation. Extent of inspection shall be limited to one location(s) for each duct system defined in the "Duct Insulation Schedule, General" Article.
- C. All insulation applications will be considered defective Work if sample inspection reveals noncompliance with requirements.

### **3.8 DUCT INSULATION SCHEDULE, GENERAL**

- A. Plenums and Ducts Requiring Insulation:
  1. Indoor, concealed supply and outdoor air.
  2. Indoor, concealed return located in unconditioned space.
  3. Indoor, exposed supply and outdoor air.
  4. Indoor, exposed return located in unconditioned space.
- B. Items Not Insulated:
  1. Metal ducts with duct liner of sufficient thickness to comply with energy code and ASHRAE/IESNA 90.1.
  2. Factory-insulated flexible ducts.
  3. Factory-insulated plenums and casings.
  4. Flexible connectors.
  5. Vibration-control devices.

6. Factory-insulated access panels and doors.

### **3.9 INDOOR DUCT AND PLENUM INSULATION SCHEDULE**

- A. Concealed supply, return, exhaust, or outdoor-air duct insulation shall be the following:
  1. Mineral-Fiber Blanket: 1-1/2 inches thick and provide a thermal resistance value of at least R-6.
- B. Exposed supply, return, exhaust, or outdoor-air duct insulation shall be the following:
  1. Mineral-Fiber Blanket: 1-1/2 inches thick and provide a thermal resistance value of at least R-6.

END OF SECTION 230713

**SECTION 230719**  
**HVAC PIPING INSULATION**

**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 insulating the following HVAC piping systems:
  - 1. Condensate drain piping, indoors.
  - 2. Refrigerant suction and hot-gas piping, indoors and outdoors.
- B. Related Sections:
  - 1. Section 230713 "Duct Insulation."

**1.3 ACTION SUBMITTALS**

- A. Product Data: For each type of product indicated. Include thermal conductivity, water-vapor permeance thickness, and jackets (both factory and field applied if any).
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
  - 1. Detail insulation application at pipe expansion joints for each type of insulation.
  - 2. Detail application of field-applied jackets.

**1.4 INFORMATIONAL SUBMITTALS**

- A. Qualification Data: For qualified Installer.
- B. Material Test Reports: From a qualified testing agency acceptable to authorities having jurisdiction indicating, interpreting, and certifying test results for compliance of insulation materials, sealers, attachments, cements, and jackets, with requirements indicated. Include dates of tests and test methods employed.
- C. Field quality-control reports.

## **1.5 QUALITY ASSURANCE**

- A. Surface-Burning Characteristics: For insulation and related materials, as determined by testing identical products according to ASTM E 84, by a testing and inspecting agency acceptable to authorities having jurisdiction. Factory label insulation and jacket materials and adhesive, mastic, tapes, and cement material containers, with appropriate markings of applicable testing agency.
  - 1. Insulation Installed Indoors: Flame-spread index of 25 or less, and smoke-developed index of 50 or less.
  - 2. Insulation Installed Outdoors: Flame-spread index of 75 or less, and smoke-developed index of 150 or less.

## **1.6 DELIVERY, STORAGE, AND HANDLING**

- A. Packaging: Insulation material containers shall be marked by manufacturer with appropriate ASTM standard designation, type and grade, and maximum use temperature.

## **1.7 COORDINATION**

- A. Coordinate clearance requirements with piping Installer for piping insulation application. Before preparing piping Shop Drawings, establish and maintain clearance requirements for installation of insulation and field-applied jackets and finishes and for space required for maintenance.

## **1.8 SCHEDULING**

- A. Schedule insulation application after pressure testing systems. Insulation application may begin on segments that have satisfactory test results.
- B. Complete installation and concealment of plastic materials as rapidly as possible in each area of construction.

## **PART 2 - PRODUCTS**

### **2.1 INSULATION MATERIALS**

- A. Comply with requirements in "Piping Insulation Schedule, General," "Indoor Piping Insulation Schedule," and "Outdoor, Aboveground Piping Insulation Schedule" articles for where insulating materials shall be applied.
- B. Products shall not contain asbestos, lead, mercury, or mercury compounds.
- C. Flexible Elastomeric Insulation: Closed-cell, sponge- or expanded-rubber materials. Comply with ASTM C 534, Type I for tubular materials.

1. **Products:** Subject to compliance with requirements, available products that may be incorporated into the Work include the following or equal:

- a. Aeroflex USA, Inc.; Aerocel.
- b. Armacell LLC; AP Armaflex.
- c. K-Flex USA; Insul-Lock, Insul-Tube, and K-FLEX LS.

D. Mineral-Fiber, Preformed Pipe Insulation:

1. **Products:** Subject to compliance with requirements, available products that may be incorporated into the Work include the following or equal:

- a. Fibrex Insulations Inc.; Coreplus 1200.
- b. Johns Manville; Micro-Lok.
- c. Knauf Insulation; 1000-Degree Pipe Insulation.
- d. Manson Insulation Inc.; Alley-K.
- e. Owens Corning; Fiberglas Pipe Insulation.

2. Type I, 850 deg F Materials: Mineral or glass fibers bonded with a thermosetting resin. Comply with ASTM C 547, Type I, Grade A, with factory-applied ASJ. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.

## 2.2 ADHESIVES

- A. Materials shall be compatible with insulation materials, jackets, and substrates and for bonding insulation to itself and to surfaces to be insulated unless otherwise indicated.

- B. Flexible Elastomeric Adhesive: Comply with MIL-A-24179A, Type II, Class I.

1. For indoor applications, adhesive shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

- C. Mineral-Fiber Adhesive: Comply with MIL-A-3316C, Class 2, Grade A.

1. For indoor applications, adhesive shall have a VOC content of 80 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

- D. ASJ Adhesive, and FSK and PVDC Jacket Adhesive: Comply with MIL-A-3316C, Class 2, Grade A for bonding insulation jacket lap seams and joints.

1. For indoor applications, adhesive shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

## 2.3 MASTICS

- A. Materials shall be compatible with insulation materials, jackets, and substrates; comply with MIL-PRF-19565C, Type II.

1. For indoor applications, use mastics that have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- B. Vapor-Barrier Mastic: Water based; suitable for indoor use on below-ambient services.
  1. Water-Vapor Permeance: ASTM E 96/E 96M, Procedure B, 0.013 perm at 43-mil dry film thickness.
  2. Service Temperature Range: Minus 20 to plus 180 deg F.
  3. Solids Content: ASTM D 1644, 58 percent by volume and 70 percent by weight.
  4. Color: White.

## **2.4 LAGGING ADHESIVES**

- A. Description: Comply with MIL-A-3316C, Class I, Grade A and shall be compatible with insulation materials, jackets, and substrates.
  1. For indoor applications, use lagging adhesives that have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
  2. Fire-resistant, water-based lagging adhesive and coating for use indoors to adhere fire-resistant lagging cloths over pipe insulation.
  3. Service Temperature Range: 0 to plus 180 deg F.
  4. Color: White.

## **2.5 SEALANTS**

- A. Joint Sealants:
  1. For indoor applications, sealants shall have a VOC content of 420 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- B. Metal Jacket Flashing Sealants:
  1. Materials shall be compatible with insulation materials, jackets, and substrates.
  2. Fire- and water-resistant, flexible, elastomeric sealant.
  3. Service Temperature Range: Minus 40 to plus 250 deg F.
  4. Color: Aluminum.
- C. ASJ Flashing Sealants:
  1. Materials shall be compatible with insulation materials, jackets, and substrates.
  2. Fire- and water-resistant, flexible, elastomeric sealant.
  3. Service Temperature Range: Minus 40 to plus 250 deg F.
  4. Color: White.
  5. For indoor applications, sealants shall have a VOC content of 420 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

## 2.6 FACTORY-APPLIED JACKETS

- A. Insulation system schedules indicate factory-applied jackets on various applications. When factory-applied jackets are indicated, comply with the following:
  - 1. ASJ: White, kraft-paper, fiberglass-reinforced scrim with aluminum-foil backing; complying with ASTM C 1136, Type I.

## 2.7 FIELD-APPLIED JACKETS

- A. Field-applied jackets shall comply with ASTM C 921, Type I, unless otherwise indicated.
- B. Metal Jacket:
  - 1. Stainless-Steel Jacket: ASTM A 167 or ASTM A 240/A 240M.
    - a. Factory cut and rolled to size.
    - b. Material, finish, and thickness are indicated in field-applied jacket schedules.
    - c. Moisture Barrier for Outdoor Applications: 3-mil- thick, heat-bonded polyethylene and kraft paper.
    - d. Factory-Fabricated Fitting Covers:
      - 1) Same material, finish, and thickness as jacket.
      - 2) Preformed 2-piece or gore, 45- and 90-degree, short- and long-radius elbows.
      - 3) Tee covers.
      - 4) Flange and union covers.
      - 5) End caps.
      - 6) Beveled collars.
      - 7) Field fabricate fitting covers only if factory-fabricated fitting covers are not available.

## 2.8 TAPES

- A. ASJ Tape: White vapor-retarder tape matching factory-applied jacket with acrylic adhesive, complying with ASTM C 1136.
  - 1. Width: 3 inches.
  - 2. Thickness: 11.5 mils.
  - 3. Adhesion: 90 ounces force/inch in width.
  - 4. Elongation: 2 percent.
  - 5. Tensile Strength: 40 lbf/inch in width.
  - 6. ASJ Tape Disks and Squares: Precut disks or squares of ASJ tape.

## 2.9 SECUREMENTS

- A. Bands:



1. Stainless Steel: ASTM A 167 or ASTM A 240/A 240M, Type 304 or Type 316; 0.015 inch thick, 1/2 inch wide with wing seal.
- B. Staples: Outward-clinching insulation staples, nominal 3/4-inch- wide, stainless steel or Monel.
- C. Wire: 0.062-inch soft-annealed, stainless steel.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Examine substrates and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of insulation application.
  1. Verify that systems to be insulated have been tested and are free of defects.
  2. Verify that surfaces to be insulated are clean and dry.
  3. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.2 PREPARATION**

- A. Surface Preparation: Clean and dry surfaces to receive insulation. Remove materials that will adversely affect insulation application.
- B. Coordinate insulation installation with the trade installing heat tracing. Comply with requirements for heat tracing that apply to insulation.
- C. Mix insulating cements with clean potable water; if insulating cements are to be in contact with stainless-steel surfaces, use demineralized water.

### **3.3 GENERAL INSTALLATION REQUIREMENTS**

- A. Install insulation materials, accessories, and finishes with smooth, straight, and even surfaces; free of voids throughout the length of piping including fittings, valves, and specialties.
- B. Install insulation materials, forms, vapor barriers or retarders, jackets, and thicknesses required for each item of pipe system as specified in insulation system schedules.
- C. Install accessories compatible with insulation materials and suitable for the service. Install accessories that do not corrode, soften, or otherwise attack insulation or jacket in either wet or dry state.
- D. Install insulation with longitudinal seams at top and bottom of horizontal runs.
- E. Install multiple layers of insulation with longitudinal and end seams staggered.

- F. Do not weld brackets, clips, or other attachment devices to piping, fittings, and specialties.
- G. Keep insulation materials dry during application and finishing.
- H. Install insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by insulation material manufacturer.
- I. Install insulation with least number of joints practical.
- J. Where vapor barrier is indicated, seal joints, seams, and penetrations in insulation at hangers, supports, anchors, and other projections with vapor-barrier mastic.
  - 1. Install insulation continuously through hangers and around anchor attachments.
  - 2. For insulation application where vapor barriers are indicated, extend insulation on anchor legs from point of attachment to supported item to point of attachment to structure. Taper and seal ends at attachment to structure with vapor-barrier mastic.
  - 3. Install insert materials and install insulation to tightly join the insert. Seal insulation to insulation inserts with adhesive or sealing compound recommended by insulation material manufacturer.
  - 4. Cover inserts with jacket material matching adjacent pipe insulation. Install shields over jacket, arranged to protect jacket from tear or puncture by hanger, support, and shield.
- K. Apply adhesives, mastics, and sealants at manufacturer's recommended coverage rate and wet and dry film thicknesses.
- L. Install insulation with factory-applied jackets as follows:
  - 1. Draw jacket tight and smooth.
  - 2. Cover circumferential joints with 3-inch- wide strips, of same material as insulation jacket. Secure strips with adhesive and outward clinching staples along both edges of strip, spaced 4 inches o.c.
  - 3. Overlap jacket longitudinal seams at least 1-1/2 inches. Install insulation with longitudinal seams at bottom of pipe. Clean and dry surface to receive self-sealing lap. Staple laps with outward clinching staples along edge at 4 inches o.c.
    - a. For below-ambient services, apply vapor-barrier mastic over staples.
  - 4. Cover joints and seams with tape, according to insulation material manufacturer's written instructions, to maintain vapor seal.
  - 5. Where vapor barriers are indicated, apply vapor-barrier mastic on seams and joints and at ends adjacent to pipe flanges and fittings.
- M. Cut insulation in a manner to avoid compressing insulation more than 75 percent of its nominal thickness.
- N. Finish installation with systems at operating conditions. Repair joint separations and cracking due to thermal movement.

- O. Repair damaged insulation facings by applying same facing material over damaged areas. Extend patches at least 4 inches beyond damaged areas. Adhere, staple, and seal patches similar to butt joints.
- P. For above-ambient services, do not install insulation to the following:
  - 1. Vibration-control devices.
  - 2. Testing agency labels and stamps.
  - 3. Nameplates and data plates.
  - 4. Handholes.

### **3.4 PENETRATIONS**

- A. Insulation Installation at Roof Penetrations: Install insulation continuously through roof penetrations.
  - 1. Seal penetrations with flashing sealant.
  - 2. For applications requiring only indoor insulation, terminate insulation above roof surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.
  - 3. Extend jacket of outdoor insulation outside roof flashing at least 2 inches below top of roof flashing.
  - 4. Seal jacket to roof flashing with flashing sealant.
- B. Insulation Installation at Interior Wall and Partition Penetrations (That Are Not Fire Rated): Install insulation continuously through walls and partitions.
- C. Insulation Installation at Fire-Rated Wall and Partition Penetrations: Install insulation continuously through penetrations of fire-rated walls and partitions.
  - 1. Comply with requirements in Section 078413 "Penetration Firestopping" for firestopping and fire-resistive joint sealers.
- D. Insulation Installation at Floor Penetrations:
  - 1. Pipe: Install insulation continuously through floor penetrations.
  - 2. Seal penetrations through fire-rated assemblies. Comply with requirements in Section 078413 "Penetration Firestopping."

### **3.5 GENERAL PIPE INSULATION INSTALLATION**

- A. Requirements in this article generally apply to all insulation materials except where more specific requirements are specified in various pipe insulation material installation articles.
- B. Insulation Installation on Fittings, Valves, Strainers, Flanges, and Unions:

1. Install insulation over fittings, unions, and other specialties with continuous thermal and vapor-retarder integrity unless otherwise indicated.
2. Insulate pipe elbows using preformed fitting insulation or mitered fittings made from same material and density as adjacent pipe insulation. Each piece shall be butted tightly against adjoining piece and bonded with adhesive. Fill joints, seams, voids, and irregular surfaces with insulating cement finished to a smooth, hard, and uniform contour that is uniform with adjoining pipe insulation.
3. Insulate tee fittings with preformed fitting insulation or sectional pipe insulation of same material and thickness as used for adjacent pipe. Cut sectional pipe insulation to fit. Butt each section closely to the next and hold in place with tie wire. Bond pieces with adhesive.
4. Insulate valves using preformed fitting insulation or sectional pipe insulation of same material, density, and thickness as used for adjacent pipe. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker. For valves, insulate up to and including the bonnets, valve stuffing-box studs, bolts, and nuts. Fill joints, seams, and irregular surfaces with insulating cement.
5. Cover segmented insulated surfaces with a layer of finishing cement and coat with a mastic. Install vapor-barrier mastic for below-ambient services and a breather mastic for above-ambient services. Reinforce the mastic with fabric-reinforcing mesh. Trowel the mastic to a smooth and well-shaped contour.
6. For services not specified to receive a field-applied jacket except for flexible elastomeric and polyolefin, install fitted PVC cover over elbows, tees, strainers, valves, flanges, and unions. Terminate ends with PVC end caps. Tape PVC covers to adjoining insulation facing using PVC tape.
7. Stencil or label the outside insulation jacket of each union with the word "union." Match size and color of pipe labels.

### **3.6 INSTALLATION OF FLEXIBLE ELASTOMERIC INSULATION**

- A. Seal longitudinal seams and end joints with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.
- B. Insulation Installation on Pipe Fittings and Elbows:
  1. Install mitered sections of pipe insulation.
  2. Secure insulation materials and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.
- C. Insulation Installation on Valves and Pipe Specialties:
  1. When preformed valve covers are not available, install cut sections of pipe and sheet insulation to valve body. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.
  2. Install insulation to flanges as specified for flange insulation application.
  3. Secure insulation to valves and specialties and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

### **3.7 INSTALLATION OF MINERAL-FIBER INSULATION**

**A. Insulation Installation on Straight Pipes and Tubes:**

1. Secure each layer of preformed pipe insulation to pipe with wire or bands and tighten bands without deforming insulation materials.
2. Where vapor barriers are indicated, seal longitudinal seams, end joints, and protrusions with vapor-barrier mastic and joint sealant.
3. For insulation with factory-applied jackets on above-ambient surfaces, secure laps with outward-clinched staples at 6 inches o.c.
4. For insulation with factory-applied jackets on below-ambient surfaces, do not staple longitudinal tabs. Instead, secure tabs with additional adhesive as recommended by insulation material manufacturer and seal with vapor-barrier mastic and flashing sealant.

**B. Insulation Installation on Pipe Fittings and Elbows:**

1. Install preformed sections of same material as straight segments of pipe insulation when available.
2. When preformed insulation elbows and fittings are not available, install mitered sections of pipe insulation, to a thickness equal to adjoining pipe insulation. Secure insulation materials with wire or bands.

**C. Insulation Installation on Valves and Pipe Specialties:**

1. Install preformed sections of same material as straight segments of pipe insulation when available.
2. When preformed sections are not available, install mitered sections of pipe insulation to valve body.
3. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.
4. Install insulation to flanges as specified for flange insulation application.

### **3.8 FIELD-APPLIED JACKET INSTALLATION**

- A.** Where metal jackets are indicated, install with 2-inch overlap at longitudinal seams and end joints. Overlap longitudinal seams arranged to shed water. Seal end joints with weatherproof sealant recommended by insulation manufacturer. Secure jacket with stainless-steel bands 12 inches o.c. and at end joints.

### **3.9 FINISHES**

- A.** Pipe Insulation with ASJ, Glass-Cloth, or Other Paintable Jacket Material: Paint jacket with paint system identified below.

1. Flat Acrylic Finish: Two finish coats over a primer that is compatible with jacket material and finish coat paint. Add fungicidal agent to render fabric mildew proof.

- a. Finish Coat Material: Interior, flat, latex-emulsion size.
- B. Flexible Elastomeric Thermal Insulation: After adhesive has fully cured, apply two coats of insulation manufacturer's recommended protective coating.
- C. Color: Final color as selected by Architect. Vary first and second coats to allow visual inspection of the completed Work.
- D. Do not field paint aluminum or stainless-steel jackets.

### **3.10 FIELD QUALITY CONTROL**

- A. Perform tests and inspections.
- B. Tests and Inspections:
  - 1. Inspect pipe, fittings, strainers, and valves, randomly selected by Architect, by removing field-applied jacket and insulation in layers in reverse order of their installation. Extent of inspection shall be limited to a single location of straight pipe. .
- C. All insulation applications will be considered defective Work if sample inspection reveals noncompliance with requirements.

### **3.11 PIPING INSULATION SCHEDULE, GENERAL**

- A. Acceptable preformed pipe and tubular insulation materials and thicknesses are identified for each piping system and pipe size range. If more than one material is listed for a piping system, selection from materials listed is Contractor's option.

### **3.12 INDOOR PIPING INSULATION SCHEDULE**

- A. Condensate and Equipment Drain Water below 60 Deg F:
  - 1. All Pipe Sizes: Insulation shall be the following:
    - a. Mineral-Fiber, Preformed Pipe Insulation, Type I: 1 inch thick.
- B. Refrigerant Suction, Liquid, and Hot-Gas Piping:
  - 1. All Pipe Sizes: Insulation shall be the following:
    - a. Flexible Elastomeric: 1 inch thick.

### **3.13 OUTDOOR, ABOVEGROUND PIPING INSULATION SCHEDULE**

- A. Refrigerant Suction, Liquid, and Hot-Gas Piping:

1. All Pipe Sizes: Insulation shall be the following:
  - a. Flexible Elastomeric: 2 inches thick.

**3.14 OUTDOOR, FIELD-APPLIED JACKET SCHEDULE**

- A. Install jacket over insulation material. For insulation with factory-applied jacket, install the field-applied jacket over the factory-applied jacket.
- B. If more than one material is listed, selection from materials listed is Contractor's option.
- C. Piping, Exposed:
  1. Stainless Steel, Type 304 or 316, Corrugated with Z-Shaped Locking Seam: 0.020 inch thick.

END OF SECTION 230719

**SECTION 232300**  
**REFRIGERANT 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. This Section includes refrigerant piping used for air-conditioning applications.

**1.3 PERFORMANCE REQUIREMENTS**

- A. Line Test Pressure for Refrigerant R-410A:
  - 1. Suction and Liquid Lines: 535 psig.

**1.4 ACTION SUBMITTALS**

- A. Product Data: For each type of valve and refrigerant piping specialty indicated. Include pressure drop, based on manufacturer's test data, for the following:
  - 1. Thermostatic expansion valves.
  - 2. Solenoid valves.
  - 3. Hot-gas bypass valves.
  - 4. Filter dryers.
  - 5. Strainers.
  - 6. Pressure-regulating valves.
- B. Shop Drawings: Show layout of refrigerant piping and specialties, including pipe, tube, and fitting sizes, flow capacities, valve arrangements and locations, slopes of horizontal runs, oil traps, double risers, wall and floor penetrations, and equipment connection details. Show interface and spatial relationships between piping and equipment.
  - 1. Shop Drawing Scale: 1/4 inch equals 1 foot.
  - 2. Refrigerant piping indicated on Drawings is schematic only. Size piping and design actual piping layout, including oil traps, double risers, specialties, and pipe and tube sizes to accommodate, as a minimum, equipment provided, elevation difference between compressor and evaporator, and length of piping to ensure proper operation and compliance with warranties of connected equipment.



**1.5 INFORMATIONAL SUBMITTALS**

- A. Welding certificates.
- B. Field quality-control test reports.

**1.6 CLOSEOUT SUBMITTALS**

- A. Operation and Maintenance Data: For refrigerant valves and piping specialties to include in maintenance manuals.

**1.7 QUALITY ASSURANCE**

- A. Welding: Qualify procedures and personnel according to ASME Boiler and Pressure Vessel Code: Section IX, "Welding and Brazing Qualifications."
- B. Comply with ASHRAE 15, "Safety Code for Refrigeration Systems."
- C. Comply with ASME B31.5, "Refrigeration Piping and Heat Transfer Components."

**1.8 PRODUCT STORAGE AND HANDLING**

- A. Store piping in a clean and protected area with end caps in place to ensure that piping interior and exterior are clean when installed.

**1.9 COORDINATION**

- A. Coordinate size and location of roof curbs, equipment supports, and roof penetrations. These items are specified in Section 077200 "Roof Accessories."

**PART 2 - PRODUCTS**

**2.1 COPPER TUBE AND FITTINGS**

- A. Copper Tube: ASTM B 88, Type K or L.
- B. Wrought-Copper Fittings: ASME B16.22.
- C. Wrought-Copper Unions: ASME B16.22.
- D. Solder Filler Metals: ASTM B 32. Use 95-5 tin antimony or alloy HB solder to join copper socket fittings on copper pipe.
- E. Brazing Filler Metals: AWS A5.8.
- F. Flexible Connectors:

1. Body: Tin-bronze bellows with woven, flexible, tinned-bronze-wire-reinforced protective jacket.
2. End Connections: Socket ends.
3. Offset Performance: Capable of minimum 3/4-inch misalignment in minimum 7-inch-long assembly.
4. Pressure Rating: Factory test at minimum 500 psig.
5. Maximum Operating Temperature: 250 deg F.

## 2.2 REFRIGERANTS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following or approved equal:
  1. Atofina Chemicals, Inc.
  2. DuPont Company; Fluorochemicals Div.
  3. Honeywell, Inc.; Genetron Refrigerants.
- B. ASHRAE 34, R-410A: Pentafluoroethane/Difluoromethane.

## PART 3 - EXECUTION

### 3.1 PIPING APPLICATIONS FOR REFRIGERANT R-410A

- A. Suction Lines NPS 1-1/2 and Smaller for Conventional Air-Conditioning Applications: Copper, Type ACR, annealed-temper tubing and wrought-copper fittings with brazed or soldered joints.
- B. Hot-Gas and Liquid Lines: Copper, Type ACR, annealed- or drawn-temper tubing and wrought-copper fittings with brazed or soldered joints.

### 3.2 PIPING INSTALLATION

- A. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems; indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated unless deviations to layout are approved on Shop Drawings.
- B. Install refrigerant piping according to ASHRAE 15.
- C. Install piping in concealed locations unless otherwise indicated and except in equipment rooms and service areas.
- D. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
- E. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.
- F. Install piping adjacent to machines to allow service and maintenance.

- G. Install piping free of sags and bends.
- H. Install fittings for changes in direction and branch connections.
- I. Select system components with pressure rating equal to or greater than system operating pressure.
- J. Refer to Section 230900 "Instrumentation and Control for HVAC" for solenoid valve controllers, and control wiring. Refer to the drawings for the sequence of operation.
- K. Install piping as short and direct as possible, with a minimum number of joints, elbows, and fittings.
- L. Arrange piping to allow inspection and service of refrigeration equipment. Install valves and specialties in accessible locations to allow for service and inspection.
- M. Install refrigerant piping in rigid or flexible conduit in locations where exposed to mechanical injury.
- N. Slope refrigerant piping as follows:
  - 1. Install horizontal hot-gas discharge piping with a uniform slope downward away from compressor.
  - 2. Install horizontal suction lines with a uniform slope downward to compressor.
  - 3. Install traps and double risers to entrain oil in vertical runs.
  - 4. Liquid lines may be installed level.
- O. When brazing or soldering, remove solenoid-valve coils and sight glasses; also remove valve stems, seats, and packing, and accessible internal parts of refrigerant specialties. Do not apply heat near expansion-valve bulb.
- P. Before installation of steel refrigerant piping, clean pipe and fittings using the following procedures:
  - 1. Shot blast the interior of piping.
  - 2. Remove coarse particles of dirt and dust by drawing a clean, lintless cloth through tubing by means of a wire or electrician's tape.
  - 3. Draw a clean, lintless cloth saturated with trichloroethylene through the tube or pipe. Continue this procedure until cloth is not discolored by dirt.
  - 4. Draw a clean, lintless cloth, saturated with compressor oil, squeezed dry, through the tube or pipe to remove remaining lint. Inspect tube or pipe visually for remaining dirt and lint.
  - 5. Finally, draw a clean, dry, lintless cloth through the tube or pipe.
  - 6. Safety-relief-valve discharge piping is not required to be cleaned but is required to be open to allow unrestricted flow.
- Q. Install piping with adequate clearance between pipe and adjacent walls and hangers or between pipes for insulation installation.
- R. Identify refrigerant piping according to Section 230553 "Identification for HVAC Piping and Equipment."

- S. Install sleeves for piping penetrations of walls, ceilings, and floors. Comply with requirements for sleeves specified in Section 230517 "Sleeves and Sleeve Seals for HVAC Piping."
- T. Install escutcheons for piping penetrations of walls, ceilings, and floors. Comply with requirements for escutcheons specified in Section 230518 "Escutcheons for HVAC Piping."

### **3.3 PIPE JOINT CONSTRUCTION**

- A. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.
- B. Soldered Joints: Construct joints according to ASTM B 828 or CDA's "Copper Tube Handbook."
- C. Brazed Joints: Construct joints according to AWS's "Brazing Handbook," Chapter "Pipe and Tube."
  - 1. Use Type BcuP, copper-phosphorus alloy for joining copper socket fittings with copper pipe.
  - 2. Use Type BAg, cadmium-free silver alloy for joining copper with bronze or steel.

### **3.4 HANGERS AND SUPPORTS**

- A. Hanger, support, and anchor products are specified in Section 230529 "Hangers and Supports for HVAC Piping and Equipment."

### **3.5 FIELD QUALITY CONTROL**

- A. Tests and Inspections:
  - 1. Comply with ASME B31.5, Chapter VI.
  - 2. Test refrigerant piping, specialties, and receivers. Isolate compressor, condenser, evaporator, and safety devices from test pressure if they are not rated above the test pressure.
  - 3. Test high- and low-pressure side piping of each system separately at not less than the pressures indicated in Part 1 "Performance Requirements" Article.
    - a. Fill system with nitrogen to the required test pressure.
    - b. System shall maintain test pressure at the manifold gage throughout duration of test.
    - c. Test joints and fittings with electronic leak detector or by brushing a small amount of soap and glycerin solution over joints.
    - d. Remake leaking joints using new materials, and retest until satisfactory results are achieved.

### **3.6 SYSTEM CHARGING**

- A. Charge system using the following procedures:
  - 1. Install core in filter dryers after leak test but before evacuation.

2. Evacuate entire refrigerant system with a vacuum pump to 500 micrometers. If vacuum holds for 12 hours, system is ready for charging.
3. Break vacuum with refrigerant gas, allowing pressure to build up to 2 psig.
4. Charge system with a new filter-dryer core in charging line.

### **3.7 ADJUSTING**

- A. Adjust thermostatic expansion valve to obtain proper evaporator superheat.
- B. Adjust high- and low-pressure switch settings to avoid short cycling in response to fluctuating suction pressure.
- C. Adjust set-point temperature of air-conditioning or chilled-water controllers to the system design temperature.
- D. Perform the following adjustments before operating the refrigeration system, according to manufacturer's written instructions:
  1. Open shutoff valves in condenser water circuit.
  2. Verify that compressor oil level is correct.
  3. Open compressor suction and discharge valves.
  4. Open refrigerant valves except bypass valves that are used for other purposes.
  5. Check open compressor-motor alignment and verify lubrication for motors and bearings.
- E. Replace core of replaceable filter dryer after system has been adjusted and after design flow rates and pressures are established.

END OF SECTION 232300

## SECTION 233113

### METAL DUCTS

#### PART 1 - GENERAL

##### 1.1 SUMMARY

A. Section Includes:

1. Rectangular ducts and fittings.
2. Round ducts and fittings.
3. Sheet metal materials.
4. Duct liner.
5. Sealants and gaskets.
6. Hangers and supports.

B. Related Sections:

1. Section 230593 "Testing, Adjusting, and Balancing for HVAC" for testing, adjusting, and balancing requirements for metal ducts.
2. Section 233300 "Air Duct Accessories" for dampers, sound-control devices, duct-mounting access doors and panels, turning vanes, and flexible ducts.
3. 133419 – "Metal Building Systems"

##### 1.2 PERFORMANCE REQUIREMENTS

- A. Delegated Duct Design: Duct construction, including sheet metal thicknesses, seam and joint construction, reinforcements, and hangers and supports, shall comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" and performance requirements and design criteria indicated in "Duct Schedule" Article.
- B. Structural Performance: Duct hangers and supports and seismic restraints shall withstand the effects of gravity and seismic loads and stresses within limits and under conditions described in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" SMACNA's "Seismic Restraint Manual: Guidelines for Mechanical Systems."

##### 1.3 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings:

1. Fabrication, assembly, and installation, including plans, elevations, sections, components, and attachments to other work.
2. Factory- and shop-fabricated ducts and fittings.
3. Duct layout indicating sizes, configuration, and static-pressure classes.

4. Elevation of top of ducts.
5. Dimensions of main duct runs from building grid lines.
6. Fittings.
7. Reinforcement and spacing.
8. Seam and joint construction.
9. Penetrations through partitions.
10. Equipment installation based on equipment being used on Project.
11. Locations for duct accessories, including dampers, turning vanes, and access doors and panels.
12. Hangers and supports, including methods for duct and building attachment, seismic restraints and vibration isolation.

**C. Delegated-Design Submittal:**

1. Sheet metal thicknesses.
2. Joint and seam construction and sealing.
3. Reinforcement details and spacing.
4. Materials, fabrication, assembly, and spacing of hangers and supports.
5. Design Calculations: Calculations, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation for selecting hangers and supports and seismic restraints.

## **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. Duct installation in congested spaces, indicating coordination with general construction, building components, and other building services. Indicate proposed changes to duct layout.
2. Suspended ceiling components.
3. Structural members to which duct will be attached.
4. Size and location of initial access modules for acoustical tile.
5. Items penetrating finished ceiling including the following:
  - a. Lighting fixtures.
  - b. Air outlets and inlets.
  - c. Speakers.
  - d. Sprinklers.
  - e. Access panels.
  - f. Perimeter moldings.

**B. Welding certificates.**

## **1.5 QUALITY ASSURANCE**

**A. Welding Qualifications:** Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel," for hangers and supports.

- B. Welding Qualifications: Qualify procedures and personnel according to the following:
  - 1. AWS D1.1/D1.1M, "Structural Welding Code - Steel," for hangers and supports.
  - 2. AWS D9.1M/D9.1, "Sheet Metal Welding Code," for duct joint and seam welding.

## **PART 2 - PRODUCTS**

### **2.1 RECTANGULAR DUCTS AND FITTINGS**

- A. General Fabrication Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" based on indicated static-pressure class unless otherwise indicated.
- B. Transverse Joints: Select joint types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 2-1, "Rectangular Duct/Transverse Joints," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
- C. Longitudinal Seams: Select seam types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 2-2, "Rectangular Duct/Longitudinal Seams," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
- D. Elbows, Transitions, Offsets, Branch Connections, and Other Duct Construction: Select types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 4, "Fittings and Other Construction," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

### **2.2 ROUND DUCTS AND FITTINGS**

- A. General Fabrication Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 3, "Round, Oval, and Flexible Duct," based on indicated static-pressure class unless otherwise indicated.
- B. Transverse Joints: Select joint types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-1, "Round Duct Transverse Joints," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
- C. Longitudinal Seams: Select seam types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-2, "Round Duct Longitudinal Seams," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."



- D. Tees and Laterals: Select types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-5, "90 Degree Tees and Laterals," and Figure 3-6, "Conical Tees," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

## **2.3 SHEET METAL MATERIALS**

- A. General Material Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for acceptable materials, material thicknesses, and duct construction methods unless otherwise indicated. Sheet metal materials shall be free of pitting, seam marks, roller marks, stains, discolorations, and other imperfections.
- B. Galvanized Sheet Steel: Comply with ASTM A 653/A 653M.
  - 1. Galvanized Coating Designation: G60.
  - 2. Finishes for Surfaces Exposed to View: Mill phosphatized.
- C. Reinforcement Shapes and Plates: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.
  - 1. Where black- and galvanized-steel shapes and plates are used to reinforce aluminum ducts, isolate the different metals with butyl rubber, neoprene, or EPDM gasket materials.
- D. Tie Rods: Galvanized steel, 1/4-inch minimum diameter for lengths 36 inches or less; 3/8-inch minimum diameter for lengths longer than 36 inches.

## **2.4 DUCT LINER**

- A. Fibrous-Glass Duct Liner: Comply with ASTM C 1071, NFPA 90A, or NFPA 90B; and with NAIMA AH124, "Fibrous Glass Duct Liner Standard."
  - 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. CertainTeed Corporation; Insulation Group.
    - b. Johns Manville.
    - c. Knauf Insulation.
    - d. Owens Corning.
  - 2. Antimicrobial Erosion-Resistant Coating: Apply to the surface of the liner that will form the interior surface of the duct to act as a moisture repellent and erosion-resistant coating. Antimicrobial compound shall be tested for efficacy by an NRTL and registered by the EPA for use in HVAC systems.
  - 3. Water-Based Liner Adhesive: Comply with NFPA 90A or NFPA 90B and with ASTM C 916.

- a. For indoor applications, adhesive shall have a VOC content of 80 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
  - b. Adhesive shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- B. Insulation Pins and Washers:
  1. Cupped-Head, Capacitor-Discharge-Weld Pins: Copper- or zinc-coated steel pin, fully annealed for capacitor-discharge welding, 0.135-inch- diameter shank, length to suit depth of insulation indicated with integral 1-1/2-inch galvanized carbon-steel washer.
  2. Insulation-Retaining Washers: Self-locking washers formed from 0.016-inch- thick stainless steel; with beveled edge sized as required to hold insulation securely in place but not less than 1-1/2 inches in diameter.
- C. Shop Application of Duct Liner: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 7-11, "Flexible Duct Liner Installation."
  1. Adhere a single layer of indicated thickness of duct liner with at least 90 percent adhesive coverage at liner contact surface area. Attaining indicated thickness with multiple layers of duct liner is prohibited.
  2. Apply adhesive to transverse edges of liner facing upstream that do not receive metal nosing.
  3. Butt transverse joints without gaps, and coat joint with adhesive.
  4. Fold and compress liner in corners of rectangular ducts or cut and fit to ensure butted-edge overlapping.
  5. Do not apply liner in rectangular ducts with longitudinal joints, except at corners of ducts, unless duct size and dimensions of standard liner make longitudinal joints necessary.
  6. Apply adhesive coating on longitudinal seams in ducts with air velocity of 2500 fpm.
  7. Secure liner with mechanical fasteners 4 inches from corners and at intervals not exceeding 12 inches transversely; at 3 inches from transverse joints and at intervals not exceeding 18 inches longitudinally.
  8. Secure transversely oriented liner edges facing the airstream with metal nosings that have either channel or "Z" profiles or are integrally formed from duct wall. Fabricate edge facings at the following locations:
    - a. Fan discharges.
    - b. Intervals of lined duct preceding unlined duct.
    - c. Upstream edges of transverse joints in ducts where air velocities are higher than 2500 fpm or where indicated.

## **2.5 SEALANT AND GASKETS**

- A. General Sealant and Gasket Requirements: Surface-burning characteristics for sealants and gaskets shall be a maximum flame-spread index of 25 and a maximum smoke-developed index of 50 when tested according to UL 723; certified by an NRTL.
- B. Two-Part Tape Sealing System:

1. Tape: Woven cotton fiber impregnated with mineral gypsum and modified acrylic/silicone activator to react exothermically with tape to form hard, durable, airtight seal.
2. Tape Width: 3 inches.
3. Sealant: Modified styrene acrylic.
4. Water resistant.
5. Mold and mildew resistant.
6. Maximum Static-Pressure Class: 10-inch wg, positive and negative.
7. Service: Indoor and outdoor.
8. Service Temperature: Minus 40 to plus 200 deg F.
9. Substrate: Compatible with galvanized sheet steel (both PVC coated and bare), stainless steel, or aluminum.
10. For indoor applications, sealant shall have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

**C. Water-Based Joint and Seam Sealant:**

1. Application Method: Brush on.
2. Solids Content: Minimum 65 percent.
3. Shore A Hardness: Minimum 20.
4. Water resistant.
5. Mold and mildew resistant.
6. VOC: Maximum 75 g/L (less water).
7. Maximum Static-Pressure Class: 10-inch wg, positive and negative.
8. Service: Indoor or outdoor.
9. Substrate: Compatible with galvanized sheet steel (both PVC coated and bare), stainless steel, or aluminum sheets.

**D. Flanged Joint Sealant: Comply with ASTM C 920.**

1. General: Single-component, acid-curing, silicone, elastomeric.
2. Type: S.
3. Grade: NS.
4. Class: 25.
5. Use: O.
6. For indoor applications, sealant shall have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

**E. Flange Gaskets: Butyl rubber, neoprene, or EPDM polymer with polyisobutylene plasticizer.**

**F. Round Duct Joint O-Ring Seals:**

1. Seal shall provide maximum leakage class of 3 cfm/100 sq. ft. at 1-inch wg and shall be rated for 10-inch wg static-pressure class, positive or negative.
2. EPDM O-ring to seal in concave bead in coupling or fitting spigot.
3. Double-lipped, EPDM O-ring seal, mechanically fastened to factory-fabricated couplings and fitting spigots.

## **2.6 HANGERS AND SUPPORTS**

- A. Hanger Rods for Noncorrosive Environments: Cadmium-plated steel rods and nuts.
- B. Hanger Rods for Corrosive Environments: Electrogalvanized, all-thread rods or galvanized rods with threads painted with zinc-chromate primer after installation.
- C. Strap and Rod Sizes: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table 5-1, "Rectangular Duct Hangers Minimum Size," and Table 5-2, "Minimum Hanger Sizes for Round Duct."
- D. Steel Cables for Galvanized-Steel Ducts: Galvanized steel complying with ASTM A 603.
- E. Steel Cables for Stainless-Steel Ducts: Stainless steel complying with ASTM A 492.
- F. Steel Cable End Connections: Cadmium-plated steel assemblies with brackets, swivel, and bolts designed for duct hanger service; with an automatic-locking and clamping device.
- G. Duct Attachments: Sheet metal screws, blind rivets, or self-tapping metal screws; compatible with duct materials.
- H. Trapeze and Riser Supports:
  - 1. Supports for Galvanized-Steel Ducts: Galvanized-steel shapes and plates.

## **PART 3 - EXECUTION**

### **3.1 DUCT INSTALLATION**

- A. Drawing plans, schematics, and diagrams indicate general location and arrangement of duct system. Indicated duct locations, configurations, and arrangements were used to size ducts and calculate friction loss for air-handling equipment sizing and for other design considerations. Install duct systems as indicated unless deviations to layout are approved on Shop Drawings and Coordination Drawings.
- B. Install ducts according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" unless otherwise indicated.
- C. Install round ducts in maximum practical lengths.
- D. Install ducts with fewest possible joints.
- E. Install factory- or shop-fabricated fittings for changes in direction, size, and shape and for branch connections.
- F. Unless otherwise indicated, install ducts vertically and horizontally, and parallel and perpendicular to building lines.
- G. Install ducts close to walls, overhead construction, columns, and other structural and permanent enclosure elements of building.

- H. Install ducts with a clearance of 1 inch, plus allowance for insulation thickness.
- I. All medium pressure ductwork mains (upstream of VAV boxes) shall have acoustic duct lining.
- J. Provide a minimum of 10'-0" of acoustic lining downstream of all air handling equipment, fan coil units, and air terminal units (fan-powered and VAV boxes).
- K. Route ducts to avoid passing through transformer vaults and electrical equipment rooms and enclosures.
- L. Where ducts pass through non-fire-rated interior partitions and exterior walls and are exposed to view, cover the opening between the partition and duct or duct insulation with sheet metal flanges of same metal thickness as the duct. Overlap openings on four sides by at least 1-1/2 inches.
- M. Protect duct interiors from moisture, construction debris and dust, and other foreign materials. Comply with SMACNA's "IAQ Guidelines for Occupied Buildings Under Construction," Appendix G, "Duct Cleanliness for New Construction Guidelines."

### **3.2 INSTALLATION OF EXPOSED DUCTWORK**

- A. Protect ducts exposed in finished spaces from being dented, scratched, or damaged.
- B. Trim duct sealants flush with metal. Create a smooth and uniform exposed bead. Do not use two-part tape sealing system.
- C. Grind welds to provide smooth surface free of burrs, sharp edges, and weld splatter. When welding stainless steel with a No. 3 or 4 finish, grind the welds flush, polish the exposed welds, and treat the welds to remove discoloration caused by welding.
- D. Maintain consistency, symmetry, and uniformity in the arrangement and fabrication of fittings, hangers and supports, duct accessories, and air outlets.
- E. Repair or replace damaged sections and finished work that does not comply with these requirements.

### **3.3 DUCT SEALING**

- A. Seal ducts for duct static-pressure, seal classes, and leakage classes specified in "Duct Schedule" Article according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
- B. Seal ducts to the following seal classes according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible":
  - 1. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
  - 2. Conditioned Space, Supply-Air Ducts in Pressure Classes 2-Inch wg and Lower: Seal Class C.
  - 3. Conditioned Space, Supply-Air Ducts in Pressure Classes Higher Than 2-Inch wg: Seal Class B.

4. Conditioned Space, Exhaust Ducts: Seal Class B.
5. Conditioned Space, Return-Air Ducts: Seal Class C.

### **3.4 HANGER AND SUPPORT INSTALLATION**

- A. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 5, "Hangers and Supports."
- B. Building Attachments: Concrete inserts, powder-actuated fasteners, or structural-steel fasteners appropriate for construction materials to which hangers are being attached.
  1. Where practical, install concrete inserts before placing concrete.
  2. Install powder-actuated concrete fasteners after concrete is placed and completely cured.
  3. Use powder-actuated concrete fasteners for standard-weight aggregate concretes or for slabs more than 4 inches thick.
  4. Do not use powder-actuated concrete fasteners for lightweight-aggregate concretes or for slabs less than 4 inches thick.
- C. Hanger Spacing: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table 5-1, "Rectangular Duct Hangers Minimum Size," and Table 5-2, "Minimum Hanger Sizes for Round Duct," for maximum hanger spacing; install hangers and supports within 24 inches of each elbow and within 48 inches of each branch intersection.
- D. Hangers Exposed to View: Threaded rod and angle or channel supports.
- E. Support vertical ducts with steel angles or channel secured to the sides of the duct with welds, bolts, sheet metal screws, or blind rivets; support at each floor and at a maximum intervals of 16 feet.
- F. Install upper attachments to structures. Select and size upper attachments with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

### **3.5 CONNECTIONS**

- A. Make connections to equipment with flexible connectors complying with Section 233300 "Air Duct Accessories."
- B. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for branch, outlet and inlet, and terminal unit connections.

### **3.6 DUCT CLEANING**

- A. Clean new duct system(s) before testing, adjusting, and balancing.
- B. Use service openings for entry and inspection.
  1. Create new openings and install access panels appropriate for duct static-pressure class if required for cleaning access. Provide insulated panels for insulated or lined duct. Patch

- insulation and liner as recommended by duct liner manufacturer. Comply with Section 233300 "Air Duct Accessories" for access panels and doors.
  2. Disconnect and reconnect flexible ducts as needed for cleaning and inspection.
  3. Remove and reinstall ceiling to gain access during the cleaning process.
- C. Particulate Collection and Odor Control:
1. When venting vacuuming system inside the building, use HEPA filtration with 99.97 percent collection efficiency for 0.3-micron-size (or larger) particles.
  2. When venting vacuuming system to outdoors, use filter to collect debris removed from HVAC system, and locate exhaust downwind and away from air intakes and other points of entry into building.
- D. Clean the following components by removing surface contaminants and deposits:
1. Air outlets and inlets (registers, grilles, and diffusers).
  2. Supply, return, and exhaust fans including fan housings, plenums (except ceiling supply and return plenums), scrolls, blades or vanes, shafts, baffles, dampers, and drive assemblies.
  3. Air-handling unit internal surfaces and components including mixing box, coil section, air wash systems, spray eliminators, condensate drain pans, humidifiers and dehumidifiers, filters and filter sections, and condensate collectors and drains.
  4. Coils and related components.
  5. Return-air ducts, dampers, actuators, and turning vanes except in ceiling plenums and mechanical equipment rooms.
  6. Supply-air ducts, dampers, actuators, and turning vanes.
  7. Dedicated exhaust and ventilation components and makeup air systems.
- E. Mechanical Cleaning Methodology:
1. Clean metal duct systems using mechanical cleaning methods that extract contaminants from within duct systems and remove contaminants from building.
  2. Use vacuum-collection devices that are operated continuously during cleaning. Connect vacuum device to downstream end of duct sections so areas being cleaned are under negative pressure.
  3. Use mechanical agitation to dislodge debris adhered to interior duct surfaces without damaging integrity of metal ducts, duct liner, or duct accessories.
  4. Clean fibrous-glass duct liner with HEPA vacuuming equipment; do not permit duct liner to get wet. Replace fibrous-glass duct liner that is damaged, deteriorated, or delaminated or that has friable material, mold, or fungus growth.
  5. Clean coils and coil drain pans according to NADCA 1992. Keep drain pan operational. Rinse coils with clean water to remove latent residues and cleaning materials; comb and straighten fins.
  6. Provide drainage and cleanup for wash-down procedures.
  7. Antimicrobial Agents and Coatings: Apply EPA-registered antimicrobial agents if fungus is present. Apply antimicrobial agents according to manufacturer's written instructions after removal of surface deposits and debris.

### 3.7 START UP

- A. Air Balance: Comply with requirements in Section 230593 "Testing, Adjusting, and Balancing for HVAC."

### 3.8 DUCT SCHEDULE

- A. Fabricate ducts with galvanized sheet steel as otherwise indicated.
- B. Elbow Configuration:
  - 1. Rectangular Duct: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 4-2, "Rectangular Elbows."
    - a. Velocity 1000 fpm or Lower:
      - 1) Radius Type RE 1 with minimum 0.5 radius-to-diameter ratio.
      - 2) Mitered Type RE 4 without vanes.
    - b. Velocity 1000 to 1500 fpm):
      - 1) Radius Type RE 1 with minimum 1.0 radius-to-diameter ratio.
      - 2) Radius Type RE 3 with minimum 0.5 radius-to-diameter ratio and two vanes.
      - 3) Mitered Type RE 2 with vanes complying with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 4-3, "Vanes and Vane Runners," and Figure 4-4, "Vane Support in Elbows."
    - c. Velocity 1500 fpm or Higher:
      - 1) Radius Type RE 1 with minimum 1.5 radius-to-diameter ratio.
      - 2) Radius Type RE 3 with minimum 1.0 radius-to-diameter ratio and two vanes.
      - 3) Mitered Type RE 2 with vanes complying with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 4-3, "Vanes and Vane Runners," and Figure 4-4, "Vane Support in Elbows."
  - 2. Rectangular Duct: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 4-2, "Rectangular Elbows."
    - a. Radius Type RE 1 with minimum 1.5 radius-to-diameter ratio.
    - b. Radius Type RE 3 with minimum 1.0 radius-to-diameter ratio and two vanes.
    - c. Mitered Type RE 2 with vanes complying with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 4-3, "Vanes and Vane Runners," and Figure 4-4, "Vane Support in Elbows."
  - 3. Round Duct: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-4, "Round Duct Elbows."
    - a. Minimum Radius-to-Diameter Ratio and Elbow Segments: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table 3-



1, "Mitered Elbows." Elbows with less than 90-degree change of direction have proportionately fewer segments.

- 1) Velocity 1000 fpm or Lower: 0.5 radius-to-diameter ratio and three segments for 90-degree elbow.
- 2) Velocity 1000 to 1500 fpm: 1.0 radius-to-diameter ratio and four segments for 90-degree elbow.
- 3) Velocity 1500 fpm or Higher: 1.5 radius-to-diameter ratio and five segments for 90-degree elbow.

- b. Round Elbows, 12 Inches and Smaller in Diameter: Stamped or pleated.
- c. Round Elbows, 14 Inches and Larger in Diameter: Standing seam.

C. Liner:

1. Supply Air Ducts: Fibrous glass, Type I, 1 inch thick for fifteen feet from air handling unit connection.
2. Return Air Ducts: Fibrous glass, Type I, 1 inch thick for fifteen feet from air handling unit connection.
3. Transfer Ducts: Fibrous glass, Type I, 1 inch thick for all transfer ductwork.

END OF SECTION 233113

**SECTION 233300**  
**AIR DUCT ACCESSORIES**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Section Includes:
  - 1. Backdraft and pressure relief dampers.
  - 2. Manual volume dampers.
  - 3. Control dampers.
  - 4. Flange connectors.
  - 5. Turning vanes.
  - 6. Duct-mounted access doors.
  - 7. Flexible connectors.
  - 8. Flexible ducts.

**1.2 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
- B. Sustainable Design Submittals:
  - 1. Detail duct accessories fabrication and installation in ducts and other construction. Include dimensions, weights, loads, and required clearances; and method of field assembly into duct systems and other construction. Include the following:
    - a. Special fittings.
    - b. Manual volume damper installations.
    - c. Control-damper installations.
    - d. Wiring Diagrams: For power, signal, and control wiring.

**1.3 CLOSEOUT SUBMITTALS**

- A. Operation and maintenance data.

## PART 2 - PRODUCTS

### 2.1 ASSEMBLY DESCRIPTION

- A. Comply with NFPA 90A, "Installation of Air Conditioning and Ventilating Systems," and with NFPA 90B, "Installation of Warm Air Heating and Air Conditioning Systems."
- B. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for acceptable materials, material thicknesses, and duct construction methods unless otherwise indicated. Sheet metal materials shall be free of pitting, seam marks, roller marks, stains, discolorations, and other imperfections.

### 2.2 MATERIALS

- A. Galvanized Sheet Steel: Comply with ASTM A 653/A 653M.
  - 1. Galvanized Coating Designation: G60.
  - 2. Exposed-Surface Finish: Mill phosphatized.
- B. Reinforcement Shapes and Plates: Galvanized-steel reinforcement where installed on galvanized sheet metal ducts; compatible materials for aluminum and stainless-steel ducts.
- C. Tie Rods: Galvanized steel, 1/4-inch minimum diameter for lengths 36 inches or less; 3/8-inch minimum diameter for lengths longer than 36 inches.

### 2.3 BACKDRAFT AND PRESSURE RELIEF DAMPERS

- 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 or equal:
  - 1. [Greenheck Fan Corporation.](#)
  - 2. [Nailor Industries Inc.](#)
  - 3. [Pottorff.](#)
  - 4. [Ruskin Company.](#)
- B. Description: Gravity balanced.

### 2.4 MANUAL VOLUME DAMPERS

- A. Standard, Steel, Manual Volume Dampers:
  - 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 or equal:

- a. [American Warming and Ventilating; a Mestek Architectural Group company.](#)
  - b. [Flexmaster U.S.A., Inc.](#)
  - c. [McGill AirFlow LLC.](#)
  - d. [Nailor Industries Inc.](#)
  - e. [Pottorff.](#)
  - f. [Ruskin Company.](#)
  - g. [Trox USA Inc.](#)
  - h. [Vent Products Co., Inc.](#)
2. Standard leakage rating, with linkage outside airstream.
  3. Suitable for horizontal or vertical applications.
  4. Provide 1" handle offset and end bearings.

## 2.5 CONTROL DAMPERS

- A. [Manufacturers:](#) Subject to compliance with requirements, provide products by one of the following or equal:
1. [Greenheck Fan Corporation.](#)
  2. [McGill AirFlow LLC.](#)
  3. [Nailor Industries Inc.](#)
  4. [Ruskin Company.](#)
- B. Control damper frames shall be constructed of galvanized steel, formed into changes and welded or riveted. Dampers shall be galvanized, with nylon bearings. Blade edge seals shall be vinyl. Blade edge and tip seals shall be included for all dampers. Blades shall be 16-gauge minimum and 6 inches wide maximum and frame shall be of welded channel iron. Damper leakage shall not exceed 10 CFM per square foot, at 1.5 inches water gauge static pressure.
- C. Damper actuators shall be spring return type. Operators shall be heavy-duty electronic type for positioning automatic dampers in response to a control signal. Motor shall be of sufficient size to operate damper positively and smoothly to obtain correct sequence as indicated. All applications requiring proportional operation shall utilize truly proportional electric actuators.

## 2.6 FLANGE CONNECTORS

- A. [Manufacturers:](#) Subject to compliance with requirements, provide products by the following or equal:
1. [Ductmate Industries, Inc.](#)
  2. [Nexus PDQ.](#)
  3. [Ward Industries; a brand of Hart & Cooley, Inc.](#)
- B. Description: Add-on or roll-formed, factory-fabricated, slide-on transverse flange connectors, gaskets, and components.

- C. Material: Galvanized steel.
- D. Gage and Shape: Match connecting ductwork.

## 2.7 TURNING VANES

- A. Manufacturers: Subject to compliance with requirements, provide products by the following or equal:
  - 1. Ductmate Industries, Inc.
  - 2. Duro Dyne Inc.
  - 3. Elgen Manufacturing.
  - 4. METALAIRE, Inc.
  - 5. SEMCO LLC.
  - 6. Ward Industries; a brand of Hart & Cooley, Inc.
- B. Manufactured Turning Vanes for Metal Ducts: Curved blades of galvanized sheet steel; support with bars perpendicular to blades set; set into vane runners suitable for duct mounting.
  - 1. Acoustic Turning Vanes: Fabricate airfoil-shaped aluminum extrusions with perforated faces and fibrous-glass fill.
- C. General Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible"; Figures 4-3, "Vanes and Vane Runners," and 4-4, "Vane Support in Elbows."
- D. Vane Construction: Single wall for ducts up to 48 inches wide and double wall for larger dimensions.

## 2.8 DUCT-MOUNTED ACCESS DOORS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following or equal:
  - 1. American Warming and Ventilating; a Mestek Architectural Group company.
  - 2. Ductmate Industries, Inc.
  - 3. Flexmaster U.S.A., Inc.
  - 4. Greenheck Fan Corporation.
  - 5. Nailor Industries Inc.
  - 6. Pottorff.
  - 7. Ventfabrics, Inc.
  - 8. Ward Industries; a brand of Hart & Cooley, Inc.
- B. Duct-Mounted Access Doors: Fabricate access panels according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible"; Figures 7-2, "Duct Access Doors and Panels," and 7-3, "Access Doors - Round Duct."

## 2.9 FLEXIBLE CONNECTORS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following or equal:
1. Ductmate Industries, Inc.
  2. Duro Dyne Inc.
  3. Ward Industries; a brand of Hart & Cooley, Inc.
- B. Materials: Flame-retardant or noncombustible fabrics.
- C. Coatings and Adhesives: Comply with UL 181, Class 1.

## 2.10 FLEXIBLE DUCTS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following or equal:
1. Flexmaster U.S.A., Inc.
  2. McGill AirFlow LLC.
  3. Ward Industries; a brand of Hart & Cooley, Inc.
- B. Insulated, Flexible Duct: UL 181, Class 1, aluminum laminate and polyester film with latex adhesive supported by helically wound, spring-steel wire; fibrous-glass insulation; polyethylene vapor-barrier film.
1. Pressure Rating: 10-inch wg positive and 1.0-inch wg negative.
  2. Maximum Air Velocity: 4000 fpm
  3. Temperature Range: Minus 20 to plus 210 deg F.
  4. Insulation R-value: Comply with ASHRAE 90.1.
- C. Flexible Duct Connectors:
1. Clamps: Stainless-steel band with cadmium-plated hex screw to tighten band with a worm-gear action in sizes 3 through 18 inches, to suit duct size.

## 2.11 DUCT ACCESSORY HARDWARE

- A. Instrument Test Holes: Cast iron or cast aluminum to suit duct material, including screw cap and gasket. Size to allow insertion of pitot tube and other testing instruments and of length to suit duct-insulation thickness.
- B. Adhesives: High strength, quick setting, neoprene based, waterproof, and resistant to gasoline and grease.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION**

- A. Install duct accessories according to applicable details in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for metal ducts and in NAIMA AH116, "Fibrous Glass Duct Construction Standards," for fibrous-glass ducts.
- B. Install duct accessories of materials suited to duct materials; use galvanized-steel accessories in galvanized-steel and fibrous-glass ducts, stainless-steel accessories in stainless-steel ducts, and aluminum accessories in aluminum ducts.
- C. Install backdraft dampers at inlet of exhaust fans or exhaust ducts as close as possible to exhaust fan unless otherwise indicated.
- D. Install volume dampers at points on supply, return, and exhaust systems where branches extend from larger ducts. Where dampers are installed in ducts having duct liner, install dampers with hat channels of same depth as liner, and terminate liner with nosing at hat channel.
- E. Set dampers to fully open position before testing, adjusting, and balancing.
- F. Install test holes at fan inlets and outlets and elsewhere as indicated.
- G. Install duct access doors on sides of ducts to allow for inspecting, adjusting, and maintaining accessories and equipment at the following locations:
  - 1. On both sides of duct coils.
  - 2. Upstream from duct filters.
  - 3. At outdoor-air intakes and mixed-air plenums.
  - 4. At drain pans and seals.
  - 5. Downstream from manual volume dampers, control dampers, backdraft dampers, and equipment.
  - 6. Control devices requiring inspection.
  - 7. Elsewhere as indicated.
- H. Install access doors with swing against duct static pressure.
- I. Access Door Sizes:
  - 1. One-Hand or Inspection Access: 8 by 5 inches.
  - 2. Two-Hand Access: 12 by 6 inches.
  - 3. Head and Hand Access: 18 by 10 inches.
  - 4. Head and Shoulders Access: 21 by 14 inches.
  - 5. Body Access: 25 by 14 inches.
  - 6. Body plus Ladder Access: 25 by 17 inches.
- J. Label access doors according to Section 230553 "Identification for HVAC Piping and Equipment" to indicate the purpose of access door.

- K. Install flexible connectors to connect ducts to equipment.
- L. Connect diffusers to ducts with maximum 60-inch lengths of flexible duct clamped or strapped in place.
- M. Connect flexible ducts to metal ducts with draw bands.
- N. Install duct test holes where required for testing and balancing purposes.

### **3.2 FIELD QUALITY CONTROL**

- A. Tests and Inspections:
  - 1. Operate dampers to verify full range of movement.
  - 2. Inspect locations of access doors and verify that purpose of access door can be performed.
  - 3. Inspect turning vanes for proper and secure installation.
  - 4. Operate remote damper operators to verify full range of movement of operator and damper.

END OF SECTION 233300



**SECTION 238126**

**SPLIT-SYSTEM AIR-CONDITIONERS**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Section includes split-system air-conditioning units consisting of separate evaporator-fan and compressor-condenser components.

**1.2 ACTION SUBMITTALS**

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
  - 1. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.

**1.3 INFORMATIONAL SUBMITTALS**

- A. Warranty: Sample of special warranty.

**1.4 CLOSEOUT SUBMITTALS**

- A. Operation and maintenance data.

**1.5 QUALITY ASSURANCE**

- 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. ASHRAE Compliance:
  - 1. Fabricate and label refrigeration system to comply with ASHRAE 15, "Safety Standard for Refrigeration Systems."
  - 2. ASHRAE Compliance: Applicable requirements in ASHRAE 62.1, Section 4 - "Outdoor Air Quality," Section 5 - "Systems and Equipment," Section 6 - "Procedures," and Section 7 - "Construction and System Start-up."
- C. ASHRAE/IESNA Compliance: Applicable requirements in ASHRAE/IESNA 90.1.

## 1.6 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of split-system air-conditioning units that fail in materials or workmanship within specified warranty period.
1. Warranty Period:
    - a. For Compressor: Five year(s) from date of Substantial Completion.
    - b. For Parts: One year from date of Substantial Completion.
    - c. For Labor: One year from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 INDOOR UNITS (5 TONS OR LESS)

- A. Concealed Evaporator-Fan Components:
1. Chassis: Galvanized steel with flanged edges, removable panels for servicing, and insulation on back of panel.
  2. Insulation: Faced, glass-fiber duct liner.
  3. Refrigerant Coil: Copper tube, with mechanically bonded aluminum fins and thermal-expansion valve. Comply with ARI 206/110.
  4. Fan: Forward-curved, double-width wheel of galvanized steel; directly connected to motor.
  5. Fan Motors:
    - a. Comply with NEMA designation, temperature rating, service factor, enclosure type, and efficiency requirements specified in Section 230513 "Common Motor Requirements for HVAC Equipment."
    - b. Multitapped, multispeed with internal thermal protection and permanent lubrication.
    - c. Wiring Terminations: Connect motor to chassis wiring with plug connection.
  6. Airstream Surfaces: Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1.
  7. Filters: Permanent, cleanable.
  8. Condensate Drain Pans:
    - a. Fabricated with two percent slope in at least two planes to collect condensate from cooling coils (including coil piping connections, coil headers, and return bends) and to direct water toward drain connection.
      - 1) Length: Extend drain pan downstream from leaving face to comply with ASHRAE 62.1.
      - 2) Depth: A minimum of 2 inches deep.
    - b. Single-wall, galvanized-steel sheet.

- c. Drain Connection: Located at lowest point of pan and sized to prevent overflow. Terminate with threaded nipple on one end of pan.
    - 1) Minimum Connection Size: **NPS 1**.
  - d. Pan-Top Surface Coating: Asphaltic waterproofing compound.
- B. Wall-Mounted, Evaporator-Fan Components:
  - 1. Cabinet: Enameled steel with removable panels on front and ends in color selected by Architect, and discharge drain pans with drain connection.
  - 2. Refrigerant Coil: Copper tube, with mechanically bonded aluminum fins and thermal-expansion valve. Comply with ARI 206/110.
  - 3. Fan: Direct drive, centrifugal.
  - 4. Fan Motors:
    - a. Comply with NEMA designation, temperature rating, service factor, enclosure type, and efficiency requirements specified in Section 230513 "Common Motor Requirements for HVAC Equipment."
    - b. Multitapped, multispeed with internal thermal protection and permanent lubrication.
    - c. Enclosure Type: Totally enclosed, fan cooled.
    - d. NEMA Premium (TM) efficient motors as defined in NEMA MG 1.
    - e. Controllers, Electrical Devices, and Wiring: Comply with requirements for electrical devices and connections specified in electrical Sections.
  - 5. Airstream Surfaces: Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1.

## **2.2 ACCESSORIES**

- A. Thermostat: Low voltage with subbase to control compressor and evaporator fan.
- B. Thermostat: Wireless infrared functioning to remotely control compressor and evaporator fan, with the following features:
  - 1. Compressor time delay.
  - 2. 24-hour time control of system stop and start.
  - 3. Liquid-crystal display indicating temperature, set-point temperature, time setting, operating mode, and fan speed.
  - 4. Fan-speed selection including auto setting.
- C. Automatic-reset timer to prevent rapid cycling of compressor.
- D. Refrigerant Line Kits: Soft-annealed copper suction and liquid lines factory cleaned, dried, pressurized, and sealed; factory-insulated suction line with flared fittings at both ends.
- E. Drain Hose: For condensate.
- F. Additional Monitoring:

1. Monitor constant and variable motor loads.
2. Monitor economizer cycle.
3. Monitor cooling load.
4. Monitor air distribution static pressure and ventilation air volumes.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION**

- A. Install units level and plumb.
- B. Install evaporator-fan components using manufacturer's standard mounting devices securely fastened to building structure.
- C. Install roof-mounted, compressor-condenser components on equipment supports specified in Section 077200 "Roof Accessories." Anchor units to supports with removable, cadmium-plated fasteners.
  1. Comply with requirements for vibration isolation devices specified in Section 230548 "Vibration Controls for HVAC."
- D. Install and connect precharged refrigerant tubing to component's quick-connect fittings. Install tubing to allow access to unit.

### **3.2 CONNECTIONS**

- A. Piping installation requirements are specified in other Sections. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Where piping is installed adjacent to unit, allow space for service and maintenance of unit.
- C. Duct Connections: Duct installation requirements are specified in Section 233113 "Metal Ducts." Drawings indicate the general arrangement of ducts. Connect supply and return ducts to split-system air-conditioning units with flexible duct connectors. Flexible duct connectors are specified in Section 233300 "Air Duct Accessories."

### **3.3 FIELD QUALITY CONTROL**

- A. Perform tests and inspections.
- B. Tests and Inspections:
  1. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
  2. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.
  3. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

- C. Remove and replace malfunctioning units and retest as specified above.
- D. Prepare test and inspection reports.

**3.4 DEMONSTRATION**

- A. Train Owner's maintenance personnel to adjust, operate, and maintain units.

END OF SECTION 238126

## **SECTION 26 05 05**

### **SELECTIVE DEMOLITION FOR ELECTRICAL**

#### **PART 1 - GENERAL**

##### **1.01 SUMMARY**

A. Section Includes:

1. Removal of existing electrical equipment, wiring, and conduit in areas to be remodeled; removal of designated construction; dismantling, cutting and alterations for completion of the Work.
2. Disposal of materials.
3. Storage of removed materials.
4. Identification of utilities.
5. Salvaged items.
6. Protection of items to remain.
7. Relocate existing equipment to accommodate construction.

##### **1.02 SUBMITTALS**

- A. Shop Drawings: Indicate demolition and removal sequence and location of salvageable items; location and construction of temporary work. Describe demolition removal procedures and schedule.

##### **1.03 CLOSEOUT SUBMITTALS**

- A. Project Record Documents: Record actual locations of capped utilities conduits and equipment abandoned in place.

##### **1.04 QUALITY ASSURANCE**

- A. Perform Work in accordance with Code or as specified herein.

##### **1.05 SCHEDULING**

- A. Schedule work to coincide with new construction.
- B. Perform noisy, malodorous, dusty or disruptive work only at times agreed in advance by Owner and Engineer.
- C. Cease operations immediately when structure appears to be in danger and notify Engineer. Do not resume operations until directed.

## **1.06 COORDINATION**

- A. Conduct demolition to minimize interference with adjacent and occupied building areas.
- B. Coordinate and sequence demolition so as not to cause shutdown of operation of surrounding areas.
- C. Shut-down Periods:
  - 1. Arrange timing of shut-down periods of in-service panels with Owner. Do not shut down any utility without prior written approval.
  - 2. Keep shut-down period to minimum or use intermittent period as directed.
  - 3. Maintain life-safety systems in full operation in occupied facilities or provide notice minimum 3 days in advance. Coordinate with and obtain permission of Owner. Manning or Fire Watches and manual operation of standby and substitute equipment shall be the Contractor's responsibility
- D. Identify salvage items in cooperation with Owner.

## **PART 2 - PRODUCTS**

### **2.01 Not Used**

## **PART 3 - EXECUTION**

### **3.01 EXAMINATION**

- A. Verify wiring and equipment indicated to be demolished serve only abandoned facilities.
- B. Verify termination points for demolished services.

### **3.02 PREPARATION**

- A. Erect, and maintain temporary safeguards, including warning signs and lights, barricades and similar measures, for protection of the public, Owner, Contractor's employees, and existing improvements to remain.
- B. Temporary egress signage and emergency lighting

### **3.03 DEMOLITION**

- A. Where furnished, demolition Drawings are based on casual field observation and existing record documents. Report discrepancies to Owner and Engineer before disturbing existing installation.

- B. Remove exposed abandoned conduit, including abandoned conduit above accessible ceiling finishes. Cut conduit flush with walls and floors and patch surfaces.
- C. Remove conduit, wire, boxes, and fastening devices to avoid any interference with new installation.
- D. Disconnect electrical systems in walls, floors, and ceilings scheduled for removal.
- E. Reconnect equipment being disturbed by renovation work and required for continue service to or nearest available panel.
- F. Disconnect or shut off service to areas where electrical work is to be removed. Remove electrical fixtures, equipment, and related switches, outlets, conduit and wiring which are not part of final project.
- G. Install temporary wiring and connections to maintain existing systems in service during construction.
- H. Perform work on energized equipment or circuits with experienced and trained personnel.
- I. Remove, relocate, and extend existing installations to accommodate new construction.
- J. Repair adjacent construction and finishes damaged during demolition and extension work.
- K. Remove exposed abandoned grounding and bonding components, fasteners and supports, and electrical identification components, including abandoned components above accessible ceiling finishes. Cut embedded support elements flush with walls and floors.
- L. Clean and repair existing equipment to remain or to be reinstalled.
- M. Protect and retain power to existing active equipment remaining.
- N. Cap abandoned empty conduit at both ends.

### **3.04 EXISTING PANELBOARDS**

- A. Ring out circuits in existing panel affected by the Work. Where additional circuits are needed, reuse circuits available for reuse. Install new breakers.
- B. Tag unused circuits as spare.
- C. Where existing circuits are indicated to be reused, use sensing measuring devices to verify circuits feeding Project area or are not in use.



- D. Remove existing wire no longer in use from panel to equipment.
- E. Provide new updated directories where more than three circuits have been modified or rewired.

### **3.05 SALVAGE ITEMS**

- A. Remove and protect items indicated on Drawings, in Schedule or indicated by Owner to be salvaged and turn over to Owner.
- B. Items of salvageable value may be removed as work progresses. Transport salvaged items from site as they are removed.

### **3.06 REUSABLE ELECTRICAL EQUIPMENT**

- A. Carefully remove equipment, materials, or fixtures which are to be reused.
- B. Disconnect, remove, or relocate existing electrical material and equipment interfering with new installation.
- C. Relocate existing lighting fixtures as necessary and as approved by the Owner. Clean fixtures and re-lamp. Test fixture to see if it is in good working condition before installation at new location.

### **3.07 CLEANING**

- A. Remove demolished materials as work progresses. Legally dispose.
- B. Keep workplace neat.

### **3.08 PROTECTION OF FINISHED WORK**

- A. Do not permit traffic over unprotected floor surface.

END OF SECTION

**SECTION 26 05 19**

**LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Section Includes:
  - 1. Building wires and cables rated 2000 V and less.
  - 2. Connectors, splices, and terminations rated 2000 V and less.

**1.2 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
- B. Product Schedule: Indicate type, use, location, and termination locations.

**1.3 INFORMATIONAL SUBMITTALS**

- A. Qualification Data: For manufacturer's authorized service representative.
- B. Field quality-control reports.

**PART 2 - PRODUCTS**

**2.1 CONDUCTORS AND CABLES**

- 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. Conductor and Cable Marking: Comply with wire and cable marking according to UL's "Wire and Cable Marking and Application Guide."
- C. Comply with UL 1277, UL 1685, and NFPA 70 for Type TC-ER cable used in VFC circuits.
- D. Conductors: Copper, complying with NEMA WC 70/ICEA S-95-658.
  - 1. Conductor Insulation: Comply with NEMA WC 70/ICEA S-95-658 for Type THHN/THWN-
  - 2. PV Conductor Insulation: Comply with UL 4703.
- E. Cable: Comply with NEMA WC 70/ICEA S-95-658 for armored cable, Type AC metal-clad cable, Type MC nonmetallic-sheathed cable, and Type NM with ground wire.

## **2.2 CONNECTORS AND SPLICES**

- A. Description: Factory-fabricated connectors and splices 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 application.

## **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. 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. Exposed Feeders: Type THHN/THWN-2, single conductors in raceway Metal-clad cable, Type MC.
- B. Feeders Concealed in Ceilings, Walls, Partitions, and Crawlspace: Type THHN/THWN-2, single conductors in raceway Armored cable, Type AC Metal-clad cable, Type MC.
- C. Feeders Installed below Raised Flooring: Type THHN/THWN-2, single conductors in raceway Armored cable, Type AC Metal-clad cable, Type MC.
- D. Feeders in Cable Tray: Type THHN/THWN-2, single conductors in raceway Armored cable, Type AC Metal-clad cable, Type MC.
- E. Exposed Branch Circuits, Including in Crawlspace: Type THHN/THWN-2, single conductors in raceway Armored cable, Type AC Metal-clad cable, Type MC.
- F. Branch Circuits Concealed in Ceilings, Walls, and Partitions: Type THHN/THWN-2, single conductors in raceway Armored cable, Type AC Metal-clad cable, Type MC.
- G. Branch Circuits Installed below Raised Flooring: Type THHN/THWN-2, single conductors in raceway Armored cable, Type AC Metal-clad cable, Type MC.
- H. Branch Circuits in Cable Tray: Type THHN/THWN-2, single conductors in raceway Armored cable, Type AC Metal-clad cable, Type MC.
- I. 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. 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."
- H. 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."

### **3.4 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 6 inches of slack.

### **3.5 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.

**3.6 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."

**3.7 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."

**3.8 FIELD QUALITY CONTROL**

- A. Perform the following tests and inspections with the assistance of a factory-authorized service representative:
  - 1. Perform each of the following visual and electrical tests:
    - a. Compare conductor and cable data with Drawings and Specifications.
    - b. Inspect exposed sections of conductor and cable for physical damage and correct connection according to the single-line diagram.
    - c. Test bolted connections for high resistance using one of the following:
      - 1) A low-resistance ohmmeter.
      - 2) Calibrated torque wrench.
      - 3) Thermographic survey.
    - d. Inspect compression applied connectors for correct cable match and indentation.
    - e. Inspect for correct identification.
    - f. Inspect cable jacket and condition.
    - g. Perform insulation-resistance test on each conductor with respect to 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.
    - h. Continuity test on each conductor and cable.
    - i. Uniform resistance of parallel conductors.
- B. Cables will be considered defective if they do not pass tests and inspections.
- C. Prepare Test and Inspection Reports: Prepare a written report 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 260519

---

SECTION 26 05 26

GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes grounding and bonding systems and equipment.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

- 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. Comply with UL 467 for grounding and bonding materials and equipment.

2.2 CONDUCTORS

- A. Insulated Conductors: Copper or tinned-copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.
- B. Bare Copper Conductors:
  - 1. Solid Conductors: ASTM B 3.
  - 2. Stranded Conductors: ASTM B 8.
  - 3. Tinned Conductors: ASTM B 33.
  - 4. Bonding Cable: 28 kcmil, 14 strands of No. 17 AWG conductor, 1/4 inch in diameter.
  - 5. Bonding Conductor: No. 4 or No. 6 AWG, stranded conductor.
  - 6. Bonding Jumper: Copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.
  - 7. Tinned Bonding Jumper: Tinned-copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.
- C. Grounding Bus: Predrilled rectangular bars of annealed copper, 1/4 by 4 inches in cross section, with 9/32-inch holes spaced 1-1/8 inches apart. Stand-off insulators for mounting shall comply with UL 891 for use in switchboards, 600 V and shall be Lexan or PVC, impulse tested at 5000 V.

## **2.3 CONNECTORS**

- A. Listed and labeled by an NRTL acceptable to authorities having jurisdiction for applications in which used and for specific types, sizes, and combinations of conductors and other items connected.
- B. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.
- C. Bus-Bar Connectors: Compression type, copper or copper alloy, with two wire terminals.
- D. Beam Clamps: Mechanical type, terminal, ground wire access from four directions, with dual, tin-plated or silicon bronze bolts.
- E. Cable-to-Cable Connectors: Compression type, copper or copper alloy.
- F. Cable Tray Ground Clamp: Mechanical type, zinc-plated malleable iron.
- G. Conduit Hubs: Mechanical type, terminal with threaded hub.
- H. Ground Rod Clamps: Mechanical type, copper or copper alloy, terminal with hex head bolt.
- I. Lay-in Lug Connector: Mechanical type, copper rated for direct burial terminal with set screw.
- J. Signal Reference Grid Clamp: Mechanical type, stamped-steel terminal with hex head screw.
- K. Straps: Solid copper, cast-bronze clamp. Rated for 600 A.
- L. Tower Ground Clamps: Mechanical type, copper or copper alloy.
- M. U-Bolt Clamps: Mechanical type, copper or copper alloy, terminal listed for direct burial.
- N. Water Pipe Clamps:
  - 1. Mechanical type, two pieces with zinc-plated bolts.
    - a. Material: Tin-plated aluminum.
    - b. Listed for direct burial.
  - 2. U-bolt type with malleable-iron clamp and copper ground connector.

## **2.4 GROUNDING ELECTRODES**

- A. Ground Rods: Copper-clad steel, sectional type; 3/4 inch by 10 feet.
- B. Ground Plates: 1/4 inch thick, hot-dip galvanized.

## **PART 3 - EXECUTION**

### **3.1 APPLICATIONS**

- A. Conductors: Install solid conductor for No. 8 AWG and smaller, and stranded conductors for No. 6 AWG and larger unless otherwise indicated.
- B. Grounding Bus: Install in electrical equipment rooms, in rooms housing service equipment, and elsewhere as indicated.
  - 1. Install bus horizontally, on insulated spacers 2 inches minimum from wall, 6 inches above finished floor unless otherwise indicated.
  - 2. Where indicated on both sides of doorways, route bus up to top of door frame, across top of doorway, and down; connect to horizontal bus.
- C. Conductor Terminations and Connections:
  - 1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.
  - 2. Underground Connections: Welded connectors except at test wells and as otherwise indicated.
  - 3. Connections to Ground Rods at Test Wells: Bolted connectors.
  - 4. Connections to Structural Steel: Welded connectors.

### **3.2 GROUNDING AT THE SERVICE**

- A. Equipment grounding conductors and grounding electrode conductors shall be connected to the ground bus. Install a main bonding jumper between the neutral and ground buses.

### **3.3 GROUNDING SEPARATELY DERIVED SYSTEMS**

- A. Generator: Install grounding electrode(s) at the generator location. The electrode shall be connected to the equipment grounding conductor and to the frame of the generator.

### **3.4 EQUIPMENT GROUNDING**

- A. Install insulated equipment grounding conductors with all feeders and branch circuits.
- B. Air-Duct Equipment Circuits: Install insulated equipment grounding conductor to duct-mounted electrical devices operating at 120 V and more, including air cleaners, heaters, dampers, humidifiers, and other duct electrical equipment. Bond conductor to each unit and to air duct and connected metallic piping.
- C. Water Heater, Heat-Tracing, and Antifrost Heating Cables: Install a separate insulated equipment grounding conductor to each electric water heater and heat-tracing cable. Bond conductor to heater units, piping, connected equipment, and components.



- D. Poles Supporting Outdoor Lighting Fixtures: Install grounding electrode and a separate insulated equipment grounding conductor in addition to grounding conductor installed with branch-circuit conductors.

### **3.5 INSTALLATION**

- A. Grounding Conductors: Route along shortest and straightest paths possible unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.
- B. Ground Bonding Common with Lightning Protection System: Comply with NFPA 780 and UL 96 when interconnecting with lightning protection system. Bond electrical power system ground directly to lightning protection system grounding conductor at closest point to electrical service grounding electrode. Use bonding conductor sized same as system grounding electrode conductor, and install in conduit.
- C. Ground Rods: Drive rods until tops are 2 inches below finished floor or final grade unless otherwise indicated.
  - 1. Interconnect ground rods with grounding electrode conductor below grade and as otherwise indicated. Make connections without exposing steel or damaging coating if any.
- D. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance except where routed through short lengths of conduit.
  - 1. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.
  - 2. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install bonding so vibration is not transmitted to rigidly mounted equipment.
  - 3. Use exothermic-welded connectors for outdoor locations; if a disconnect-type connection is required, use a bolted clamp.
- E. Grounding and Bonding for Piping:
  - 1. Metal Water Service Pipe: Install insulated copper grounding conductors, in conduit, from building's main service equipment, or grounding bus, to main metal water service entrances to building. Connect grounding conductors to main metal water service pipes; use a bolted clamp connector or bolt a lug-type connector to a pipe flange by using one of the lug bolts of the flange. Where a dielectric main water fitting is installed, connect grounding conductor on street side of fitting. Bond metal grounding conductor conduit or sleeve to conductor at each end.
  - 2. Water Meter Piping: Use braided-type bonding jumpers to electrically bypass water meters. Connect to pipe with a bolted connector.
  - 3. Bond each aboveground portion of gas piping system downstream from equipment shutoff valve.

END OF SECTION 260526

---

SECTION 26 05 29

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.
- B. Section 133419 - Metal Building Systems

1.2 SUMMARY

- A. Section Includes:
  - 1. Hangers and supports for electrical equipment and systems.
  - 2. Construction requirements for concrete bases.

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. Hangers.
    - b. Steel slotted support systems.
    - c. Nonmetallic support systems.
    - d. Trapeze hangers.
    - e. Clamps.
    - f. Turnbuckles.
    - g. Sockets.
    - h. Eye nuts.
    - i. Saddles.
    - j. Brackets.
  - 2. Include rated capacities and furnished specialties and accessories.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Flame Rating: Class 1.
2. Self-extinguishing according to ASTM D 635.

## **2.2 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS**

- A. Steel Slotted Support Systems: Comply with MFMA-4 factory-fabricated components for field assembly.
  1. Material: Galvanized steel.
  2. Channel Width: 1-5/8 inches.
  3. Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-4.
  4. Nonmetallic Coatings: Manufacturer's standard PVC, polyurethane, or polyester coating applied according to MFMA-4.
  5. Painted Coatings: Manufacturer's standard painted coating applied according to MFMA-4.
  6. Protect finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
  7. Channel Dimensions: Selected for applicable load criteria.
- B. Aluminum Slotted Support Systems: Comply with MFMA-4 factory-fabricated components for field assembly.
  1. Channel Width: 1-5/8 inches.
  2. Nonmetallic Coatings: Manufacturer's standard PVC, polyurethane, or polyester coating applied according to MFMA-4.
  3. Painted Coatings: Manufacturer's standard painted coating applied according to MFMA-4.
  4. Protect finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
  5. Channel Dimensions: Selected for applicable load criteria.
- C. Conduit and Cable Support Devices: Steel hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.
- D. Support for Conductors in Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug or plugs for nonarmored electrical conductors or cables in riser conduits. Plugs shall have number, size, and shape of conductor gripping pieces as required to suit individual conductors or cables supported. Body shall be made of malleable iron.
- E. Structural Steel for Fabricated Supports and Restraints: ASTM A 36/A 36M steel plates, shapes, and bars; black and galvanized.
- F. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:
  1. Mechanical-Expansion Anchors: Insert-wedge-type, stainless steel, for use in hardened portland cement concrete, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.

2. Concrete Inserts: Steel or malleable-iron, slotted support system units are similar to MSS Type 18 units and comply with MFMA-4 or MSS SP-58.
3. Clamps for Attachment to Steel Structural Elements: MSS SP-58 units are suitable for attached structural element.
4. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM A 325.
5. Toggle Bolts: All-steel springhead type.
6. Hanger Rods: Threaded steel.

## **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 NECA 1 and NECA 101 for application of hangers and supports for electrical equipment and systems unless requirements in this Section are stricter.
- B. Comply with requirements for raceways and boxes specified in Section 260533 "Raceways and Boxes for Electrical Systems."
- C. Maximum Support Spacing and Minimum Hanger Rod Size for Raceway: Space supports for EMTs, IMCs, and RMCs as required by NFPA 70. Minimum rod size shall be 1/4 inch in diameter.
- D. Multiple Raceways or Cables: Install trapeze-type supports fabricated with steel slotted or other 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.
- E. 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, EMTs 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 by means that comply with seismic-restraint strength and anchorage requirements.
- 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 CONCRETE BASES**

- A. Construct concrete bases of dimensions indicated but not less than 4 inches larger in both directions than supported unit, and so anchors will be a minimum of 10 bolt diameters from edge of the base.
- B. Use 3000-psi, 28-day compressive-strength concrete. Concrete materials, reinforcement, and placement requirements are specified in Section 033000 "Cast-in-Place Concrete."
- C. Anchor equipment to concrete base as follows:
  - 1. Place and secure anchorage devices. Use supported equipment manufacturer's setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

2. Install anchor bolts to elevations required for proper attachment to supported equipment.
3. Install anchor bolts according to anchor-bolt manufacturer's written instructions.

### **3.5 PAINTING**

- A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.
  1. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils.
- B. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

END OF SECTION 260529

**SECTION 26 05 33**

**RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Section Includes:
  - 1. Metal conduits, tubing, and fittings.
  - 2. Nonmetal conduits, tubing, and fittings.
  - 3. Metal wireways and auxiliary gutters.
  - 4. Nonmetal wireways and auxiliary gutters.
  - 5. Surface raceways.
  - 6. Boxes, enclosures, and cabinets.
  - 7. Handholes and boxes for exterior underground cabling.
- B. Related Requirements:
  - 1. Section 133419 "Metal Building Systems"

**1.2 ACTION SUBMITTALS**

- A. Product Data: For surface raceways, wireways and fittings, floor boxes, hinged-cover enclosures, and cabinets.
- B. Shop Drawings: For custom enclosures and cabinets. Include plans, elevations, sections, and attachment details.

**1.3 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. Seismic Qualification Certificates: For enclosures, cabinets, and conduit racks and their mounting provisions, including those for internal components, from manufacturer.

## **PART 2 - PRODUCTS**

### **2.1 METAL CONDUITS, TUBING, AND FITTINGS**

- A. Listing and Labeling: Metal conduits, tubing, and fittings shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. GRC: Comply with ANSI C80.1 and UL 6.
- C. ARC: Comply with ANSI C80.5 and UL 6A.
- D. IMC: Comply with ANSI C80.6 and UL 1242.
- E. PVC-Coated Steel Conduit: PVC-coated rigid steel conduit.
  - 1. Comply with NEMA RN 1.
  - 2. Coating Thickness: 0.040 inch, minimum.
- F. EMT: Comply with ANSI C80.3 and UL 797.
- G. FMC: Comply with UL 1; zinc-coated steel.
- H. LFMC: Flexible steel conduit with PVC jacket and complying with UL 360.
- I. Fittings for Metal Conduit: Comply with NEMA FB 1 and UL 514B.
  - 1. Conduit Fittings for Hazardous (Classified) Locations: Comply with UL 886 and NFPA 70.
  - 2. Fittings for EMT:
    - a. Material: Steel or die cast.
    - b. Type: compression.
  - 3. 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.
  - 4. Coating for Fittings for PVC-Coated Conduit: Minimum thickness of 0.040 inch, with overlapping sleeves protecting threaded joints.
- J. Joint Compound for IMC, GRC, or ARC: 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, TUBING, AND FITTINGS**

- A. Listing and Labeling: Nonmetallic conduits, tubing, and fittings shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. ENT: Comply with NEMA TC 13 and UL 1653.



- C. RNC: Type EPC-40-PVC, complying with NEMA TC 2 and UL 651 unless otherwise indicated.
- D. LFNC: Comply with UL 1660.
- E. Continuous HDPE: Comply with UL 651B.
- F. Coilable HDPE: Preassembled with conductors or cables, and complying with ASTM D 3485.
- G. Fittings for ENT and RNC: Comply with NEMA TC 3; match to conduit or tubing type and material.
- H. Fittings for LFNC: Comply with UL 514B.
- I. Solvents and Adhesives: As recommended by conduit manufacturer.

### **2.3 METAL WIREWAYS AND AUXILIARY GUTTERS**

- A. Description: Sheet metal, complying with UL 870 and NEMA 250, Type 1 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.
- B. 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.

### **2.4 NONMETALLIC WIREWAYS AND AUXILIARY GUTTERS**

- A. Listing and Labeling: Nonmetallic wireways and auxiliary gutters shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Description: Fiberglass polyester, extruded and fabricated to required size and shape, without holes or knockouts. Cover shall be gasketed with oil-resistant gasket material and fastened with captive screws treated for corrosion resistance. Connections shall be flanged and have stainless-steel screws and oil-resistant gaskets.
- C. Description: PVC, extruded and fabricated to required size and shape, and having snap-on cover, mechanically coupled connections, and plastic fasteners.
- D. Fittings and Accessories: Couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings shall match and mate with wireways as required for complete system.
- E. Solvents and Adhesives: As recommended by conduit manufacturer.

## **2.5 SURFACE RACEWAYS**

- A. Listing and Labeling: Surface raceways and tele-power poles shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Surface Metal Raceways: Galvanized steel with snap-on covers complying with UL 5.
- C. Surface Nonmetallic Raceways: Two- or three-piece construction, complying with UL 5A, and manufactured of rigid PVC. Product shall comply with UL 94 V-0 requirements for self-extinguishing characteristics.
- D. Tele-Power Poles:
  - 1. Material: Galvanized steel with ivory baked-enamel finish.
  - 2. Fittings and Accessories: Dividers, end caps, covers, cutouts, wiring harnesses, devices, mounting materials, and other fittings shall match and mate with tele-power pole as required for complete system.

## **2.6 BOXES, ENCLOSURES, AND CABINETS**

- A. General Requirements for Boxes, Enclosures, and Cabinets: Boxes, enclosures, and cabinets installed in wet locations shall be listed for use in wet locations.
- B. Sheet Metal Outlet and Device Boxes: Comply with NEMA OS 1 and UL 514A.
- C. Cast-Metal Outlet and Device Boxes: Comply with NEMA FB 1,, Type FD, with gasketed cover.
- D. Nonmetallic Outlet and Device Boxes: Comply with NEMA OS 2 and UL 514C.
- E. Metal Floor Boxes:
  - 1. Material: Cast metal or sheet metal.
  - 2. Type: Fully adjustable.
  - 3. Shape: Rectangular.
  - 4. Listing and Labeling: Metal floor boxes shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- F. Nonmetallic Floor Boxes: Nonadjustable, rectangular.
  - 1. Listing and Labeling: Nonmetallic floor boxes shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- G. 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.
- H. Paddle Fan Outlet Boxes: Nonadjustable, designed for attachment of paddle fan weighing 70 lb.

1. Listing and labeling: Paddle fan outlet boxes shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- I. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.
- J. Cast-Metal Access, Pull, and Junction Boxes: Comply with NEMA FB 1 and UL 1773, galvanized, cast iron with gasketed cover.
- K. Box extensions used to accommodate new building finishes shall be of same material as recessed box.
- L. Device Box Dimensions: 4 inches square by 2-1/8 inches deep.
- M. Gangable boxes are allowed.
- N. Hinged-Cover Enclosures: Comply with UL 50 and NEMA 250, Type 1 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.
- O. Cabinets:
  1. NEMA 250, Type 1 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.

## 2.7 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. Standard: Comply with SCTE 77.
  2. Configuration: Designed for flush burial with **[open]** **[closed]** **[integral closed]** bottom unless otherwise indicated.

3. Cover: Weatherproof, secured by tamper-resistant locking devices and having structural load rating consistent with enclosure and handhole location.
  4. Cover Finish: Nonskid finish shall have a minimum coefficient of friction of 0.50.
  5. Cover Legend: Molded lettering, "ELECTRIC."
  6. Conduit Entrance Provisions: Conduit-terminating fittings shall mate with entering ducts for secure, fixed installation in enclosure wall.
- C. Fiberglass Handholes and Boxes: Molded of fiberglass-reinforced polyester resin, with frame and covers of polymer concrete.
1. Standard: Comply with SCTE 77.
  2. Configuration: Designed for flush burial with closed bottom unless otherwise indicated.
  3. Cover: Weatherproof, secured by tamper-resistant locking devices and having structural load rating consistent with enclosure and handhole location.
  4. Cover Finish: Nonskid finish shall have a minimum coefficient of friction of 0.50.
  5. Cover Legend: Molded lettering, "ELECTRIC."
  6. Conduit Entrance Provisions: Conduit-terminating fittings shall mate with entering ducts for secure, fixed installation in enclosure wall.

## **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. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
  5. Boxes and Enclosures, Aboveground: NEMA 250, Type 4.
- B. Indoors: Apply raceway products as specified below unless otherwise indicated.
1. Exposed, Not Subject to Severe Physical Damage: EMT.
  2. Exposed and Subject to Severe Physical Damage: GRC. Raceway locations include the following:
    - a. Mechanical rooms.
  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 1, 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 and Intermediate Steel Conduit: Use threaded rigid steel conduit fittings unless otherwise indicated. Comply with NEMA FB 2.10.
  2. PVC Externally Coated, Rigid Steel Conduits: Use only fittings listed for use with this type of conduit. Patch and seal all joints, nicks, and scrapes in PVC coating after installing conduits and fittings. Use sealant recommended by fitting manufacturer and apply in thickness and number of coats recommended by manufacturer.
  3. EMT: Use compression, steel fittings. Comply with NEMA FB 2.10.
  4. Flexible Conduit: Use only fittings listed for use with flexible conduit. Comply with NEMA FB 2.20.
- E. Do not install aluminum conduits, boxes, or fittings in contact with concrete or earth.
- F. Install surface raceways only where indicated on Drawings.
- G. Do not install nonmetallic conduit where ambient temperature exceeds 120 deg F.

### **3.2 INSTALLATION**

- A. 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.
- B. 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.
- C. Comply with requirements in Section 260529 "Hangers and Supports for Electrical Systems" for hangers and supports.
- D. Arrange stub-ups so curved portions of bends are not visible above finished slab.
- E. 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.
- F. Conceal conduit and EMT within finished walls, ceilings, and floors unless otherwise indicated. Install conduits parallel or perpendicular to building lines.
- G. Support conduit within 12 inches of enclosures to which attached.
- H. 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 RNC, Type EPC-40-PVC, before rising above floor.
- I. Stub-ups to Above Recessed Ceilings:
  - 1. Use EMT, IMC, or RMC for raceways.
  - 2. Use a conduit bushing or insulated fitting to terminate stub-ups not terminated in hubs or in an enclosure.
- J. 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.
- K. Coat field-cut threads on PVC-coated raceway with a corrosion-preventing conductive compound prior to assembly.
- L. Raceway Terminations at Locations Subject to Moisture or Vibration: Use insulating bushings to protect conductors including conductors smaller than No. 4 AWG.
- M. 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.
- N. 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.
- O. Surface Raceways:
  - 1. Install surface raceway with a minimum 2-inch radius control at bend points.
  - 2. Secure surface raceway with screws or other anchor-type devices at intervals not exceeding 48 inches and with no less than two supports per straight raceway section. Support surface raceway according to manufacturer's written instructions. Tape and glue are not acceptable support methods.
- P. 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.
- Q. 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 conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
  - 2. Where an underground service raceway enters a building or structure.
  - 3. Where otherwise required by NFPA 70.
- R. 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.
  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.
    - d. Attics: 135 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 degree F of temperature change for PVC 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.
- S. Flexible Conduit Connections: Comply with NEMA RV 3. Use a maximum of 72 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.
- T. 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.
- U. 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 the box and cover plate or the supported equipment and box.
- V. Horizontally separate boxes mounted on opposite sides of walls so they are not in the same vertical channel.
- W. Locate boxes so that cover or plate will not span different building finishes.
- X. 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.
- Y. Fasten junction and pull boxes to or support from building structure. Do not support boxes by conduits.
- Z. Set metal floor boxes level and flush with finished floor surface.
- AA. 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 duct elbows for stub-up at poles and equipment and at building entrances through floor unless otherwise indicated. Encase elbows for stub-up ducts throughout length of elbow.
5. 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.
6. 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. Field-cut openings for conduits according to enclosure manufacturer's written instructions. Cut wall of enclosure with a tool designed for material to be cut. Size holes for terminating fittings to be used, and seal around penetrations after fittings are installed.



**3.5 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."

**3.6 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 260533

---

SECTION 26 05 44

SLEEVES AND SLEEVE SEALS FOR ELECTRICAL RACEWAYS AND CABLING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Sleeves for raceway and cable penetration of non-fire-rated construction walls and floors.
  2. Sleeve-seal systems.
  3. Sleeve-seal fittings.
  4. Grout.
  5. Silicone sealants.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 SLEEVES

- A. Wall Sleeves:
1. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, zinc coated, plain ends.
  2. Cast-Iron Pipe Sleeves: Cast or fabricated "wall pipe," equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop unless otherwise indicated.
- B. Sleeves for Conduits Penetrating Non-Fire-Rated Gypsum Board Assemblies: Galvanized-steel sheet; 0.0239-inch minimum thickness; round tube closed with welded longitudinal joint, with tabs for screw-fastening the sleeve to the board.
- C. Sleeves for Rectangular Openings:
1. Material: Galvanized sheet steel.
  2. Minimum Metal Thickness:
    - a. For sleeve cross-section rectangle perimeter less than 50 inches and with no side larger than 16 inches, thickness shall be 0.052 inch.
    - b. For sleeve cross-section rectangle perimeter 50 inches or more and one or more sides larger than 16 inches, thickness shall be 0.138 inch.

## **2.2 SLEEVE-SEAL SYSTEMS**

- A. Description: Modular sealing device, designed for field assembly, to fill annular space between sleeve and raceway or 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.

## **2.3 SLEEVE-SEAL FITTINGS**

- A. Description: Manufactured plastic, sleeve-type, waterstop assembly made for embedding in concrete slab or wall. Unit shall have plastic or rubber waterstop collar with center opening to match piping OD.

## **2.4 GROUT**

- A. Description: Nonshrink; recommended for interior and exterior sealing openings in non-fire-rated walls or floors.
- B. Standard: ASTM C 1107/C 1107M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.
- C. Design Mix: 5000-psi, 28-day compressive strength.
- D. Packaging: Premixed and factory packaged.

# **PART 3 - EXECUTION**

## **3.1 SLEEVE INSTALLATION FOR NON-FIRE-RATED ELECTRICAL PENETRATIONS**

- A. Comply with NECA 1.
- B. Comply with NEMA VE 2 for cable tray and cable penetrations.
- C. 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 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."
    - b. Seal space outside of sleeves with mortar or grout. Pack sealing material solidly between sleeve and wall so no voids remain. Tool exposed surfaces smooth; protect material while curing.

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 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.
- D. Sleeves for Conduits Penetrating Non-Fire-Rated Gypsum Board Assemblies:
1. Use circular metal sleeves unless penetration arrangement requires rectangular sleeved opening.
  2. Seal space outside of sleeves with approved joint compound for gypsum board assemblies.
- E. Roof-Penetration Sleeves: Seal penetration of individual raceways and cables with flexible boot-type flashing units applied in coordination with roofing work.
- F. Aboveground, Exterior-Wall Penetrations: Seal penetrations using [steel] [cast-iron] pipe sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch annular clear space between pipe and sleeve for installing mechanical sleeve seals.
- G. Underground, Exterior-Wall and Floor Penetrations: Install cast-iron pipe sleeves. Size sleeves to allow for 1-inch annular clear space between raceway or cable and sleeve for installing sleeve-seal system.

### **3.2 SLEEVE-SEAL-SYSTEM INSTALLATION**

- 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.

### **3.3 SLEEVE-SEAL-FITTING INSTALLATION**

- A. Install sleeve-seal fittings in new walls and slabs as they are constructed.
- B. Assemble fitting components of length to be flush with both surfaces of concrete slabs and walls. Position waterstop flange to be centered in concrete slab or wall.
- C. Secure nailing flanges to concrete forms.
- D. Using grout, seal the space around outside of sleeve-seal fittings.

END OF SECTION 260544

**SECTION 26 05 53**

**IDENTIFICATION FOR ELECTRICAL SYSTEMS**

**PART 1 - GENERAL**

**1.1 SUMMARY**

A. Section Includes:

1. Identification for raceways.
2. Identification of power and control cables.
3. Identification for conductors.
4. Underground-line warning tape.
5. Warning labels and signs.
6. Instruction signs.
7. Equipment identification labels, including arc-flash warning labels.
8. Miscellaneous identification products.

**1.2 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
- B. Delegated-Design Submittal: For arc-flash hazard study.

**PART 2 - PRODUCTS**

**2.1 PERFORMANCE REQUIREMENTS**

- A. Comply with ASME A13.1 and IEEE C2.
- B. Comply with NFPA 70.
- 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.
- B. 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."

## **2.3 LABELS**

- A. Vinyl Labels for Raceways Carrying Circuits at 600 V or Less: Preprinted, flexible labels laminated with a clear, weather- and chemical-resistant coating and matching wraparound clear adhesive tape for securing label ends.
- B. Self-Adhesive Labels:
  1. Preprinted, 3-mil-thick, vinyl flexible label with acrylic pressure-sensitive adhesive.
  2. Vinyl, thermal, transfer-printed, 3-mil-thick, multicolor, weather- and UV-resistant, pressure-sensitive adhesive labels, configured for display on front cover, door, or other access to equipment unless otherwise indicated.
    - a. Nominal Size: 3.5-by-5-inch.

## **2.4 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.
- 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.
- C. Floor Marking Tape: 2-inch-wide, 5-mil pressure-sensitive vinyl tape, with yellow and black stripes and clear vinyl overlay.
- D. Underground-Line Warning Tape
  1. 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.
  2. 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".
  3. Tag: Type I:

- a. Pigmented polyolefin, bright colored, continuous-printed on one side with the inscription of the utility, compounded for direct-burial service.
  - b. Width: 3 inches.
  - c. Thickness: 4 mils. Weight: 18.5 lb/1000 sq. ft..
  - d. Tensile according to ASTM D 882: 30 lbf and 2500 psi.
- 4. Tag: Type ID:
  - a. Detectable three-layer laminate, consisting of a printed pigmented polyolefin film, a solid aluminum-foil core, and a clear protective film that allows inspection of the continuity of the conductive core; bright colored, continuous-printed on one side with the inscription of the utility, compounded for direct-burial service.
  - b. Width: 3 inches.
  - c. Overall Thickness: 5 mils.
  - d. Foil Core Thickness: 0.35 mil.
  - e. Weight: 28 lb/1000 sq. ft..
  - f. Tensile according to ASTM D 882: 70 lbf and 4600 psi.
- 5. Tag: Type IID:
  - a. Reinforced, detectable three-layer laminate, consisting of a printed pigmented woven scrim, a solid aluminum-foil core, and a clear protective film that allows inspection of the continuity of the conductive core; bright-colored, continuous-printed on one side with the inscription of the utility, compounded for direct-burial service.
  - b. Width: 3 inches
  - c. Overall Thickness: 8 mils.
  - d. Foil Core Thickness: 0.35 mil.
  - e. Weight: 34 lb/1000 sq. ft..
  - f. Tensile according to ASTM D 882: 300 lbf and 12,500 psi.

## **2.5 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.
- 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.
- C. Write-On Tags:
  - 1. Polyester Tags: 0.010 inch thick, with corrosion-resistant grommet and cable tie for attachment to raceway, conductor, or cable.
  - 2. Marker for Tags: Permanent, waterproof, black ink marker recommended by tag manufacturer.

## **2.6 CABLE TIES**

- A. General-Purpose Cable Ties: Fungus inert, self-extinguishing, one piece, self-locking, Type 6/6 nylon.
  - 1. Minimum Width: 3/16 inch.
  - 2. Tensile Strength at 73 deg F according to ASTM D 638: 12,000 psi.
  - 3. Temperature Range: Minus 40 to plus 185 deg F.
  - 4. Color: Black, except where used for color-coding.
- B. UV-Stabilized Cable Ties: Fungus inert, designed for continuous exposure to exterior sunlight, self-extinguishing, one piece, self-locking, Type 6/6 nylon.
  - 1. Minimum Width: 3/16 inch.
  - 2. Tensile Strength at 73 deg F according to ASTM D 638: 12,000 psi.
  - 3. Temperature Range: Minus 40 to plus 185 deg F.
  - 4. Color: Black.
- C. Plenum-Rated Cable Ties: Self-extinguishing, UV stabilized, one piece, self-locking.
  - 1. Minimum Width: 3/16 inch.
  - 2. Tensile Strength at 73 deg F according to ASTM D 638: 7000 psi.
  - 3. UL 94 Flame Rating: 94V-0.
  - 4. Temperature Range: Minus 50 to plus 284 deg F.
  - 5. Color: Black.

## **2.7 MISCELLANEOUS IDENTIFICATION PRODUCTS**

- A. 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 INSTALLATION**

- A. Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment.
- B. Apply identification devices to surfaces that require finish after completing finish work.
- C. Attach plastic raceway and cable labels that are not self-adhesive type with clear vinyl tape, with adhesive appropriate to the location and substrate.
- D. Cable Ties: For attaching tags. Use general-purpose type, except as listed below:
  - 1. Outdoors: UV-stabilized nylon.
  - 2. In Spaces Handling Environmental Air: Plenum rated.



- E. 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.

### **3.2 IDENTIFICATION SCHEDULE**

- A. 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 vinyl label. Install labels at 10-foot maximum intervals.
- B. Accessible Raceways and Cables within Buildings: Identify the covers of each junction and pull box of the following systems with self-adhesive vinyl labels containing the wiring system legend and system voltage. System legends shall be as follows:
  - 1. "EMERGENCY POWER."
  - 2. "POWER."
- C. Control-Circuit Conductor Identification: For conductors and cables in pull and junction boxes, manholes, and handholes, use write-on tags with the conductor or cable designation, origin, and destination.
- D. Control-Circuit Conductor Termination Identification: For identification at terminations, provide heat-shrink preprinted tubes with the conductor designation.
- E. Auxiliary Electrical Systems Conductor Identification: Identify field-installed alarm, control, and signal connections.
  - 1. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, and pull points. Identify by system and circuit designation.
  - 2. Use system of marker-tape designations that is uniform and consistent with system used by manufacturer for factory-installed connections.
  - 3. Coordinate identification with Project Drawings, manufacturer's wiring diagrams, and operation and maintenance manual.
- F. Locations of Underground Lines: Identify with underground-line warning tape for power, lighting, communication, and control wiring and optical-fiber cable.
  - 1. Limit use of underground-line warning tape to direct-buried cables.
- G. Workspace Indication: Install floor marking tape to 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.
- H. Warning Labels for Indoor Cabinets, Boxes, and Enclosures for Power and Lighting: Self-adhesive warning labels.
  - 1. Comply with 29 CFR 1910.145.
  - 2. Identify system voltage with black letters on an orange background.
  - 3. Apply to exterior of door, cover, or other access.

4. For equipment with multiple power or control sources, apply to door or cover of equipment, including, but not limited to, the following:
  - a. Power-transfer switches.
  - b. Controls with external control power connections.
- I. Arc Flash Warning Labeling: Self-adhesive thermal transfer vinyl labels.
  1. Comply with NFPA 70E and ANSI Z535.4.
  2. Comply with Section 260574 "Overcurrent Protective Device Arc-Flash Study" requirements for arc-flash warning labels.
- J. Operating Instruction Signs: Install instruction signs to facilitate proper operation and maintenance of electrical systems and items to which they connect. Install instruction signs with approved legend where instructions are needed for system or equipment operation.
- K. 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.
- L. Equipment Identification Labels: On each unit of equipment, install unique designation label that is consistent with wiring diagrams, schedules, and operation and maintenance manual.
  1. Labeling Instructions:
    - a. Indoor Equipment: Self-adhesive label. 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.
    - b. Outdoor Equipment: Engraved, laminated acrylic or melamine label.
    - c. Elevated Components: Increase sizes of labels and letters to those appropriate for viewing from the floor.
    - d. Unless labels are provided with self-adhesive means of attachment, fasten them with appropriate mechanical fasteners that do not change the NEMA or NRTL rating of the enclosure.

END OF SECTION 260553

**SECTION 26 27 26**

**WIRING DEVICES**

**PART 1 - GENERAL**

**1.1 SUMMARY**

A. Section Includes:

1. Straight-blade convenience receptacles.
2. USB charger devices.
3. GFCI receptacles.
4. SPD receptacles.
5. Toggle switches.
6. Decorator-style convenience.
7. Wall switch sensor light switches with dual technology sensors.
8. Wall switch sensor light switches with passive infrared sensors.
9. Wall switch sensor light switches with ultrasonic sensors.
10. Digital timer light switches.
11. Residential devices.
12. Wall-box dimmers.
13. Wall plates.

**1.2 DEFINITIONS**

A. Abbreviations of Manufacturers' Names:

1. Cooper: Copper Wiring Devices; Division of Cooper Industries, Inc.
2. Hubbell: Hubbell Incorporated: Wiring Devices-Kellems.
3. Leviton: Leviton Mfg. Company, Inc.
4. Pass & Seymour: Pass& Seymour/Legrand.

**1.3 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.
- C. Samples: One for each type of device and wall plate specified, in each color specified.

**1.4 INFORMATIONAL SUBMITTALS**

- A. Field quality-control reports.

**1.5 CLOSEOUT SUBMITTALS**

- A. Operation and maintenance data.

**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 application.
- B. Comply with NFPA 70.
- C. 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 the requirements in this Section.
- D. Source Limitations: Obtain each type of wiring device and associated wall plate from single source from single manufacturer.

**2.2 STRAIGHT-BLADE RECEPTACLES**

- A. Duplex Convenience Receptacles, 125 V, 20 A: Comply with NEMA WD 1, NEMA WD 6 Configuration 5-20R, UL 498, and FS W-C-596.

**2.3 GFCI RECEPTACLES**

- A. General Description:
  - 1. 125 V, 20 A, straight blade, feed-through type.
  - 2. Comply with NEMA WD 1, NEMA WD 6 Configuration 5-20R, UL 498, UL 943 Class A, and FS W-C-596.
  - 3. Include indicator light that shows when the GFCI has malfunctioned and no longer provides proper GFCI protection.

**2.4 TWIST-LOCKING RECEPTACLES**

- A. Twist-Lock, Single Convenience Receptacles: as indicated on drawing; comply with NEMA WD 1, NEMA WD 6 Configuration as indicated on drawing, and UL 498.

**2.5 TOGGLE SWITCHES**

- A. Comply with NEMA WD 1, UL 20, and FS W-S-896.

- B. Switches, 120/277 V, 20 A:
  - 1. Single Pole:
  - 2. Two Pole:
  - 3. Three Way:
  - 4. Four Way:
- C. Single-Pole, Double-Throw, Momentary-Contact, Center-off Switches: 120/277 V, 20 A; for use with mechanically held lighting contactors.

## **2.6 DECORATOR-STYLE DEVICES**

- A. Convenience Receptacles: Commercial grade, square face, 125 V, 15 A; comply with NEMA WD 1, NEMA WD 6 Configuration 5-15R, and UL 498.
- B. Tamper-Resistant Convenience Receptacles: Square face, 125 V, 15 A; comply with NEMA WD 1, NEMA WD 6 Configuration 5-15R, and UL 498.
  - 1. Description: Labeled to comply with NFPA 70, "Receptacles, Cord Connectors, and Attachment Plugs (Caps)" Article, "Tamper-Resistant Receptacles in Dwelling Units" Section.
- C. Tamper-Resistant and Weather-Resistant Convenience Receptacles: Square face, 125 V, 15 A; comply with NEMA WD 1, NEMA WD 6 Configuration 5-15R, and UL 498.
  - 1. Description: Labeled to comply with NFPA 70, "Receptacles, Cord Connectors, and Attachment Plugs (Caps)" Article, "Tamper-Resistant Receptacles in Dwelling Units" Section, when installed in wet and damp locations.
- D. GFCI, Feed-Through Type, Convenience Receptacles: Square face, 125 V, 15 A; comply with NEMA WD 1, NEMA WD 6 Configuration 5-15R, UL 498, and UL 943 Class A.
- E. GFCI, Tamper-Resistant and Weather-Resistant Convenience Receptacles: Square face, 125 V, 15 A; comply with NEMA WD 1, NEMA WD 6 Configuration 5-15R, UL 498, and UL 943 Class A.
  - 1. Description: Labeled to comply with NFPA 70, "Receptacles, Cord Connectors, and Attachment Plugs (Caps)" Article, "Tamper-Resistant Receptacles in Dwelling Units" Section.
- F. Toggle Switches: Square Face, 120/277 V, 15 A: Comply with NEMA WD 1, UL 20, and FS W-S-896.

## **2.7 WALL SWITCH SENSOR LIGHT SWITCH, DUAL TECHNOLOGY**

- A. Description: Switchbox-mounted, combination lighting-control sensor and conventional switch lighting-control unit using dual technology.
  - 1. Rated 960 W at 120-V ac for tungsten lighting, 10 A at 120-V ac or 10 A at 277-V ac for fluorescent or LED lighting, and 1/4 hp at 120-V ac.
  - 2. Integral relay for connection to BAS.

3. Adjustable time delay of 20 minutes.
4. Able to be locked to Automatic-On or Manual-On mode as indicated on drawings.
5. Automatic Light-Level Sensor: Adjustable from 2 to 200 fc.
6. Comply with NEMA WD 1, UL 20, and FS W-S-896.

## **2.8 WALL SWITCH SENSOR LIGHT SWITCH, PASSIVE INFRARED**

- A. Description: Switchbox-mounted, combination, lighting-control sensor and conventional switch lighting-control unit using passive infrared technology.
1. Rated 960 W at 120-V ac for tungsten lighting, 10 A at 120-V ac or 10 A at 277-V ac for fluorescent or LED lighting, and 1/4 hp at 120-V ac.
  2. Integral relay for connection to BAS.
  3. Adjustable time delay of 20 minutes.
  4. Able to be locked to Automatic-On mode.
  5. Automatic Light-Level Sensor: Adjustable from 2 to 200 fc.
  6. Comply with NEMA WD 1, UL 20, and FS W-S-896.

## **2.9 WALL SWITCH SENSOR LIGHT SWITCH, ULTRASONIC**

- A. Description: Switchbox-mounted, combination, lighting-control sensor and conventional switch lighting-control unit using ultrasonic technology.
1. Rated 960 W at 120-V ac for tungsten lighting, 10 A at 120-V ac or 10 A at 277-V ac for fluorescent or LED lighting, and 1/4 hp at 120-V ac.
  2. Integral relay for connection to BAS.
  3. Adjustable time delay of 20 minutes.
  4. Able to be locked to Automatic-On mode.
  5. Automatic Light-Level Sensor: Adjustable from 2 to 200 fc.
  6. Comply with NEMA WD 1, UL 20, and FS W-S-896.

## **2.10 WALL-BOX DIMMERS**

- A. Dimmer Switches: Modular, full-wave, solid-state units with integral, quiet on-off switches, with audible frequency and EMI/RFI suppression filters.
- B. Control: Continuously adjustable slider; with single-pole or three-way switching. Comply with UL 1472.
- C. LED Lamp Dimmer Switches: Modular; compatible with LED lamps; trim potentiometer to adjust low-end dimming; capable of consistent dimming with low end not greater than 20 percent of full brightness.

## **2.11 FINISHES**

- A. Device Color:
1. Wiring Devices Connected to Normal Power System: As selected by Architect unless otherwise indicated or required by NFPA 70 or device listing.

2. Wiring Devices Connected to Emergency Power System: Red.
3. SPD Devices: Blue.
4. Isolated-Ground Receptacles: Orange.

- B. Wall Plate Color: For plastic covers, match device color.

## **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 meet provisions of 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 down, 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. GFCI Receptacles: Install non-feed-through-type GFCI receptacles where protection of downstream receptacles is not required.

### **3.2 FIELD QUALITY CONTROL**

- A. Test Instruments: Use instruments that comply with UL 1436.
- B. Test Instrument for Convenience Receptacles: Digital wiring analyzer with digital readout or illuminated digital-display indicators of measurement.
- C. Wiring device will be considered defective if it does not pass tests and inspections.
- D. Prepare test and inspection reports.

END OF SECTION 262726



---

**SECTION 26 28 13**

**FUSES**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Section Includes:
  - 1. Cartridge fuses rated 600 V ac and less for use in the following:
    - a. Control circuits.
    - b. Motor-control centers.
    - c. Panelboards.
    - d. Switchboards.
    - e. Enclosed controllers.
    - f. Enclosed switches.

**1.2 ACTION SUBMITTALS**

- A. Product Data: For each type of product.

**1.3 CLOSEOUT SUBMITTALS**

- A. Operation and maintenance data.

**PART 2 - PRODUCTS**

**2.1 CARTRIDGE FUSES**

- A. Characteristics: NEMA FU 1, current-limiting, nonrenewable cartridge fuses with voltage ratings consistent with circuit voltages.
  - 1. Type RK-1: 600-V, zero- to 600-A rating, 200 kAIC.
  - 2. Type RK-5: 600-V, zero- to 600-A rating, 200 kAIC.
  - 3. Type CC: 600-V, zero- to 30-A rating, 200 kAIC.
  - 4. Type CD: 600-V, 31- to 60-A rating, 200 kAIC.
  - 5. Type J: 600-V, zero- to 600-A rating, 200 kAIC.
  - 6. Type L: 600-V, 601- to 6000-A rating, 200 kAIC.
  - 7. Type T: 600-V, zero- to 800-A rating, 200 kAIC.
- B. 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.
- C. Comply with NEMA FU 1 for cartridge fuses.

- D. Comply with NFPA 70.
- E. Coordinate fuse ratings with utilization equipment nameplate limitations of maximum fuse size and with system short-circuit current levels.

### **PART 3 - EXECUTION**

#### **3.1 INSTALLATION**

- A. Install fuses in fusible devices. Arrange fuses so rating information is readable without removing fuse.
- B. Install spare-fuse cabinet(s) in location shown on the Drawings or as indicated in the field by Owner.

#### **3.2 IDENTIFICATION**

- A. Install labels complying with requirements for identification specified in Section 260553 "Identification for Electrical Systems" and indicating fuse replacement information inside of door of each fused switch and adjacent to each fuse block, socket, and holder.

END OF SECTION 262813

**SECTION 26 28 16**

**ENCLOSED SWITCHES AND CIRCUIT BREAKERS**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Section Includes:
  - 1. Fusible switches.
  - 2. Nonfusible switches.
  - 3. Receptacle switches.
  - 4. Shunt trip switches.
  - 5. Molded-case circuit breakers (MCCBs).
  - 6. Molded-case switches.
  - 7. Enclosures.

**1.2 ACTION SUBMITTALS**

- A. Product Data: For each type of enclosed switch, circuit breaker, accessory, and component indicated. Include nameplate ratings, dimensioned elevations, sections, weights, and manufacturers' technical data on features, performance, electrical characteristics, ratings, accessories, and finishes.
- B. Shop Drawings: For enclosed switches and circuit breakers.
  - 1. Include plans, elevations, sections, details, and attachments to other work.
  - 2. Include wiring diagrams for power, signal, and control wiring.

**1.3 INFORMATIONAL SUBMITTALS**

- A. Qualification Data: For qualified testing agency.
- B. Seismic Qualification Certificates: For enclosed switches and circuit breakers, accessories, and components, from manufacturer.
- C. Field quality-control reports.

**1.4 CLOSEOUT SUBMITTALS**

- A. Operation and maintenance data.

## **1.5 WARRANTY**

- A. Manufacturer's Warranty: Manufacturer and Installer agree to repair or replace components that fail in materials or workmanship within specified warranty period.
  - 1. Warranty Period: One year(s) from date of Substantial Completion.

## **PART 2 - PRODUCTS**

### **2.1 PERFORMANCE REQUIREMENTS**

- A. Seismic Performance: Enclosed switches and circuit breakers shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

### **2.2 GENERAL REQUIREMENTS**

- A. Source Limitations: Obtain enclosed switches and circuit breakers, overcurrent protective devices, components, and accessories, within same product category, from single manufacturer.
- B. Product Selection for Restricted Space: Drawings indicate maximum dimensions for enclosed switches and circuit breakers, including clearances between enclosures, and adjacent surfaces and other items. Comply with indicated maximum dimensions.
- C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by an NRTL, and marked for intended location and application.
- D. Comply with NFPA 70.

### **2.3 FUSIBLE SWITCHES**

- A. Type HD, Heavy Duty:
  - 1. Single throw.
  - 2. Three pole.
  - 3. 600-V ac.
  - 4. 1200 A and smaller.
  - 5. UL 98 and NEMA KS 1, horsepower rated, with clips or bolt pads to accommodate indicated fuses.
  - 6. Lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.
- B. Accessories:
  - 1. Equipment Ground Kit: Internally mounted and labeled for copper and aluminum ground conductors.
  - 2. Neutral Kit: Internally mounted; insulated, capable of being grounded and bonded; labeled for copper and aluminum neutral conductors.

3. Isolated Ground Kit: Internally mounted; insulated, labeled for copper and aluminum neutral conductors.
4. Class R Fuse Kit: Provides rejection of other fuse types when Class R fuses are specified.
5. Service-Rated Switches: Labeled for use as service equipment.

## **2.4 NONFUSIBLE SWITCHES**

- A. Type GD, General Duty, Three Pole, Single Throw, 240-V ac, 600 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, lockable handle with capability to accept two padlocks, and interlocked with cover in closed position.
- B. Type HD, Heavy Duty, Three Pole, Single Throw, 600-V ac, 1200 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.
- C. Accessories:
  1. Equipment Ground Kit: Internally mounted and labeled for copper and aluminum ground conductors.
  2. Neutral Kit: Internally mounted; insulated, capable of being grounded and bonded; labeled for copper and aluminum neutral conductors.
  3. Isolated Ground Kit: Internally mounted; insulated, labeled for copper and aluminum neutral conductors.
  4. Class R Fuse Kit: Provides rejection of other fuse types when Class R fuses are specified.
  5. Service-Rated Switches: Labeled for use as service equipment.

## **2.5 ENCLOSURES**

- A. Enclosed Switches and Circuit Breakers: UL 489, NEMA KS 1, NEMA 250, and UL 50, to comply with environmental conditions at installed location.
- B. Conduit Entry: NEMA 250 Types 4, 4X, and 12 enclosures shall contain no knockouts. NEMA 250 Types 7 and 9 enclosures shall be provided with threaded conduit openings in both endwalls.
- C. Operating Mechanism: The circuit-breaker operating handle shall be externally operable with the operating mechanism being an integral part of the box, not the cover. The cover interlock mechanism shall have an externally operated override. The override shall not permanently disable the interlock mechanism, which shall return to the locked position once the override is released. The tool used to override the cover interlock mechanism shall not be required to enter the enclosure in order to override the interlock.
- D. Enclosures designated as NEMA 250 Type 4, 4X stainless steel, 12, or 12K shall have a dual cover interlock mechanism to prevent unintentional opening of the enclosure cover when the circuit breaker is ON and to prevent turning the circuit breaker ON when the enclosure cover is open.
- E. NEMA 250 Type 7/9 enclosures shall be furnished with a breather and drain kit to allow their use in outdoor and wet location applications.

### **PART 3 - EXECUTION**

#### **3.1 ENCLOSURE ENVIRONMENTAL RATING APPLICATIONS**

- A. Enclosed Switches and Circuit Breakers: Provide enclosures at installed locations with the following environmental ratings.
  - 1. Indoor, Dry and Clean Locations: NEMA 250, Type 1.
  - 2. Outdoor Locations: NEMA 250, Type 4X.
  - 3. Other Wet or Damp, Indoor Locations: NEMA 250, Type 4.
  - 4. Indoor Locations Subject to Dust, Falling Dirt, and Dripping Noncorrosive Liquids: NEMA 250, Type 12.

#### **3.2 INSTALLATION**

- A. Interruption of Existing Electric Service: Do not interrupt electric service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary electric service according to requirements indicated:
  - 1. Notify Owner no fewer than seven days in advance of proposed interruption of electric service.
  - 2. Indicate method of providing temporary electric service.
  - 3. Do not proceed with interruption of electric service without Owner's written permission.
  - 4. Comply with NFPA 70E.
- B. Coordinate layout and installation of switches, circuit breakers, and components with equipment served and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.
- C. Install individual wall-mounted switches and circuit breakers with tops at uniform height unless otherwise indicated.
- D. Comply with mounting and anchoring requirements specified in Section 260548.16 "Seismic Controls for Electrical Systems."
- E. Temporary Lifting Provisions: Remove temporary lifting of eyes, channels, and brackets and temporary blocking of moving parts from enclosures and components.
- F. Install fuses in fusible devices.
- G. Comply with NFPA 70 and NECA 1.
- H. Set field-adjustable circuit-breaker trip ranges to values indicated on the Drawings.

#### **3.3 IDENTIFICATION**

- A. Comply with requirements in Section 260553 "Identification for Electrical Systems."

1. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs.
2. Label each enclosure with engraved metal or laminated-plastic nameplate.

### **3.4 FIELD QUALITY CONTROL**

- A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
- B. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
- C. Tests and Inspections for Switches:
  1. Visual and Mechanical Inspection:
    - a. Inspect physical and mechanical condition.
    - b. Inspect anchorage, alignment, grounding, and clearances.
    - c. Verify that the unit is clean.
    - d. Verify blade alignment, blade penetration, travel stops, and mechanical operation.
    - e. Verify that fuse sizes and types match the Specifications and Drawings.
    - f. Verify that each fuse has adequate mechanical support and contact integrity.
    - g. Inspect bolted electrical connections for high resistance using one of the two following methods:
      - 1) Use a low-resistance ohmmeter.
        - a) Compare bolted connection resistance values to values of similar connections. Investigate values that deviate from those of similar bolted connections by more than 50 percent of the lowest value.
      - 2) Verify tightness of accessible bolted electrical connections by calibrated torque-wrench method in accordance with manufacturer's published data or NETA ATS Table 100.12.
        - a) Bolt-torque levels shall be in accordance with manufacturer's published data. In the absence of manufacturer's published data, use NETA ATS Table 100.12.
    - h. Verify that operation and sequencing of interlocking systems is as described in the Specifications and shown on the Drawings.
    - i. Verify correct phase barrier installation.
    - j. Verify lubrication of moving current-carrying parts and moving and sliding surfaces.
  - D. Enclosed switches and circuit breakers will be considered defective if they do not pass tests and inspections.

END OF SECTION 262816

# Appendix 1

## Camden County & NJ Statewide Wage Rates

<https://www.nj.gov/labor/wageandhour/prevaling-rates/public-works/currentprevailingwage.shtml>

## Debarred Listing

<https://www.nj.gov/labor/wageandhour/registration-permits/register/debarmentlist.shtml>





STATE OF NEW JERSEY  
Department of Labor and Workforce Development  
Division of Wage and Hour Compliance - Public Contracts Section  
PO Box 389  
Trenton, NJ 08625-0389

### PREVAILING WAGE RATE DETERMINATION

The New Jersey Prevailing Wage Act (N.J.S.A. 34:11-56.25 et seq.) requires that the Department of Labor and Workforce Development establish and enforce a prevailing wage level for workers engaged in public works in order to safeguard their efficiency and general well being and to protect them as well as their employers from the effects of serious and unfair competition.

Prevailing wage rates are wage and fringe benefit rates based on the collective bargaining agreements established for a particular craft or trade in the locality in which the public work is performed. In New Jersey, these rates vary by county and by the type of work performed.

Applicable prevailing wage rates are those wages and fringe benefits in effect on the date the contract is awarded. All pre-determined rate increases listed at the time the contract is awarded must also be paid, beginning on the dates specified. Rates that have expired will remain in effect until new rates are posted.

#### Prevailing Wage Rate

The prevailing wage rate for each craft will list the effective date of the rate and the following information:

**W** = Wage Rate per Hour

**B** = Fringe Benefit Rate per Hour\*

**T** = Total Rate per Hour

- \* Fringe benefits are an integral part of the prevailing wage rate. Employers not providing such benefits must pay the fringe benefit amount directly to the employee each payday. Employers providing benefits worth less than the fringe benefit amount must pay the balance directly to the employee each payday.

Unless otherwise stated in the Prevailing Wage Rate Determination, the fringe benefit rate for overtime hours remains at the straight time rate.

When the Overtime Notes in the Prevailing Wage Rate Determination state that the overtime rates are "inclusive of benefits," the benefit rate is increased by the same factor as the wage rate (i.e. multiplied by 1.5 for time and one-half, multiplied by 2 for double time, etc.).

#### Apprentice Rate Schedule

An "apprentice" is an individual who is registered with the United States Department of Labor - Office of Apprenticeship and enrolled in a certified apprenticeship program during the period in which they are working on the public works project.

The apprentice wage rate is a percentage of the journeyman wage rate, unless otherwise indicated. The apprentice benefit rate is the full journeyman benefit rate, unless otherwise indicated.

If there is no apprentice rate schedule listed, the individual must be paid at least the journeyman rate even if that individual is in a certified apprentice program for that trade.

If there is no ratio of apprentices to journeymen listed for a particular craft, then the ratio shall be one (1) apprentice to every four (4) journeymen.

## Comments/Notes

For each craft listed there will be comments/notes that cover the definition of the regular workday, shift differentials, overtime, recognized holidays, and any other relevant information.

## Public Works Contractor Registration

The Public Works Contractor Registration Act (N.J.S.A. 34:11-56.48, et seq.) requires that **all** contractors, subcontractors, or lower tier subcontractors who are working on or who bid on public works projects register with the Department of Labor and Workforce Development. Applications are available at [www.nj.gov/labor](http://www.nj.gov/labor) (click on Wage & Hour and then go to Registration & Permits).

Pursuant to N.J.S.A. 34:11-56.51:

*No contractor shall bid on any contract for public work as defined in section 2 of P.L.1963, c. 150 (C.34:11-56.26) unless the contractor is registered pursuant to this act. No contractor shall list a subcontractor in a bid proposal for the contract unless the subcontractor is registered pursuant to P.L.1999, c.238 (C.34:11-56.48 et seq.) at the time the bid is made. No contractor or subcontractor, including a subcontractor not listed in the bid proposal, shall engage in the performance of any public work subject to the contract, unless the contractor or subcontractor is registered pursuant to that act.*

## Snow Plowing

Snow plowing contracts are not subject to the New Jersey Prevailing Wage Act or the Public Works Contractor Registration Act.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT  
PREVAILING WAGE RATE DETERMINATION**

**County - CAMDEN**

**Craft: Air Conditioning & Refrigeration - Service and Repair**

**PREVAILING WAGE RATE**

	03/03/21
Journeyman (Mechanic)	W41.48 B26.57 T68.05

**Craft: Air Conditioning & Refrigeration - Service and Repair**

**APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
As Shown	1st Year	2nd Year	3rd Year	4th Year	5th Year	Wage = %	of Jnymn	Wage		
Wage and Bene	40%	50%	60%	70%	80%	Bene = %	of Jnymn	Bene		

**Ratio of Apprentices to Journeymen - 1:4**

**Craft: Air Conditioning & Refrigeration - Service and Repair**

**COMMENTS/NOTES**

THESE RATES MAY BE USED FOR THE FOLLOWING:

- Service/Repair/Maintenance Work to EXISTING facilities.
- Replacement or Installation of air conditioning and refrigeration equipment when the combined tonnage does not exceed 15 tons for refrigeration, or 25 tons for air conditioning.
- Replacement or Installation of "packaged" or "unitary" rooftop-type units when the combined tonnage of the units does not exceed 75 tons.

NOTE: These rates may NOT be used for any work in new construction (including work on new additions).

The regular workday shall consist of 8 hours, starting between 6:00 AM and 10:00 AM, Monday through Friday.

SHIFT DIFFERENTIALS:

- The second and third shifts shall be paid an additional 15% of the hourly rate.
- All shifts must run for a minimum of 5 consecutive days.

OVERTIME:

Hours worked in excess of 8 per day or before or after the regular workday, that are not shift work, and all hours on Saturday shall be paid at time and one-half the hourly rate, inclusive of benefits. All hours on Sunday and holidays shall be paid at double the hourly rate, inclusive of benefits.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Veterans' Day, Thanksgiving Day, Christmas Day.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT  
PREVAILING WAGE RATE DETERMINATION**

**County - CAMDEN**

**Craft: Boilermaker**

**PREVAILING WAGE RATE**

	01/01/21
Foreman	W52.51 B45.60 T98.11
General Foreman	W54.51 B46.63 T101.14
Journeyman	W47.51 B43.91 T91.42

**Craft: Boilermaker**

**APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
1000 Hours	65%	70%	75%	80%	85%	90%	95%			
Benefit =	37.08	37.99	39.49	39.84	40.78	41.70	42.61			

**Ratio of Apprentices to Journeymen - \***

\* 1 apprentice will be allowed for the first 5 journeymen, 1 apprentice for the next 10 journeymen and 1 apprentice for each succeeding 20 journeymen up to a maximum of 5 apprentices per contractor on any one job.

**Craft: Boilermaker**

**COMMENTS/NOTES**

APPRENTICE RATE SCHEDULE AS OF 1-1-21:

INTERVAL	PERIOD AND RATES							
1000 Hours	65%	70%	75%	80%	85%	90%	95%	
Benefits	37.72	38.20	39.20	40.14	41.09	42.03	42.96	

**HIGH WORK:** All apprentices working on the erection, repair, or dismantling of smoke stacks, standpipes, or water towers shall be paid the Journeyman rate.

The regular workday shall consist of 8 hours, between 8:00 AM and 4:30 PM.

**SHIFT DIFFERENTIALS:**

- The second shift shall work 7½ hours and receive 8 hours pay, at a rate equal to the regular hourly rate plus 10%.
- The third shift shall work 7 hours and receive 8 hours pay, at a rate equal to the regular hourly rate plus 20%.
- For "Municipal Water Works" projects only, the following shall apply: Two, four day, 10 hour shifts may be worked at straight time Monday through Thursday. The day shift shall work four days, at 10 hours, for 10 hours pay. The second shift shall work four days, at nine and a half hours, for 10 hours pay, plus 10% the hourly rate for new work and .25 cents on repair work. Friday may be used as a make-up day at straight time, due to weather conditions, holiday or any other circumstances beyond the employer's control.

**OVERTIME:**

- Hours in excess of 8 per day, Monday through Friday, and all hours on Saturdays shall be paid at time and one-half the hourly rate. All hours on Sundays and holidays (except Labor Day) shall be paid at double the hourly rate. All hours on Labor Day shall be paid at four times the hourly rate.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT  
PREVAILING WAGE RATE DETERMINATION**

**County - CAMDEN**

- If any other craft employed by the same contractor, or a subcontractor thereof, receives double time in lieu of time and one-half, then the Boilermaker shall receive double time in lieu of time and one-half.
- For "Municipal Water Works" projects only, the following shall apply: Four 10 hour days may be worked Monday through Thursday at straight time. Friday may be used as a make-up day for a day lost to inclement weather, holiday or other conditions beyond the control of the employer. Overtime shall be paid for any hours that exceed 10 hours per day or 40 hours per week.

RECOGNIZED HOLIDAYS: New Year's Day, Washington's Birthday, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. Sunday holidays observed the following Monday.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT  
PREVAILING WAGE RATE DETERMINATION**

**County - CAMDEN**

**Craft: Boilermaker - Minor Repairs**

**PREVAILING WAGE RATE**

	01/01/21
Foreman	W34.62 B17.57 T52.19
General Foreman	W35.25 B17.57 T52.82
Mechanic	W33.25 B17.57 T50.82

**Craft: Boilermaker - Minor Repairs**

**COMMENTS/NOTES**

NOTE: These rates apply to MINOR REPAIR WORK ONLY (repair work in the field for which the contract amount does not exceed \$125,000.00), for boilers that do not produce electric or are not used in the heating of petroleum products.

**OVERTIME:**

Hours in excess of 8 per day, Monday through Friday, and all hours on Saturdays shall be paid at time and one-half the hourly rate. All hours on Sundays and holidays (except Labor Day) shall be paid at double the hourly rate. All hours on Labor Day shall be paid at four times the hourly rate.

RECOGNIZED HOLIDAYS: New Year's Day, Washington's Birthday, Good Friday, Memorial Day, July 4th, Labor Day, Presidential Election Day, Thanksgiving Day, day after Thanksgiving, Christmas Day. Saturday holidays observed the preceding Friday, Sunday holidays observed the following Monday.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT  
PREVAILING WAGE RATE DETERMINATION**

**County - CAMDEN**

**Craft: Bricklayer, Stone Mason**

**PREVAILING WAGE RATE**

	05/01/21
Deputy Foreman	W48.20 B33.73 T81.93
Foreman	W51.20 B33.73 T84.93
Journeyman	W45.20 B33.73 T78.93

**Craft: Bricklayer, Stone Mason**

**APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
6 months	40%	50%	55%	60%	65%	70%	75%	80%		
Benefits	4.00	5.00	5.50	6.00	22.17	23.66	25.14	26.62		

**Ratio of Apprentices to Journeymen - 1:5**

**Craft: Bricklayer, Stone Mason**

**COMMENTS/NOTES**

The regular workday shall consist of 8 hours, between 6:00 AM and 4:30 PM.

**SHIFT DIFFERENTIALS:**

- When a 2 shift schedule (including a day shift) is established, the first, or day shift, shall be established on an 8 hour basis. The second shift shall be established on an 8 hour basis, and receive the regular rate plus 10%, inclusive of benefits.
- When a three shift schedule is established, the first shift shall be established on an 8 hour basis, the second shift on a 7.5 hour basis, and the third shift on a 7 hour basis. The first shift shall receive the regular hourly rate, the second shift shall receive the regular rate plus 10%, inclusive of benefits, and the third shift shall receive the regular rate plus 15%, inclusive of benefits.
- When there is no day shift, and a second or third shift is established, it shall be established on an 8 hour basis. The second shift shall receive the regular rate plus 10%, inclusive of benefits, and the third shift shall receive the regular rate plus 15%, inclusive of benefits.
- When an irregular shift must be established, this shift shall receive the regular rate plus 10%, inclusive of benefits.

**OVERTIME:**

- The first 2 hours in excess of 8 per day, or before or after the regular workday that are not shift work, Monday through Friday, shall be paid at time and one-half the regular rate, inclusive of benefits. Any additional overtime shall be paid at double the regular rate, inclusive of benefits. The first 10 hours on Saturday shall be paid at time and one-half the regular rate, inclusive of benefits. Any additional overtime shall be paid at double the regular rate, inclusive of benefits. All hours on Sundays and holidays shall be paid at double the regular rate, inclusive of benefits.
- Saturday may be used as a make-up day for hours lost to inclement weather.
- When Bricklayers/Stone Masons work on Saturday with Laborers, and no other crafts are working on the project for the day, benefits may be paid at straight time. If other crafts are present, the applicable overtime rate for benefits shall be paid.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT  
PREVAILING WAGE RATE DETERMINATION**

**County - CAMDEN**

RECOGNIZED HOLIDAYS: New Year's Day, President's Day, Memorial Day, July 4th, Labor Day, Veterans' Day, Thanksgiving Day, Christmas Day. Sunday holidays will be observed the following Monday.



**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT  
PREVAILING WAGE RATE DETERMINATION**

**County - CAMDEN**

**Craft: Carpenter**

**PREVAILING WAGE RATE**

	05/01/21
Foreman	W59.67 B34.56 T94.23
Journeyman	W51.89 B30.12 T82.01

**Craft: Carpenter**

**APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
Yearly	40%	55%	65%	80%	90%					
Benefit	57% of	Appren	tice	Wage Rate	for all	intervals	+ \$0.55			

**Ratio of Apprentices to Journeymen - 1:3**

**Craft: Carpenter**

**COMMENTS/NOTES**

**FOREMAN REQUIREMENTS:**

- When there are 2 or more Carpenters on a job, 1 shall be designated as a Foreman.
- When there are 21 or more Carpenters on a job, 2 shall be designated as Foremen.

The regular workday shall consist of 8 hours, starting between 6:00 AM and 9:00 AM.

**SHIFT DIFFERENTIALS:**

- When a 2 shift schedule (including a day shift) is established, the day shift shall be established on an 8 hour basis. The second shift shall be established on an 8 hour basis, and receive the regular rate plus 10%, inclusive of benefits.
- When a three shift schedule is established, the first shift shall be established on an 8 hour basis, the second shift on a 7.5 hour basis, and the third shift on a 7 hour basis. The first shift shall receive the regular hourly rate, the second shift shall receive the regular rate plus 10% and the third shift shall receive the regular rate plus 15%, inclusive of benefits.
- When there is no day shift, and a second or third shift is established, it shall be established on an 8 hour basis. The second shift shall receive the regular rate plus 10% and the third shift shall receive the regular rate plus 15%, inclusive of benefits.
- When an irregular shift must be established, this shift shall receive the regular rate plus 15%, inclusive of benefits.

**OVERTIME:**

- All hours in excess of 8 per day, or before or after an established shift that are not shift work, and all hours on Saturdays shall be paid at time and one-half the hourly rate, inclusive of benefits. All hours on Sundays and holidays shall be paid at double the hourly rate, inclusive of benefits.
- Four 10-hour days may be worked, Monday to Thursday, at straight time. Friday may be used as a make-up day for a day lost due to inclement weather. If Friday is not a make-up day, all hours on Friday shall be paid at time and one-half the hourly rate, inclusive of benefits.

**RECOGNIZED HOLIDAYS:** New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Veterans' Day, Thanksgiving Day, Christmas Day. Sunday holidays observed the following Monday. Veterans' Day may be substituted for the day after Thanksgiving.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT  
PREVAILING WAGE RATE DETERMINATION**

**County - CAMDEN**

**Craft: Carpenter - Resilient Flooring**

**PREVAILING WAGE RATE**

	05/01/21
Foreman	W59.67 B34.47 T94.14
Journeyman	W51.89 B30.03 T81.92

**Craft: Carpenter - Resilient Flooring**

**APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
Yearly	40%	55%	65%	80%	90%					
Benefit	57% of	Appren	tice	Wage Rate	for all	intervals	+ \$0.46			

**Ratio of Apprentices to Journeymen - \***

\* Ratio is 1 apprentice to 2 journeymen. No more than 3 apprentices may be on any 1 project.

**Craft: Carpenter - Resilient Flooring**

**COMMENTS/NOTES**

**FOREMAN REQUIREMENTS:**

- On any job where there are 4 or more Carpenters of Resilient Flooring, 1 must be designated a Foreman.

**FOR SYNTHETIC TURF INSTALLATION ONLY:**

- The rate shall be 90% of the wage and benefit rate.

The regular workday consists of 8 hours, starting between 6:00 AM and 9:00 AM.

**SHIFT DIFFERENTIALS:**

- When a 2 shift schedule (including a day shift) is established, the day shift, shall be established on an 8 hour basis. The second shift shall be established on an 8 hour basis, and receive the regular wage rate plus 10%.
- When a three shift schedule is established, the first shift shall be established on an 8 hour basis, the second shift on a 7.5 hour basis, and the third shift on a 7 hour basis. The first shift shall receive the regular wage rate, the second shift shall receive the regular wage rate plus 10% and the third shift shall receive the regular wage rate plus 15%.
- When there is no day shift, and a second or third shift is established, it shall be established on an 8 hour basis. The second shift shall receive the regular wage rate plus 10% and the third shift shall receive the regular wage rate plus 15%.
- When an irregular shift must be established, this shift shall receive the regular rate plus 15%, inclusive of benefits.

**OVERTIME:**

- Hours in excess of 8 per day or 40 per week, or before or after the regular workday, Monday through Friday, shall be paid at time and one-half the wage rate. Saturday may be used as a make-up day, at straight time, up to 8 hours, for hours lost to reasons beyond the control of the employer, up to a total of 40 hours per week; hours in excess of 8 on Saturday shall then be paid at time and one-half the wage rate. If Saturday is not a make-up day, all hours on Saturday shall be paid at time and one-half the wage rate. All hours on Sundays and holidays shall be paid at double the wage rate.
- Four 10-hour days may be worked, Monday to Thursday, at straight time. Friday may be used as a make-up day for hours lost to reasons beyond the control of the employer. If Friday is not a make-up day, all hours on Friday shall be paid at time and one-half the wage rate.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT  
PREVAILING WAGE RATE DETERMINATION**

**County - CAMDEN**

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Veterans' Day, Thanksgiving Day, Christmas Day. Sunday holidays will be observed the following Monday. Veterans' Day may be substituted for the day after Thanksgiving.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT  
PREVAILING WAGE RATE DETERMINATION**

**County - CAMDEN**

**Craft: Cement Mason**

**PREVAILING WAGE RATE**

See " Bricklayer, Stone Mason" Rates

**Craft: Cement Mason**

**COMMENTS/NOTES**

\*\*\*See " Bricklayer, Stone Mason" Rates

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT  
PREVAILING WAGE RATE DETERMINATION**

**County - CAMDEN**

**Craft: Commercial Painter**

**PREVAILING WAGE RATE**

	08/10/21
Foreman	W46.37 B27.61 T73.98
General Foreman	W50.58 B28.10 T78.68
Journeyman	W42.15 B27.11 T69.26

**Craft: Commercial Painter**

**APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
6 Months	40%	45%	55%	65%	70%	75%	80%	80%		
Benefits	8.40	8.40	10.40	10.40	11.40	11.40	14.15	14.15		

**Ratio of Apprentices to Journeymen - 1:4**

**Craft: Commercial Painter**

**COMMENTS/NOTES**

\* Commercial Painters perform work on all commercial structures such as offices, schools, hotels, shopping malls, restaurants, condominiums, etc.

Spraying, sandblasting, lead abatement work on commercial buildings, work performed above 3 stories or 30 feet in height, or using swing scaffolds requires an additional 10% of the wage rate.

**FOREMEN REQUIREMENTS:**

- When there are 4 or more Painters on a job, 1 shall be designated a Foreman.
- When there are 15 or more Painters on a job, 1 shall be designated a General Foreman.

The regular workday shall consist of 8 hours between 7:00 AM and 5:30 PM.

**SHIFT DIFFERENTIALS:**

- The second shift shall receive an additional 10% of the hourly rate, per hour, and the third shift shall receive an additional 15% of the hourly rate, per hour.

**OVERTIME:**

- Hours in excess of 8 per day, or before or after the regular workday, Monday through Friday, and all hours on Saturdays shall be paid at time and one-half the regular rate. All hours on Sundays and holidays shall be paid at double the regular rate.
- Saturday or Sunday may be used to make up a day lost to inclement weather, at straight time.
- Four 10-hour days may be worked, at straight time, Monday through Friday.

**RECOGNIZED HOLIDAYS:** New Year's Day, President's Day, Memorial Day, July 4th, Labor Day, General Election Day,

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT  
PREVAILING WAGE RATE DETERMINATION**

**County - CAMDEN**

Veterans' Day, Thanksgiving Day, Christmas Day.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT  
PREVAILING WAGE RATE DETERMINATION**

**County - CAMDEN**

**Craft: Diver                      PREVAILING WAGE RATE**

	05/07/21
Diver	W52.48 B38.14 T90.62
Tender	W43.73 B38.14 T81.87

**Craft: Diver                      APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
1500 hours	70%	75%	80%	85%						
Benefits	27.67	28.48	29.27	30.09						

**Ratio of Apprentices to Journeymen - 1:4**

**Craft: Diver                      COMMENTS/NOTES**

**OVERTIME:**

- The first 2 hours in excess of 8 per day (9th and 10th hours), Monday through Friday, and the first 8 hours on Saturdays shall be paid at time and one-half the hourly rate. Hours in excess of 10 per day, Monday through Friday, hours in excess of 8 per day on Saturdays, and all hours on Sundays and holidays shall be paid at double the hourly rate.
- Employees may work four 10-hour days, Monday through Thursday, at straight time, with Friday used as a make-up day for a day lost to inclement weather. If Friday is not a make-up day, the first 10 hours on Friday shall be paid at time and one-half the hourly rate. Hours in excess of 10 per day shall be paid at double the hourly rate.

**RECOGNIZED HOLIDAYS:** New Year's Day, Washington's Birthday, Memorial Day, July 4th, Labor Day, Thanksgiving Day, Christmas Day. Sunday holidays will be observed the following Monday.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT  
PREVAILING WAGE RATE DETERMINATION**

**County - CAMDEN**

**Craft: Dockbuilder**

**PREVAILING WAGE RATE**

	05/07/21
Foreman	W52.48 B38.14 T90.62
Journeyman	W43.73 B38.14 T81.87

**Craft: Dockbuilder**

**APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
1500 hours	40%	50%	65%	80%						
Benefits	22.82	24.44	26.87	29.27						

**Ratio of Apprentices to Journeymen - 1:4**

**Craft: Dockbuilder**

**COMMENTS/NOTES**

Creosote Handling:

May 1st to Sept. 30th: + \$0.50 above hourly rate

Oct. 1st to April 30th: + \$0.25 above hourly rate

Hazardous Material Work:

On hazardous material work on a state or federally designated hazardous work site where the worker is required to wear Level A, B or C personal protection, the worker shall receive an additional 20% of the hourly rate, per hour.

**OVERTIME:**

- The first 2 hours in excess of 8 per day (9th and 10th hours), Monday through Friday, and the first 8 hours on Saturdays shall be paid at time and one-half the hourly rate. Hours in excess of 10 per day, Monday through Friday, hours in excess of 8 per day on Saturdays, and all hours on Sundays and holidays shall be paid at double the hourly rate.

- Employees may work four 10-hour days, Monday through Thursday, at straight time, with Friday used as a make-up day for a day lost to inclement weather. If Friday is not a make-up day, the first 10 hours on Friday shall be paid at time and one-half the hourly rate. Hours in excess of 10 per day shall be paid at double the hourly rate.

**RECOGNIZED HOLIDAYS:** New Year's Day, Washington's Birthday, Memorial Day, July 4th, Labor Day, Thanksgiving Day, Christmas Day. Sunday holidays will be observed the following Monday.



**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT  
PREVAILING WAGE RATE DETERMINATION**

**County - CAMDEN**

**Craft: Drywall Finisher**

**PREVAILING WAGE RATE**

	05/01/21
Foreman	W44.43 B27.68 T72.11
General Foreman	W46.45 B27.68 T74.13
Journeyman	W40.39 B27.68 T68.07

**Craft: Drywall Finisher**

**APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
6 Months	40%	50%		60%	70%		80%	90%		
Benefits	Intervals	1 to 2 =	10.75	Intervals	3 to 4 =	13.52	Intervals	5 to 6 =	17.13	

**Ratio of Apprentices to Journeymen - 1:4**

**Craft: Drywall Finisher**

**COMMENTS/NOTES**

The regular workday shall consist of 8 hours between 7:00 AM and 5:30 PM.

**SHIFT DIFFERENTIALS:**

- The second shift shall receive an additional 10% of the hourly rate, per hour, and the third shift shall receive an additional 15% of the hourly rate, per hour.
- When 3 shifts are worked, the second shift shall receive 8 hours pay for 7.5 hours of work, and the third shift shall receive 8 hours pay for 7 hours of work.
- Shift work must run for a minimum of 5 consecutive workdays.

**OVERTIME:**

- Hours in excess of 8 per day, Monday through Friday, and all hours on Saturdays shall be paid at time and one-half the regular rate, inclusive of benefits. All hours on Sundays and holidays shall be paid at double the regular rate, inclusive of benefits.
- Saturday or Sunday may be used to make up a day lost to inclement weather, at straight time.

**RECOGNIZED HOLIDAYS:** New Year's Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. Saturday holiday observed the preceding Friday. Sunday holiday observed the following Monday.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT  
PREVAILING WAGE RATE DETERMINATION**

**County - CAMDEN**

**Craft: Electrician**

**PREVAILING WAGE RATE**

	09/28/20
Asst. General Foreman	W58.78 B51.66 T110.44
Foreman	W54.86 B48.62 T103.48
General Foreman	W63.67 B55.47 T119.14
Journeyman, Cable Splicer	W48.98 B44.04 T93.02
Lead Foreman	W56.33 B49.76 T106.09
Working Foreman, Welder, Crane Operator (all types)	W51.43 B45.94 T97.37

**Craft: Electrician**

**APPRENTICE RATE SCHEDULE**

<u>INTERVAL</u>	<u>PERIOD AND RATES</u>									
Yearly	14.93	19.16	23.40	27.63	31.87					
Benefits	7.50	8.69	9.90	11.11	12.31					

**Ratio of Apprentices to Journeymen - 2:3**

**Craft: Electrician**

**COMMENTS/NOTES**

THESE RATES ALSO APPLY TO THE FOLLOWING:

- All fire and burglar alarm work.
- All fiber optic work.
- Teledata work in new construction (including additions).
- Teledata work involving 16 or more instruments or voice/data lines.
- All camera installations.

Height Work: 40 feet above ground/floor: +10% of the wage and benefit amount.

FOREMAN REQUIREMENTS (number of Electricians on site):

(2 to 10) - a Working Foreman; (11 to 22) - a Foreman; (23 to 44) - a Lead Foreman; (35 to 48) - an Assistant General Foreman; (49 or more) - a General Foreman.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT  
PREVAILING WAGE RATE DETERMINATION**

**County - CAMDEN**

The regular workday consists of 8 hours, between 7:00 AM and 4:30 PM.

**SHIFT DIFFERENTIALS:**

- Shift work must run for a minimum of 5 consecutive workdays
- 2nd Shift (4:30 PM to 12:30 AM): 8 hrs. pay for 7.5 hrs. work + an additional 10% of the wage rate, inclusive of benefits.
- 3rd Shift (12:30 AM to 8:00 AM): 8 hrs. pay for 7 hrs. work + an additional 15% of the wage rate, inclusive of benefits.

**OVERTIME:**

The first 4 hours in excess of 8 per day, or before or after the regular workday, Monday through Friday, and the first 8 hours on Saturdays, shall be paid at time and one-half the regular rate, inclusive of benefits. Hours in excess of 12 per day, Monday through Friday, in excess of 8 on Saturdays, and all hours on Sundays and holidays shall be paid at double the regular rate, inclusive of benefits.

**RECOGNIZED HOLIDAYS:** New Year's Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. Sunday holidays will be observed the following Monday.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT  
PREVAILING WAGE RATE DETERMINATION**

**County - CAMDEN**

**Craft: Electrician - Teledata (15 Voice/Data Lines & Less)**

**PREVAILING WAGE RATE**

	01/08/21
Master Technician/Gen. Foreman (31+ Workers on Job)	W49.88 B36.24 T86.12
Senior Technician/Lead Foreman (21-30 Workers on Job)	W45.27 B34.80 T80.07
Technician A/Foreman (11-20 Workers on Job)	W43.14 B34.12 T77.26
Technician B/Working Foreman (4-10 Workers on Job)	W41.88 B32.74 T74.62
Technician C/Journeyman (1-3 Workers on Job)	W37.94 B30.50 T68.44

**Craft: Electrician - Teledata (15 Voice/Data Lines & Less)**

**APPRENTICE RATE SCHEDULE**

<u>INTERVAL</u>	<u>PERIOD AND RATES</u>									
6 Months	17.26	17.26	20.54	20.54	25.48	25.48	30.02	30.02		
Benefits	9.45	9.45	10.42	10.42	12.37	12.37	14.72	14.72		

**Ratio of Apprentices to Journeymen - 2:3**

**Craft: Electrician - Teledata (15 Voice/Data Lines & Less)**

**COMMENTS/NOTES**

NOTES: These rates are for service, maintenance, moves and/or changes affecting 15 voice/data lines or less. These rates may NOT be used for any new construction or fiber optic work.

**FOREMAN REQUIREMENTS:**

The number of workers on the jobsite is the determining factor for which Foreman category applies.

**HIGH WORK:** Any work performed 40 feet above ground or floor: +10% of the wage and benefit amount.

**SHIFT DIFFERENTIAL:**

- 2nd Shift (4:30 PM to 12:30 AM) - 8 hrs. pay for 7.5 hrs. work + an additional 10% of the wage rate, inclusive of benefits.

- 3rd Shift (12:30 AM to 8:00 AM) - 8 hrs. pay for 7 hrs. work + an additional 15% of the wage rate, inclusive of benefits.

**OVERTIME:**

Hours in excess of 8 per day, Monday through Friday, and all hours on Saturdays shall be paid at time and one-half the regular rate, inclusive of benefits. All hours on Sundays and holidays shall be paid at double the regular rate, inclusive of benefits.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT  
PREVAILING WAGE RATE DETERMINATION**

**County - CAMDEN**

RECOGNIZED HOLIDAYS: New Year's Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans Day, Thanksgiving Day, Christmas Day. Sunday holidays will be observed the following Monday.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT  
PREVAILING WAGE RATE DETERMINATION**

**County - CAMDEN**

**Craft: Electrician - Teledata (16 Instruments & More)**

**PREVAILING WAGE RATE**

See "Electrician" Rates

**Craft: Electrician - Teledata (16 Instruments & More)**

**COMMENTS/NOTES**

\*\*\*See ELECTRICIAN Rates\*\*\*

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT  
PREVAILING WAGE RATE DETERMINATION**

**County - CAMDEN**

**Craft: Electrician- Outside Commercial**

**PREVAILING WAGE RATE**

	09/28/20
Assistant General Foreman	W58.78 B51.55 T110.33
Foreman	W54.86 B48.48 T103.34
General Foreman	W63.67 B55.40 T119.07
Groundhand, Truck Driver, Conduit Installer (1 year or more experience)	W24.49 B24.60 T49.09
Groundhand, Truck Driver, Conduit Installer (2 years or more experience)	W34.29 B32.32 T66.61
Groundhand, Truck Driver, Conduit Installer (3 years or more experience)	W41.63 B38.08 T79.71
Groundhand, Truck Driver, Conduit Installer (less than 1 year exp.)	W19.59 B1.20 T20.79
Journeyman Lineman	W48.98 B43.86 T92.84
Lead Foreman	W56.33 B49.63 T105.96
Working Foreman	W51.43 B45.78 T97.21

**Craft: Electrician- Outside Commercial**

**APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
6 Months	25.52	27.63	29.75	31.87	33.99	36.11	38.22			
Benefits	10.30	10.92	11.52	12.15	12.76	13.38	14.00			

**Craft: Electrician- Outside Commercial**

**COMMENTS/NOTES**

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT  
PREVAILING WAGE RATE DETERMINATION**

**County - CAMDEN**

\* FOR UTILITY WORK PLEASE SEE STATEWIDE RATES

**FOREMAN REQUIREMENTS** (number of Electricians on site):

(1 to 10)- one Working Foreman.

(11 to 20)- one Working Foreman and one Foreman.

(21 to 30)- one Working Foreman, one Foreman and one Lead Foreman.

(31 to 40) - one Working Foreman, two (2) Foremen and one Lead Foreman.

(41 to 50)- one Working Foreman, four (4) Foremen, one Assistant General Foreman (runs 5 foremen), and one General Foreman.

(51 to 60)- one Working Foreman, five (5) Foremen, one Assistant General Foreman (runs 5 foremen), and one General Foreman

(runs one foreman).

(61 to 70)- one Working Foreman, six (6) Foremen, one Assistant General Foreman (runs 5 foremen), and one General Foreman

(runs two foremen).

(71 to 80)- one Working Foreman, seven (7) Foremen, two (2) Assistant General Foremen and one General Foreman.

(81 to 90)- one Working Foreman, eight (8) Foremen, two (2) Assistant General Foremen, and one General Foreman.

(91 to 100)- one Working Foreman, nine (9) Foremen, two (2) Assistant General Foremen and one General Foreman.

The regular workday consists of 8 hours, between 7:00 AM and 4:30 PM.

**SHIFT DIFFERENTIALS:**

Shift work must run for a minimum of 5 consecutive workdays.

2nd Shift (4:30 PM to 12:30 AM): 8 hrs. pay for 7.5 hrs. work + an additional 10% of the wage rate, inclusive of benefits.

3rd Shift (12:30 AM to 8:00 AM): 8 hrs. pay for 7 hrs. work + an additional 15% of the wage rate, inclusive of benefits.

**OVERTIME:**

All hours in excess of 8 per day, Monday through Friday, that are not shift work, and all hours on Saturday shall be paid at time and one-half the regular rate, inclusive of benefits. All hours on Sundays and Holidays shall be paid at double the regular rate, inclusive of benefits.

**RECOGNIZED HOLIDAYS:**

New Year's Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. Sunday holidays will be observed the following Monday.



**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT  
PREVAILING WAGE RATE DETERMINATION**

**County - CAMDEN**

**Craft: Electrician-Utility Work (North)**

**PREVAILING WAGE RATE**

Rates are located in the "Statewide" rate package

**Craft: Electrician-Utility Work (North)**

**APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
* 6 Months	60%	65%	70%	75%	80%	85%	90%			
Benefits	69% of	Appren	tice	Wage	Rate	for all	intervals			

**Craft: Electrician-Utility Work (North)**

**COMMENTS/NOTES**

Electrician-Utility Work (North) rates are located in the "Statewide" rate package.

\* The apprentice wage rate is paid at the percentage of the Journeyman Lineman wage rate located in the "Statewide" rate package.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT  
PREVAILING WAGE RATE DETERMINATION**

**County - CAMDEN**

**Craft: Electrician-Utility Work (South)**

**PREVAILING WAGE RATE**

Rates are located in the "Statewide" rate package

**Craft: Electrician-Utility Work (South)**

**APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
6 Months	29.70	32.18	34.65	37.13	39.60	42.08	44.55			
Benefits	26.19	27.65	29.10	30.58	32.04	33.51	34.95			

**Craft: Electrician-Utility Work (South)**

**COMMENTS/NOTES**

Electrician-Utility Work (South) rates are located in the "Statewide" rate package.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT  
PREVAILING WAGE RATE DETERMINATION**

**County - CAMDEN**

**Craft: Elevator Constructor**

**PREVAILING WAGE RATE**

	01/01/21
Helper-Over 5 Years	W43.00 B39.80 T82.80
Helper-Under 5 Years	W43.00 B38.94 T81.94
Mechanic (Journeyman) over 5 years	W61.43 B41.27 T102.70
Mechanic (Journeyman) under 5 years	W61.43 B40.04 T101.47
Mechanic in Charge (Foreman) over 5 years	W69.11 B41.88 T110.99
Mechanic in Charge (Foreman) under 5 years	W69.11 B40.50 T109.61
Probationary Helper (1st 6 months)	W30.72 B38.20 T68.92

**Craft: Elevator Constructor**

**APPRENTICE RATE SCHEDULE**

<u>INTERVAL</u>	<u>PERIOD AND RATES</u>									
Yearly	55%	65%	70%	80%						
Benefits	full	journeyma	benefit	rate for	all	intervals				

**Ratio of Apprentices to Journeymen - \***

\* Total number of helpers and apprentices shall not exceed the number of mechanics on the job , except where 2 teams are working, 1 additional helper or apprentice may be employed for first 2 teams and an extra helper or apprentice for each additional 3 teams. Further, the employer may use as many helpers or apprentices as needed, under the direction of a mechanic in wrecking old plants, handling and hoisting material, and on foundation work. When replacing cables on existing elevators, employer may use 2 helpers or apprentices to 1 mechanic.

**Craft: Elevator Constructor**

**COMMENTS/NOTES**

**SHIFT DIFFERENTIALS:**

- 2nd Shift (4:30 PM to 12:30 AM) shall be established on the basis of 7.5 hours of work for 8 hours of pay, plus an additional 10% per hour.
- 3rd Shift (12:30 AM to 8:00 AM) shall be established on the basis of 7 hours of work for 8 hours of pay, plus an additional 15% per hour.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT  
PREVAILING WAGE RATE DETERMINATION**

**County - CAMDEN**

**OVERTIME:**

- Hours in excess of 8 per day, Monday through Friday, and all hours on Saturdays, Sundays, and holidays shall be paid at double the hourly rate.
- Four 10-hour days may be worked, Monday to Thursday or Tuesday to Friday, at straight time. When working a 4-10 hour day schedule, all hours worked on a day other than the days established for the 4-10 hour schedule shall be paid at double the hourly rate.

**RECOGNIZED HOLIDAYS:** New Year's Day, Memorial Day, July 4th, Labor Day, Veterans' Day, Thanksgiving Day and day after, Christmas Day. Saturday holidays observed the preceding Friday, Sunday holidays observed the following Monday.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT  
PREVAILING WAGE RATE DETERMINATION**

**County - CAMDEN**

**Craft: Glazier**

**PREVAILING WAGE RATE**

	06/04/21
Foreman	W49.67 B34.38 T84.05
Journeyman	W45.67 B34.38 T80.05

**Craft: Glazier**

**APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
Yearly	19.00	22.00	28.50	36.00						
Benefits	18.50	20.34	21.78	23.72						

**Ratio of Apprentices to Journeymen - 1:3**

**Craft: Glazier**

**COMMENTS/NOTES**

HIGH WORK (30 feet above ground /floor or using a swing stage): +\$1.00/hr

**FOREMAN REQUIREMENT:**

- When 4 or more Glaziers are working on a job that runs for 10 days or more, 1 shall be designated a Foreman.

The regular workday shall be 8 hours, between 6:00 AM and 4:30 PM.

**SHIFT DIFFERENTIALS:**

- Second and Third shift shall receive the regular hourly rate, plus 15% per hour.

**OVERTIME:**

- The first 2 hours in excess of 8 per day (9th and 10th hours), or outside the regular workday, Monday through Friday, that are not shift work, and the first 8 hours on Saturdays shall be paid at time and one-half the regular rate. All other daily overtime, and all hours on Sundays and holidays shall be paid at double the regular rate.

- Four 10-hour days may be worked at straight time, Monday through Friday. The 11th and 12th hours on the 4 days worked, and the first 12 hours on the fifth day shall be paid at time and one-half the regular rate. All other daily overtime, and all hours on Saturdays, Sundays, and holidays shall be paid at double the regular rate.

- Benefits on overtime hours are as follows:

Time and one-half = \$42.32/hr.

Double time = \$50.26/hr.

**RECOGNIZED HOLIDAYS:** New Year's Day, Memorial Day, July 4th, Thanksgiving Day, Christmas Day.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT  
PREVAILING WAGE RATE DETERMINATION**

**County - CAMDEN**

**Craft: Heat & Frost Insulator**

**PREVAILING WAGE RATE**

	05/01/21
Foreman (11-20 workers)	W59.79 B39.95 T99.74
Foreman (1-5 workers)	W57.07 B39.95 T97.02
Foreman (21-49 workers)	W62.50 B39.95 T102.45
Foreman (50+ workers)	W65.22 B39.95 T105.17
Foreman (6-10 workers)	W58.15 B39.95 T98.10
Journeyman	W54.35 B39.95 T94.30

**Craft: Heat & Frost Insulator**

**APPRENTICE RATE SCHEDULE**

<u>INTERVAL</u>	<u>PERIOD AND RATES</u>									
1000 Hours	40%	45%	48%	50%	55%	60%	65%	70%	75%	80%
Benefits	29.21	29.21	Intervals	3 to 10 =	33.46					

**Ratio of Apprentices to Journeymen - 1:4**

**Craft: Heat & Frost Insulator**

**COMMENTS/NOTES**

**FOREMAN REQUIREMENTS:**

- Foremen shall be designated based upon the number of Heat & Frost Insulators on the job, with the rates as shown above.
- If there is only 1 Heat & Frost Insulator on the job, he or she must be designated a Foreman.

The regular workday shall be 8 hours between 7:00 AM and 5:30 PM.

**SHIFT DIFFERENTIALS:**

- Shift work must run for a minimum of 3 consecutive workdays, with a minimum of 2 consecutive shifts each day.
- 2nd Shift shall be between the hours of 4:00 PM and 12:00 AM.
- 3rd Shift shall be between the hours of 12:00 AM and 8:00 AM.
- All shift work shall be paid an additional 15% of the regular rate, inclusive of benefits.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT  
PREVAILING WAGE RATE DETERMINATION**

**County - CAMDEN**

**OVERTIME:**

- The 2 hours immediately before or after the regular workday, and the first 10 hours on Saturdays shall be paid at time and one-half the regular rate, inclusive of benefits. All hours in excess of 10 per day, Monday through Saturday, and all hours on Sundays and holidays (except Labor Day), shall be paid at double the regular rate, inclusive of benefits. All hours on Labor Day shall be paid at triple the regular rate, inclusive of benefits.
- Four 10-hour days may be worked, Monday through Thursday, at straight time, with Friday used as a make-up day for a day lost to inclement weather. If Friday is not a make-up day, all hours on Friday shall be paid at time and one-half the regular rate, inclusive of benefits.

**RECOGNIZED HOLIDAYS:** New Year's Day, Memorial Day, July 4th, Labor Day, Thanksgiving Day, Christmas Day. Sunday holidays observed the following Monday.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT  
PREVAILING WAGE RATE DETERMINATION**

**County - CAMDEN**

**Craft: Heat & Frost Insulator - Asbestos Worker**

**PREVAILING WAGE RATE**

	05/01/21
Material Handler - 1st Level	W30.61 B22.79 T53.40
Material Handler - 2nd Level	W44.20 B22.79 T66.99
Mechanic (Journeyman)	W54.35 B39.95 T94.30

**Craft: Heat & Frost Insulator - Asbestos Worker**

**APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
	SEE	Heat &	Frost	Insulator						

**Craft: Heat & Frost Insulator - Asbestos Worker**

**COMMENTS/NOTES**

NOTE: These rates apply ONLY to the REMOVAL of insulation containing asbestos from mechanical systems, including containment erection and demolition, and the placing of material in appropriate containers.

**JOB TITLES:**

- Mechanic: 8,000 hours or more of asbestos removal experience
- Material Handler - 2nd Level: 3,000 hours or more (up to 8,000 hours) of asbestos removal experience
- Material Handler - 1st Level: up to 3,000 hours of asbestos removal experience

**RATIOS:**

- The first worker on the project must be a Mechanic.
- Ratio of Material Handlers to Mechanics is 5:1 (5 Handlers to 1 Mechanic), with a minimum of two of the Handlers being 2nd Level Handlers.

**SHIFT DIFFERENTIALS:**

- 2nd Shift shall work 7.5 hours and receive 8 hours pay, plus \$0.25 per hour.
- 3rd Shift shall work 7 hours and receive 8 hours pay, plus \$0.50 per hour.

**OVERTIME:**

- Hours in excess of 40 per week, and all hours on Saturdays shall be paid at time and one-half the regular rate, inclusive of benefits.
- All hours on Sundays and holidays (except Labor Day) shall be paid at double the regular rate, inclusive of benefits.
- All hours on Labor Day shall be paid at triple the regular rate, inclusive of benefits.

**RECOGNIZED HOLIDAYS:** New Year's Day, Memorial Day, July 4th, Labor Day, Thanksgiving Day, Christmas Day. Sunday holidays observed the following Monday.



**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT  
PREVAILING WAGE RATE DETERMINATION**

**County - CAMDEN**

**Craft: Industrial Painter- Bridges**

**PREVAILING WAGE RATE**

	02/11/21
Foreman	W62.18 B31.62 T93.80
General Foreman	W64.18 B31.62 T95.80
Journeyman	W57.18 B31.62 T88.80

**Craft: Industrial Painter- Bridges**

**APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
6 Months	60%	70%	80%	90%						
Benefits	14.27	14.50	17.73	17.96						

**Ratio of Apprentices to Journeymen - 1:4**

**Craft: Industrial Painter- Bridges**

**COMMENTS/NOTES**

\* Industrial Painters perform work on all industrial structures, such as bridges, water tanks, waste water facilities, refineries, any structural steel work, etc.

These rates apply to: All bridges that span waterways, roadways, railways and canyons. All tunnels, overpasses, viaducts and all appurtenances.

**FOREMEN REQUIREMENTS:**

- When there are 4 or more Painters on a job, 1 shall be designated a Foreman.
- When there are 15 or more Painters on a job, 1 shall be designated a General Foreman.

The regular workday shall consist of 8 hours between 7:00 AM and 5:30 PM.

**SHIFT DIFFERENTIALS:**

- The second shift shall receive an additional 10% of the hourly rate, per hour, and the third shift shall receive an additional 15% of the hourly rate, per hour.

**OVERTIME:**

- Hours in excess of 8 per day, Monday through Friday, and all hours on Saturdays and Sundays shall be paid at time and one-half the regular rate. All hours on holidays shall be paid at double the regular rate.
- Saturday or Sunday may be used to make up a day lost to inclement weather, at straight time.
- Four 10-hour days may be worked, at straight time, Monday through Friday.

**RECOGNIZED HOLIDAYS:** New Year's Day, President's Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. Saturday holiday observed the preceding Friday. Sunday holiday

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT  
PREVAILING WAGE RATE DETERMINATION**

**County - CAMDEN**

observed the following Monday.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT  
PREVAILING WAGE RATE DETERMINATION**

**County - CAMDEN**

**Craft: Industrial Painter- Structural Steel**

**PREVAILING WAGE RATE**

	02/11/21
Foreman	W50.92 B29.27 T80.19
General Foreman	W52.92 B29.27 T82.19
Journeyman	W45.92 B29.27 T75.19

**Craft: Industrial Painter- Structural Steel**

**APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
	SEE	INDUST	RIAL	PAINTER	BRIDGES					

**Ratio of Apprentices to Journeymen - 1:4**

**Craft: Industrial Painter- Structural Steel**

**COMMENTS/NOTES**

\* Industrial Painters perform work on all industrial structures, such as bridges, water tanks, waste water facilities, refineries, any structural steel work, etc.

These rates apply to: All work in power plants (any aspect). On steeples, on dams, on hangers, transformers, substations, on all open steel, in refineries, tank farms, water/sewerage treatment facilities and on pipelines.

**FOREMEN REQUIREMENTS:**

- When there are 4 or more Painters on a job, 1 shall be designated a Foreman.
- When there are 15 or more Painters on a job, 1 shall be designated a General Foreman.

The regular workday shall consist of 8 hours between 7:00 AM and 5:30 PM.

**SHIFT DIFFERENTIALS:**

- The second shift shall receive an additional 10% of the hourly rate, per hour, and the third shift shall receive an additional 15% of the hourly rate, per hour.

**OVERTIME:**

- Hours in excess of 8 per day, Monday through Friday, and all hours on Saturdays and Sundays shall be paid at time and one-half the regular rate. All hours on holidays shall be paid at double the regular rate.
- Saturday or Sunday may be used to make up a day lost to inclement weather, at straight time.
- Four 10-hour days may be worked, at straight time, Monday through Friday.

**RECOGNIZED HOLIDAYS:** New Year's Day, President's Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. Saturday holiday observed the preceding Friday. Sunday holiday observed the following Monday.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT  
PREVAILING WAGE RATE DETERMINATION**

**County - CAMDEN**

**Craft: Industrial Painter- Water Tanks**

**PREVAILING WAGE RATE**

	02/11/21
Foreman	W51.97 B28.92 T80.89
General Foreman	W53.97 B28.92 T82.89
Journeyman	W46.97 B28.92 T75.89

**Craft: Industrial Painter- Water Tanks**

**APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
6 Months	50%	70%	90%							
Benefits	11.77	14.50	17.96							

**Ratio of Apprentices to Journeymen - 1:4**

**Craft: Industrial Painter- Water Tanks**

**COMMENTS/NOTES**

\* Industrial Painters perform work on all industrial structures, such as bridges, water tanks, waste water facilities, refineries, any structural steel work, etc.

These rates apply to: All new and repaint water tanks (interior and exterior).

**FOREMEN REQUIREMENTS:**

- When there are 4 or more Painters on a job, 1 shall be designated a Foreman.
- When there are 15 or more Painters on a job, 1 shall be designated a General Foreman.

The regular workday shall consist of 8 hours between 7:00 AM and 5:30 PM.

**SHIFT DIFFERENTIALS:**

- The second shift shall receive an additional 10% of the hourly rate, per hour, and the third shift shall receive an additional 15% of the hourly rate, per hour.

**OVERTIME:**

- Hours in excess of 8 per day, Monday through Friday, and all hours on Saturdays and Sundays shall be paid at time and one-half the regular rate. All hours on holidays shall be paid at double the regular rate.
- Saturday or Sunday may be used to make up a day lost to inclement weather, at straight time.
- Four 10-hour days may be worked, at straight time, Monday through Friday.

**RECOGNIZED HOLIDAYS:** New Year's Day, President's Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. Saturday holiday observed the preceding Friday. Sunday holiday observed the following Monday.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT  
PREVAILING WAGE RATE DETERMINATION**

**County - CAMDEN**

**Craft: Industrial Painter-Containment**

**PREVAILING WAGE RATE**

	02/11/21
Journeyman	W38.23 B28.67 T66.90

**Craft: Industrial Painter-Containment**

**COMMENTS/NOTES**

Note: These rates shall require no painting, but used in a supporting capacity only, such as wrapping, boxing, fencing, etc. on tanks.

The regular workday shall consist of 8 hours between 7:00 AM and 5:30 PM.

**SHIFT DIFFERENTIALS:**

- The second shift shall receive an additional 10% of the hourly rate, per hour, and the third shift shall receive an additional 15% of the hourly rate, per hour.
- When 3 shifts are worked, the second shift shall receive 8 hours pay for 7.5 hours of work, and the third shift shall receive 8 hours pay for 7 hours of work.

**OVERTIME:**

- Hours in excess of 8 per day, Monday through Friday, and all hours on Saturdays shall be paid at time and one-half the regular rate. All hours on Sundays and holidays shall be paid at double the regular rate.
- Saturday or Sunday may be used to make up a day lost to inclement weather, at straight time.
- Four 10-hour days may be worked, at straight time, Monday through Friday.

**RECOGNIZED HOLIDAYS:** New Year's Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT  
PREVAILING WAGE RATE DETERMINATION**

**County - CAMDEN**

**Craft: Ironworker**

**PREVAILING WAGE RATE**

	07/15/21
Foreman- Fence and Guardrail	W50.30 B35.64 T85.94
Foreman-Rod/Mesh	W53.80 B36.42 T90.22
Foreman-Structural	W54.92 B36.42 T91.34
Journeyman- Fence and Guardrail	W46.57 B35.64 T82.21
Journeyman-Rod/Mesh	W48.04 B36.42 T84.46
Journeyman-Structural	W49.04 B36.42 T85.46

**Craft: Ironworker**

**APPRENTICE RATE SCHEDULE**

<u>INTERVAL</u>	<u>PERIOD AND RATES</u>									
Yearly	60%	75%	85%							

**Ratio of Apprentices to Journeymen - \***

\* On all work EXCEPT Ornamental Iron and Bridge Cable Spinning Work 1:4; On Ornamental Iron and Bridge Cable Spinning Work 1:1.

**Craft: Ironworker**

**COMMENTS/NOTES**

Note: For work on hazardous waste sites, workers shall receive an additional \$3.00 per hour.

The regular workday shall consist of 8 hours between 6:00 AM and 5:00 PM.

**SHIFT DIFFERENTIALS:**

- Second shift shall receive an additional 10% per hour.
- Third shift shall receive an additional 15% per hour.
- An irregular shift (shift starting after 6:00 PM) shall receive an additional 15% per hour.

**OVERTIME:**

- Time and one-half the wage rate for hours in excess of 8 per day, or before or after the regular workday, Monday through Friday, and for all hours on Saturdays. Double the wage rate for all hours on Sundays and holidays.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT  
PREVAILING WAGE RATE DETERMINATION**

**County - CAMDEN**

- Employees may work four 10-hour days, Monday to Thursday, at straight time. Friday may be used as a make-up day for a day lost to inclement weather. If Friday is not a make-up day, all hours worked on Friday shall be paid at time and one-half the wage rate.

- Benefits on overtime hours shall be paid at the following rates:

For Rod/Mesh and Structural-

When wages are time and one-half, benefits = \$41.13.

When wages are double, benefits = \$45.84.

For Fence and Guardrail-

When wages are time and one-half, benefits = \$39.96.

When wages are double, benefits = \$44.28.

RECOGNIZED HOLIDAYS: New Year's Day, Memorial Day, July 4th, Labor Day, General and Presidential Election Day, Thanksgiving Day, Christmas Day. Sunday holidays observed the following Monday.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT  
PREVAILING WAGE RATE DETERMINATION**

County - CAMDEN

**Craft: Laborer - Asbestos & Hazardous Waste Removal**

**PREVAILING WAGE RATE**

	10/20/20
Journeyman (Handler)	W32.98 B23.66 T56.64

**Craft: Laborer - Asbestos & Hazardous Waste Removal**

**APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
Yearly	19.79	23.09	26.38	29.68						
Benefits	21.51	for	all	intervals						

**Ratio of Apprentices to Journeymen - \***

\* Ratio of apprentices to journeymen shall not be more than one apprentice for the first journeyman and no more than one (1) apprentice for each additional three (3) journeymen.

**Craft: Laborer - Asbestos & Hazardous Waste Removal**

**COMMENTS/NOTES**

NOTE: These rates apply to work in connection with Asbestos, Radiation, Hazardous Waste, Lead, Chemical, Biological, Mold Remediation and Abatement.

The regular workday shall be 8 hours.

**OVERTIME:**

- Hours in excess of 8 per day, Monday through Saturday, and all hours on Sunday and holidays shall be paid at time and one-half the regular rate.
- Benefits on ALL overtime hours shall be paid at straight time.

**RECOGNIZED HOLIDAYS:** New Year's Day, President's Day, Easter, Memorial Day, July 4th, Labor Day, Veterans Day, Thanksgiving Day, Christmas Day. (Holidays start at 12:00 am).



**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT**

**PREVAILING WAGE RATE DETERMINATION**

**County - CAMDEN**

**Craft: Laborer - Building**

**PREVAILING WAGE RATE**

	05/07/21
Class A Journeyman	W35.25 B30.62 T65.87
Class B Journeyman	W34.50 B30.62 T65.12
Class C Journeyman	W29.33 B30.62 T59.95
Foreman	W39.66 B30.62 T70.28
General Foreman	W44.06 B30.62 T74.68

**Craft: Laborer - Building**

**APPRENTICE RATE SCHEDULE**

<u>INTERVAL</u>	<u>PERIOD AND RATES</u>									
6 Months	60%	70%	80%	90%						
Benefit	27.37	27.37	27.37	27.37						

**Ratio of Apprentices to Journeymen - \***

\* Ratio of apprentices to journeymen shall not be more than one apprentice for the first journeyman and no more than one (1) apprentice for each additional three (3) journeymen.

**Craft: Laborer - Building**

**COMMENTS/NOTES**

CLASS A: Specialist laborer including mason tender or concrete pour crew; scaffold builder (scaffolds up to 14 feet in height); operator of forklifts, Bobcats (or equivalent machinery), jack hammers, tampers, motorized tampers and compactors, vibrators, street cleaning machines, hydro demolition equipment, riding motor buggies, conveyors, burners; and nozzlemen on gunite work.

CLASS B: Basic laborer - includes all laborer work not listed in Class A or Class C.

CLASS C: Janitorial-type light clean-up work associated with the TURNOVER of a project, or part of a project, to the owner. All other clean-up work is Class B.

The regular workday shall be 8 hours between 6:00 AM and 6:00 PM.

**SHIFT DIFFERENTIALS:**

- Shift work must run for a minimum of 5 consecutive workdays.
- When a 2-shift schedule is worked, including a day shift, both shifts shall be established on the basis of 8 hours pay for 8 hours worked. The second shift shall receive the regular rate plus an additional 10%.
- When a 3-shift schedule is worked, the day shift shall be established on the basis of 8 hours pay for 8 hours worked, the second shift shall be established on the basis of 8 hours pay for 7.5 hours worked, and the third shift shall be established

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT  
PREVAILING WAGE RATE DETERMINATION**

**County - CAMDEN**

on the basis of 8 hours pay for 7 hours worked. The day shift shall receive the regular rate, the second shift shall receive the regular rate plus an additional 10%, and the third shift shall receive the regular rate plus an additional 15%.

- When a second or third shift is worked with no day shift, the second or third shift shall be established on the basis of 8 hours pay for 8 hours worked. The second shift shall receive the regular rate plus an additional 10%, and the third shift shall receive the regular rate plus an additional 15%.

**OVERTIME:**

- Hours in excess of 8 per day, or outside the regular workday that are not shift work, Monday through Friday, and all hours on Saturdays shall be paid at time and one-half the regular rate. Saturday may be used as a make-up day (paid at straight time) for a day lost to inclement weather, or for a holiday that is observed during the work week, Monday through Friday. All hours on Sundays and holidays shall be paid at double the regular rate.

- Four 10-hour days may be worked Monday to Thursday, at straight time, with Friday used as a make-up day for a day lost to inclement weather. If Friday is not a make-up day, all hours on Friday shall be paid at time and one-half the regular rate.

- Benefits on ALL overtime hours shall be paid at time and one-half.

**RECOGNIZED HOLIDAYS:** New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Veterans Day, Thanksgiving Day, Christmas Day. Sunday holidays observed the following Monday.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT  
PREVAILING WAGE RATE DETERMINATION**

**County - CAMDEN**

**Craft: Laborer - Heavy & General**

**PREVAILING WAGE RATE**

Rates are located in the  
"Statewide" rate package

**Craft: Laborer - Heavy & General**

**APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
1000 Hours	60%	70%	80%	90%						
Benefit	22.48	for	all	intervals						

**Ratio of Apprentices to Journeymen - \***

\* No more than 1 apprentice for the first journeyman and no more than 1 apprentice for each additional 3 journeymen.

**Craft: Laborer - Heavy & General**

**COMMENTS/NOTES**

Heavy & General Laborer rates are located in the "Statewide" rate package.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT  
PREVAILING WAGE RATE DETERMINATION**

**County - CAMDEN**

**Craft: Laborer-Residential and Modular Construction**

**PREVAILING WAGE RATE**

	04/01/20
* Skilled Tradesman (only applies to Modular Construction)	W26.55 B5.45 T32.00
Foreman (person directing crew, regardless of his skill classification)	W30.55 B5.45 T36.00
Laborer	W22.55 B5.45 T28.00
Laborer (for single family and stand-alone duplex owned by single owner)	W17.05 B2.95 T20.00

**Craft: Laborer-Residential and Modular Construction**

**APPRENTICE RATE SCHEDULE**

<u>INTERVAL</u>	<u>PERIOD AND RATES</u>									
As shown	800 hours	600 hours	600 hours							
wage & benefits	70%	80%	90%							

Ratio of Apprentices to Journeymen-

One (1) apprentice shall be allowed for the first journeyman on site and no more than one (1) additional apprentice for each additional three (3) journeymen on site.

**Craft: Laborer-Residential and Modular Construction**

**COMMENTS/NOTES**

**\* SKILLED TRADESMAN-**

any worker doing work not typically done by a Building Laborer. Some examples are installing interior doors, sheet rock, hooking up appliances, installing light fixtures, installing railing systems, etc. Please note where local building codes require that certain work be performed under the supervision of a licensed tradesman (i.e. Plumber, Electrician, etc.) Laborers shall work under such supervision.

**RESIDENTIAL CONSTRUCTION-** All residential construction (not commercial), single-family, stand-alone duplex houses, townhouses and multi-family buildings of not more than four (4) floors. Each housing unit must be fully and independently functional; each housing unit must have its own kitchen and bathroom. The definition includes all incidental items such as site work, parking areas, utilities, streets and sidewalks. Please note the construction must be Residential in nature. A First Floor at or below grade may contain commercial space not to exceed 50% square footage of the floor; at least 50% of the First Floor must contain living accommodations or related nonresidential uses (e.g. laundry space, recreation/hobby rooms, and/or corridor space). Basement stories below grade used for storage, parking, mechanical systems/equipment, etc., are considered basement stories which are not used in determining the building's height. An attic is an unfinished space located immediately below the roof. Such space is not used in determining a building's height even if used for storage purposes. In addition, barracks and dormitories are not considered residential projects.

**MODULAR RESIDENTIAL CONSTRUCTION-** all aspects of modular residential construction (not commercial) at the site of installation of structures of no more than four (4) stories, including all excavation and site preparation, footings and

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT  
PREVAILING WAGE RATE DETERMINATION**

**County - CAMDEN**

foundation systems whether poured on-site or prefabricated, all underground waterproofing, underground utilities, concrete slabs, sidewalks, driveways, paving, hardscape and landscaping. Please note the construction must be Residential as defined above. All work performed by the Set Crew (the crew of workers who set the modular boxes on the foundation), including the rigging, setting, attaching and assembly of all modules and structural members, preparation of the foundation to accept modules, such as sill plates, connection of all in-module and under-module connections including, but not limited to, plumbing, electrical, HVAC, fire suppression, CATS, telephone, television/internet, and fiber optic, the building or installation of any porches or decks regardless of material or method of construction, the on-site installation of, or completion of any roof system, doors, windows and fenestrations, including flashing, gutter and soffit systems, waterproofing, insulation and interior and exterior trim work, and painting. Please note that modular construction does not include on-site stick built construction, tip up construction or panel built construction.

The regular workday shall be 8 hours between 6:00 AM and 6:00 PM.

**OVERTIME:**

Hours worked in excess of 8 per day/40 per week, Monday through Saturday, and all hours worked on Sunday and holidays shall be paid at time and one-half the hourly rate.

**RECOGNIZED HOILDAYS:**

New Year's Day, Martin Luther King Day, Memorial Day, July 4th, Labor Day, Thanksgiving Day and Christmas Day.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT  
PREVAILING WAGE RATE DETERMINATION**

**County - CAMDEN**

**Craft: Millwright**

**PREVAILING WAGE RATE**

	05/01/21
Foreman	W59.87 B35.32 T95.19
Journeyman	W52.06 B30.79 T82.85

**Craft: Millwright**

**APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
6 Months	40%	55%	65%	80%	90%					
Benefits	58% of	Appren	tice	Wage	Rate	for all	intervals	+ \$.60		

**Ratio of Apprentices to Journeymen - 1:3**

**Craft: Millwright**

**COMMENTS/NOTES**

**FOREMAN REQUIREMENTS:**

- When there are 2 or more Millwrights on a job, 1 shall be designated as a Foreman.

The regular workday shall consist of 8 hours, starting between 6:00 AM and 9:00 AM.

**SHIFT DIFFERENTIALS:**

- When a 2 shift schedule (including a day shift) is established, the day shift shall be established on an 8 hour basis. The second shift shall be established on an 8 hour basis, and receive the regular rate plus 15%, inclusive of benefits.
- When a three shift schedule is established, the first shift shall be established on an 8 hour basis, the second shift on a 7.5 hour basis, and the third shift on a 7 hour basis. The first shift shall receive the regular hourly rate, the second shift shall receive the regular rate plus 15% and the third shift shall receive the regular rate plus 20%, inclusive of benefits.
- When there is no day shift, and a second or third shift is established, it shall be established on an 8 hour basis. The second shift shall receive the regular rate plus 15% and the third shift shall receive the regular rate plus 20%, inclusive of benefits.
- When an irregular shift must be established, this shift shall receive the regular rate plus 15%, inclusive of benefits.

**OVERTIME:**

- All hours in excess of 8 per day, or before or after an established shift that are not shift work, and all hours on Saturdays shall be paid at time and one-half the hourly rate, inclusive of benefits. All hours on Sundays and holidays shall be paid at double the hourly rate, inclusive of benefits.
- Four 10-hour days may be worked, Monday to Thursday, at straight time. Friday may be used as a make-up day for a day lost due to inclement weather. If Friday is not a make-up day, all hours on Friday shall be paid at time and one-half the hourly rate, inclusive of benefits.

**RECOGNIZED HOLIDAYS:** New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Veterans' Day, Thanksgiving Day, Christmas Day. Sunday holidays will be observed the following Monday. Veterans' Day may be substituted for the day after Thanksgiving.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT  
PREVAILING WAGE RATE DETERMINATION**

**County - CAMDEN**

**Craft: Operating Engineer**

**PREVAILING WAGE RATE**

Rates are located in the  
"Statewide" rate package

**Craft: Operating Engineer**

**APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
Yearly	60%	70%	80%	90%						

**Ratio of Apprentices to Journeymen - \***

\* 1 apprentice for each piece of heavy equipment. At least 10 pieces of heavy equipment or a minimum of 5 Operating Engineers must be on site.

**Craft: Operating Engineer**

**COMMENTS/NOTES**

Operating Engineer rates are located in the "Statewide" rate package.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT  
PREVAILING WAGE RATE DETERMINATION**

**County - CAMDEN**

**Craft: Operating Engineer - Field Engineer**

**PREVAILING WAGE RATE**

Rates are located in the  
"Statewide" rate package

**Craft: Operating Engineer - Field Engineer**

**APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
Yearly	70%	75%	of Rod/	Chainman	Wage					
Yearly			80%	90%	Transit/	Instrument	man	Wage		

**Ratio of Apprentices to Journeymen - \***

\* No more than 1 Field Engineer Apprentice per Survey Crew.

**Craft: Operating Engineer - Field Engineer**

**COMMENTS/NOTES**

Operating Engineer - Field Engineer rates are located in the "Statewide" rate package.



**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT  
PREVAILING WAGE RATE DETERMINATION**

**County - CAMDEN**

**Craft: Painter - Line Striping**

**PREVAILING WAGE RATE**

	12/10/20
Apprentice (1st year)	W27.50 B12.15 T39.65
Apprentice (2nd year)	W31.50 B23.10 T54.60
Foreman (Charge Person)	W40.15 B23.88 T64.03
Journeyman 1 (at least 1 year of working exp. as a journeyman)	W35.38 B23.88 T59.26
Journeyman 2 (at least 2 years of working exp. as a journeyman)	W39.15 B23.88 T63.03

**Craft: Painter - Line Striping**

**COMMENTS/NOTES**

**OVERTIME:**

Hours in excess of 8 per day, Monday through Saturday, and all hours on Sundays and holidays shall be paid at time and one-half the hourly rate.

**RECOGNIZED HOLIDAYS:** New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Veterans Day, Thanksgiving Day and Christmas Day. Veterans Day may be substituted for the day after Thanksgiving.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT  
PREVAILING WAGE RATE DETERMINATION**

**County - CAMDEN**

**Craft: Paperhanger**

**PREVAILING WAGE RATE**

	05/01/21
Foreman	W47.34 B27.22 T74.56
Journeyman	W43.04 B27.22 T70.26

**Craft: Paperhanger**

**APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
	SEE	COMME R	CIAL	PAINTER	NEW	CONSTR	UCTION			

**Craft: Paperhanger**

**COMMENTS/NOTES**

**FOREMEN REQUIREMENTS:**

- When there are 4 or more Paperhangers on a job, 1 shall be designated a Foreman.

The regular workday shall consist of 8 hours between 7:00 AM and 5:30 PM.

**SHIFT DIFFERENTIALS:**

- The second shift shall receive an additional 10% of the hourly rate, per hour, and the third shift shall receive an additional 15% of the hourly rate, per hour.

**OVERTIME:**

- Hours in excess of 8 per day, Monday through Friday, and all hours on Saturdays shall be paid at time and one-half the regular rate. All hours on Sundays and holidays shall be paid at double the regular rate.  
- Saturday or Sunday may be used to make up a day lost to inclement weather, at straight time.  
- Four 10-hour days may be worked, at straight time, Monday through Friday.

**RECOGNIZED HOLIDAYS:** New Year's Day, President's Day, Memorial Day, July 4th, Labor Day, General Election Day, Veterans' Day, Thanksgiving Day, Christmas Day

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT  
PREVAILING WAGE RATE DETERMINATION**

**County - CAMDEN**

**Craft: Pipefitter**

**PREVAILING WAGE RATE**

See "Plumber" Rates

**Craft: Pipefitter**

**COMMENTS/NOTES**

\*\*\* See PLUMBER Rates\*\*\*

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT  
PREVAILING WAGE RATE DETERMINATION**

**County - CAMDEN**

**Craft: Plasterer**

**PREVAILING WAGE RATE**

See "Cement Mason" Rates

**Craft: Plasterer**

**COMMENTS/NOTES**

\*\*\*See CEMENT MASON Rates\*\*\*

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT  
PREVAILING WAGE RATE DETERMINATION**

**County - CAMDEN**

**Craft: Plumber                      PREVAILING WAGE RATE**

	05/28/21
Foreman	W51.39 B48.39 T99.78
Journeyman	W46.72 B48.39 T95.11

**Craft: Plumber                      APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
6 Months	30%	35%	45%	50%	55%	60%	65%	70%	75%	80%
Benefits	30.05	31.40	34.09	35.42	36.76	38.10	39.46	40.79	42.14	43.47

**Ratio of Apprentices to Journeymen - 1:4**

**Craft: Plumber                      COMMENTS/NOTES**

**FOREMAN REQUIREMENTS:**

- On any job having 2 or more Journeyman Plumbers, 1 must be designated a Foreman.
- There must be 1 additional Foreman for every 10 Plumbers on the job.

The regular workday is 8 hours, between 7:00 AM and 4:30 PM.

**SHIFT DIFFERENTIALS:**

- Shift work must run for a minimum of 5 consecutive workdays.
- When 2 shifts are worked, the second shift shall receive 8 hours pay for 8 hours of work.
- When 3 shifts are worked, the second shift shall receive 8 hours pay for 7.5 hours of work, and the third shift shall receive 8 hours pay for 7 hours of work.
- The rate of pay for all shift work shall be an additional 15% of the hourly rate, per hour.

**OVERTIME:**

The first 4 hours in excess of 8 per day, or before or after the regular workday that are not shift work, Monday through Friday, and the first 12 hours on Saturdays shall be paid at time and one-half the regular rate, inclusive of benefits. Hours in excess of 12 per day, and all hours on Sundays and holidays shall be paid at double the regular rate, inclusive of benefits.

**RECOGNIZED HOLIDAYS:** New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. Sunday holidays will be observed the following Monday.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT  
PREVAILING WAGE RATE DETERMINATION**

**County - CAMDEN**

**Craft: Roofer**

**PREVAILING WAGE RATE**

	06/29/21
Foreman (5 workers or less)	W42.33 B33.12 T75.45
Foreman (6 workers or more)	W42.83 B33.12 T75.95
Journeyman	W40.33 B33.12 T73.45

**Craft: Roofer**

**APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
Yearly	52%	55%	60%	75%						
Benefits	22.39	26.39	33.12	33.12						

**Ratio of Apprentices to Journeymen - \***

\* 1:2, 2:4, 3:6, 4:8, 5:10, 6:12, 7:14

**Craft: Roofer**

**COMMENTS/NOTES**

NOTE: Mopper, Operator of Felt Laying Machine or Slag Dispenser shall receive an additional \$.50 per hour.

**FOREMAN REQUIREMENTS:**

- There must be a Foreman on all jobs.
- Foreman rate depends on the number of Roofers on the job, as indicated.

The regular workday is 8 hours between 5:00 AM and 4:30 PM.

**OVERTIME:**

Hours in excess of 8 per day, or before or after the regular workday, Monday through Friday, and all hours on Saturdays, Sundays, and holidays shall be paid at time and one-half the wage rate.

**RECOGNIZED HOLIDAYS:** New Year's Day, Memorial Day, July 4th, Labor Day, Thanksgiving Day, Christmas Day. Sunday holidays will be observed the following Monday.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT  
PREVAILING WAGE RATE DETERMINATION**

**County - CAMDEN**

**Craft: Roofer - Shingle, Slate & Tile**

**PREVAILING WAGE RATE**

	06/29/21
Foreman (3 workers or less)	W30.75 B21.55 T52.30
Foreman (4 workers or more)	W31.50 B21.55 T53.05
Helper	W15.25 B21.55 T36.80
Journeyman (shingle work)	W30.50 B21.55 T52.05

**Craft: Roofer - Shingle, Slate & Tile**

**APPRENTICE RATE SCHEDULE**

<u>INTERVAL</u>	<u>PERIOD AND RATES</u>									
Yearly	60%	70%	80%							

**Ratio of Apprentices to Journeymen - \***

\* 1:2, 2:4, 3:6, 4:8, 5:10, 6:12, 7:14

**Craft: Roofer - Shingle, Slate & Tile**

**COMMENTS/NOTES**

NOTE: Above rates are for Shingle work only. Slate and Tile work rates are an additional \$3.00 per hour.

HELPER RATIO: 1 Helper to 1 Journeyman

**FOREMAN REQUIREMENTS:**

- There must be a Foreman on all jobs.
- Foreman rate depends on the number of Roofers on the job, as indicated.

**OVERTIME:**

Hours in excess of 8 per day, Monday through Friday, and all hours on Saturdays, Sundays, and holidays shall be paid at time and one-half the wage rate.

RECOGNIZED HOLIDAYS: New Year's Day, Memorial Day, July 4th, Labor Day, Thanksgiving Day, Christmas Day. Sunday holidays will be observed the following Monday.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT  
PREVAILING WAGE RATE DETERMINATION**

**County - CAMDEN**

**Craft: Sheet Metal Sign Installation**

**PREVAILING WAGE RATE**

	07/27/21
Foreman	W31.49 B23.90 T55.39
Journeyman	W29.49 B23.90 T53.39

**Craft: Sheet Metal Sign Installation**

**APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
1000 Hours	40%	45%	50%	55%	60%	65%	70%	75%	80%	90%
Benefits	23.36	23.41	23.45	23.50	23.54	23.59	23.63	23.67	23.72	23.81

**Ratio of Apprentices to Journeymen - 1:2**

**Craft: Sheet Metal Sign Installation**

**COMMENTS/NOTES**

**HAZARDOUS DUTY:**

Sign Installers working from a bosun's chair or outside swinging scaffold at a height of 60 feet or more: + \$5.00 per hour.

**FOREMAN REQUIREMENTS:**

When there are 3 or more Sign Installers on a job, one must be designated a Foreman.

The regular workday shall be 8 hours, between 8:00 AM and 5:00 PM.

**OVERTIME:**

Hours in excess of 8 per day, or outside the regular workday, Monday through Friday, and all hours on Saturdays and Sundays shall be paid at time and one-half the regular rate. All hours on holidays shall be paid at time and one-half the regular rate.

**RECOGNIZED HOLIDAYS:** New Year's Day, Presidents' Day, Good Friday, Memorial Day, July 4th, Labor Day, Veterans' Day, Thanksgiving Day, day after Thanksgiving, Christmas Day. Saturday holidays will be observed the preceding Friday, Sunday holidays will be observed the following Monday.



**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT  
PREVAILING WAGE RATE DETERMINATION**

**County - CAMDEN**

**Craft: Sheet Metal Worker**

**PREVAILING WAGE RATE**

	05/05/21
Foreman	W57.61 B45.94 T103.55
General Foreman	W61.38 B45.94 T107.32
Journeyman	W53.84 B45.94 T99.78

**Craft: Sheet Metal Worker**

**APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
6 Months	40%	45%	55%	60%	65%	70%	75%	85%		
Benefits	24.90	24.90	28.24	28.77	28.77	28.77	28.77	28.77		

**Ratio of Apprentices to Journeymen - 1:4**

**Craft: Sheet Metal Worker**

**COMMENTS/NOTES**

**FOREMAN REQUIREMENTS:**

- When there are 1 to 10 Sheet Metal Workers on a job, 1 must be designated a foreman.
- When there are 11 to 20 Sheet Metal Workers on a job, 1 must be designated a foreman, and 1 must be designated a general foreman.
- When there are 21 or more Sheet Metal Workers on a job, 2 must be designated foremen, and 1 must be designated a general foreman.

The regular workday is 8 hours, between 7:00 AM and 3:30 PM.

**SHIFT DIFFERENTIALS:**

- Shift work must run for a minimum of 5 consecutive workdays.
- When 2 shifts are worked, the second shift shall receive 8 hours pay for 8 hours of work.
- When 3 shifts are worked, the second shift shall receive 8 hours pay for 7.5 hours of work, and the third shift shall receive 8 hours pay for 7 hours of work.
- The rate of pay for all shift work shall be an additional 15% of the regular rate, per hour, inclusive of benefits.

**OVERTIME:**

The first 2 hours in excess of 8 per day, or before or after the regular workday that are not shift work, and the first 10 hours on Saturdays shall be paid at time and one-half the regular rate, inclusive of benefits. Hours in excess of 10 per day, and all hours on Sundays and holidays shall be paid at double the regular rate, inclusive of benefits.

**RECOGNIZED HOLIDAYS:** New Year's Day, Good Friday, Memorial Day, July 4th, Labor Day, General Election Day, Thanksgiving Day, Christmas Day. Sunday holidays observed the following Monday.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT  
PREVAILING WAGE RATE DETERMINATION**

**County - CAMDEN**

**Craft: Sprinkler Fitter**

**PREVAILING WAGE RATE**

	05/01/21
Foreman	W64.58 B30.34 T94.92
Journeyman	W60.83 B30.34 T91.17

**Craft: Sprinkler Fitter**

**APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
6 Months	18.25	18.25	21.29	24.33	27.37	33.46	39.54	42.58	45.62	48.66
Benefits	12.09	12.09	15.09	22.09	22.59	23.09	23.09	23.59	24.09	25.09

**Ratio of Apprentices to Journeymen - 1:4**

**Craft: Sprinkler Fitter**

**COMMENTS/NOTES**

The regular workday shall be 8 hours, between 7:00 AM and 4:30 PM.

**SHIFT DIFFERENTIALS:**

- Second and third shifts shall receive an additional 15% of the hourly rate, per hour.

**OVERTIME:**

- Hours outside of the regular workday, and the first 2 hours in excess of 8 per day (9th and 10th hours), Monday through Friday, and the first 8 hours on Saturdays shall be paid at time and one-half the hourly rate. Hours in excess of 10 per day, Monday through Friday, hours in excess of 8 on Saturdays, and all hours on Sundays and holidays shall be paid at double the hourly rate.
- Employees may work four 10-hour days at straight time, Monday through Friday, between 7:00 AM and 6:30 PM. The first 2 hours in excess of 10 per day (11th and 12th hours), the first 10 hours on the fifth day, and the first 10 hours on Saturdays shall be paid at time and one-half the hourly rate. Hours in excess of 12 per day, Monday through Friday, and all hours on Sundays and holidays shall be paid at double the hourly rate.

**RECOGNIZED HOLIDAYS:** New Year's Day, Memorial Day, July 4th, Labor Day, Thanksgiving Day, the day after Thanksgiving, Christmas Day. Sunday holidays will be observed the following Monday.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT  
PREVAILING WAGE RATE DETERMINATION**

**County - CAMDEN**

**Craft: Tile Worker**

**PREVAILING WAGE RATE**

	07/01/21
Finisher	W42.05 B28.21 T70.26
Setter	W48.94 B33.79 T82.73

**Craft: Tile Worker**

**APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
750 Hours	40%	45%	50%	55%	60%	65%	70%	75%	80%	90%

**Ratio of Apprentices to Journeymen - 1:4**

**Craft: Tile Worker**

**COMMENTS/NOTES**

NOTE: These rates also apply to Terrazzo and Marble work.

**OVERTIME:**

Hours in excess of 8 per day, Monday through Friday, and the first 10 hours on Saturdays shall be paid at time and one half the regular rate, inclusive of benefits. Hours in excess of 10 on Saturdays, and all hours on Sundays and holidays shall be paid at double the regular rate, inclusive of benefits.

**RECOGNIZED HOLIDAYS:**

New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Veterans' Day, Thanksgiving Day and Christmas Day. Sunday holidays shall be observed the following Monday.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT  
PREVAILING WAGE RATE DETERMINATION**

**County - CAMDEN**

**Craft: Truck Driver**

**PREVAILING WAGE RATE**

	07/15/21
Bucket, Tack Spreader trucks	W38.75 B29.42 T68.17
Concrete mobile unit; Seeding/Fertilizing/ Mulching truck	W38.75 B29.42 T68.17
Dump, Water, Form, Vacuum or Vac-All, Pick-up trucks	W38.75 B29.42 T68.17
Helper on Straight 3-axle truck; Mechanic's helper	W38.55 B29.42 T67.97
Large, off-road Dump or Water truck, Transit Mix Driver	W39.10 B29.42 T68.52
Mechanics	W39.25 B29.42 T68.67
Shop Steward	W40.10 B29.42 T69.52
Straight 3-axle truck	W38.75 B29.42 T68.17
Tow truck	W38.90 B29.42 T68.32
Tractor-Trailer (any), Fuel, Winch, Asphalt Oil Distributor trucks	W39.10 B29.42 T68.52

**Craft: Truck Driver**

**COMMENTS/NOTES**

**HAZARDOUS WASTE WORK:**

- On hazardous waste removal work on a State-designated hazardous waste site where the driver is in direct contact with hazardous materials and when personal protective equipment is required for respiratory, skin, and eye protection: + \$3.00 per hour.
- All other designated hazardous waste sites: + \$1.00 per hour.

**SHIFT DIFFERENTIALS:**

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT  
PREVAILING WAGE RATE DETERMINATION**

**County - CAMDEN**

- Second and Third shifts shall receive an additional \$1.50 per hour.

**OVERTIME:**

- Hours in excess of 8 per day, Monday through Friday, and all hours on Saturdays shall be paid at time and one-half the hourly rate. All hours on Sundays and holidays shall be paid at double the hourly rate.
- Four 10-hour days may be worked at straight time, Monday through Thursday, with Friday used as a make-up day. If Friday is not a make-up day, then all hours on Friday shall be paid at time and one-half the hourly rate.

**RECOGNIZED HOLIDAYS:** New Year's Day, President's Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. The day after Thanksgiving may be substituted for Veterans' Day.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT  
PREVAILING WAGE RATE DETERMINATION**

**County - CAMDEN**

**Craft: Truck Driver-Material Delivery Driver**

**PREVAILING WAGE RATE**

	07/15/21
Driver	W33.35 B29.42 T62.77

**Craft: Truck Driver-Material Delivery Driver**

**COMMENTS/NOTES**

These rates apply to delivery of materials TO a jobsite.

**SHIFT DIFFERENTIALS:**

- Second and Third shifts shall receive an additional \$1.50 per hour.

**OVERTIME:**

- Hours in excess of 8 per day, Monday through Friday, and all hours on Saturdays shall be paid at time and one-half the hourly rate. All hours on Sundays and holidays shall be paid at double the hourly rate.
- Four 10-hour days may be worked at straight time, Monday through Thursday, with Friday used as a make-up day. If Friday is not a make-up day, then all hours on Friday shall be paid at time and one-half the hourly rate.

**RECOGNIZED HOLIDAYS:** New Year's Day, President's Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. The day after Thanksgiving may be substituted for Veterans' Day.

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT  
PREVAILING WAGE RATE DETERMINATION**

**County - CAMDEN**

**Craft: Welder**

**PREVAILING WAGE RATE**

Welder

**Craft: Welder**

**COMMENTS/NOTES**

Welders rate is the same as the craft to which the welding is incidental .

# STATEWIDE RATES



**OPERATING ENGINEERS**     **Rates Expiration Date :**

{For apprentice rates refer to "Operating Engineers" apprentice rates in any county rate package}

The regular workday consists of 8 hours, Monday to Friday, between 6:00 AM and 4:30 PM.

**SHIFT DIFFERENTIALS:**

- Shift work must run for 5 consecutive workdays.
- When 2 shifts are worked, the second shift shall receive an additional 10% of the regular rate inclusive of benefits, per hour.
- When 3 shifts are worked, the second shift shall receive 8 hours pay for 7.5 hours of work, plus an additional 10% of the regular rate inclusive of benefits, per hour. The third shift shall receive 8 hours pay for 7 hours of work, plus an additional 15% of the regular rate inclusive of benefits, per hour.
- When such hours are mandated by the project owner, a shift that starts between 8:00 PM and midnight and ends by 6:00 AM Saturday, or that starts after 8:00 PM on Sunday, provided there are consecutive hours of work within the shift, shall receive an additional 15% of the regular rate, inclusive of benefits.
- On Highway, Road, Street, and Sewer projects irregular shifts starting between 5:00 PM and 12:00 AM may be worked Monday through Friday, and shall receive an additional 15% of the regular rate, inclusive of benefits. When working with other trades that receive a higher irregular shift rate, the Operating Engineer shall also receive the higher irregular shift rate.

**OVERTIME:**

- Hours in excess of 8 per day, or outside of the regular workday, Monday through Friday, that are not shift work, and all hours on Saturdays shall be paid at time and one-half the regular rate, inclusive of benefits. All hours on Sundays and holidays shall be paid at double the regular rate, inclusive of benefits.
- Four 10-hour days may be worked, Monday through Thursday, at straight time, with all hours on Friday paid at time and one-half the regular rate, inclusive of benefits.

**RECOGNIZED HOLIDAYS:** New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans Day, Thanksgiving Day, Christmas Day. Sunday holidays observed the following Monday. When all trades on a particular job site agree, the day after Thanksgiving may be substituted for Veteran's Day.

On hazardous waste removal work or asbestos removal work, on a state or federally designated hazardous waste site, where the operating engineer is in direct contact with hazardous material and when personal protective equipment is required for respiratory, skin, and eye protection, the operating engineer shall receive an additional 20% of the hourly wage, per hour.

**OPERATING ENGINEERS**      **Rates Expiration Date :**

**Effective Dates:**

07/01/2021			07/01/2022
Rate	Fringe	Total	Total
54.43	35.60	90.03	92.28

**CLASSIFICATIONS:**

A-Frame

Backhoe (combination)

Boom Attachment on loaders (Except pipehook)

Boring & Drilling Machine

Brush Chopper, Brush Shredder, Tree Shredder, Tree Shearer

Bulldozer, finish grade

Cableway

Carryall

Concrete Pump

Concrete Pumping System (Pumpcrete & similar types)

Conveyor, 125 feet or longer

Drill Doctor (Duties include dust collector and maintenance)

Front End Loader (2 cu. yds. but less than 5 cu. yds.)

Grader, finish

Groove Cutting Machine (ride-on type)

Heater Planer

Hoist: Outside Material Tower Hoist (all types including steam, gas, diesel, electric, air hydraulic, single and double drum, concrete, brick shaft caisson, snorkle roof, and other similar types, Except Chicago-boom type) \* receives an additional \$1.00 per hour on 100 ft. up to 199 ft. total height, and an additional \$2.00 per hour on 200 ft. and over total height.

Hydraulic Crane (10 tons & under)

Hydraulic Dredge

Hydro-Axe

Hydro-Blaster

**OPERATING ENGINEERS**      **Rates Expiration Date :**

**Effective Dates:**

<b>07/01/2021</b>			<b>07/01/2022</b>
Rate	Fringe	Total	Total
54.43	35.60	90.03	92.28

**CLASSIFICATIONS:**

Jack (screw, air hydraulic, power-operated unit, or console type, Except hand jack or pile load test type)

Log Skidder

Pan

Paver, concrete

Plate & Frame Filter Press

Pumpcrete (unit type)

Pumpcrete, Squeezecrete, or Concrete Pumping machine (regardless of size)

Scraper

Side Boom

Straddle Carrier (Ross and similar types)

Whiphammer

Winch Truck (hoisting)

**OPERATING ENGINEERS**      **Rates Expiration Date :**

**Effective Dates:**

<b>07/01/2021</b>			<b>07/01/2022</b>
Rate	Fringe	Total	Total
52.52	35.60	88.12	90.37

**CLASSIFICATIONS:**

Asphalt Curbing Machine

Asphalt Plant Engineer

Asphalt Spreader

Autograde Curb Trimmer & Sidewalk Shoulder Slipform (CMI & similar types)

Autograde Curecrete Machine (CMI & similar types)

Autograde Tube Finisher & Texturing Machine (CMI & similar types)

Bar Bending Machines (Power)

Batcher, Batching Plant, & Crusher [On Site]

Belt Conveyor System

Boom-Type Skimmer Machine

Bridge Deck Finisher

Bulldozer (all sizes)

Captain (Power Boats)

Car Dumper (railroad)

Compressor & Blower unit for loading/unloading of concrete,  
cement, fly ash, or similar type materials (used independently  
or truck-mounted)

Compressor (2 or 3 battery)

Concrete Breaking Machine

Concrete Cleaning/Decontamination Machine

Concrete Finishing Machine

Concrete Saw or Cutter (ride-on type)

Concrete Spreader (Hetzl, Rexomatic & similar types)

Concrete Vibrator

**OPERATING ENGINEERS**      **Rates Expiration Date :**

**Effective Dates:**

<b>07/01/2021</b>			<b>07/01/2022</b>
Rate	Fringe	Total	Total
52.52	35.60	88.12	90.37

**CLASSIFICATIONS:**

Conveyors - under 125 feet

Crane Signalman

Crushing Machine

Directional Boring Machine

Ditching Machine - Small (Ditchwitch, Vermeer or similar types)

Dope Pot - Mechanical (with or without pump)

Dumpster

Elevator

Fireman

Fork Lift (Economobile, Lull & similar types)

Front End Loader (1 cu. yd. and over but less than 2 cu. yds.)

Generator (2 or 3 battery)

Giraffe Grinder

Goldhofer/Hydraulic Jacking Trailer

Grader & Motor Patrols

Grout Pump

Gunnite Machine (Excluding nozzle)

Hammer - Vibratory (in conjunction with generator)

Heavy Equipment Robotics - Operator/Technician

Hoist (roof, tugger, aerial platform hoist, house car)

Hopper

Hopper Doors (power operated)

Ladder (motorized)

**OPERATING ENGINEERS**      **Rates Expiration Date :**

**Effective Dates:**

<b>07/01/2021</b>			<b>07/01/2022</b>
Rate	Fringe	Total	Total
52.52	35.60	88.12	90.37

**CLASSIFICATIONS:**

Laddervator

Locomotive (Dinky-type)

Maintenance Utility Man

Master Environmental Maintenance Technician

Mechanic

Mixer (Except paving mixers)

Pavement Breaker (truck-mounted or small self-propelled  
ride-on type)

Pavement Breaker - maintenance of compressor or hydraulic unit

Pipe Bending Machine (power)

Pitch Pump

Plaster Pump (regardless of size)

Post Hole Digger (post pounder, auger)

Rod Bending Machines

Roller (black top)

Scale (power)

Seamen Pulverizing Mixer

Shoulder Widener

Silo

Skimmer Machine (boom type)

Steel Cutting Machine (service & maintenance)

Tamrock Drill

Tractor

Transfer Machines

**OPERATING ENGINEERS**      **Rates Expiration Date :**

**Effective Dates:**

<b>07/01/2021</b>			<b>07/01/2022</b>
Rate	Fringe	Total	Total
52.52	35.60	88.12	90.37

**CLASSIFICATIONS:**

Tug Captains

Tug Master (Power Boats)

Ultra High Pressure Waterjet Cutting Tool System -  
Operator/Maintenance Technician

Vacuum Blasting Machine - Operator/Maintenance Technician

Vibrating Plant (used with unloading)

Welder & Repair Mechanic

**Effective Dates:**

<b>07/01/2021</b>			<b>07/01/2022</b>
Rate	Fringe	Total	Total
49.18	35.60	84.78	87.03

**CLASSIFICATIONS:**

Assistant Engineer/Oiler

Driller's Helper

Field Engineer - Transit man or Instrument man

Maintenance Apprentice (Deckhand)

Maintenance Apprentice (Oiler)

Mechanic's Helper

Off Road Back Dump

Tire Repair & Maintenance

**Effective Dates:**

<b>07/01/2021</b>			<b>07/01/2022</b>
Rate	Fringe	Total	Total
46.60	35.60	82.20	84.45

**CLASSIFICATIONS:**

Field Engineer - Rodman or Chainman

TERRITORY  
ENTIRE STATE

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT  
PREVAILING WAGE RATE DETERMINATION

OPERATING ENGINEERS      Rates Expiration Date :

Effective Dates:

07/01/2021			07/01/2022
Rate	Fringe	Total	Total
56.76	35.60	92.36	94.61

**CLASSIFICATIONS:**

Lead Engineer, Foreman Engineer, Safety Engineer (minimum)



**OPERATING ENGINEERS**      **Rates Expiration Date :**

**Effective Dates:**

<b>07/01/2021</b>			<b>07/01/2022</b>
Rate	Fringe	Total	Total
56.02	35.60	91.62	93.87

**CLASSIFICATIONS:**

Autograde Pavement Profiler (CMI & similar types)

Autograde Pavement Profiler - Recycle Type (CMI & similar types)

Autograde Placer/Trimmer/Spreader Combination (CMI & similar types)

Autograde Slipform Paver (CMI & similar types)

Backhoe (Excavator)

Central Power Plant

Concrete Paving Machine

Cranes, Derricks, Pile Drivers (all types), under 100 tons with a boom (including jib and/or leads) under 100 ft.

Draglines

Drill, Bauer, AMI and similar types

Drillmaster, Quarrymaster

Drillmaster/Quarrymaster (down-the-hole drill), rotary drill, self-propelled hydraulic drill, self-powered drill

Elevator Grader

Field Engineer-Chief of Party

Front End Loader (5 cu. yards or larger)

Gradall

Grader, Rago

Helicopter Co-Pilot

Helicopter Communications Engineer

Juntann Pile Driver

Locomotive (large)

Mucking Machine

OPERATING ENGINEERS

Rates Expiration Date :

Effective Dates:

07/01/2021			07/01/2022
Rate	Fringe	Total	Total
56.02	35.60	91.62	93.87

CLASSIFICATIONS:

- Pavement & Concrete Breaker (Superhammer & Hoe Ram)
- Pile Driver
- Prentice Truck
- Roadway Surface Grinder
- Scooper (loader & shovel)
- Shovel (Excavator)
- Trackhoe (Excavator)
- Tree Chopper with boom
- Trenching Machine (cable plow)
- Tunnel Boring Machine
- Vacuum Truck

**OPERATING ENGINEERS**      **Rates Expiration Date :**

**Effective Dates:**

<b>07/01/2021</b>			<b>07/01/2022</b>
Rate	Fringe	Total	Total
50.89	35.60	86.49	88.74

**CLASSIFICATIONS:**

Chipper

Compressor (single)

Concrete Spreader (small type)

Conveyor Loader (Except elevator graders)

Engines, Large Diesel (1620 HP) & Staging Pump

Farm Tractor

Fertilizing Equipment (operation & maintenance)

Fine Grade Machine (small type)

Form Line Grader (small type)

Front End Loader (under 1 cubic yard)

Generator (single)

Grease, Gas, Fuel, & Oil Supply Trucks

Heaters (Nelson or other type)

Lights - portable generating light plant

Mixer, Concrete (small)

Mulching Equipment (operation & maintenance)

Power Broom or Sweeper

Pump (diesel engine & hydraulic - regardless of power)

Pump (larger than 2 inch suction, including submersible pumps)

Road Finishing Machine (small type)

Roller - grade, fill, or stone base

Seeding Equipment (operation & maintenance)

Sprinkler & Water Pump Trucks

**OPERATING ENGINEERS**      **Rates Expiration Date :**

**Effective Dates:**

<b>07/01/2021</b>			<b>07/01/2022</b>
Rate	Fringe	Total	Total
50.89	35.60	86.49	88.74

**CLASSIFICATIONS:**

Steam Generator or Boiler

Stone Spreader

Tamping Machine (vibrating ride-on type)

Temporary Heating Plant (Nelson or other type, including  
propane, natural gas, and flow-type units)

Water or Sprinkler Truck

Welding Machine (gas, diesel, or electric convertor, of any type)

Welding System - Multiple (rectifier transformer type)

Wellpoint Systems (including installation by bull gang and  
maintenance)

**Effective Dates:**

<b>07/01/2021</b>			<b>07/01/2022</b>
Rate	Fringe	Total	Total
57.84	35.60	93.44	95.69

**CLASSIFICATIONS:**

Helicopter Pilot/Engineer

**Effective Dates:**

<b>07/01/2021</b>			<b>07/01/2022</b>
Rate	Fringe	Total	Total
62.52	35.60	98.12	100.37

**CLASSIFICATIONS:**

Cranes, Derricks, Pile Driver (all types), 100 tons and over and TOWER CRANE with boom (including jib and/or leads) 140 ft. and over

**Effective Dates:**

<b>07/01/2021</b>			<b>07/01/2022</b>
Rate	Fringe	Total	Total
61.52	35.60	97.12	99.37

**CLASSIFICATIONS:**

Cranes, Derricks, Pile Driver (all types), 100 tons and over and TOWER CRANE with boom (including jib and/or leads) from 100 ft. to  
139 ft.

**OPERATING ENGINEERS**      **Rates Expiration Date :**

**Effective Dates:**

<b>07/01/2021</b>			<b>07/01/2022</b>
Rate	Fringe	Total	Total
58.02	35.60	93.62	95.87

**CLASSIFICATIONS:**

Cranes, Derricks, Pile Driver (all types) , under 100 tons with a boom (including jib and/or leads) 140 ft. and over

**Effective Dates:**

<b>07/01/2021</b>			<b>07/01/2022</b>
Rate	Fringe	Total	Total
60.52	35.60	96.12	98.37

**CLASSIFICATIONS:**

Cranes, Derricks, Pile Driver (all types), 100 tons and over and TOWER CRANE with a boom (including jib and/or leads) under 100 ft.

**Effective Dates:**

<b>07/01/2021</b>			<b>07/01/2022</b>
Rate	Fringe	Total	Total
57.02	35.60	92.62	94.87

**CLASSIFICATIONS:**

Cranes, Derricks, Pile Driver (all types), under 100 tons with a boom (including jib and/or leads) from 100 ft. to 139 ft.

**STRUCTURAL STEEL ERECTION**     **Rates Expiration Date :**

{For apprentice rates refer to "Operating Engineers" apprentice rates in any county rate package}

The regular workday consists of 8 hours, Monday to Friday, between 6:00 AM and 4:30 PM.

**SHIFT DIFFERENTIALS:**

- Shift work must run for 5 consecutive workdays.
- When 2 shifts are worked, the second shift shall receive an additional 10% of the regular rate inclusive of benefits, per hour.
- When 3 shifts are worked, the second shift shall receive 8 hours pay for 7.5 hours of work, plus an additional 10% of the regular rate inclusive of benefits, per hour. The third shift shall receive 8 hours pay for 7 hours of work, plus an additional 15% of the regular rate inclusive of benefits, per hour.
- When such hours are mandated by the project owner, a shift that starts between 8:00 PM and midnight and ends by 6:00 AM Saturday, or that starts after 8:00 PM on Sunday, provided there are consecutive hours of work within the shift, shall receive an additional 15% of the regular rate, inclusive of benefits.
- On Highway, Road, Street, and Sewer projects irregular shifts starting between 5:00 PM and 12:00 AM may be worked Monday through Friday, and shall receive an additional 15% of the regular rate, inclusive of benefits. When working with other trades that receive a higher irregular shift rate, the Operating Engineer shall also receive the higher irregular shift rate.

**OVERTIME:**

- Hours in excess of 8 per day, or outside of the regular workday, Monday through Friday, that are not shift work, and all hours on Saturdays shall be paid at time and one-half the regular rate, inclusive of benefits. All hours on Sundays and holidays shall be paid at double the regular rate, inclusive of benefits.
- Four 10-hour days may be worked, Monday through Thursday, at straight time, with all hours on Friday paid at time and one-half the regular rate, inclusive of benefits.

**RECOGNIZED HOLIDAYS:** New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans Day, Thanksgiving Day, Christmas Day. Sunday holidays observed the following Monday. When all trades on a particular job site agree, the day after Thanksgiving may be substituted for Veteran's Day.

On hazardous waste removal work or asbestos removal work, on a state or federally designated hazardous waste site, where the operating engineer is in direct contact with hazardous material and when personal protective equipment is required for respiratory, skin, and eye protection, the operating engineer shall receive an additional 20% of the hourly wage, per hour.

**Effective Dates:**

<b>07/01/2021</b>			<b>07/01/2022</b>
Rate	Fringe	Total	Total
59.65	35.60	95.25	97.50

**CLASSIFICATIONS:**

Helicopter Co-Pilot & Communications Engineer

TERRITORY  
ENTIRE STATE

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT  
PREVAILING WAGE RATE DETERMINATION

**STRUCTURAL STEEL ERECTION**      **Rates Expiration Date :**

**Effective Dates:**

<b>07/01/2021</b>			<b>07/01/2022</b>
Rate	Fringe	Total	Total
55.59	35.60	91.19	93.44

**CLASSIFICATIONS:**

A-Frame

Cherry Picker -10 tons or less (Over 10 tons use crane rate)

Hoist (all types Except Chicago-boom)

Jack (screw, air hydraulic, power-operated unit or console  
type, Except hand jack or pile load test type)

Side Boom

Straddle Carrier

**STRUCTURAL STEEL ERECTION**      **Rates Expiration Date :**

**Effective Dates:**

<b>07/01/2021</b>			<b>07/01/2022</b>
Rate	Fringe	Total	Total
52.93	35.60	88.53	90.78

**CLASSIFICATIONS:**

Aerial Platform Used On Hoists

Apprentice Engineer/Oiler with Compressor or Welding Machine

Captain (Power Boats)

Compressor (2 or 3 in battery)

Concrete Cleaning/Decontamination Machine Operator

Conveyor or Tugger Hoist

Directional Boring Machine

Elevator or House Car

Fireman

Forklift

Generator (2 or 3)

Heavy Equipment Robotics, Operator/Technician

Maintenance Utility Man

Master Environmental Maintenance Technician

Tug Master (Power Boats)

Ultra High Pressure Waterjet Cutting Tool System Operator/Maintenance Technician

Vacuum Blasting Machine Operator/Maintenance Technician

Welding Machines, Gas or Electric Converters on any type-2 or 3 in battery including diesels



**STRUCTURAL STEEL ERECTION**      **Rates Expiration Date :**

**Effective Dates:**

07/01/2021			07/01/2022
Rate	Fringe	Total	Total
51.40	35.60	87.00	89.25

**CLASSIFICATIONS:**

Compressor (Single)

Generators

Welding Machines, Gas, Diesel, Or Electric Converters of any type-single

Welding System, Multiple (Rectifier Transformer Type)

**Effective Dates:**

07/01/2021			07/01/2022
Rate	Fringe	Total	Total
49.64	35.60	85.24	87.49

**CLASSIFICATIONS:**

Assistant Engineer/Oiler

Drillers Helper

Field Engineer - Transit/Instrument Man

Maintenance Apprentice (Deckhand)

Maintenance Apprentice (Oiler)

Off Road Back Dump

**Effective Dates:**

07/01/2021			07/01/2022
Rate	Fringe	Total	Total
57.21	35.60	92.81	95.06

**CLASSIFICATIONS:**

Lead Engineer, Foreman Engineer, Safety Engineer (Minimum)

**Effective Dates:**

07/01/2021			07/01/2022
Rate	Fringe	Total	Total
46.60	35.60	82.20	84.45

**CLASSIFICATIONS:**

Field Engineer - Rodman or Chainman

**STRUCTURAL STEEL ERECTION**      **Rates Expiration Date :**

**Effective Dates:**

07/01/2021			07/01/2022
Rate	Fringe	Total	Total
56.35	35.60	91.95	94.20

**CLASSIFICATIONS:**

Field Engineer-Chief of Party

Vacuum Truck

**Effective Dates:**

07/01/2021			07/01/2022
Rate	Fringe	Total	Total
64.54	35.60	100.14	102.39

**CLASSIFICATIONS:**

Cranes (all cranes, land or floating with booms, including jib, 140 ft. and over, above ground). Derricks (all derricks, land, floating or Chicago Boom type with booms including jib, 140 ft. and over, above ground), and Pile Drivers (all types) 100 tons and over and Tower Cranes.

**Effective Dates:**

07/01/2021			07/01/2022
Rate	Fringe	Total	Total
62.88	35.60	98.48	100.73

**CLASSIFICATIONS:**

Cranes (all cranes, land or floating with booms including jib, less than 140 ft. above ground), Derricks (all derricks, land, floating or Chicago Boom type with booms including jib, less than 140 ft. above ground), Pile Drivers (all types), 100 tons and over and Tower Crane.

**Effective Dates:**

07/01/2021			07/01/2022
Rate	Fringe	Total	Total
60.04	35.60	95.64	97.89

**CLASSIFICATIONS:**

Cranes (all cranes, land or floating with booms including jib, 140 ft. and over, above ground), Derricks (all derricks, land, floating or Chicago Boom type with booms including jib, 140 ft. and over, above ground), Pile Drivers (all types), under 100 tons.

**Effective Dates:**

07/01/2021			07/01/2022
Rate	Fringe	Total	Total
58.38	35.60	93.98	96.23

**CLASSIFICATIONS:**

Cranes (all cranes, land or floating with booms including jib, less than 140 ft. above ground), Derricks (all derricks, land, floating or Chicago Boom type with booms including jib, less than 140 ft. above ground), Pile Drivers (all types), under 100 tons.

TERRITORY  
ENTIRE STATE

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT  
PREVAILING WAGE RATE DETERMINATION

STRUCTURAL STEEL ERECTION      Rates Expiration Date :

Effective Dates:

07/01/2021			07/01/2022
Rate	Fringe	Total	Total
60.04	35.60	95.64	97.89

CLASSIFICATIONS:

Helicopter Pilot & Engineer

**TEST BORING PRELIMINARY TO CONSTRUCTION-SOUTH/WEST**      **Rates Expiration Date :**

THESE RATES APPLY IN THE FOLLOWING COUNTIES ONLY:

Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester, Hunterdon, Mercer, Monmouth, Ocean, Salem, Sussex, Warren

The regular workday consists of 8 hours, Monday to Friday, between 6:00 AM and 4:30 PM.

**SHIFT DIFFERENTIALS:**

- Shift work must run for 5 consecutive workdays.
- When 2 shifts are worked, the second shift shall receive an additional 10% of the regular rate inclusive of benefits, per hour.
- When 3 shifts are worked, the second shift shall receive 8 hours pay for 7.5 hours of work, plus an additional 10% of the regular rate inclusive of benefits, per hour. The third shift shall receive 8 hours pay for 7 hours of work, plus an additional 15% of the regular rate inclusive of benefits, per hour.
- When such hours are mandated by the project owner, a shift that starts between 8:00 PM and midnight and ends by 6:00 AM Saturday, or that starts after 8:00 PM on Sunday, provided there are consecutive hours of work within the shift, shall receive an additional 15% of the regular rate, inclusive of benefits.
- On Highway, Road, Street, and Sewer projects irregular shifts starting between 5:00 PM and 12:00 AM may be worked Monday through Friday, and shall receive an additional 15% of the regular rate, inclusive of benefits. When working with other trades that receive a higher irregular shift rate, the Operating Engineer shall also receive the higher irregular shift rate.

**OVERTIME:**

- Hours in excess of 8 per day, or outside of the regular workday, Monday through Friday, that are not shift work, and all hours on Saturdays shall be paid at time and one-half the regular rate, inclusive of benefits. All hours on Sundays and holidays shall be paid at double the regular rate, inclusive of benefits.
- Four 10-hour days may be worked, Monday through Thursday, at straight time, with all hours on Friday paid at time and one-half the regular rate, inclusive of benefits.

**RECOGNIZED HOLIDAYS:** New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans Day, Thanksgiving Day, Christmas Day. Sunday holidays observed the following Monday. When all trades on a particular job site agree, the day after Thanksgiving may be substituted for Veteran's Day.

On hazardous waste removal work or asbestos removal work, on a state or federally designated hazardous waste site, where the operating engineer is in direct contact with hazardous material and when personal protective equipment is required for respiratory, skin, and eye protection, the operating engineer shall receive an additional 20% of the hourly wage, per hour.

**Effective Dates:**

07/01/2021			07/01/2022
Rate	Fringe	Total	Total
56.02	35.60	91.62	93.87

**CLASSIFICATIONS:**

Driller

**Effective Dates:**

07/01/2021			07/01/2022
Rate	Fringe	Total	Total
49.18	35.60	84.78	87.03

**CLASSIFICATIONS:**

Driller's Helper

**FREE AIR TUNNEL JOBS**      **Rates Expiration Date :**

{For apprentice rates refer to "Heavy & General" apprentice rates in any county rate package}

The regular workday consists of 8 hours, starting at 7:00 AM or 8:00 AM.

**SHIFT DIFFERENTIALS:**

- Shifts must start at 3:00 PM, 4:00 PM, 12:00 AM, or 1:00 AM, to be considered shift work, except when the project owner mandates special hours of work in the job specifications, in which case those hours may be considered shift work.
- When such hours are mandated by the project owner, a shift that begins before midnight on Friday and ends on Saturday morning, or that begins at or after 8:00 PM on Sunday and ends on Monday morning may be paid at the shift differential rate.
- Shifts shall receive an additional \$3.00 per hour.

**OVERTIME:**

- Hours in excess of 8 per day, Monday through Friday, or outside of the regular workday that are not shift work, and all hours on Saturdays, shall be paid at time and one-half the hourly rate. All hours on Sundays and holidays shall be paid at double the hourly rate.
- Four 10-hour days may be worked, Monday through Thursday, at straight time, with Friday used as a make-up day for a day lost to inclement weather. If Friday is not a make-up day, all hours on Friday shall be paid at time and one-half the hourly rate.

**RECOGNIZED HOLIDAYS:** New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. Sunday holidays observed the following Monday. Veterans Day may be substituted for the day after Thanksgiving. However, in the trading of Veterans Day for the day after Thanksgiving, if overtime is worked on Veterans Day, it shall be paid at double the hourly rate.

**Hazardous Waste Work:**

- where Level A, B, or C protection is required: + \$3.00/hr
- other Hazardous Waste site: + \$1.00/hr

**Effective Dates:**

03/03/2021			09/01/2021	03/01/2022	03/01/2023
Rate	Fringe	Total	Total	Total	Total
46.25	33.23	79.48	80.78	83.53	86.03

**CLASSIFICATIONS:**

Walking Boss & Superintendent

**Effective Dates:**

03/03/2021			09/01/2021	03/01/2022	03/01/2023
Rate	Fringe	Total	Total	Total	Total
45.95	33.23	79.18	80.48	83.23	85.73

**CLASSIFICATIONS:**

Heading Foreman, Shaft Foreman, Rod Foreman, Electrician Foreman, Rigging Foreman

**TERRITORY**  
**ENTIRE STATE**

**NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT**  
**PREVAILING WAGE RATE DETERMINATION**

**FREE AIR TUNNEL JOBS**      **Rates Expiration Date :**

**Effective Dates:**

<b>03/03/2021</b>			<b>09/01/2021</b>	<b>03/01/2022</b>	<b>03/01/2023</b>
Rate	Fringe	Total	Total	Total	Total
45.45	33.23	78.68	79.98	82.73	85.23

**CLASSIFICATIONS:**

Iron Foreman, Caulking Foreman, Form Foreman, Cement Finishing Foreman, Concrete Foreman, Track Foreman, Cleanup Foreman, Grout Foreman

**Effective Dates:**

<b>03/03/2021</b>			<b>09/01/2021</b>	<b>03/01/2022</b>	<b>03/01/2023</b>
Rate	Fringe	Total	Total	Total	Total
47.95	33.23	81.18	82.48	85.23	87.73

**CLASSIFICATIONS:**

Blaster

**Effective Dates:**

<b>03/03/2021</b>			<b>09/01/2021</b>	<b>03/01/2022</b>	<b>03/01/2023</b>
Rate	Fringe	Total	Total	Total	Total
44.90	33.23	78.13	79.43	82.18	84.68

**CLASSIFICATIONS:**

Top Labor Foreman

**Effective Dates:**

<b>03/03/2021</b>			<b>09/01/2021</b>	<b>03/01/2022</b>	<b>03/01/2023</b>
Rate	Fringe	Total	Total	Total	Total
44.55	33.23	77.78	79.08	81.83	84.33

**CLASSIFICATIONS:**

Skilled Men (including Caulker, Powder Carrier, all other skilled men)

Skilled Men (including Miner, Drill Runner, Iron Man, Conveyor Man, Manitenance Man, Safety Miner, Rigger, Block Layer, Cement Finisher, Tod Man)

**Effective Dates:**

<b>03/03/2021</b>			<b>09/01/2021</b>	<b>03/01/2022</b>	<b>03/01/2023</b>
Rate	Fringe	Total	Total	Total	Total
44.40	33.23	77.63	78.93	81.68	84.18

**CLASSIFICATIONS:**

Semi-Skilled Men (including Bell or Signal Man Top or Bottom, Form Worker & Mover, Concrete Worker, Shaft Man, Tunnel Laborer, Caulker's Helper, all other semi-skilled)

Semi-Skilled Men (including Miner's Helper, Chuck Tender, Track Man, Nipper, Brake Man, Derail Man, Cable Man, Hose Man, Gravel Man, Form Man)

TERRITORY  
ENTIRE STATE

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT  
PREVAILING WAGE RATE DETERMINATION

FREE AIR TUNNEL JOBS      Rates Expiration Date :

**Effective Dates:**

03/03/2021			09/01/2021	03/01/2022	03/01/2023
Rate	Fringe	Total	Total	Total	Total
44.00	33.23	77.23	78.53	81.28	83.78

**CLASSIFICATIONS:**

All Others (including Powder Watchman, Change House Attendant, Top Laborer)

**DRILL FOR GROUND WATER SUPPLY**     **Rates Expiration Date :**

The well driller and/or helper may perform all work relative to the construction, finishing, and servicing of wells, pumps and borings for ground water supply. The present methods of well drilling entailing as they do, many diverse job operations calling for drilling, pump discharge, piping, and the operation of various types of related power equipment, shall all be within the job duties and functions of the well driller and/or helper. In the event that an extension of work should occur beyond water well drilling functions, into the field of general construction work, such extension of work would come under the appropriate rates listed elsewhere in this wage determination.

- For Work Hours, Shift Differentials, Overtime Rates, and Recognized Holidays see the "Operating Engineers" section of this wage determination.

**Effective Dates:**

07/01/2021			07/01/2022
Rate	Fringe	Total	Total
54.77	35.60	90.37	92.62

**CLASSIFICATIONS:**

Driller

**Effective Dates:**

07/01/2021			07/01/2022
Rate	Fringe	Total	Total
47.93	35.60	83.53	85.78

**CLASSIFICATIONS:**

Driller's Helper



**OPERATING ENGINEERS MARINE-DREDGING**     **Rates Expiration Date :**

NOTE: These wage rates only apply to dredging and other marine construction activities occurring in navigable waters and their tributaries.

Boat crews carrying explosive material (dynamite, pourfex, and other similar materials) shall be paid at 120% of the hourly wage rate for hours engaged in handling of said materials. Employees required to possess a Hazardous Material Certification as a condition of employment shall be compensated at 120% of the hourly wage rate.

**OVERTIME:**

Hours in excess of 40 per week, and all hours on Saturdays and Sundays, shall be paid at time and one-half the hourly rate. All hours on holidays shall be paid at double the hourly rate.

**RECOGNIZED HOLIDAYS:** New Year's Day, Martin Luther King Day, Good Friday, Memorial Day, July 4th, Labor Day, Veterans' Day, Thanksgiving Day, Christmas Day. Sunday holidays observed the following Monday.

**Effective Dates:**

**10/01/2020**

Rate	Fringe	Total
41.42	15.29	56.71

**CLASSIFICATIONS:**

Lead Dredgerman, Operator, Leverman

Licensed Tug Operator (over 1000 HP)

**Effective Dates:**

**10/01/2020**

Rate	Fringe	Total
35.82	14.84	50.66

**CLASSIFICATIONS:**

Derrick Operator, Spider/Spill Barge Operator

Engineer, Electrician, Chief Welder, Chief Mate

Fill Placer, Operator II

Licensed Boat Operator

Maintenance Engineer

**Effective Dates:**

**10/01/2020**

Rate	Fringe	Total
33.72	14.67	48.39

**CLASSIFICATIONS:**

Certified Welder

**OPERATING ENGINEERS MARINE-DREDGING**     **Rates Expiration Date :**

**Effective Dates:**

**10/01/2020**

Rate	Fringe	Total
32.80	14.30	47.10

**CLASSIFICATIONS:**

Mate, Drag Barge Operator, Steward, Assistant Fill Placer

Welder

**Effective Dates:**

**10/01/2020**

Rate	Fringe	Total
31.74	14.21	45.95

**CLASSIFICATIONS:**

Boat Operator

**Effective Dates:**

**10/01/2020**

Rate	Fringe	Total
26.37	13.48	39.85

**CLASSIFICATIONS:**

Shoreman, Deckhand, Rodman, Scowman

**Effective Dates:**

**10/01/2020**

Rate	Fringe	Total
36.91	14.93	51.84

**CLASSIFICATIONS:**

Crane Operator

**MICROSURFACING/SLURRY SEAL**     **Rates Expiration Date :**

THESE RATES APPLY IN THE FOLLOWING COUNTIES ONLY:

Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester, Mercer, Ocean, Salem

\*\*\*IN ALL OTHER COUNTIES use the Heavy and General Laborers - North "Slurry Seal Laborer" rates.\*\*\*

**SHIFT DIFFERENTIALS:**

Any shift starting at 3:30 PM or later shall receive an additional \$0.35/hr

**OVERTIME:**

Hours in excess of 8 per day or 40 per week shall be paid at time and one-half the hourly rate. All hours on holidays shall be paid at double the hourly rate.

RECOGNIZED HOLIDAYS: New Year's Day, Washington's Birthday, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day.

**Effective Dates:**

**03/01/2017**

Rate	Fringe	Total
36.50	21.27	57.77

**CLASSIFICATIONS:**

Foreman

**Effective Dates:**

**03/01/2017**

Rate	Fringe	Total
33.80	21.27	55.07

**CLASSIFICATIONS:**

Box man

**Effective Dates:**

**03/01/2017**

Rate	Fringe	Total
31.75	21.27	53.02

**CLASSIFICATIONS:**

Microsurface/Slurry Preparation

**Effective Dates:**

**03/01/2017**

Rate	Fringe	Total
31.75	21.27	53.02

**CLASSIFICATIONS:**

Squeegee man

TERRITORY  
ENTIRE STATE

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT  
PREVAILING WAGE RATE DETERMINATION

MICROSURFACING/SLURRY SEAL      Rates Expiration Date :

Effective Dates:

03/01/2017

Rate	Fringe	Total
30.30	21.27	51.57

**CLASSIFICATIONS:**

Cleaner, Taper

**ASPHALT LABORERS - SOUTH**      **Rates Expiration Date :**

"THESE RATES APPLY IN THE FOLLOWING COUNTIES ONLY: Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester, Mercer, Ocean, Salem

{For apprentice rates refer to "Laborer - Heavy & General" apprentice rates in any county rate package}

The regular workday consists of 8 hours, starting at 7:00 AM or 8:00 AM.

**SHIFT DIFFERENTIALS:**

- Shifts must start at 3:00 PM, 4:00 PM, 12:00 AM, or 1:00 AM, to be considered shift work, except when the project owner mandates special hours of work in the job specifications, in which case those hours may be considered shift work.
- When such hours are mandated by the project owner, a shift that begins before midnight on Friday and ends on Saturday morning, or that begins at or after 8:00 PM on Sunday and ends on Monday morning may be paid at the shift differential rate.
- Shifts shall receive an additional \$3.00 per hour.

**OVERTIME:**

- Hours in excess of 8 per day, Monday through Friday, or outside of the regular workday that are not shift work, and all hours on Saturdays, shall be paid at time and one-half the hourly rate. All hours on Sundays and holidays shall be paid at double the hourly rate.
- Four 10-hour days may be worked, Monday through Thursday, at straight time, with Friday used as a make-up day for a day lost to inclement weather. If Friday is not a make-up day, all hours on Friday shall be paid at time and one-half the hourly rate.

**RECOGNIZED HOLIDAYS:** New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. Sunday holidays observed the following Monday. Veterans Day may be substituted for the day after Thanksgiving. However, in the trading of Veterans Day for the day after Thanksgiving, if overtime is worked on Veterans Day, it shall be paid at double the hourly rate.

**Hazardous Waste Work:**

- where Level A, B, or C protection is required: + \$5.00/hr
- other Hazardous Waste site: + \$1.00/hr

**FOR TIDE WORK** (pertains to tidal water): A contractor can start their job according to tide schedules (tide schedules are the various high and low tides related to this work) providing the eight (8) hour shift is completed between the hours of 5:00 AM and 6:30 PM.

**Effective Dates:**

	<b>03/19/2021</b>		<b>09/01/2021</b>	<b>03/01/2022</b>	<b>03/01/2023</b>
Rate	Fringe	Total	Total	Total	Total
45.75	33.23	78.98	80.28	84.03	87.53

**CLASSIFICATIONS:**

Paving Foreman

**Effective Dates:**

	<b>03/19/2021</b>		<b>09/01/2021</b>	<b>03/01/2022</b>	<b>03/01/2023</b>
Rate	Fringe	Total	Total	Total	Total
44.30	33.23	77.53	78.83	81.58	84.08

**CLASSIFICATIONS:**

Head Raker

**Effective Dates:**

	<b>03/19/2021</b>		<b>09/01/2021</b>	<b>03/01/2022</b>	<b>03/01/2023</b>
Rate	Fringe	Total	Total	Total	Total
44.45	33.23	77.68	78.98	81.73	84.23

**CLASSIFICATIONS:**

Screedman

**ASPHALT LABORERS - SOUTH**      **Rates Expiration Date :**

**Effective Dates:**

03/19/2021			09/01/2021	03/01/2022	03/01/2023
Rate	Fringe	Total	Total	Total	Total
43.90	33.23	77.13	78.43	81.18	83.68

**CLASSIFICATIONS:**

Tampers, Smoothers, Kettlemen,  
Painters, Shovelers, Roller Boys

**Effective Dates:**

03/19/2021			09/01/2021	03/01/2022	03/01/2023
Rate	Fringe	Total	Total	Total	Total
44.00	33.23	77.23	78.53	81.28	83.78

**CLASSIFICATIONS:**

Milling Controller

**Effective Dates:**

03/19/2021			09/01/2021	03/01/2022	03/01/2023
Rate	Fringe	Total	Total	Total	Total
44.20	33.23	77.43	78.73	81.48	83.98

**CLASSIFICATIONS:**

Traffic Control Coordinator

**Effective Dates:**

03/19/2021			09/01/2021	03/01/2022	03/01/2023
Rate	Fringe	Total	Total	Total	Total
44.15	33.23	77.38	78.68	81.43	83.93

**CLASSIFICATIONS:**

Raker, Luteman

**TEST BORING PRELIMINARY TO CONSTRUCTION-NORTH**      **Rates Expiration Date :**

THESE RATES APPLY IN THE FOLLOWING COUNTIES ONLY:  
Bergen, Essex, Hudson, Middlesex, Morris, Passaic, Somerset, Union

**SHIFT DIFFERENTIAL:**

Employees on a shift other than between the hours of 8:00 AM and 5:00 PM shall receive an additional \$2.00 per hour.

**OVERTIME:**

Hours in excess of 8 per day, Monday through Friday, and all hours on Saturday shall be paid at time and one-half the regular rate. All hours on Sundays and holidays shall be paid at double the regular rate.

**RECOGNIZED HOLIDAYS:** New Year's Day, Memorial Day, July 4th, Labor Day, Thanksgiving Day, and Christmas Day. Sunday holidays observed the following Monday.

Hazardous Waste Pay (for Levels A, B, and C): an additional 15% of the hourly rate, per hour.

A newly hired Helper with no experience in the industry shall be paid as follows:

- 1st year on the job - 70% of Helper wage rate
- 2nd year on the job - 80% of Helper wage rate
- 3rd year on the job - 90% of Helper wage rate
- All helpers receive full fringe benefit rate.

**Effective Dates:**

10/18/2020			10/18/2021	10/18/2022
Rate	Fringe	Total	Total	Total
32.92	29.50	62.42	64.17	65.92

**CLASSIFICATIONS:**

Helper (4th year helper)

**Effective Dates:**

10/18/2020			10/18/2021	10/18/2022
Rate	Fringe	Total	Total	Total
41.74	29.50	71.24	73.24	75.24

**CLASSIFICATIONS:**

Driller

**Effective Dates:**

10/18/2020			10/18/2021	10/18/2022
Rate	Fringe	Total	Total	Total
47.78	29.50	77.28	79.28	81.28

**CLASSIFICATIONS:**

Foreman

**HEAVY & GENERAL LABORERS - NORTH**      **Rates Expiration Date :**

THESE RATES APPLY IN THE FOLLOWING COUNTIES ONLY:

Bergen, Essex, Hudson, Hunterdon, Middlesex, Monmouth, Morris, Passaic, Somerset, Sussex, Union, Warren

{For apprentice rates refer to "Laborer - Heavy & General" apprentice rates in any county rate package}

The regular workday consists of 8 hours, starting at 7:00 AM or 8:00 AM.

**SHIFT DIFFERENTIALS:**

- Shifts must start at 3:00 PM, 4:00 PM, 12:00 AM, or 1:00 AM, to be considered shift work, except when the project owner mandates special hours of work in the job specifications, in which case those hours may be considered shift work.
- When such hours are mandated by the project owner, a shift that begins before midnight on Friday and ends on Saturday morning, or that begins at or after 8:00 PM on Sunday and ends on Monday morning may be paid at the shift differential rate.
- Shifts shall receive an additional \$3.00 per hour.

FOR TIDE WORK (pertains to tidal water): A contractor can start their job according to tide schedules (tide schedules are the various high and low tides related to this work) providing the eight (8) hour shift is completed between the hours of 5:00 AM and 6:30 PM.

**OVERTIME:**

- Hours in excess of 8 per day, Monday through Friday, or outside of the regular workday that are not shift work, and all hours on Saturdays, shall be paid at time and one-half the hourly rate. All hours on Sundays and holidays shall be paid at double the hourly rate.
- Four 10-hour days may be worked, Monday through Thursday, at straight time, with Friday used as a make-up day for a day lost to inclement weather. If Friday is not a make-up day, all hours on Friday shall be paid at time and one-half the hourly rate.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. Sunday holidays observed the following Monday. Veterans Day may be substituted for the day after Thanksgiving. However, in the trading of Veterans Day for the day after Thanksgiving, if overtime is worked on Veterans Day, it shall be paid at double the hourly rate.

**Hazardous Waste Work:**

- where Level A, B, or C protection is required: + \$5.00/hr
- other Hazardous Waste site: + \$1.00/hr

**Effective Dates:**

	03/03/2021		09/01/2021	03/01/2022	03/01/2023
Rate	Fringe	Total	Total	Total	Total
43.50	33.23	76.73	78.03	80.78	83.28

**CLASSIFICATIONS:**

**"D" Rate:**

basic, landscape, asphalt, slurry seal, or railroad track laborer; utility meter installer; flagman; salamander tender; pitman; dumpman; rakers or tampers on cold patch work; wrappers or coaters of pipe; waterproofer; timberman; wagon drill or drill master helper; powder carrier; magazine tender; signal man; power buggy operator; tree cutter; operator of basic power tools

**Effective Dates:**

	03/03/2021		09/01/2021	03/01/2022	03/01/2023
Rate	Fringe	Total	Total	Total	Total
44.20	33.23	77.43	78.73	81.48	83.98

**CLASSIFICATIONS:**

**"C" Rate:**

pipe layer; laser man; conduit or duct line layer; operator of jack hammer, chipping hammer, pavement breaker, concrete cutter, asphalt cutter, sheet hammer, or walk-behind saw cutter; sandblaster; acetylene cutting or burning; wagon drill, directional drill, or hydraulic drill operator; drill master; core driller; traffic control coordinator; asphalt raker or lute man



**HEAVY & GENERAL LABORERS - NORTH**

**Rates Expiration Date :**

**Effective Dates:**

03/03/2021			09/01/2021	03/01/2022	03/01/2023
Rate	Fringe	Total	Total	Total	Total
44.45	33.23	77.68	78.98	81.73	84.23

**CLASSIFICATIONS:**

"B" Rate:

concrete finisher; setter of brick or stone pavers; stone cutter; form setter; manhole, catch basin, or inlet builder; asphalt screedman; rammer; hardscaping; gunite nozzle man

**Effective Dates:**

03/03/2021			09/01/2021	03/01/2022	03/01/2023
Rate	Fringe	Total	Total	Total	Total
48.00	33.23	81.23	82.53	85.28	87.78

**CLASSIFICATIONS:**

"A" Rate:

blaster

**Effective Dates:**

03/03/2021			09/01/2021	03/01/2022	03/01/2023
Rate	Fringe	Total	Total	Total	Total
45.75	33.23	78.98	80.28	84.03	87.53

**CLASSIFICATIONS:**

"FOREMAN" Rate:

labor foreman, asphalt foreman, drill foreman, pipe foreman, grade foreman, finisher foreman, concrete foreman

**Effective Dates:**

03/03/2021			09/01/2021	03/01/2022	03/01/2023
Rate	Fringe	Total	Total	Total	Total
46.75	33.23	79.98	81.28	85.03	88.53

**CLASSIFICATIONS:**

"GENERAL FOREMAN" Rate

**HEAVY & GENERAL LABORERS - SOUTH**     **Rates Expiration Date :**

THESE RATES APPLY IN THE FOLLOWING COUNTIES ONLY:

Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester, Mercer, Ocean, Salem

{For apprentice rates refer to "Laborer - Heavy & General" apprentice rates in any county rate package}

The regular workday consists of 8 hours, starting at 7:00 AM or 8:00 AM.

**SHIFT DIFFERENTIALS:**

- Shifts must start at 3:00 PM, 4:00 PM, 12:00 AM, or 1:00 AM, to be considered shift work, except when the project owner mandates special hours of work in the job specifications, in which case those hours may be considered shift work.
- When such hours are mandated by the project owner, a shift that begins before midnight on Friday and ends on Saturday morning, or that begins at or after 8:00 PM on Sunday and ends on Monday morning may be paid at the shift differential rate.
- Shifts shall receive an additional \$3.00 per hour.

FOR TIDE WORK (pertains to tidal water): A contractor can start their job according to tide schedules (tide schedules are the various high and low tides related to this work) providing the eight (8) hour shift is completed between the hours of 5:00 AM and 6:30 PM.

**OVERTIME:**

- Hours in excess of 8 per day, Monday through Friday, or outside of the regular workday that are not shift work, and all hours on Saturdays, shall be paid at time and one-half the hourly rate. All hours on Sundays and holidays shall be paid at double the hourly rate.
- Four 10-hour days may be worked, Monday through Thursday, at straight time, with Friday used as a make-up day for a day lost to inclement weather. If Friday is not a make-up day, all hours on Friday shall be paid at time and one-half the hourly rate.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. Sunday holidays observed the following Monday. Veterans Day may be substituted for the day after Thanksgiving. However, in the trading of Veterans Day for the day after Thanksgiving, if overtime is worked on Veterans Day, it shall be paid at double the hourly rate.

**Hazardous Waste Work:**

- where Level A, B, or C protection is required: + \$5.00/hr
- other Hazardous Waste site: + \$1.00/hr

**Effective Dates:**

03/10/2021			09/01/2021	03/01/2022	03/01/2023
Rate	Fringe	Total	Total	Total	Total
43.50	33.23	76.73	78.03	80.78	83.28

**CLASSIFICATIONS:**

basic, landscape, or railroad track laborer; utility meter installer; flagman; salamander tender; pitman; dumpman; rakers or tampers on cold patch work; wrappers or coaters of pipe; waterproofers; tree cutter, timberman

**Effective Dates:**

03/10/2021			09/01/2021	03/01/2022	03/01/2023
Rate	Fringe	Total	Total	Total	Total
43.50	33.23	76.73	78.03	80.78	83.28

**CLASSIFICATIONS:**

wagon drill or drill master helper; powder carrier; magazine tender; signal man

**HEAVY & GENERAL LABORERS - SOUTH**

**Rates Expiration Date :**

**Effective Dates:**

03/10/2021			09/01/2021	03/01/2022	03/01/2023
Rate	Fringe	Total	Total	Total	Total
44.20	33.23	77.43	78.73	81.48	83.98

**CLASSIFICATIONS:**

pipe layer; laser man; conduit or duct line layer; operator of jack hammer, chipping hammer, pavement breaker, concrete cutter, asphalt cutter, sheet hammer, or walk-behind saw cutter; sandblaster; acetylene cutting or burning

**Effective Dates:**

03/10/2021			09/01/2021	03/01/2022	03/01/2023
Rate	Fringe	Total	Total	Total	Total
44.20	33.23	77.43	78.73	81.48	83.98

**CLASSIFICATIONS:**

wagon or directional drill operator; drill master

**Effective Dates:**

03/10/2021			09/01/2021	03/01/2022	03/01/2023
Rate	Fringe	Total	Total	Total	Total
48.00	33.23	81.23	82.53	85.28	87.78

**CLASSIFICATIONS:**

blaster

**Effective Dates:**

03/10/2021			09/01/2021	03/01/2022	03/01/2023
Rate	Fringe	Total	Total	Total	Total
45.75	33.23	78.98	80.28	84.03	87.53

**CLASSIFICATIONS:**

labor foreman, drill foreman, pipe foreman, grade foreman, finisher foreman, concrete foreman

**Effective Dates:**

03/10/2021			09/01/2021	03/01/2022	03/01/2023
Rate	Fringe	Total	Total	Total	Total
46.75	33.23	79.98	81.28	85.03	88.53

**CLASSIFICATIONS:**

general foreman

HEAVY & GENERAL LABORERS - SOUTH

Rates Expiration Date :

Effective Dates:

03/10/2021			09/01/2021	03/01/2022	03/01/2023
Rate	Fringe	Total	Total	Total	Total
44.45	33.23	77.68	78.98	81.73	84.23

CLASSIFICATIONS:

concrete finisher; setter of brick or stone pavers; stone cutter; form setter; manhole, catch basin, or inlet builder; rammer; gunite nozzle man

**PIPELINE - MAINLINE TRANSMISSION**      **Rates Expiration Date :**

These rates apply to the following: welding on Transportation Mainline pipe lines (cross-country pipe lines, or any segments thereof, transporting coal, gas, oil, water or other transportable materials, vapors or liquids, including portions of such pipe lines within private property boundaries up to the final metering station or connection - the point where a valve, consumer connection, or town border station divides mainline transmission lines or higher pressure lateral and branch lines from lower pressure distribution systems).

**PER DIEM PAYMENT:**

In addition to the total wage rate paid for each craft, the following per diem (per day) amounts must also be paid - Pipeline Journeyman: \$80.50; Pipeline Journeyman Welder: \$140.50; and Pipeline Helper: \$64.50. Note: in order to receive the per diem payment an employee must work a minimum of 8 hours in a 24 hour period.

**NOTES:**

- Journeymen employed as "stringer bead" welders and journeymen who are regularly employed as "hot-pass" welders shall receive \$1.00 per hour more than other journeymen.
- Welders running "stringer bead" or "hot-pass" on "cutouts" or "tie-ins" on a production basis shall be paid \$1.00 per hour above the journeymen rate.
- Whenever a welder helper is employed using a power buffer or power grinder immediately behind the stringer bead and/or hot-pass welders, and the pipe gang is set on a production basis, the helper shall be paid \$2.00 per hour above the helper rate.
- If back welding is performed inside a pipe under either or both of the following conditions, the welder engaged in the welding will receive \$3.00 per hour above the regular rate for the job only for the days on which such back welding is performed:
  - The employer elects, as a regular procedure, to back weld each line-up. This condition is not intended to apply to occasional back welding performed by the pipe gang to repair a bead, to rectify a "high-lo" condition or wall thickness, etc.
  - A welder is required to back weld a completed weld behind the firing line.
- If the welder helper is required to go inside the pipe for the purpose of brushing, buffing and grinding the weld, they shall receive a wage rate \$1.00 per hour above the regular helper rate for the days involved.
- Welders working on "hot work" shall be paid \$2.00 per hour above the regular rate for each day engaged in such work. "Hot work" is defined as work on lines in service where there is the danger of fire or explosion.

The regular workday shall be 8 hours, between 8:00 AM and 4:30 PM.

**OVERTIME:**

Hours in excess of 8 per day, and all hours on Sundays shall be paid at time and one-half the regular rate, inclusive of benefits. All hours on holidays shall be paid at double the regular rate, inclusive of benefits.

**RECOGNIZED HOLIDAYS:** New Year's Day, July 4th, Labor Day, Thanksgiving Day, and Christmas Day. Sunday holidays observed the following Monday.

**Effective Dates:**

**06/15/2021**

Rate	Fringe	Total
54.64	33.55	88.19

**CLASSIFICATIONS:**

Pipeline Journeyman Welder

TERRITORY  
ENTIRE STATE

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT  
PREVAILING WAGE RATE DETERMINATION

PIPELINE - MAINLINE TRANSMISSION

Rates Expiration Date :

Effective Dates:

06/15/2021

Rate	Fringe	Total
54.64	33.55	88.19

**CLASSIFICATIONS:**

Pipeline Journeyman

Effective Dates:

06/15/2021

Rate	Fringe	Total
33.84	23.17	57.01

**CLASSIFICATIONS:**

Pipeline Helper

**PIPELINE - GAS DISTRIBUTION**      **Rates Expiration Date :**

These rates apply to the following: welding on gas line distribution systems (that portion of the gas distribution system placed in streets, roads, subways, tunnels, viaducts, highways and easements which serves the users of gas).

**SHIFT DIFFERENTIALS:**

An "irregular" shift may start any time from 5:00 PM to 12:00 AM, Monday through Friday, and shall receive an additional 15% of the regular rate per hour, inclusive of benefits.

**OVERTIME:**

Hours in excess of forty per week, and all hours on Saturdays shall be paid at time and one-half the regular rate, inclusive of benefits. All hours on Sundays and holidays shall be paid at double the regular rate, inclusive of benefits.

**RECOGNIZED HOLIDAYS:** New Year's Day, Memorial Day, July 4th, Labor Day, Thanksgiving Day, and Christmas Day. Sunday holidays observed the following Monday.

**Effective Dates:**

11/02/2020			11/01/2021	11/01/2022
Rate	Fringe	Total	Total	Total
61.50	27.23	88.73	91.23	93.73

**CLASSIFICATIONS:**

Pipeline Journeyman Welder

**Effective Dates:**

11/02/2020			11/01/2021	11/01/2022
Rate	Fringe	Total	Total	Total
61.50	27.23	88.73	91.23	93.73

**CLASSIFICATIONS:**

Pipeline Journeyman

**Effective Dates:**

11/02/2020			11/01/2021	11/01/2022
Rate	Fringe	Total	Total	Total
39.46	19.88	59.34	61.01	62.68

**CLASSIFICATIONS:**

Pipeline Helper

**ASPHALT LABORERS- NORTH**     **Rates Expiration Date :**

THESE RATES APPLY IN THE FOLLOWING COUNTIES ONLY:

Bergen, Essex, Hudson, Hunterdon, Middlesex, Monmouth, Morris, Passaic, Somerset, Sussex, Union, Warren  
{For apprentice rates refer to "Laborer - Heavy & General" apprentice rates in any county rate package}

The regular workday consists of 8 hours, starting at 7:00 AM or 8:00 AM.

**SHIFT DIFFERENTIALS:**

- Shifts must start at 3:00 PM, 4:00 PM, 12:00 AM, or 1:00 AM, to be considered shift work, except when the project owner mandates special hours of work in the job specifications, in which case those hours may be considered shift work.
- When such hours are mandated by the project owner, a shift that begins before midnight on Friday and ends on Saturday morning, or that begins at or after 8:00 PM on Sunday and ends on Monday morning may be paid at the shift differential rate.
- Shifts shall receive an additional \$3.00 per hour.

**OVERTIME:**

- Hours in excess of 8 per day, Monday through Friday, or outside of the regular workday that are not shift work, and all hours on Saturdays, shall be paid at time and one-half the hourly rate. All hours on Sundays and holidays shall be paid at double the hourly rate.
- Four 10-hour days may be worked, Monday through Thursday, at straight time, with Friday used as a make-up day for a day lost to inclement weather. If Friday is not a make-up day, all hours on Friday shall be paid at time and one-half the hourly rate.

**RECOGNIZED HOLIDAYS:** New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. Sunday holidays observed the following Monday. Veterans Day may be substituted for the day after Thanksgiving. However, in the trading of Veterans Day for the day after Thanksgiving, if overtime is worked on Veterans Day, it shall be paid at double the hourly rate.

**Hazardous Waste Work:**

- where Level A, B, or C protection is required: + \$5.00/hr
- other Hazardous Waste site: + \$1.00/hr

**FOR TIDE WORK** (pertains to tidal water): A contractor can start their job according to tide schedules (tide schedules are the various high and low tides related to this work) providing the eight (8) hour shift is completed between the hours of 5:00 AM and 6:30 PM.

**Effective Dates:**

<b>03/03/2021</b>			<b>09/01/2021</b>	<b>03/01/2022</b>	<b>03/01/2023</b>
Rate	Fringe	Total	Total	Total	Total
45.75	33.23	78.98	80.28	84.03	87.53

**CLASSIFICATIONS:**

Asphalt Foreman

**Effective Dates:**

<b>03/03/2021</b>			<b>09/01/2021</b>	<b>03/01/2022</b>	<b>03/01/2023</b>
Rate	Fringe	Total	Total	Total	Total
44.45	33.23	77.68	78.98	81.73	84.23

**CLASSIFICATIONS:**

Asphalt Screedman

**Effective Dates:**

<b>03/03/2021</b>			<b>09/01/2021</b>	<b>03/01/2022</b>	<b>03/01/2023</b>
Rate	Fringe	Total	Total	Total	Total
44.20	33.23	77.43	78.73	81.48	83.98

**CLASSIFICATIONS:**

Asphalt Raker or Lute Man



TERRITORY  
ENTIRE STATE

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT  
PREVAILING WAGE RATE DETERMINATION

ASPHALT LABORERS- NORTH      Rates Expiration Date :

Effective Dates:

03/03/2021			09/01/2021	03/01/2022	03/01/2023
Rate	Fringe	Total	Total	Total	Total
43.50	33.23	76.73	78.03	80.78	83.28

CLASSIFICATIONS:

Asphalt Laborer

**ELECTRICIAN- UTILITY WORK (NORTH)**     **Rates Expiration Date :**

Electrician-Utility Work (North)

(For apprentice rates refer to Electrician-Utility Work (North) in any county rate package).

These rates apply to work contracted for by the following utility companies:

Public Service Electric & Gas Co. of NJ, GPU Energy, Borough of Madison Electric Department, Sussex Rural Electric Cooperative, Rockland Utilities, and Butler Municipal Electric Co.

These rates do not apply to work on substations or switching stations.

For Utility work contracted for by a utility company other than those listed above or those listed under "Electrician-Utility Work (South), see the "Outside Commercial Rates" for the county in which the jobsite is located.

\* FOR OUTSIDE COMMERCIAL RATES PLEASE SEE COUNTY RATES

The regular workday is 8 hours, between 6:00 AM and 6:00 PM.

FOR EMERGENCY WORK ONLY: (emergency work is defined as work caused by storm, catastrophe, act of god, and circumstances beyond the control of the employer)-all hours of work shall be paid at double the hourly rate.

**SHIFT DIFFERENTIALS:**

Shift work must run for a minimum of 5 consecutive workdays.

2nd shift (between the hours of 4:30 PM and 1:00 AM): 8 hours of work + 17.3% of the regular rate, inclusive of benefits.

3rd shift (between the hours of 12:30 AM and 9:00 AM): 8 hours of work + 31.4% of the regular rate per hour, inclusive of benefits.

**OVERTIME:**

Hours in excess of 8 per day, or before or after the regular workday Monday through Friday, that is not shift work, and all hours on Saturday shall be paid at time and one-half the regular rate, inclusive of benefits. All hours on Sundays and holidays shall be paid at double the hourly rate, inclusive of benefits.

Four 10-hour days may be worked, at straight time, between 7:00 AM and 6:30 PM, Monday through Thursday.

**RECOGNIZED HOLIDAYS:**

New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day and Christmas Day, or day on which they are legally observed.

**Effective Dates:**

**11/29/2020**

Rate	Fringe	Total
57.30	39.54	96.84

**CLASSIFICATIONS:**

Chief Lineman

**Effective Dates:**

**11/29/2020**

Rate	Fringe	Total
54.06	37.30	91.36

**CLASSIFICATIONS:**

Journeyman Lineman

**ELECTRICIAN- UTILITY WORK (NORTH)**

**Rates Expiration Date :**

**Effective Dates:**

**11/29/2020**

Rate	Fringe	Total
54.06	37.30	91.36

**CLASSIFICATIONS:**

Special License Operator

**Effective Dates:**

**11/29/2020**

Rate	Fringe	Total
53.52	36.92	90.44

**CLASSIFICATIONS:**

Transit Man

**Effective Dates:**

**11/29/2020**

Rate	Fringe	Total
51.90	35.80	87.70

**CLASSIFICATIONS:**

Line Equipment Operator

**Effective Dates:**

**11/29/2020**

Rate	Fringe	Total
45.41	31.32	76.73

**CLASSIFICATIONS:**

Dynamite Man

**Effective Dates:**

**11/29/2020**

Rate	Fringe	Total
67.57	46.62	114.19

**CLASSIFICATIONS:**

General Foreman

**Effective Dates:**

**11/29/2020**

Rate	Fringe	Total
62.17	42.88	105.05

**CLASSIFICATIONS:**

Assistant General Foreman

**ELECTRICIAN- UTILITY WORK (NORTH)**

**Rates Expiration Date :**

**Effective Dates:**

**11/29/2020**

Rate	Fringe	Total
60.55	41.77	102.32

**CLASSIFICATIONS:**

Line Foreman

**Effective Dates:**

**11/29/2020**

Rate	Fringe	Total
43.79	30.20	73.99

**CLASSIFICATIONS:**

Street Light Mechanical Leader

**Effective Dates:**

**11/29/2020**

Rate	Fringe	Total
41.63	28.71	70.34

**CLASSIFICATIONS:**

Groundman Winch Operator

**Effective Dates:**

**11/29/2020**

Rate	Fringe	Total
41.63	28.71	70.34

**CLASSIFICATIONS:**

Groundman Truck Operator

**Effective Dates:**

**11/29/2020**

Rate	Fringe	Total
41.08	28.35	69.43

**CLASSIFICATIONS:**

Street Light Mechanic

**Effective Dates:**

**11/29/2020**

Rate	Fringe	Total
41.08	28.35	69.43

**CLASSIFICATIONS:**

Line Equipment Mechanic

**ELECTRICIAN- UTILITY WORK (NORTH)**      **Rates Expiration Date :**

**Effective Dates:**

**11/29/2020**

Rate	Fringe	Total
35.14	24.24	59.38

**CLASSIFICATIONS:**

Groundman 2nd Year

**Effective Dates:**

**11/29/2020**

Rate	Fringe	Total
32.44	22.36	54.80

**CLASSIFICATIONS:**

Groundman 1st Year

**Effective Dates:**

**11/29/2020**

Rate	Fringe	Total
53.52	36.92	90.44

**CLASSIFICATIONS:**

Line Equipment Foreman

**ELECTRICIAN- UTILITY WORK (SOUTH)**     **Rates Expiration Date :**

Electrician-Utility Work (South)

(For apprentice rates refer to Electrician-Utility Work (South) in any county rate package).

These rates apply to work contracted for by the following utility company:

Atlantic City Electric.

These rates do not apply to work on substations or switching stations.

For utility work contracted for by a utility company other than the one listed above or those listed under "Electrician-Utility Work (North)", see the "Outside Commercial Rates" for the county in which the jobsite is located.

\* FOR OUTSIDE COMMERCIAL RATES PLEASE SEE COUNTY RATES

The regular workday is 8 hours, between 7:00 AM and 4:30 PM.

FOR EMERGENCY WORK ONLY: (emergency work is defined as work caused by storm, catastrophe, act of god, and circumstances beyond the control of the employer)- all hours of work shall be paid at double the hourly rate.

**SHIFT DIFFERENTIALS:**

Shift work must run for a minimum of 5 consecutive workdays.

When two (2) or three (3) shifts are worked the following shall apply:

1st shift (between the hours of 8:00 AM and 4:30 PM)

2nd shift (between the hours of 4:30 PM and 12:30 AM): 8 hours of work + 10% of the regular rate of pay for 7.5 hours worked.

3rd shift (between the hours of 12:30 AM and 8:00 AM): 8 hours of work + 15% of the regular rate of pay for 7 hours worked.

**OVERTIME:**

Hours in excess of 8 per day, or before or after the regular workday Monday through Friday, that is not shift work, and all hours on Saturday shall be paid at time and one-half the regular rate. All hours on Sundays and Holidays shall be paid double the hourly rate.

Four 10-hour days may be worked, at straight time, between 6:00 AM and 6:00 PM, Monday through Thursday with Friday used as a make-up day.

**RECOGNIZED HOLIDAYS:**

New Year's Day, Memorial Day, July 4th, Labor Day, Veterans' Day, Thanksgiving Day and Christmas Day or on days celebrated.

**WORKING RULES:**

There shall be a Foreman in charge of each work crew. No crews are to exceed twelve (12) men, including Foremen.

There shall be a General Foreman designated for transmission work when three (3) or more crews are on the same job and for distribution work where there are more than twenty (20) employees on site.

A small job crew shall consist of five (5) or less employees, one (1) of the Journeyman Linemen in the crew shall be designated as a Small Job Foreman.

Work performed from ladders and/or mechanical lift equipment shall be the work of Linemen and/or Apprentices.

On new construction, fitting and framing poles, towers or structures may be done by Journeymen and/or Apprentices. Groundmen may assist, but may not perform any work which would be performed by Linemen if assembled in the air.

There shall be a Journeyman Lineman in each pole setting, erection, grounding, wire and cable-pulling crew of more than three (3) men.

**Effective Dates:**

**12/02/2020**

Rate	Fringe	Total
63.56	51.00	114.56

**CLASSIFICATIONS:**

General Foreman

**ELECTRICIAN- UTILITY WORK (SOUTH)**

**Rates Expiration Date :**

**Effective Dates:**

**12/02/2020**

Rate	Fringe	Total
56.43	46.88	103.31

**CLASSIFICATIONS:**

Foreman

**Effective Dates:**

**12/02/2020**

Rate	Fringe	Total
53.46	45.13	98.59

**CLASSIFICATIONS:**

Small Job Foreman

**Effective Dates:**

**12/02/2020**

Rate	Fringe	Total
49.50	42.79	92.29

**CLASSIFICATIONS:**

Heavy Equipment Operator

**Effective Dates:**

**12/02/2020**

Rate	Fringe	Total
49.50	42.79	92.29

**CLASSIFICATIONS:**

Cable Splicer

**Effective Dates:**

**12/02/2020**

Rate	Fringe	Total
49.50	42.79	92.29

**CLASSIFICATIONS:**

Journeyman Lineman

**Effective Dates:**

**12/02/2020**

Rate	Fringe	Total
49.50	42.79	92.29

**CLASSIFICATIONS:**

Journeyman Welder

**ELECTRICIAN- UTILITY WORK (SOUTH)**      **Rates Expiration Date :**

**Effective Dates:**

**12/02/2020**

Rate	Fringe	Total
49.50	42.79	92.29

**CLASSIFICATIONS:**

Journeyman Painter

**Effective Dates:**

**12/02/2020**

Rate	Fringe	Total
39.60	36.94	76.54

**CLASSIFICATIONS:**

Light Equipment Operator

**Effective Dates:**

**12/02/2020**

Rate	Fringe	Total
34.65	34.00	68.65

**CLASSIFICATIONS:**

Groundman Truck Driver

**Effective Dates:**

**12/02/2020**

Rate	Fringe	Total
32.18	32.55	64.73

**CLASSIFICATIONS:**

Groundman 3rd Year

**Effective Dates:**

**12/02/2020**

Rate	Fringe	Total
29.70	31.09	60.79

**CLASSIFICATIONS:**

Groundman 2nd Year

**Effective Dates:**

**12/02/2020**

Rate	Fringe	Total
27.23	29.62	56.85

**CLASSIFICATIONS:**

Groundman 1st Year



TERRITORY  
ENTIRE STATE

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT  
PREVAILING WAGE RATE DETERMINATION

ELECTRICIAN- UTILITY WORK (SOUTH)      Rates Expiration Date :

Effective Dates:

12/02/2020

Rate	Fringe	Total
21.78	26.40	48.18

**CLASSIFICATIONS:**

Flagman

**HEAVY & GENERAL LABORERS- NEW TRANS HUDSON TUNNELS**      **Rates Expiration Date :**

**\*\*THESE RATES APPLY TO CONSTRUCTION ON NEW TRANS HUDSON TUNNELS ONLY\*\***

{For apprentice rates refer to "Laborer - Heavy & General" apprentice rates in any county rate package}

The regular workday consists of 8 hours, starting at 7:00 AM or 8:00 AM.

**SHIFT DIFFERENTIALS:**

- Shifts must start at 3:00 PM, 4:00 PM, 12:00 AM, or 1:00 AM, to be considered shift work, except when the project owner mandates special hours of work in the job specifications, in which case those hours may be considered shift work.
- When such hours are mandated by the project owner, a shift that begins before midnight on Friday and ends on Saturday morning, or that begins at or after 8:00 PM on Sunday and ends on Monday morning may be paid at the shift differential rate.
- Shifts shall receive an additional \$3.00 per hour.

**OVERTIME:**

- Hours in excess of 8 per day, Monday through Friday, or outside of the regular workday that are not shift work, and all hours on Saturdays, shall be paid at time and one-half the hourly rate. All hours on Sundays and holidays shall be paid at double the hourly rate.
- Four 10-hour days may be worked, Monday through Thursday, at straight time, with Friday used as a make-up day for a day lost to inclement weather. If Friday is not a make-up day, all hours on Friday shall be paid at time and one-half the hourly rate.

**RECOGNIZED HOLIDAYS:** New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. Sunday holidays observed the following Monday. Veterans Day may be substituted for the day after Thanksgiving. However, in the trading of Veterans Day for the day after Thanksgiving, if overtime is worked on Veterans Day, it shall be paid at double the hourly rate.

**Hazardous Waste Work:**

- where Level A, B, or C protection is required: + \$3.00/hr
- other Hazardous Waste site: + \$1.00/hr

**Effective Dates:**

	<b>03/03/2021</b>		<b>09/01/2021</b>	<b>03/01/2022</b>	<b>03/01/2023</b>
Rate	Fringe	Total	Total	Total	Total
69.38	33.23	102.61	104.31	107.86	111.19

**CLASSIFICATIONS:**

Walking Boss & Superintendent

**Effective Dates:**

	<b>03/03/2021</b>		<b>09/01/2021</b>	<b>03/01/2022</b>	<b>03/01/2023</b>
Rate	Fringe	Total	Total	Total	Total
68.93	33.23	102.16	103.86	107.41	110.74

**CLASSIFICATIONS:**

Heading Foreman, Shaft Foreman, Rod Foreman, Electrical Foreman, Rigging Foreman

**HEAVY & GENERAL LABORERS- NEW TRANS HUDSON TUNNELS**      **Rates Expiration Date :**

**Effective Dates:**

03/03/2021			09/01/2021	03/01/2022	03/01/2023
Rate	Fringe	Total	Total	Total	Total
68.18	33.23	101.41	103.11	106.66	109.99

**CLASSIFICATIONS:**

Iron Foreman, Caulking Foreman, Form Foreman, Cement Finishing Foreman, Concrete Foreman, Track Foreman, Clean-up Foreman, Grout Foreman

**Effective Dates:**

03/03/2021			09/01/2021	03/01/2022	03/01/2023
Rate	Fringe	Total	Total	Total	Total
71.93	33.23	105.16	106.86	110.41	113.74

**CLASSIFICATIONS:**

Blaster

**Effective Dates:**

03/03/2021			09/01/2021	03/01/2022	03/01/2023
Rate	Fringe	Total	Total	Total	Total
67.35	33.23	100.58	102.28	105.83	109.16

**CLASSIFICATIONS:**

Top Labor Foreman

**Effective Dates:**

03/03/2021			09/01/2021	03/01/2022	03/01/2023
Rate	Fringe	Total	Total	Total	Total
66.83	33.23	100.06	101.76	105.31	108.64

**CLASSIFICATIONS:**

Skilled Men (including Caulker, Powder Carrier, all other skilled men)

Skilled Men (including Miner, Drill Runner, Iron Man, Conveyor Man, Maintenance Man, Safety Miner, Rigger, Block Layer, Cement Finisher, Rod Man)

**Effective Dates:**

03/03/2021			09/01/2021	03/01/2022	03/01/2023
Rate	Fringe	Total	Total	Total	Total
66.60	33.23	99.83	101.53	105.08	108.41

**CLASSIFICATIONS:**

Semi-Skilled Men (including Bell or Signal Man top or bottom, Form Worker & Mover, Concrete Worker, Shaft Man, Tunnel Laborer, Caulker's Helper, all other semi-skilled)

Semi-Skilled Men (including Miner's Helper, Chuck Tender, Track Man, Nipper, Brake Man, Derail Man, Cable Man, Hose Man, Gravel Man, Form Man)

TERRITORYNEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

ENTIRE STATEPREVAILING WAGE RATE DETERMINATION

HEAVY & GENERAL LABORERS- NEW TRANS HUDSON TUNNELS

Rates Expiration Date :

Effective Dates:

03/03/2021			09/01/2021	03/01/2022	03/01/2023
Rate	Fringe	Total	Total	Total	Total
66.00	33.23	99.23	100.93	104.48	107.81

CLASSIFICATIONS:

All others (including Powder Watchman, Change House Attendant, Top Laborer, Job Steward)

# Appendix 2

## Bid Express Instructions

Follow this detailed guide to get set up and start bidding on bidexpress.com today!

### How to register and get your Info Tech Digital ID...

1. To complete the registration process for your company, go to [www.bidexpress.com](http://www.bidexpress.com) and click the blue Register button at the top right of the page.
2. Enter your name in the First Name and Last Name fields. This name will appear on the registration page for your company. Type in your email address.  
  
**NOTE:** *This email address will become your username for the account. It is also where all email notifications from the agencies with which you bid will be received.*
3. Create a secure password for your account. The password must be at least eight characters long and contain at least one capital letter, one lowercase letter, one number, and one symbol.
4. Select a security question and provide your answer. The answer to this question will be requested of you each time you've clicked that you've forgotten your account password and is case sensitive.
5. Next, complete the Business Name and contact information fields. After doing so, agree to the Privacy Policy, Terms of Use, and DMCA Policy at the bottom of the registration page and click the green **REGISTER** button. The Bid Express service sends a registration confirmation email to the address entered as the username.
6. Click the Activate Account link in the email. Enter the password you used on the registration page in the Password field and click **ACTIVATE**. The Bid Express service displays the HOME tab where you must install the Info Tech Express Sign Tool and Generate an Info Tech Digital ID.
7. Click **INSTALL SIGN TOOL**. Note that you will have to install the sign tool on every computer you wish to set up for bidding. Once installed, close your internet browser and start it back up.
8. Click the blue **GENERATE DIGITAL ID** link. This will walk you step by step through creating a Digital ID for your company.
9. The blue and gray My Info Tech Digital ID page appears. Click the blue **CREATE** button to continue your ID generation.
10. A United States map pop-up will appear. Select the agency or agencies with which you intend to do business with and click the blue **NEXT**.

**NOTE:** *If you do not see the agency you plan to bid to, you may need to alternatively subscribe to our second site, [bidx.com](http://bidx.com). You may click the "Try the Bidx.com service" link from the top of this same pop-up to navigate to the correct site.*

11. A Create an Info Tech Digital ID pop-up will appear. Confirm that the name of the person listed in the screen is the authorized signer for your company, your company name matches how you would like to submit bids to the agency(s), and click **SUBMIT**.

**NOTE:** *If the person listed for your company is not the authorized signer, cancel ID generation. The back of this quick start guide will assist you with changing the contact information associated with your login, or inviting the appropriate authorized signer to your company.*

12. The wizard will load and then prompt you to back up your new Digital ID. Click **BACKUP**, then enter a password for the backup file of your Digital ID in the Password and Verify Password fields. This password will be used when importing the Digital ID to another computer for bidding. DO NOT FORGET THIS PASSWORD, as there is no way for the Bid Express team to retrieve or reset it. Click **OK**.

13. Save the Digital ID backup file to a memory stick, CD, company server, or other secure location outside of this computer for safe keeping.
14. Add the signer's name to the file name from Info Tech Express Digital ID.pfx so it will more recognizable when used for importing the backup file, (eg. John\_Smith\_Digital\_ID.pfx). This will ensure you do not confuse your company's other Digital IDs. Once you have entered the Digital ID name and location, click **SAVE**. The Bid Express service returns you to the Bid Express Digital ID Generation window. Click **NEXT**.
15. Click **PRINT** to print a copy of the new registration page to have signed/notarized and mailed to our Customer Support team; the address will be on the page.  
  
**NOTE:** *Customer Support must receive this page for processing before the due date of the job you wish to bid. When you have finished printing the document, close the print window and click **FINISH**.*
16. When your Digital ID is activated, the red Digital ID field on the home page of your new account will disappear and you will be able to begin purchasing and bidding on solicitations posted by the agencies with which you work.

## How to bid...

---

1. To select a solicitation to bid, click on the drop down menu in the top left corner of the screen and choose Bid Express. From the Bid Express homepage, click the Solicitations tab at the top of the screen. Find the solicitation from the list; if you have a keyword for the job, type it in the search box to the top right.
2. Click on the blue job name. When you've determined you want to bid the job, click the green Select for Bidding button at the top right. You will then be prompted to opt for the Pay As You Go approach or a Monthly Subscription. After completing your purchase, you will be navigated into the project to complete your bid.
3. As you are working, make sure to click Save Draft as you work. When the bid is ready for submission, simply click the green Submit Bid button at the top and then click Submit Bid again to confirm. The job will submit and you will receive an email for your bid submission receipt.

## Change your contact information or invite a user...

---

1. Click the drop down menu in the top left corner of the screen and select My Account.
2. If you do not wish to invite additional users to your business but need your Info Tech Digital ID to reflect the name of your authorized signer, click the blue **EDIT** button in the top right corner of the My Account section. Change just the First and Last Name fields and click **UPDATE**. You may now generate a digital ID to reflect this person's name.
3. If you need to invite a new user to your company, scroll down to the Employees field from the My Account screen. Type the email address of the additional user(s) and click Invite Employee.

**NOTE:** *You will need to assign the new user a role from this same screen after they've completed their registration, and a role from the Bid Express site. **CLICK** the Help tab at the top of the Bid Express page for an explanation of roles under the My Business section.*

4. Click the drop down in the top left corner of your account and select Bid Express to do so. You can manage the additional roles for each user from the My Business tab.

**NOTE:** *If you want to create a Joint Venture Digital ID for bidding, follow the steps above from the beginning. You will need to create a separate account for the Joint Venture because our system will see it as a separate company entirely.*

## Where to get help...

Customer support hours are **7:00 a.m. to 8:00 p.m. EST**, Monday through Friday (excluding major U.S. holidays). Our toll free number is **(888) 352-BIDX(2439)**, our email is **support@bidexpress.com**.